

Rosemount™ 708 Wireless Acoustic Transmitter



WirelessHART IEC CE

Revisions

Device	Revision
Rosemount 708 Hardware Revision	1
HART® Device Revision	1
Field Communicator Field Device Revision	Dev v1, DD v1

Rosemount 708 Wireless Acoustic Transmitter safety messages

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, ensure you thoroughly understand the contents before installing, using, or maintaining this product.

Customer Central

1-800-999-9307 (7:00 a.m. to 7:00 P.M. CST)

National Response Center

1-800-654-7768 (24 hours a day)

Equipment service needs

International

1-(952) 906-8888

NOTICE

Emerson Wireless Gateway

The Rosemount 708 Transmitter and all other wireless devices should be installed only after the Emerson Wireless Gateway has been installed and is functioning properly. Wireless devices should also be powered up in order of proximity from the Emerson Wireless Gateway, beginning with the closest. This will result in a simpler and faster network configuration.

Use caution when making changes to the TCP/IP network settings. If they are lost or entered incorrectly, the Gateway will require a factory reset. Contact your network administrator for information on the proper TCP/IP network settings.

Shipping considerations for wireless products.

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

Each power module contains one “D” size primary lithium battery. 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.

The polymer enclosure 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.

Power module considerations

Battery hazards remain when cells are discharged.

Potential electrostatic charging hazard

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

Installation considerations

Ensure only qualified personnel perform the installation.

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

Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

⚠ CAUTION

Individuals who handle products exposed to a hazardous substance can avoid injury if they are informed of and understand the hazard. If the product being returned was exposed to a hazardous substance as defined by Occupational Safety and Health Administration (OSHA), a copy of the required Safety Data Sheet (SDS) for each hazardous substance identified must be included with the returned goods.

⚠ CAUTION

The products described in this document are NOT designed for nuclear-qualified applications.

Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact your local Emerson Sales Representative.

⚠ CAUTION

Install and tighten process connectors before applying pressure.

Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

If the sensor is installed in a high-voltage environment and a fault or installation error occurs, high voltage may be present on transmitter leads and terminals.

⚠ WARNING

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

Ensure only qualified personnel perform the installation.

⚠ WARNING

Explosions could result in death or serious injury.

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.

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

⚠ WARNING

Electrical shock can result in death or serious injury.

Use extreme caution when making contact with the leads and terminals.

⚠ WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

⚠ 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.

Related information

[Product Certifications](#)

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1 Overview

1.1 Introduction

1.2 Using this manual

The sections in this manual provide information on installing, operating, and maintaining the Rosemount™ 708 Acoustic Wireless Transmitter. The sections are organized as follows:

[Configuration](#) provides instruction on commissioning and operating transmitters. Information on software functions, configuration parameters, and online variables is also included.

[Installation](#) contains mechanical and electrical installation instructions, and field upgrade options.

[Commissioning](#) contains techniques for properly commissioning the device.

[Operation and Maintenance](#) contains operation and maintenance techniques.

[Troubleshooting](#) provides troubleshooting techniques for the most common operating problems.

[Specifications and Reference Data](#) supplies reference and specification data, as well as ordering information.

[Product Certifications](#) contains intrinsic safety approval information, European ATEX directive information, and approval drawings.

[Recommended Wireless Network Practices](#) contains guidelines to achieve the best possible Emerson Wireless Network.

1.3 Product recycling/disposal

Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislation/regulations.

2 Configuration

2.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

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. Verify that the operating environment of the device is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals. Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

2.2 Device configuration

Remove the power module cover and connect to the HART[®] Communication terminals for configuration.

The Rosemount 708 Acoustic Wireless Transmitter will receive HART Communication from a Field Communicator or AMS[™] Device Manager. When using a Field Communicator, any configuration changes must be sent to the transmitter using the Send key (F2). AMS Device Manager configuration changes are implemented when the Apply button is selected.

