

Rosemount™ 2160 Wireless Level Detector

Vibrating Fork



WirelessHART



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1 About this guide

This Quick Start Guide provides basic guidelines for the Rosemount 2160. Refer to the Rosemount 2160 [Reference Manual](#) for more instructions. The manual and this guide are also available electronically at [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

1.1 Safety messages

NOTICE

Power module considerations.

Each Power Module contains two "C" size primary lithium/thionyl chloride batteries. Each battery contains approximately 2.5 grams of lithium, for a total of 5 grams in each pack. Under normal conditions, the battery materials are self-contained and are not reactive as long as the batteries and the pack integrity are maintained. Care should be taken to prevent thermal, electrical or mechanical damage. Contacts should be protected to prevent premature discharge.

Battery hazards remain when cells are discharged.

Use caution when handling the power module. The Power Module may be damaged if dropped from heights in excess of 20 ft. (6 m).

Power modules should be stored in a clean and dry area. For maximum battery life, storage temperature should not exceed 86 °F (30 °C).

The power module may be replaced in a hazardous area. The power module has surface resistivity greater than one gigaohm and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

NOTICE

Shipping considerations for wireless products.

The unit was shipped to you without the power module installed. Remove the power module prior to shipping.

Each power module contains two “C” size primary lithium batteries. Primary lithium batteries are regulated in transportation by the U. S. Department of Transportation, and are also covered by IATA (International Air Transport Association), ICAO (International Civil Aviation Organization), and ARD (European Ground Transportation of Dangerous Goods). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Consult current regulations and requirements before shipping.

⚠ WARNING

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

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

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

The weight of a level detector with a heavy flange and extended fork length may exceed 37 lb. (18 kg). A risk assessment is required before carrying, lifting, and installing the level detector.

⚠ WARNING

Explosions could result in death or serious injury.

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

Before connecting a handheld communicator in an explosive atmosphere, ensure that the instruments in the loop 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 housing covers when power is applied to the level detector.

Both housing covers must be fully engaged to meet flameproof/explosion-proof requirements.

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

Ensure the level detector is handled carefully. If the process seal is damaged, gas might escape from the vessel (tank) or pipe.

⚠ 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.

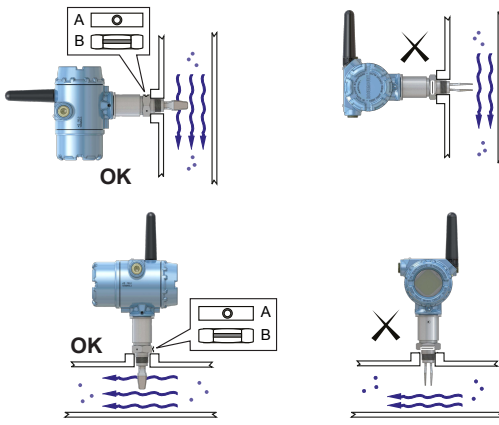


2 Installation

2.1 Fork alignment in a pipe installation

The fork is correctly aligned by positioning the groove or notch as indicated (Figure 2-1).

Figure 2-1: Correct Fork Alignment for Pipe Installation

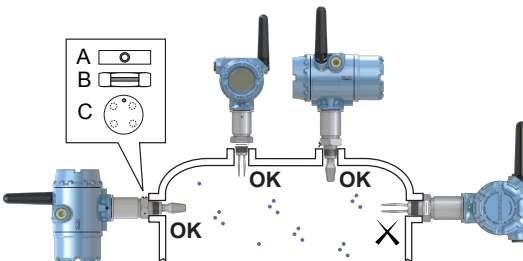


- A. Tri Clamp process connections have a circular notch
- B. Threaded process connections have a groove

2.2 Fork alignment in a vessel (tank) installation

The fork is correctly aligned by positioning the groove or notch as indicated (Figure 2-2).

Figure 2-2: Correct Fork Alignment for Vessel (Tank) Installation



- A. Tri Clamp process connections have a circular notch
- B. Threaded process connections have a groove
- C. Flanged process connections have a circular notch

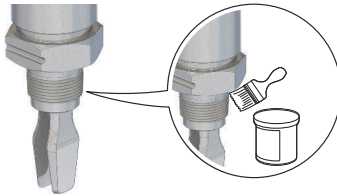
2.3 Mounting the threaded version

2.3.1 Threaded vessel (tank) or pipework connection

Procedure

1. Seal and protect the threads. Use anti-seize paste or PTFE tape according to site procedures.

A gasket may be used as a sealant for BSPP (G) threaded connections.

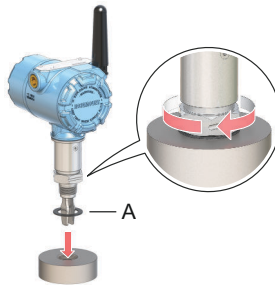


2. Screw the level detector into the process connection.

Note

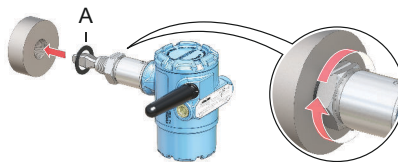
Tighten using the hexagon nut only.

