Honeywell
THE POWER OF CONNECTED

SmartLine Wireless Transmitter
User's manual

34-SW-25-01
Revision 3
December 2018

Honeywell Process Solutions

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About This Document

This document describes preparation, operation and maintenance of the SmartLine™ Wireless Pressure Transmitters. Mounting, installation and wiring are covered in other documents.

Honeywell does not recommend using devices for critical control where there is a single point of failure or where single points of failure result in unsafe conditions. OneWireless is targeted at open loop control, supervisory control, and controls that do not have environmental or safety consequences. As with any process control solution, the end-user must weigh the risks and benefits to determine if the products used are the right match for the application based on security, safety, and performance. Additionally, it is up to the end-user to ensure that the control strategy sheds to a safe operating condition if any crucial segment of the control solution fails.

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References

The following list of documents are sources of reference for material discussed in this publication.

Document Title	Doc #
STDW800 Wireless Specification, Differential Transmitter	34-SW-03-01
STAW800 Wireless Specification, Absolute Transmitter	34-SW-03-02
STGW800 Wireless Specification, Gauge Transmitter	34-SW-03-03
STFW700_800 Wireless Specification, Flanged Transmitter	34-SW-03-04
STRW700_800 Wireless Specification, Remote Seal Transmitter	34-SW-03-05
STDW700 Wireless Specification, Differential Transmitter	34-SW-03-06
STAW700 Wireless Specification, Absolute Transmitter	34-SW-03-07
STGW700 Wireless Specification, Gauge Transmitter	34-SW-03-08
OneWireless R310 Release Notes	OWDOC-X252-en-310A
OneWireless R310 Migration Users Guide	OWDOC-X258-en-310
OneWireless R310 Field Device Access Point Users Guide	OWDOC-X256-en-310
OneWireless R310 Wireless Device Manager Users Guide	OWDOC-X254-en-310
OneWireless R300 Experion PKS Integration Guide	OWDOC-X259-en-300
OneWireless R300 Wireless LAN Controller Configuration Guide	OWDOC-X255-en-300
OneWireless R300 Network Planning an Installation Guide	OWDOC-X253-en-300

Support and Contact Information

For Europe, Asia Pacific, North and South America contact details, refer to the back page of this manual or the appropriate Honeywell Support web site:

Honeywell Corporate	www.honeywell.com
Honeywell Process Solutions	https://www.honeywellprocess.com/*
Training Classes	https://www.honeywellprocess.com/en-US/training

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Global Email Support	Honeywell Process Solutions	hfs-tac-support@honeywell.com

Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: **Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

continued

Symbol	Description
	The Factory Mutual® Approval mark means the equipment has been rigorously tested and certified to FM standards for safety and/or performance.
	The Canadian Standards mark means the equipment has been tested and meets applicable standards for safety and/or performance.
	The Ex mark means the equipment complies with the requirements of the European standards that are harmonized with the 94/9/EC Directive (ATEX Directive, named after the French "ATmosphere EXplosible").
	For radio equipment used in the European Union in accordance with the Radio Equipment Directive (RED) and the CE Mark. The alert sign must be used when a restriction on use (output power limit by a country at certain frequencies) applies to the equipment and must follow the CE marking.
	The C-Tick mark is a certification trade mark registered to ACMA (Australian Communications and Media Authority) in Australia under the Trade Marks Act 1995 and to RSM in New Zealand under section 47 of the NZ Trade Marks Act. The mark is only to be used in accordance with conditions laid down by ACMA and RSM. This mark is equal to the CE Mark used in the European Union. N314 directly under the logo is Honeywell's unique supplier identification number.
	The ISA100 Wireless Compliant logo indicates the device has received ISA100.11a conformance certification and is registered with the Wireless Compliance Institute, assuring device interoperability.
CRN	Canadian Registration Number

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1. Introduction

1.1 Purpose

This manual describes the Honeywell SmartLine Wireless Transmitter function, operation and maintenance.

1.2 Scope

The manual includes:

- Details of topics that relate uniquely to the Honeywell SmartLine Wireless Transmitter

1.3 OneWireless network overview

OneWireless is an all digital, two-way communication mesh network that interconnects industrial field sensors to a central system.

OneWireless has defined standards to which field devices and operator stations communicate with one another. The communications protocol is built as an "open system" to allow all field devices and equipment that are built to OneWireless standard to be integrated into a system, regardless of the device manufacturer. This interoperability of devices using OneWireless technology is to become an industry standard for automation systems.

1.4 Security Considerations

Honeywell OneWireless Transmitters conform to the security features provided by compliance to the ISA100.11a standard for both stack and device interoperability and security. The security aspects of the ISA100.11a standard include multi-level authentication for endpoint validation, data privacy consisting of network and end to end encryption, network diversity using spread spectrum technology and time slot allocation, and data integrity using quality and latency attributes.

For assure availability, the placement of Wireless transmitters and other wireless network components should consider signal quality under various environmental conditions. Signal quality can be monitored by inspection of the Receive Signal Strength Indicator (RSSI) and Receive Signal Quality Indications (RSQI). The RSSI and RQSI for mesh links can be viewed on the OneWireless Wireless Device Manager (WDM) network display.

Physical security of the transmitter relies on restricting access to the transmitter and related network components to only authorized personal.

1.5 Licensing and License Keys for Anti-Aliasing Filter

This option enables the Anti-Alias filter which attenuates the higher frequencies and helps to prevent aliasing components from being sampled.
License Keys can be purchased from Honeywell to Activate the Anti-Aliasing Filter Feature. To Order Contact Honeywell and Provide the Device ID value for the transmitter you want to buy the feature for. The Device ID can be found under “Device Vendor Parameters” in the WDM interface.

1.6 About the transmitter

The SmartLine Wireless Transmitter is furnished with an ISA100.11a-compliant wireless interface to operate in a compatible distributed ISA100.11a wireless system. The transmitter will interoperate with any ISA100.11a wireless network.

The transmitter includes ISA100.11a-compliant electronics for operating in a 2.4 GHz wireless network. It features function block architecture and instantiable input channels.

The SmartLine Wireless Transmitter comes in a variety of models for measurement applications involving one of these basic types of pressure:

- Differential pressure
- Gauge pressure
- Absolute pressure

The transmitter measures the process pressure and transmits the measured value as a digital output signal in user-configured engineering units. Its major components are an electronics housing and a meter body as shown in Figure 1-1 (a typical differential pressure model transmitter).

The SmartLine Wireless transmits its output in a digital OneWireless protocol format for direct digital communications with systems.

The Process Variable (PV) is available for monitoring and alarm purposes. Available PV update rates: 0.5, 1, 5, 10, 30 seconds, 1, 5, 15, 30 minutes and 1 hour are set on the OneWireless User Interface. Slower update rates extend battery life. The meter body temperature is also available as a secondary variable for monitoring. Figure 1-1 shows a block diagram of the SmartLine Wireless Transmitter's operating functions.

The SmartLine Wireless DP model type is capable of measuring mass flow and volumetric flow. When minimum and maximum flow rate values are configured as PV scale 0% and 100% values at given PV units of measure, and the respective DP values at those limits are configured as the calibration scale 0% and 100% values, the PV value becomes a flow rate in the selected units of measure. Minimum and maximum flow rate data at given DP values is either provided on or with orifice plates, or is commonly available according to orifice plate size.

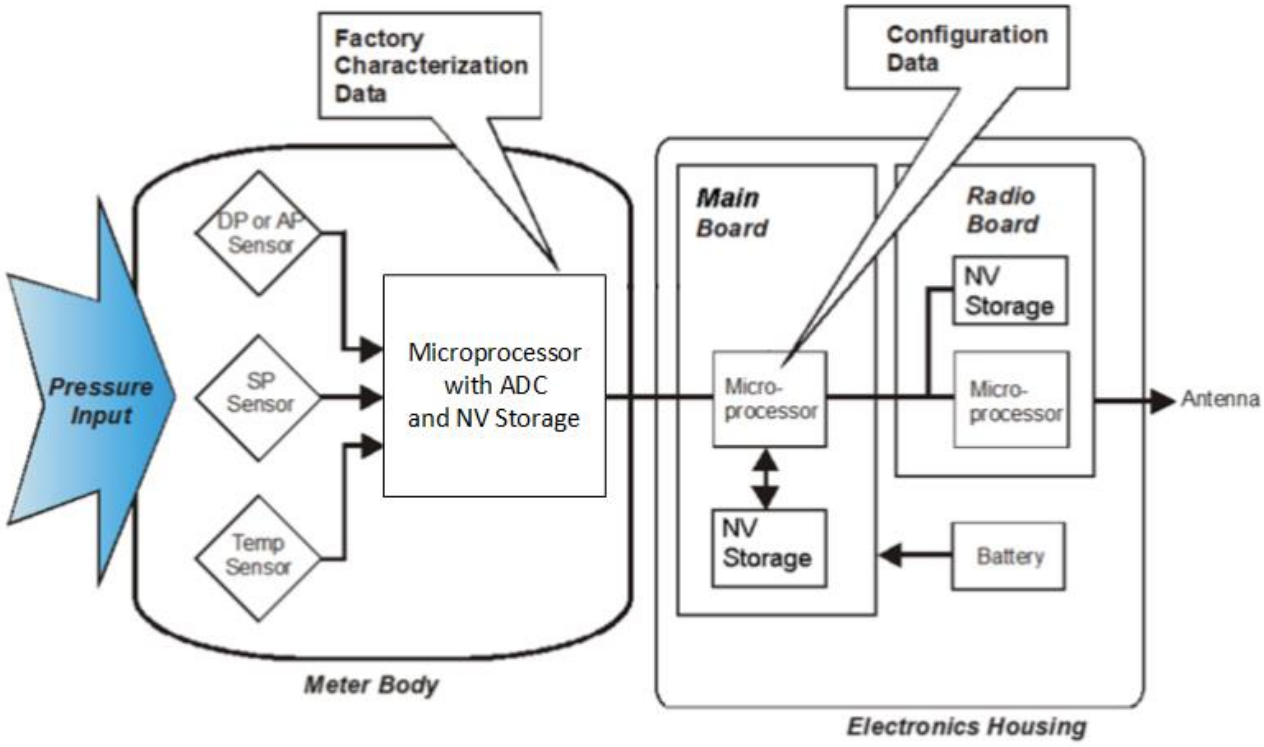


Figure 1-1 - SmartLine Wireless Transmitter Functional Diagram

1.7 Physical Characteristics

As shown in Figure 1-2, the SmartLine Wireless transmitter is packaged in two major assemblies: the Electronics Housing and the meter body. The elements in the Electronic Housing respond to IR commands and execute the software and protocol for the different pressure measurement types. Figure 1-3 shows the assemblies in the Electronics Housing.
The meter body provides connection to a process system. Several physical interface configurations are available, as determined by the mounting and mechanical connections, all of which are described in the **Installation** section of this manual.

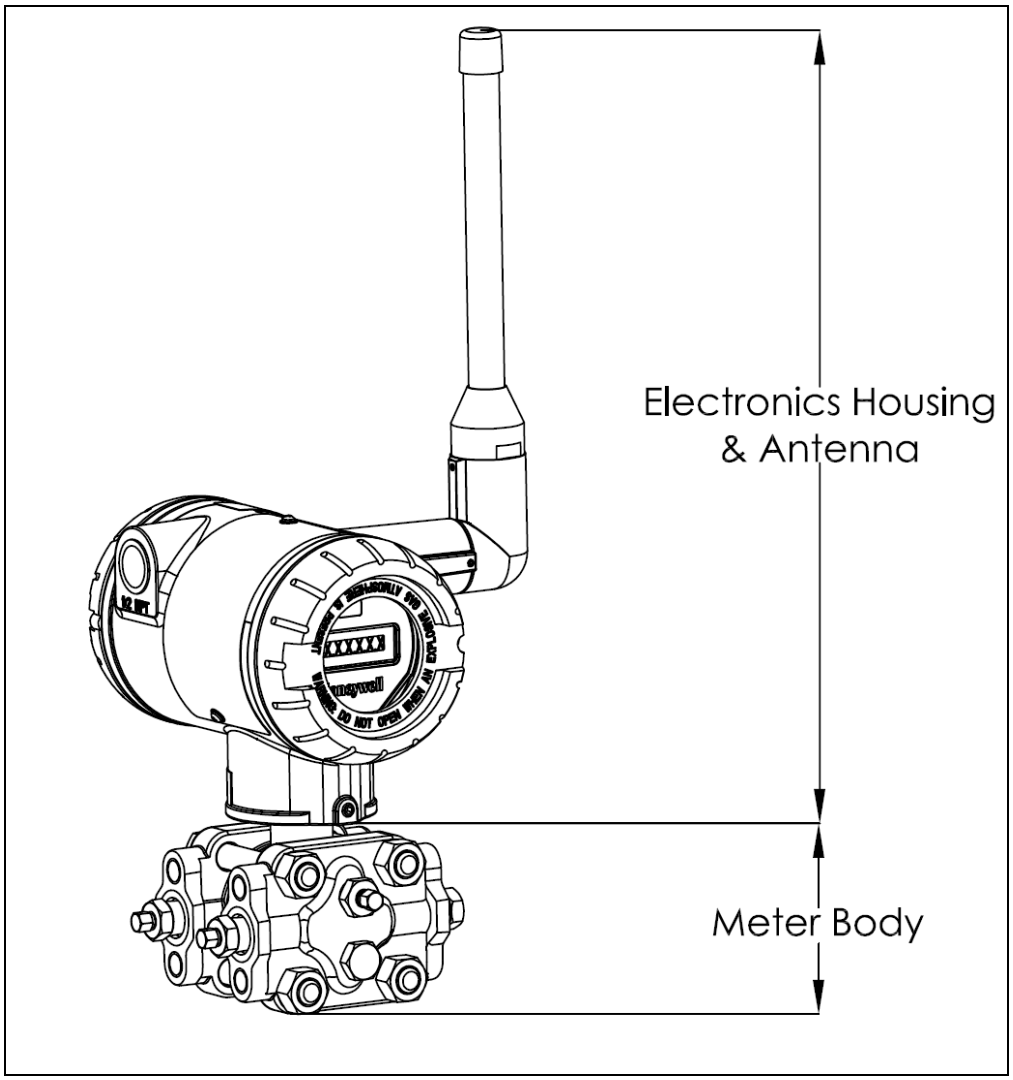


Figure 1-2 – SmartLine Wireless Transmitter Major Assemblies

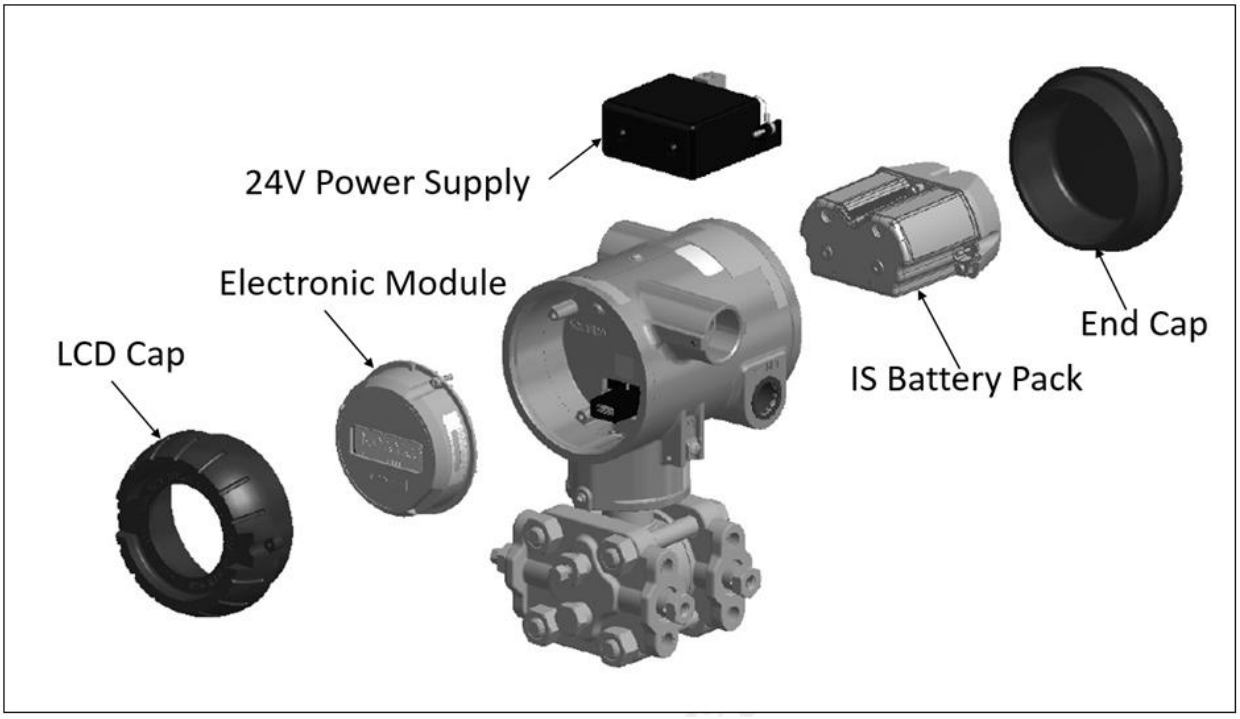


Figure 1-3– SmartLine Wireless Transmitter Electronics Housing Components

2. Preparation and Quick Start

2.1 Introduction

This section is useful if you are unfamiliar with the SmartLine Wireless transmitter, want a quick start list, or if you want to configure and test your transmitter in an office environment before installing it in its final location.

2.2 Set up the Network

Refer to the One Wireless Device Manager User Guide and Field Device Access Point User Guide to setup the gateway, wireless device manager (WDM) and the access points (FDAP).

See *References.*

Ensure you have access to the WDM through the browser interface.

2.3 Transmitter Quick Start

1. INSTALL. If desired, mount or install the transmitter. If setting up in an office environment for test, place the transmitter securely on a work surface.
2. ANTENNA. The transmitter can be supplied with an integral 4dBi antenna. If the transmitter is equipped with a remote mount antenna connection, connect the antenna with a RF cable. The transmitter remote mount and antennas utilize N-type connectors.
3. POWER up the transmitter.

   Remove the end cap, opposite the LCD display, to connect power. Ensure the internal power cable is connected to the battery pack or 24V supply module as applicable.

   a. Battery Operated transmitters require two 3.6 V D-Size lithium thionyl chloride batteries. See section 4.1 for specific battery requirements.

   b. Line powered transmitters with the power supply option require 24V DC connected to the input connector P3. See section 4.2 for details.

   Once powered, verify that the transmitter LCD is functioning. If the LCD is blank, check the power connections, and batteries as applicable.
4. PROVISION the transmitter to the network

   a. Over The Air (OTA) provisioning can be done using the WDM interface.

      i. Enable OTA provisioning on the access point closest to the transmitter. On the WDM interface, select the access point, then on the property panel expand and “Device Management” and under Over the Air Provisioning press “Enable for 60 Minutes”

      ii. Select the transmitter in the selection panel

      iii. Press the provisioning green “Accept” check mark button

b. Handheld provisioning can be done through the IR port with a Handheld Provisioning Device such as MCT404

See section 4.5 for further provisioning details. This step may take several minutes, depending on your network.

5. VERIFY that the transmitter appears in the wireless network, and is transmitting PVs. This step may take several minutes, depending on your network.
    a. Drag the transmitter icon from the selection panel to the map (optional)
    b. Load the DD file (if not done previously)
        i. Select the transmitter.
        ii. Press the maintenance “Templates” button.
        iii. Press “Load DD File”, and select the DD .zip file.
        iv. Refresh the browser to re-load the WDM web interface. This will require to log in again.
    c. Activate the channel
        i. Select the transmitter channel to activate
        ii. Press the Channel green “Activate” button
    d. Configure the transmitter as desired using the property panel
        i. Tag Name, Description, Display Tag, Routing assignment, Publication frequency, Publication attributes, etc.
        ii. Ensure the press “Apply” after the changes, and wait for the changes to take effect.
    e. Configure the channel as desired using the property panel.
        i. Name, Description, Process limits, Process Scale, etc.
        ii. Ensure to press “Apply” after the changes, and wait for the changes to take effect.
6. INSTALL. If not done already, once the transmitter is verified to be functioning as expected, it can be powered off and installed in the field. The provisioning key will remain.
7. CALIBRATE. If required, calibration should only be done after the transmitter is installed in its final location. See section 4.6.

3. Installation

3.1 Installation Site Evaluation

Evaluate the site selected for the SmartLine Wireless Transmitter installation with respect to the process system design specifications and Honeywell's published performance characteristics for your particular model. Some parameters that you may want to include in your site evaluation are:

- Environmental Conditions:
  - Ambient Temperature
  - Relative Humidity
- Potential Noise Sources:
  - Radio Frequency Interference (RFI)
  - Electromagnetic Interference (EMI)
- Vibration Sources
  - Pumps
  - Motorized System Devices (e.g., pumps)
  - Valve Cavitation
- Process Parameters
  - Temperature
  - Maximum Pressure Rating

3.2 Maximum Working Pressure:

Refer to the applicable specification sheets in *References*

3.3 Environmental Conditions:

Refer to the specification sheet for performance considerations, see *References*

The transmitter operates with an ambient temperature of -40 °C to +85 °C. If installed in a hazardous environment, the maximum ambient temperature may be limited. Refer to the control drawing and the markings on the transmitter nameplate.

The process fluid temperature at the meter body operates from -40 °C to +125 °C.

Ambient humidity limits are 0 to 100% relative humidity.

The transmitter may be installed indoors or outdoors, with pollution degree 4. The enclosure is rated Type 4X, IP66 / IP67.

The transmitter operates up to an altitude of 2,000 m.

Entry plugs/glands rated for the installation environment are required to be installed on the transmitter.

3.4 Transmitter Weights and Dimensions

Weights

Table 3-1: Weights

Transmitter Model	Weight
STDW7xx **STDW8xx** **STGW7x0** **STGW8x0** **STRW7xD** **STRW8xD**	11 lbs (5 kg)
STAW7xL **STAW8xL** **STRW7xA** **STRW8xA** **STRW7xG** **STRW8xG** **STGW7xL** **STGW8xL**	7 lbs (3.2 kg)
STFW7xF	17 lbs (7.7 kg) for 2” 150# flanged head
STFW8xF	21 lbs (9.5 kg) for 3” 150# flanged head
STFW7xx **STFW8xx**	23 to 36 lbs (10.5 kg to 16.4 kg) depending on flange size

Note: Add 8.0 pounds (3.6 kg) to any model equipped with the stainless-steel housing option (Model Selection Guide Table IV selections M or N)

For Flange and Remote Seal transmitter dimensions, obtain appropriate installation drawing using Installation drawing number tables in section 3, as a guide.