2.2.1 Configure the device using AMS Device Manager

AMS Device Manager is capable of connecting to devices directly, using a HART modem, or remotely using the Gateway.

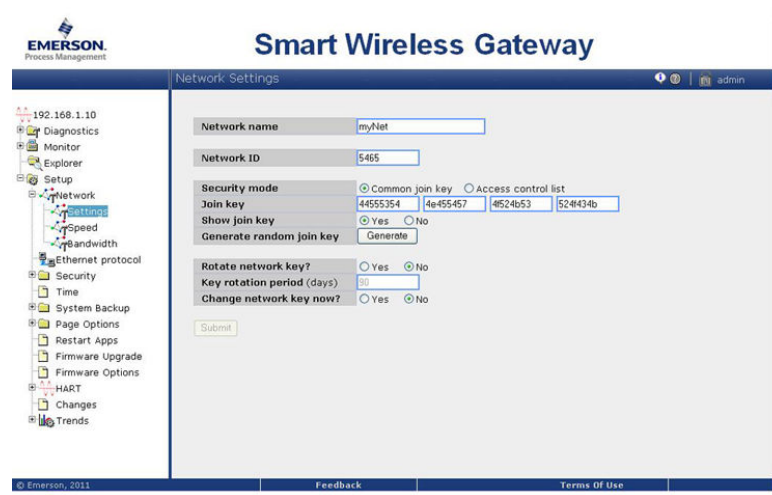
Procedure

- To configure the Rosemount 708 Transmitter, double click (or right click and select **Configure/Setup**) on the device icon that will appear below either the HART modem or Gateway connection tree.

2.3 Device network configuration

To communicate with the Gateway (and ultimately the host system), the transmitter must be configured to communicate with the wireless network. Using a Field Communicator or AMS Device Manager, enter the network ID and join key so they match the network ID and join key of the Gateway and other devices in the network. If they do not match, the acoustic transmitter will not communicate with the network. The network ID and join key may be obtained from the Gateway on the Systems Settings>Network>Network Settings page on the web server, shown in Figure 2-1.

Figure 2-1: Gateway Network Settings



2.3.1 Configure the network using AMS Device Manager

Procedure

1. Right click on the acoustic transmitter and select **Configure**.
2. When the menu opens, select **Join Device to Network** and follow the method to enter the network ID and join key.

2.3.2 Field Communicator

The network ID and join key may be changed in the wireless device by using the following Fast Key sequence. Set both network ID and join key.

Function	Key sequence	Menu items
Join Device to Network	2, 1, 2	Network ID, Set Join Key

2.3.3 Fast Key sequence

Table 2-1 lists the Fast Key sequence for common transmitter functions.

Table 2-1: Rosemount 708 Fast Key Sequence

Function	Key sequence	Menu items
Device Information	2, 2, 5	Tag, Long Tag, Descriptor, Message, Date, Country, SI Unit Control
Guided Setup	2, 1	Basic Setup, Join Device to Network, Configure Update Rates, Alert Setup
Manual Setup	2, 2	Wireless, Sensor, HART, Security, Device Information, Power
Wireless	2, 2, 1	Network ID, Join Device to Network, Broadcast Information

