

**SmartLine Wireless
Temperature and Universal I/O
Transmitters
User's manual**

**34-SW-25-04
Revision 2
November 2022**

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About This Document

This document describes preparation, operation and maintenance of the SmartLine™ Wireless Temperature 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.

Revision Information

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References

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

Document Title	Doc #
SmartLine Wireless Temperature and Universal IO Transmitters Quick Start Guide	34-SW-25-02
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
OneWireless Network Planning and Installation Guide	OWDOC-X253-en-320A

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://process.honeywell.com>
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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.

Symbol	Description
	<p>The Factory Mutual® Approval mark means the equipment has been rigorously tested and certified to FM standards for safety and/or performance.</p>
	<p>The Canadian Standards mark means the equipment has been tested and meets applicable standards for safety and/or performance.</p>
	<p>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").</p>
	<p>For equipment declared to meet the CE marking requirements of the European Economic Area (EEA).</p>
	<p>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.</p>
<p>CRN</p>	<p>Canadian Registration Number</p>

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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

SmartLine wireless transmitters conform to the security features specified in the ISA100.11a standard. 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. This section provides an overview of considerations for overall security of SmartLine Wireless Temperature Multi I/O transmitter. Refer OneWireless Network Planning and Installation Guide (OWDOC-X253-en-320A) for detailed information for planning secure deployment of the transmitter.

To reduce security threats, wireless field device network ensures that all process data is 128-bit encrypted. The data is encrypted at the source and decrypted at the destination to provide end-to-end security for the process data. In addition to data encryption, ISA100.11a standard requires all the devices to be authenticated before joining the network. SmartLine wireless transmitters supports infrared authentication key distribution mechanism. This mechanism is very secure since it requires the user to be physically located near the device to authenticate it. Devices can also be authenticated by over the air provisioning. The keys are encrypted when distributed using over the air provisioning mechanism. It is recommended to configure a suitable key rotation period to further secure the network.

Prior to deploying the transmitter, a radio frequency assessment is recommended to determine the number and placement of access points that provide adequate network coverage throughout the network. To ensure 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 Wireless Device Manager (WDM) network display.

Firmware image for this transmitter is protected by Honeywell PKI signing process. This ensures that only firmware that has a valid signature can be used to update the transmitter. If the new firmware image fails signature validation, it will be discarded and the transmitter will continue operate with previous version of the firmware. Boot loader also validates the signature of the current running firmware image in the flash storage every time transmitter powers up. If the flash firmware signature validation fails, transmitter will not transition to operational mode and appropriate error message will be displayed on the local display.

This transmitter supports battery power option. It is important to review and follow the recommendations in Battery Power Option Chapter for safe and secure operation of the battery powered devices. Transmitter continuously monitors battery status that can be accessed using wireless interface or local display. Low battery alarm will be issued by the transmitter if the battery power dips below critical level. Batteries must be replaced as soon as possible when battery power is low for secure operation of the device.

It is the responsibility of the end-user to establish measures that designed to deny unauthorized access and ensure physical security of the transmitter and associated equipment. Following the security best practices outlined below makes the deployment as secure as possible.

- Transmitter must be installed in a physically secure location and limit the access to only authorized personnel.
- The handheld provision device must be protected with a strong alpha-numeric passcode and must be stored in a physically secure storage.
- Load the handheld provisioning device with only the adequate number of keys to provision all the devices and set the expiration to a reasonable limit.
- Erase all the security keys from the handheld provisioning device, before returning the device to storage to prevent unauthorized use.
- Wireless signal strength may vary due to physical changes around transmitter or environment conditions. Periodically check wireless signal strength and take necessary action to ensure optimum signal level.
- Periodically check battery power status. Replace batteries as needed.

How to Report Security Vulnerability

A security vulnerability is defined as a software defect or weakness that can be exploited to modify the operational or security capabilities of the product. Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services very seriously. To report a potential security vulnerability against any Honeywell product, please navigate to <https://honeywell.com/pages/vulnerabilityreporting.aspx>, click on Vulnerability Reporting in the left menu and follow the instructions.

1.5 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 Temperature and Universal I/O Transmitters come in three models for applications involving these I/O types:

1. T/C (Thermocouple)
2. mV (millivolts)
3. DI (Discrete Input, contact closure)
4. 2-Wire Resistance
5. 3-Wire RTD or Resistance (STIW400 only)
6. 0-20mA or 4-20mA current input (also referred to as HLAI) (STUW750 and STUW751 only)
7. DO (discrete output) (STUW751 only)

The Temperature and Universal I/O transmitter can be configured, using channel instantiation, for the following channel I/O combinations according to model number.

STIW400

Channel 1	Channel 2	Channel 3	Channel 4
T/C or mV or DI or 2-wire resistance	T/C or mV or DI or 2-wire resistance	T/C or mV or DI or 2-wire resistance	T/C or mV or DI or 2-wire resistance
3-Wire RTD or resistance	n/a	T/C or mV or DI or 2-wire resistance	T/C or mV or DI or 2-wire resistance
3-Wire RTD or resistance	n/a	3-Wire RTD or resistance	n/a
T/C or mV or DI or 2-wire resistance	T/C or mV or DI or 2-wire resistance	3-Wire RTD or resistance	n/a

STUW750

Channel 1	Channel 2	Channel 3
T/C or mV or DI or 2-wire resistance or current (0/4-20mA)	T/C or mV or DI or 2-wire resistance or current (0/4-20mA)	T/C or mV or DI or 2-wire resistance or current (0/4-20mA)

STUW751

Channel 1	Channel 2	Channel 3
T/C or mV or DI or 2-wire resistance or current (0/4-20mA)	T/C or mV or DI or 2-wire resistance or current (0/4-20mA)	DO

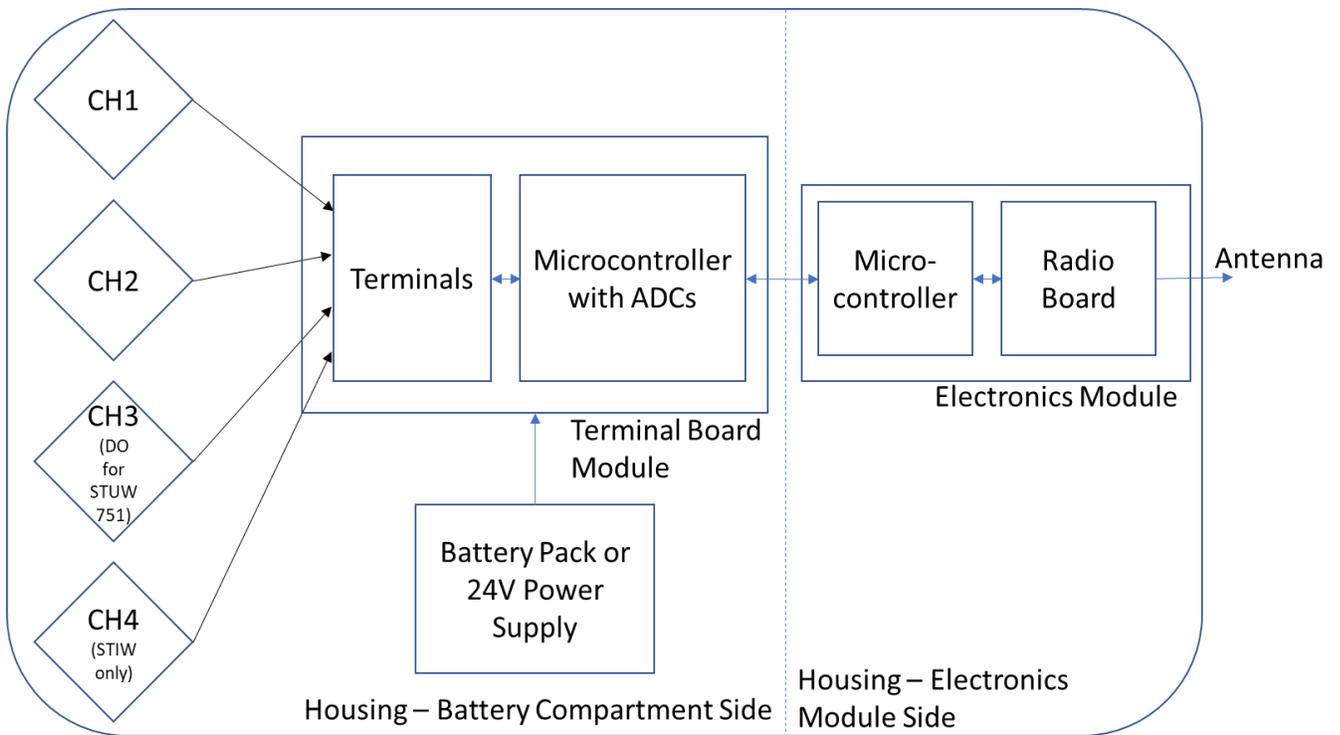


Figure 1-1 - SmartLine Wireless Transmitter Functional Diagram

1.6 Physical Characteristics

As shown in [Figure 1-2](#), the SmartLine Wireless transmitter is packaged in one major assembly: the Electronics Housing with the Housing Adaptor. The elements in the Electronic Housing respond to IR commands and execute the software and protocol for the different temperature measurement types. [Figure 1-3](#) shows the assemblies in the Electronics Housing.

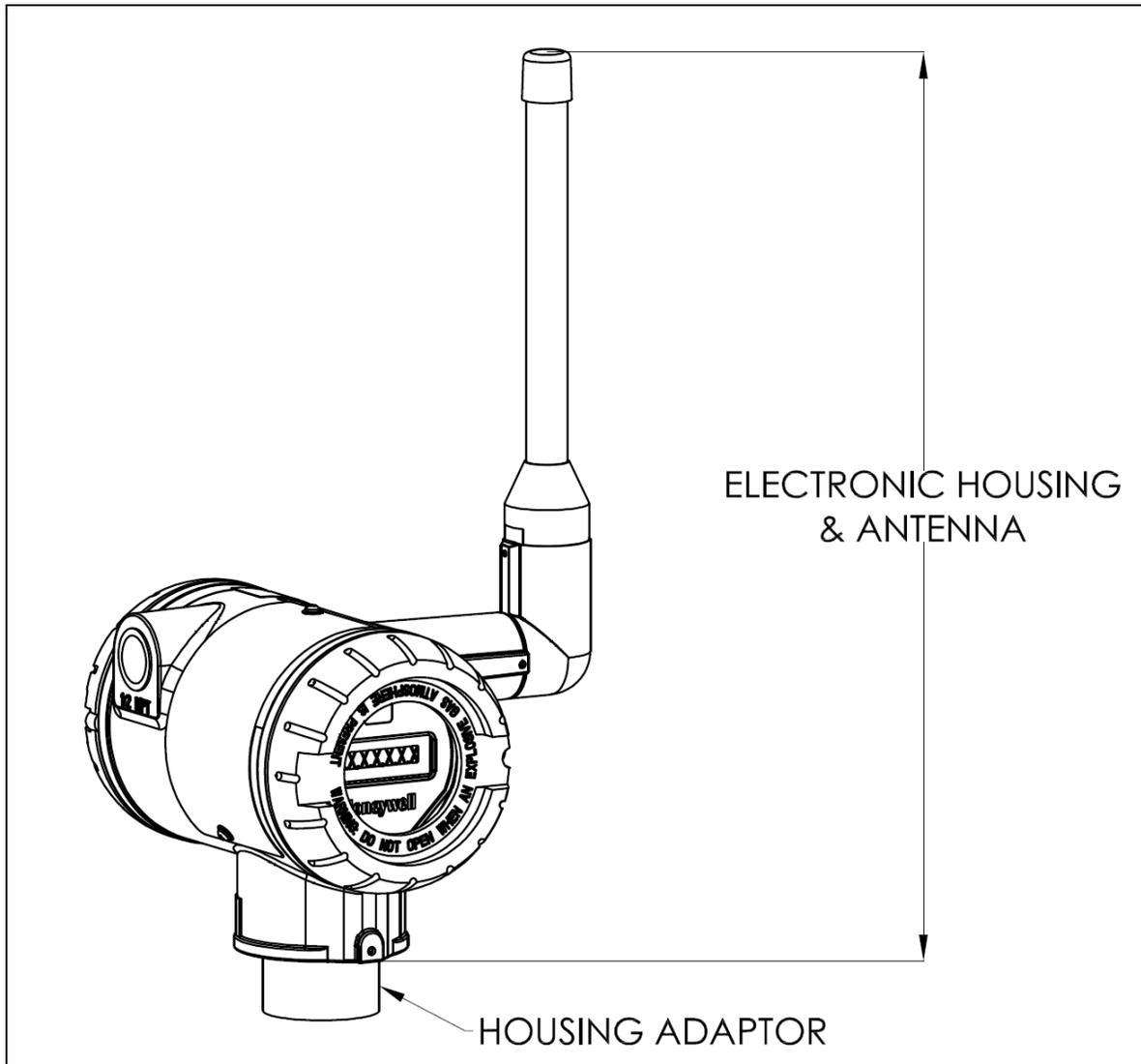


Figure 1-2 – SmartLine Wireless Transmitter Major Assembly

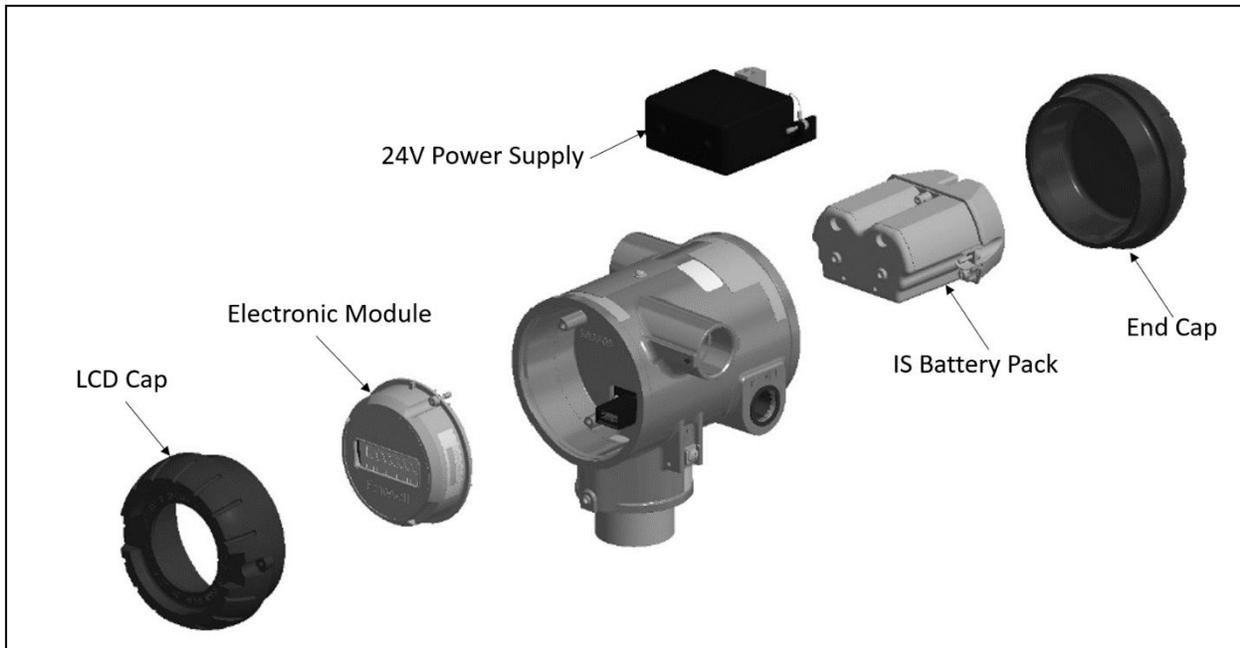


Figure 1-3– SmartLine Wireless Transmitter Electronics Housing Components

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 [5.1](#) for specific battery requirements.
- b. Line powered transmitters with the power supply option require 24V DC connected to the input connector P3. See section [5.2](#) 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 [5.5](#) for further provisioning details. This step may take several minutes, depending on your network.

