

# Rosemount™ 5408 and 5408:SIS Level Transmitters

## Process Seal Antenna



**Contents**

About this guide..... 3

Confirm approval type.....5

Mount the flanged version..... 6

Mount the Tri Clamp version..... 8

Mount the bracket.....9

Align transmitter head..... 10

Adjust display orientation (optional)..... 12

Prepare the electrical connections.....13

Connect wiring and power up.....20

Configuration.....24

# 1 About this guide

This Quick Start Guide provides basic guidelines for the Rosemount 5408 and 5408:SIS Level Transmitters. Refer to the Rosemount 5408 and 5408:SIS with HART® [Reference Manual](#) and Rosemount 5408 with FOUNDATION™ Fieldbus [Reference Manual](#) for more instructions. The manuals and this guide are also available electronically on [Emerson.com/Rosemount](https://emerson.com/Rosemount).

## 1.1 Safety messages

### **⚠ WARNING**

**Failure to follow safe installation and servicing guidelines could result in death or serious injury.**

Ensure the transmitter is installed by qualified personnel and in accordance with applicable code of practice.

Use the equipment only as specified in this manual. Failure to do so may impair the protection provided by the equipment.

For installations in hazardous locations, the transmitter must be installed according to the Rosemount 5408 and 5408:SIS [Product Certifications](#) document and System Control Drawing (D7000002-885).

Repair, e.g. substitution of components, etc. may jeopardize safety and is under no circumstances allowed.

### **⚠ WARNING**

**Explosions could result in death or serious injury.**

Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Before connecting a handheld communicator in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

In Explosion-proof/Flameproof and Non-Incendive/Type n installations, do not remove the transmitter covers when power is applied to the unit.

Both transmitter covers must be fully engaged to meet Explosion-proof/Flameproof requirements.

**⚠ WARNING****Electrical shock could cause death or serious injury.**

In Explosion-proof/Flameproof and Non-Incendive/Type n installations, avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

Ensure the mains power to the transmitter is off and the lines to any other external power source are disconnected or not powered while wiring the transmitter.

**⚠ WARNING****Process leaks could result in death or serious injury.**

Ensure that the transmitter is handled carefully. If the process seal is damaged, gas might escape from the tank.

**⚠ WARNING****Physical access**

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

**⚠ CAUTION****Hot surfaces**

The flange and process seal may be hot at high process temperatures. Allow to cool before servicing.



## 2 Confirm approval type

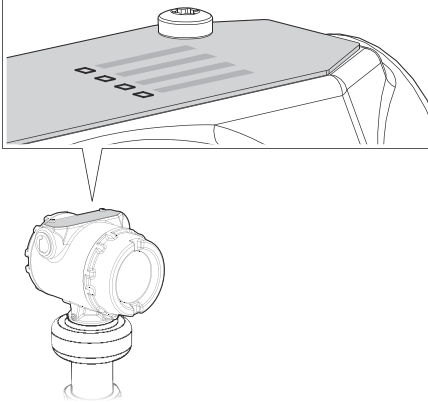
For hazardous locations transmitters labeled with multiple approval types:

### Procedure

Permanently mark the checkbox of the selected approval type(s).

---

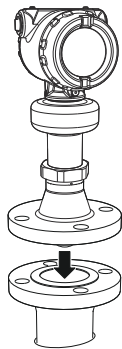
**Figure 2-1: Label with Multiple Approval Types**



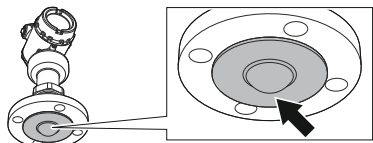
### 3 Mount the flanged version

**Procedure**

- 1. Lower the transmitter into the nozzle.



**Note**  
Be careful not to scratch or otherwise damage the PTFE sealing.



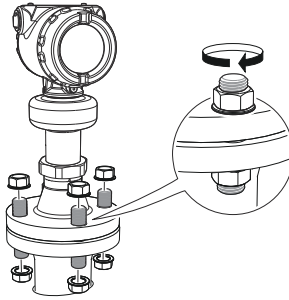
**Note**  
Do not remove the PTFE sealing.