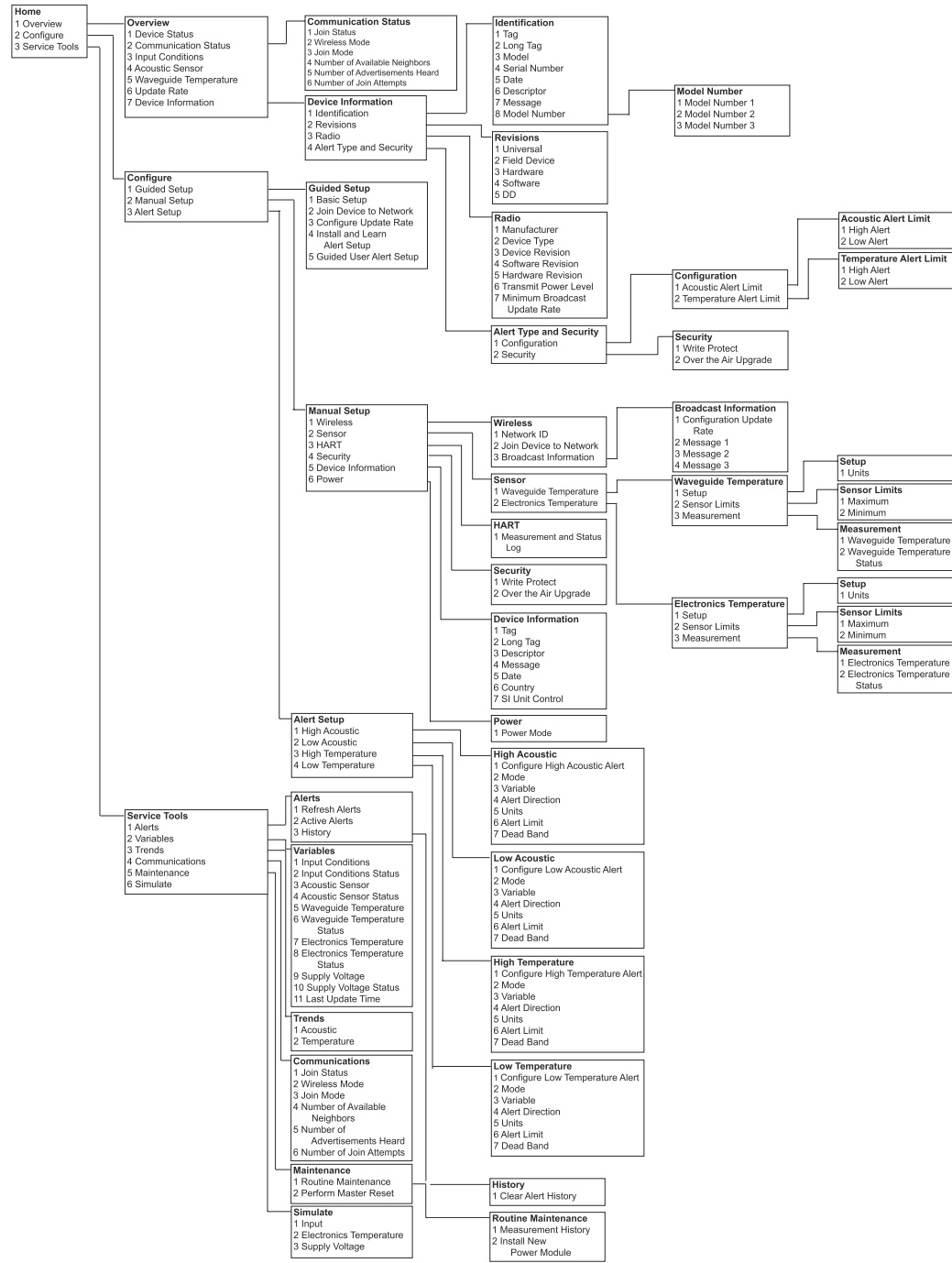
2.4 Remove power module

Procedure

- After the device has been configured, remove the power module and replace the power module cover. The power module should be inserted only when the device is ready for commissioning.

2.5 HART menu tree

Figure 2-2: Field Communicator Menu Tree



3 Installation

3.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

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. Verify that the operating environment of the device is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals. Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

3.2 Considerations

3.2.1 General

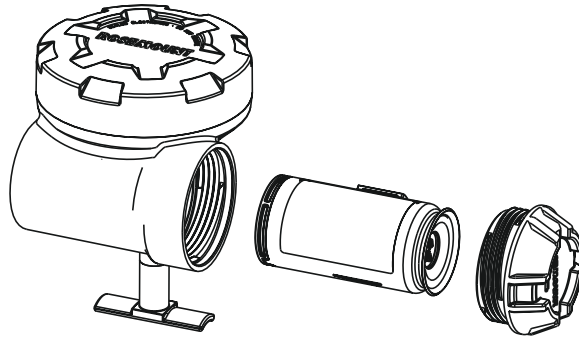
The Rosemount 708 Acoustic Wireless Transmitter measures the level of ultrasonic acoustic noise and waveguide temperature. The Rosemount 708 Transmitter converts the acoustic and temperature measurements into output data and alerts.