Dimensions

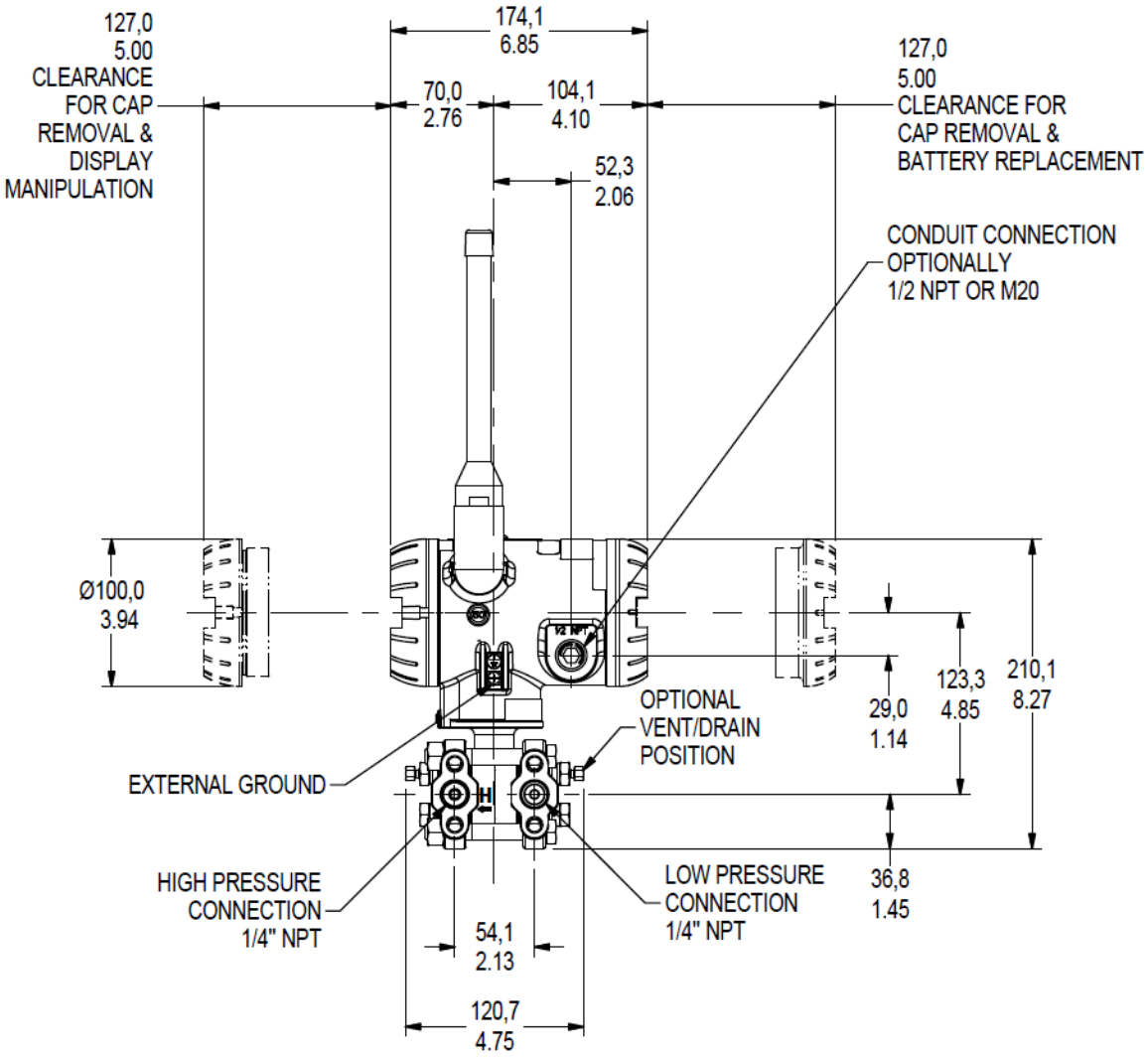


Figure 3-1: DP/DHGP Pressure transmitter dimensions unit mm/inch

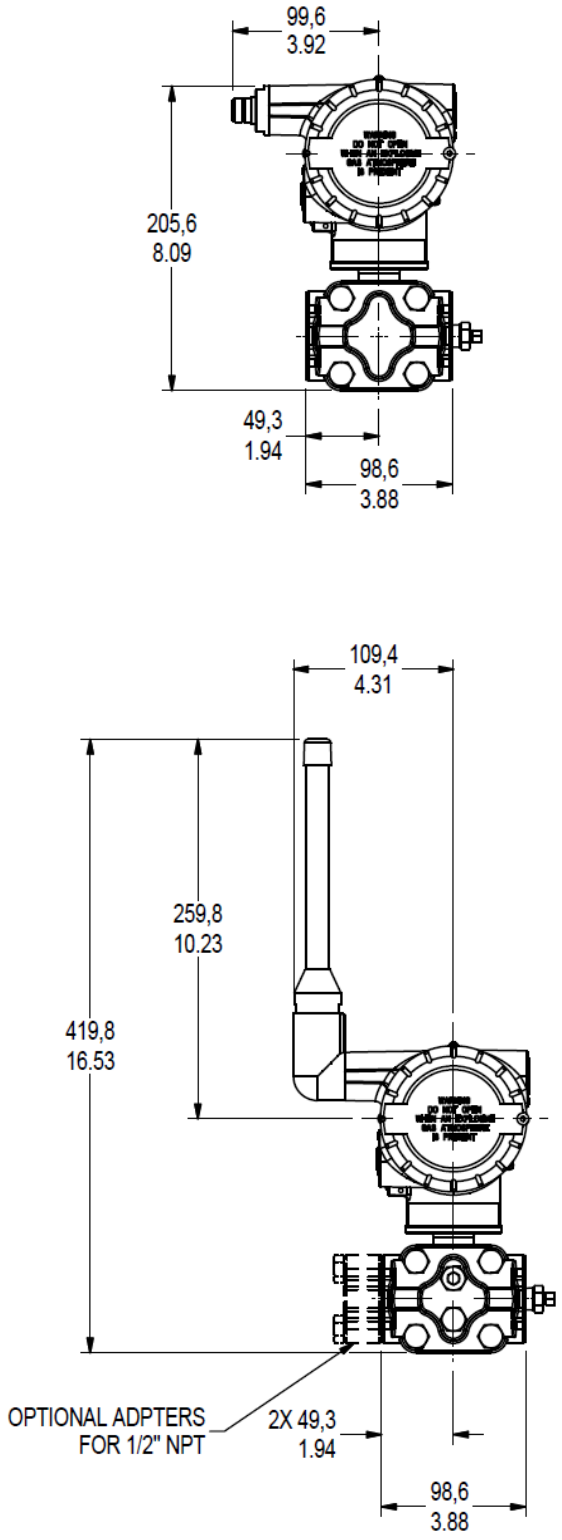


Figure 3-2: DP/DHGP Pressure antenna dimensions unit mm/inch

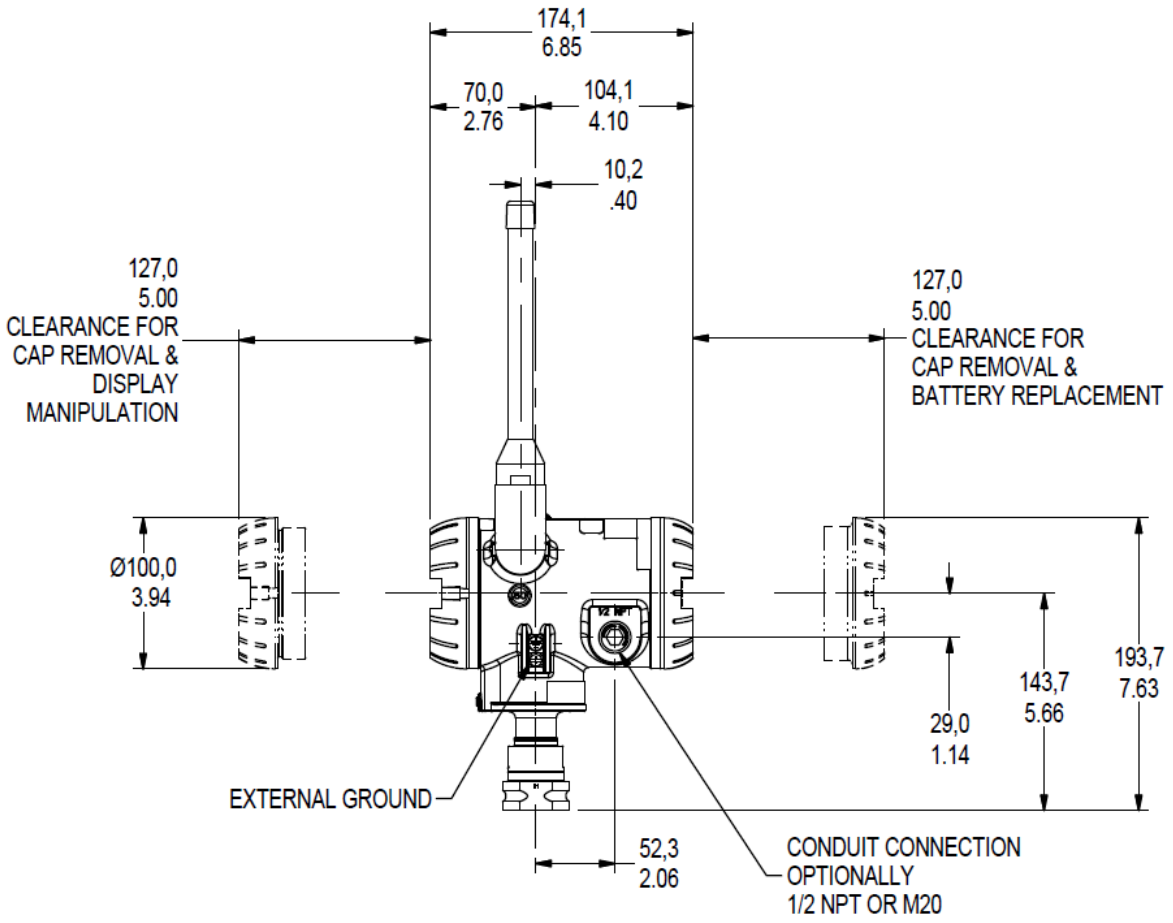


Figure 3-3: GP/AP Pressure transmitter dimensions unit mm/inch

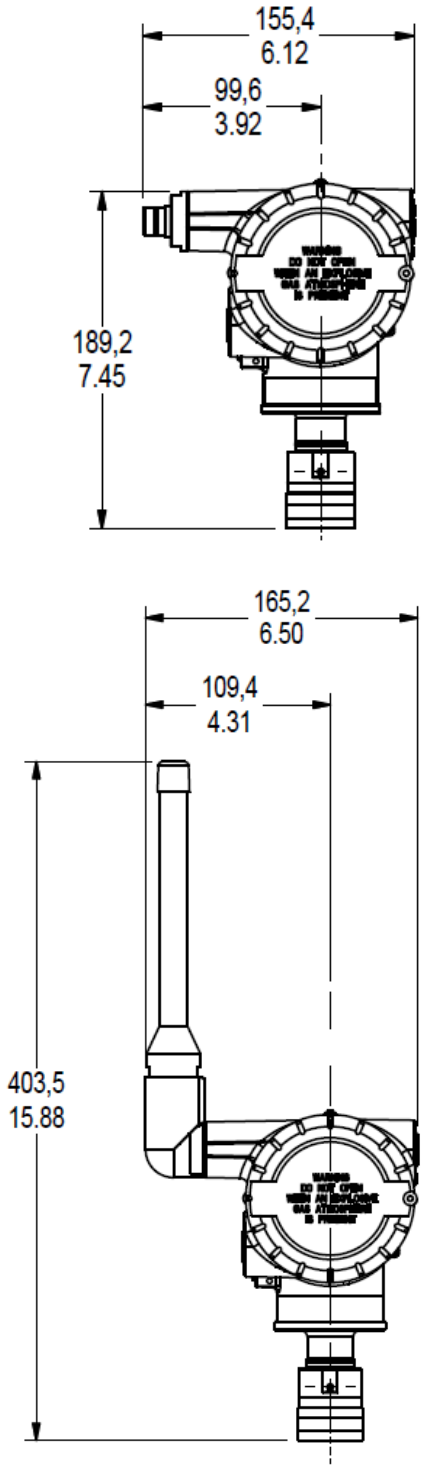


Figure 3-4: GP/AP Pressure antenna dimensions unit mm/inch

3.5 Installation drawing number tables

If an installation drawing from the table below is required, please contact your local Honeywell representative. Refer to Honeywell drawing numbers in Table 3-2 for detailed dimensions. Abbreviated overall dimensions are also shown on the Specification Sheets for the transmitter models, see *References*

This section assumes that the mounting dimensions have already been taken into account and the mounting area can accommodate the Transmitter.

Table 3-2: Drawing numbers for pressure transmitters

DRAWING	DRAWING NUMBER
INSTALLATION DRAWING STW700/800 PRESSURE, DP, SMV, DHGP, AND DHAP	50136136
INSTALLATION DRAWING STW700/800 PRESSURE, INLINE (LAP AND LGP)	50136137
INSTALLATION DRAWING STW700/800 PRESSURE PSEUDO FLANGE	50136138
INSTALLATION DRAWING STW700/800 PRESSURE EXTENDED AND FLUSH FLANGE	50136139
INSTALLATION DRAWING STW700/800 PRESSURE DP, DHGP AND DHAP REMOTE SEAL	50136140
INSTALLATION DRAWING STW700/800 PRESSURE INLINE (LGP AND LAP) REMOTE SEAL	50136141
INSTALLATION DRAWING STW700/800 PRESSURE PULP AND PAPER	50136142
INSTALLATION INSTRUCTIONS STW700/800 PRESSURE ANGLE MOUNTING BRACKET	50136143
INSTALLATION INSTRUCTIONS STW700/800 PRESSURE FLAT MOUNTING BRACKET	50136144

3.6 Conduit / Cable Entries

NOTICE

THIS PRODUCT IS SUPPLIED WITH PLASTIC DUST PLUGS IN THE CONDUIT/CABLE GLAND ENTRIES. IT IS THE USERS RESPONSIBILITY TO PROVIDE CABLE GLANDS, ADAPTORS AND/OR BLANKING PLUGS SUITABLE FOR THE ENVIRONMENT IN WHICH THIS PRODUCT IS INSTALLED. WHEN INSTALLED IN A HAZARDOUS LOCATION THE CABLE GLANDS, ADAPTORS AND/OR BLANKING PLUGS SHALL ADDITIONALLY BE SUITABLE FOR THE HAZARDOUS LOCATION, THE PRODUCT CERTIFICATION AND ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION FOR THE INSTALLATION

Summary

Table 3-3: Conduit entry plugs and cable glands for your transmitter.

Factory Part No.	Description	Environmental rating	Ambient	Hazardous Location Certification
50000547-001	M20 Conduit Plug	IP66-68, 4X, 6P	–40 – 85ºC –40 – 185ºF	ATEX ⟨Ex⟩ II 2 GD EEx de IIC
50021832-002	½ NPT Conduit Plug	IP66-68, 4/4X, 6/6P	–40 – 85ºC –40 – 185ºF	ATEX ⟨Ex⟩ II 2 GD EEx d IIC; CSAcus CL I, Zone 1, Ex/AEx d IIC; CL I, Div 1 & 2, GP ABCD; CL II, Div 1 & 2, GP EFG; CL III, Div 1 & 2
50023232-001	M20 Cable Gland	IP68	–40 – 100ºC –40 – 212ºF	----------
50023212-001	½ NPT Cable Gland	IP68	–40 – 100ºC –40 – 212ºF	----------

Note: Torque conduit entry plugs, cable glands, or adapters to 32 Nm (24 lb-ft).

3.7 Mounting Summary

Transmitter models, except those with integral flanges, can be attached to a two-inch (50 millimeter) vertical or horizontal pipe using Honeywell's optional angle or flat mounting bracket; alternately you can use your own bracket. Models with integral flanges are supported by the flange connection.

Figure 3-5 shows typical bracket-mounted and flange-mounted transmitter installations.

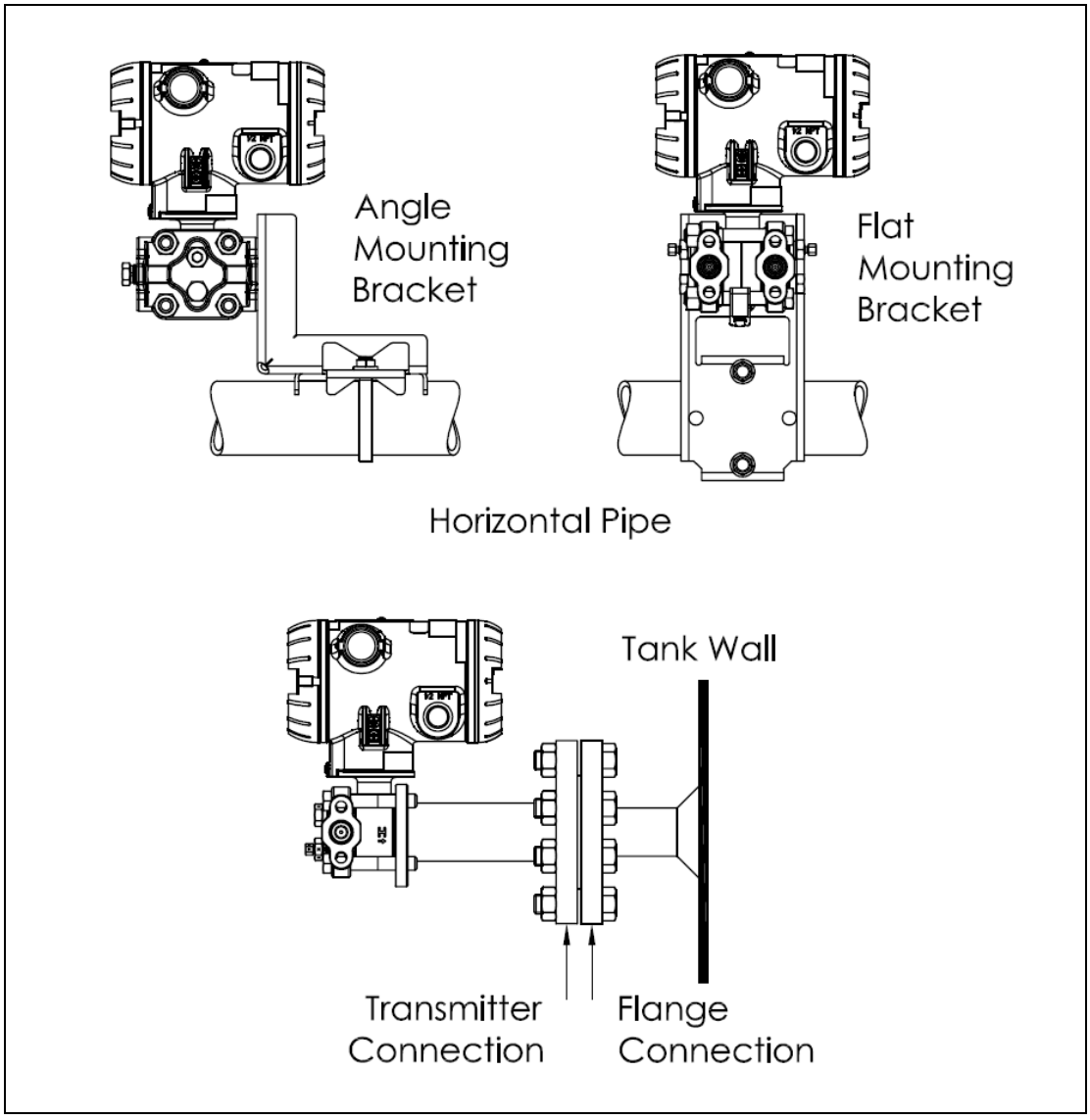


Figure 3-5: Typical Bracket Mounted and Flange Mounted Installations

Bracket Mounting Procedure

If you are using an optional bracket, start with Step 1. For an existing bracket, start with Step 2.

1. Refer to Figure 3-6. Position the bracket on a 2-inch (50.8 mm) horizontal or vertical pipe, and install a "U" bolt around the pipe and through the holes in the bracket. Secure the bracket with the nuts and lock washers provided.

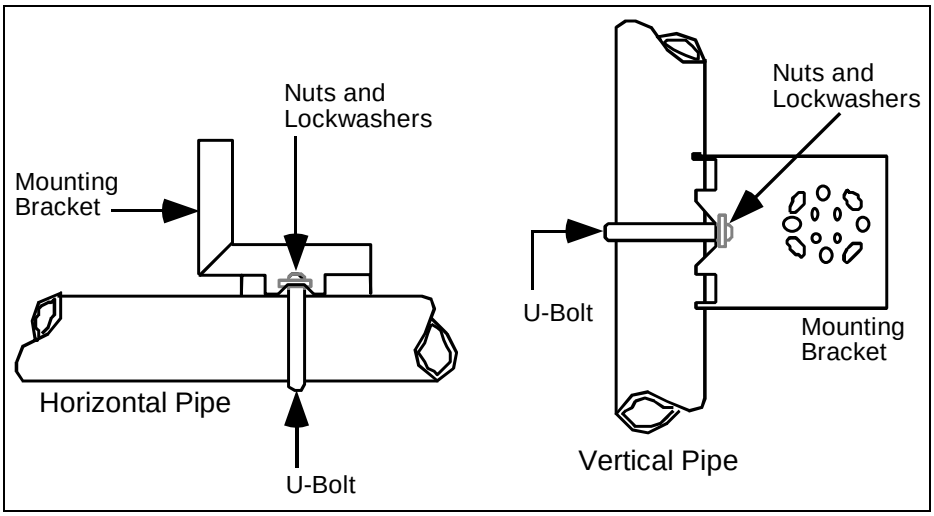


Figure 3-6: Angle Mounting Bracket Secured to a Horizontal or Vertical Pipe

2. Align the appropriate mounting holes in the Transmitter with the holes in the bracket. Use the bolts and washers provided to secure the Transmitter to the bracket; see the following variations.

Transmitter Type	Use Hardware
DP with double-ended process heads and/or remote seals	Alternate mounting holes in the ends of the heads
In-line GP and AP (STGWxxL and STAWxxL)	The smaller "U" bolt provided to attach the meter body to the bracket. See the following example.
Dual-head GP and AP	Mounting holes in the end of the process head.

EXAMPLE: Inline model mounted to an optional angle bracket. See Figure 3-7.

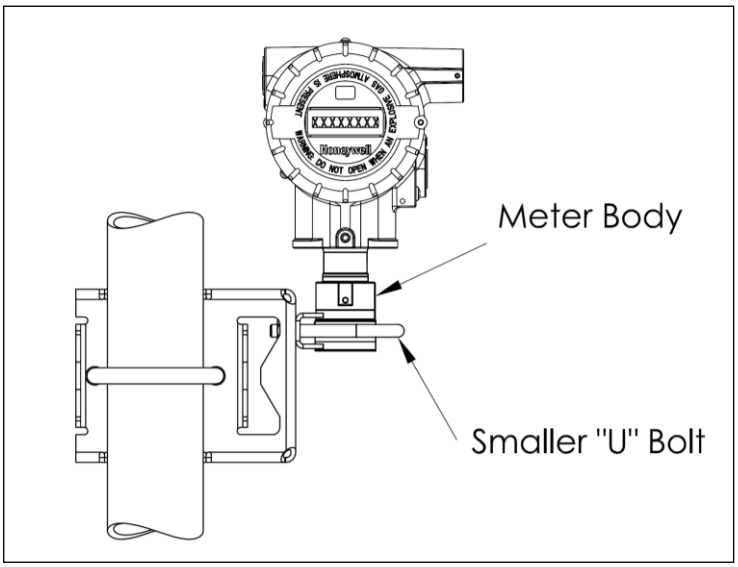


Figure 3-7: – Inline Model Mounted to an Optional Bracket

3. Loosen the set screw on the outside neck of the Transmitter one (1) full turn.

4. Rotate the Electronics housing a maximum of 180º left or right from the center to the position you require, and tighten the set screw 8.9 to 9.7 lb-in (1.40 to 1.68 Nm), using a 4mm metric socket head wrench. See Figure 3-8.

EXAMPLE: Rotating the Electronics Housing.

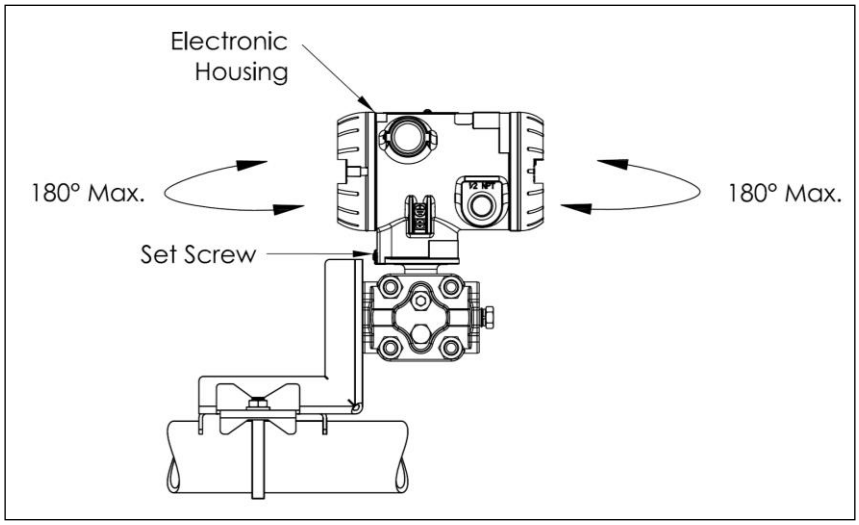


Figure 3-8: Rotating the Electronic Housing

The mounting position of absolute pressure models STAW822, STAW82L, or a draft range model STDW810 is critical as the transmitter spans become smaller.
A maximum zero shift of 2.5 mmHg for an Absolute transmitter or 1.5 inches of water (inH_2O) for a Draft Range transmitter can result from a mounting position that is rotated 90º from the

vertical. A typical zero-shift of 0.12 mmHg or 0.20 inH_2O can occur for a five (5)-degree rotation from the vertical.

Mounting Transmitters with Small Absolute or Differential Pressure Spans

To minimize positional effects on calibration (zero shift), take the appropriate mounting precautions for the respective transmitter model. For a model STAW822 or STAW82L, ensure that the Transmitter is vertical when mounting it. You do this by leveling the Transmitter side-to-side and front-to-back. **Figure 3-9** shows how to level a transmitter using a spirit level.

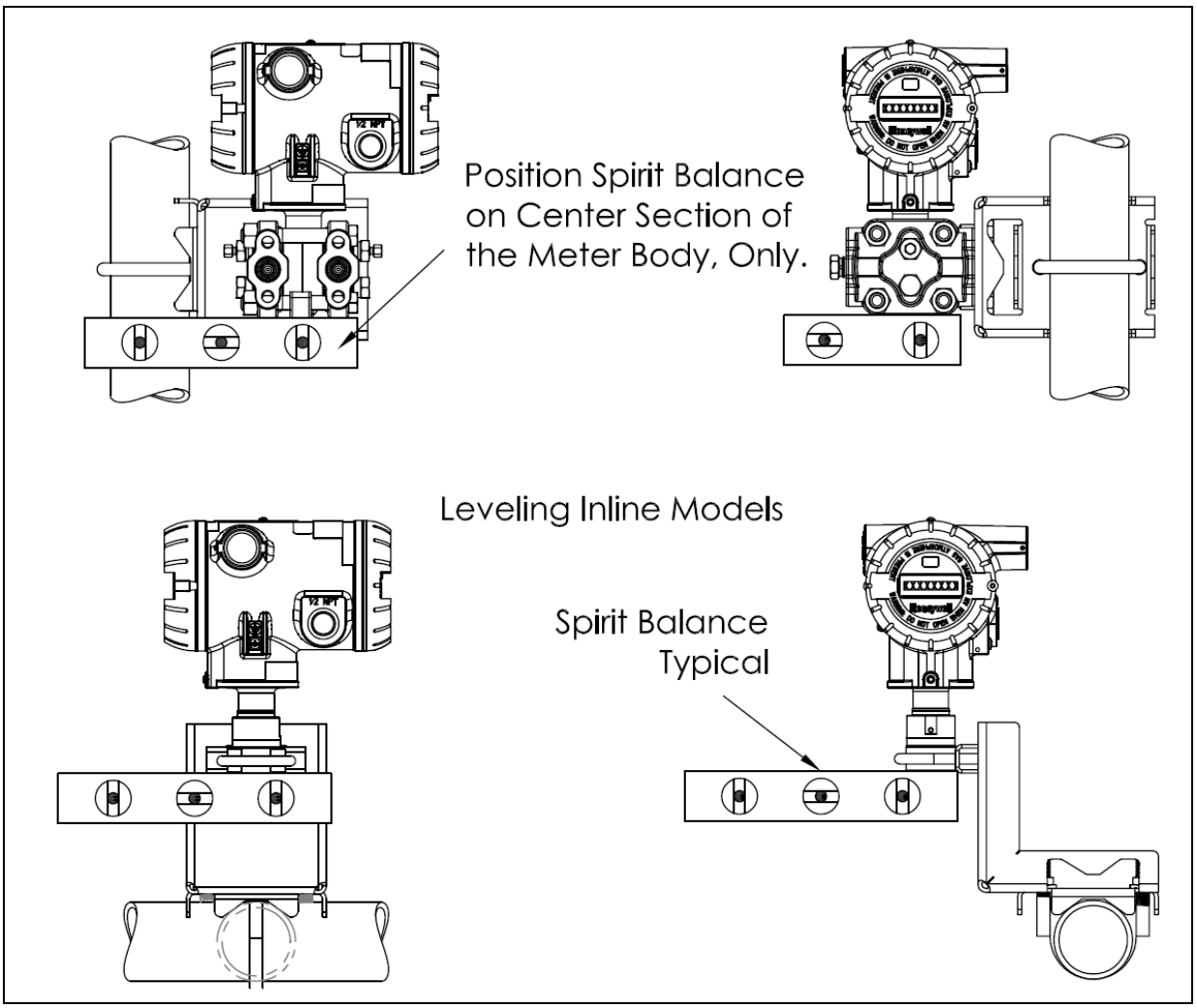


Figure 3-9: Using a Spirit Balance to Level a Transmitter

Flange Mounting

Figure 3-10 shows a typical tank-flange mount installation, with the transmitter flange mounted to the pipe on the wall of the tank.

On insulated tanks, remove enough insulaiton to accommodate the flange extension.

When flange-mounting to a tank, note the following:

- The End User is responsible for providing a flange gasket and mounting hardware suitable for the Transmitter service conditions.
- To prevent performance degradation in extended-mount flanged transmitters, ensure that sufficient clearance exists in front of the sensing diaphragm body.

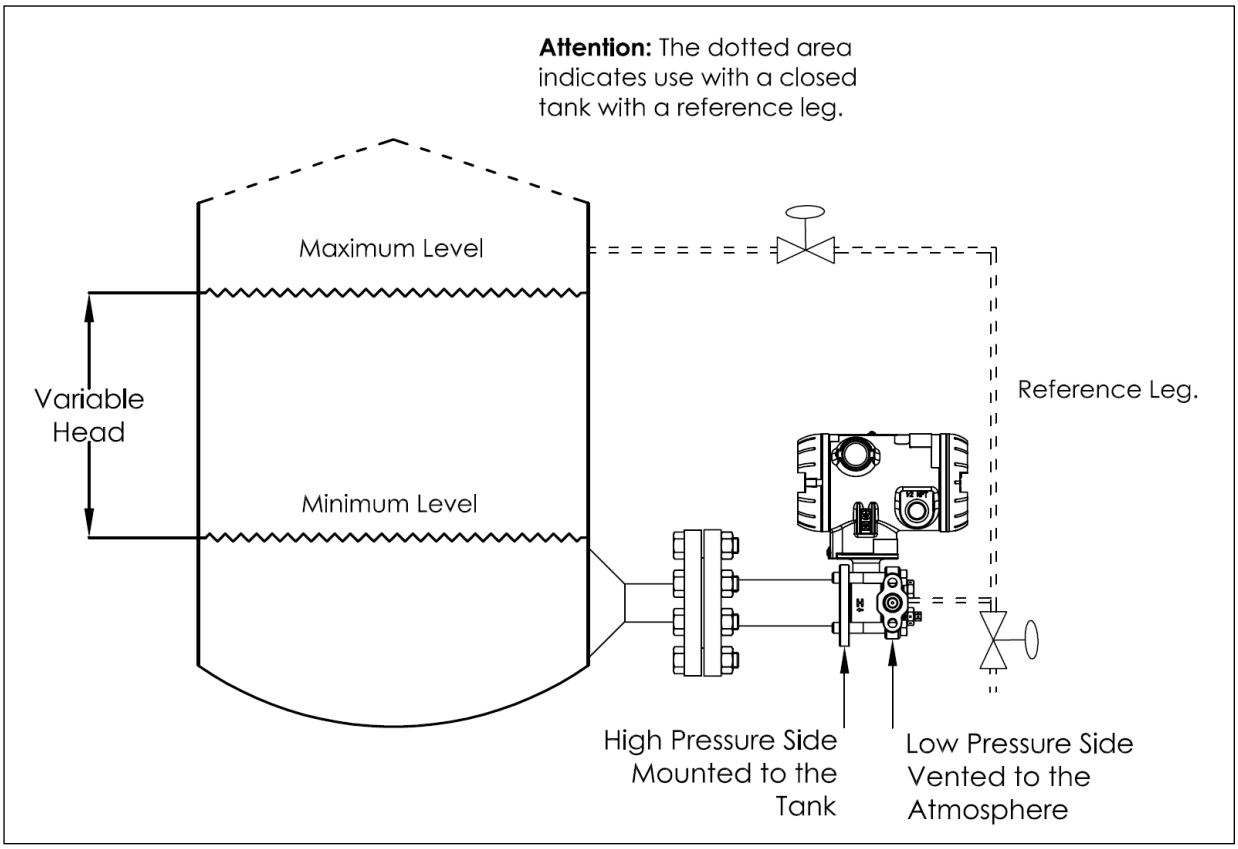


Figure 3-10: Tank-Flange Mounted Transmitter

Remote Diaphragm Seal Mounting Information

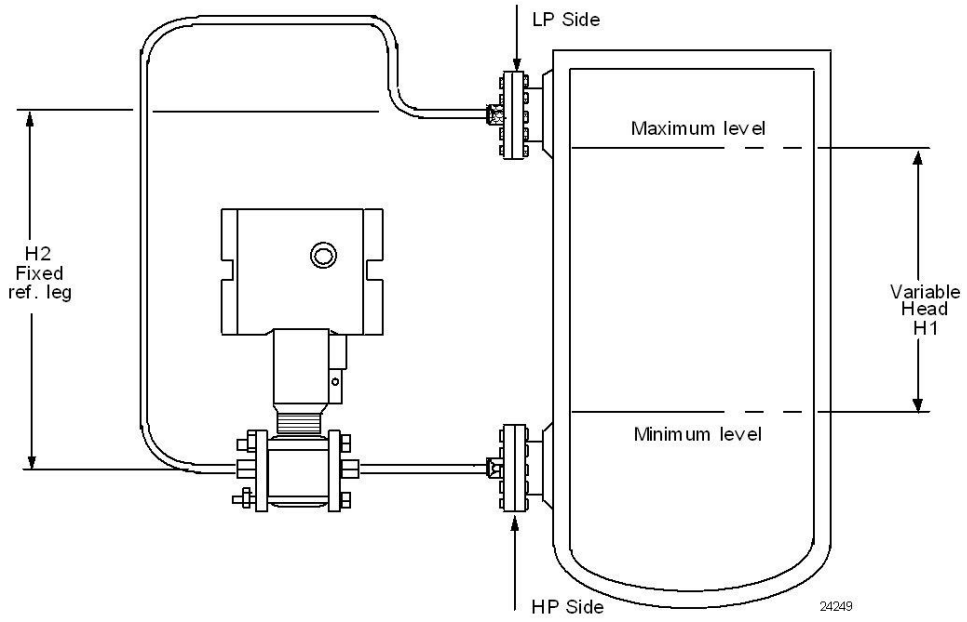
The combination of tank vacuum and high pressure capillary head effect should not exceed nine (9) psi (300 mmHg) absolute. For insulated tanks, be sure to remove enough insulation to accommodate the flange extension. The end user is responsible for supplying a flange gasket and mounting hardware suitable for the service condition of the Transmitter.

Mount the transmitter flanges within the limits in for the fill fluid in the capillary tubes, with a tank at one (1) atmosphere.

Table 3-4: Flange Mounting Guidelines

Fill Fluid	Mount the Flange…
Silicone 200 Oil	≤22 feet (6.7 meters) below the Transmitter
Chlorotrifluoroethylene (CTFE)	≤11 feet (3.4 meters) below the Transmitter

Refer to Figure 3-11 for a representative remote diaphragm seal installation. Mount the transmitter at a remote distance determined by the length of the capillary tubing.