2. Preparation and Quick Start

2.3. Transmitter Quick Start

5. VERIFY that the transmitter appears in the wireless network. 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. 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.
 - d. Configure the Channel types in the Transmitter→Channel Configuraiton panel. By default, there are no installed channels on the transmitter. You must select one, two, three, or four channels with the applicable sensor types.
 - i. Ensure the press “Apply” after the changes, and wait for the changes to take effect.
 - e. Configure the channel(s) as desired using the Channel configuration property panels.
 - i. Sensor Type, Name, Description, Process limits, Process Scale, etc.
 - ii. Ensure to press “Apply” after the changes, and wait for the changes to take effect.
 - f. Put the channel(s) into the desired operating mode. The default will be Out of Service (OOS)
 - i. OOS, Manual, Auto, Normal.
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 user calibration is required. See section [7.5](#)

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

3.2 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. Installation

3.3. Transmitter Weights and Dimensions

3.3 Transmitter Weights and Dimensions

Weights

Table 3-1: Weights

Transmitter Model	Weight
STIW400 STUW75X	6 lbs (2.7 kg)

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)

Dimensions

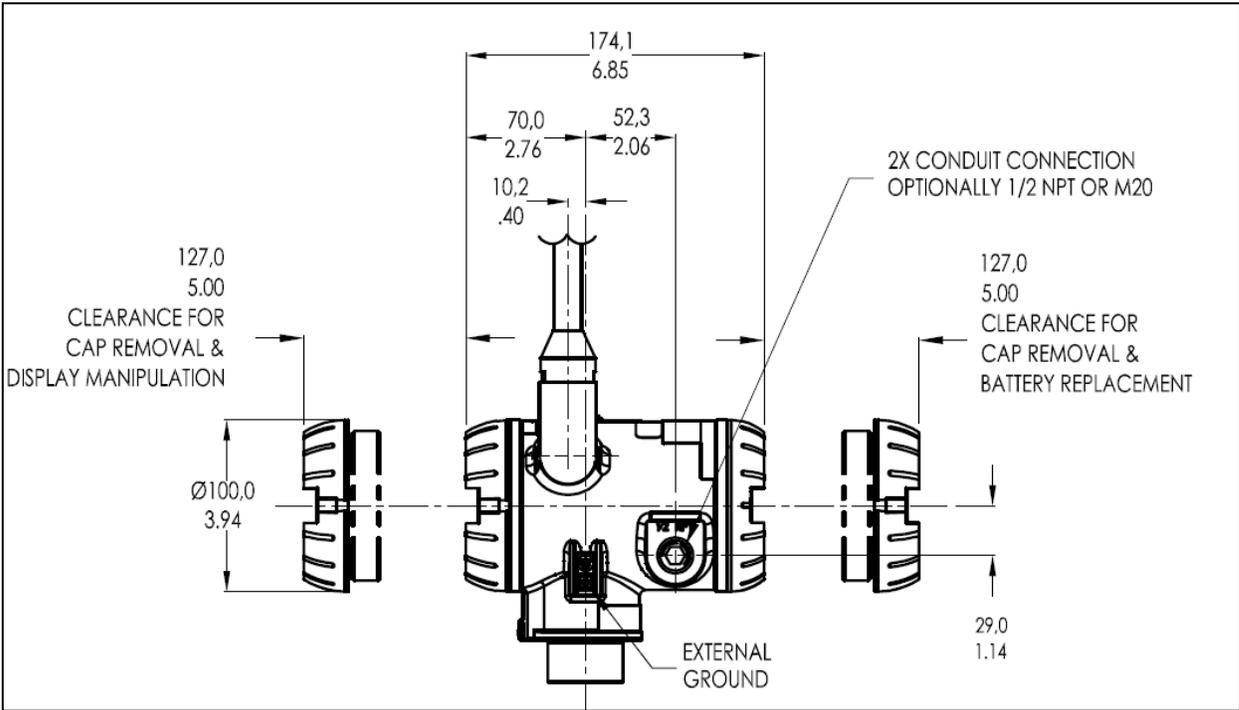


Figure 3-1: Temperature/UIO transmitter dimensions' unit mm/inch

3. Installation

3.3. Transmitter Weights and Dimensions

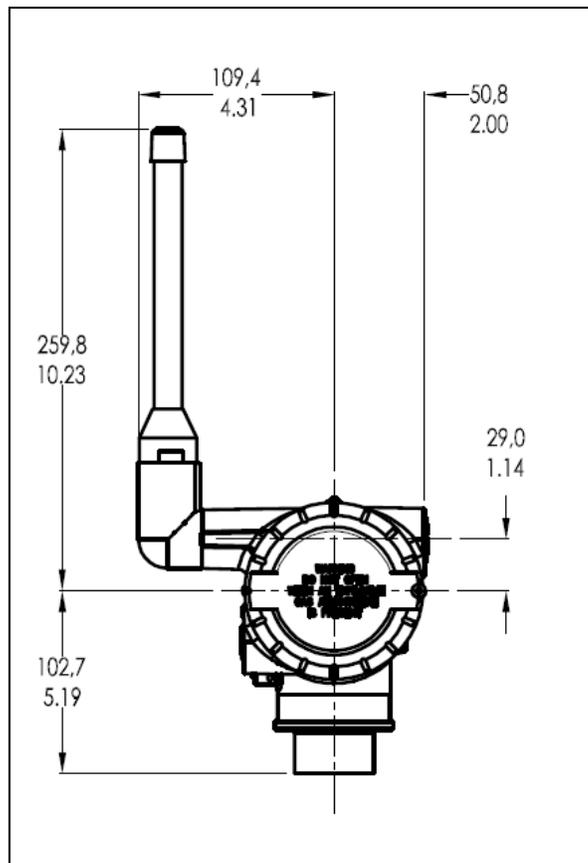
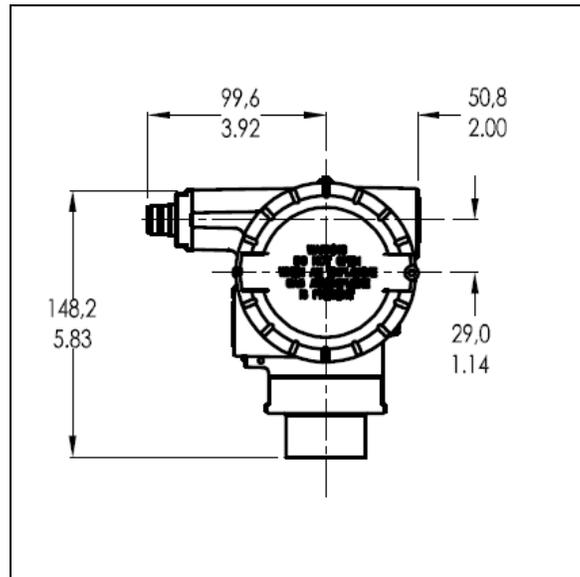


Figure 3-2: Temperature/UIO antenna dimensions unit mm/inch

3.4 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 temperature/UIO transmitters

DRAWING	DRAWING NUMBER
INSTALLATION DRAWING STW TEMPERATURE UIO TRANSMITTERS	50148942
INSTALLATION INSTRUCTIONS PIPE MOUNTING BRACKET, FLAT STW TEMPERATURE UIO TRANSMITTERS	50154107
INSTALLATION INSTRUCTIONS PIPE MOUNTING BRACKET, ANGLE STW TEMPERATURE UIO TRANSMITTERS	50154108

3.5 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 – 85°C -40 – 185°F	ATEX  II 2 GD EEx de IIC
50021832-002	½ NPT Conduit Plug	IP66-68, 4/4X, 6/6P	-40 – 85°C -40 – 185°F	ATEX  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 – 100°C -40 – 212°F	-----
50023212-001	½ NPT Cable Gland	IP68	-40 – 100°C -40 – 212°F	-----

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

3.6 Mounting Summary

Transmitter models 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. [Figure 3-3](#) shows typical bracket-mounted transmitter installations.

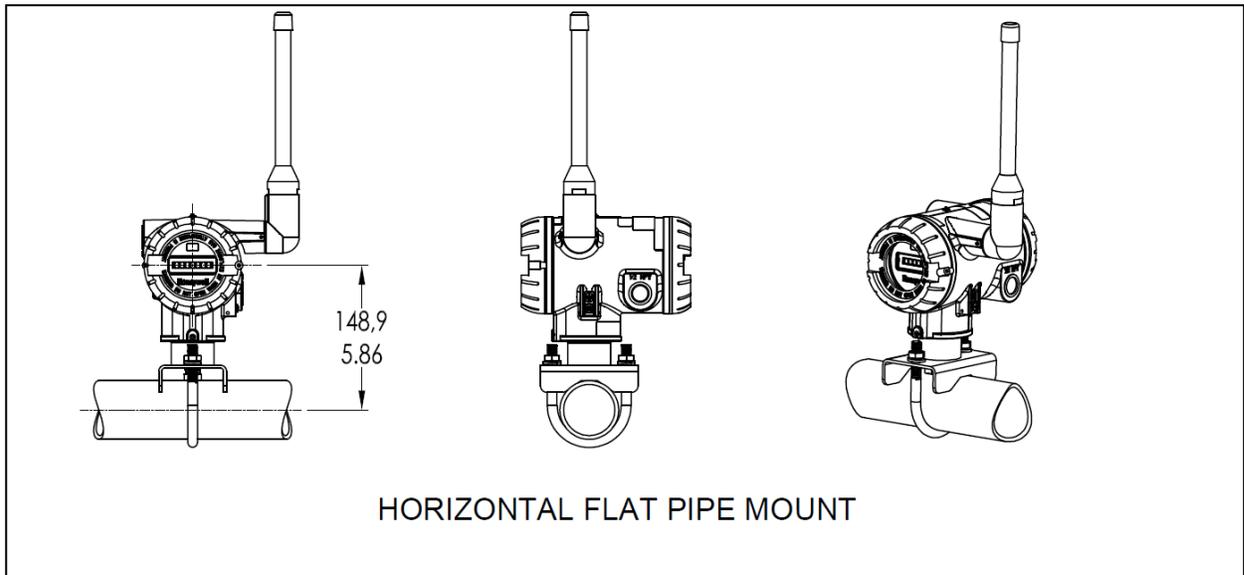


Figure 3-3: Typical Flat Bracket Mounted

3. Installation
3.6. Mounting Summary

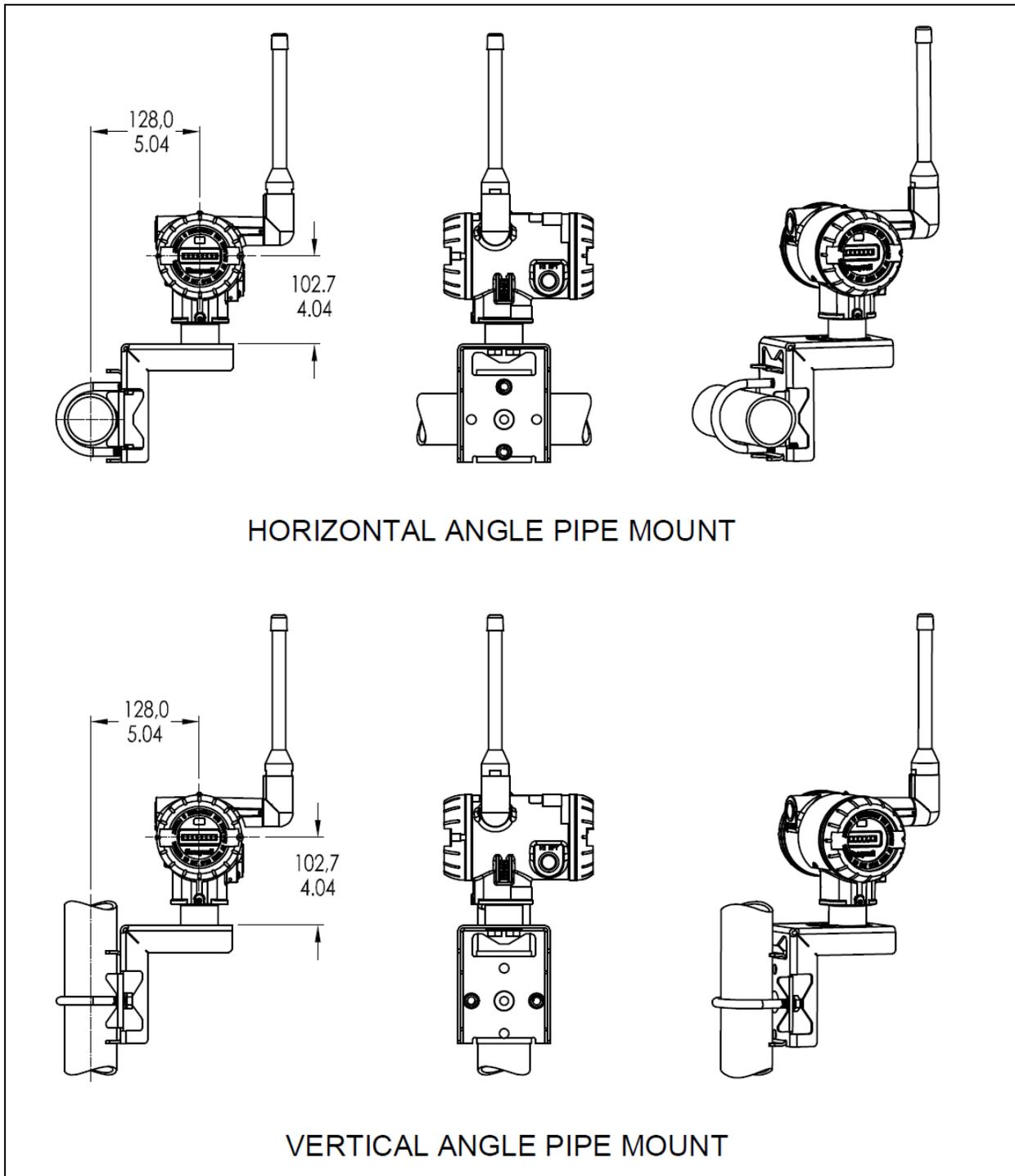


Figure 3-4: Typical Angle Bracket Mounted

Bracket Mounting Procedure

1. Align the two mounting holes in the transmitter with the two slots in the mounting bracket and assemble the (2) M8 hex cap screws, (2) lockwashers and (2) flat washers provided. Rotate transmitter assembly to the desired position and torque the M8 hex cap screws to 27,0 Nm/20,0 Lb-ft maximum.
2. Pipe Mount Option: Refer to [Figure 3-5](#). 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, flat washers and lock washers provided.