3.2.2 Wireless considerations

Power-up sequence

The Emerson Wireless Gateway (Gateway) should be installed and functioning properly before any wireless devices are powered. Install the power module, SmartPower™ Solutions, model number 701PGN Green Power Module, into the Rosemount 708 Transmitter to power the device. This results in a simpler and faster network configuration. Enabling Active Advertising on the Gateway ensures new devices are able to join the network faster. For more information, see the [Emerson Wireless Gateway Reference Manual](#).

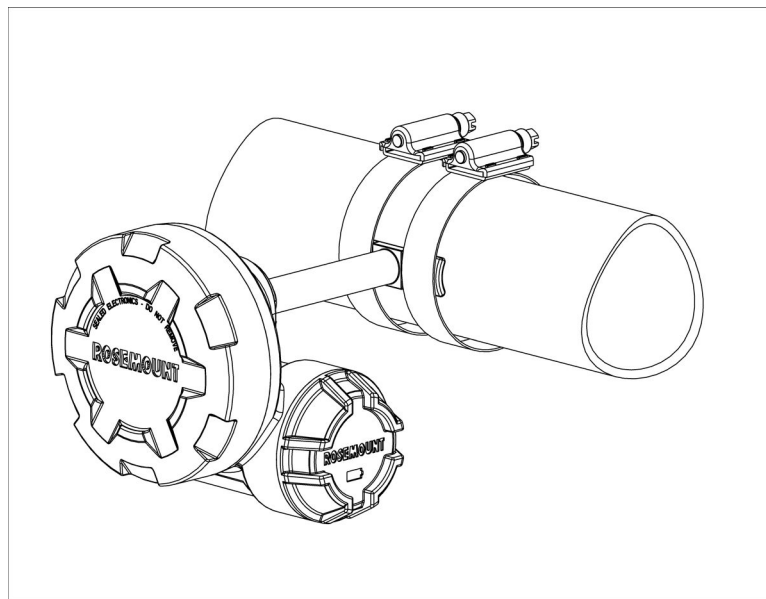
Figure 3-1: Power Module Installation



Antenna position

The antenna is internal to the acoustic transmitter. To achieve optimal range, position the transmitter with the waveguide horizontal and the power module closest to the ground as shown in [Figure 3-2](#). Good connectivity can also be achieved in other orientations. The antenna should also be approximately 1 m (3 ft.) from any large structure, building, or conductive surface to allow for clear communication to other devices. Refer to best practices for additional information on optimal mounting locations of device.

Figure 3-2: Antenna Position



Recommended practices

When mounting the device, recommended practices should be considered to achieve the best wireless performance.

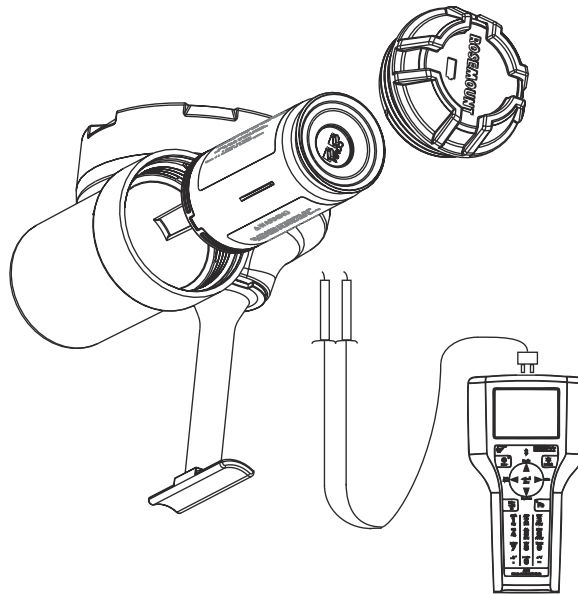
Related information

[Recommended Wireless Network Practices](#)