NOTE: Lower flange seal should not be mounted over 22 feet below or above the transmitter for silicone fill fluid (11 feet for CTFE fill fluid) with tank at one atmosphere. The combination of tank vacuum and high pressure capillary head effect should not exceed 9 psi vacuum (300 mmHg absolute).

Figure 3-11: Representative Remote Diaphragm Seal Transmitter Installation

Depending on transmitter model, connect the remote seal to the tank shown below.

Table 3-5: Remote Diaphragm Mounting Details

Transmitter Model	Connect the Remote Seal on ….	
	Variable Head	Fixed or Constant Head
STRW82D	Transmitter High Pressure (HP) Side to tank wall lower flange mounting.	Transmitter Low Pressure (LP) side to tank wall upper flange.
STRW83D	Transmitter Low Pressure (LP) Side to tank wall lower flange mounting.	Transmitter Low Pressure (LP) side to tank wall upper flange. **OR** High Pressure (HP) side to tank wall upper flange.

3.8 Piping the SmartLine Wireless Transmitter

Piping Arrangements

Piping arrangements vary depending upon process measurement requirements and the transmitter model. For example, a differential pressure transmitter comes with double-ended process heads with ¼-inch NPT connections, which can be modified to accept ½-inch NPT through optional flange adapters. Gauge pressure transmitters are available with various connections for direct mounting to a process pipe.

A ½-inch, schedule 80, steel pipe is commonly used for transmitter integration into a process system. Many piping arrangements use a three-valve manifold to connect the process piping to the transmitter. A manifold makes it easy to install and remove or re-zero a transmitter without interrupting the process. A manifold also accommodates the installation of blow-down valves to clear debris from pressure lines.

Figure 3-12 represents a typical piping arrangement using a three-valve manifold and blow-down lines for a differential pressure transmitter being used to measure flow.

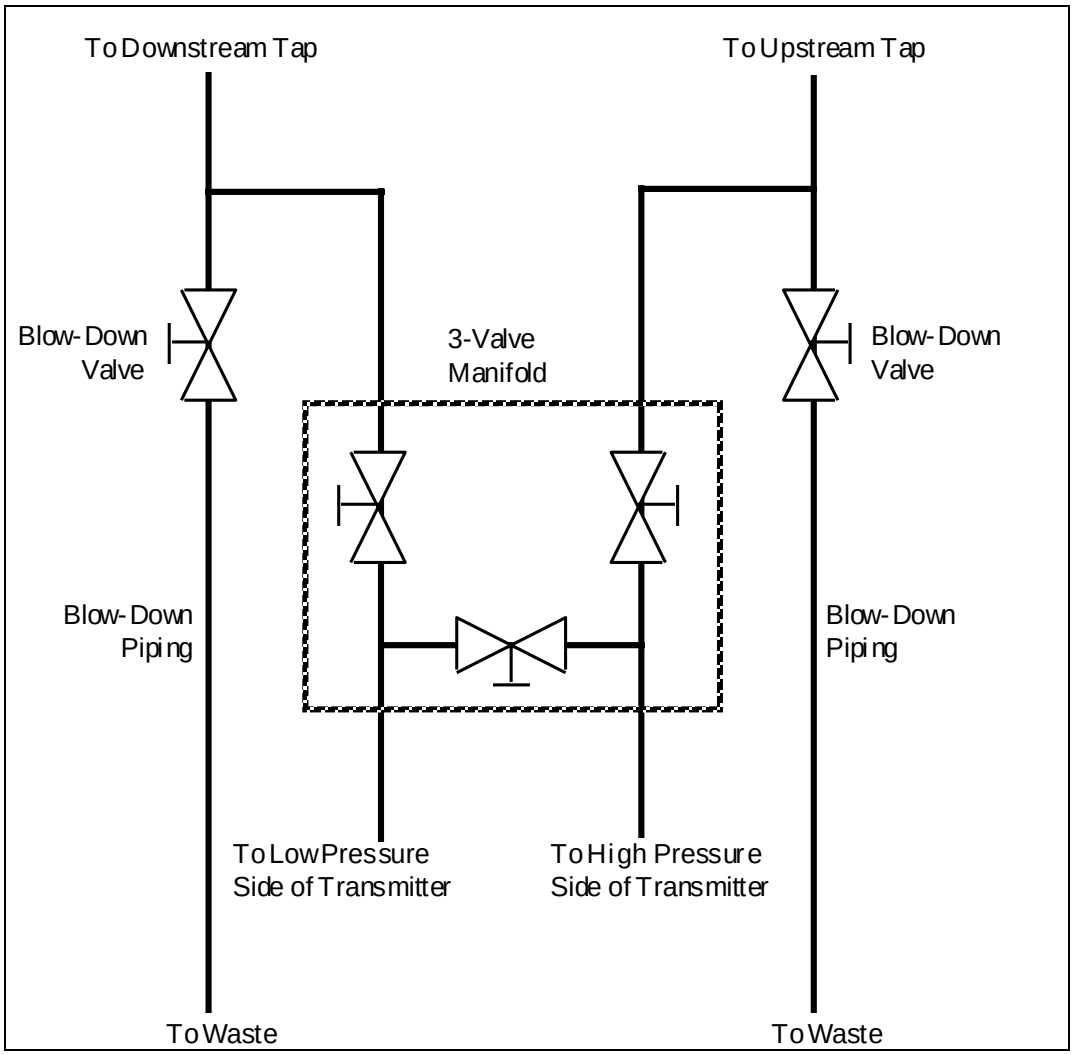


Figure 3-12: Typical 3-Valve Manifold with Blow-Down Piping

Suggestions for Transmitter Location

Suggests connections based on what is being processed by the system.

Table 3-6: Suggested Connection Locations

Process	Suggested Location	Description
Gases	Above the gas line.	The condensate drains away from the Transmitter.
Liquids	Below but near the elevation of the process connection.	This minimizes that static head effect of the condensate.
	Level with or above the process connection.	This requires a siphon to protect. the Transmitter from process steam. The siphon retains water as a *fill fluid*.

1. For liquid or steam, the piping should slope a minimum of 25.4 mm (1 inch) per 305 mm (1 foot).
2. Slope the piping down toward the transmitter if it is below the process connection to allow the bubbles to rise back into the piping through the liquid.
3. If the transmitter is located above the process connection, the piping should rise vertically above the Transmitter. In this case, slope down toward the flow line with a vent valve at the high point.
4. For gas measurement, use a condensate leg and drain at the low point (freeze protection may be required here).

ATTENTION Care must be taken when installing transmitters on hot processes. The operating temperature limits for the device (see section **3.3**) must not be exceeded. Impulse piping may be used to reduce the temperature of the process that comes into contact with the transmitter meter body. As a general rule there is a 56 °C drop (100 °F) in the temperature of the process for every foot of ½ inch uninsulated piping.

General Piping Guidelines

- When measuring fluids that contain suspended solids, install permanent valves at regular intervals to blow-down piping.
- Blow-down all lines on new installations with compressed air or steam, and flush them with process fluids (where possible) before connecting these lines to the transmitter meter body.
- Verify that the valves in the blow-down lines are closed tightly after the initial blow-down procedure and each maintenance procedure thereafter.

Procedure to Install Flange Adapters

The following procedure provides the steps for removing and replacing an optional flange adapter on the process head. See Figure 3-13.

This procedure does not require that the meter body be removed from the Electronics Housing. If flange adapters are being replaced with parts from other kits (for example, process heads), follow the procedures for the kits and incorporate the following procedure.

NOTE: The threaded hole in each Flange Adapter is offset from center. To ensure proper orientation for re-assembly, note the orientation of the offset relative to each Process Head **before removing any adapter**.

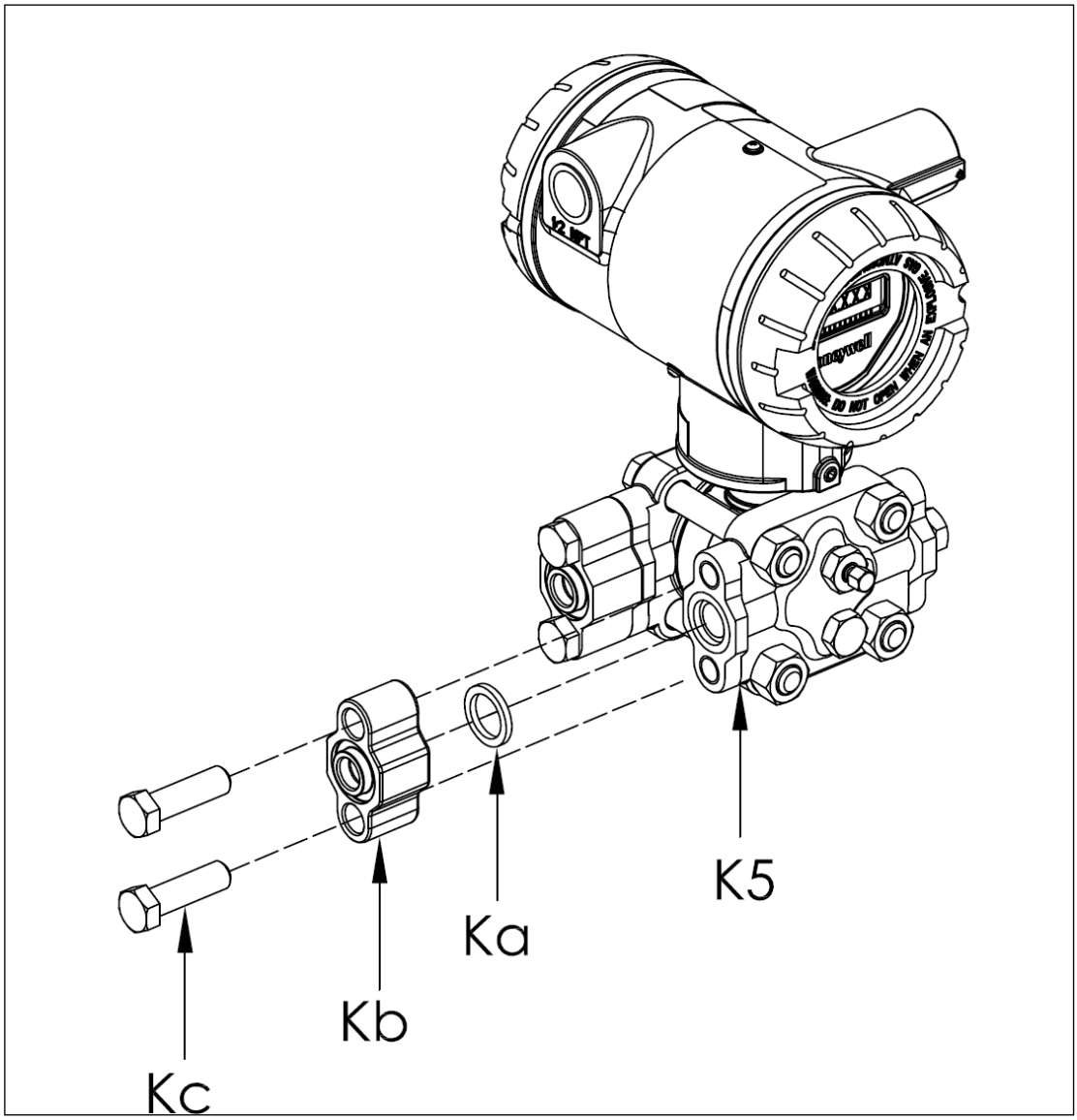


Figure 3-13: Flange Adapter Removal and Replacement

Refer to the instructions included with the kit for removal and replacement procedures.

3.9 Rotate transmitter housing

You can rotate the transmitter for better viewing, access, or antenna position. Loosen set screw (see A in Figure 3-14) on outside neck of transmitter one full turn. Rotate transmitter housing up to 180 degrees in either direction to desired position.

CAUTION Do not rotate the housing past 180 degrees in any direction or you could damage the internal wiring.

Tighten set screw.

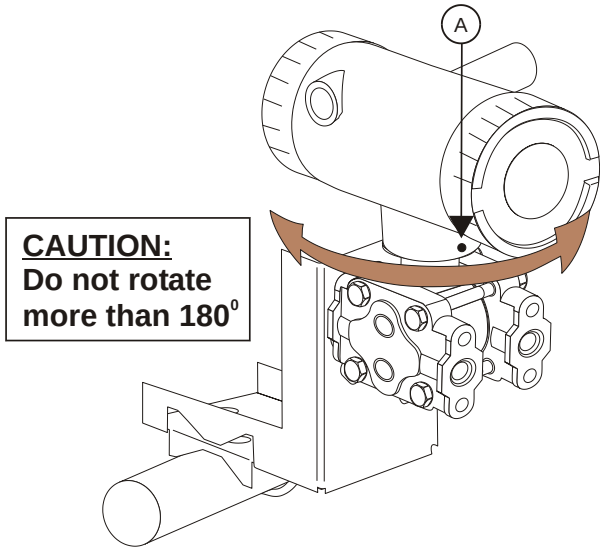


Figure 3-14: Rotating transmitter housing

3.10 Rotate display

If the transmitter's mounting is such that the display is not horizontal, you can rotate the display 90 degree clockwise or counterclockwise to provide horizontal viewing.

Tools required

- #1 Phillips Screwdriver or 1/8" Slotted Screwdriver
- Torque Screwdriver
- 1.5 mm hex key

Procedure

WARNING

Risk of death or serious injury by explosion. Do not open transmitter enclosure when an explosive gas atmosphere is present.

CAUTION

Take precautions against electrostatic discharge to prevent damaging the display/sensor module.

Display adjustment

Step	Action
1	Honeywell recommends that the transmitter be removed from service and moved to a clean area before servicing.
2	Loosen the M3 locking set screw on the display end-cap. See item 1 in Figure 3-15. Unscrew and remove the end cap.
3	Loosen the two captive screws on the display/sensor module. See items 2 in Figure 3-15.
4	Rotate the display 90 degrees in either direction so the screws line up with the threaded holes. Do not rotate more than 90 degrees or you could damage the wires behind the display.
5	There are two connectors on the back of the display/sensor module, J4 and J5, either of which can be used to connect to the meter body cable. If required, move the meter body cable to the other position.
6	Re-attach the display's two captive screws. Tighten to 0,4 – 0,6 Nm (3.5 – 5.3 lb-in.).
7	Replace end cap and tighten M3 locking screw.

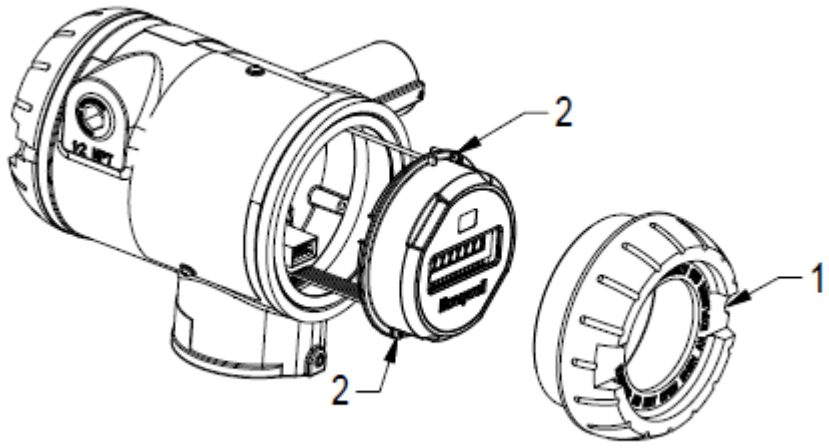


Figure 3-15: Display rotation

3.11 Antenna adjustment and mounting

Requirements

Radio installation requirements

ATTENTION

Professional Installation is required to insure conformity with Federal Communications Commission (FCC) in the USA, Industry Canada (IC) in Canada and the Radio and Telecommunications Terminal Equipment Directive, 1999/5/EC (R&TTE), in the European Union (EU).

Professional installation is required for the selection and installation of approved antennas and setup of the maximum allowable radiated power from the SmartLine Wireless Transmitter as configured for the particular installation site.

The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm (8 inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

For remote antenna, see antenna installation requirements to satisfy FCC RF exposure requirements.

ATTENTION

Federal Communications Commission (FCC):

The SmartLine Wireless Transmitters comply with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada (IC):

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF fields in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's web site **www.hc-sc.gc.ca/rpb.**

Integral antenna

WARNING

POTENTIAL ELECTROSTATIC CHARGING HAZARD

The integrally mounted antenna shroud may have a surface resistance greater than 1Gohm per square. When the SmartLine transmitter is installed in potentially hazardous locations care should be taken not to electrostatically charge the surface of the antenna shroud by rubbing the surface with a cloth, or cleaning the surface with a solvent. If electrostatically charged, discharge of the antenna shroud to a person or a tool could possibly ignite a surrounding hazardous atmosphere.

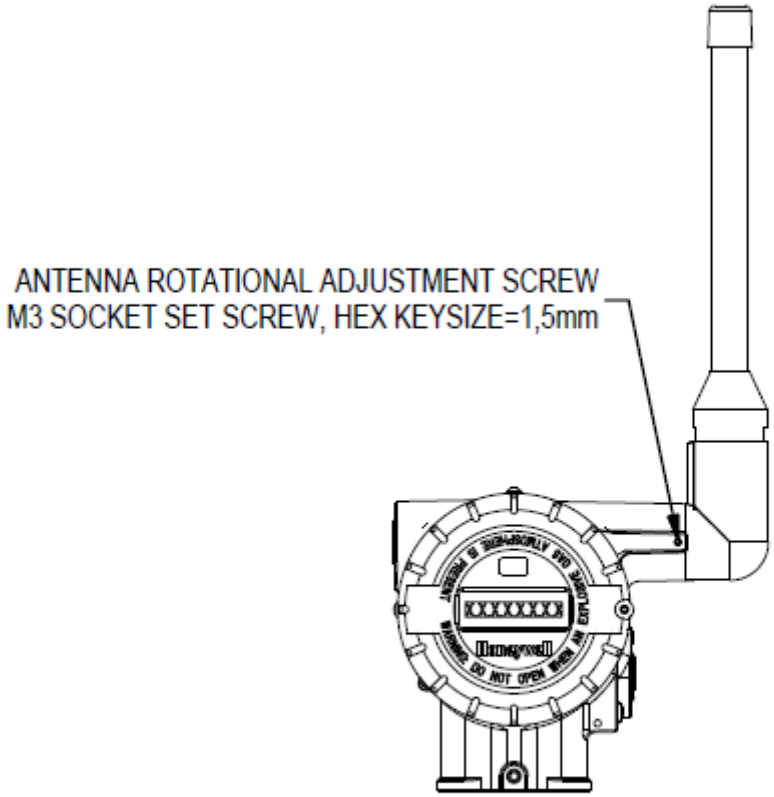


Figure 3-16: Elbow antenna adjustment

If your model has the integral elbow antenna you can adjust it to improve reception. Typically, pointed straight up gives best performance but your installation may vary. Loosen the 1.5mm set screw located near the antenna base. Rotate antenna for best reception. Do not rotate antenna more than 180 degrees either direction or you could damage internal wiring. Tighten set screw shown in Figure 3-16.

3.12 Remote antenna

Outdoor installation warnings

WARNING

LIVES MAY BE AT RISK! Carefully observe these instructions and any special instructions that are included with the equipment you are installing.

WARNING

Contacting power lines can be lethal.

Look over the site before beginning any installation, and anticipate possible hazards, especially these:

Make sure no power lines are anywhere where possible contact can be made. Antennas, masts, towers, guy wires or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.

Assume all overhead lines are power lines.

The horizontal distance from a tower, mast or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls either during installation or later.

WARNING

To avoid falling, use safe procedures when working at heights above ground.

Select equipment locations that will allow safe, simple equipment installation.

Don’t work alone. A friend or co-worker can save your life if an accident happens.

Use approved non-conducting ladders and other safety equipment. Make sure all equipment is in good repair.

If a tower or mast begins falling, don’t attempt to catch it. Stand back and let it fall.

If anything such as a wire or mast does come in contact with a power line, DON’T TOUCH IT OR ATTEMPT TO MOVE IT. Instead, save your life by calling the power company.

Don’t attempt to erect antennas or towers on windy days.

WARNING

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna.

The base of the antenna mast or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 1 OAWG ground wire and corrosion-resistant connectors.

Refer to the National Electrical Code for grounding details.

Lightning arrestors for antenna feed coaxial cables are available from HyperLink Technologies, Inc.

WARNING

If a person comes in contact with electrical power, and cannot move:

DON'T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.

Use a non-conductive dry board, stick or rope to push or drag them so they no longer are in contact with electrical power.

Once they are no longer contacting electrical power, administer CPR if you are certified, and make sure that emergency medical aid has been requested.

Choosing a Mounting Location

The location of the antenna is important. Objects such as metal columns, walls, etc. will reduce efficiency. Best performance is achieved when antennas for both Multinodes and SmartLine Transmitters (Leaf Nodes) are mounted at the same height and in a direct line of sight with no obstructions. If this is not possible and reception is poor, you should try different mounting positions to optimize reception.

Antennas should be mounted clear of any obstructions to the sides of the radiating element. If the mounting location for an omnidirectional antenna is on the side of a building or tower, then the antenna pattern will be degraded on the building or tower side.

Site Selection

Before attempting to install your antenna, think where you can best place the antenna for safety and performance.

Follow these steps to determine a safe distance from wires, power lines, and trees.

Step	Action
1	Measure the height of your antenna.
2	Add this length to the length of your tower or mast and then double this total for the minimum recommended safe distance.
	CAUTION If you are unable to maintain this safe distance, stop and get professional help.

Generally, the higher your antenna is above the ground, the better it performs. Good practice is to install your antenna about 5 to 10 feet (1.5 to 3 meters) above the roof line and away from all power lines and obstructions. If possible, find a mounting place directly above your wireless device so that the lead-in cable can be as direct as possible.

Mounting the Antenna

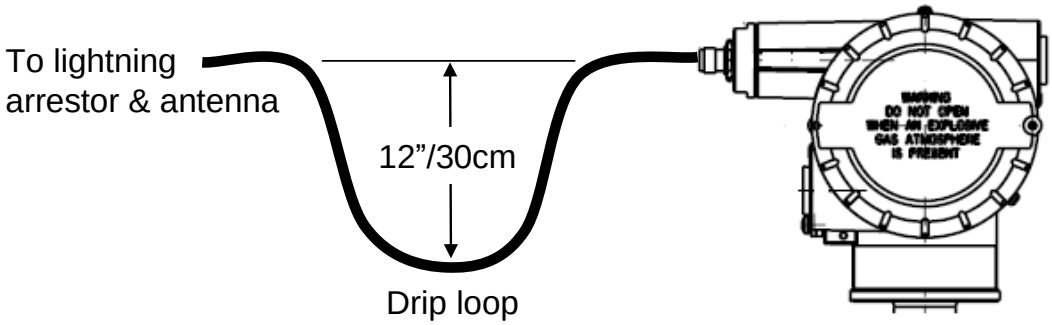
Antennas are provided with a mast mounting kit consisting of a mounting bracket and two U-bolt clamps. This kit allows you to mount the antenna to masts with outside diameters (O.D.) from 1.25 inches (3.2 centimeters) to 2 inches (5.1 centimeters). Honeywell recommends that a 1.5 inch (3.8 centimeter) or larger tubing mast be used.

Omnidirectional antennas are vertically polarized. It is very important to mount the antenna in a vertical (not leaning) position for optimal performance.

Follow these steps to mount the antenna on a mast.

Step	Action
1	Assemble your new antenna on the ground at the installation site. See the instructions on the following pages for your type of antenna.
2	Attach the antenna to the mast and connect its coaxial cable while you are on the ground, using the mounting kit provided with the antenna. Tighten cables by hand only; do not use tools or you could overtighten. After the cable is attached to the antenna, make sure that the connections are sealed (if outdoors) the prevent moisture and other weathering elements from effecting performance. Honeywell recommends using a weathering tape (such as Coax-Seal®) for outdoor connections. Silicon sealant or electrical tape is not recommended for sealing out door connections.
3	Using tie-wraps (cable ties), secure the coax cable to the mast, using a tie-wrap every ten to twelve inches (25 to 30 cm).
4	Follow standard strain relief practice when installing the antenna cable. Avoid excessive strain, bending, kinks, or crushing (stepping on or placing any weight on cable) before, during or after the coax cable is secured in its final position.
5	Make sure the mast does not fall the "wrong way" should you lose control as you raise or take down the mast. Use a durable non-conductive rope. Have an assistant tend to the rope; ready to pull the mast clear of any hazards (such as power lines) should it begin to fall.
6	If the installation will use guy wires: • Install guy anchor bolts. • Estimate the length of guy wire and cut it before raising the mast. • Attach guy wires to a mast using guy rings.
7	Carefully connect the antenna and mast assembly to its mounting bracket and tighten the clamp bolts. In the case of a guyed installation, you must have at least one assistant to hold the mast upright while the guy wires are attached and tightened to the anchor bolts.
8	Attach the provided self-adhering "DANGER" label at eye level on the mast.
9	Install ground rods to remove any static electricity buildup and connect a ground wire to the mast and ground rod. Use ground rods designed for that purpose; do not use a spare piece of pipe.

Step	Action
10	When attaching the coax cable to the SmartLine Wireless transmitter, it is recommended that a drip loop with a radius of at least 12 inches (30 cm) be formed close to the SmartLine transmitter. This will minimize ice and water buildup on the transmitter itself. Tighten cables by hand only; do not use tools or you could overtighten.



Directional mounting procedure

Step	Action
1	Secure mast mounting bracket to mast as shown using 2 U-bolts and supplied hardware.
2	Attach antenna to mast mounting bracket as shown using supplied hardware.
3	Adjust antenna to desired tilt and lock into place using the antenna tilt adjustment nut.

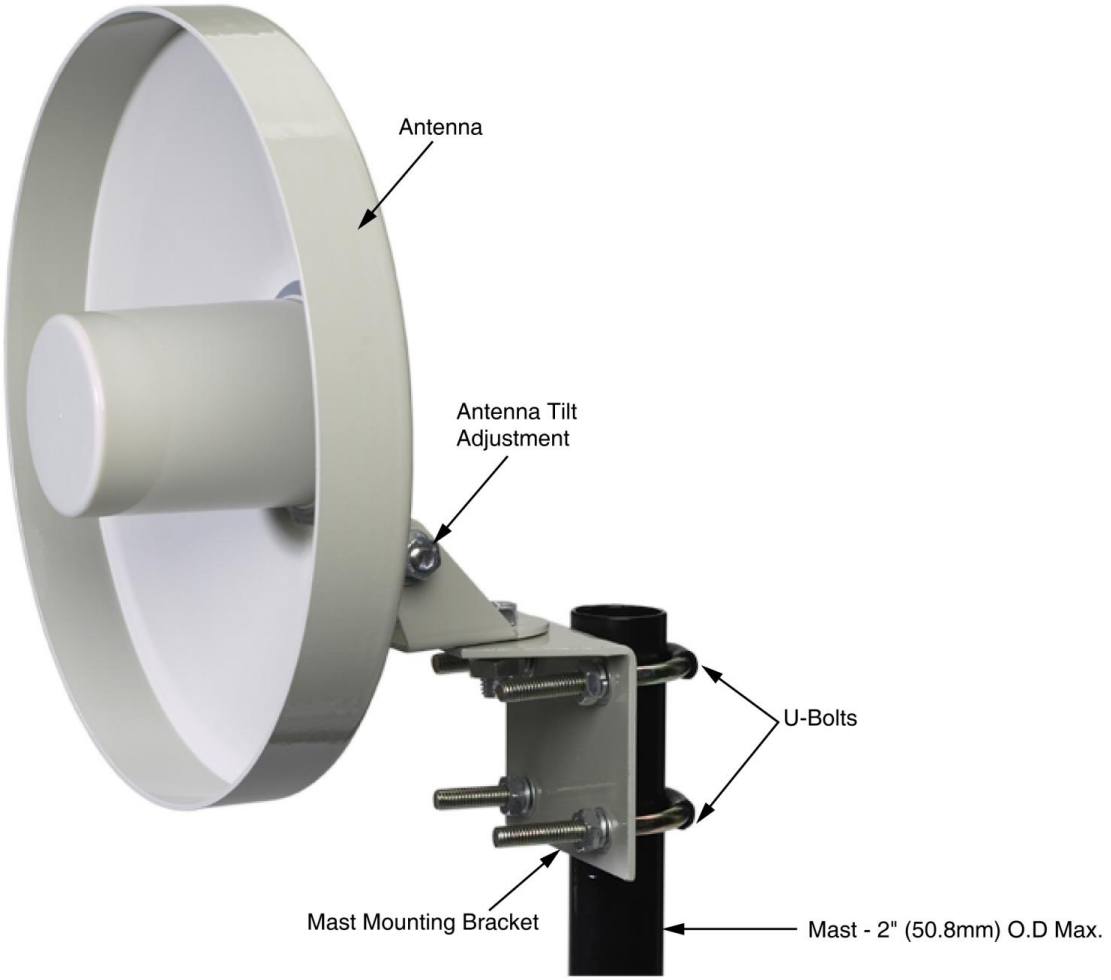


Figure 3-17: Directional antenna mounting

Omnidirectional mounting procedure

Step	Action
1	Secure mast mounting bracket to mast as shown using 2 U-bolts and supplied hardware.
2	Remove antenna mounting bolt and washer from antenna base.
3	Insert antenna into mounting bracket and secure with washer and antenna mounting bolt. Do not overtighten.
4	Any drain holes in the antenna base must be kept clear for proper operation.