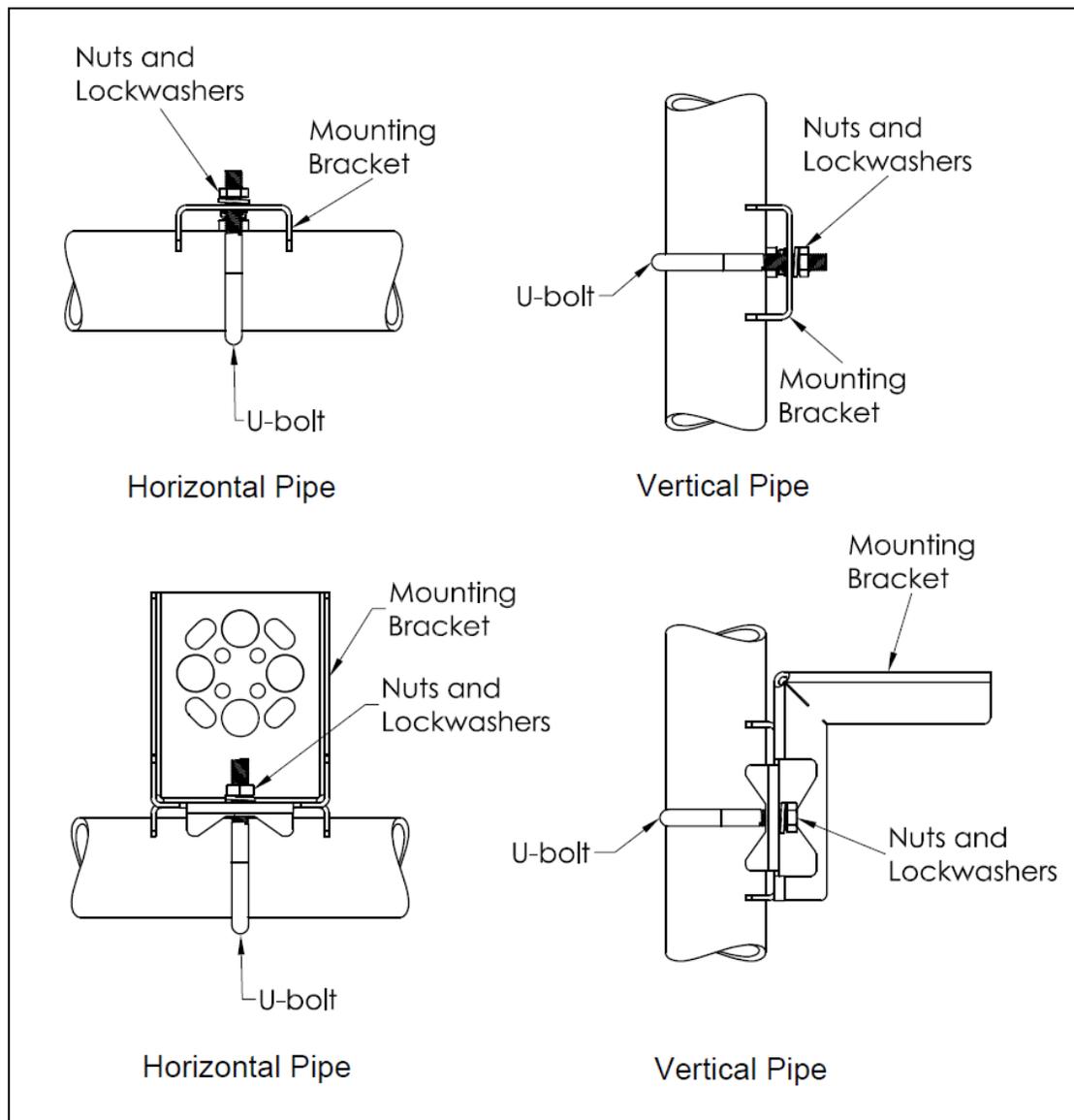


Figure 3-5: Pipe Mounting Bracket Secured to a Horizontal or Vertical Pipe

3. Installation

3.7. Rotate transmitter housing

3.7 Rotate transmitter housing

You can rotate the transmitter for better viewing, access, or antenna position. Loosen set screw (see A in

Figure 3-6) on outside neck of transmitter one full turn. Rotate transmitter housing up to 180 degrees in either direction to desired position. Tighten set screw.

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

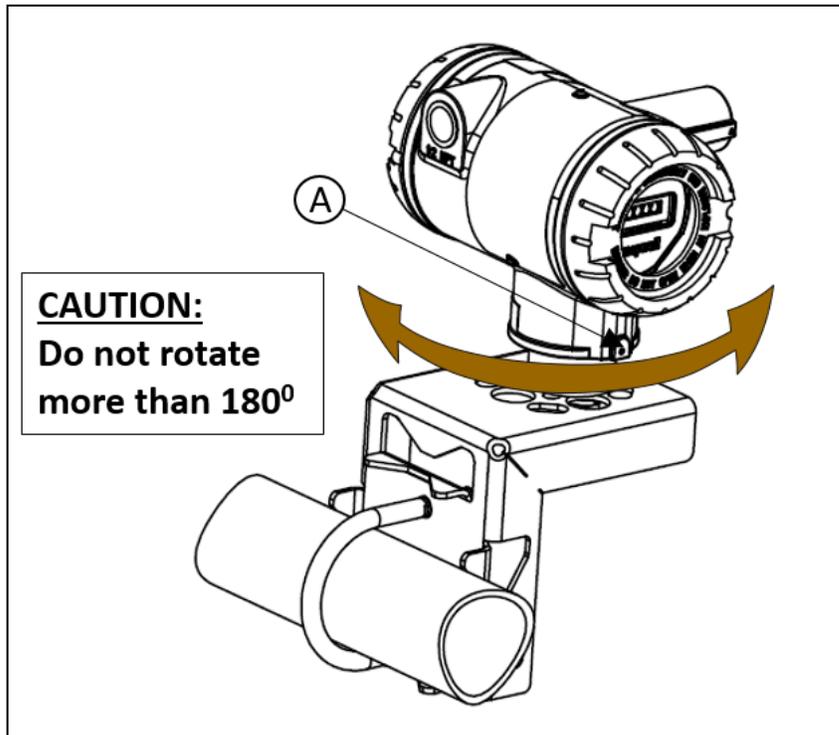


Figure 3-6: Rotating transmitter housing

3.8 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/electronics 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 3-7 . Unscrew and remove the end cap.
3	Loosen the two captive screws on the display/electronics module. See items 2 in Figure 3-7 .
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/electronics 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.

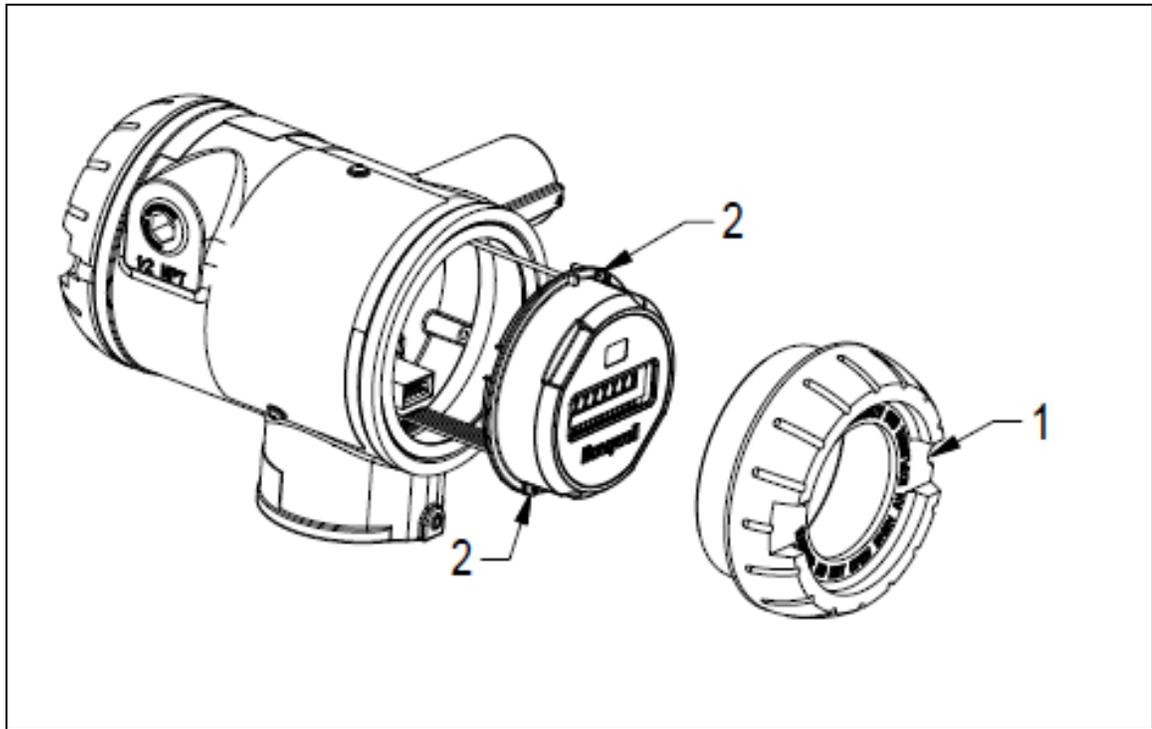


Figure 3-7: Display rotation

3. Installation

3.9. Antenna adjustment and mounting

3.9 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.

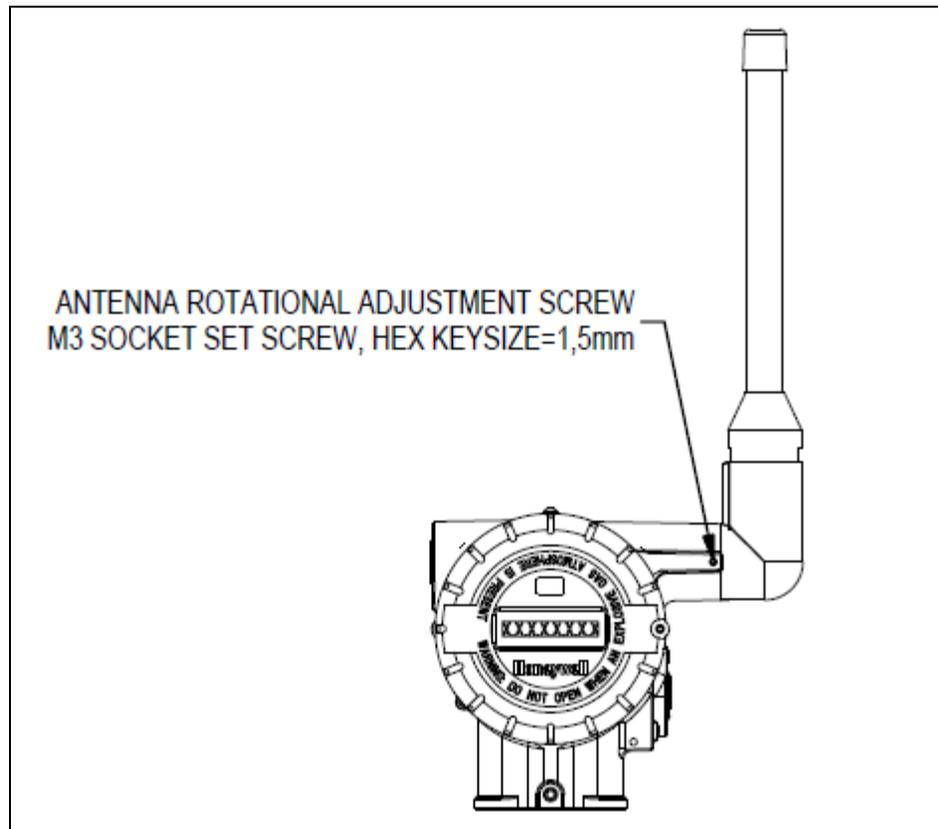


Figure 3-8: Elbow antenna adjustment

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 3-8](#).

3.10 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

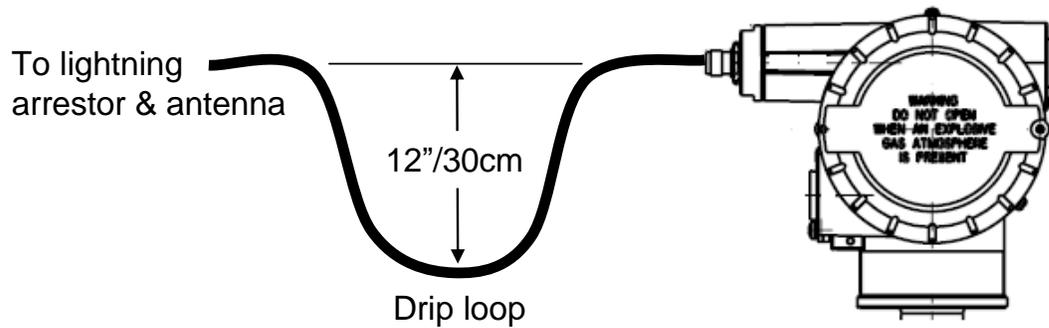
Antennas are provided with a mast mounting kit consisting of a mounting bracket and two U-bolt clamps. This kit allows you to mount the antenna to masts with outside diameters (O.D.) from 1.25 inches (3.2 centimeters) to 2 inches (5.1 centimeters). Honeywell recommends that a 1.5 inch (3.8 centimeter) or larger tubing must 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) to prevent moisture and other weathering elements from affecting performance. Honeywell recommends using a weathering tape (such as Coax-Seal®) for outdoor connections. Silicon sealant or electrical tape is not recommended for sealing outdoor 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: <ul style="list-style-type: none">• 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 3-9: 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.

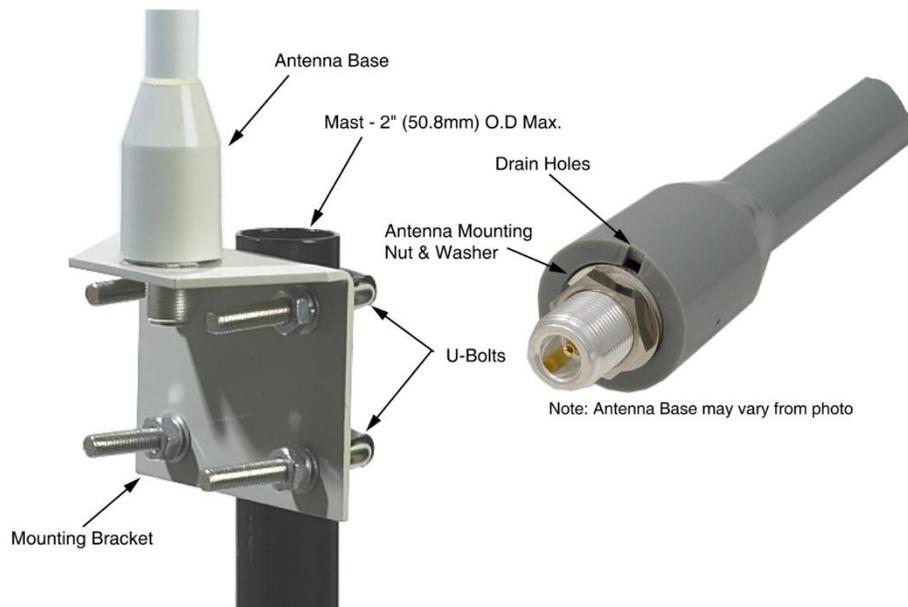


Figure 3-10: Omnidirectional antenna mounting

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 arrester 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 arrester earth ground connection. The lightning arrester 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 arrester should be mounted as close as possible to where the lead-in wire enters the building. The lightning arrester 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 arrester can also be mounted using the included stainless steel mounting bracket. Both connector ports of the lightning arrester 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.