Figure 2-3: Vertical Installation



A. Gasket for BSPP (G) threaded connection

Figure 2-4: Horizontal Installation

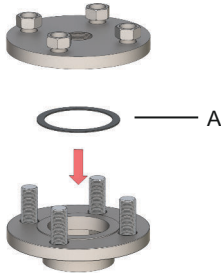


A. Gasket for BSPP (G) threaded connection

2.3.2 Threaded flange connection

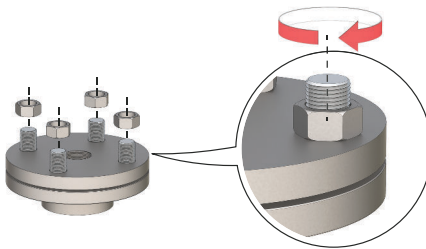
Procedure

1. Place the customer-supplied flange and gasket on the vessel (tank) nozzle.



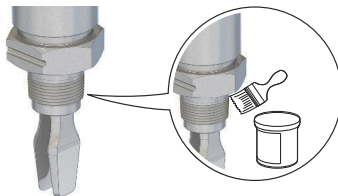
A. Gasket (customer supplied)

2. Tighten the bolts and nuts with sufficient torque for the flange and gasket.



3. Seal and protect the threads. Use anti-seize paste or PTFE tape according to site procedures.

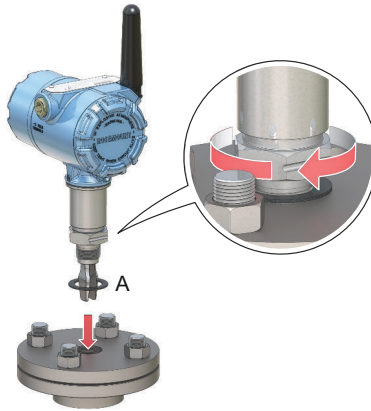
A gasket may be used as a sealant for BSPP (G) threaded connections.



- Screw the level detector into the flange thread.

Note

Tighten using the hexagon nut only.

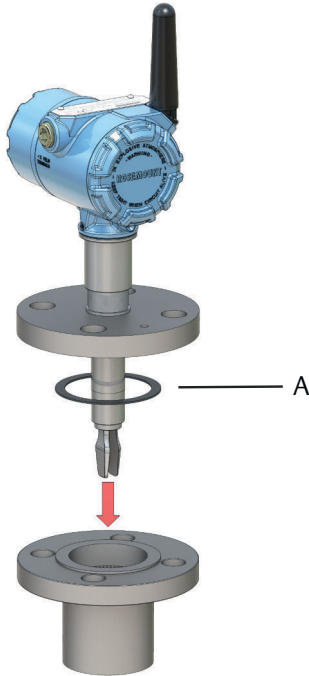


A. Gasket for BSPP (G) threaded connection

2.4 Mounting the flanged version

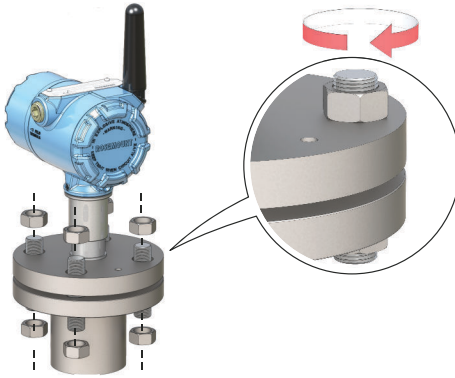
Procedure

1. Lower the level detector into the nozzle.
-



A. Gasket (customer supplied)

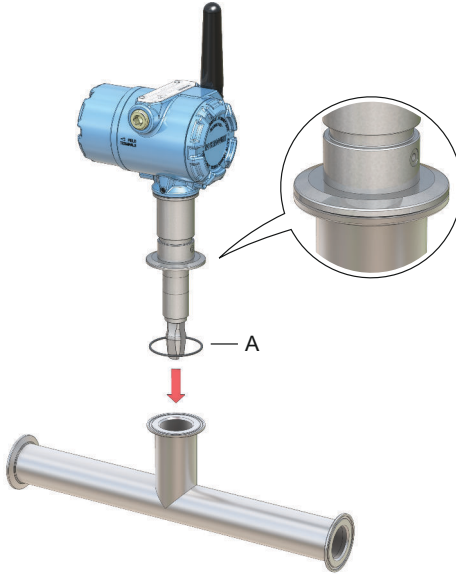
2. Tighten the bolts and nuts with sufficient torque for the flange and gasket.



2.5 Mounting the Tri Clamp version

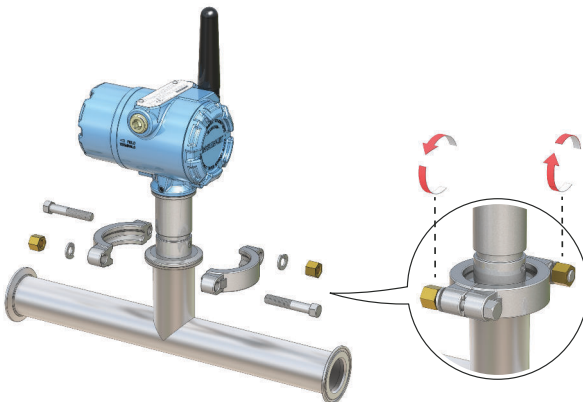
Procedure

1. Lower the level detector into the flange face.



A. Seal (supplied with Tri Clamp)

2. Fit the Tri Clamp.



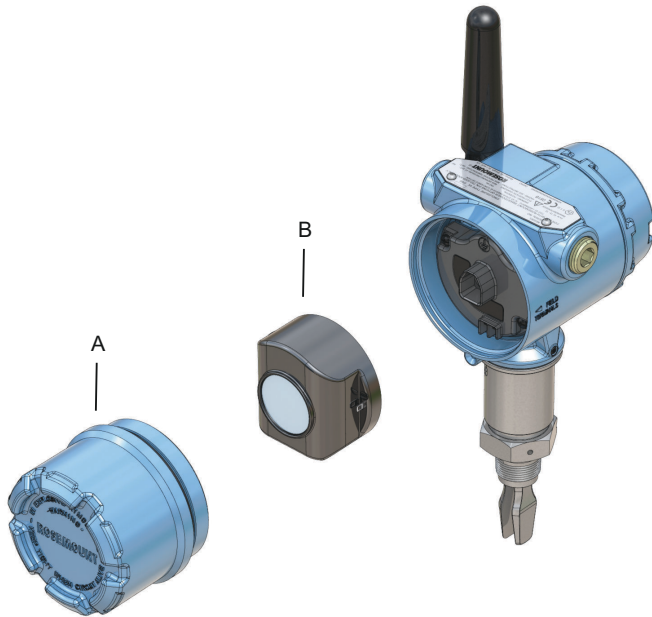
2.6 Install the power module

To install the battery that supplies all power to the Rosemount 2160:

Procedure

1. Remove the power module cover.
2. Connect the power module.
3. Replace the power module cover and tighten to safety specification (metal-to-metal).