2. Tighten the bolts and nuts (see [Table 3-1](#)).

**Note**

- Re-tighten after 24 hours and again after the first temperature cycle.
- Check at regular intervals and re-tighten if necessary.



**Postrequisites**

Align the transmitter head.

### 3.1 Torque specifications

The conditions used for the calculation are: Standard mating metal flange, A193 B8M Cl.2 / A4-70 bolt material, and a friction coefficient of  $\mu=0.16$ .

Low strength bolt and non-metallic mating flange may require lower tightening torque.

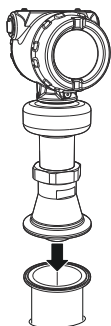
**Table 3-1: Torque Values for Process Seal Antenna, lb-ft (N-m)**

Process connection size	Process connection rating					
	ASME B16.5		EN1092-1			JIS B2220
	Class 150	Class 300	PN6	PN10/ PN16	PN25/ PN40	10K
2-in./DN50/50A	29 (40)	52 (70)	15 (20)	26 (35)	29 (40)	18 (25)
3-in./DN80/80A	33 (45)	48 (65)	37 (50)	37 (50)	41 (55)	22 (30)
4-in./DN100/100A	59 (80)	52 (70)	37 (50)	37 (50)	74 (100)	26 (35)

## 4 Mount the Tri Clamp version

### Procedure

1. Lower the transmitter into the nozzle.

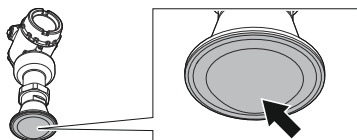


---

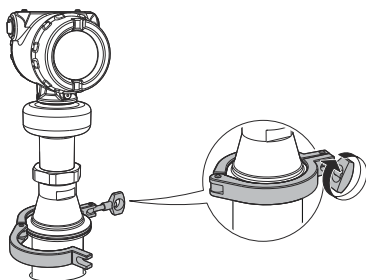
### Note

Be careful not to scratch or otherwise damage the PTFE sealing.

---



2. Tighten the clamp to the recommended torque (see the manufacturer's instruction manual).



### Postrequisites

Align the transmitter head.

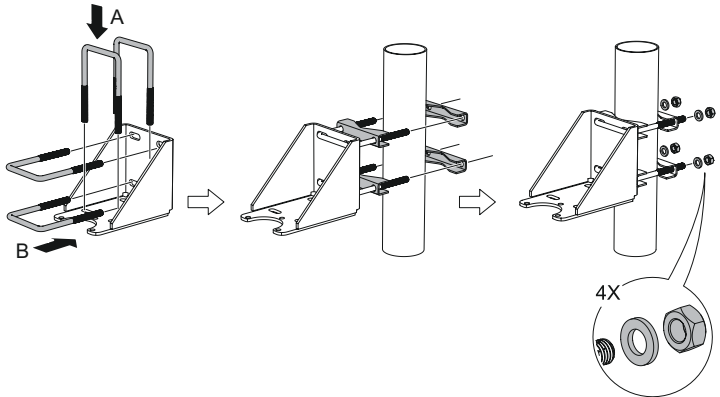


## 5 Mount the bracket

### Procedure

1. Mount the bracket to the pipe/wall.

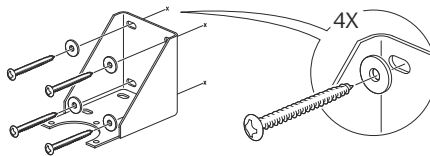
On pipe:



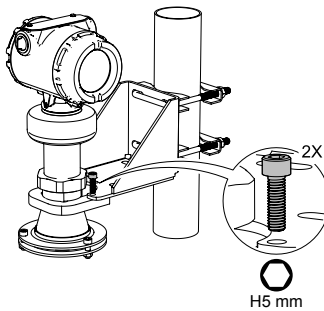
A. Horizontal pipe

B. Vertical pipe

On wall:



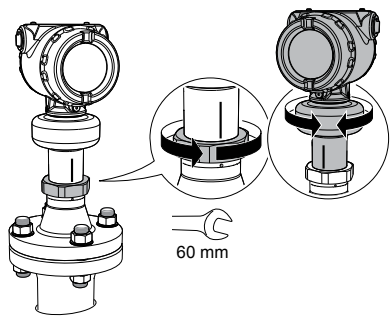
2. Mount the transmitter to the bracket.