3. Installation

3.10. Remote antenna

Step

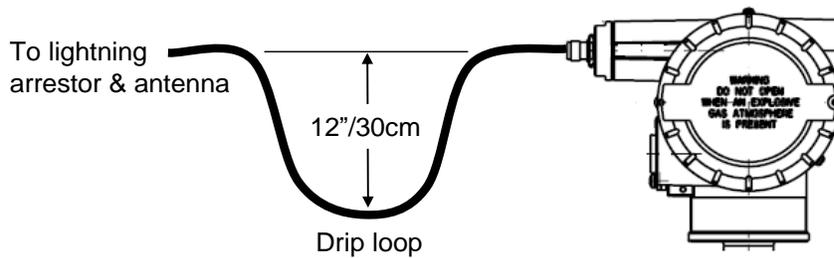
Action



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. Sensor and Electrical Connections

4.1 Introduction

This section explains the sensor connections

4.2 I/O Types

The transmitter accepts the following types of I/O and ranges

Transmitter	I/O Type	Configurable Range / parameters
STIW400, STUW750, STUW751	T/C	Thermocouple types B, E, J, K, N, R, S, T
STIW400, STUW750, STUW751	mV millivolt	0 to 10mV 0 to 50mV 0 to 100mV
STIW400, STUW750, STUW751	DI discrete input	Default ON contact resistance 200ohms (configurable) Default OFF contact resistance 300ohms (configurable)
STIW400, STUW750, STUW751	2-Wire Resistance	0 to 100ohms 0 to 200ohms 0 to 500ohms 0 to 1000ohms
STIW400	RTD	PT100, PT200, PT500
STIW400	3-Wire resistance	0 to 100ohms 0 to 200ohms 0 to 500ohms 0 to 1000ohms
STUW750, STUW751	Current / HLAI	0-20mA 4-20mA
STUW751	DO discrete output	30V DC max / 30Vpeak AC max. 0.5A DC or Peak AC max

4.3 STIW400 Terminal Connections

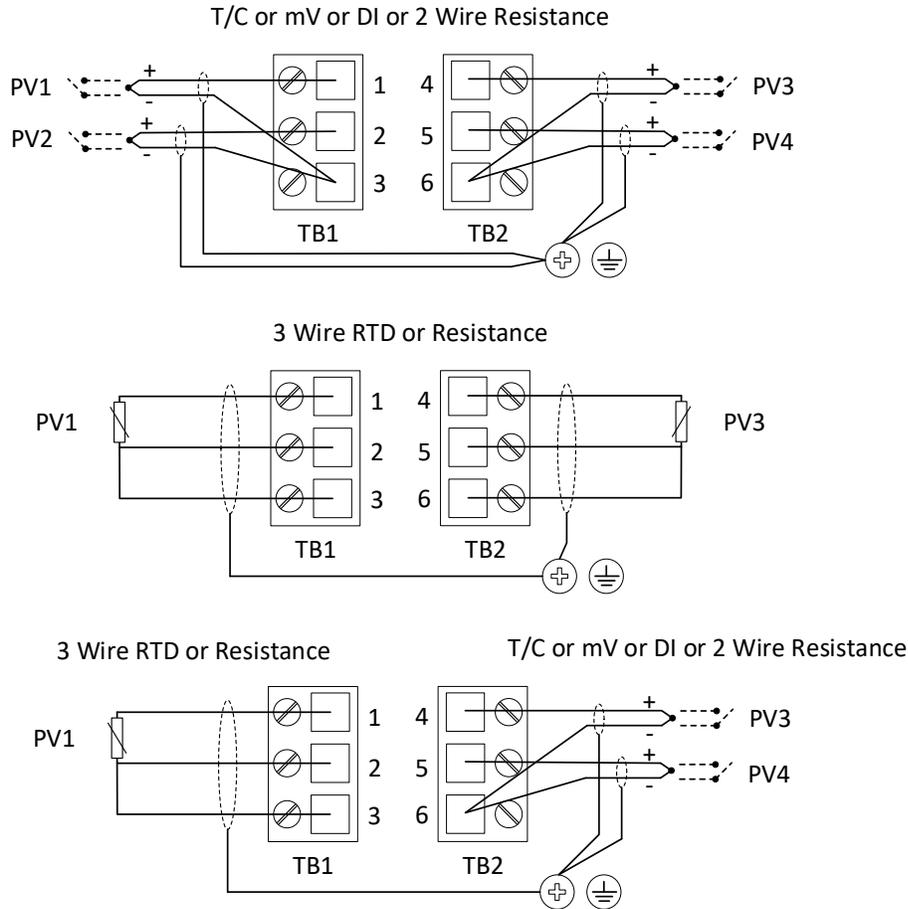


Figure 4-1: STIW400 Terminal Connections

NOTES:

1. The terminals accept 14-26AWG wire, and the screws shall be torqued to 0.4-0.5Nm (3.5 – 4.4 in-lb)
2. Any combination of sensor type inputs is allowed
3. Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only.
4. When remote mounted probe sensors are used and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
5. Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV and RTD/ohms inputs must be isolated from ground (the probe) and from each other.
6. Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

4.1 STUW750 Terminal Connections

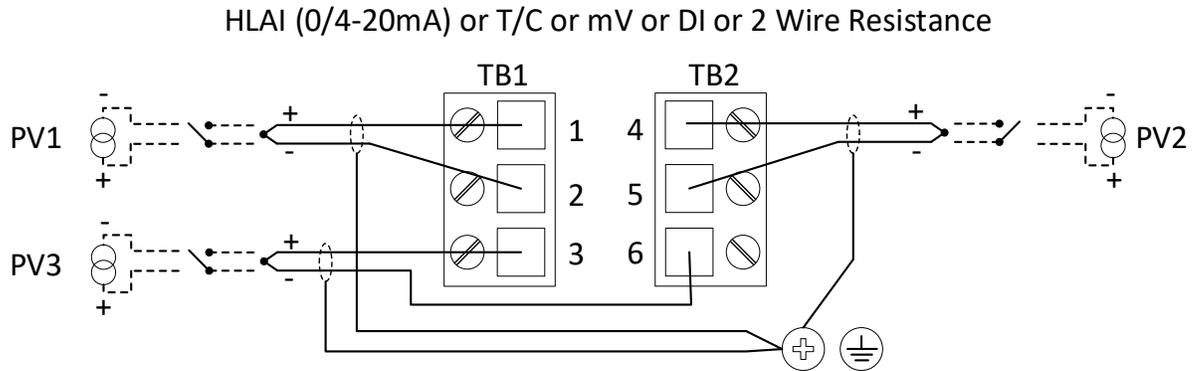


Figure 4-2: STUW750 Terminal Connections

NOTES:

1. The terminals accept 14-26AWG wire, and the screws shall be torqued to 0.4-0.5Nm (3.5 – 4.4 in-lb)
2. Any combination of sensor type inputs is allowed
3. Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only. If the shield is grounded at the remote end, the shield shall not be connected at the transmitter end.
4. When remote mounted probe sensors are used, and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
5. Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV, RTD/ohms, and HLA I inputs must be isolated from ground (the probe) and from each other.
6. Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

4.2 STUW751 Terminal Connections

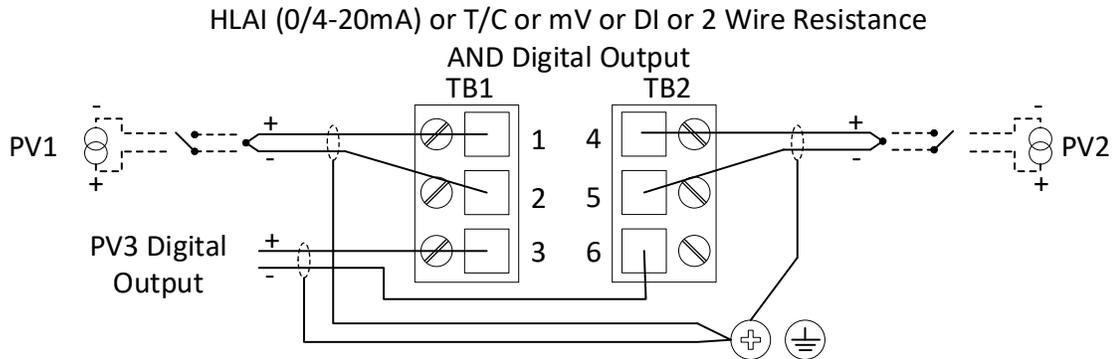


Figure 4-3: STUW751 Terminal Connections

NOTES:

1. The terminals accept 14-26AWG wire, and the screws shall be torqued to 0.4-0.5Nm (3.5 – 4.4 in-lb)
2. Any combination of sensor type inputs is allowed
3. Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only. If the shield is grounded at the remote end, the shield shall not be connected at the transmitter end.
4. When remote mounted probe sensors are used and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
5. Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV, RTD/ohms, and HLAI inputs must be isolated from ground (the probe) and from each other.
6. Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

5. Power and Start up

5.1 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)
-

5. Power and Start up
5.1. Battery Power Option

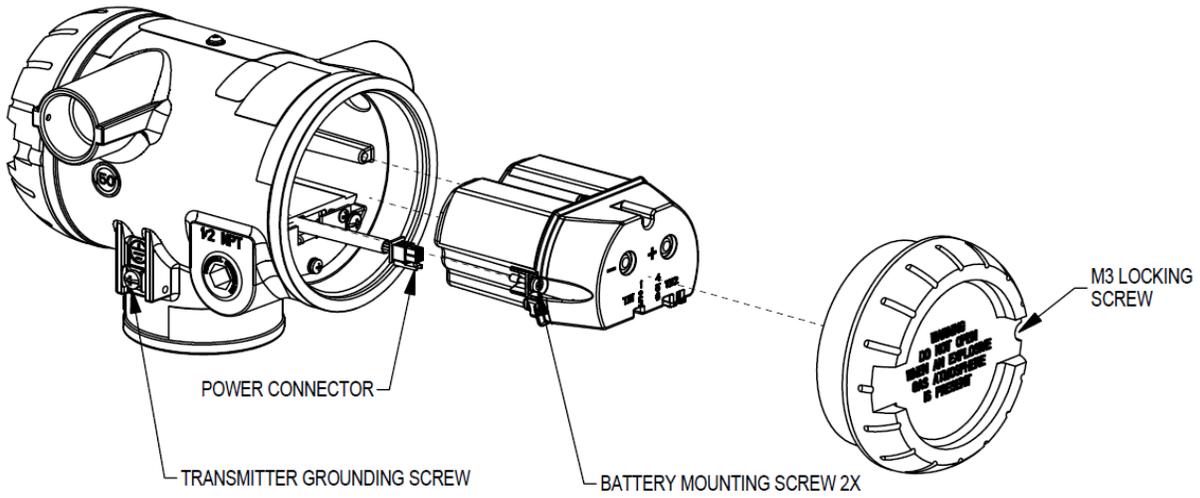


Figure 5-1: IS Battery Pack Installation

Battery Pack

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

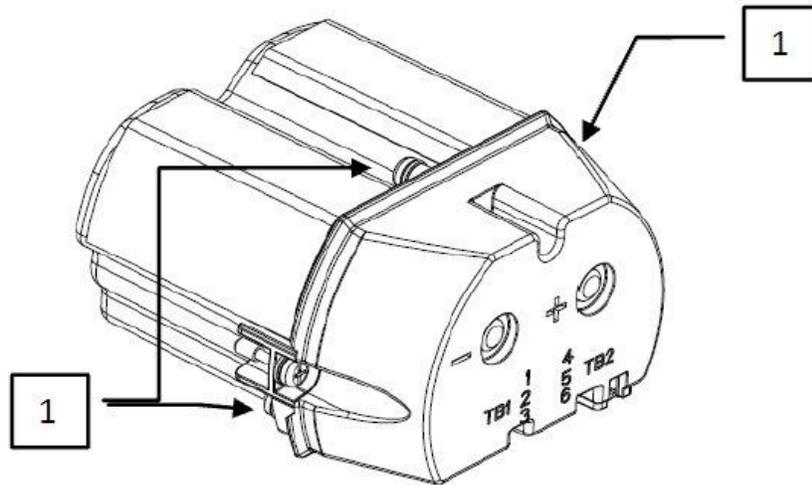


Figure 5-2: IS Battery Pack

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
	<p>WARNING</p> <p>DO NOT ASSEMBLE/DISASSEMBLE WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT</p>
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 5-2
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).

5.2 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 AWG wiring. The terminals shall be torqued from 0.4 Nm to 0.5 Nm (3.5 to 4.4 lb-in).

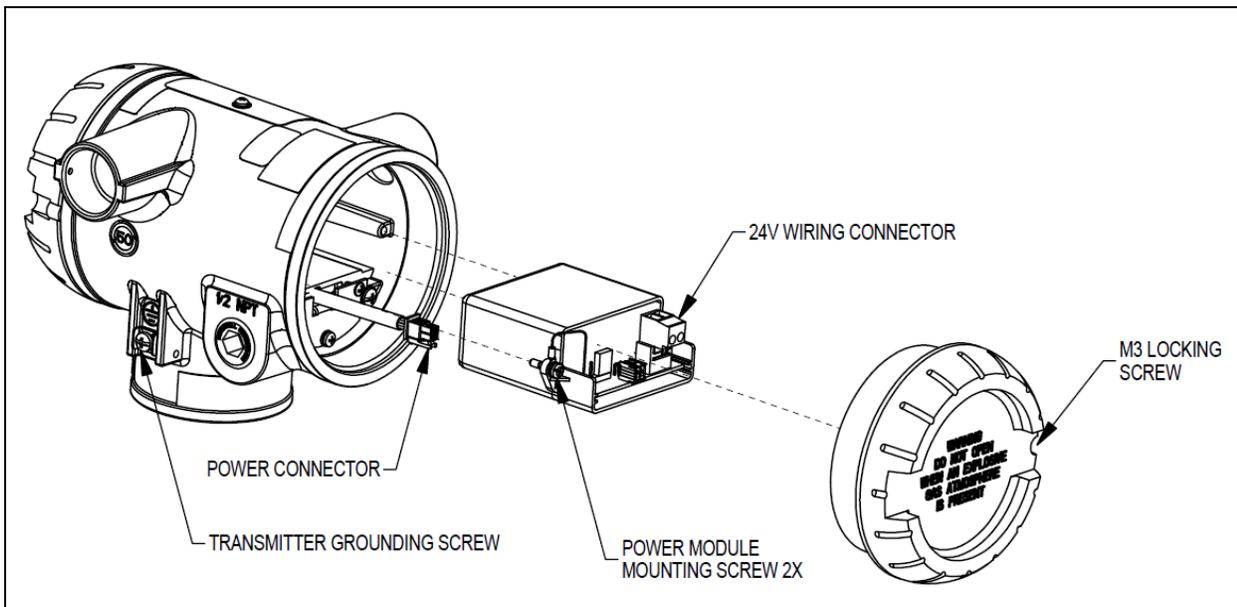


Figure 5-3: 24V Power Supply Installation

24V Power Supply

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

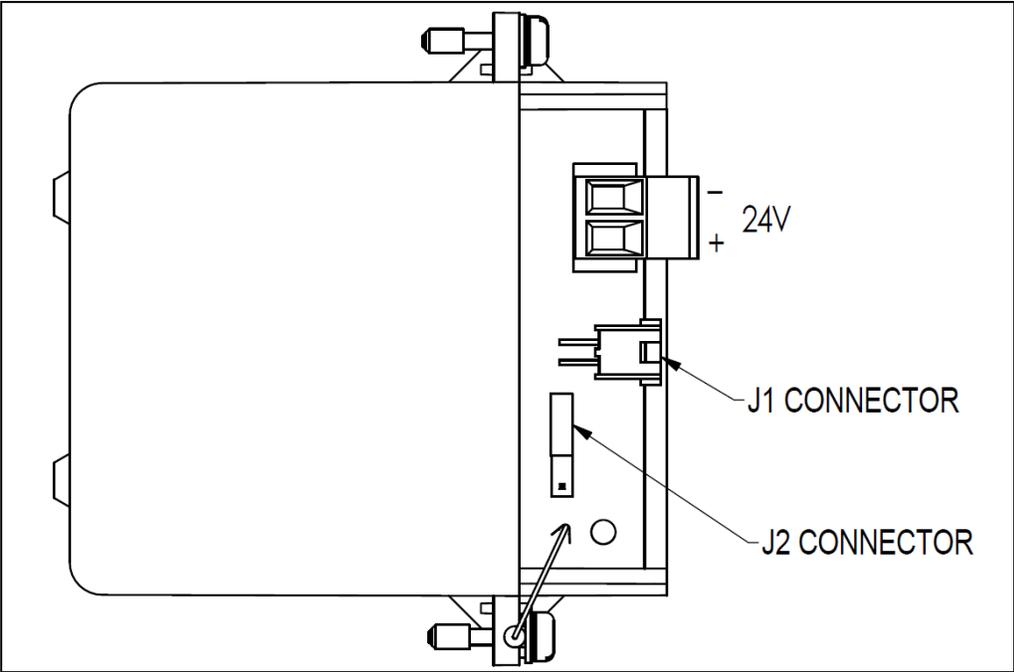


Figure 5-4: 24V Power Supply Module

5. Power and Start up

5.2. 24V Power Supply Option

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.