Figure 2-5: Wireless Power Module Installation

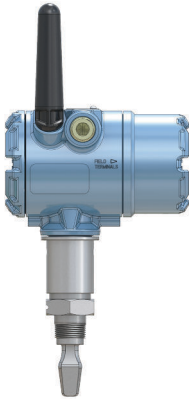


- A. Power module cover
B. Power module
-

2.7 Position the antenna

The antenna should be positioned vertically, either straight up or straight down, and it should be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.

Figure 2-6: Antenna Positioned Vertically



2.8 Adjust LCD meter orientation

If a device display is ordered, it will be shipped attached to the level detector. The display is ordered in the level detector model number, option code M5.

2.8.1 Rotate the device display

The device display can be rotated in 90-degree increments.

Procedure

1. Squeeze the two black tabs on opposite sides of the display.
2. Gently pull out the display.
3. Rotate the display to the desired orientation, and snap the display into place.

Note

If the device display four-pin connector is inadvertently removed from the interface board, carefully re-insert the connector before snapping the device display back into place.

2.9 Adjust housing orientation

The housing can be rotated for optimal viewing of the optional LCD display and to get the best antenna position.

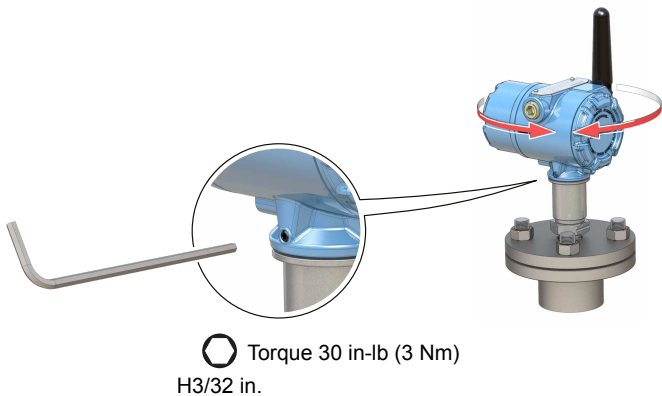
Procedure

1. Loosen the set screw until the level detector housing can rotate smoothly.
Do not unscrew all the way. Rotating the housing, without this screw in place, can damage the internal wiring.
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.
3. Re-tighten the set screw.

Note

Do not attempt to rotate the housing beyond the thread limit.

Figure 2-7: Housing Rotation



3 Configuration

3.1 Configuration procedure

Follow these steps for proper configuration:

Procedure

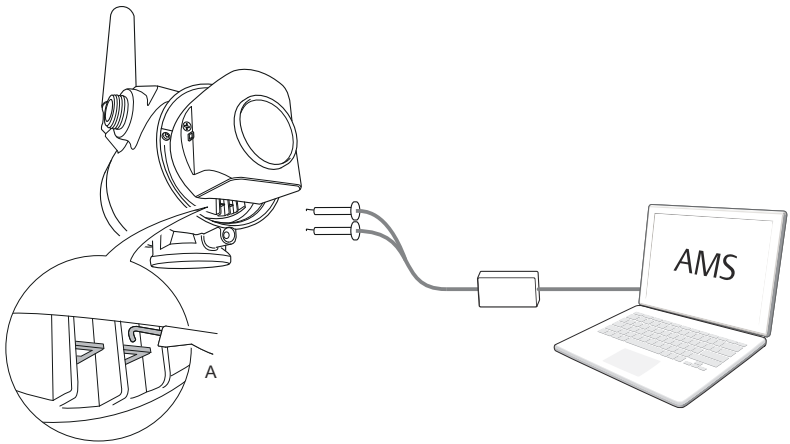
1. Get started with your preferred configuration tool.
 - AMS Wireless Configurator
 - Handheld communicator
2. Join device to wireless network.
 - a) Insert the power module.
 - b) Connect to device.
 - c) Configure update rate.
 - d) Obtain network ID and join key.
 - e) Enter network ID and join key.
 - f) Verify device joins Network.
3. Configure device.
 - a) Connect to device.
 - b) Configure using basic setup.
 - c) Consider optional guided setups.
4. Verify the fork status (dry or wet) is as expected.

3.2 Get started with your preferred configuration tool

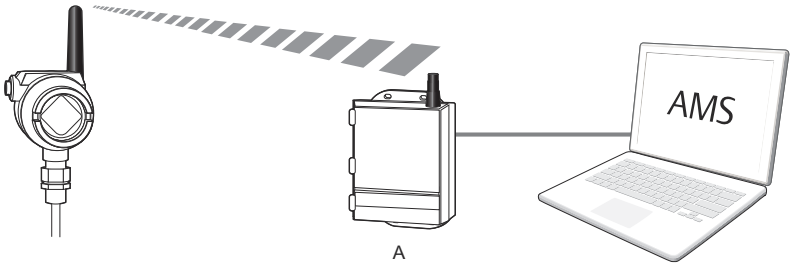
3.2.1 AMS Wireless Configurator

The AMS Wireless Configurator is the recommended software tool for the wireless network devices, and is supplied with the Emerson Wireless Gateway.