Field Communicator connections

The power module needs to be installed in the device for the Field Communicator to interface with the Rosemount 708 Transmitter. This transmitter uses the green power module; order model number 701PGN. Field communication with this device requires a HART®-based Field Communicator using the correct Rosemount 708 DD. Field Communicator connections are located on the power module. The power module is keyed and can only be inserted in one orientation. Refer to [Figure 3-3](#) for instructions on connecting the Field Communicator to the transmitter.

Figure 3-3: Connection Diagram



3.2.3 Mechanical

Location

When choosing a location and position, consider access to the power module compartment for easy power module replacement.

Electronics cover

The electronics cover is sealed and cannot be removed. Do not attempt to unscrew the cover.

3.2.4 Electrical

Power module

The Rosemount 708 Transmitter is self-powered. The power module contains one “D” size primary lithium/thionyl chloride battery. Each battery contains approximately 5.0 grams of lithium. Under normal conditions, the battery materials are self-contained and are not

reactive as long as the battery and the power module are maintained. Care should be taken to prevent thermal, electrical, or mechanical damage. Contacts should be protected to prevent premature discharge.

⚠ CAUTION

Use caution when handling the power module, it may be damaged if dropped from heights exceeding 6.10 m (20 ft).

3.2.5 Environmental

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

Temperature effects

The transmitter will operate within specifications for ambient temperatures between –40 and 85 °C (–40 and 185 °F).

Heat from the process is transferred to the transmitter housing. If the process temperature is high, the ambient temperature will need to be lower to account for heat transferred to the transmitter housing. See [Table 3-1](#) for ambient temperature derating. Refer to [Table 3-2](#) for High Temperature option (HT01) for ambient temperature derating.

Table 3-1: Ambient Temperature Derating

Process temperature		Max ambient	
°C	°F	°C	°F
260	500	41	106
240	464	45	113
220	428	49	120
200	392	53	127
180	356	57	135
160	320	61	142
140	284	64	147
120	248	58	136
100	212	72	162
85	185	75	167

Table 3-2: Ambient Temperature Derating - HT01

Process temperature		Max ambient	
°C	°F	°C	°F
550	1022	41	106
520	968	45	113
490	914	47	117

Table 3-2: Ambient Temperature Derating - HT01 (continued)

Process temperature		Max ambient	
°C	°F	°C	°F
460	860	49	120
430	806	51	124
400	752	53	127
370	698	56	133
340	644	58	136
310	590	60	140
280	536	62	144
260	500	63	145

3.2.6 Mounting installation considerations

Procedure

1. Inspect mounting bands periodically and re-tighten if necessary. Some loosening may occur after initial installation due to thermal expansion/contraction.
2. Ensure the waveguide is in direct contact with the pipe.
3. Insulate process piping to minimize ambient temperature effects (see [Figure 3-8](#)). Insulation thickness over the top of the waveguide foot should not exceed 2.54 cm (1 in.).
4. For best results, mount the transmitter within 15.24 cm (6 in.) of the equipment being monitored.
5. The stainless steel mounting bands could be affected by stress corrosion and potentially fail when in the presence of chlorides.
6. The transmitter should be installed such that steam or other high temperature fluids do not directly impinge the housing of the device.
7. If installing the device on a steam trap, the device should be installed on the upstream side of the trap.

3.3 Mounting

For high temperature mounting, see [Mounting in a high temperature application](#).

Procedure

1. Locate the Rosemount 708 Transmitter on a horizontal section of piping as close as possible to the equipment to be monitored. Align the waveguide of the transmitter as shown in [Figure 3-4](#).
2. Ensure the mounting location is free of foreign matter and corrosion to ensure good contact between the piping and waveguide.
3. Tighten each clamp to 10.2 N-m (90 in-lb). Trim the excess clamp band material to prevent unwanted acoustic noise.