Step	Action
	WARNING ENSURE POWER IS OFF BEFORE OPENING COVER IN AN EXPLOSIVE ATMOSPHERE
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 Temperature 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

5.3 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 mm²) bare or green covered wire for this connection. The tightening torque for the grounding screw (shown in Figure 5-3 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)

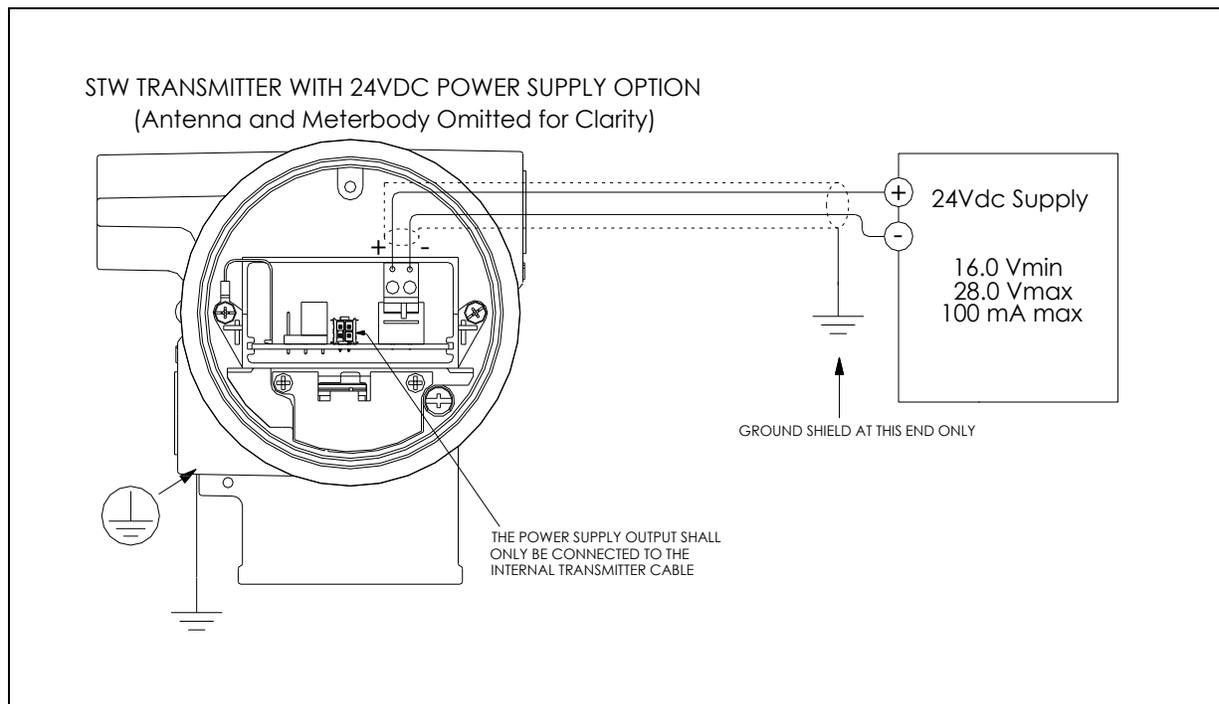


Figure 5-5: Power Supply 24V dc Option (DC) System Diagram

5.4 Display sequence

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

5.5 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).

See also section 7.4

6. Function blocks

6.1 Introduction

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

6.2 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 6-1: 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 BITB BOTB	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. A BITB defines a measurement sensor channel for a digital/binary process variable. A BOTB defines an output channel for a digital/binary process variable.
Radio	Contains parameters related to radio communication between the transmitter and the multimode(s).

Each of these blocks contains parameters that are standard WNSIA-transmitter defined parameters. The AITB, BITB, BOTB 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.

7. Operation

7.1. Transmitter connection status

7. Operation

7.1 Transmitter connection status

Table 7-1: 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 53.
UNJOINED	Transmitter has backed off and is in between discovery attempts.	If Transmitter does not join the network within five minutes, do the following: <ul style="list-style-type: none">• 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 Manage 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 Manage 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.

7.2 Transmitter PV display

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

Table 7-2: Transmitter PV display

Item displayed	Example	Details
PV value	4.7	Latest PV value.
PV engineering units	OHMS	See Table 7-5 .
PV status	BAD	See Table 7-5 . If PV status is not displayed, then the PV value is good.
Device status	LOW BAT	See Table 7-5 . 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.
Sensor Status	OOS	Out of Service
Sensor Channel Status	NoChEn	No channel enabled
Radio Status	RSSI	RSSI signal value returned from GXRm radio, values as per table...
Radio Status	RSQI	RSQI signal value returned from GXRm radio, values as per table...
PV Channel	CHAN #	Channel number, followed by PV
PV Unit	DEG C	PV temperature units in Celsius
PV Unit	DEG F	PV temperature units in Fahrenheit
PV Unit	PERCENT	% of range setting
PV Unit	mV	Milli Volt, voltage measurement
PV Unit	mA	Milly Amps, current measurement
Diagnostic information	OVR TEMP	Over Temperature diagnostic detail
Diagnostic information	OVR LOAD	Over Load diagnostic detail
Diagnostic information	SNSR ERR	Sensor diagnostic status reported on LCD
Diagnostic information	INPT BAD	Input Status diagnostic status reported on LCD
Calibration Information	CAL ERR	Calibration Error
Calibration Information	FACT ERR	Factroy Error
PV Limit	LIMIT LO	PV Status below limit low
PV Limit	LIMIT HI	PV Status below limit High

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 7-3: PV Status

PV status	Cause - Action
(blank)	<ul style="list-style-type: none"> • PV is normal – no action required
'B'	<ul style="list-style-type: none"> • Possible calibration error – Clear calibration • (A/B) (I/O) TB 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
	<ul style="list-style-type: none"> • Configuration is bad – Check possible units and range settings for input type and correct AITB configuration.
	<ul style="list-style-type: none"> • Hardware fault detected - Replace sensor board
'U'	<ul style="list-style-type: none"> • 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'	<ul style="list-style-type: none"> • 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 7-4: 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 electronics module and meter body. If still doesn't work, replace sensor. See page 61.
'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 62.
NO RADIO	Radio Interprocessor Comm Error	Radio Board is not accessible.	Restart both the radio and sensor. If condition persists, replace electronics module. See page 61.
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 electronics module. See page 61.
'F' Status	Program Memory Fault*	Startup diagnostics detected defect in Sensor Read Only Memory	Replace electronics module. See page 61.
'F' Status	RAM Fault*	Startup diagnostics detected defect in Processor Random Access Memory	Replace electronics module. See page 61.
The following statuses are displayed only in OneWireless UI Device Status.			
'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

Transmitter display	OneWireless User Interface display	Definition	What to do
'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.

Table 7-5: SmartLine TEMP-UIO units

Temperature	Description
degC	Celsius
degF	Fahrenheit
RTD, 2W and 3W resistance	
Ohm	Ohm
%	Percent
Voltage	
mV	Millivolts
HLAI	
mA	Milliamps
%	Percent
Digital Input and Digital Output	
ON/OFF	ON or OFF state

Table 7-6: Radio menu

RADIO	Radio menu																																	
PRI RSSI	<p>Primary receive signal strength. Read only. Signal strength 00 is too weak to connect to the network.</p> <table border="1"> <thead> <tr> <th><u>Displayed Value</u></th> <th><u>Value dBm</u></th> <th><u>Rx Margin dB</u></th> </tr> </thead> <tbody> <tr> <td>00</td> <td>< -86</td> <td>< 10</td> </tr> <tr> <td>01</td> <td>-86 to -81</td> <td>10 to 15</td> </tr> <tr> <td>02</td> <td>-80 to -75</td> <td>16 to 21</td> </tr> <tr> <td>03</td> <td>-74 to -69</td> <td>22 to 27</td> </tr> <tr> <td>04</td> <td>-68 to -63</td> <td>28 to 33</td> </tr> <tr> <td>05</td> <td>-62 to -57</td> <td>34 to 39</td> </tr> <tr> <td>06</td> <td>-56 to -51</td> <td>40 to 45</td> </tr> <tr> <td>07</td> <td>-50 to -45</td> <td>46 to 51</td> </tr> <tr> <td>08</td> <td>-44 to -11</td> <td>52 to 85</td> </tr> <tr> <td>09</td> <td>≥ -10</td> <td>Saturation</td> </tr> </tbody> </table>	<u>Displayed Value</u>	<u>Value dBm</u>	<u>Rx Margin dB</u>	00	< -86	< 10	01	-86 to -81	10 to 15	02	-80 to -75	16 to 21	03	-74 to -69	22 to 27	04	-68 to -63	28 to 33	05	-62 to -57	34 to 39	06	-56 to -51	40 to 45	07	-50 to -45	46 to 51	08	-44 to -11	52 to 85	09	≥ -10	Saturation
<u>Displayed Value</u>	<u>Value dBm</u>	<u>Rx Margin dB</u>																																
00	< -86	< 10																																
01	-86 to -81	10 to 15																																
02	-80 to -75	16 to 21																																
03	-74 to -69	22 to 27																																
04	-68 to -63	28 to 33																																
05	-62 to -57	34 to 39																																
06	-56 to -51	40 to 45																																
07	-50 to -45	46 to 51																																
08	-44 to -11	52 to 85																																
09	≥ -10	Saturation																																

7.3 Transmitter Channel Configuration

Channel Status

Using the WDM interface, each transmitter channel can be configured as per available options. More details about the WDM interface can be found in [References](#)

After provisioning, or after transmitter is reset to default settings, the channels are not enabled (Unassigned) and the LCD indicates: “NoChEn”.

Once channels are configured, they will be shown on the LCD as “CHAN #” followed by its status/PV value (for example “OOS”, or PV value) followed by the measurement units.

Channel Configuration

To configure a channel in WDM interface:

- In Transmitter menu -> Channel Configuration: Select channel and channel type and then Save setting. The LCD display will indicate the activated channel.
 - to disable/remove a channel, set it to “Unassigned”
- In Channel menu -> Select Sensor type (if applicable) and then Save setting
- In Channel menu -> Select Scale and units (if applicable) and then Save setting
- In Channel menu -> Select Mode (i.e. AUTO). The LCD display will indicate the PV value for the activated measurement.
- In Transmitter menu -> Input Publication select Publication rate (i.e. 30 seconds) and Attribute to be published for each activated channel (i.e. PV) and then Save setting. The WDM will display the activated channel and the PV received at the selected published rate interval.



ATTENTION

Minimum Publication rate value selectable from WDM interface is $\frac{1}{2}$ second. This can be achieved only for a single Channel measurement. If more than one channel is configured and enabled, then Input publication rate must be greater than 1 second.

The Process Variable (PV) is available for monitoring and alarm purposes. The cold junction temperature is also available for monitoring. Slower update rates extend battery life.

7. Operation

7.3. Transmitter Channel Configuration

Cold Junction

The Cold Junction values is available for Thermocouple channels only and it is shown in the Channel ->Sensor menu. The value is also available for monitoring over the OPC interface.



CJ value is updated at a lower rate than the normal PV publish rate.

Digital Inputs

The discrete input channels support voltage-free floating contacts. Default ON contact resistance is 200 ohms. Default OFF contact resistance is 300 ohms.



Digital Input limits for the ON/OFF status are configurable in the Channel ->Digital Input menu. The ON threshold resistance should be lower than the OFF threshold value by at least 100 ohms to allow a hysteresis region. When Digital input resistance is in the hysteresis zone, the LCD and the WDM interface will indicate a “U”- uncertain status for the measured value and will maintain the latest value until the value passes the hysteresis zone limit.

7.4 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 7-1: 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).

NOTE: Device Local Configuration is not supported. All configuration access must be done online via the WDM interface.



Figure 7-2: 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 7-3

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 7-3](#).

Similar to quick view parameters on the transmitter display.



Figure 7-3: Read Device Information

Table 7-7: 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:	<p>Function of the device in the wireless network.</p> <p>No Routing – Device functions only as a transmitter</p> <p>I/O Router – Device functions both as a transmitter and as a field router</p>
Join Status:	<p>The first line displays one of the following connection states.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Joined – A secure connection is formed with the network.</p> <p>The second line contains detailed state information useful for problem reporting.</p>

Advanced Options

Advanced options are non-typical configuration commands.

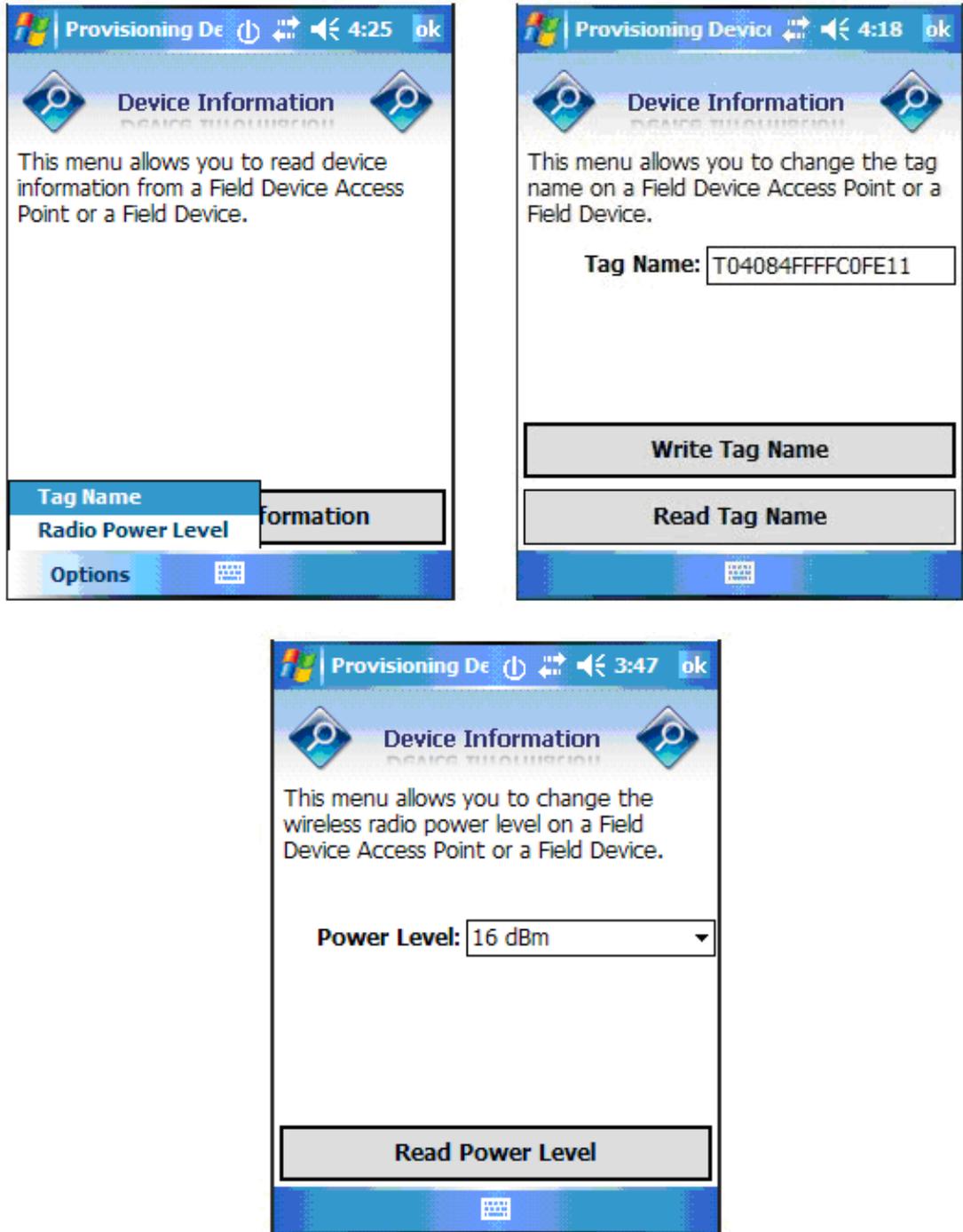


Figure 7-4: Advanced Options

Table 7-8: 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

7.5 Calibrating the transmitter

Overview

Calibration by the user is optional, performed with the OneWireless user interface. The transmitter is calibrated at the factory and will operate within its specified tolerances without any additional calibration by the user. Performing a calibration through the OneWireless interface will not affect the factory calibration. Clearing any calibration through the OneWireless interface will not affect the default factory calibration, it will only remove the calibration performed by user through this interface. Performing a calibration may increase the accuracy of measurement, and/or adjust the measurement to match known setpoints.