Configuration can be done by connecting to the wireless network devices either point-to-point using a HART modem as shown in [Figure 3-1](#), or wirelessly through the Gateway as shown in [Figure 3-2](#). Initial configuration to join a device to the wireless network must be done point-to-point.

Figure 3-1: Connect Point-to-Point using HART Modem


A. Communication terminals

Figure 3-2: Connect Wirelessly through the Wireless Gateway


A. Wireless Gateway

Download the latest Device Descriptor (DD)

The Device Descriptor (DD) is a configuration tool that is developed to assist the user through the configuration.

Procedure

Download the latest DD at [Emerson.com/DeviceInstallKits](https://www.emerson.com/DeviceInstallKits).

Add the DD to AMS Wireless Configurator

Prerequisites

The Rosemount 2160 DD is typically installed together with AMS Wireless Configurator.

Procedure

1. Close AMS Wireless Configurator.
 2. Go to **Start** → **Programs** → **AMS Device Manager** and select **Add Device Type**.
 3. Browse to the downloaded DD files and select **Ok**.
-

Need help?

In the **Add Device Type** application, select the **Help** button for more information on how to complete this operation.

Configure the HART® modem interface

Before connecting to the device using a HART modem, the HART modem interface must be configured in AMS Wireless Configurator.

Procedure

1. Close AMS Wireless Configurator.
 2. Go to **Start** → **Programs** → **AMS Device Manager** and select **Network Configuration**.
 3. Select **Add**.
 4. In the drop down list, select **HART modem** and then select **Install**.
 5. Follow the on-screen instructions.
-

Need help?

In the **Network Configuration** application, select the **Help** button for more information on how to complete this operation.

Configure the wireless network interface

Before connecting to the device wirelessly using a Wireless Gateway, the wireless network must be configured in AMS Wireless Configurator.

Procedure

1. Close AMS Wireless Configurator.
 2. Go to **Start** → **Programs** → **AMS Device Manager** and select **Network Configuration**.
 3. Select **Add**.
 4. In the drop-down list select **Wireless Network** and then select **Install**.
 5. Follow the on-screen instructions.
-

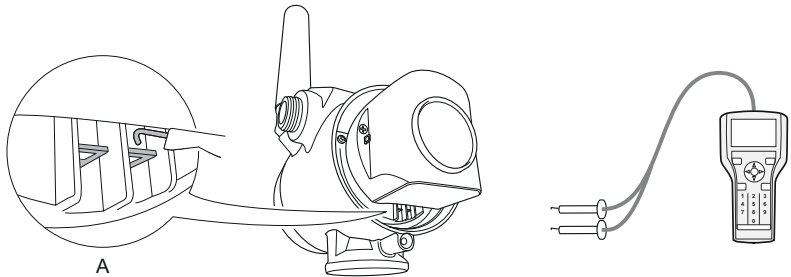
Need help?

In the **Network Configuration** application, select the **Help** button for more information on how to complete this operation.

3.2.2 Handheld communicator

This section describes how to prepare the handheld communicator to communicate with a Rosemount 2160. The handheld communicator can be used to configure the device with a point-to-point connection. Connect the leads on the handheld communicator to the communication terminals of the device.

Figure 3-3: Connect Point-to-Point using a Handheld Communicator



A. Communication terminals

Get the latest Device Descriptor (DD)

If the DD is not installed in your handheld communicator, see the appropriate handheld communicator User's Manual available at Emerson.com/FieldCommunicator for instructions on how to update the handheld communicator with the latest DD.

3.3 Join device to wireless network

3.3.1 Power up the wireless device

Prerequisites

Make sure that the Wireless Gateway is installed and functioning properly before any wireless field devices are powered.

Wireless devices should be powered up in order of proximity from the Gateway, beginning with the closest. This will result in a simpler and faster network installation.

Procedure

1. Install the power module.
2. Enable **Active Advertising** on the Gateway to ensure that new devices join the network faster.

Startup screen sequence

The following screens will be displayed in sequence when the power module is first connected to the Rosemount 2160.

Table 3-1: Startup Screen Sequence

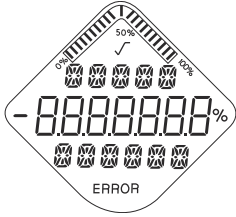
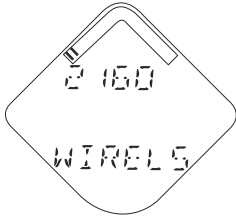
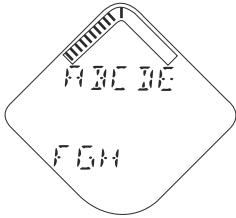
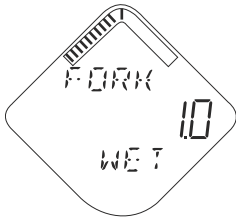
| Screen | Sequence | Description |
|---|--|---|
|  | <p>1. All segments ON</p> | <p>Used to visually determine if there are any bad segments on the device display.</p> |
|  | <p>2. Device identification</p> | <p>Identification string used to determine the device type.</p> |
|  | <p>3. Device information: Tag</p> | <p>User entered tag, 8 characters long. This screen will not display if all characters are blank.</p> |
|  | <p>4. Primary Variable (PV) - Fork state</p> | <p>Fork (switch) state.</p> |

Table 3-1: Startup Screen Sequence (continued)