# 6      Align transmitter head

**Procedure**

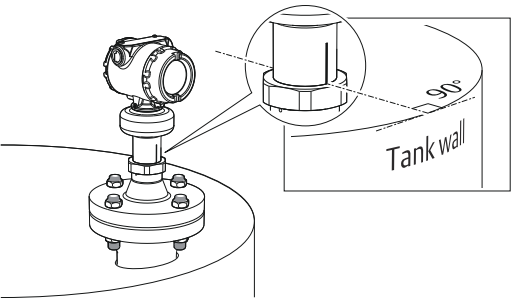
- 1. Loosen the nut slightly and turn the transmitter.



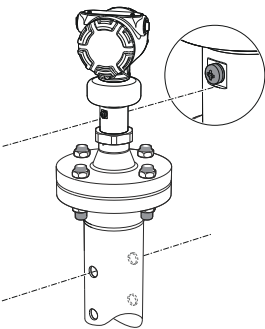
- 2. Verify the transmitter head is properly aligned.

Option	Description
Open tank	Align the marking on the sensor module toward the tank wall (see <a href="#">Figure 6-1</a> ).
Still pipe	Align the external ground screw toward the holes of the still pipe (see <a href="#">Figure 6-2</a> ).
Chamber	Align the external ground screw toward the process connections (see <a href="#">Figure 6-3</a> ).

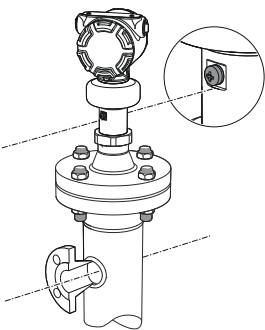
**Figure 6-1: Open Tank**



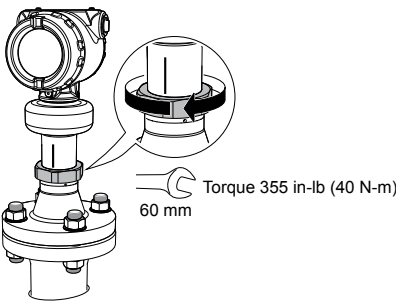
**Figure 6-2: Still pipe**



**Figure 6-3: Chamber**



3. Tighten the nut.



## 7 Adjust display orientation (optional)

To improve field access to wiring or to better view the optional LCD display:

### Prerequisites

---

#### Note

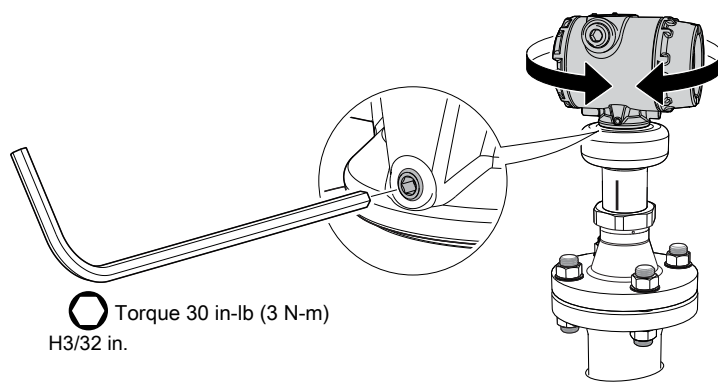
In high vibration applications, the transmitter housing must be fully engaged into the sensor module to meet the vibration test specifications. This is achieved by rotating the transmitter housing clockwise to thread limit.

---

### Procedure

1. Loosen the set screw until the transmitter housing can rotate smoothly.
  2. First, rotate the housing clockwise to the desired location. If the desired location cannot be achieved due to thread limit, rotate the housing counterclockwise to the desired location (up to 360° from thread limit).
  3. Re-tighten the set screw.
- 

**Figure 7-1: Rotate the Transmitter Housing**



## 8 Prepare the electrical connections

### 8.1 Cable selection

**Table 8-1: Recommended Cable Size**

Protocol	Wire diameter
4–20 mA/HART®	24-14 AWG
FOUNDATION™ Fieldbus	18 AWG, Fieldbus type A cable

Twisted pairs and shielded wiring are recommended for environments with high EMI (electromagnetic interference).