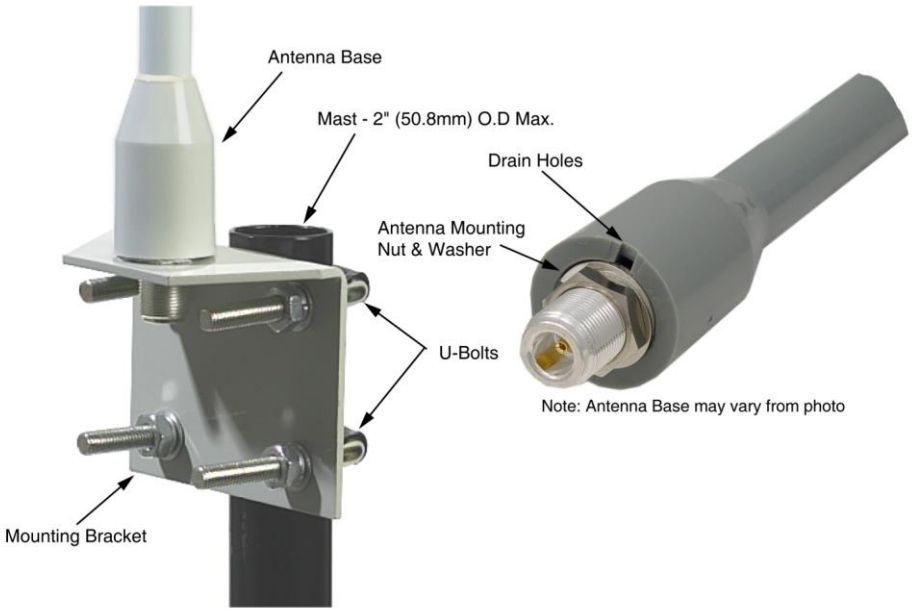


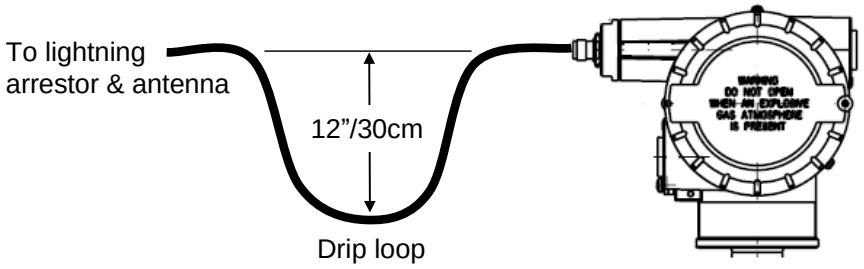
Figure 3-18: Omnidirectional antenna mounting

Grounding the antenna

Follow these guidelines to ground the antenna in accordance with national electrical code instructions.

Step	Action
1	Use No. 10 AWG copper or No. 8 or larger copper-clad steel or bronze wire as ground wires for both mast and lead-in. Securely clamp the wire to the bottom of the mast.
2	Secure the lead-in wire to a lightning arrestor and mast ground wire to the building with stand-off insulators spaced from 4 feet (1.2 meters) to 8 feet (1.8 meters) apart.
3	Using coaxial cable, connect the antenna base to the transmitter's remote antenna connector (located at top right as you face the transmitter display). Antenna cable shield is bonded to earth ground via either the transmitter earth ground connection and/or by the lightning arrestor earth ground connection. The lightning arrestor must be bonded to earth ground in order to function properly. Tighten cables by hand only; do not use tools or you could overtighten. See section 3 for cable types and connection information.
4	If the coax cable is to enter a building, then the lightning arrestor should be mounted as close as possible to where the lead-in wire enters the building. The lightning arrestor sold by Honeywell features a bulkhead N-Female connector with a rubber "O"-ring seal which can be used for mounting through an enclosure wall. The lightning arrestor can also be mounted using the included stainless steel mounting bracket. Both connector ports of the lightning arrestor provide equal protection no matter which way it is installed. Either port can face the antenna and either port can face the Transmitter.
5	Drill a hole in the building's wall as close as possible to the equipment to which you will connect the lead-in cable.

Step	Action
	CAUTION There may be wires in the wall. Before drilling check that the area is clear of any obstructions or other hazards.
6	Pull the cable through the hole and form a drip loop on the outside close to where the cable enters the building. The drip loop should have a radius of at least 12 inches (30 cm).
7	Thoroughly waterproof the lead-in area.
8	Connect the lead-in cable to the SmartLine Transmitter. Tighten cables by hand only; do not use tools or you could overtighten.



4. Start up

4.1 Battery Power Option

Install/Replace batteries

WARNING

Risk of death or serious injury from explosion or fire.

- When not in use the Battery Pack must be stored in a non Hazardous Area
- Do not change batteries in an explosive gas atmosphere.
- The batteries used in this device may present a risk of fire or chemical burn if mistreated. Do not recharge, disassemble, heat above 100°C (212°F), or incinerate.
- When installing batteries, do not snag the battery terminal on the clip or the battery may be damaged. Do not apply excessive force.
- Do not drop. Dropping the battery may cause damage. If a battery is dropped, do not install the dropped battery into the transmitter. Dispose of dropped battery promptly per local regulations or per the battery manufacturer's recommendations.

ATTENTION

Both batteries must be the same model from the same manufacturer. Mixing old and new batteries or different manufacturers is not permitted.

Use only the following 3.6V lithium thionyl chloride (Li-SOCl2) batteries (non-rechargeable), size D. No other batteries are approved for use in SmartLine Wireless Transmitters.

- Xeno Energy XL-205F
- Eagle Picher PT-2300H
- Tadiran TL-5930/s
- Tadiran GmbH, SL-2780 (Not approved by FM or CSA)
- Honeywell p/n 50026010-501 (Two 3.6V lithium thionyl chloride batteries)
- Honeywell p/n 50026010-502 (Four 3.6V lithium thionyl chloride batteries)
- Honeywell p/n 50026010-503 (Ten 3.6V lithium thionyl chloride batteries)

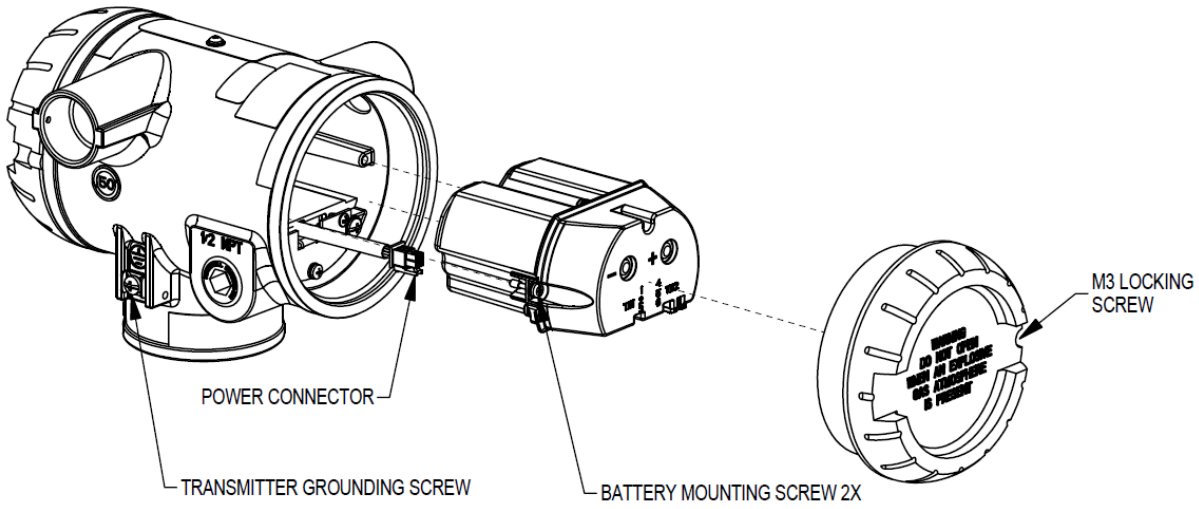


Figure 4-1: IS Battery Pack Installation

Battery Pack

Repalcement Battery Pack (without batteries) Honeywell part number: 50047517-501

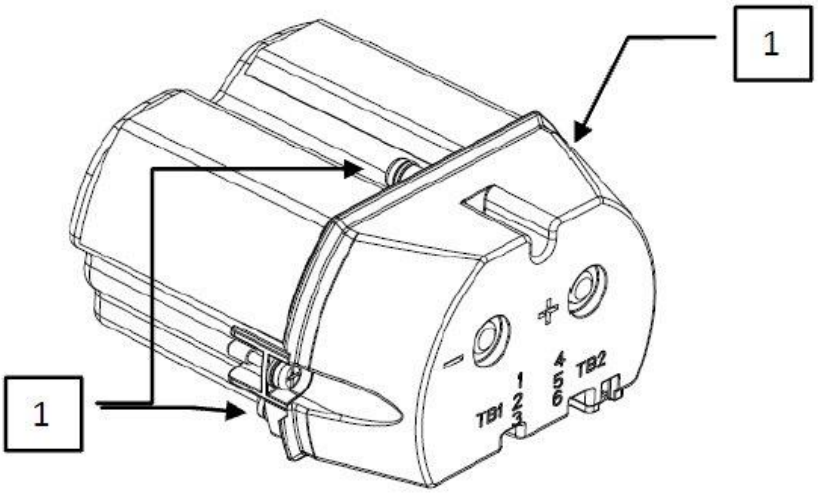


Figure 4-2: IS Battery Pack

Battery Pack installation and replacement procedure

Tools required

- #1 Phillips Screwdriver or 1/8” Slotted Screwdriver
- Torque Screwdriver
- 1.5 mm hex key

It is the User/Installer’s responsibility to install the SmartLine Wireless Transmitters in accordance with national and local code requirements.

Step **Action**

WARNING

DO NOT ASSEMBLE/DISASSEMBLE WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

1. Loosen the M3 locking set screw on the battery end-cap (opposite end from display). Unscrew and remove the end cap.
2. Using thumb and forefinger, squeeze the battery connector at top and bottom to disengage the locking mechanism, then pull to disconnect.
3. Loosen the two-battery pack retaining screws (closest to the batteries). The screws are captive.
4. Pull the battery pack out of the transmitter.
5. Remove top of battery pack by using a #1 Philips or 1/8” slotted screwdriver for the screws identified as #1 in Figure 4-2
6. Remove the spent batteries and dispose of them promptly according to local regulations of the battery manufacturer’s recommendations.
7. Install the batteries following the polarity as noted on the lid
8. Re-install top of the battery pack and tighten screws
9. Insert the Battery pack into the transmitter. Re-attach the three screws to 0.4 to 0.6 Nm (3.5 – 5.3 lb-in).
10. Reconnect the Battery Pack power connector to the transmitter
11. Ensure all wires are free of the threads to allow the cap to be re-installed
12. Honeywell recommends lubricating the end cap threads with a silicone grease such as Dow Corning #55 or equivalent before replacing the end cap
13. Screw the cap back on and tighten the M3 locking screw

Battery Pack Test Terminals

The cap of the battery pack includes two, exposed, metal terminals marked “+” and “-“. These terminals are for test purposes only and shall not be connected to power the transmitter. Using an appropriate volt meter, these terminals can be used to measure the battery pack voltage (2 in series D size lithium thionyl chloride (Li-SOCl2) batteries).

4.2 24V Power Supply Option

ELECTRICAL CONNECTION SPECIFICATIONS

The 24V power supply requires 16 Vdc to 28 Vdc, 100 mA max supply connection to the 24V wiring connector terminals. For hazardous location installation, and intrinsic safety entity parameters, refer to the control drawing.

1. The 24V wiring terminals accepts 26 to 12 gauge wiring. The terminals shall be torqued from 0.4 Nm to 0.5 Nm (3.5 to 4.4 lb-in).

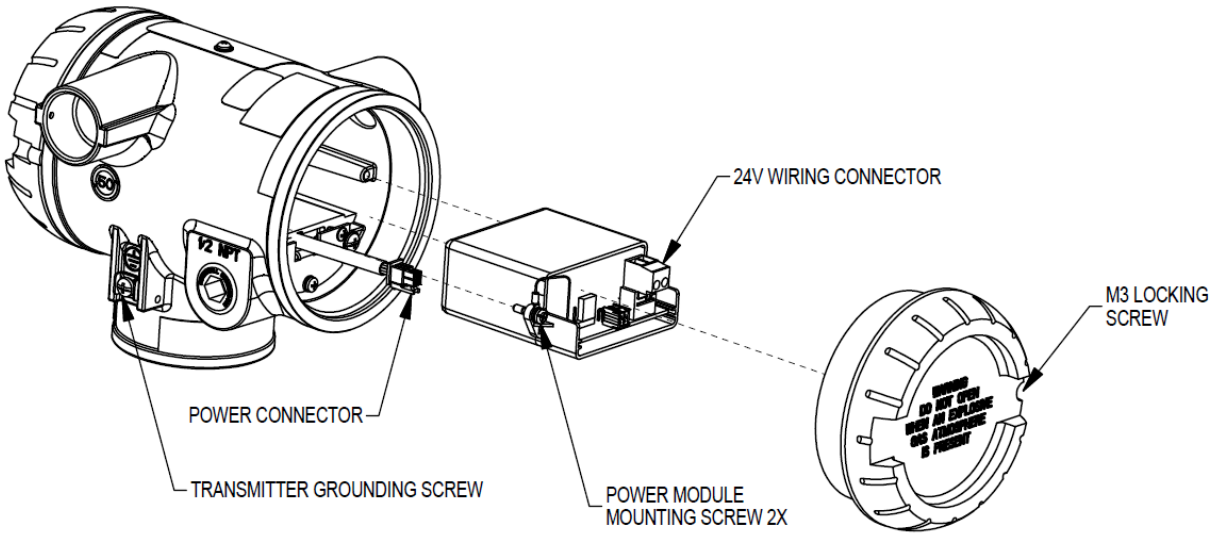


Figure 4-3: 24V Power Supply Installation

24V Power Supply

Replacement 24V Power Supply Honeywell part number: 50136118-501

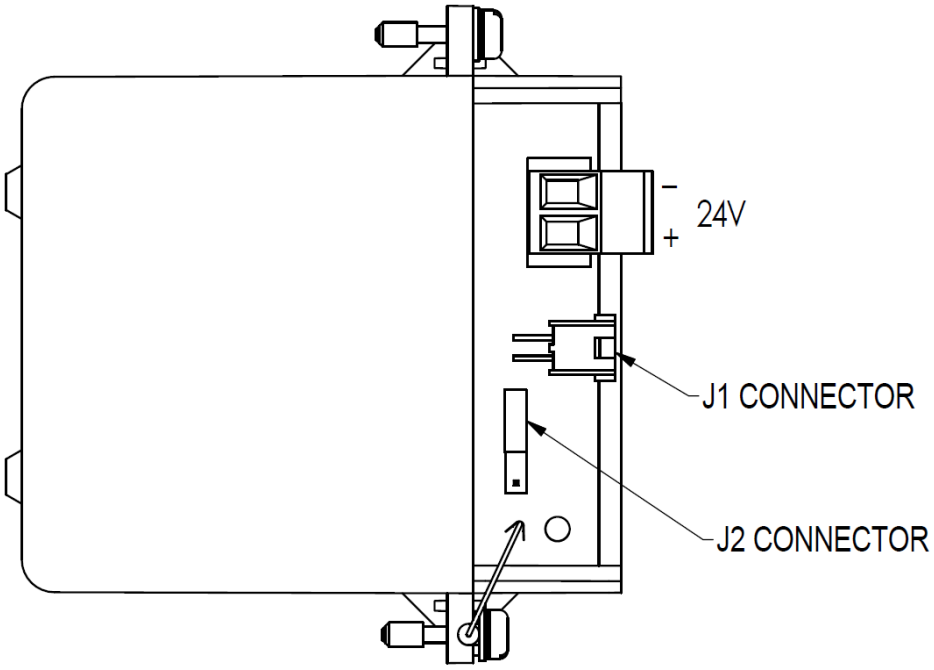


Figure 4-4: 24V Power Supply Module

24V Power Supply Connection/Replacement Procedure

Tools required

- #1 Phillips Screwdriver or 1/8” Slotted Screwdriver
- Torque Screwdriver
- 1.5 mm hex key

It is the User/Installer’s responsibility to install the SmartLine Wireless Transmitters in accordance with national and local code requirements.

Refer to Error! Reference source not found. and Error! Reference source not found.

Step	Action

WARNING

ENSURE POWER IS OFF BEFORE OPENING COVER IN AN EXPLOSIVE ATMOSHPERE

1. Loosen the M3 locking set screw on the supply end-cap (opposite end from display). Unscrew and remove the end cap.
2. Install a cable gland appropriate for the environment on one of the conduit entries on the side of the enclosure. Plug the unused conduit entrance with a conduit plug appropriate for the environment
3. Feed the power supply wires (26 to 12 gauge) through the cable gland, and insert into the 24V terminals. The terminals tightening torque is 0.4 Nm to 0.5 Nm (3.5 to 4.4 lb-in)
4. If shielded wire is used, do not terminate the shield at the transmitter. The shield should be terminated at the power supply end.
5. If replacing the 24V power supply module, loosen the two retaining screws, ensure the power supply connector is disconnected, and pull out the out module. Install the new module. Reattach the screws and tighten to 0.4 – 0.6 Nm (3.5 – 5.3 lb-in).
6. Ensure the “J2” Jumper in the NON-RTD position for pressure transmitters.
7. If disconnected, reconnect the 24V Power Supply connector J1 to the transmitter power connector.
8. Ensure all wires are free of the threads to allow the cap to be re-installed.
9. Honeywell recommends lubricating the end cap threads with a silicone grease such as Dow Corning #55 or equivalent before replacing the end cap
10. Screw the cap back on and tighten the M3 locking screw
11. Turn on the 24V source supply

.

4.3 Grounding

If the transmitter is not grounded solidly through the meterbody mounting, ground the transmitter by connecting a wire from the Earth Ground Clamp on the side of the transmitter to Earth Ground as short as possible. Use a size 8AWG or (8.37 mm^2) bare or green covered wire for this connection. The tightening torque for the grounding screw (shown in Figure 4-3 is 0.8 Nm to 1.0 Nm (7.1 to 8.9 lb-in).

24V dc Power Supply Option (DC) System Diagram

(Ordinary Non-Hazardous Locations)

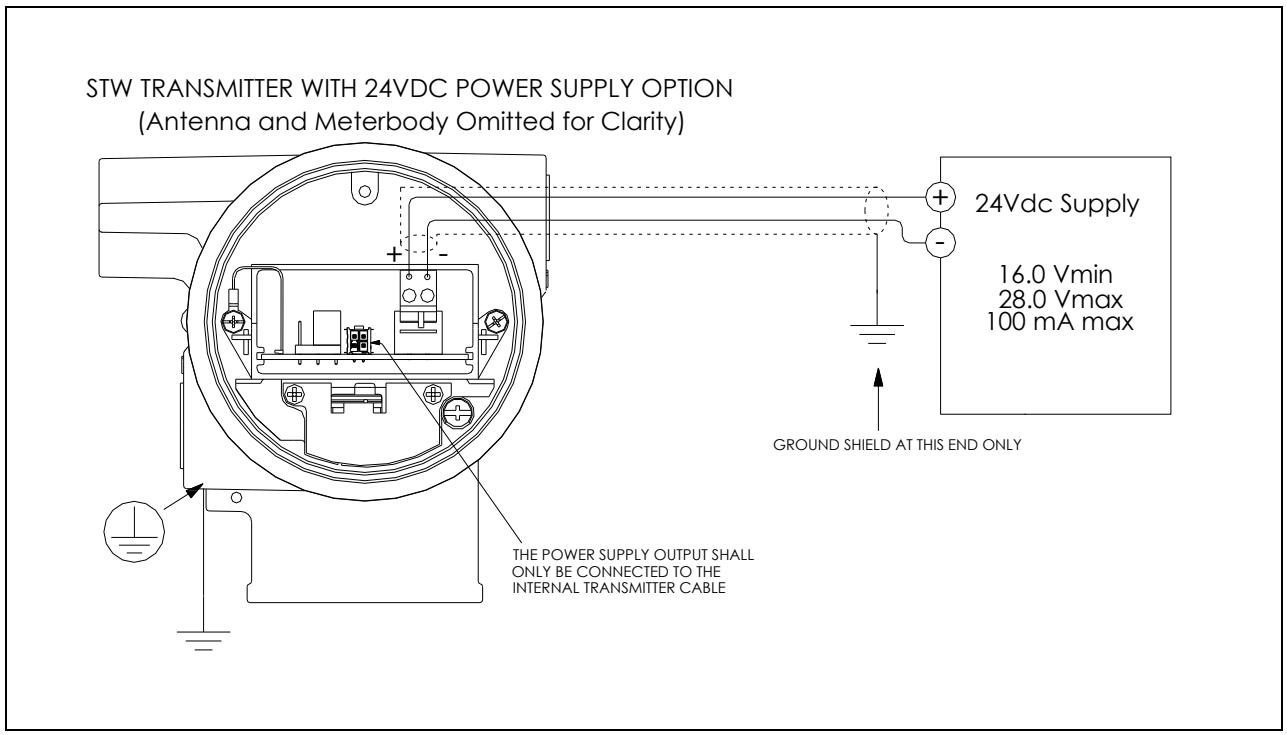


Figure 4-5: Power Supply 24V dc Option (DC) System Diagram

4.4 Display sequence

After power up, the transmitter will display its boot sequence which includes the firmware revision. It will then perform a sensor (meter body) check and proceed to connecting to the wireless network. A series of messages will be displayed depending on the network connection status. The process variable will also be displayed. Once connected to the wireless network, an antenna symbol (triangle) will be shown on the left hand side of the LCD along with the process variable on the right.

4.5 Provisioning

Before the transmitter can be configured it must be provisioned with a security key so it can join the wireless network. Use the Provisioning Device Pocket PC software to receive security keys from the Key Server manager, then aim the Pocket PC at the transmitter and transmit a key.

Transmitters in the OneWireless Network with R240 or later release software, can be provisioned using over-the-air provisioning.
The Wireless Device Manager (WDM) provisions the access points, and the access points that are enabled to function as provisioning devices can then provision the transmitters. To enable the over-the-air provisioning capability, you must first enable this feature in the OneWireless User Interface.
For more information, please reference the One Wireless R310 Wireless Device Manager User's Guide (OWDOC-X254-en-310).

4.6 Calibrating the transmitter

Overview

The OneWireless User Interface must be used to calibrate the transmitter.

Calibrate zero

Calibrates the sensor to correct the input measurement due to fill fluid and transmitter position effects once the transmitter is installed and operating under process conditions.

ATTENTION

Setting user trim points will effectively override the calibration zero. Normally the calibration zero is only required if you do not intend to provide process-specific trim points.

Table 4-1: Calibrate zero

Step	Action
1	Apply zero input pressure for your transmitter's pressure type as follows. Differential: With process pressure applied, connect HP and LP inputs together using the crossover valve on the 3-valve manifold or other equivalent method. Gauge: Isolate the input pressure from the process and vent to the atmosphere. Absolute: Due to the difficulty of applying absolute 0 psi, zero calibration of the AP transmitter is not recommended.
2	In OneWireless User Interface, set the transmitter's Software Write Protect option to Disable.
3	In OneWireless User Interface, set the transmitter's channel to Out of Service.
4	Verify the channel is out of service (OOS) message. If the transmitter is write protected a Read Only error will be displayed. Go to step 2. If the channel is not out of service a WRONG MODE error will be displayed. Go to step 3.
5	Select CAL ZERO. With CAL ZERO displayed, press Enter to set the current applied pressure to zero. If successful, the display will briefly show "ZERO SET". If unsuccessful the display will briefly show "ERROR".
6	When ready, in OneWireless User Interface return the transmitter's channel to service Automatic and set Software Write Protect to Enable.

Procedure for field calibration of Honeywell compound characterized SmartLine Wireless Transmitters

This procedure applies to the following Honeywell SmartLine Wireless Transmitters

- 0-25 to 0-400 inH_20/0-62.2 to 0-1000 mbar Compound Characterized
- 0-5 to 0-100 psi/0-0.34 to 0-7 bar Compound Characterized

Honeywell SmartLine Wireless Transmitters are fully characterized at the factory and have an applied factory calibration over the range of the transmitter (URL). Field calibration is provided to allow up to 5% adjustment over a reduced operating range providing accuracy within .075% of the reduce range or ±0.025 + 0.05 20 psi span psi or ±0.025 + 0.05 (1.4 bar) span bar in % span. Compound characterized pressure transmitters allow calibration at both positive and negative relative pressure calibration points within the characterized range of the transmitters meter body.

Table 4-2: Field calibration

SmartLine Wireless Model	Description	Range Limits	Span Limits	Min Lower Range
STFW128	Flange Mounted Liquid Level Transmitter	0 to 4.0 inH_2O	0 to 400 inH_2O	-400 inH_2O
STFW132	Flange Mounted Liquid Level Transmitter	0 to 1.0 psi	0 to 100 psig	-100 psi
STFW924	Flange Mounted Liquid Level Transmitter	0 to 10 inH_2O	0 to 400 inH_2O	-400 inH_2O
STFW932	Flange Mounted Liquid Level Transmitter	0 to 5 psi	0 to 100 psig	-100 psi
STRW12D	Remote Diaphragm Seal Pressure Transmitter	0 to 4.0 inH_2O	0 to 400 inH_2O	-400 inH_2O
STRW13D	Remote Diaphragm Seal Pressure Transmitter	0 to 1.0 psi	0 to 100 psi	-100 psi
STRW93D	Remote Diaphragm Seal Pressure Transmitter	0 to 5.0 psi	0 to 100 psig	-100 psi

Upper and Lower Calibration:

The SmartLine Wireless Transmitters provide calibration for upper and lower calibration points as well as the option for calibration of zero. The zero calibration is independent of the upper and lower calibration and is applied as a bias whereas upper and lower calibration adjusts the gain and offset of the characterization. Zero calibration is available from the local interface at the transmitter and is done with the device mounted in its operating orientation and applied “zero” offset head pressure.

Upper and lower calibration are only available when connected to the network where access to the upper and lower calibration points as well as access to the calibration command is available. Upper and lower calibration requires the values for the upper and lower calibration points to be entered and the status of the calibration operation to be verified.

Definitions:

For compound characterized meter bodies the following definition is used:

Positive applied pressure value: A positive applied pressure is an applied pressure where the pressure at the high side of the meter body is greater than the applied pressure at the low side of the meter body thus asserting a “positive” relative pressure between the high and low side of the meter body.

Negative applied pressure value: A negative applied pressure is an applied pressure where the pressure at the high side of the meter body is lower than the applied pressure at the low side of the meter body thus asserting a “negative” relative pressure between the high and low sides of the meter body.

One side calibration: Often only a positive calibration pressure source is available and compound calibration is done by applying regulated pressure relative to ambient air to only one side of the meter body with the other side of the meter body vented to ambient air. In this way a positive calibration pressure applied to the low side of the meter body can be used to apply “negative” relative pressure value during calibration of the lower calibration point. Both the upper and lower calibration points can be either positive or negative values as long as the upper calibration point is greater than the lower calibration point.

Compound Calibration Procedure:

Select the upper and lower calibration points where the transmitter is to be calibrated:

1. Select the Cal Clear command to remove any zero bias from the transmitter and return the calibration to a gain of 1 and calibration offset zero in respect to the factory characterization. The calibration status should return SUCCESS and the Calibration Source will be set to NONE. This operation will set the device to a known good state. If the calibration status does not return SUCCESS stop and call Honeywell customer support for further assistance. Cal Clear will clear any previous user calibration including and zero bias established using a CAL ZERO command. Factory calibration is preserved but it is not applied.

Note: Make sure the transmitter is in the OOS (Out of Service) state prior to beginning calibration.

2. Select the upper and lower calibration points where the transmitter is to be calibrated. The upper and lower calibration points can be either positive or negative values as long as the upper calibration point is greater than the lower calibration point.
3. Set the lower calibration point to the pressure value to be applied for lower calibration. This calibration point can be either a positive or negative value as long as it is less than the upper calibration point.
4. Set the upper calibration point to the pressure value to be applied for upper calibration. This calibration point can be either a positive or negative value as long as it is greater than the lower calibration point.
5. Apply the lower pressure to the meter body. When applying a negative pressure the high side of the meter body will be at a lower pressure than the low side.

6. Select the Cal Lower command and wait for the calibration status value to change from NONE to SUCCESS, SUCCESS with EXCESS, or FAILURE. If the status returns FAILURE stop and check that the value of the lower calibration point is within the range of the meter body.

7. Apply the upper pressure to the meter body. As with the lower pressure value, when applying a negative pressure the high side of the meter body will be at a lower pressure than the low side.

8. Select the Cal Upper command and wait for the calibration status value to change from NONE to SUCCESS, SUCCESS with EXCESS, or FAILURE. If the status returns FAILURE stop and check that the value of the upper calibration point is within the range of the meter body. If the status returns SUCCESS with EXCESS, the calibration was applied but the adjusted characterization value is outside it's allowed adjustment range and the accuracy of the process value over the calibrated range is not guaranteed to be within the specified tolerance.

Note: When applying pressure, ensure the pressure is stable to get a valid setting. Some pressure sources can vary in pressure (bounce especially dead weight testers) and this will give false reading.

Notes on Calibration Status:

SUCCESS: If the calibration status return SUCCESS it is indicating that the transmitter successfully applied a gain and offset that provides a process value that is within the specified accuracy over the calibrated range of .075% of the reduce range or ±0.025 + 0.05 20 psi span psi or ±0.025 + 0.05 (1.4 bar) span bar in % span.

FAILURE: If the calibration status returns FAILURE it is indicating that the transmitter could not be calibrated either due to the calibration points being beyond the range of the meter body or the calibration span (difference between the upper and lower calibration points) is too small.

SUCCESSS with EXCESS: If the calibration status returns SUCCESS with EXCESS it is indicating that the calibration was successful but the applied gain or offset resulting from the calibration is deviates by more than 5% of the characterized range. This could happen if the applied calibration pressure for either the upper or lower calibration point deviates from the selected calibration point in a manner that will cause the adjusted gain or zero correction be greater than 5% of the URL.