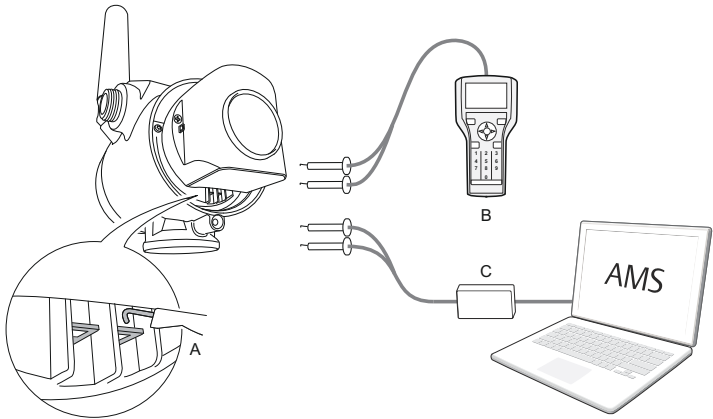
| Screen | Sequence | Description |
|---|---|--|
| <p>The LCD screen displays the text 'FREQ' at the top, followed by the large number '13500' in the center, and 'HZ' at the bottom. The screen is framed by a diamond-shaped border with a small icon at the top.</p> | <p>5. Secondary Variable (PV) - Fork frequency</p> | <p>Fork (switch) frequency.</p> |
| <p>The LCD screen displays the text 'TEMP' at the top, followed by the large number '2250' in the center, and 'DEG C' at the bottom. The screen is framed by a diamond-shaped border with a small icon at the top.</p> | <p>6. Tertiary Variable (TV) - Electronic temperature</p> | <p>Temperature value of device electronics.</p> |
| <p>The LCD screen displays the text 'SUPPLY' at the top, followed by the large number '721' in the center, and 'VOLTS' at the bottom. The screen is framed by a diamond-shaped border with a small icon at the top.</p> | <p>7. Quaternary Variable (QV) - Supply voltage</p> | <p>Voltage reading of the power module.</p> |
| <p>The LCD screen displays the text 'ALERT' at the top and 'PRESENT' at the bottom. The screen is framed by a diamond-shaped border with a small icon at the top.</p> | <p>8. Active alert present</p> | <p>This screen will only appear if there is at least one active alert present. For detailed information of the failure source and recommended actions, go to the Active Alerts screen in AMS Wireless Configurator or the handheld communicator.</p> <p>Some active alerts will be displayed on the LCD display as part of the diagnostic button screen sequence.</p> |

3.3.2 Connect to device

Procedure

1. Connect a handheld communicator or a HART[®] modem to the communication terminals as shown in [Figure 3-4](#).

Figure 3-4: Connect to Device



- A. Communication terminals
 B. Handheld communicator
 C. HART modem

2. Do one of the following:
 - AMS Wireless Configurator:
 - a. Start AMS Wireless Configurator.
 - b. Select **View** → **Device Connection View**.
 - c. Double click the device under the HART modem.
 - Handheld communicator:
 - Turn on the handheld communicator and connect to the device.

3.3.3 Configure update rate

The **Update Rate** is the frequency at which a new measurement is transmitted over the wireless network. The default update rate is 1 minute.

This may be changed at commissioning, or at any time using AMS Wireless Configurator or a handheld communicator.

Procedure

1. Select **Configure** → **Guided Setup**.
2. Select **Configure Update Rate**, and follow the instructions.

Note

If the time between each update is too long, the high/low alerts may be triggered too late.

Note

If the update rate is reconfigured, the unit will continuously update for five minutes and then update with the reconfigured update rate.

3.3.4 Obtain network ID and join key

In order to communicate with the Wireless Gateway, and ultimately the host system, the Rosemount 2160 must be configured to communicate on the wireless network. This step is the wireless equivalent of connecting wires from a device to the host system.

Procedure

From the Wireless Gateway's integrated web interface, select **Setup** → **Network** → **Settings**.

3.3.5 Enter network ID and join key

The device must be configured with the same Network ID and Join Key as the Gateway in order to join the network.

Procedure

1. Select **Configure** → **Guided Setup**.
2. Select **Join Device to Network**, and follow the instructions.

Postrequisites

If the device is not to be commissioned yet, remove the power module and fasten the housing cover. This is to conserve power module life and to ensure safe transmitter transportation. The power module should be inserted only when the device is ready to be commissioned.

3.3.6 Verify device joins network

Network connection can be verified in four ways, further described in this section:

- At the device display

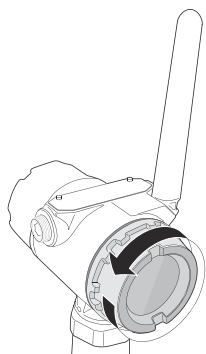
- Using the AMS Wireless Configurator
- In the Wireless Gateway's integrated web interface
- Using the handheld communicator

If the Rosemount 2160 was configured with the Network ID and Join Key, and sufficient time has passed, the device should be connected to the network. It usually takes a few minutes for the device to join the network.

Verify by device display

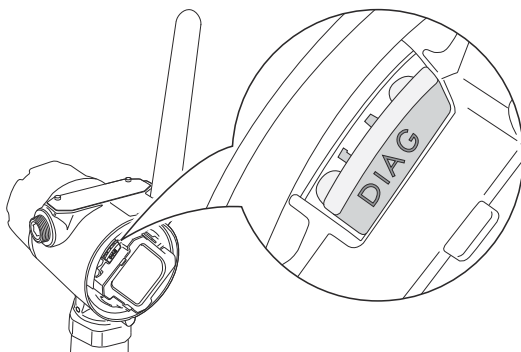
Procedure

1. Unscrew the device display cover.



2. Press the **DIAG** button.

The display will show: Tag, Device Serial Number, Network ID, Network Connection Status, and Supply Voltage screens.



When the network diagnostic status is displayed as "NETWK OK", the device has successfully joined the network.

Network connection status screens

When joining the wireless network, there is a sequence of status changes until the network is finally joined. [Table 3-2](#) presents the different network connection status screens.