Use wire rated at least 5 °C above maximum ambient temperature.

Two wires can be safely connected to each terminal screw.

### 8.2 Cable gland/conduit

For explosion-proof/flameproof installations, only use cable glands or conduit entry devices certified explosion-proof or flameproof.

### 8.3 Power consumption

Max. 1 W, current max. 23 mA

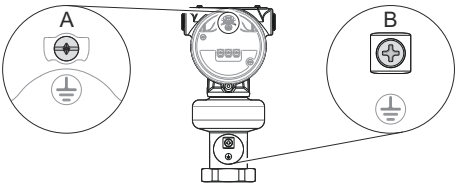
### 8.4 Grounding

Make sure grounding is done according to national and local electrical codes. Failure to do so may impair the protection provided by the equipment.

#### Transmitter housing

The most effective grounding method is direct connection to earth ground with minimal impedance. There are two grounding screw connections provided (see [Figure 8-1](#)).

**Figure 8-1: Ground Screws**



A. Internal ground screw

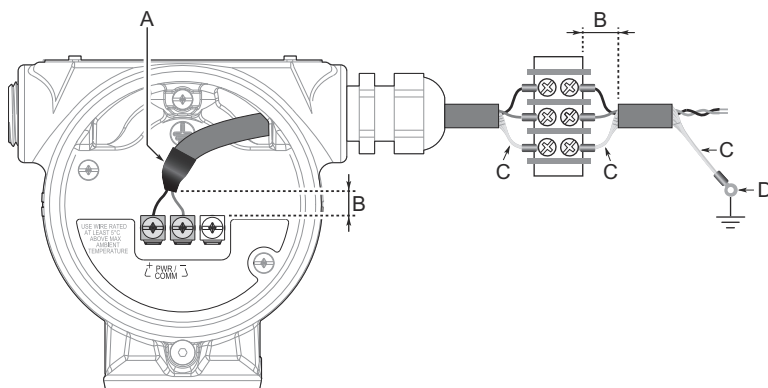
B. External ground screw

## Cable shield grounding

Make sure the instrument cable shield is:

- Trimmed close and insulated from touching the transmitter housing.
- Continuously connected throughout the segment.
- Connected to a good earth ground at the power supply end.

**Figure 8-2: Cable Shield**



- A. Insulate shield and drain wire
- B. Minimize distance
- C. Trim shield and insulate exposed drain wire
- D. Connect drain wire to the power supply ground

### Note

Do not ground the shield and its drain wire at the transmitter. If the cable shield touches the transmitter housing, it can create ground loops and interfere with communications.

## 8.5 Power supply

### 4-20 mA/HART®

The transmitter operates on 12-42.4 Vdc (12-30 Vdc in Intrinsically Safe installations) at the transmitter terminals.

### FISCO/FOUNDATION™ Fieldbus

The transmitter operates on 9-32 Vdc (9-30 Vdc in Intrinsically Safe installations and 9-17.5 Vdc for FISCO) at the transmitter terminals.

## 8.6 Signal termination

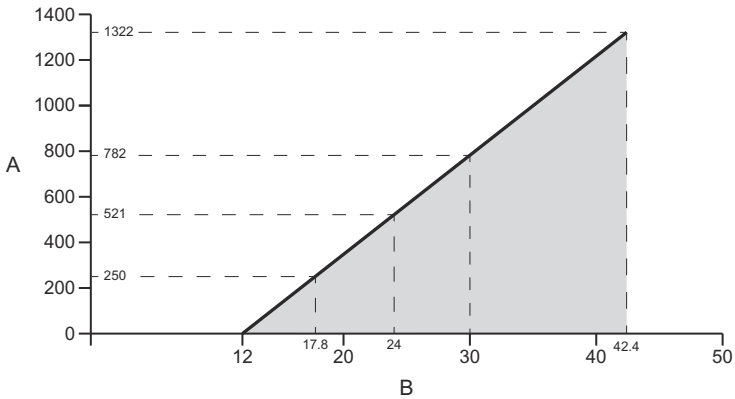
A terminator should be installed at the beginning and end of every Fieldbus segment.