5. Function blocks

5.1 Introduction

This section explains the construction and contents of the SmartLine Wireless Transmitter Function Blocks.

5.2 Block description

Block types

Blocks are the key elements that make up the transmitter's configuration. The blocks contain data (block objects and parameters) which define the application, such as the inputs and outputs, signal processing and connections to other applications. The SmartLine Wireless Transmitter contains the following block types.

Table 5-1: Blocks

Block Type	Function
Device	Contains parameters related to the overall field device rather than a specific input or output channel within it. A field device has exactly one device block.
AITB	Contains parameters related to a specific process input or output channel in a measurement or actuation device. An AITB defines a measurement sensor channel for an analog process variable represented by a floating-point value. There is one AITB per sensor.
Radio	Contains parameters related to radio communication between the transmitter and the multimode(s).

Block diagram

Figure 5-1 shows the blocks of the SmartLine Wireless Transmitter.

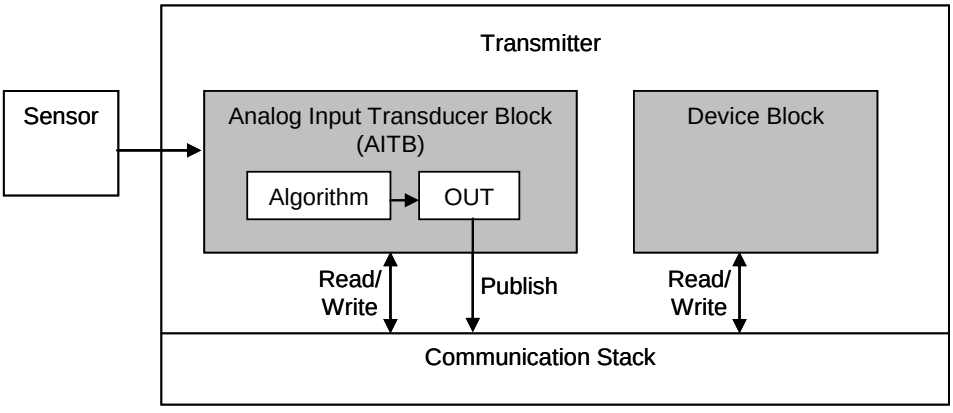


Figure 5-1: Block Diagram

Each of these blocks contains parameters that are standard WNSIA-transmitter defined parameters. The AITB and device blocks contain standard parameters common to all ISA100.11a-compliant transmitters as well as model-specific parameters. The radio block contains parameters for communication with the wireless network.

6. Operation

6.1 Overview

Display modes

The transmitter has the following display modes.

- Test pattern. All segments appear On for 1 sec and then Off.
- Connection status. Shows Status periodically and also shows an Antenna to indicate Joined Network Status or ‘N’ to indicate Not Joined Network Status. See section 6.2.
- PV display. Default mode of the transmitter displays the PV and any status messages. See section 6.3 on page 54.

6.2 Transmitter connection status

Table 6-1: Transmitter connection status

Displayed status	Definition	What to do
NO-KEY	Transmitter needs a key from the Provisioning Device and is not transmitting.	Transmit a key to the transmitter. See page 60.
UNJOINED	Transmitter has backed off and is in between discovery attempts.	If Transmitter does not join the network within five minutes, do the following: • Check that Key is correct for the network you are trying to join. • Check that FDAP(s) in the local area are turned on and are already a secure part of the network. • Check if KeyServer is active. • Check the KeyServer Event Log to see if the Transmitter is actively trying to join. Errors in the Event Log show that the Transmitter is trying to join but that there are problems. Consult the OneWireless User Interface documentation for troubleshooting errors.
DISCOVER	Transmitter has not made a connection to a FDAP and is in discovery (searching for a connection to a FDAP). Transmitter will automatically enter a power saving mode if it cannot make a connection and will retry later.	Wait for connection. If Transmitter does not make a connection within five minutes, see UNJOINED in this table.
RXADVERT	The transmitter has received an advertisement message for the ISA network	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
FIND MAC	The transmitter is attempting to find the MAC of the nearest FDAP	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
WAIT MAC	The transmitter is waiting for the FDAP to respond with its MAC address	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SENDSMJR	The transmitter is sending a Join Request to the Security Manange Network Object	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SMJRSENT	The transmitter has sent a Join Request to the Security Manange Network Object and is awaiting a response	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SENDSMCR	The transmitter is sending a Control Request to the Security Manager Network Object	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SMCRSENT	The transmitter has sent a ControlRequest to the Security Manager Network Object and is awaiting a response	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.

SEND SCR	The transmitter is sending a Security Confirmation Request to the Network	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SCR SENT	The transmitter has sent a Security Confirmation Request to the Network and is awaiting a response	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
SJR SENT	The transmitter has sent a Secure Join Request to the Network and is awaiting a response	Wait for connection. If the transmitter does not make a connection within five minutes, see UNJOINED in this table.
-No MAC-	The Radio Has not been assigned a MAC address at the factory.	Contact Honeywell Support. A new radio is required.
JOINED	Transmitter has validated the key and has made a secure connection with at least two Multinodes. Transmitter should appear in OneWireless User Interface as an uncommissioned device.	No action required.

6.3 Transmitter PV display

In PV display, the following information is displayed in sequence.

Table 6-2: Transmitter PV display

Item displayed	Example	Details
PV value	4.7	Latest PV value.
PV engineering units	PSI	See Table 6-3
PV status	BAD	See Table 6-3. If PV status is not displayed, then the PV value is good.
Device status	LOW BAT	See Table 6-3. If multiple device status messages are in effect, they are displayed one message per channel until all messages have been displayed. If no device status is displayed, then the device status is normal.

Table 6-3: SmartLine Wireless DP units

Pressure	Description
PA	Pascal
GPA	gigapascal
MPA	megapascal
KPA	kilopascal
mPA	millipascal
uPA	micropascal
hPA	hectopascal
BAR	Bar
mBAR	millibar
TORR	Torr
ATM	Atmosphere
PSI	Pounds per square inch
PSIA	Pounds per square inch absolute
PSIG	Pounds per square inch gage
GCM2	grams per centimeter square

Pressure	Description
KGCM2	Kilograms per centimeter square
INH20	Inches H2O
INH20_4C	Inches H2O referenced to 4˚C
INH20_68f	Inches H2O referenced to 68˚F
MMH20	millimeters H2O
MMH20_4C	millimeters H2O referenced to 4˚C
MMH20_68F	millimeters H2O referenced to 68˚F
FTH20	Feet H2O
FTH20_4C	Feet H2O referenced to 4˚C
FTH20_68F	Feet H2O referenced to 68˚F
INHG	Inches mercury
INHG_0C	Inches mercury referenced to 0˚C
MMGH	millimeters mercury
MMGH_0C	millimeters mercury referenced to 0˚C

For Pressure

The upper and lower calibration points indicate the upper and lower pressure value that will correspond the upper and lower scale value respectively.

Flow = (scale EU100 – scale EU0) * sqroot((DP – Cal Lower) / (Cal Upper – Cal Lower)) – scale EU0 for DP > cal Lower

Flow = (scale EU100 – scale EU0) * sqroot((Cal Lower - DP) / (Cal Upper – Cal Lower)) – scale EU0 for DP < -cal Lower

Flow = 0 for DP < abs (cal lower)

Where scale EU100 and scale EU0 are in flow units and Cal Upper and Cal Lower are in pressure units.

The square root function is automatically employed for conversion from pressure to flow scale units. Calibration units are always in pressure units.

Table 6-4: SmartLine Wireless Flow units

FLOW	Description
CMPS	cubic meters per second
CMPM	cubic meters per minute
CMPH	cubic meters per hour
CMPD	cubic meters per day
LPS	liters per second
LPM	liters per minute
LPH	liters per hour
LPD	liters per day
MLPD	million liters per day
CFPS	cubic feet per second
CFPM	cubic feet per minute
CFPH	cubic feet per hour
CFPD	cubic feet per day
SCFPM	standard cubic meters per second
SCFPH	standard cubic meters per minute
USGPS	US gallons per second
USGPM	US gallons per minute
USGPH	US gallons per hour
USGPD	US gallons per day
MUSGPD	million US gallons per day
IGPS	Imperial gallons per second
IGPM	Imperial gallons per minute
IGPH	Imperial gallons per hour
IGPD	Imperial gallons per day

For Flow:

1. Select the upper and lower scale values in flow units.
2. Set the Pressure Scale 100% EU value to the pressure that will be asserted when the flow is to be the upper scale value.
3. Set the Pressure Scale 0% EU value to the pressure that will be asserted when the flow is to be the lower scale value.

PV status

PV Status is indicated by the Second Left-most Character on the display when showing the PV Value. Blank indicates good/normal status. 'B' Indicated Bad Status. 'U' indicates uncertain status and 'F' indicates Failure Status.

Table 6-5: PV Status

PV status	Cause - Action
(blank)	• PV is normal – no action required
'B'	• Possible calibration error – Clear calibration • AITB cannot execute due to internal firmware state – Attempt cold restart of device. • AITB cannot execute due to hardware fault – Replace sensor board • Sensor failure – Check Connection between Sensor board and meter body. • Meter body Characterization Data is Bad – Replace meter body • Meter body A/D Failure – Replace meter body • Meter body Sensor Fail – Replace meter body
	• Configuration is bad – Check possible units and range settings for input type and correct AITB configuration.
	• Hardware fault detected - Replace sensor board
'U'	• Warning: Calibration (zero or trim) is causing excessive adjustment to characterization value. • Warning: Input inaccurate due to uncertain input data integrity. • Warning: Input inaccurate due to input conversion limitations or resolution. • Warning: Input outside of characterized range. Value is estimated.
'F'	• Sensor Failure has occurred or the transmitter was unable to communicate with the sensor. • Check the connection between the Sensor and the Main Board of the transmitter. • Contact Honeywell Support if the problem persists.

Table 6-6: Device status

Transmitter display	OneWireless User Interface display	Definition	What to do
OoS	OOS	All channels are out of service.	Restore mode to Auto in OneWireless User Interface.
SNSR ERR	Sensor Error	Sensor can not access meter body A/D converter.	Check connection between sensor module and meter body. If still doesn't work, replace sensor. See page 70.
OVR TEMP	Over Temperature	The meter body has exceeded the maximum temperature as defined by the meter body characterization data.	Determine cause excessive temperature.
OVR LOAD	Over Load	The applied pressure has exceeded the limit defined by the meter body characterization data.	Determine cause of over pressure.
'U' Status	Calibration Error	Calibration Data Invalid or could not be read.	Use Cal Clear, or User Calibrate.
LOW BAT	Low Battery	Battery Voltage Critically Low	Replace batteries as soon as possible. See page 71.
NO RADIO	Radio Interprocessor Comm Error	Radio Board is not accessible.	Restart both the radio and sensor. If condition persists, replace sensor module. See page 70.
The following status messages have multiple meanings. Refer to OneWireless UI Device Status for exact cause.			
'F' Status	Input Failure	Input Error	Possible meter body sensor failure.
'F' Status	NVM Fault*	Startup diagnostics detected defect in Sensor Non-Volatile Memory	Replace sensor module. See page 70.
'F' Status	Program Memory Fault*	Startup diagnostics detected defect in Sensor Read Only Memory	Replace sensor module. See page 70.
'F' Status	RAM Fault*	Startup diagnostics detected defect in Processor Random Access Memory	Replace sensor module. See page 70.
The following statuses are displayed only in OneWireless UI Device Status.			

Transmitter display	OneWireless User Interface display	Definition	What to do
'U' Status	Excess Zero Calibration	The selected zero offset or the lower calibration trim point is beyond 5% of the lower end of the characterized range of the device.	Clear Calibration
'U' Status	Excess Span Calibration	The calibrated upper and lower trim has produced a span that is greater than 5% of the characterized span of the transmitter.	Clear Calibration Or Set Factory Calibration Or Check the applied trim points and re-attempt lower and upper (trim) calibration.
'U' Status	Excess Calibrated Range	The selected calibration points used for upper and lower trim are outside the characterized range of the transmitter.	Check that the upper and lower trim points are both within the characterized range of the transmitter and re-attempt upper and lower (trim) calibration.
blank	Calibration Cleared	Indicates that both the upper and lower trim points as well as the zero offset has been cleared. The calibration source is none.	Calibration the zero offset Or Calibrate using the lower and upper trim points.

6.4 Provisioning Device menus

Overview

Hold the Provisioning Device no more than 6” (15 cm) from the transmitter and aim the infrared beam at the transmitter display while tapping on the screen command or button.

Main menu

The main menu is shown below. Details start on the next page.

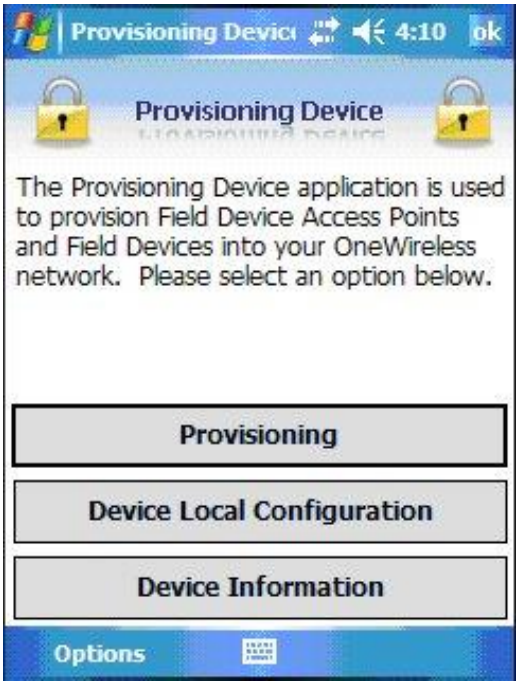


Figure 6-1: Main menu

Security and Node Deployment

Use this to:

- receive new security keys,
- transmit security keys for connecting the transmitter (or other nodes) to the OneWireless network,
- clear all security keys from the Provisioning Device,
- clear the transmitter’s key and reset its configuration to factory defaults (such as for deprovisioning).

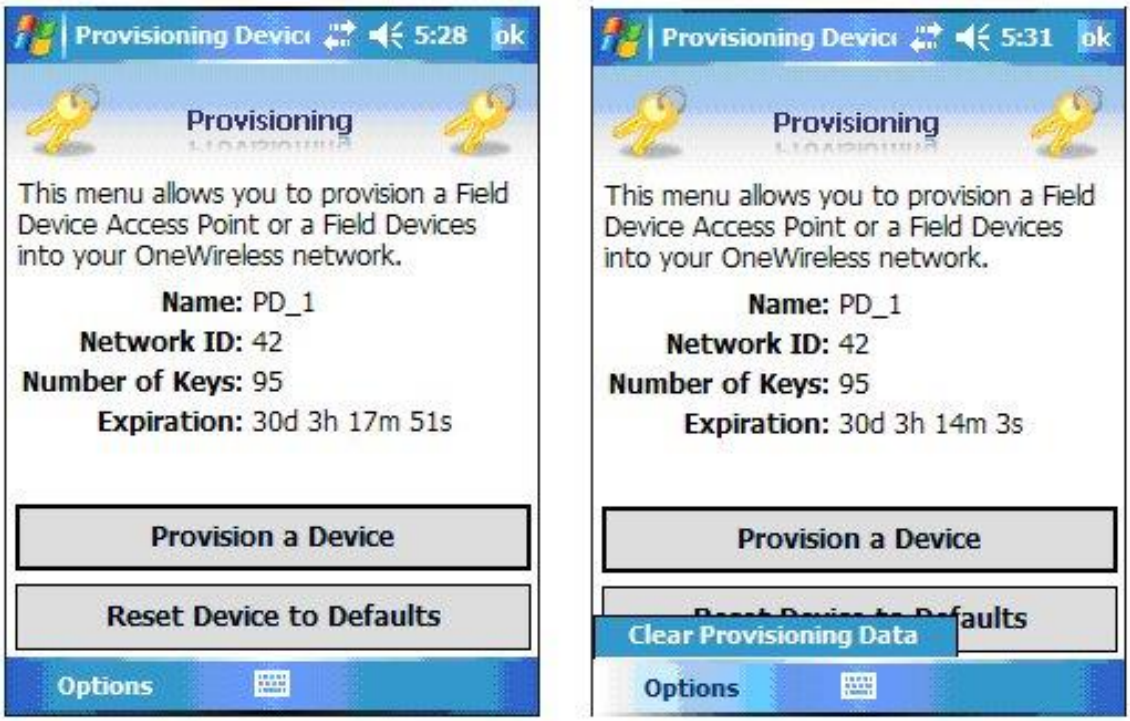


Figure 6-2: Security and Node Deployment

To connect your transmitter to the OneWireless network perform the following steps.

Step	Action
1	If the Provisioning Device contains no keys, obtain new security keys from the WDM Provisioning tab
2	When the Provisioning Device has valid unexpired keys, aim it at the transmitter and transmit a key to the transmitter. The transmitter will validate the key and then use it to make a connection to the OneWireless network. The Transmitter may continue to show the diagnostic message “NO KEY” for a brief time while it validates the key before showing the “DISCOVER” message. To verify your transmitter has been provisioned, see the Connection prompt on the Read Device Information screen Figure 6-3

De-provisioning

To de-provision the transmitter from the network and reset all settings to their default factory values, select Reset Device to Defaults. To simply remove the device from the network select the transmitter in the WDM and click Delete. This will remove the device from the network and you will have to manually accept it back onto the network via the WDM interface if you want it to re-join the same network. This will preserve the settings and Key data etc. If the device is to be moved to a different ISA100 Network then the only option is to Reset Device to Defaults, and provision it for the new network. In this case any custom settings will have to be re-applied once the transmitter is on the new network.

To reset to defaults, perform the following steps:

Select **Provisioning Data** (under Advanced Options) when:

- The Provisioning Device has keys from one system, but you are using provision device on another system, or
- you want to clear all keys so that you cannot deploy any more keys without going to the Wireless System Gateway user interface and getting more.

For more details on keys, refer to the One Wireless documents in *References*

Read Device Information

Use this to read the transmitter's information shown in Figure 6-3.

Similar to quick view parameters on the transmitter display.

Figure 6-3: Read Device Information

Table 6-7: Read Device Information

Item	Description
Tag Name:	The name given to this transmitter
Vendor:	Manufacturer of device
Model:	Description of device
Revision:	Software revision of sensor firmware
Radio Version:	Software revision of radio firmware
Serial Number:	Transmitter serial number. This is the WBSN on the transmitter's nameplate. Do not confuse this with the other nameplate item marked "Serial."
Network ID	Network Address of the device in hexadecimal.
IP Address:	IP Address of radio
Device Role:	Function of the device in the wireless network. No Routing – Device functions only as a transmitter I/O Router – Device functions both as a transmitter and as a field router
Join Status:	The first line displays one of the following connection states. **No Security Key** – No security key has been deployed to the device or multinode. The user must give a security key to the device or multinode before it will join the wireless sensor network. **Not Joined** – A security key exists in the device or multinode, but no connection has been formed. The device or multinode is waiting to form a connection and will automatically retry shortly. Users may transmit a new security key in order to force the device or multinode to immediately retry to form a connection. **Discover** – The device is attempting to form a connection to the wireless sensor network. The device is discovering multinodes and, if a multinode is found, will transition to the securing state. **Joined** – A secure connection is formed with the network. The second line contains detailed state information useful for problem reporting.

Advanced Options

Advanced options are non-typical configuration commands.

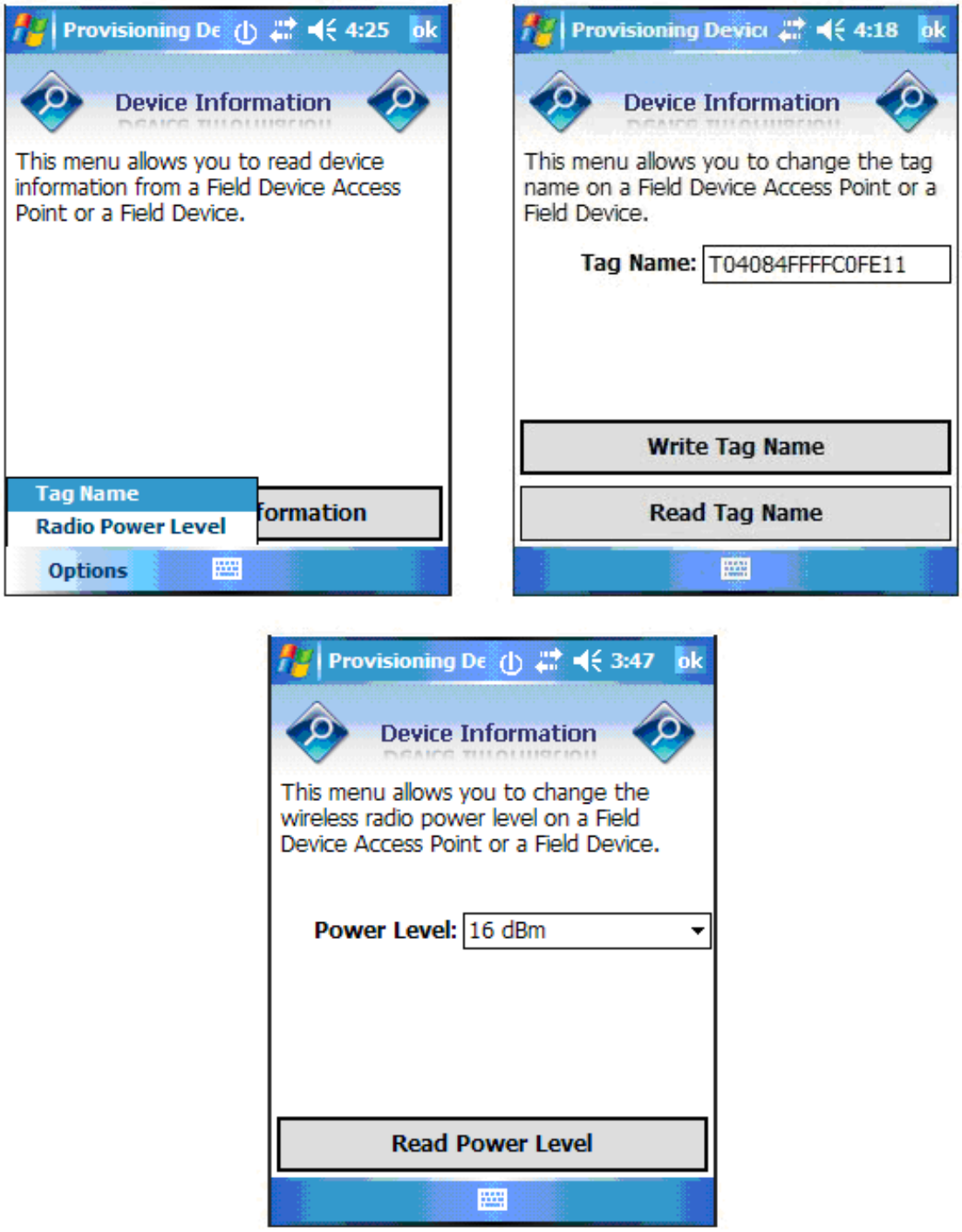


Figure 6-4: Advanced Options

Table 6-8: Advanced Options

Item	Description
Read Power Level	Reads the transmission power level of the transmitter radio.
Read Tag Name	Reads the transmitter's tag name
Write Tag Name	Write the transmitter's tag name with the entered text, maximum 16 characters

7. Maintenance/Repair

7.1 Introduction

This section provides information about preventive maintenance routines and replacing damaged parts. The topics covered in this section are:

- Preventive maintenance of the meter body barrier diaphragms and process piping to the transmitter.
- Replacement of damaged parts such as the transmitter display/sensor and batteries.

7.2 Preventive maintenance

The SmartLine Wireless Transmitter itself does not require any specific maintenance routine at regularly scheduled intervals. However, you should consider carrying out these typical inspection and maintenance routines on a schedule that is dictated by the characteristics of the process medium being measured and whether blow-down facilities or purge systems are being used.

- Check piping for leaks.
- Clear the piping of sediment or other foreign matter.
- Clean the transmitter's pressure chambers including the barrier diaphragms.

7.3 Inspecting and cleaning barrier diaphragms

Depending on the characteristics of the process medium being measured, sediment or other foreign particles may collect in the process head cavity/chamber and cause faulty measurement. In addition, the barrier diaphragm or diaphragms in the transmitter's meter body may become coated with a residue from the process medium. The latter is also true for external diaphragms on flange mount and remote seal type transmitters.

In most cases, you can readily remove the process head or heads from the transmitter's meter body to clean the process head cavity and inspect the barrier diaphragm or diaphragms. For flange mount and remote seal diaphragms, you may only need to run a purge line in the tank to rinse off the face of the diaphragm.

The procedure in Table 7-1 outlines the general steps for inspecting and cleaning barrier diaphragms. You may have to modify the steps to meet your particular process or transmitter model requirements. Figure 7-1 shows an exploded view of a DP transmitter's meter body for reference.

Tools required

- 5/8" Wrench or Socket for 7/16" Dia. Hex Bolt
- 3/4" Wrench or Socket for 7/16" Hex Nut
- Calibrated torque wrench. For the most accurate performance, select a torque wrench with which the applied torque value is near the middle of the tool's torque range. For example, if applying 68 Nm (50 lb-ft), select a torque wrench with range of 7 Nm to 136 Nm (5 to 100 lb-ft).

WARNING

Risk of death or serious injury by explosion. Do not open transmitter enclosure when an explosive gas atmosphere is present.

Procedure

Table 7-1: Inspecting and Cleaning Barrier Diaphragms

Step	Action
1	Close all valves and isolate transmitter from process. Open vent in process head to drain fluid from transmitter's meter body, if required.
	ATTENTION We recommend that you remove the transmitter from service and move it to a clean area before taking it apart.
	WARNING Risk of death or serious injury by explosion. Do not open transmitter enclosure when an explosive gas atmosphere is present.
2	Remove nuts from bolts that hold process head or heads to meter body. Remove process heads and bolts. See Figure 7-1
3	Remove gasket and clean interior of process head using soft bristle brush and suitable solvent.
	CAUTION Diaphragm surface is fragile. Be very gentle, do not damage.
4	Inspect barrier diaphragm for any signs of deterioration or corrosion. Look for possible residue and clean if necessary. If diaphragm is dented, has distorted convolutions or radial wrinkles, performance may be affected. Contact Honeywell for assistance.
5	Replace process head gasket.
	ATTENTION • We recommend that you install a new gasket whenever a process head is removed for cleaning.
	For process heads of a GP or AP transmitter with dual-head design, see illustration for differential pressure transmitters in Figure 7-1.
6	Coat threads on process head bolts with anti-seize compound such as "Neverseize" or equivalent.
7	Replace process head or heads and bolts. Finger tighten nuts.
8	Use a torque wrench to gradually tighten nuts to torque rating shown in Table 7-2, and in sequence shown in Figure 7-1. Tighten head bolts in stages of 1/3 full torque, 2/3 full torque, and then full torque.
9	Return transmitter to service.