There are 2 types of calibration possible on any AITB (Voltage, Temperature, Current, Resistance) in the transmitter. Each of these are mutually exclusive; you can either apply a Zero Calibration OR Two Point Calibration, not both. These are:

1. Zero Calibration
2. Two Point Calibration

Note: Calibration is only supported while the transmitter is connected to the WDM. Local / Offline calibration using the provisioning device is not supported.

Zero Calibration

For Zero Calibration, the user applies a signal to the input which is the desired Zero value for the PV. This could be zero mV or mA etc or it could be a baseline value for which all measurements should be referenced to. In the WDM interface for the channel that is being calibrated, the user should select 'CAL ZERO' from the Cal Cmd combo box and click apply. The unit will then measure the input and then subtract that value from all PVs. The Cal Status will change to USER indicating the calibration is complete and is active.

1. Set the process input to the transmitter to the desired zero state.
2. Ensure the transmitter channel mode is Out of Service.
3. In the WDM interface, select the transmitter channel. In the Calibration Menu set "Cal Cmd" to "Cal Zero" and press Apply.
4. Ensure that the "Cal Status" changes to "User"

Two Point Calibration

For Two Point Calibration, the user applies two known inputs to the transmitter channel, one High and one Low. At each point the User will enter the known input value into either CAL POINT HIGH or CAL POINT LOW in the Calibration interface in the WDM, and then set Cal Cmd to the appropriate command, either CAL UPPER or CAL LOWER. The device will take measurement of the process at each of these two points and once BOTH have been completed, the transmitter will calculate a Slope and an Offset to apply to the PVs based on the known input values entered by the user, and the measured values for those inputs. If the slope is > 1.05 or less than 0.95 then the status will be SUCCESS WITH EXCESS, indicating that the slope is outside of the expected corrective range and the user may want to check there was no mistake made during the calibration process. If everything is ok then the status will be SUCCESS and the Cal Source will change to USER.

1. Select the transmitter channel in the WDM interface.
2. Ensure the transmitter channel mode is Out of Service.
3. Set the process input to the transmitter high or upper value. (If desired, the low value can be applied first).
4. In the Calibration Menu set “Cal Cmd” to “Cal Upper” and press Apply.
5. Set the process input to the transmitter low value.
6. In the Calibration Menu set “Cal Cmd” to “Cal Lower” and press Apply.

Clearing Calibration

To clear any previously performed Calibration the user should select CAL CLEAR from the Cal Cmd input and hit apply. This will remove any performed user calibration from affecting the PV.

1. Select the transmitter channel in the WDM interface.
2. Ensure the mode is Out of Service.
3. In the Calibration menu change “Cal Cmd” to “Cal Clear” and press Apply.
4. Ensure the the Cal Source changes to “None”

8. Maintenance/Repair

8.1 Introduction

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

- Replacement of damaged parts such as the transmitter display/sensor and batteries.

8.2 Transmitter Firmware upgrade

The SmartLine Wireless Temperature/UIO Transmitter allows firmware to be updated Over The Air (OTA). Follow standard OTA firmware update procedure as documented in the OW and WDM product manuals.



Ensure that DD files are updated once a transmitter is provisioned to the the OW network or after each FW upgrade. Individual DD files are required to be installed for each transmitter type.

8.3 Preventive maintenance

The SmartLine Wireless Temperature/UIO Transmitter itself does not require any specific maintenance routine at regularly scheduled intervals. Maintenance is limited to ensuring the connections, seals and mounting are tight and secure. There are no moving parts or adjustments and hence no reason to open the field housing except to inspect for corrosion or conductive dust entry which could later affect reliable operation. Maintenance is limited to ensuring that connections, seals and mounting are tight and secure. There are no moving parts or adjustments and hence no reason to open the field housing except to inspect for corrosion or conductive dust entry which could later affect reliable operation.

8.4 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 electronics module.

Table 8-1: 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 8-1 . Unscrew and remove the end cap.
3	Loosen the two screws on the electronics module. See items 2 in Figure 8-1
4	Disconnect each connector on the electronics module. See items 3 in Figure 8-1
5	<p>Install new electronics module. Be sure to orient the module in the proper viewing orientation before tightening two sensor compartment screws.</p> <p>Reverse steps 1-4.</p> <p>Torque screws to 0,4 – 0,6 Nm (3.5 – 5.3 lb-in).</p> <p>Honeywell recommends lubricating the end cap O-ring with a Silicone Grease such as Dow Corning #55 or equivalent before replacing the end cap.</p> <p>Return transmitter to service.</p>

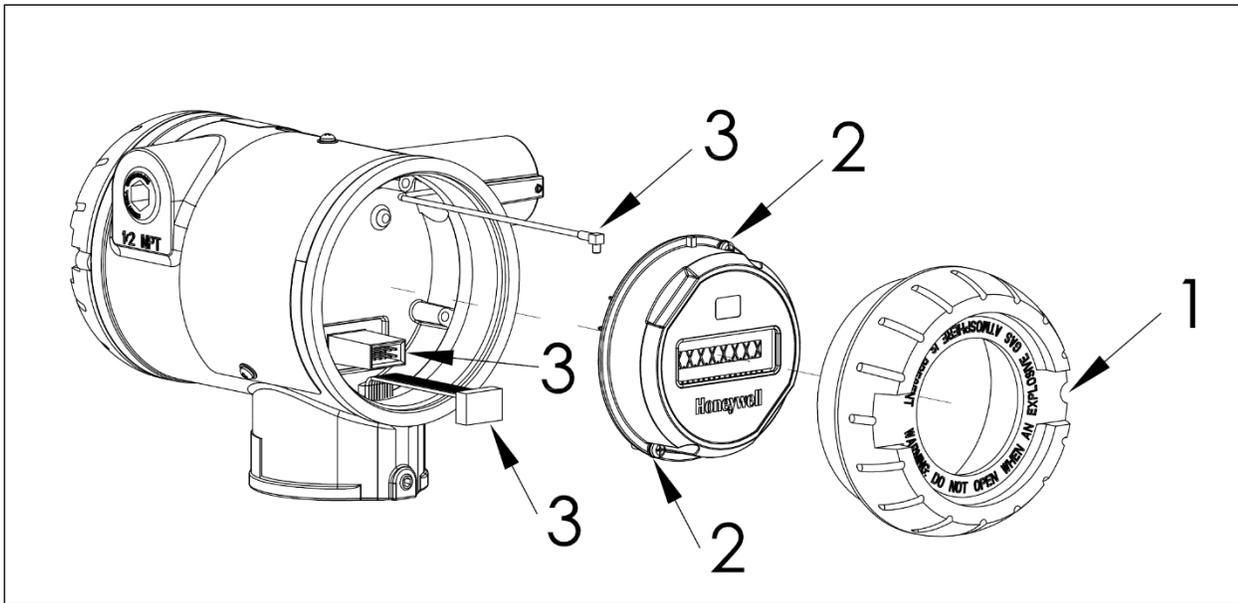


Figure 8-1: Electronics module removal and replacement

8.5 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 5.1 for battery replacement procedure.

8.6 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 5.2 for 24V power supply module replacement procedure.

8.7 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 electronics 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.

8. Maintenance/Repair
8.7. Replacing antenna

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 8-2 . Unscrew and remove the front end cap.
3	Loosen the two screws on the electronics module. See items 2 in Figure 8-2
4	Remove the electronics module from the transmitter body and disconnect the antenna connector from CN2 connector on the electronics module. See item 3 in Figure 8-2
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 8-2
6	Feed the new antenna's connector through the antenna hole to the front of the transmitter. Do not connect to electronics 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 electronics module. See item 3 in Figure 8-2 .
8	Insert electronics module. Orient in the proper viewing orientation before tightening two module compartment screws. See items 2 in Figure 8-2 . 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.

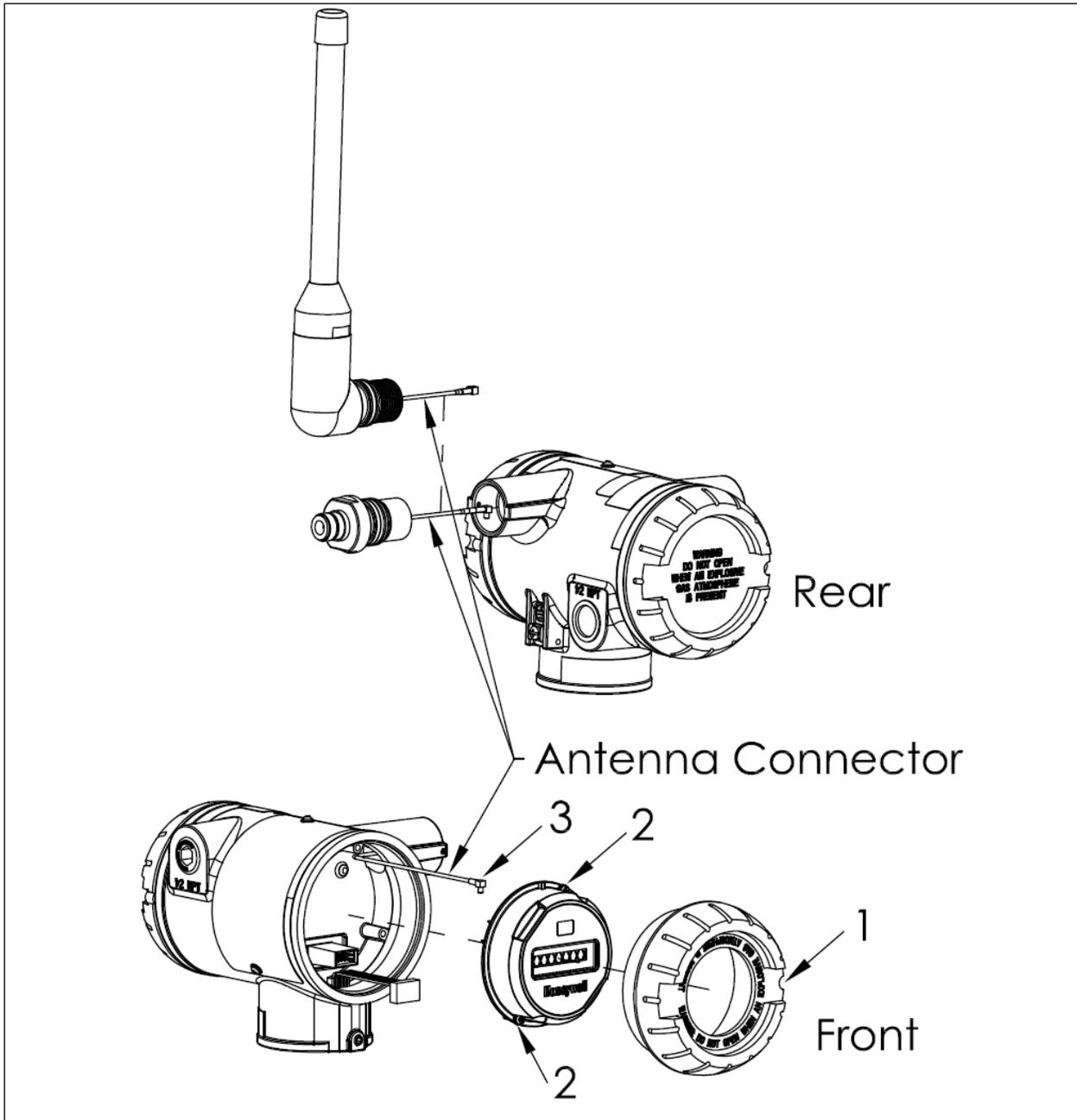


Figure 8-2: Antenna replacement

9. Parts

0. 9.1 Transmitter body

9. 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.

9.1 Transmitter body

Table 9-1: Transmitter Body Parts

Part number	Qty	Description
50148951-501	1	ELECTRONICS MODULE ASSEMBLY for TEMPERATURE/UIO ISA100.11a
50016190-508	1	CAP ASSEMBLY, WITH BATTERY LABEL, ALUMINUM, BLUE, EPOXY-POLYESTER POWDER COAT
50016190-510	1	CAP ASSEMBLY, NO LABEL, ALUMINUM, BLUE, EPOXY-POLYESTER POWDER COAT
50015623-505	1	CAP ASSEMBLY, LCD, ALUMINUM, BLUE, EPOXY-POLYESTER POWDER COAT
50026127-503	1	CAP ASSEMBLY, WITH BATTERY LABEL, STAINLESS STEEL
50026127-504	1	CAP ASSEMBLY, NO LABEL, STAINLESS STEEL
50026009-502	1	CAP ASSEMBLY, LCD, STAINLESS STEEL
50030973-504	1	ANTENNA ASSEMBLY, 4 dBi INTEGRAL, ALUMINUM, EPOXY-POLYESTER POWDER COAT
50030973-505	1	ANTENNA ASSEMBLY, 4 dBi INTEGRAL, STAINLESS STEEL
50018414-501	1	REMOTE OMNI-DIRECTIONAL ANTENNA, 8 dBi
50018415-501	1	REMOTE DIRECTIONAL ANTENNA, 14 dBi
50028364-504	1	ANTENNA ADAPTER ASSEMBLY, REMOTE, TYPE N, ALUMINUM, EPOXY-POLYESTER
50028364-505	1	ANTENNA ADAPTER ASSEMBLY, REMOTE, TYPE N, STAINLESS STEEL
50018278-501	1	COAX CABLE ASSY, 1.0M (3.3 Ft) LONG, N-MALE - N-MALE
50018278-503	1	COAX CABLE ASSY, 3.0M (10.0 Ft) LONG, N-MALE - N-MALE
50018278-510	1	COAX CABLE ASSY, 10.0M (33.0 Ft) LONG, N-MALE - N-MALE
50018279-590	1	LIGHTNING SURGE ARRESTOR
50047517-501	1	I.S. BATTERY PACK HOUSING ASSEMBLY
50136118-501	1	24V EXTERNAL POWER MODULE
50026010-501	2	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI ₂) BATTERY
50026010-502	4	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI ₂) BATTERY
50026010-503	10	3.6V LITHIUM THIONYL CHLORIDE (Li-SOCI ₂) BATTERY