For transmitter with built-in terminator, connect a jumper wire between the "TERMINATE ON" terminals to activate the terminator. Refer to [Cable selection](#) for recommended wire size.

## 8.7 Load limitations

For HART® communication, a minimum loop resistance of 250 Ω is required. Maximum loop resistance is determined by the voltage level of the external power supply.

**Figure 8-3: Load Limits**



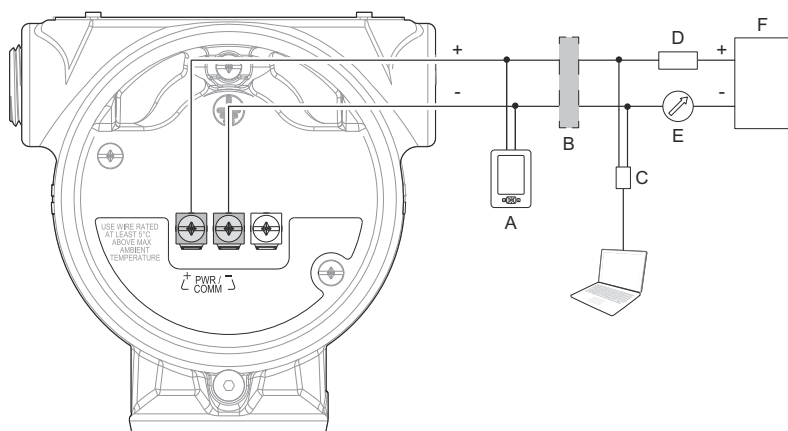
$$\text{Maximum Loop Resistance} = 43.5 \times (\text{External Power Supply Voltage} - 12)$$

A. Loop Resistance (Ohms)

B. External Power Supply Voltage (Vdc)

## 8.8 Wiring diagram

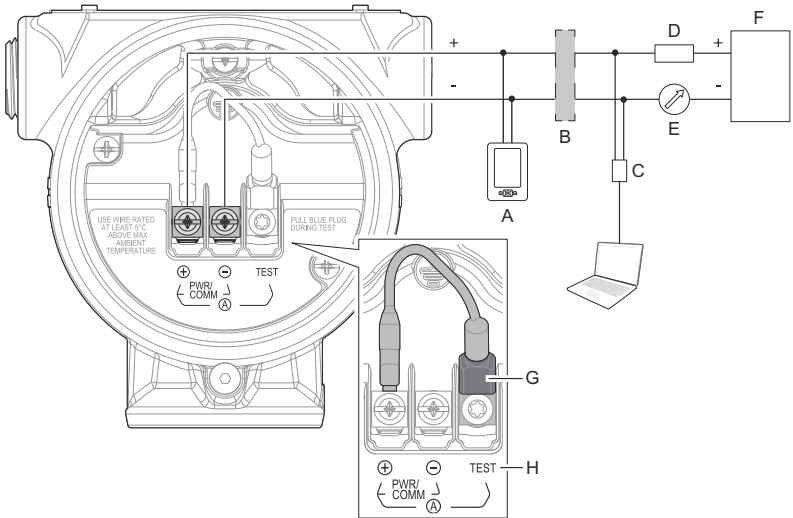
**Figure 8-4: 4-20 mA/HART® Communication**



- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. HART modem
- D. Load resistance ( $\geq 250 \Omega$ )
- E. Current meter
- F. Power supply



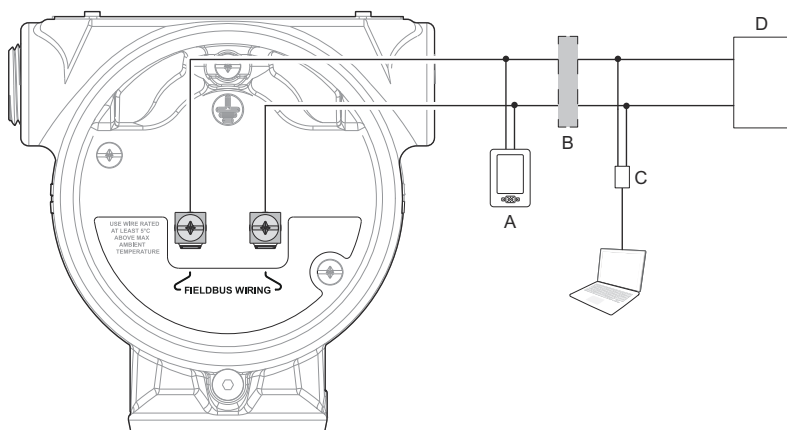
**Figure 8-5: 4-20 mA/HART Communication - Terminal Block with TEST Terminal**



- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. HART modem
- D. Load resistance ( $\geq 250 \Omega$ )
- E. Current meter
- F. Power supply
- G. Blue plug
- H. TEST terminal

**Note**

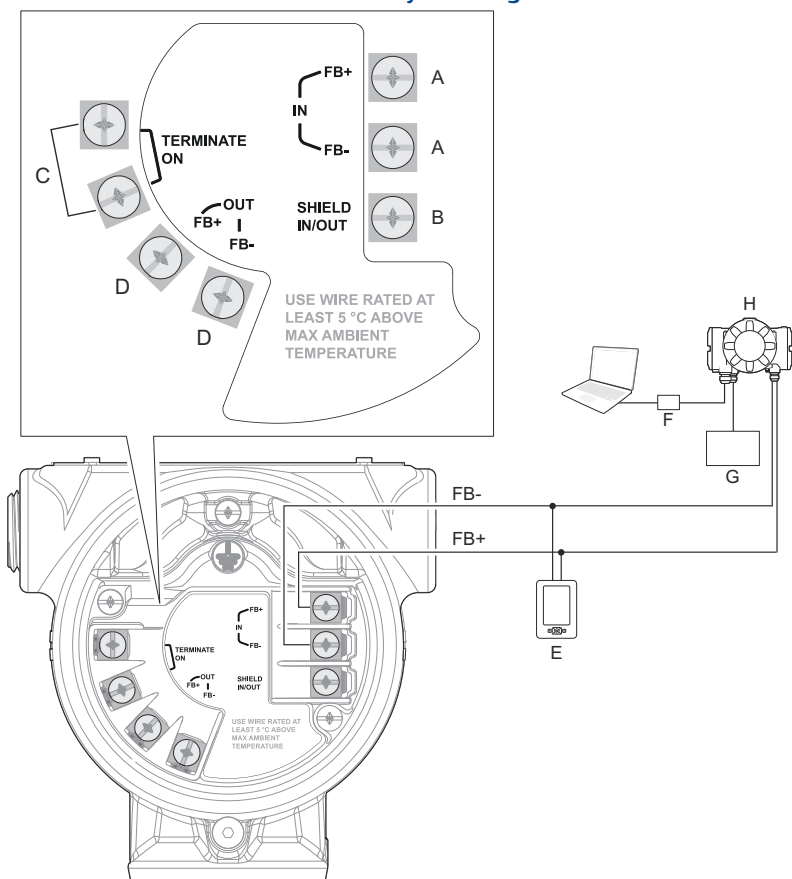
Disconnect the blue plug only during the loop current measurement procedure.

**Figure 8-6: FOUNDATION™ Fieldbus**

- A. Handheld communicator
- B. Approved IS barrier (for Intrinsically Safe installations only)
- C. FOUNDATION Fieldbus modem
- D. Power supply

The terminals are not polarity sensitive.

**Figure 8-7: FOUNDATION Fieldbus - Terminal Block with Built-in Terminator and Connections for Daisy-chaining**

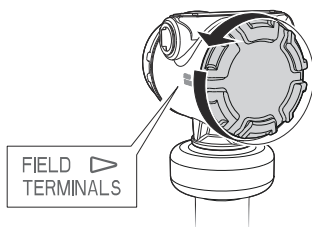


- A. Tankbus
- B. Cable shield (insulate from touching the transmitter housing)
- C. Built-in terminator (connect jumper if last device on the fieldbus segment)
- D. Daisy-chain connection to other devices
- E. Handheld communicator
- F. Fieldbus modem
- G. Power supply
- H. Rosemount™ 2410 Tank Hub

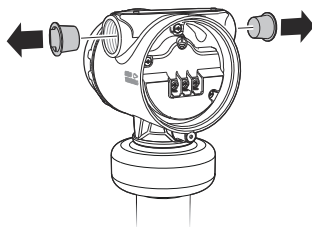
## 9 Connect wiring and power up

### Procedure

1. ⚠ Verify the power supply is disconnected.
2. Remove the cover.