Table 3-2: Network Connection Status Screens


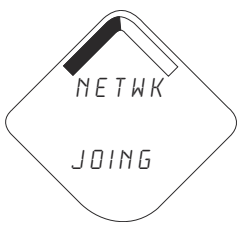


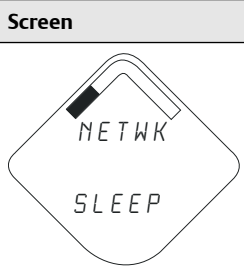
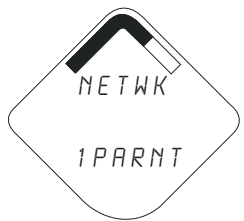
| Screen | Status | Description |
|---|------------------------|--|
|  | Network Unknown | The device is still in the process of being activated. |
|  | Network Joining | The device has started the process of joining a network. |
|  | Network Active Search | The device is actively searching for a network. |
|  | Network Passive Search | The device is passively searching for a network. |

Table 3-2: Network Connection Status Screens (continued)

| Screen | Status | Description |
|---|------------------|---|
|  | Network Sleep | The device couldn't find the network and is in deep sleep mode to preserve battery power. |
|  | Network 1 Parent | The device has joined a network and has been fully configured but has only 1 parent device. |

Verify with AMS Wireless Configurator

Procedure

- Start the AMS Wireless Configurator. When the device has joined the network, it will appear in the AMS Wireless Configurator window as illustrated in Figure 3-5.

Figure 3-5: AMS Wireless Configurator Screen

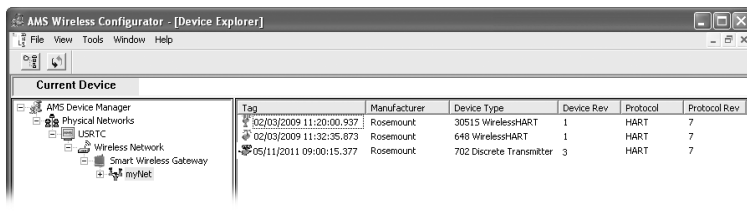


Figure 3-6 presents the different network connection status images that are shown in the AMS Wireless Configurator Overview screen.

Figure 3-6: Network Connection Status Images


Verify by Gateway

Procedure

1. To use the Wireless Gateway's integrated web interface, navigate to the **Explorer** → **Status** page as shown in [Figure 3-7](#).
This page shows whether the device has joined the network and if it is communicating properly.
2. Locate the device in question and verify all status indicators are good (green).
It may take several minutes for the device to join the network and be seen on the Gateway's integrated web interface.

Figure 3-7: Wireless Gateway Explorer Status Page

| HART Tag | HART status | Last update | PV | SV | TV | QV | Burst rate |
|-------------------|-------------|-------------------|--------------------|---------------|---------------|---------------|------------|
| 2160 Level | ● | 04/20/11 18:09:53 | 0.000 ● | 1394.483 Hz ● | 23.000 DegC ● | 7.502 V ● | 8 |
| 30515 Pressure | ● | 04/20/11 18:09:55 | -0.027 INH2O 68F ● | 22.750 DegC ● | 22.750 DegC ● | 7.115 V ● | 8 |
| 6081 Conductivity | ● | 04/20/11 18:09:42 | 9.795 pH ● | 23.322 DegC ● | | 7.283 V ● | 16 |
| 6081 ppt | ● | 04/20/11 18:09:50 | 9.803 pH ● | 22.822 DegC ● | -165.002 mv ● | 7.287 V ● | 16 |
| 648 Temperature | ● | 04/20/11 18:09:55 | 22.859 DegC ● | NaN DegC ⚠ | 22.500 DegC ● | 7.116 V ● | 8 |
| 9320 Position | ● | 04/20/11 18:09:57 | 1.000 % ● | 1.000 ● | 0.000 ● | 23.000 DegC ● | 4 |
| 702 Discrete | ● | 04/20/11 18:09:53 | 0.000 ● | 0.000 ● | 23.250 DegC ● | 7.063 V ● | 8 |
| 848 Temperature | ● | 04/20/11 18:09:35 | 22.850 DegC ● | 22.822 DegC ● | 22.822 DegC ● | 24.861 DegC ● | 32 |
| 9420 Vibration | ● | 04/20/11 17:25:22 | 0.023 in/s ● | 0.022 g/s ● | 2.501 V ● | 7.143 V ● | 01:00:00 |
| 248 Temperature | ● | 04/20/11 18:09:55 | 22.959 DegC ● | NaN DegC ⚠ | 22.550 DegC ● | 7.116 V ● | 16 |
| 708 Acoustic | ● | 04/20/11 18:09:54 | 6.378 Counts ● | 24.559 DegC ● | 22.550 DegC ● | 3.391 V ● | 16 |

Verify with handheld communicator

Prerequisites

Do not remove the power module. Removing the power module may cause the device to drop off the network.

Note

In order to communicate with a handheld communicator, the device must be powered by the power module.

Procedure

1. Connect the handheld communicator.
2. Select **Service Tools** → **Communications**.
3. Select **Join Status**.

3.4 Configure device using guided setup

3.4.1 Start guided basic setup using AMS Wireless Configurator

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

Procedure

1. Start AMS Wireless Configurator.
2. Select **View** → **Device Connection View**.

3. Double-click the device icon.
4. Select **Configure** → **Guided Setup**.
5. Select **Basic Setup** and follow the on-screen instructions.

3.4.2 Start guided basic setup using a handheld communicator

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

Procedure

1. Turn on the handheld communicator and connect to the device.
2. Select **Configure** → **Guided Setup**.
3. Select **Basic Setup** and follow the on-screen instructions.

3.4.3 Optional guided setups

Consider optional guided setups such as **Configure Device Display** and **Configure Alerts**.

Procedure

1. Select **Configure** → **Guided Setup**.
2. Select the desired wizard, and follow the instructions.

Additional configuration parameters are available in the **Manual Setup** menu.