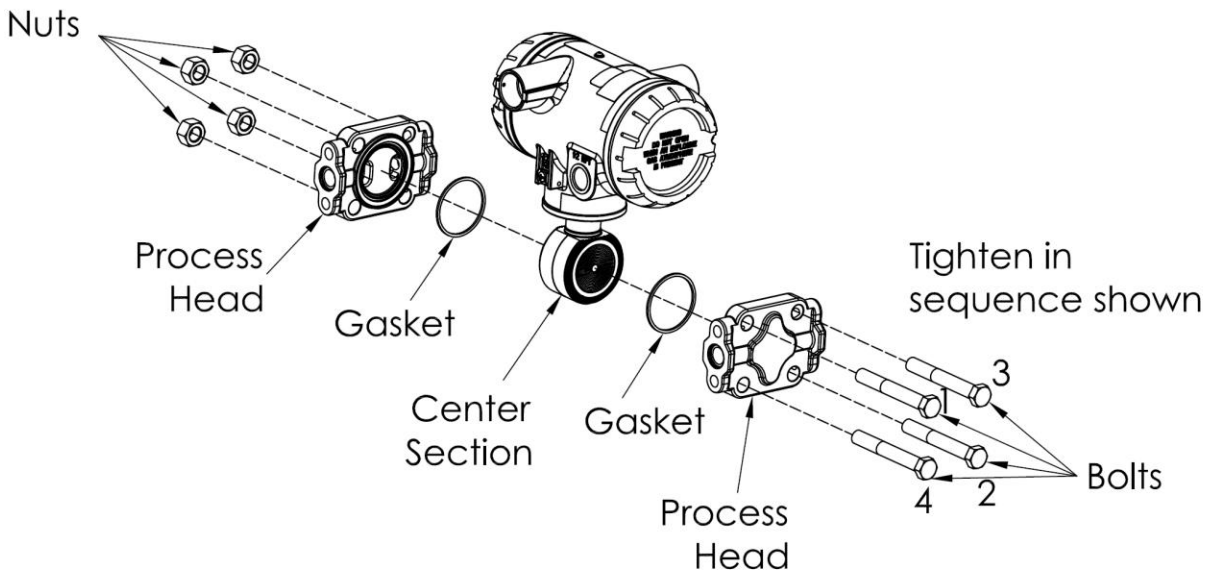


Figure 7-1: Assembly of DP Transmitter Process Heads

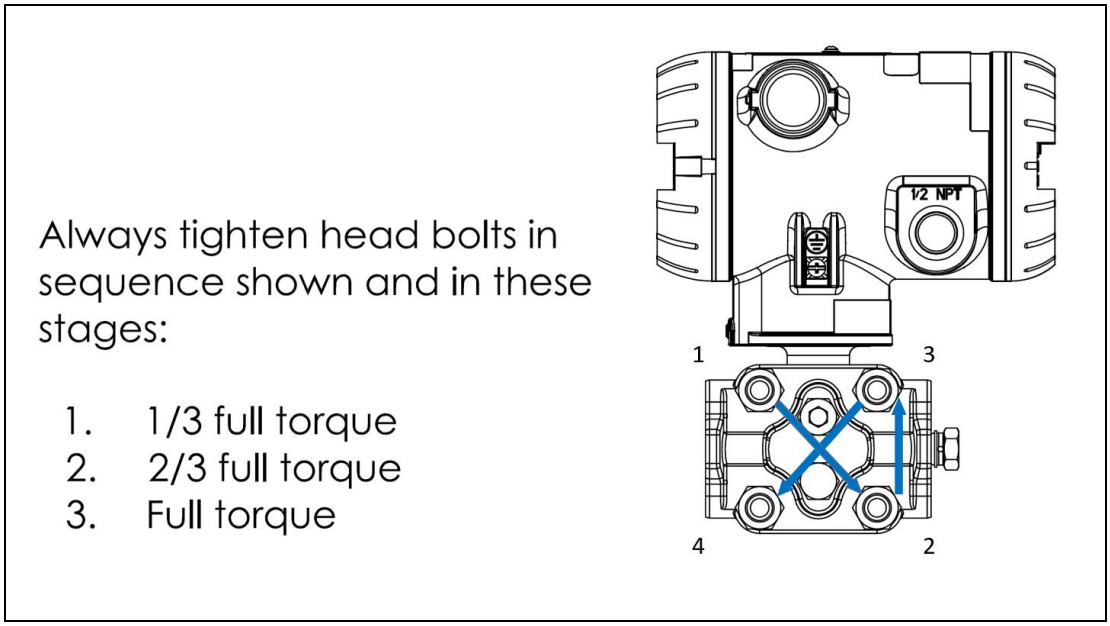


Figure 7-2: STW Standard Transmitter - Head Bolt Tightening Sequence

Torque ratings

Table 7-2: Head Bolt Torque Values

Bolting Type	B7M bolting Table III B7 option Bolt 51452557-004 Nut 51452559-003	PTFE Coated B7M bolting Y special option Bolt 51452557-007 Nut 51452559-007	MONEL K500 bolting Y special option Bolt 51452557-005 Nut 51452559-005	25% Chromium super duplex bolting Y special option Bolt 51452557-006 Nut 51452559-006	316 Satiless Steel bolting table III SS option Bolt 51452557-003 Nut 51452559-003 Bolt 51452557-004	NACE CR bolting Table III CR option Bolt 51452557-002 Nut 51452559-002	All Grade 660 class D bolting Y special option Bolt 51452557-001 Nut 51452559-008	Carbon Steel bolting standard option Bolt 51452557-001 Nut 51452559-001	All Grade 660 class D bolting Y special 6 KPSI option Bolt 51452557-202 Nut 51452559-008
50049713XXXX Except XXX5 all transmitters except draft range	48,8 Nm +/- 2,4 Nm (36.0 lb-ft +/- 1.8 lb-ft)				56,9 Nm +/- 2,8 Nm (42.0 lb-ft +/- 2.1 lb-ft)			67,8 Nm +/- 3,4 Nm (50.0 lb-ft +/- 2.5 lb-ft)	
50049713XXX5 draft range transmitters only	20,3 Nm +/- 1,0 Nm (15.0 lb-ft +/- 0.8 lb-ft)								

7.4 Replacing Electronics Module

Tools required

- #1 Phillips Screwdriver or 1/8” Slotted Screwdriver
- Torque Screwdriver
- 1.5 mm hex key

Procedure

WARNING

Risk of death or serious injury by explosion. Do not open transmitter enclosure when an explosive gas atmosphere is present.

CAUTION

Take precautions against electrostatic discharge to prevent damaging the sensor module.

Table 7-3: Electronics module replacement

Step	Action
1	Honeywell recommends that the transmitter be removed from service and moved to a clean area before servicing.
2	Loosen the M3 locking set screw on the display end-cap. See item 1 in Figure 7-3. Unscrew and remove the end cap.
3	Loosen the two screws on the electronics module. See items 2 in Figure 7-3
4	Disconnect each connector on the electronics module. See items 3 in Figure 7-3
5	Install new electronics module. Be sure to orient the module in the proper viewing orientation before tightening two sensor compartment screws. Reverse steps 1-4. Torque screws to 0,4 – 0,6 Nm (3.5 – 5.3 lb-in). Honeywell recommends lubricating the end cap O-ring with a Silicone Grease such as Dow Corning #55 or equivalent before replacing the end cap. Return transmitter to service.

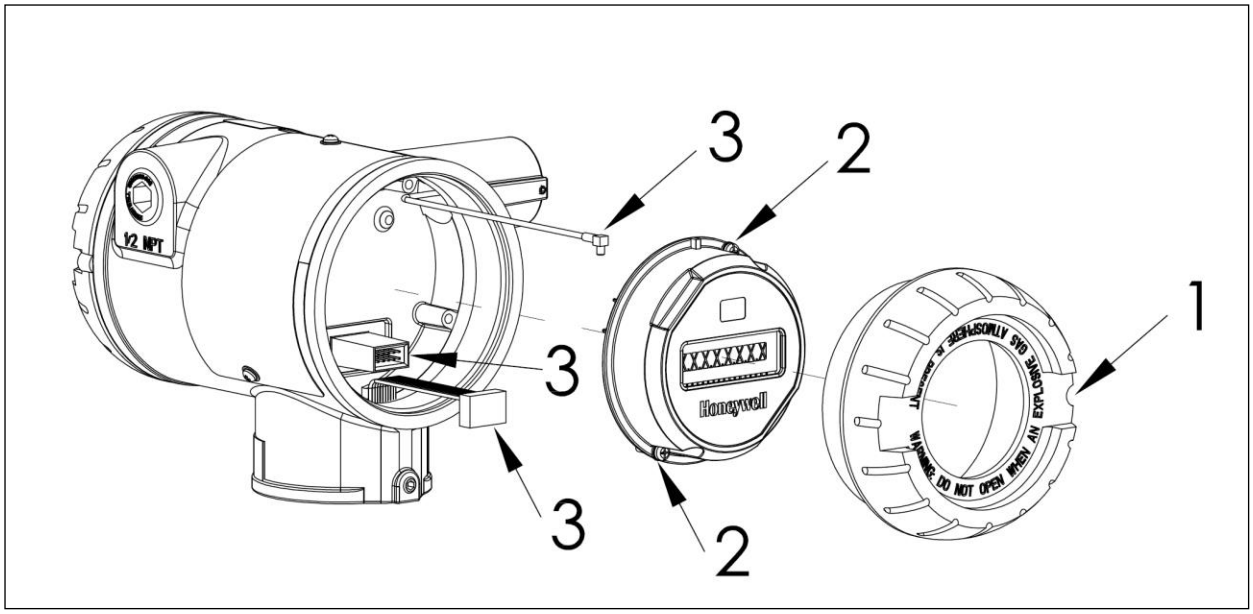


Figure 7-3: Sensor module removal and replacement

7.5 Replacing batteries

When to replace

When the transmitter displays a LOW BAT message you have 2-4 weeks to replace both batteries before they reduce in performance. When batteries are removed or expired, all transmitter data is retained in the transmitter's non-volatile memory.

See section 4.1 for battery replacement procedure.

7.6 Replacing 24V external power module

When to replace

If the 24V power source should be replaced if the transmitter doesn't power up or the output voltage of the 24V supply is less than 7.5V.

See section 4.2 for 24V power supply module replacement procedure.

7.7 Replacing antenna

Tools required

- #1 Phillips Screwdriver or 1/8” Slotted Screwdriver
- Torque Screwdriver
- 1.5 mm hex key

Procedure

ATTENTION

You must replace your antenna with the same type, that is, elbow, straight, or remote. Changing to a different antenna type is not permitted by approval agencies.

CAUTION

Take precautions against electrostatic discharge to prevent damaging the sensor module.

WARNING

POTENTIAL ELECTROSTATIC CHARGING HAZARD

The integrally mounted antenna shroud is made of Teflon® and has a surface resistance greater than 1G ohm per square. When the SmartLine Wireless transmitter is installed in potentially hazardous locations care should be taken not to electrostatically charge the surface of the antenna shroud by rubbing the surface with a cloth, or cleaning the surface with a solvent. If electrostatically charged, discharge of the antenna shroud to a person or a tool could possibly ignite a surrounding hazardous atmosphere.

Antenna replacement procedure

Step	Action
1	Honeywell recommends that the transmitter be removed from service and moved to a clean area before servicing.
2	Loosen the M3 locking set screw on the display end-cap. See item 1 in Figure 7-4. Unscrew and remove the front end cap.
3	Loosen the two screws on the sensor module. See items 2 in Figure 7-4
4	Remove the sensor module from the transmitter body and disconnect the antenna connector from CN2 connector on the sensor module. See item 3 in Figure 7-4
5	Loosen the locking set screw at the antenna base. Unscrew the antenna from the transmitter. Remove the antenna and its connector from the transmitter. See Figure 7-4
6	Feed the new antenna's connector through the antenna hole to the front of the transmitter. Do not connect to sensor module yet. Lubricate O-ring with a Silicone Grease such as Dow Corning #55 Screw new antenna into transmitter body until finger-tight, then back off 180 degrees to permit adjustment later.
7	Attach antenna connector to CN2 connector on sensor module. See item 3 in Figure 7-4.
8	Insert sensor module. Orient in the proper viewing orientation before tightening two sensor compartment screws. See items 2 in Figure 7-4. Torque screws to 0,4 – 0,6 Nm (3.5 – 5.3 lb-in).
9	Replace the front end cap. Honeywell recommends lubricating the front end cap O-ring with a Silicone Grease such as Dow Corning #55 or equivalent before replacing the end cap.
10	Adjust antenna for best reception. Don't rotate antenna more than 180 degrees either direction or you could twist and break the antenna wiring inside. Tighten the antenna locking set screw.

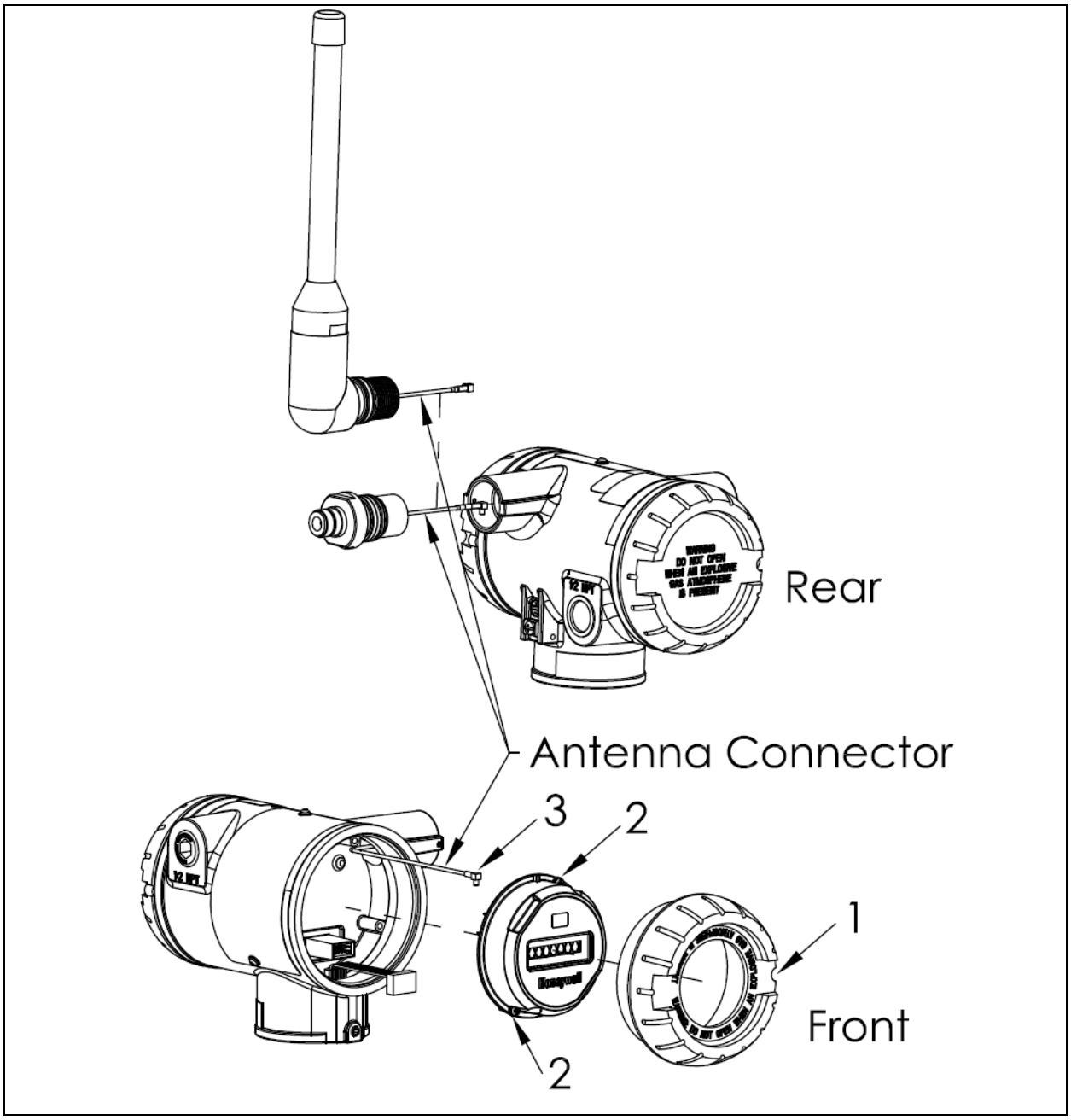


Figure 7-4: Antenna replacement

8. Parts

Individually saleable parts for the various transmitter models are listed in this section. Some parts are illustrated for identification. Parts are identified and listed in the corresponding tables as follows:

- Individually saleable parts are indicated in each figure by key number callout.
- Parts that are supplied in kits are indicated in each illustration by key number callout with the letter K prefix.

Note that the meter body replacement parts and mounting brackets for the SmartLine wireless pressure transmitters are the same as and interchangeable with the STW700/800 series of pressure transmitters, for like models.

7.8 Transmitter body

Table 8-1: Transmitter Body Parts

Part number	Qty	Description
50136119-501	1	ELECTRONICS MODULE ASSEMBLY aka SENSOR MODULE for Pressure ISA100.11a
50016190-507	1	CAP ASSEMBLY, BATTERY, ALUMINUM, BLUE, POLYESTER POWDER COAT
50016190-508	1	CAP ASSEMBLY, BATTERY, ALUMINUM, BLUE, EPOXY-POLYESTER POWDER COAT
50015623-504	1	CAP ASSEMBLY, LCD, ALUMINUM, BLUE, POLYESTER POWDER COAT
50015623-505	1	CAP ASSEMBLY, LCD, ALUMINUM, BLUE, EPOXY-POLYESTER POWDER COAT
50026127-503	1	CAP ASSEMBLY, BATTERY, STAINLESS STEEL
50026009-502	1	CAP ASSEMBLY, LCD, STAINLESS STEEL
50031715-503	1	ANTENNA ASSEMBLY, 4 dBi INTEGRAL, ALUMINUM, POLYESTER POWDER COAT
50031715-504	1	ANTENNA ASSEMBLY, 4 dBi INTEGRAL, ALUMINUM, EPOXY-POLYESTER POWDER COAT
50031715-505	1	ANTENNA ASSEMBLY, 4 dBi INTEGRAL, STAINLESS STEEL
50018414-001	1	REMOTE OMNI-DIRECTIONAL ANTENNA, 8 dBi
50018415-001	1	REMOTE DIRECTIONAL ANTENNA, 14 dBi
50028364-503	1	ANTENNA ADAPTER ASSEMBLY, REMOTE, TYPE N, ALUMINUM, POLYESTER
50028364-504	1	ANTENNA ADAPTER ASSEMBLY, REMOTE, TYPE N, ALUMINUM, EPOXY-POLYESTER
50028364-505	1	ANTENNA ADAPTER ASSEMBLY, REMOTE, TYPE N, STAINLESS STEEL
50018278-001	1	COAX CABLE ASSY, 1.0M (3.3 Ft) LONG, N-MALE - N-MALE
50018278-002	1	COAX CABLE ASSY, 3.0M (10.0 Ft) LONG, N-MALE - N-MALE
50018278-003	1	COAX CABLE ASSY, 10.0M (33.0 Ft) LONG, N-MALE - N-MALE
50018279-090	1	LIGHTNING SURGE ARRESTOR
50047517-501	1	I.S. BATTERY PACK HOUSING ASSEMBLY
50136118-501	1	24V EXTERNAL POWER MODULE
50026010-001	2	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI2) BATTERY
50026010-002	4	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI2) BATTERY
50026010-003	10	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI2) BATTERY

Mounting Brackets

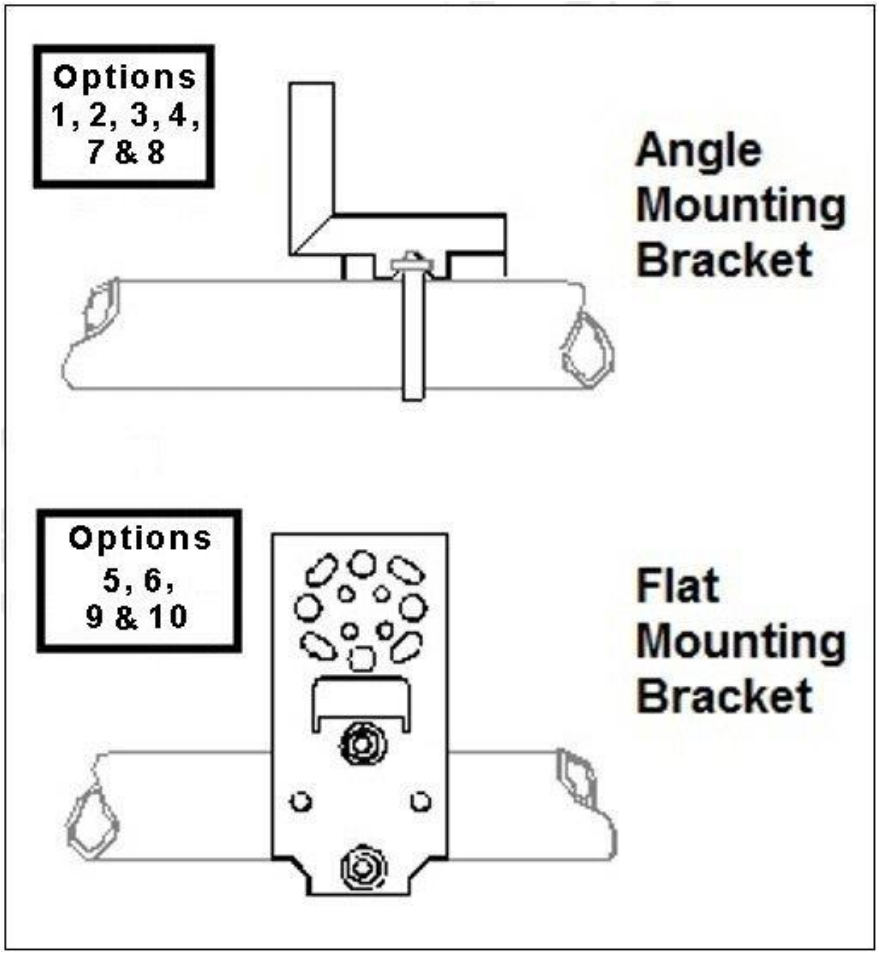


Figure 8-1: Angle and Flat Bracket Parts

Table 8-2: Angle and Flat Bracket Parts (Refer to Figure 8-1)

Key No.	Part Number	Description	Quantity Per Unit
1	30752770-603	SS 304 Angle Bracket Mounting kit for all models except In-line mount transmitters	1
2	30752770-604	SS 304 Angle Bracket Mounting kit for all In-Line mount transmitters	1
5	51196557-505	SS 304 Flat Bracket Mounting kit for all models except In-line mount transmitters	1
6	51196557-506	SS 304 Flat Bracket Mounting kit for all In-line transmitters	1
7	30752770-603	SS 316 Angle Bracket Mounting kit for all In-line transmitters except In-Line mount transmitters	1
8	30752770-604	SS 316 Angle Bracket Mounting kit for all In-Line mount transmitters	1
9	51196557-508	SS 316 Flat Bracket Mounting kit for all In-line transmitters except In-Line mount transmitters	1
10	51196557-509	SS 316 Flat Bracket Mounting kit for all In-Line mount transmitters	1

Table 8-3: Transmitter Enclosure O-Ring Kit

Key No.	Part Number	Description	Quantity Per Unit
K7	30757503-007	Electronics enclosure seals kit. Kit includes: O-ring for transmitter end caps O-ring for meter body to electronics housing	 6 3

Table 8-4: Meter Body Parts

Part Number	Meter body	Figure No.	Key No.
Specify complete number from nameplate	DP Models	**Figure 8-2**	1
	GP/AP HEAD Models	**Figure 8-2** **Figure 8-3**	1
	LGP/LAP Models	**Figure 8-3**	1
	Flange Mount Models	**Figure 8-5** and **Figure 8-6**	1
	Remote Diaphragm Seal Models	**Figure 8-8**	1

Table 8-5: Models STDW810, 820, 825, 830 & 870

(Ref. Figure 8-2)

Key No.	Part Number	Description	Qty/Kit
		Meter body Gasket Kits	
	51452865-501 51452865-502 51452865-503 51452865-504	Glass Filled PTFE VITON 100% PTFE GRAPHITE	
		Each Meter body Gasket Kit includes:	
K6		Gasket, Process Head (6 Gaskets / 1 Kit)	6
Ka		Gasket, Flange Adapter (6 Gaskets / 1 Kit)	6
K7		O-Ring, meter body to Electronics Housing (3 Gaskets / 1 Kit)	3
		K6 Process Head Gasket Kits	
K6 K6 K6	51452868-501 51452868-502 51452868-507	Gasket only, Process Head (12 PTFE Gaskets/pack) Gasket only, Process Head (6 Viton Head O-Rings) Gasket only, Process Head Graphite Gasket (use only as replacement of existing graphite gasket)	12 6 6
		Ka Flange Adapter Gasket Kits	
Ka Ka Ka	51452868-504 51452868-505 51452868-508	Gasket only, Flange Adapter, 6 PTFE Adapter Gaskets Gasket only, Flange Adapter, 6 VITON Adapter O-Rings Gasket only, Flange Adapter Graphite Gasket (use only as replacement of existing graphite gasket)	6 6 6
		½-Inch NPT Flange Adapter Kits	
	 51452867-110 51452867-210 51452867-310 51452867-410 51452867-150 51452867-350 51452867-130 51452867-330	Flange Adapter Kit, with: SS Flange Adapters and with carbon steel bolts SS Flange Adapters and with A286 SS (NACE) bolts SS Flange Adapters and with 316 SS (non-NACE) bolts SS Flange Adapters and with B7M alloy steel bolts Monel Flange Adapters and with carbon steel bolts Monel Flange Adapters and with 316 SS (non-NACE) bolts Hastelloy C Flange Adapters and with carbon steel bolts Hastelloy C Flange Adapters and with 316 SS (non-NACE) bolts	
		Each 1/2-inch NPT Flange Adapter Kit includes:	
Ka		Gasket, Flange Adapter	2
Kb		1/2-inch NPT Flange Adapter	2
Kc		Bolt, hex head, 7/16-20 UNF, 1.50 inches long	4

Bolt and Nut Kit			
	51452866-501	Carbon steel bolt and Nut Kit	
	51452866-502	Stainless Steel Bolt and Nut Kit with NACE Certificate	
	51452866-503	Stainless Steel Bolt and Nut Kit without NACE Certificate	
	51452866-504	B7M Bolt and Nut Kit	
	51452866-505	All Stainless Steel Bolt and Nut Kit with NACE	
	51452866-506	Monel Bolt and Nut Kit	
	51452866-507	Duplex Bolt and Nut Kit	
	51452866-508	Stainless Steel Bolt and Nut Kit with NACE 6K	
Each Bolt and Nut Kit Includes:			
K8		Head Bolt	4
K4		Head Nut	4
Kc		Adapter Bolt	4

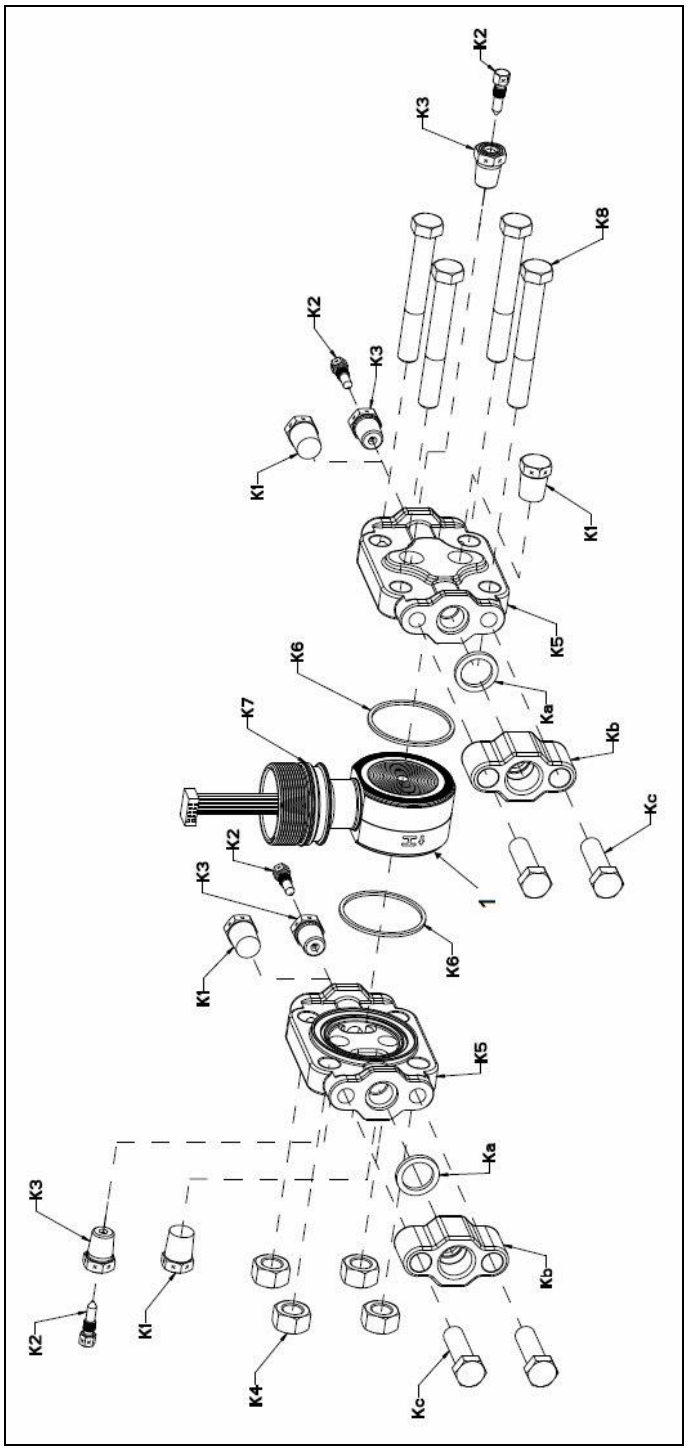


Figure 8-2: Models STDW810, 820, 825, 830, & 870

(Ref. Table 8-5)

Table 8-6: Parts for STGW830, 840, 870 and STAW822, 840 Transmitter Body

(Ref. Figure 8-3)

Key No.	Part Number	Description	Qty/Unit
Process Head Assembly Kits with PTFE Gaskets			
	51452864-010 51452864-012 51452864-020 51452864-022 51452864-030 51452864-032 51452864-040 51452864-042 51452864-050 51452864-052	Carbon steel head (zinc plated) without side vent/drain Carbon steel head (zinc plated) with side vent/drain Stainless steel head without side vent/drain Stainless steel head with side vent/drain Hastelloy C head without side vent/drain Hastelloy C head with side vent/drain Monel head without side vent/drain Monel head with side vent/drain Carbon steel head (nickel plated) without side vent/drain Carbon steel head (nickel plated) with side vent/drain	
Process Head Assembly Kits with VITON Gaskets			
	51452864-110 51452864-112 51452864-120 51452864-122 51452864-130 51452864-132 51452864-140 51452864-142 51452864-150 51452864-152	Carbon steel head (zinc plated) without side vent/drain Carbon steel head (zinc plated) with side vent/drain Stainless steel head without side vent/drain Stainless steel head with side vent/drain Hastelloy C head without side vent/drain Hastelloy C head with side vent/drain Monel head without side vent/drain Monel head with side vent/drain Carbon steel head (nickel plated) without side vent/drain Carbon steel head (nickel plated) with side vent/drain	
Each process head assembly kit includes:			
K1		Pipe Plug (See notes 1 & 2)	1
K2		Vent Plug (See note 1)	1
K3		Vent Bushing (See note 1.)	1
K5		Process Head	1
K6		Gasket (PTFE), Process Head	1
Ka		Gasket (PTFE), Flange Adapter	1
	Notes		
	Note 1: This item is made of the same material as the Process Heads, except for Kits with carbon steel Process Heads, which include stainless steel Pipe Plug, Vent Plug, and Vent Bushing. Note 2: The Kit for Process Heads without side vent/drain does not include Pipe Plugs (K1).		
Reference Head			
K9	51452951-502	316 SS Blind Reference Head	11