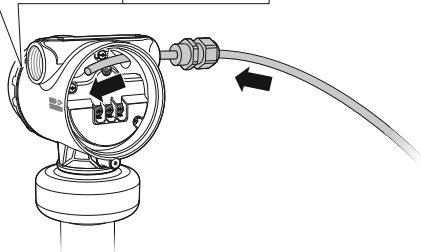
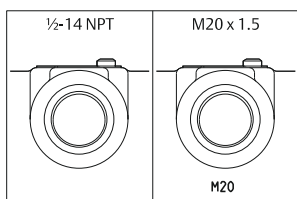


3. Remove the plastic plugs.



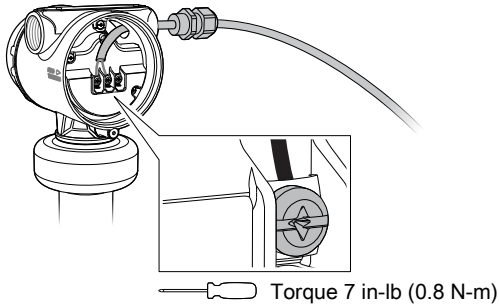
4. Pull the cable through the cable gland/conduit.<sup>(1)</sup>

Identification of thread size and type:



<sup>(1)</sup> Unless marked, the conduit/cable entries in the transmitter housing use a 1/2-14 NPT thread form.

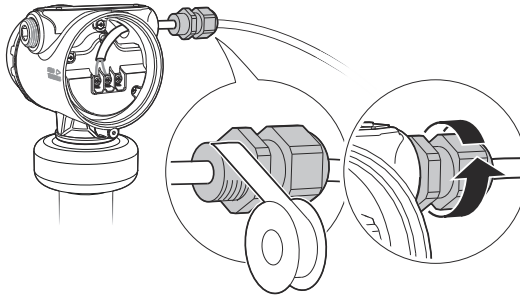
5. Connect the cable wires.



6. Ensure proper grounding.

7. Tighten the cable gland.

Apply PTFE tape or other sealant to the threads.

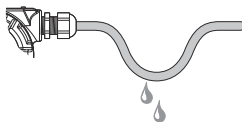


---

**Note**

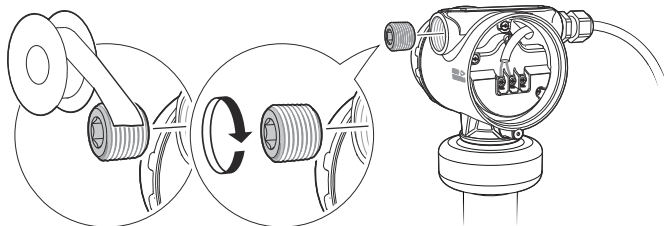
Make sure to arrange the wiring with a drip loop.

---



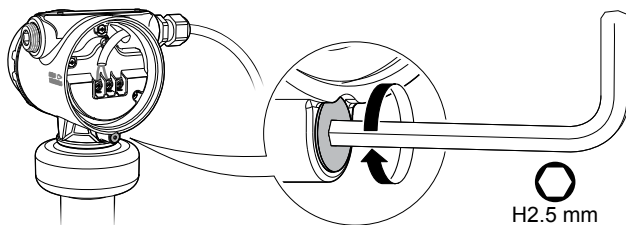
8. Seal any unused ports with the enclosed metal plug.

Apply PTFE tape or other sealant to the threads.

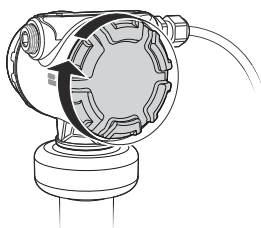


9. Attach and tighten the cover.

- a) Verify the cover jam screw is completely threaded into the housing.



- b) Attach and tighten the cover.