4 Product certifications

Rev. 4.2

4.1 European directive information

A copy of the EU Declaration of Conformity can be found in the section [EU Declaration of Conformity](#). The most recent revision of the EU Declaration of Conformity can be found at [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

4.2 Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

4.3 FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference and this device must accept any interference, including any interference that may cause undesired operation of the device. This device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

4.4 South Africa



Certificate Ta-2020/7139

4.5 Overfill approval

Certificate Z-65.11-518

TÜV-tested and approved for overfill protection according to the German DIBt/WHG regulations. Certified under safety devices for tanks and piping related to water pollution control.

4.6 NAMUR approval

The NAMUR NE95 type test report is available upon request. Complies with NAMUR NE21.

4.7 U.S.A.

4.7.1 I5 Intrinsic Safety (IS), Non-Incendive (NI), Dust Ignition-proof (DIP)

| | |
|--------------------|--|
| Certificate | FM17US0357X |
| Standards | FM Class 3600:2011; FM Class 3610:2010; FM Class 3611:2004; FM 3810:2005; ANSI/ISA 61010-1:2012; ANSI/ISA 60079-11:2013; ANSI/NEMA® 250:1991; ANSI/IEC 60529:2004 |
| Markings | IS: Class I/II/III, Division 1, Groups A, B, C, D, E, F, and G IS: Class I, Zone 0, AEx ia IIC T4 (Ta = -58 °F to +158 °F / -50 °C to +70 °C) NI: Class I, Division 2, Groups A, B, C, and D T4 (Ta = -58 °F to +158 °F / -50 °C to +70 °C) DIP: Class II/III, Division 1, Groups E, F, and G T4 (Ta = -50 °C to +85 °C) Type 4X/IP66 |

As standard, the level detector has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Specific condition of use (X):

1. WARNING - Potential Electrostatic Charging Hazard - The enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

4.8 Canada

4.8.1 I6 Intrinsic Safety

| | |
|--------------------|---|
| Certificate | 80051772 |
| Standards | CSA Std C22.2 No. 0-M91(R 2006); CSA C22.2 No. 157-M1992 (R 2006); CSA Std C22.2 No. 30-M1986 (R 2003); CAN/CSA-C22.2 No. 94-M91 (R 2006); CSA Std C22.2 No. 142-M1987 (R 2004); CAN/CSA E60079-11:02; ANSI/ISA - 12.27.01-2003 |
| Markings | Class I, Division 1, Groups A, B, C, D T3C Type 4X/IP67 |


4.8.2 Canadian Registration Number (CRN)

| | |
|------------|------------|
| CRN | 0F04227.2C |
|------------|------------|

The requirements of CRN are met when a Rosemount 2160 CSA-approved vibrating fork level switch model is configured with 316/316L stainless steel (1.4401/1.4404) process-wetted parts and either NPT threaded or 2-in. to 8-in. ASME B16.5 flanged process connections.

4.9 Europe

4.9.1 I1 ATEX Intrinsic Safety (IS)

| | |
|--------------------|--|
| Certificate | Baseefa 09ATEX0253X |
| Standards | EN IEC 60079-0:2018; EN 60079-11:2012 |
| Markings | Compact version:  II 1 G Ex ia IIC T5...T2 Ga IP66 |

Specific Instructions:

See [Instructions for hazardous area installations \(I1 and I7\)](#)

Specific condition of use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The Rosemount 2160 enclosure is made of aluminum alloy and given a protective epoxy coating; however, care should be taken to protect it from impact or abrasion if located in a Zone 0.

4.10 International

4.10.1 I7 IECEx Intrinsic Safety (IS)

| | |
|--------------------|-------------------------------------|
| Certificate | IECEx BAS 09.0123X |
| Standards | IEC 60079-0:2017; IEC 60079-11:2011 |
| Markings | Ex ia IIC T5-T2 |

Specific Instructions:

See [Instructions for hazardous area installations \(I1 and I7\)](#)

Specific condition of use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The Rosemount 2160 enclosure is made of aluminum alloy and given a protective epoxy coating; however, care should be taken to protect it from impact or abrasion if located in a Zone 0.

4.11 South Korea

4.11.1 IP KTL Intrinsic Safety (IS)

| | |
|--------------------|--|
| Certificate | 20-KA4BO-0922X |
| Markings | Ex ia IIC T5-T2 Ta (see table in the certificate) |

4.11.2 GP Korean Testing Laboratory

| | |
|--------------------|----------------------------|
| Certificate | KCC-REM-ERN-RMDSWIT2160XXX |
|--------------------|----------------------------|

4.12 China

4.12.1 I3 NEPSI Intrinsic Safety (IS)

| | |
|--------------------|----------------------|
| Certificate | GYJ20.1149X (CCC 认证) |
| Markings | Ex ia IIC T5-T2 |

Specific Instructions:

See certificate

Specific condition of use (X):

See certificate

4.13 Technical Regulations Customs Union (TR-CU)



TR CU 012/2011 “On safety of equipment intended for use in explosive atmospheres”

4.13.1 IM Technical Regulations Customs Union (EAC) Intrinsic Safety

| | |
|--------------------|-----------------------------|
| Certificate | EAЭC RU-C-SE.AA87.B.0072221 |
| Markings | 0Ex ia IIC T5...T3 Ga X |

0Ex ia IIC T5...T2 Ga X

Specific Instructions:

See certificate

Specific condition of use (X):

See certificate

4.13.2 TR TC 032/2013 "On the safety equipment of high pressure"

Certificate EAЭC N RU Д-SE.PA01.B.01263_21 (Self Declaration)
EAЭC RU C-SE.AБ53.B.00581_21

4.14 Brazil

4.14.1 I2 INMETRO Intrinsic Safety

Contact manufacturer for further details.