Mounting Brackets

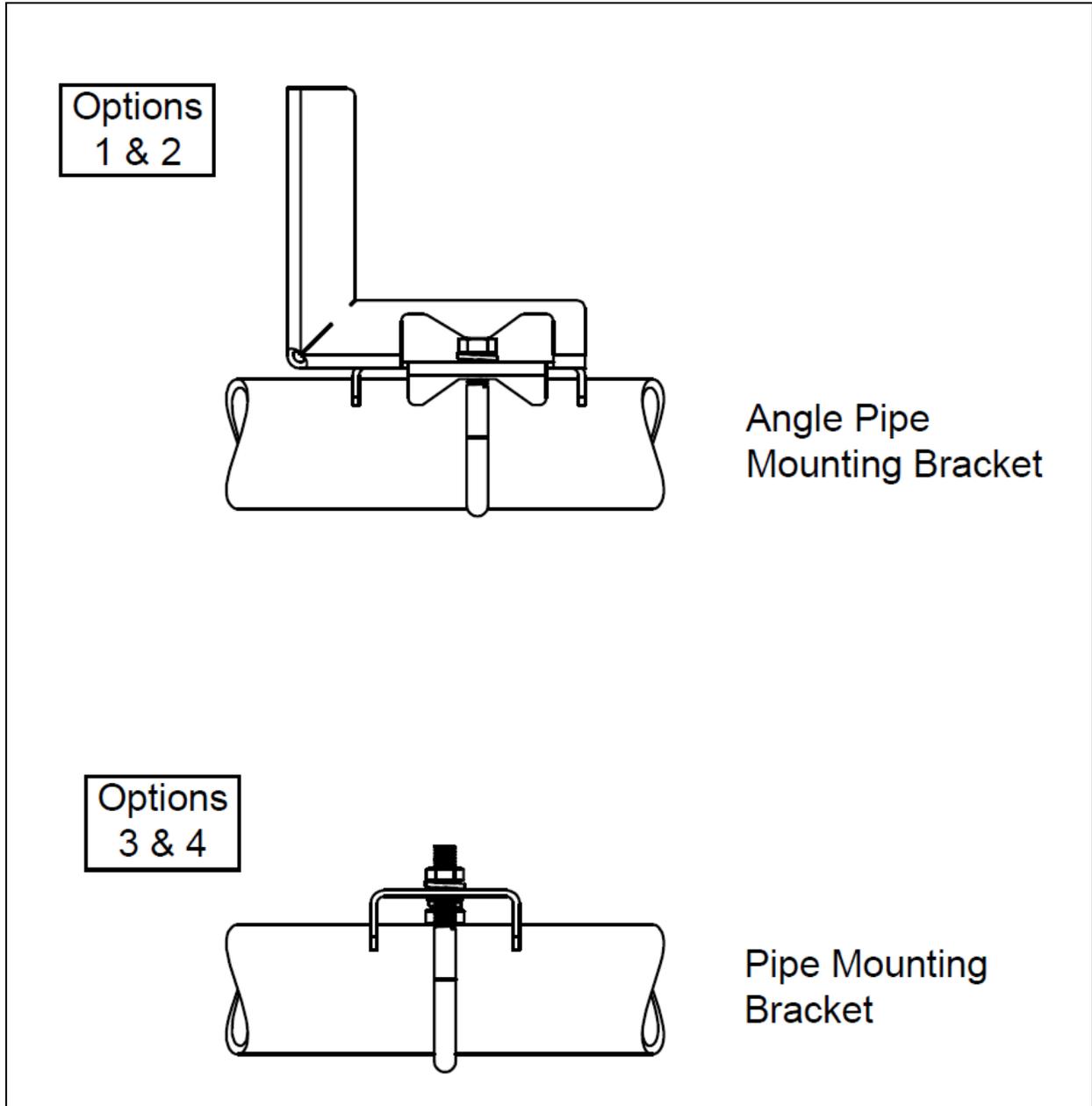


Figure 9-1: Angle and Flat Bracket Parts

9. Parts0. 9.1 Transmitter body

Table 9-2: Angle and Flat Bracket Parts (Refer to Figure 9-1)

Key No.	Part Number	Description	Quantity Per Unit
1	50154109-501	Carbon Steel Angle Pipe Bracket Mounting Kit for all Models	1
2	50154109-503	316 Stainless Steel Angle Pipe Bracket Mounting Kit for all Models	1
3	50148944-501	Carbon Steel Pipe Bracket Mounting Kit for all Models	1
4	50148944-503	316 Stainless Steel Wall Bracket Mounting Kit for all Models	1

Table 9-3: Transmitter Enclosure O-Ring Kit

Key No.	Part Number	Description	Quantity Per Unit
K7	30757503-507	Electronics enclosure seals kit. Kit includes: O-ring for transmitter end caps O-ring for housing adaptor to electronics housing	6 3

Appendix A - Modbus

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
UAP_STREV	Field device application static data revision level.	UInt16		2 Read Only	Static Revision		
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		
						2147483648 - 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	Faults in sensor
						33554432 - Installation or Calibration Problem	Installation or calibration problem
						16777216 - Out Of Service	At least one Transducer is OOS
						131072 - Manual Mode Active	At least one Transducer is in Manual Mode
						1048576 - Power is Critically Low	Power is critical low: maintenance needed
						128 - Calibration Error	Error in Calibration
						1 - Detail Information Available	Detail information available
UAP_OPTION	Option	BitString		2 Read/Write	Static		
UAPMO_ALERT	No Help Available	UInt8		1 Read/Write	Static	8192 - Enable Software Write Protect	Enable Software Write Protect
						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	Device self-diagnosis information	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
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	Powered by internal battery
						2 - 24V External Power Module	Powered using 24V external power

Name	Description	Data Type	Data Size	Access	Class	Enum Value	Enum Description
V_POWER	Power voltage	Float	4	Read Only	Dynamic		
DL_ALIAS_16_BIT	Field device radio short address.	Uint16	2	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
POWER_SUPPLY_STATUS	Field device power supply status.	Uint8	1	Read Only	Dynamic		
						0 - Line Powered	Line Powered
						1 - Battery	High
						2 - Battery	Medium
						3 - Battery	Low
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		
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

Table A-1: Device Level Modbus Table

Name	Description	Data Type	Data Size	Access	Class
DLMO_RADIO_TRANSMIT_POWER	Radio maximum transmit level.	Int8	1	Read Only	Static
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.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
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_ALERTREPSSEND	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

Table A-2: Network Level Modbus Table

Name	Description	Data Type	D	Access	Class	Enum Value	Enum Description
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 Restore	Restore calibration
						4 - Cal Clear	Clear calibration
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	Cal Point High	Float	4	Read/Write	Static		
CAL_POINT_LO	Cal 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	1001 - Â°C	degree Celsius
						1002 - Â°F	degree Fahrenheit
						1243 - mV	millivolt
						1342 - %	percent
SENSOR_TYPE	Describes the type of sensor. Different values for different types of AITB (Thermocouple, mV, mA, Ohm, RTD, etc) Thermocouple AITB	UInt8	1	Read/Write	Static	1 - TC-B	Thermocouple B type
						2 - TC-E	Thermocouple E type
						3 - TC-J	Thermocouple J type
						4 - TC-K	Thermocouple K type
						5 - TC-NIC	Thermocouple NIC type
						6 - TC-R	Thermocouple R type
						7 - TC-S	Thermocouple S type
						8 - TC-T	Thermocouple T type
	RTD AITB					1 - PT100	PT100 RTD Type
						2 - PT200	PT200 RTD Type
						3 - PT500	PT500 RTD Type
	Current AITB					1 - 0 - 20 mA	Zero To Twenty Milliamp Range
						2 - 4 - 20mA	Four To Twenty Milliamp Range
	Millivolt AITB					1 - 0 - 10 mV	Zero to Ten Millivolt Range
						2 - 0 - 50 mV	Zero to Fifty Millivolt Range
						3 - 0 - 100 mV	Zero to One Hundred Millivolt Range
	Resistance AITB					1 - 0 - 100 Ohms	Zero to One Hundred Ohm Range
						2 - 0 - 200 Ohms	Zero to Two Hundred Ohm Range
						3 - 0 - 500 Ohms	Zero to Five Hundred Ohm Range
						3 - 0 - 1000 Ohms	Zero to One Thousand Ohm Range
PV.STATUS	The Status of the Process Variable			1 Read	Dynamic		The Status of the Process Variable
COLD_JUNC	The Value of the Cold Junction Sensor	float	4	Read	Dynamic		Only Available on Thermocouple type AITBs

Table A-3: AITB Modbus Table

Name	Description	Data Type	Data Size	Access	Class
PV_B.VALUE	The Value of the Process Variable	float	4	Read	Dynamic
PV_B.STATUS	The Status of the Process Variable	Uint8	1	Read	Dynamic
ON_RESISTANCE	Maximum Contact Resistance for ON	float	4	Read/Write	Dynamic
OFF_RESISTANCE	Minimum Contact Resitsnce for OFF	float	4	Read/Write	Dynamic
CONTACT_RESISTANCE	The Measured Value of the Contact Resistance	float	4	Read	Dynamic

Table A-4: BITB Modbus Table

Name	Description	Data Type	Data Size	Access	Class
PV_B.VALUE	The Value of the Process Variable	Boolean	1	Read/Write	Dynamic
PV_B.STATUS	The Status of the Process Variable	Uint8	1	Read	Dynamic
READBACK_B.VALUE	The Value of the Readback of the Process Variable	Boolean	1	Read	Dynamic
READBACK_B_STATUS	The Status of the Readback of the Process Variable	Uint8	1	Read	Dynamic

Table A-4: BOTB Modbus Table

Appendix B - Certifications and Approvals

B1. EU Declaration of Conformity

A copy of the Smartline Wireless Transmitters EU Declaration of Conformity can be downloaded here:

<https://www.honeywellprocess.com/library/support/Public/Documents/50136122.pdf>

The Smartline Wireless Temperature and Universal I/O Transmitters complies with the following directives

DIRECTIVE	DESCRIPTION
2014/53/EU	Radio Equipment Directive
2014/34/EU	ATEX Directive

EMC Conformity:

The Smartline Wireless Temperature and Universal I/O Transmitters complies with the following EMC standards

STANDARD	DESCRIPTION
EN 300 328 V2.1.1	Wideband transmission systems; Data transmission equipment operating in the 2,4GHz ISM band
EN 61326-1: 2013	Electrical equipment for measurement, control and laboratory use - EMC requirements
EN 301 489-1 V2.1.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services

B2. Hazardous location certifications

Refer to product label for applicable approvals.

Table B-2 Certifications and Approvals

AGENCY	TYPE OF PROTECTION					
<p style="text-align: center;">CSA</p>	<p>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</p>					
	<p>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</p>					
	<p>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</p>					
	<p>Enclosure: Type 4X/ IP66/ IP67</p>					
<p style="text-align: center;">(USA and Canada)</p>	<p>Standards Used:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;"> 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 </td> <td style="width: 33%;"> 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 </td> <td style="width: 33%;"> 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 </td> </tr> </table>			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
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AGENCY	TYPE OF PROTECTION		Ambient Temperature Product Applicability
FM Approvals™ (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 °C to +85 °C
	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
	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
	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		
ATEX	Intrinsically Safe: II 1 G Ex ia IIC T4 Ga II 3 G Ex ic IIC T4 Gc		
	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		
	Non Incendive: II 3[1] G Ex ec [ia Ga] IIC T6...T4 Gc		
	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		
IECEx	Intrinsically Safe: Ex ia IIC T4 Ga Ex ic IIC T4 Gc		
	Flameproof / Dust Proof: Ex db [ia Ga] IIC T6...T4 Gb Ex tb [ia Da] IIIC T95C...T125C Db		
	Non Incendive: Ex ec [ia Ga] IIC T6..T4 Gc		
	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

B3. 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.

B4. 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.

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.

B5. Radio Compliance Information

The SmartLine Wireless Temperature 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 B5: 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 .
		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.



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.

B6. Control Drawing

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				ISS	REVISION & DATE		APPD					
				A	24 June 2019 2019-3519		MJW					
<p>STIW400, STUW750, STUW751 TEMPERATURE AND UNIVERSAL IO WIRELESS TRANSMITTERS INSTALLATION CONTROL DRAWING</p>												
MASTER FILE TYPE: MS WORD	DRAWN			Honeywell								
	CHECKED	see	note 12	CONTROL DRAWING								
	DEV ENG			WIRELESS TRANSMITTERS STIW400, STUW750, STUW751								
	MFG ENG			50136129								
	QA ENG			A/A4								
	TOLERANCE UNLESS NOTED			SCALE: None		USED ON		SH. 1 OF 10				
ANGULAR DIMENSION												

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:

$U_o, V_{oc}, \text{ or } V_t \leq U_i \text{ or } V_{max}; I_o, I_{sc}, \text{ or } I_t \leq I_i \text{ or } I_{max}; C_a \text{ or } C_o \geq C_i + C_{cable}, L_a \text{ or } L_o \geq L_i + L_{cable}, P_o \leq P_i.$

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: $V_{max} V_{oc} \text{ or } U_o, I_{max} I_{sc} \text{ or } I_o;$

STW Transmitter: $C_i + C_{cable} \leq \text{Control Apparatus } C_a,$

STW Transmitter: $L_i + L_{cable} \leq \text{Control Apparatus } L_a.$
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. 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 2019-3519

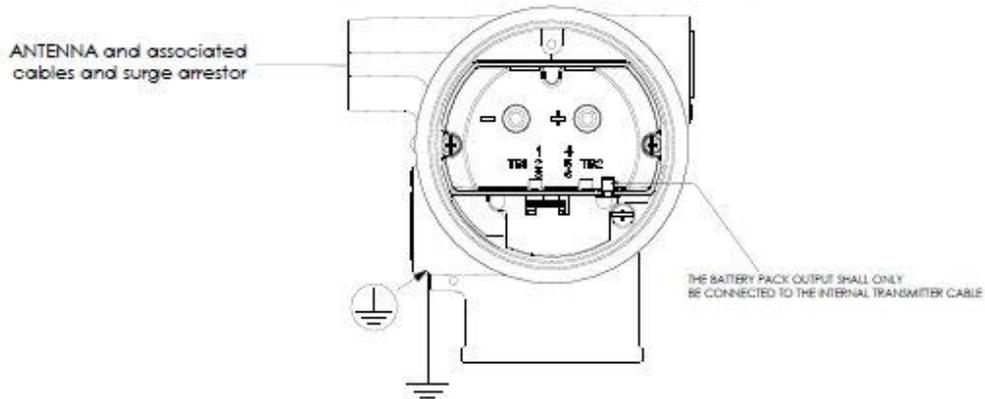
Honeywell	A/A4	50136129	
	SCALE: None	REV A DATE 24 June 2019	SH. 2 of 10

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 μ F	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)



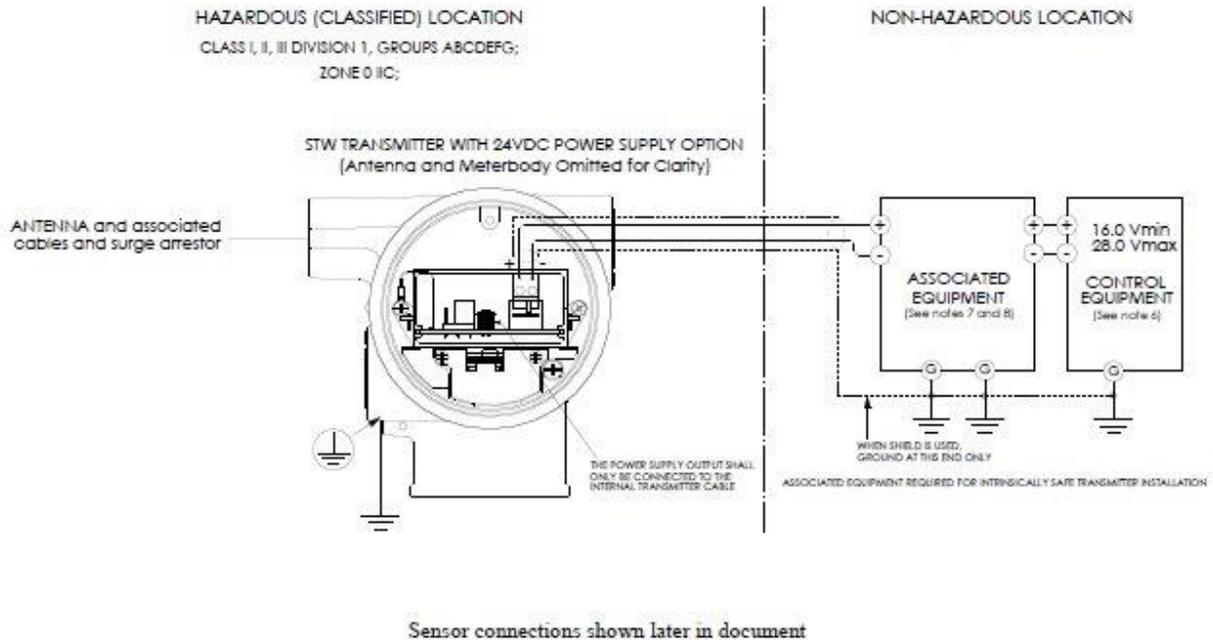
Sensor connections shown later in document