Bolt and Nut Kit			
	51452866-501	Carbon steel bolt and Nut Kit	
	51452866-502	Stainless Steel Bolt and Nut Kit with NACE Certificate	
	51452866-503	Stainless Steel Bolt and Nut Kit without NACE Certificate	
	51452866-504	B7M Bolt and Nut Kit	
	51452866-505	All Stainless Steel Bolt and Nut Kit with NACE	
	51452866-506	Monel Bolt and Nut Kit	
	51452866-507	Duplex Bolt and Nut Kit	
	51452866-508	Stainless Steel Bolt and Nut Kit with NACE 6K	
Each Bolt and Nut Kit Includes:			
K8		Head Bolt	4
K4		Head Nut	4
Kc		Adapter Bolt	4

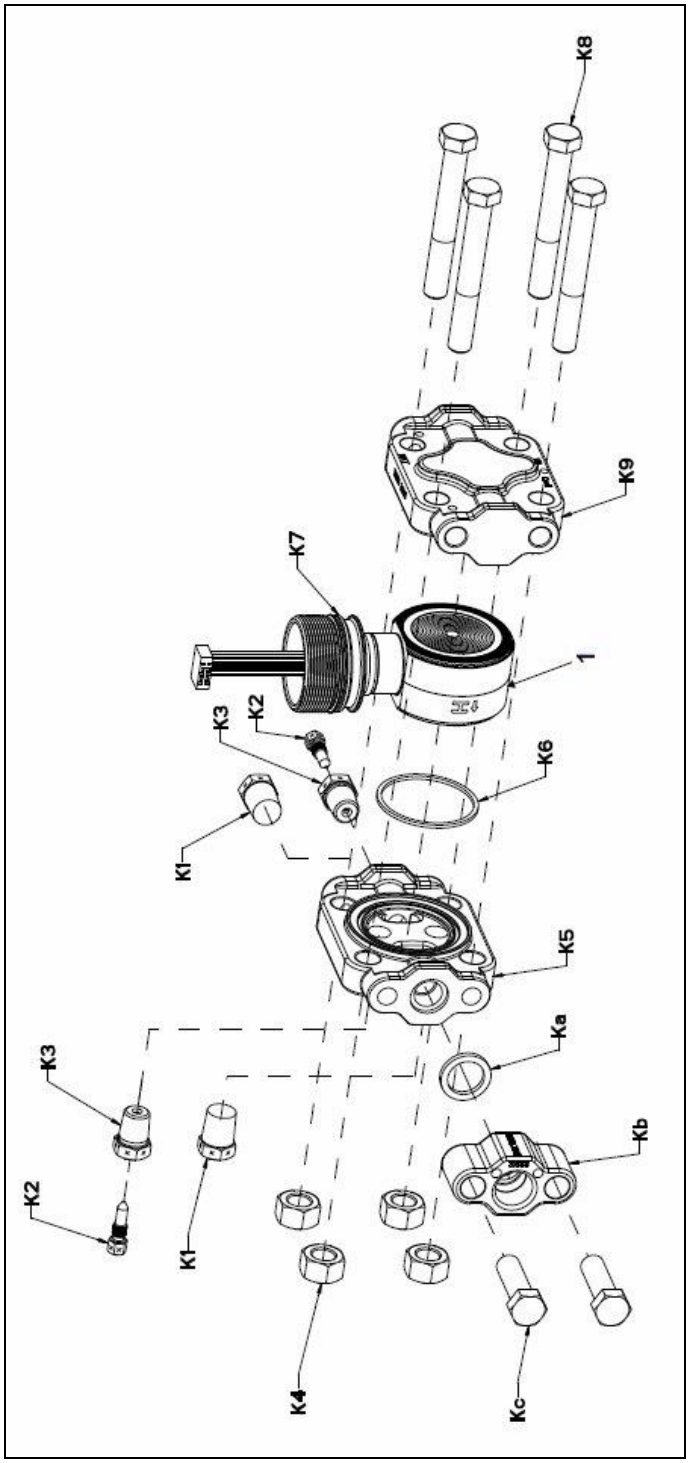


Figure 8-3: STGW830, 840, 870, and STAW822, 840 Transmitter Body

(Ref. Table 8-6)

Table 8-7: Inline Gauge and Inline Atmospheric Meter Body Parts

Key No.	Part Number	Description	Qty/Unit
	Specify complete model number from nameplate	STW Series replacement meter body (LAP/LGP model)	1

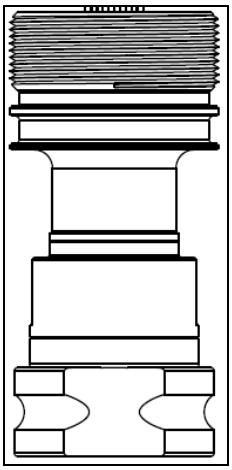


Figure 8-4: Inline Gauge and Inline Atmospheric Display Bodies

Table 8-8: Flange-Mounted Meter Body Parts

(Refer to Figure 8-5 and Figure 8-6)

Key No.	Part Number	Description	Qty/Unit
1	Specify complete model number from nameplate	STW Series 800 replacement meter body	1

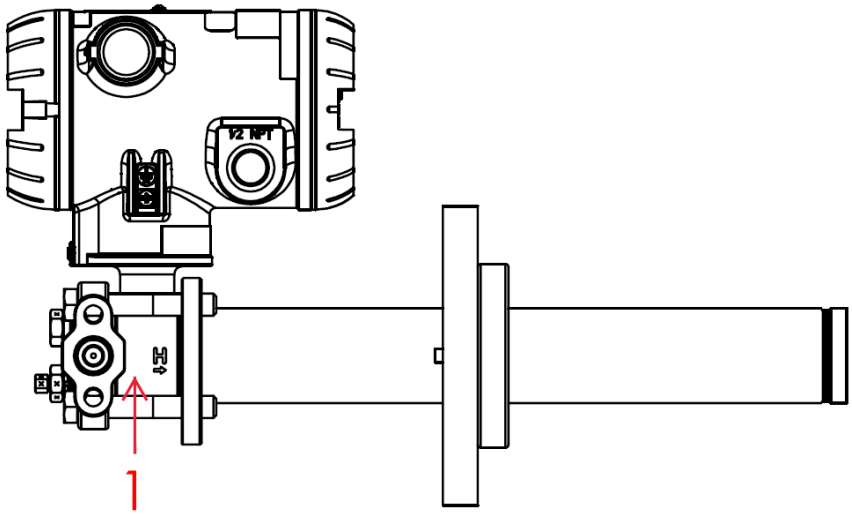


Figure 8-5: Extended Flange Design

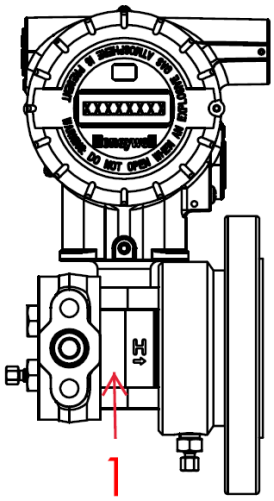


Figure 8-6: Pseudo Flange design

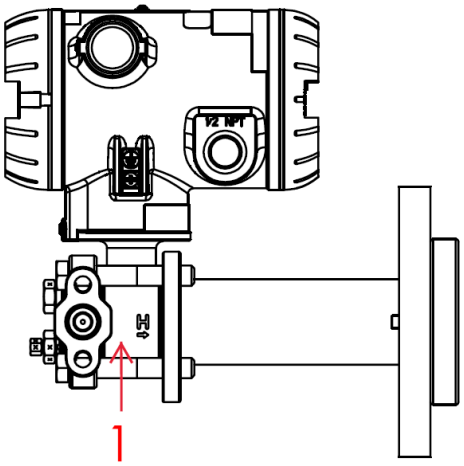


Figure 8-7: Flush Flange Design

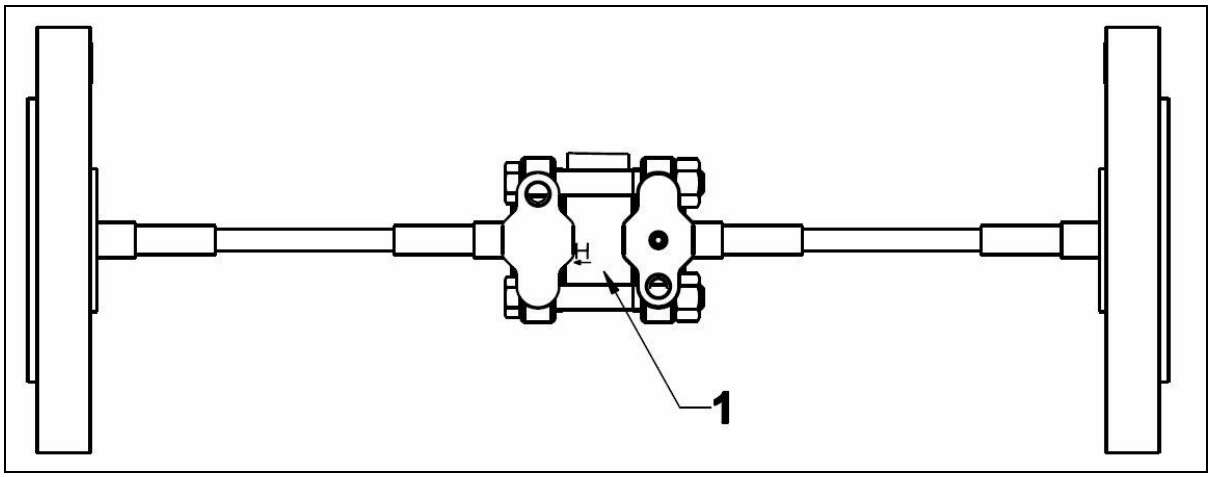


Figure 8-8: Remote Seal Diaphragm

No replacement meter body (Key No.1) is available for Remote Diaphragm Seal models

Appendix A - Modbus

Table 8-9: SmartLine Wireless Pressure – Modbus table

Wireless Pressure

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
PV	Channel process value.	AnalogValueStatus	5	Read Only	Dynamic		
MODE	Channel mode.	Mode	4	Read/Write	Static		
MODE.TARGET	Channel target mode.	Uint8	1	Read/Write	Static		
						0 - Normal	Normal
						1 - OOS	Out Of Service Mode
						16 - Auto	Automatic Mode
MODE.ACTUAL	Channel actual mode.	Uint8	1	Read Only	Static		
						1 - OOS	Out Of Service Mode
						16 - Auto	Automatic Mode
MODE.PERMITTED	Channel permitted mode.	BitString	1	Read/Write	Static		
						1 - OOS	Out of Service Mode Permitted
						16 - Auto	Automatic Mode Permitted
MODE.NORMAL	Channel normal mode.	Uint8	1	Read/Write	Static		
						1 - OOS	Out Of Service Mode
						16 - Auto	Automatic Mode
SCALE	Channel transducer scale.	Scaling	11	Read/Write	Static		
SCALE.EU_100	Channel EU at 100%.	Float	4	Read/Write	Static		
SCALE.EU_0	Channel EU at 0%.	Float	4	Read/Write	Static		
SCALE.UNITS_INDEX	Channel units index.	Uint16	2	Read/Write	Static		
						1002 - Â°F	degree Fahrenheit
						1132 - MPa	megapascal
						1133 - kPa	kilopascal
						1137 - bar	bar
						1138 - mbar	millibar
						1141 - psi	pounds per square inch
						1142 - psia	pounds per square inch absolute
						1143 - psig	pounds per square inch gauge
						1144 - g/cmÂ²	gram per square centimeter
						1145 - kg/cmÂ²	kilogram per square centimeter
						1147 - inH2O (4Â°C)	inches of water at 4Â°C
						1148 - inH2O (68Â°F)	inches of water at 68Â°F
						1150 - mmH2O (4Â°C)	millimeters of water at 4Â°C
						1151 - mmH2O (68Â°F)	millimeters of water at 68Â°F
						1156 - inHg (0Â°C)	inches of mercury at 0Â°C
						1158 - mmHg (0Â°C)	millimeters of mercury at 0Â°C
						1342 - %	percent
SCALE.DECIMAL	Channel decimal points.	Uint8	1	Read/Write	Static		

Wireless Pressure continued ..

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
ALERTS	No Help Available	Uint8	1	Read/Write	Static		
						0 - High	No Help Available
						1 - HighHigh	No Help Available
						2 - Low	No Help Available
						3 - LowLow	No Help Available
						6 - OutOfService	No Help Available
						128 - Sensor Over Temperature	No Help Available
CAL_CMD	Calibration command	Uint8	1	Read/Write	Dynamic		
						0 - None	No value
						1 - Cal Lower	Calibrate for lower value
						2 - Cal Upper	Calibrate for upper value
						3 - Cal Zero	Calibrate for zero
						4 - Cal Restore	Restore calibration command
						5 - Cal Clear	Clear calibration command
CAL_STATUS	Calibration status	Uint8	1	Read Only	Dynamic		
						0 - None	No value
						1 - Success	Calibration successful
						2 - Failed	Calibrate failed
						3 - Bad Factory Cal	Bad factory calibration
						4 - Bad User Cal	Bad user calibration
						5 - Internal Error	Internal error
						6 - Bad Units	Bad units
						7 - Bad Sensor	Bad sensor
						8 - Bad Trim Point	Bad trim point
						9 - Success with Excess	Success with excess
CAL_POINT_HI	Calibration Point High	Float	4	Read/Write	Static		
CAL_POINT_LO	Calibration point low	Float	4	Read/Write	Static		
CAL_SOURCE	Calibration Source	Uint8	1	Read Only	Dynamic		
						1 - None	Calibration source none
						2 - User	User Calibration
						3 - Factory	Factory Calibration
CAL_UNIT	Units of calibration point	Uint16	2	Read/Write	Static		
						1002 - Â°F	degree Fahrenheit
						1132 - MPa	megapascal
						1133 - kPa	kilopascal
						1137 - bar	bar
						1138 - mbar	millibar
						1141 - psi	pounds per square inch
						1142 - psia	pounds per square inch absolute
						1143 - psig	pounds per square inch gauge
						1144 - g/cmÂ²	gram per square centimeter
						1145 - kg/cmÂ²	kilogram per square centimeter
						1147 - inH2O (4Â°C)	inches of water at 4Â°C
						1148 - inH2O (68Â°F)	inches of water at 68Â°F
						1150 - mmH2O (4Â°C)	millimeters of water at 4Â°C
						1151 - mmH2O (68Â°F)	millimeters of water at 68Â°F
						1156 - inHg (0Â°C)	inches of mercury at 0Â°C
						1158 - mmHg (0Â°C)	millimeters of mercury at 0Â°C
						1342 - %	percent

Wireless Pressure continued ..

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description		
SENSOR_TEMP	Sensor temperature value	AnalogValueStatus	5	Read Only	Dynamic				
SENSOR_TEMP.TEMP_VAL_STAT	Digital transducers	unlike their analog versions can detect faults that make the measurement bad or prevent the actuator from responding. This additional valuable information will be passed along with each transmission of a data value in the form of a status attribute.			Uint8			1 Read Only	Dynamic
SENSOR_TEMP.TEMP_VAL	A numerical quantity entered by a user or calculated by the algorithm.	Float	4	Read Only	Dynamic				
TEMP_UNIT	Units of temperature	Uint16	2	Read/Write	Static				
						1001 - Â°C	degree Celsius		
						1002 - Â°F	degree Fahrenheit		
SENSOR_RANGE	Upper and lower range limits of sensor	expressed in units chosen in SCALE unit index	Scaling		11	Read Only	Constant		
SENSOR_RANGE.EU100	The engineering unit value which represents the upper end of range of the associated block parameter.	Float	4	Read Only	Constant				
SENSOR_RANGE.EU0	The engineering unit value which represents the lower end of range of the associated block parameter.	Float	4	Read Only	Constant				
SENSOR_RANGE.UNITS_INDEX	Device Description units code index for the engineering unit descriptor for the associated block value.	Uint16	2	Read Only	Constant				
						1002 - Â°F	degree Fahrenheit		
						1132 - MPa	megapascal		
						1133 - kPa	kilopascal		
						1137 - bar	bar		
						1138 - mbar	millibar		
						1141 - psi	pounds per square inch		
						1142 - psia	pounds per square inch absolute		
						1143 - psig	pounds per square inch gauge		
						1144 - g/cmÂ²	gram per square centimeter		
						1145 - kg/cmÂ²	kilogram per square centimeter		
						1147 - inH2O (4Â°C)	inches of water at 4Â°C		
						1148 - inH2O (68Â°F)	inches of water at 68Â°F		
						1150 - mmH2O (4Â°C)	millimeters of water at 4Â°C		
						1151 - mmH2O (68Â°F)	millimeters of water at 68Â°F		
						1156 - inHg (0Â°C)	inches of mercury at 0Â°C		
						1158 - mmHg (0Â°C)	millimeters of mercury at 0Â°C		
						1342 - %	percent		
SENSOR_RANGE.DECIMAL	The number of digits to the right of the decimal point which should be used by an interface device in displaying the specified parameter.	Uint8	1	Read Only	Constant				
MAX_SP	Maximum static pressure rating in selected scale units	Float	4	Read Only	Constant				
MAX_OVP	Maximum over pressure rating in selected scale units	Float	4	Read Only	Constant				

Table 8-10 SmartLine Wireless – Modbus table

Wireless Pressure									
Name	**Description**	**Data Type**	**Data Size**	**Access**	**Class**	**Enum Value**	**Enum Description**		
UAP_VERREV	Field device application revision.	VisibleString	64	Read Only	Static				
UAP_STREV	Field device application static data revision level.	Uint16	2	Read Only	Static Revision				
IDENT_NUMBER	Field device application identity.	OctetString	8	Read Only	Static				
CTS_VERSION	Field device application CTS version.	Uint16	2	Read Only	Static				
ITS_VERSION	Field device application ITS version.	Uint16	2	Read Only	Static				
DIAG_STATUS	Field device application diagnostic status bitstring.	BitString	4	Read Only	Dynamic				
						2147483647 - Failure Status	Failure status		
						1073741824 - Function Check Status	Function check status		
						536870912 - Out of Specification Status	Out of specification status		
						268435456 - Maintenance Required Status	Maintenance required status		
						134217728 - Fault in Electronics	Faults in electronics		
						67108864 - Fault in Sensor or Actuator Element	Faults in sensor or actuator element		
						33554432 - Installation or Calibration Problem	Installation or calibration problem		
						8388608 - Outside Sensor Limits	Outside sensor limits		
						1048576 - Power is Critically Low: Maintenance Need Short-term	Power is critical low: maintenance need short-term		
						128 - Configuration Error	Invalid	inconsistent	corrupted or lost static data
						1 - Detail Information Available	Detail information available		
UAP_OPTION	Option	BitString	2	Read/Write	Static				
						8192 - Enable Software Write Protect	Enable Software Write Protect		
UAPMO_ALERT	No Help Available	Uint8	1	Read/Write	Static				
						0 - Begin Alert Recovery	No Help Available		
						1 - End Alert Recovery	No Help Available		
						2 - Device Restart	No Help Available		
						3 - Maintenance Alert	No Help Available		
						4 - Out of Specification Alert	No Help Available		
						5 - Function Check Alert	No Help Available		
						6 - Failure Status Alert	No Help Available		
DIAG_STATUS_DETAIL_1	Diag status detail	BitString	4	Read Only	Dynamic				
						1 - Electronics Failure	An electronic component has failed		
						4 - Input Failure	Input failure		
						16 - Low Battery	Battery needs replacement		
						128 - Calibration Error	Persistent calibration error		
						256 - No Radio Error	Radio is not present or not functioning		
						4096 - Low External Power	External power is low		
						65536 - Program Memory Fault	Program memory is corrupted		
						131072 - RAM Fault	Random access memory is corrupted		
						262144 - NVM Fault	Non-volatile memory is corrupted		
						524288 - ADC Failure	Analog to digital converter failed		
						1048576 - Characterization Memory Fault	Characterization memory fault		
						16777216 - Meter Body Over Temperature	Meter body temperature is too high		
						33554432 - Meter Body Overload	Pressure input exceeds twice the upper range limit		
						67108864 - Excess Zero Calibration	Zero calibration exeeds 5 percent		
						134217728 - Excess Span Calibration	Span calibration exeeds 5 percent		
						268435456 - Excess Calibrated Range	Calibrated span exceeds the sensor span		
						536870912 - Calibration Cleared	Calibration was reset		

Wireless Pressure continued ..

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description		
SENSOR_DEVREV	Device Revision	Uint16	2	Read Only	Static				
SENSOR_BUILD	Software Version	Uint16	2	Read Only	Static				
MAINTENANCE_ALERT	Maintenance Alert	BinaryAlarmDesc	2	Read/Write	Static				
MAINTENANCE_ALERT.ALERT_DISABLE	Enable or Disable the Alert	Boolean	1	Read/Write	Static				
MAINTENANCE_ALERT.ALERT_PRIORITY	Priority set for the Alert	Uint8	1	Read/Write	Static				
OUT_OF_SPEC_ALERT	Out of Specification Alert	BinaryAlarmDesc	2	Read/Write	Static				
OUT_OF_SPEC_ALERT.ALERT_DISABLE	Enable or Disable the Alert	Boolean	1	Read/Write	Static				
OUT_OF_SPEC_ALERT.ALERT_PRIORITY	Priority set for the Alert	Uint8	1	Read/Write	Static				
FUNCTION_CHECK_ALERT	Function Check Alert	BinaryAlarmDesc	2	Read/Write	Static				
FUNCTION_CHECK_ALERT.ALERT_DISABLE	Enable or Disable the Alert	Boolean	1	Read/Write	Static				
FUNCTION_CHECK_ALERT.ALERT_PRIORITY	Priority set for the Alert	Uint8	1	Read/Write	Static				
FAILURE_STATUS_ALERT	Failure Status Alert	BinaryAlarmDesc	2	Read/Write	Static				
FAILURE_STATUS_ALERT.ALERT_DISABLE	Enable or Disable the Alert	Boolean	1	Read/Write	Static				
FAILURE_STATUS_ALERT.ALERT_PRIORITY	Priority set for the Alert	Uint8	1	Read/Write	Static				
POWER_SOURCE	Power source	Uint8	1	Read Only	Dynamic				
						1 - Battery Module	Device is powered by internal battery		
						2 - 24V External Power Module	Device is powered using 24V external power		
V_POWER	Power voltage	Float	4	Read Only	Dynamic				
EUI_64	Field device radio EUI64 unique identifier.	OctetString	0	Read Only	Constant				
DL_ALIAS_16_BIT	Field device radio short address.	Uint16	2	Read Only	Static				
NETWORK_ADDRESS_128_BIT	Field device radio IP6 address.	OctetString	0	Read Only	Static				
DEVICE_ROLE_CAPABILITY	Field device radio role capability.	Uint16	2	Read Only	Constant				
						128 - Provisioning Device	Provisioning Device		
						64 - System Time Source	System Time Source		
						32 - Security Manager	Security Manager		
						16 - System Manager	System Manager		
						8 - Gateway	Gateway		
						4 - Access Point	Access Point		
						2 - Routing Device	Routing Device		
						1 - I/O Device	I/O Device		
VENDOR_ID	Field device radio vendor ID.	VisibleString	16	Read Only	Constant				
MODEL_ID	Field device radio model ID.	VisibleString	16	Read Only	Constant				
TAG_NAME	Field device tag name.	VisibleString	16	Read/Write	Static				
SERIAL_NUMBER	Field device radio serial number.	VisibleString	16	Read Only	Constant				
POWER_SUPPLY_STATUS	Field device power supply status.	Uint8	1	Read Only	Dynamic				
						0 - Line Powered	Line Powered		
						1 - Battery	High	Battery powered	greater than 75% remaining
						2 - Battery	Medium	Battery powered	between 25% to 75% remaining
						3 - Battery	Low	Battery powered	less than 25% remaining
JOIN_COMMAND	Field device radio join command.	Uint8	1	Read/Write	Static				
						0 - None	None		
						2 - Warm Restart	Warm Restart		
						3 - Restart as Provisioned	Restart as Provisioned		
RESTART_COUNT	Field device radio restart counter.	Uint16	2	Read Only	Static				
UPTIME	Field device radio uptime.	Uint32	4	Read Only	Dynamic				
SOFTWARE_REVISION	Field device radio revision.	VisibleString	16	Read Only	Constant				
DROP_OFF_COUNT	Field device radio network drop off counter.	Uint16	2	Read Only	Static				
JOIN_ATTEMPT_COUNT	Field device radio network join attempt counter.	Uint16	2	Read Only	Static				
RESET_COUNTERS	Field device radio reset counters command.	Boolean	1	Read/Write	Static				
ROUTING_ASSIGNMENT	Field device radio network routing assignment.	Uint8	1	Read/Write	Static				
						0 - Routing Disabled	Routing Disabled		
						1 - Routing Enabled	Routing Enabled		
						2 - Not Applicable	Not Applicable		

Wireless Pressure continued ..

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
DLMO_RADIO_TRANSMIT_POWER	Radio maximum transmit level.	Int8	1	Read Only	Static		
DLMO_CHANNEL_DIAG	Channel diagnostics.	ChannelDiag[16]	3	Read Only	Dynamic		
DLMO_CHANNEL_DIAG.CHANNEL	Channel number.	Uint8	1	Read Only	Dynamic		
DLMO_CHANNEL_DIAG.NO_ACK	Percentage of transmissions for this channel that did not receive an ACK or NACK.	Uint8	1	Read Only	Dynamic		
DLMO_CHANNEL_DIAG.BACKOFF	Percentage of transmissions for this channel aborted due to CCA backoff.	Uint8	1	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG	Neighbor diagnostics.	NeighborDiag[8]	27	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.NEIGHBOR	Neighbor name.	VisibleString	16	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.RSSI	RSSI (Received Signal Strength Indicator) with respect to this neighbor.	Int16	2	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.RSQI	RSQI (Received Signal Quality Indicator) with respect to this neighbor.	Uint8	1	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.TX_FAILED	Number of failed unicast transmissions to this neighbor.	Uint16	2	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.TX_BACKOFF	Number of transmissions to this neighbor that were aborted due to CCA backoff.	Uint16	2	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.TX_NACK	Number of NACKs received from this neighbor.	Uint16	2	Read Only	Dynamic		
DLMO_NEIGHBOR_DIAG.CLOCK_SIGMA	Standard deviation of clock corrections with respect to this neighbor.	Int16	2	Read Only	Dynamic		
STAT_PUBSEND	Publications from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_PUBRECV	Publications from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_READREQSEND	Read requests from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_READREQRECV	Read requests from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_READREQTIMEOUT	Read request timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_READRSPSEND	Read response from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_READRSPRECV	Read response from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_READRSPTIMEOUT	Read response timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_WRITEREQSEND	Write request from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_WRITEREQRECV	Write requests from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_WRITEREQTIMEOUT	Write request timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		

Wireless Pressure continued ..

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
STAT_WRITERSPSEND	Write response from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_WRITERSPRECV	Write response from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_WRITERSPTIMEOUT	Write response timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_EXECREQSEND	Execute request from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_EXECREQRECV	Execute requests from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_EXECREQTIMEOUT	Execute request timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_EXECRSPSEND	Execute response from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_EXECRSPRECV	Execute response from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_EXECRSPTIMEOUT	Execute response timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_ALERTREPSEND	Alert report from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_ALERTREPRECV	Alert report from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_ALERTREPTIMEOUT	Alert report timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_ALERTACKSEND	Alert acknowledge from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_ALERTACKRECV	Alert acknowledge from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_ALERTACKTIMEOUT	Alert acknowledge timeouts between WDM and field device application.	Uint32	4	Read Only	Dynamic		
STAT_PUBMISSED	Publications missed from field device application to WDM.	Uint32	4	Read Only	Dynamic		
STAT_RESETSTATS	Reset statistics.	Boolean	1	Read/Write	Dynamic		
STAT_PUBTIMEOUT	Publication timeouts from WDM to field device application.	Uint32	4	Read Only	Dynamic		
STAT_EUI64STR	Field device EUI64 string.	VisibleString	16	Read Only	Dynamic		
STAT_IP6ADDRSTR	Field device IP6 address string.	VisibleString	32	Read Only	Dynamic		
STAT_SHORTADDR	Field device short address.	Uint16	2	Read Only	Dynamic		
STAT_VENDOR	Field device application vendor string.	VisibleString	24	Read Only	Dynamic		
STAT_MODEL	Field device application model string.	VisibleString	16	Read Only	Dynamic		
STAT_REVISION	Field device application revision string.	VisibleString	64	Read Only	Dynamic		
STAT_RADIOVENDOR	Field device radio vendor string.	VisibleString	24	Read Only	Dynamic		
STAT_RADIOMODEL	Field device radio model string.	VisibleString	16	Read Only	Dynamic		
STAT_RADIOREVISION	Field device radio revision string.	VisibleString	16	Read Only	Dynamic		
STAT_SERIALNUMBER	Field device serial number.	VisibleString	16	Read Only	Dynamic		

Appendix B - Certifications and Approvals

B1. EU Declaration of Conformity

CE Honeywell

50136122 Revision: B

EU DECLARATION OF CONFORMITY

We,

Honeywell International Inc.
Honeywell Field Solutions
512 Virginia Drive
Fort Washington, PA 19034 USA

declare under our sole responsibility that the following products,

Smartline Series Wireless Transmitters
Models: STAW, STDW, STFW, STGW, STRW

to which this declaration relates, is in conformity with the relavent Union harmonization legislation as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and when applicable or required, a European Community notified body certification, as shown in the attached schedule.

Signed for and on behalf of:

M Williams

Michael Williams, Principal Engineer
Honeywell Process Solutions
500 Brooksbank Ave
North Vancouver, BC, V7J 3S4, CANADA
Issue Date: 15 October 2018

Honeywell

SCHEDULE
50136122 Revision: B

Radio Equipment Directive 2014/53/EU

Radio Compliance	
EN 300328 V2.1.1 (2016-11)	Wideband transmission systems; Data transmission equipment operating in the 2,4GHz ISM band
EMC Compliance	
EN 61326-1: 2013	Electrical Equipment for Measurement, Control and Laboratory Use – EMC
EN 301 489-1 V2.1.1	Requirements.