4.15 United Arab Emirates

4.15.1 Intrinsic Safety

Certificate 20-11-28736/Q20-11-001012

Markings Same as IECEx (I7)

4.16 Instructions for hazardous area installations (I1 and I7)

Model numbers covered:

2160X**S*****I1*****

2160X**E*****I1*****

2160X**S*****I7*****

2160X**E*****I7*****

("*" indicates options in construction, function, and materials).

1. The Rosemount 2160 may be used in a hazardous area with flammable gases and vapors with apparatus groups IIC, IIB and IIA, and temperature classes T1 to T5. The temperature class of the installation will be determined from the highest process or ambient temperature. The temperature class of the installation will be determined from the highest process or ambient temperature.
2. It is a special condition of the certification that the temperature of the electronics housing is in the range of –50 to 70 °C. The Rosemount 2160 must not be used outside this range. Limit the external ambient temperature if the process temperature is high.


- 3. Suitably trained personnel shall carry out installation in accordance with the applicable code of practice.
- 4. The user should not repair this equipment.
- 5. If equipment is likely to come into contact with aggressive substances, it is the user’s responsibility to take suitable precautions that prevent it from being adversely affected, thus ensuring the type of protection is not compromised.

Aggressive substances: Acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable precautions: Regular checks as part of routine inspections or establishing from a material's data sheet that it is resistant to specific chemicals.

- 6. Special conditions of use
 - a. The user is to ensure the ambient air temperature (Ta) and the process temperature (Tp) are within the range detailed above for the T class of the specific flammable gases or vapors present.
 - b. The surface resistivity of the antenna is greater than 1 gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
 - c. The Rosemount 2160 enclosure is made of aluminum alloy and given a protective epoxy coating; however, care should be taken to protect it from impact or abrasion if located in an area where Equipment Protection Level Ga is required (Zone 0 locations).

7. Technical data

- a. ATEX coding:  II 1 G, Ex ia IIC T5...T2 Ga
- b. IECEx coding: Ex ia IIC T5-T2
- c. Temperature:

2160X**S*****11*****,
 2160X**S*****17*****:

| Temperature classes | Maximum ambient air temperature (Ta) | Maximum process temperature (Tp) |
|---------------------|--------------------------------------|----------------------------------|
| T5,T4,T3,T2,T1 | 104 °F (40 °C) | 176 °F (80 °C) |
| T4,T3,T2,T1 | 158 °F (70 °C) | 212 °F (100 °C) |
| T4,T3,T2,T1 | 140 °F (60 °C) | 239 °F (115 °C) |
| T3,T2,T1 | 122 °F (50 °C) | 302 °F (150 °C) |

Minimum ambient air temperature (T_a) = -40 °F (-40 °C)

Minimum process temperature (T_p) = -40 °F (-40 °C)

2160X**E*****|1*****;
 2160X**E*****|7*****;

| Temperature classes | Maximum ambient air temperature (T_a) | Maximum process temperature (T_p) |
|---------------------|---|---------------------------------------|
| T5,T4,T3,T2,T1 | 104 °F (40 °C) | 176 °F (80 °C) |
| T4,T3,T2,T1 | 158 °F (70 °C) | 239 °F (115 °C) |
| T3,T2,T1 | 149 °F (65 °C) | 365 °F (185 °C) |
| T2,T1 | 140 °F (60 °C) | 500 °F (260 °C) |




Minimum ambient air temperature (T_a) = -58 °F (-50 °C)

Minimum process temperature (T_p) = -94 °F (-70 °C)

- d. Materials: Refer to the Rosemount 2160 [Product Data Sheet](#).
- e. Year of manufacture: Printed on the product label.

4.17 EU Declaration of Conformity

Figure 4-1: EU Declaration of Conformity

| | |
|--|---|
|  |  |
| EU Declaration of Conformity No: RMD 1076 Rev. I | |
| <p>We,</p> <p>Rosemount Tank Radar AB Layoutvägen 1 S-435 33 MÖLNLYCKE Sweden</p> <p>declare under our sole responsibility that the product,</p> <p style="text-align: center;">Rosemount™ 2160 Series WirelessHART™ Vibrating Fork Liquid Level Switch</p> <p>manufactured by,</p> <p>Rosemount Tank Radar AB Layoutvägen 1 S-435 33 MÖLNLYCKE Sweden</p> <p>to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.</p> <p>Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.</p> | |
|  _____ (signature) | _____ Manager Product Approvals (function) |
| _____ Dajana Prastalo (name) | _____ 28-Aug-20; (date of issue) |
| Page 1 of 3 | |
| en | |



EU Declaration of Conformity

No: RMD 1076 Rev. I

EMC Directive (2014/30/EU)

All Models

Harmonized Standards: EN 61326-1:2013

RED Directive (2014/53/EU)

All Models

Harmonized Standards: EN 300 328: V2.1.1

Other Standards Used: EN 301 489-1: V2.2.0
EN 301 489-17: V3.2.0
EN 61010-1:2010

ATEX Directive (2014/34/EU)

Rosemount 2160X*****I1WA3WK1*

Baseefa 09ATEX0253X – Intrinsically safe

Equipment Group II, Category 1 G (Ex ia IIC T5... T2 Ga)

Harmonized Standards: EN 60079-0:2018
EN 60079-11:2012

(Minor variations in design to suit the application and/or mounting requirements are identified by alpha/numeric characters where indicated * above)



EU Declaration of Conformity

No: RMD 1076 Rev. I

ATEX Notified Body

SGS Fimko Oy [Notified Body Number: 0598]

Särkiniementie 3

P.O. Box 30

FI-00211, Helsinki

Finland

ATEX Notified body for Quality Assurance

DNV Nemko Presafe AS [Notified Body Number: 2460]

Veritasveien 1

1322 HØVIK

Norway



Quick Start Guide
00825-0100-4160, Rev. CC
February 2021

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