Honeywell	A/A4	50136129		
	SCALE: None	REV A	DATE 24 June 2019	SH. 3 of 10

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
U_i or $V_{max} \leq 30V$	U_o, V_{oc} or $V_t \leq 30 V$
I_i or $I_{max} \leq 120$ mA	I_o (I_{sc} or I_t) ≤ 120 mA
P_i or $P_{max} = 0.9W$	$P_o \leq 0.9 W$
$C_i = 2.2$ nF	C_a or $C_o \geq C_{cable} + C_{STW}$
$L_i = 620.4$ uH	L_a or $L_o \geq L_{cable} + L_{STW}$

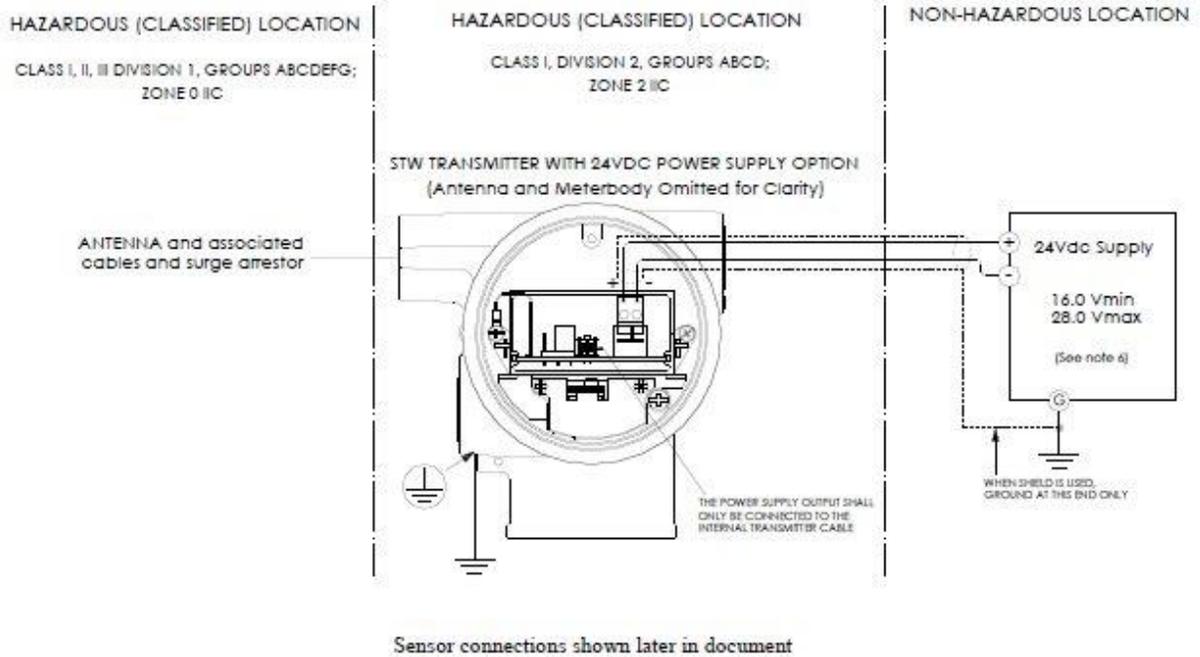
ENTITY PARAMETERS for ANTENNA	
ia ENTITY (Transmitter Antenna Output)	Associated Apparatus (Antenna, Cables, Arrestor) Simple Apparatus Only
C_o or $C_a = 0.02$ μF	$C_i \leq C_o$ or C_a
L_o or $L_a = 25.57$ mH	$L_i \leq L_o$ or L_a



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

ENTITY PARAMETERS for 24V Supply connection	ENTITY PARAMETERS for ANTENNA	
ic ENTITY PARAMETERS (Transmitter 24V Input)	ia ENTITY (Transmitter Antenna Output)	Associated Apparatus (Antenna, Cables, Arrestor) Simple Apparatus Only
Ui or Vmax \leq 30 V	Co or Ca = 0.02 μ F	Ci \leq Co or Ca
Ii or Imax \leq 180 mA	Lo or La = 25.57 mH	Li \leq Lo or La
Pi or Pmax = 0.9 W		
Ci = 2.2 nF		
Li = 620.4uH		



Honeywell

A/A4

50136129

SCALE: None

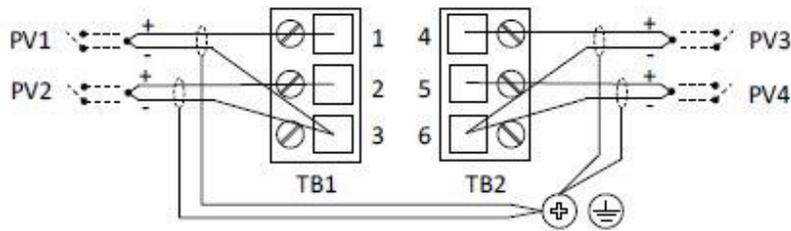
REV A

DATE 24 June 2019

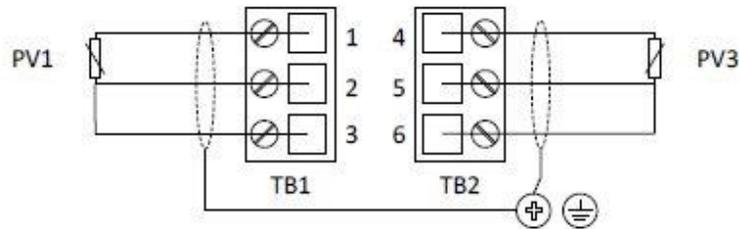
SH. 5 of 10

STIW400 TEMPERATURE TRANSMITTER CONNECTIONS

T/C or mV or DI or 2 Wire Resistance

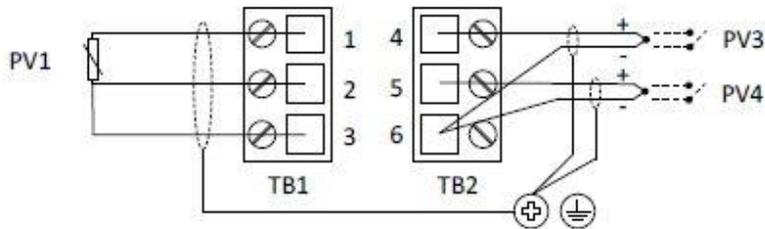


3 Wire RTD or Resistance



3 Wire RTD or Resistance

T/C or mV or DI or 2 Wire Resistance



IS FIELD WIRING PARAMETERS FOR EACH INPUT:

Simple Apparatus
 U_o or $V_{oc} = 9.88V$
 I_o or $I_{sc} = 79.4mA$
 P_o or $P_t = 196mW$
 C_o or $C_a = 2.64\mu F$
 L_o or $L_a = 5.59mH$

NOTES:

- Any combination of sensor type inputs is allowed
- Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only.
- When remote mounted probe sensors are used and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
- Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV and RTD/ohms inputs must be insulated from ground (the probe) and from each other.
- Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

Honeywell

A/A4

50136129

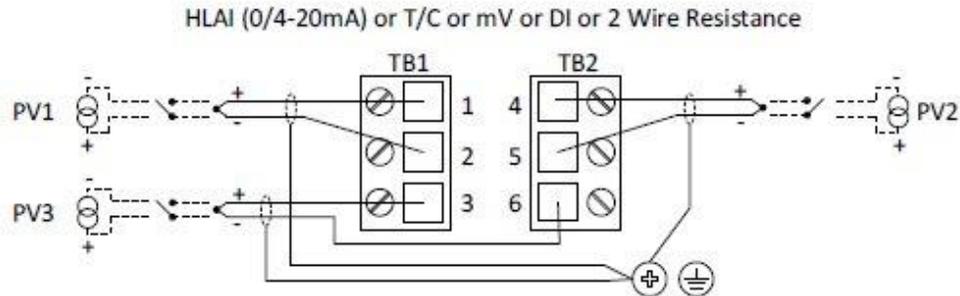
SCALE: None

REV A

DATE 24 June 2019

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STUW750 UNIVERSAL IO TRANSMITTER CONNECTIONS



IS FIELD WIRING PARAMETERS FOR T/C or mV or DI or Resistance inputs:

Simple Apparatus
 U_o or $V_{oc} = 8.8V$
 I_o or $I_{sc} = 2.94mA$
 P_o or $P_t = 6.5mW$
 C_o or $C_a = 5.5\mu F$
 L_o or $L_a = 100mH$

IS ENTITY PARAMETERS FOR HLA1 0/4-20mA inputs:

$U_i (V_{max}) = 30V$
 $I_i (I_{max}) = 125mA$
 $P_i = 0.95W$
 $C_i = 3nF$
 $L_i = 0.9\mu H$

NOTES:

- Any combination of sensor type inputs is allowed
- Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only. If the shield is grounded at the remote end, the shield shall not be connected at the transmitter end.
- When remote mounted probe sensors are used, and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
- Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV and RTD/ohms inputs must be insulated from ground (the probe) and from each other.
- Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

Honeywell

A/A4

50136129

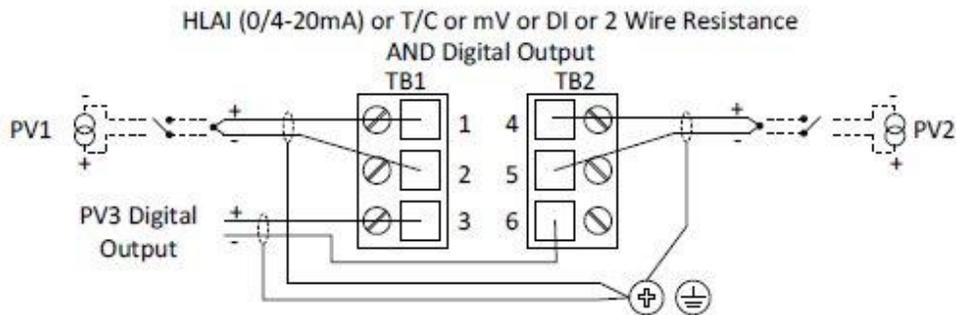
SCALE: None

REV A

DATE 24 June 2019

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STUW751 UNIVERSAL IO TRANSMITTER CONNECTIONS



IS FIELD WIRING PARAMETERS FOR T/C or mV or DI or Resistance inputs:

Simple Apparatus
 U_o or $V_{oc} = 8.8V$
 I_o or $I_{sc} = 2.94mA$
 P_o or $P_t = 6.5mW$
 C_o or $C_a = 5.5\mu F$
 L_o or $L_a = 100mH$

IS ENTITY PARAMETERS FOR HLA1 0/4-20mA INPUTS AND DIGITAL OUTPUT:

$U_i (V_{max}) = 30V$
 $I_i (I_{max}) = 125mA$
 $P_i = 0.95W$
 $C_i = 3nF$
 $L_i = 0.9\mu H$

NOTES:

- Any combination of sensor type inputs is allowed
- Shielded cable is required for EMC conformity and is recommended for all remote sensor installations. The shield shall be grounded at the transmitter end only. If the shield is grounded at the remote end, the shield shall not be connected at the transmitter end.
- When remote mounted probe sensors are used and the shield is grounded at the probe, the shield shall not be connected at the transmitter end.
- Duplex (redundant) sensors that are bonded to the probe are not permitted. All thermocouple/mV and RTD/ohms inputs must be insulated from ground (the probe) and from each other.
- Digital Input switches, DI, must be dry contact type, simple apparatus and properly segregated from all other sources of power.

Honeywell

A/A4

50136129

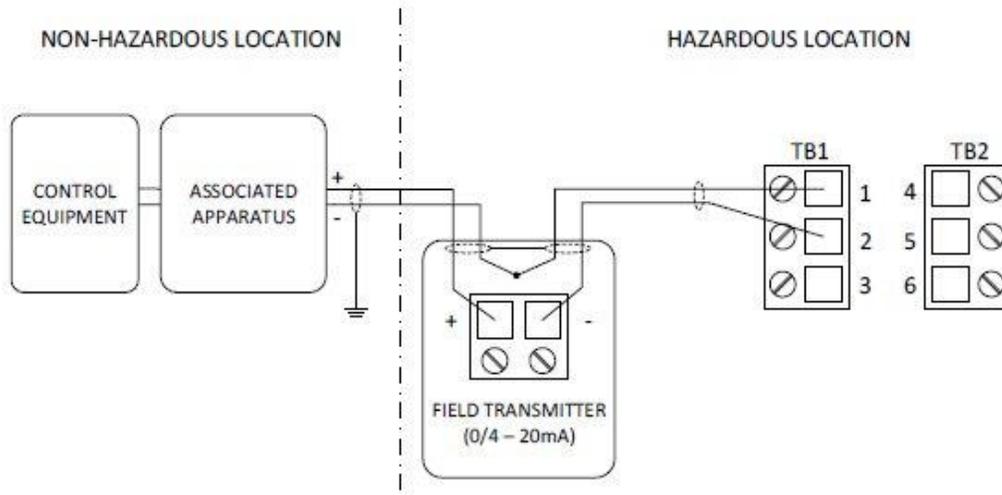
SCALE: None

REV A

DATE 24 June 2019

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**STUW750/STUW751 UNIVERSAL IO TRANSMITTER CONNECTIONS
WITH 0/4-20mA FIELD TRANSMITTER CURRENT SOURCE**



NOTES:

1. See previous sheets for entity parameter information and connection information for other terminals
2. STUW750 0/4-20mA connection allowed on terminals 1,2 and/or 4,5 and/or 3,6
3. STUW751 0/4-20mA connection allowed on terminals 1,2 and/or 4,5
4. The field transmitter must be certified for the hazardous location accordingly
5. Shielded cable is required for EMC conformity and is recommended for all installations. The shield shall be grounded at one end only. The shield should be grounded at the non-hazardous end. If the shield is grounded at the transmitter end, the shield shall not be connected at the other end.

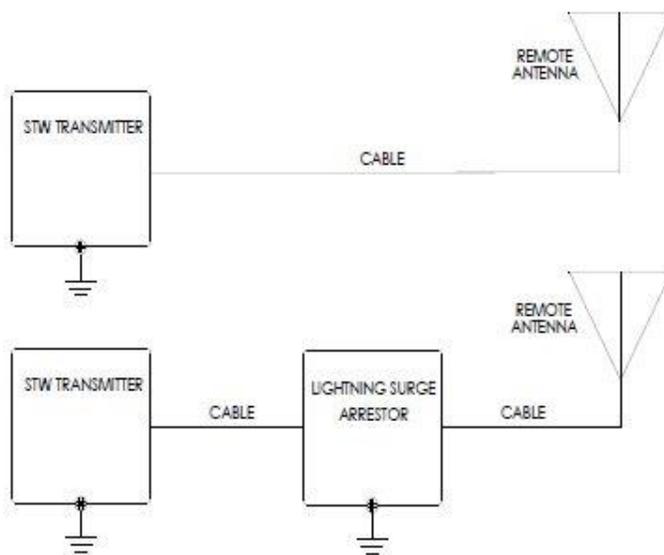
Honeywell	A/A4	50136129		
	SCALE: None	REV A	DATE 24 June 2019	SH. 9 of 10

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 arrester 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 arrester:

$C_a = 0.02 \mu\text{F}$, $L_a = 25.57 \text{ mH}$



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

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B7. 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

B7. Recycling and Disposal of Product

Please consider recycling the product and packaging materials. If possible, remove any batteries from the product first and recycle/dispose of them separately, in accordance with the battery manufacturer recommendations. The product should be disposed of in accordance with local and national regulations.

Glossary

AWG	American Wire Gauge
DE	Digital Enhanced Communications Mode
DI	Discrete Input
DO	Discrete Output
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
Hz	Hertz
LRL	Lower Range Limit
LRV	Lower Range Value
mAdc	Milliamperes Direct Current
mV	Millivolts
Nm	Newton-meters
NPT	National Pipe Thread
NVM	Non-Volatile Memory
PM	Process Manger
PV	Process Variable
PWA	Printed Wiring Assembly
RFI	Radio Frequency Interference
RTD	Resistance Temperature Detector
SFC	Smart Field Communicator
T/C	Thermocouple
TC	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.

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Or contact your Honeywell Account Manager

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