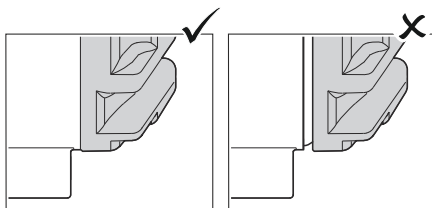


---

**Note**

Make sure the cover is fully engaged. There should be no gap between the cover and the housing.

---



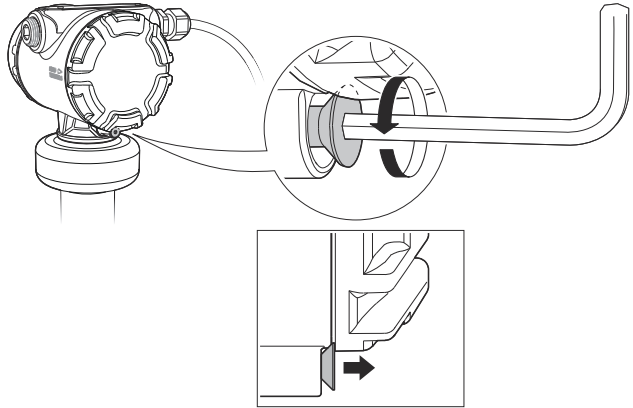
- c) Turn the jam screw counterclockwise until it contacts the cover.

---

**Note**

Required for explosion-proof/flameproof installations only.

---



- d) Turn the jam screw an additional  $\frac{1}{2}$  turn counterclockwise to secure the cover.

10. Connect the power supply.

---

**Note**

It may take up to 15 seconds before the LCD display lights up.

---

## 10 Configuration

### 10.1 Configuration tools

- Field Device Integration (FDI) based systems (required to run Rosemount Radar Master Plus)
- Device Descriptor (DD) based systems
- Device Type Manager (DTM™) based systems

### 10.2 Rosemount Radar Master Plus

The Rosemount Radar Master Plus is a user-friendly software package that includes basic configuration options, as well as advanced configuration and service functions.

Rosemount Radar Master Plus is the recommended tool for configuration. The AMS Instrument Inspector Application or any FDI compliant host is needed to run Rosemount Radar Master Plus.

#### Related information

[Emerson.com/RosemountRadarMasterPlus](https://emerson.com/RosemountRadarMasterPlus)

#### 10.2.1 Download AMS Instrument Inspector

##### Prerequisites

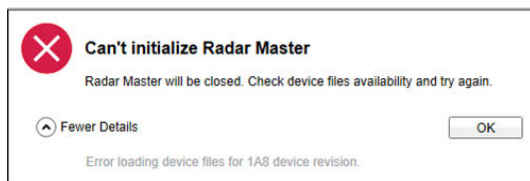
See the [Release Note](#) for a list of supported modems and system requirements.

##### Procedure

Download the software at [Emerson.com/InstrumentInspector](https://emerson.com/InstrumentInspector).

#### 10.2.2 Radar Master error message

If the `Can't initialize Radar Master` error message occurs, then the software revision on your device requires an update of the Rosemount Radar Master Plus FDI Package.





## 10.3 Confirm correct device driver

### Procedure

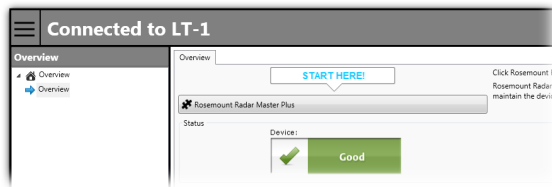
1. Verify that the correct FDI/DD/DTM Package is loaded on your systems to ensure proper communication.
2. Download the latest FDI/DD/DTM Package at [Emerson.com/DeviceInstallKits](http://Emerson.com/DeviceInstallKits) or [FieldCommGroup.org](http://FieldCommGroup.org).

## 10.4 Configure transmitter using guided setup

The options available in the Guided Setup wizard include all items required for basic operation.

### Procedure

1. If using an FDI compliant software, then select **Overview** → **Rosemount Radar Master Plus**.



2. Select **Configure** → **Guided Setup** and follow the on-screen instructions.







**Quick Start Guide**  
**00825-0500-4408, Rev. BC**  
**April 2022**

©2022 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

**ROSEMOUNT™**