ATEX Directive 2014/34/EU

EC-Type Examination Certificate No: SIRA 17ATEX2162X- **Flameproof "d" Certificate**

EN 60079-0: 2012 + A11:2013 EN 60079-1: 2014
EN 60079-7: 2015 EN 60079-31: 2013

EC-Type Examination Certificate No: SIRA 17ATEX2162X - **Intrinsically Safe "ia" Certificate**

EN 60079-0: 2012 + A11 :2013 EN 60079-11: 2012
EN 60079-7 : 2015

Type Examination Certificate No: SIRA 17ATEX4161X - **Non Sparking "ec" and Intrinsically Safe "ic" Certificate**

EN 60079-0: 2012 + A11 :2013 EN 60079-7: 2015
EN 60079-11 : 2012

ATEX Notified Body for EC Type Certificates
Sira Certifcation Service [Notified Body Number: 0518]
Rake Lane
Eccleston, Chester CH4 9JN
England

ATEX Notified Body for Quality Assurance
DEKRA Certification B.V. [Notified Body Number: 0344]
Meander 1051
6825 MJ Arnhem
The Netherlands

Honeywell

SCHEDULE
50136122 Revision: B

Pressure Equipment Directive (PED) 2014/68/EU

Pressure Transmitter	PED Module
Absolute Pressure	Sound Engineering Practice (SEP)
STAW822/ STAW722	
STAW82L/ STAW72L	
STAW840/ STAW740	
STAW84L/ STAW74L	
STAW87L/ STAW77L	Module A
Differential Pressure	
STDW810	Module A
STDW820/ STDW720	
STDW825	
STDW830/ STDW730	
STDW870/ STDW770	
Gauge Pressure	
STGW830/ STGW730	Sound Engineering Practice (SEP)
STGW840/ STGW740	
STGW83L/ STGW73L	
STGW84L/ STGW74L	
STGW870/ STGW770	Module A
STGW87L/ STGW78L	
STGW88L/ STGW78L	
STGW89L/ STGW79L	
Flange Mounted	
STFW828/ STFW728	Sound Engineering Practice (SEP)
STFW832/ STFW732	
STFW82F/ STFW72F	
STFW83F/ STFW73F	
Remote Diaphragm	
STRW82D/ STRW73D	Sound Engineering Practice (SEP)
STRW83D	
STRW84G/ STRW74G	
STRW87G	
STRW84A	

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50136122 Revision: B

RoHS 2 Directive 2011/65/EU

EN 50581:2012

The products mentioned herein, based on supplier declarations, material declarations, and/or analytical test results, are compliant to Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

B2. Hazardous Locations Certifications

Hazardous location certifications

Refer to product label for applicable approvals.

Table B-2 Certifications and Approvals

AGENCY	TYPE OF PROTECTION	Ambient Temperature	Product Applicability
CSA (USA and Canada)	**Intrinsically Safe:** Class I; Division 1; Groups A, B, C, D; Class II, Division 1, Groups E, F, G; Class III, Division 1; T4 Class I, Zone 0 AEx ia IIC T4 Ga Class I Zone 2 AEx ic IIC T4 Gc Ex ia IIC T4 Ga Ex ic IIC T4 Gc	See tables below	Pressure
	Non Incendive: Class I; Division 2; Groups A, B, C, D; Class II, Division 2, Groups E, F, G; Class III, Division 2, T6...T4 Ex nA [ia Ga] IIC T6...T4 Gc Class I, Zn 2, AEx nA [ia Ga] IIC T6...T4 Gc	See tables below	Pressure
	Explosion-Proof/ Flameproof/Dust Proof: Class I, Division 1; Groups A, B, C, D; Class II, Division 1, Groups E, F, G; Class III, Division 1; T6...T4 Ex db [ia Ga] IIC T6...T4 Gb Ex tb [ia Da] IIIC T95...T125 Db Class I, Zn 1 AEx db [ia Ga] IIC T6...T4 Gb Class II, Zn 21, AEx tb [ia Da] IIIC T95...T125 Db	See tables below	Pressure
	Enclosure: Type 4X/ IP66/ IP67		
	Standards Used: CSA C22.2 No. 0-10 CSA C22.2 No.94.2-15 CSA C22.2 No.213-16 CAN/CSA C22.2 No.60079-1:16 CAN/CSA C22.2 No.60079-31:15 ANSI/UL 60079-1-2015 ANSI/UL 60079-31-2015 FM 3616 – Dec 2011 ANSI/UL 50E-2015	CSA C22.2 No.25-17 CAN/CSA C22.2 No.61010-1-12 CAN/CSA C22.2 No.60529:16 CAN/CSA C22.2 No.60079-11:14 ANSI/ISA 12.12.01-2015 ANSI/UL 60079-11-2014 FM 3600 – Dec 2011 ANSI/IEC 60529 – 2004 ANSI/UL 61010-1-2016	CSA C22.2 No.30-M1986 CAN/CSA C22.2 No.157-92 CAN/CSA C22.2 No.60079-0:15 CAN/CSA C22.2 No.60079-15:16 ANSI/UL 60079-0-2013 ANSI/UL 60079-15-2013 FM 3615 – Aug 2006 ANSI/UL 913-2015

AGENCY	TYPE OF PROTECTION	Ambient Temperature	Product Applicability
FM ApprovalsTM (USA)	**Intrinsically Safe:** IS Class I, II, III; Division 1; Groups ABCDEFG; T4 Class I, Zone 0 AEx ia IIC Ga T4 Class I, Zone 2[0] AEx ic [ia Ga] IIC Gc T4	-40 ºC to +85 °C	Pressure
	Non Incendive: NI-AIS Class I; DIV 2; Groups ABCD; T5...T6 Class I, Zone 2[0] AEx nA [ia Ga] IIC Gc; T5...T6	-40 °C to +85 °C : T5 -40 °C to +70 °C : T6	Pressure
	Dust Proof: DIP-AIS Class II, III DIV 1; Groups EFG; T5...T6 Zone 21[20] AEx tb [ia Da] IIIC T95°C Db	-40 °C to +85 °C : T5, T95 -40 °C to +70 °C : T6	Pressure
	Enclosure: Type 4X/ IP66/ IP67		
	Standards Used: FM 3600:2018 ANSI/ISA 60079-0: 2013 ANSI/ ISA 60079-15: 2013 ANSI/ NEMA 250: 2008	FM 3610: 2018 FM 3810: 2018 ANSI/ ISA 60079-31: 2015	FM 3611: 2018 FM 3616: 2011 ANSI/ ISA 60079-11: 2014 ANSI/ ISA 60529: 2004

AGENCY	TYPE OF PROTECTION	Ambient Temperature	Product Applicability
ATEX	Intrinsically Safe: II 1 G Ex ia IIC T4 Ga II 3 G Ex ic IIC T4 Gc	See tables below	Pressure
	Flameproof / Dust Proof: II 2[1] G Ex db [ia Ga] IIC T6...T4 Gb II 2[1] D Ex tb [ia Da] IIIC T95C...T125C Db	See tables below	Pressure
	Non Incendive: II 3[1] G Ex ec [ia Ga] IIC T6...T4 Gc	See tables below	Pressure
	Enclosure: IP66/ IP67		
	Standards Used: EN 60079-0 : 2012 + A1 EN 60079-26 : 2006	EN 60079-1 : 2014 EN 60079-7 : 2015	EN 60079-11 : 2012 IEC 60079-31 : 2013

AGENCY	TYPE OF PROTECTION	Ambient Temperature	Product Applicability*
IECEx	**Intrinsically Safe:** Ex ia IIC T4 Ga Ex ic IIC T4 Gc	See tables below	Pressure
	Flameproof / Dust Proof: Ex db [ia Ga] IIC T6...T4 Gb Ex tb [ia Da] IIIC T95C...T125C Db	See tables below	Pressure
	Non Incendive: Ex ec [ia Ga] IIC T6..T4 Gc	See tables below	Pressure
	Enclosure: IP66 /IP67		
	Standards Used: IEC 60079-0 : 2011 IEC 60079-26 : 2006	IEC 60079-1 : 2014 IEC 60079-7 : 2015	IEC 60079-11 : 2011 IEC 60079-31 : 2013

For Intrinsic Safety Installations:

The applicable temperature class, ambient temperature (Ta) and process temperature (Tp) range of the equipment when installed with type protection "Ex ia" is as follows:

Protection Type	Temperature Class
	T4
Ex ia	Ta = -40 to 80°C Tp = -40 to 125°C
Ex ic	Ta = -40 to 85°C Tp = -40 to 125°C

For Flameproof , Dustproof, increased safety and non incendive Installations:

The applicable temperature class, ambient temperature (Ta) and process temperature (Tp) range of the equipment when installed with type protection "Ex db", "Ex nA", or "Ex ec" is as follows:

Protection Type	Temperature Class		
	T4	**T5**	**T6**
Ex db Ex nA Ex ec	Ta = -40 to 85°C Tp = -40 to 125°C	Ta = -40 to 85°C Tp = -40 to 100°C	Ta = -40 to 75°C Tp = -40 to 85°C

The applicable temperature class, ambient temperature (Ta) and process temperature (Tp) range of the equipment when installed with type protection "Ex tb" is as follows:

Protection Type	Temperature Class	
	T125C	**T95C**
Ex tb	Ta = -40 to 85°C Tp = -40 to 125°C	Ta = -40 to 85°C Tp = -40 to 100°C

Electrical Data:

Battery

Two series connected (D size) Lithium batteries, type 5930 manufactured by Tadiran, type XL-205F manufactured by Zeno Energy or type PT-2300H manufactured by Eagle Picher.

Additionally, for ATEX and IECEx certifications, lithium battery SL-2780, manufactured by Tadiran, GmbH may be used.

24V DC Supply

For Ordinary Locations, Explosion-proof and Non Incendive:

16.0 V min to 28.0 V max, Supply Current Capability 100 mA

For Intrinsically Safe:

A suitable barrier, mounted in a suitable enclosure, or in a non-hazardous location is needed. See Control drawings later in this section, for entity parameters and other details.

B3. Conditions of Certification

FM Approval Specific Conditions of Use

1) For Zone 2 installation with the 24V Power Supply, the installer shall provide transient over-voltage protection external to the equipment such that the voltage at the supply terminal of the equipment does not exceed 140% of the voltage rating of the equipment.

2) The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

3) Painted surface of the enclosure may store electrostatic charge and become a source of ignition in applications with a low relative humidity less than approximately 30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust or oil. Cleaning of the painted surface should only be done with a damp cloth.

CSA, IECEx and ATEX Conditions of Certification

1) Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.

2) The enclosure is manufactured from low copper aluminum alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation, particularly if the equipment is installed in a zone 0 location.

3) Temperature Codes are assigned as per tables shown in section **Error! Reference source not found.**.

Apparatus Marked with Multiple Types of Protection

The user must determine the type of protection required for installation of the equipment. The user shall then check the box [□] adjacent to the type of protection used on the equipment certification nameplate. Once a type of protection has been checked on the nameplate, the equipment will not be reinstalled using any of the other certification types.

B4. Radio Compliance Information

The SmartLine Wireless pressure transmitter uses a low powered ISA100 2.4GHz radio to communicate with the Radio Infrastructure and Gateway devices that are connected to a wired DCS network. The wireless transmit power is set at the factory depending on the destination country. The combination of allowed transmit power and antenna gains result in a maximum EIRP of 26 dBm = 398 mW transmitted power. This power is limited depending on destination country.

Table B4: Radio Certifications

Agency	Certification	Description
Federal Communications Commission (FCC)	FCC ID: S5751454941	The SmartLine Wireless Transmitters comply with part 15 of the FCC rules. Operation is subject to the following two conditions. (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Industry Canada (IC)	IC: 573W-51454941	The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF fields in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's web site **www.hc-sc.gc.ca/rpb.**
CE		The SmarLine wireless transmitter has been assessed and is in compliance with the Radio Equipment Directive (RED) 2014/53/EU.

Radio Frequency (RF) statement

To comply with FCC's and Industry Canada's RF exposure requirements, the following antenna installation and device operating configurations must be satisfied.

- Remote Point-to-Multi-Point antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) of greater than 20cm and a separation distance of at least 20cm from all persons.
- Remote Fixed Point–to-Point antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) of greater than 20cm and a separation distance of at least 100cm from all persons.
- Furthermore, when using integral antenna(s) the SmartLine Wireless Transmitter unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20cm from all persons.

European Union restriction

The SmartLine Wireless Transmitters are in conformity with the applicable standards as required by the Radio Equipment Directive (RED) 2014/53/EU.

Restriction

France restricts outdoor use to 10mW (10dBm) EIRP in the frequency range of 2,454-2,483.5 MHz. Installations in France must limit EIRP to 10dBm, for operating modes utilizing frequencies in the range of 2,454 – 2,483.5MHz.

Japanese Restrictions

For locations in Japan the transmitter power is restricted to 12.14dBm/Mhz {32mW (15.4 dBm)} maximum EIRP including the antenna.

ATTENTION

SmartLine Wireless units must be professionally installed

FCC compliance statements

- This device complies with Part 15 of FCC Rules and Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.
- Intentional or unintentional changes or modifications must not be made to the SmartLine Wireless Transmitters unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty.

IC compliance statements

- To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropic radiated power (EIRP) is not more than that permitted for successful communication.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- This Class A digital apparatus complies with Canadian ICES-003.
- French: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

B5. Control Drawing

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PRE REL		
ISS	REVISION & DATE	APPD
B	02 Nov 2018	MJW

STW SERIES WIRELESS TRANSMITTERS INSTALLATION CONTROL DRAWING

1. Intrinsically safe installation shall be in accordance with
   a. FM (USA): ANSI/NFPA 70, NEC® Articles 504 and 505.
   b. CSA (Canada): Canadian Electrical Code (CEC), part I, section 18.
   c. ATEX: Requirements of EN 60079-14, 12.3 (See also 5.2.4).
   d. IECEx: Requirements of IEC 60079-14, 12.3 (See also 5.2.4).
2. ENTITY approved equipment shall be installed in accordance with the manufacturer's Intrinsic Safety Control Drawing.
3. The Intrinsic Safety ENTITY concept allows the interconnection of two ENTITY Approved Intrinsically safe devices with ENTITY parameters not specifically examined in combination as a system when:

   Uo, Voc, or Vt $\leq$ Ui or Vmax; Io, Isc, or It $\leq$ Ii or Imax; Ca or Co $\geq$ Ci + Ccable, La or Lo $\geq$ Li + Lcable, Po $\leq$ Pi. Where two separate barrier channels are required, one dual-channel or two single-channel barriers may be used, where in either case, both channels have been Certified for use together with combined entity parameters that meet the above equations.
4. System Entity Parameters:

   STW Transmitter: Vmax Voc or Uo, Imax Isc or Io;
   STW Transmitter: Ci + Ccable $\leq$ Control Apparatus Ca,
   STW Transmitter: Li + Lcable $\leq$ Control Apparatus La.
5. When the electrical parameters of the cable are unknown, the following values may be used:

   Capacitance: 197pF/m (60 pF/ft) Inductance: 0.66µH/m (0.020µH/ft).
6. Control equipment that is connected to Associated Equipment must not use or generate more than 50V 47-63Hz AC or 50V DC.
7. Associated equipment must be FM, CSA ATEX or IECEx (depending on location) listed. Associated equipment may be installed in a Class I, Division 2 or Zone 2 Hazardous (Classified) location if so approved.
8. IS installation in Zone 0 or Div 1 must use Galvanically isolated, non-grounded, associated equipment for the 24V input. IS installation in Zone 1 may use either galvanically isolated, non grounded, or Non-Galvanically isolated equipment. Grounded Zener Barriers must be connected to a suitable ground electrode per:
   a. FM (USA): NFPA 70, Article 504 and 505. The resistance of the ground path must be less than 1.0 ohm.
   b. CSA (Canada): Canadian Electrical Code (CEC), part I, section 10.
   c. ATEX: Requirements of EN 60079-14, 12.2.4.
   d. IECEx: Requirements of IEC 60079-14, 12.2.4.
9. Intrinsically Safe DIVISION 1/ Zone 0 WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN HAZARDOUS LOCATIONS.
10. Division 2/ Zone 2: WARNING: DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT.
11. NO REVISION OF THIS CONTROL DRAWING IS PERMITTED WITHOUT AUTHORIZATION FROM THE AGENCIES listed.
12. For release approvals see ECN 2018-4135

DRAWN			Honeywell
CHECKED			CONTROL DRAWING STW SERIES WIRELESS TRANSMITTER DIVISIONS 1 & 2 / ZONE 0 & 2
DEV ENG			
MFG ENG			
QA ENG			
TOLERANCE UNLESS NOTED			A/A4 — 50136123
ANGULAR DIMENSION			SCALE: None | USED ON | SH. 1 OF 5

MASTER FILE TYPE: MS WORD

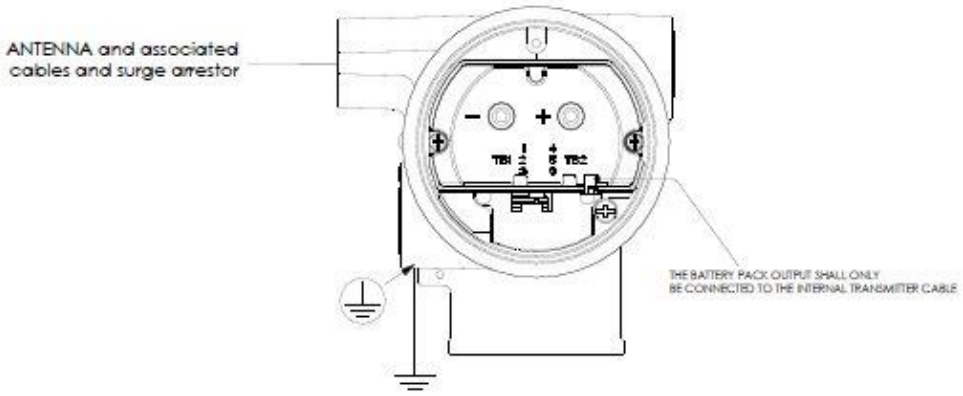
STW PRESSURE TRANSMITTER WITH BATTERY PACK

ENTITY PARAMETERS for ANTENNA	
ia ENTITY (Transmitter Antenna Output)	**Associated Apparatus** (Antenna, Cables, Arrestor) Simple Apparatus Only
Co or Ca = 0.02 µF	Ci <= Co or Ca
Lo or La = 25.57 mH	Li <= Lo or La

HAZARDOUS (CLASSIFIED) LOCATION

CLASS I, II, III DIVISION 1, GROUPS ABCDEFG;
ZONE 0 IIC;

STW TRANSMITTER WITH BATTERY PACK OPTION
(Antenna and Meterbody Omitted for Clarity)

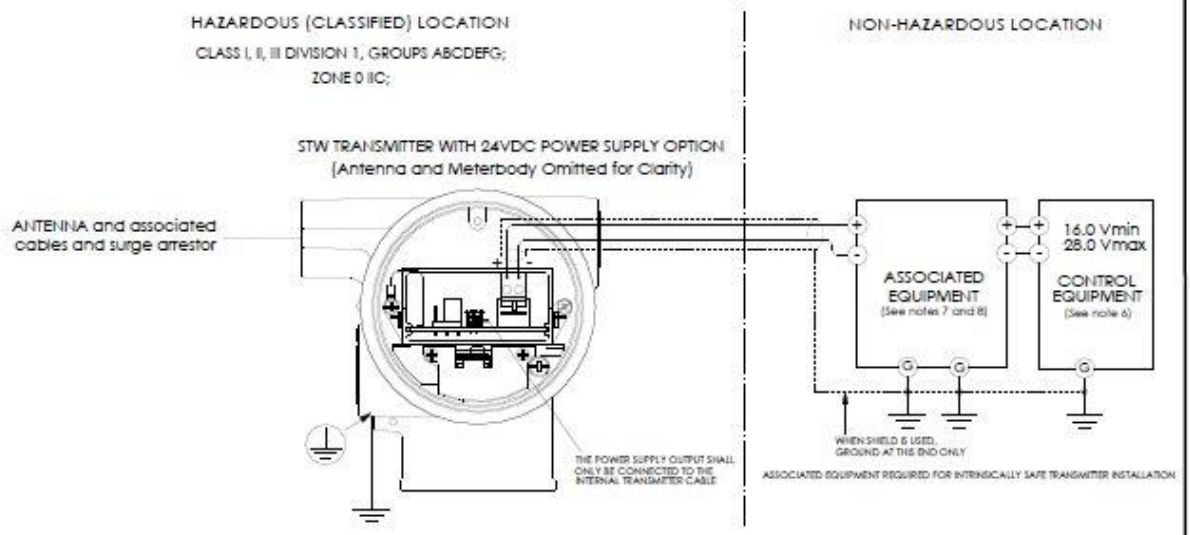


Honeywell	A/A4	50136123	
	SCALE: None	REV B DATE 11/02/2018	SH. 2 of 5

STW PRESSURE TRANSMITTER WITH 24VDC INPUT POWER SUPPLY
DIVISION 1 OR ZONE 0 INSTALLATION

ENTITY PARAMETERS for 24V Supply connection	
ia ENTITY PARAMETERS (Transmitter 24V Input)	**Associated Apparatus**
Ui or Vmax ≤ 30V	Uo, Voc or Vt ≤ 30 V
Ii or Imax ≤ 120 mA	Io (Isc or It) ≤ 120 mA
Pi or Pmax = 0.9W	Po ≤ 0.9 W
Ci = 2.2 nF	Ca or Co ≥ C_{cable} + C_{STW}
Li = 620.4 uH	La or Lo ≥ L_{cable} + L_{STW}

ENTITY PARAMETERS for ANTENNA	
ia ENTITY (Transmitter Antenna Output)	**Associated Apparatus** (Antenna, Cables, Arrestor) Simple Apparatus Only
Co or Ca = 0.02 µF	Ci <= Co or Ca
Lo or La = 25.57 mH	Li <= Lo or La

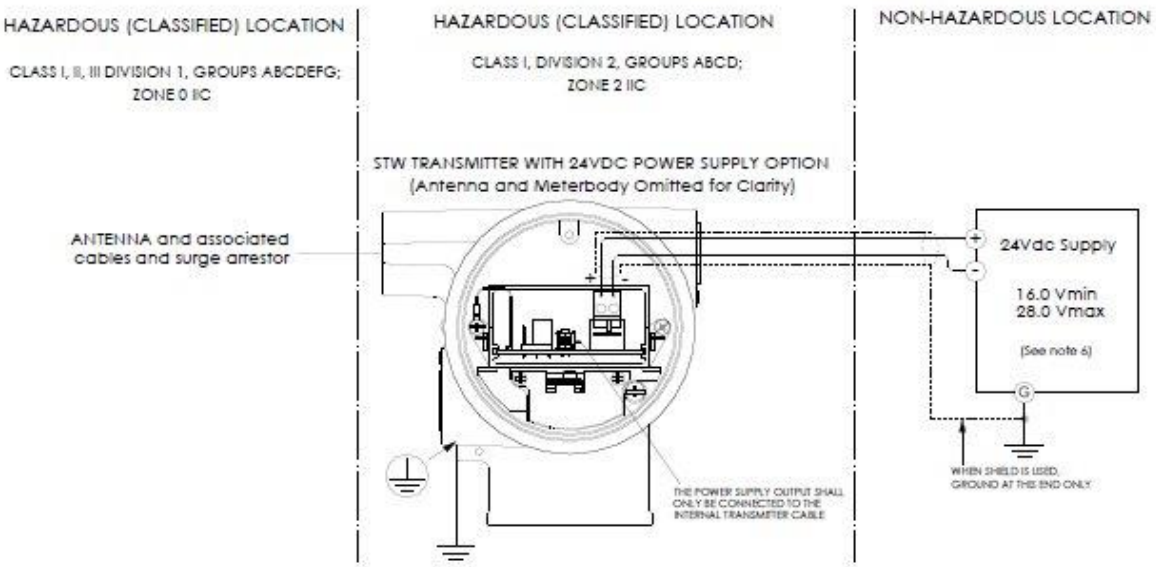


Honeywell	A/A4	50136123	
	SCALE: None	REV B DATE 11/02/2018	SH. 3 of 5

STW PRESSURE TRANSMITTER WITH 24VDC INPUT POWER SUPPLY
DIVISION 2 OR ZONE 2 INSTALLATION

ENTITY PARAMETERS for 24V Supply connection
ic ENTITY PARAMETERS (Transmitter 24V Input)
Ui or Vmax ≤ 30 V
Ii or Imax ≤ 180 mA
Pi or Pmax = 0.9 W
Ci = 2.2 nF
Li = 620.4uH

ENTITY PARAMETERS for ANTENNA	
ia ENTITY (Transmitter Antenna Output)	**Associated Apparatus** (Antenna, Cables, Arrestor) Simple Apparatus Only
Co or Ca = 0.02 µF	Ci <= Co or Ca
Lo or La = 25.57 mH	Li <= Lo or La

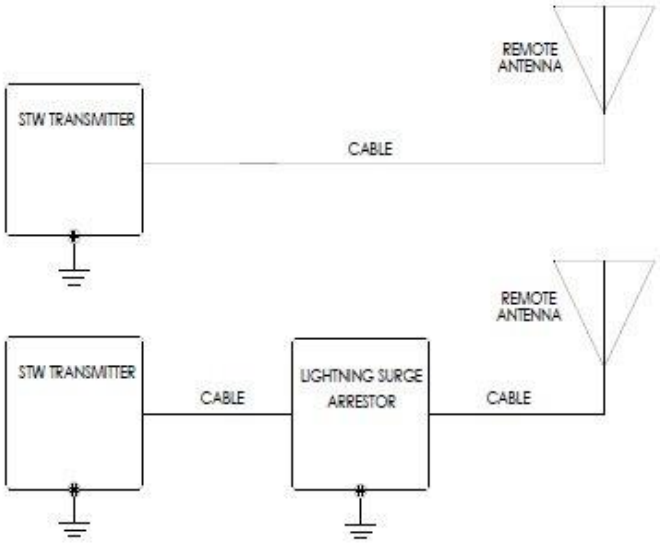


Honeywell	A/A4	50136123	
	SCALE: None	REV B DATE 11/02/2018	SH. 4 of 5

REMOTE ANTENNAS

The STW series transmitters may include an integral antenna, or remote mount antennas. The remote mount antennas must be passive elements only, and may be installed with a total cable length not to exceed 20m. The antenna cable shield shall be bonded to earth ground. A lightning surge arrestor is optional. Honeywell supplied antenna connection cables are LMR 400DB with Type N-Male connectors on each end.

The IS Parameters for remote antennas, cables, and lightning arrestor:
Ca = 0.02 µF, La = 25.57 mH



CABLE PARAMTERS				LIGHTNING SURGE ARRESTOR PARAMETERS
CABLE LENGTH	CABLE PART #	CAPACITANCE	INDUCTANCE	
1 m	50018278-001	78.4 pF	0.2 µH	Capacitance = 1 pF
3 m	50018278-003	235.2 pF	0.6 µH	Inductance = 10 nH
10 m	50018278-010	784 pF	2.0 µH	

Honeywell	A/A4	50136123	
	SCALE: None	REV B DATE 11/02/2018	SH. 5 of 5

B6. European Union Usage

This product may be used in any of the following European Union nations.

Table B-3 European Union Usage

Country	ISO 3166 2 letter code	Country	ISO 3166 2 letter code
Austria	AT	Latvia	LV
Belgium	BE	Liechtenstein	LI
Bulgaria	BG	Lithuania	LT
Cyprus	CY	Malta	MT
Czech Republic	CZ	Netherlands	NL
Denmark	DK	Norway	NO
Estonia	EE	Poland	PL
Finland	FI	Portugal	PT
France	FR	Romania	RO
Germany	DE	Slovakia	SK
Greece	GR	Slovenia	SI
Hungary	HU	Spain	ES
Iceland	IS	Sweden	SE
Ireland	IE	Switzerland	CH
Italy	IT	United Kingdom	BG

Glossary

AP	Absolute Pressure
AWG	American Wire Gauge
DE	Digital Enhanced Communications Mode
DP	Differential Pressure
d1	Inside diameter of pipe
d2	Orifice plate bore diameter at flowing temperature
do	Inside diameter of orifice
EMI	Electromagnetic Interference
FTA	Field Termination Assembly
GP	Gauge Pressure
HP	High Pressure (also, High Pressure side of a Differential Pressure Transmitter)
Hz	Hertz
inH_2O	Inches of Water
LGP	In-Line Gauge Pressure
LP	Low Pressure (also, Low Pressure side of a Differential Pressure Transmitter)
LRL	Lower Range Limit
LRV	Lower Range Value
mAdc	Milliamperes Direct Current
mmHg	Millimeters of Mercury
mV	Millivolts
Nm	Newton·meters
NPT	National Pipe Thread
NVM	Non-Volatile Memory
Pa	Measured static pressure in PV4 algorithm
Pc	Absolute critical pressure of the gas
Pd	Static pressure at downstream point
Pdp	Measured differential pressure in Pascals in PV4 algorithm
Pf	Absolute pressure of flowing gas
Pr	Reduced pressure
Pu	Static pressure at upstream point

PM Process Manger

PSI Pounds per Square Inch

PSIA Pounds per Square Inch Absolute

PV Process Variable

PWA Printed Wiring Assembly

RFI Radio Frequency Interference

RTD Resistance Temperature Detector

SFC Smart Field Communicator

STIM Pressure Transmitter Interface Module

STIMV IOP Pressure Transmitter Interface Multivariable Input/Output Processor

T/C Thermocouple

URL Upper Range Limit

URV Upper Range Value

US Universal Station

Vac Volts Alternating Current

Vdc Volts Direct Current

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Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

ASIA PACIFIC

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