4. If commissioning the device, install the power module (see [Power module](#)).
5. Ensure the power module cover is fully tightened to prevent moisture ingress. The lip of the polymer power module cover should be in contact with the surface of the polymer enclosure to ensure a proper seal. Do not over tighten.

Example

Figure 3-4: Transmitter Orientation

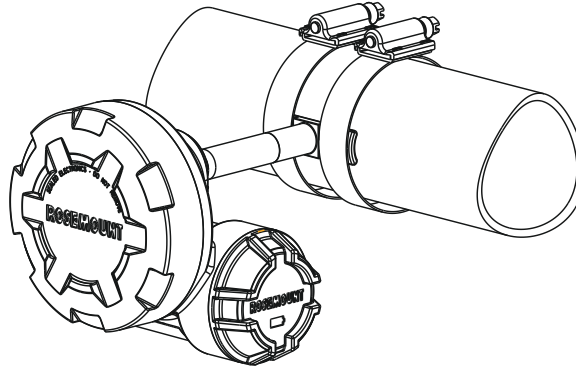
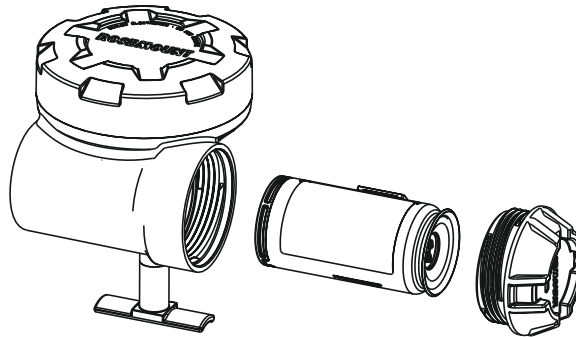


Figure 3-5: Power Module Installation



Note

Wireless devices should be powered up in order of proximity from the Gateway, beginning with the closest device to the Gateway. This will result in faster network formation.

3.3.1 Mounting in a high temperature application

High temperature mounting hardware should be used when process temperatures exceed 260 °C (500 °F).

Procedure

1. Place the foot of the transmitter between the standoff mounting hardware plates as shown in [Figure 3-6](#).
2. Press standoff plates together so plates and transmitter foot are aligned.
3. Tighten each screw to 90 in-lb (10.2 N-m).

4. Locate the Rosemount 708 Transmitter and high temperature mounting hardware on a horizontal section of the piping as close as possible to the equipment being monitored.
5. Ensure the mounting location is free of foreign matter and corrosion to ensure good contact between the piping and mounting hardware.
6. Insert the U-bolt through the standoff mounting hardware.
7. Tighten each nut to 90 in-lb (10 N-m) [Figure 3-7](#).
8. If commissioning the device, install the power module (see [Figure 3-5](#)).
9. Ensure the power module cover is fully tightened to prevent moisture ingress. The lip of the polymer power module cover should be in contact with the surface of the polymer enclosure to ensure a proper seal. Do not over tighten.

Example

Figure 3-6: High Temperature Mounting Hardware

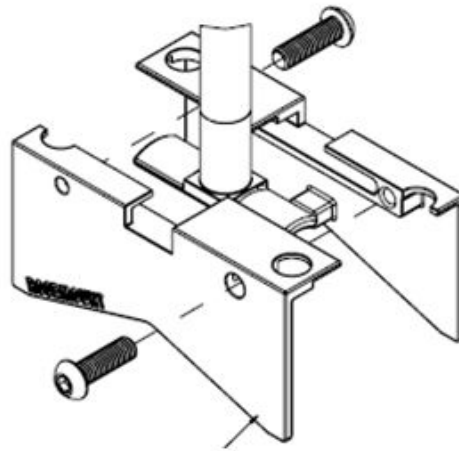
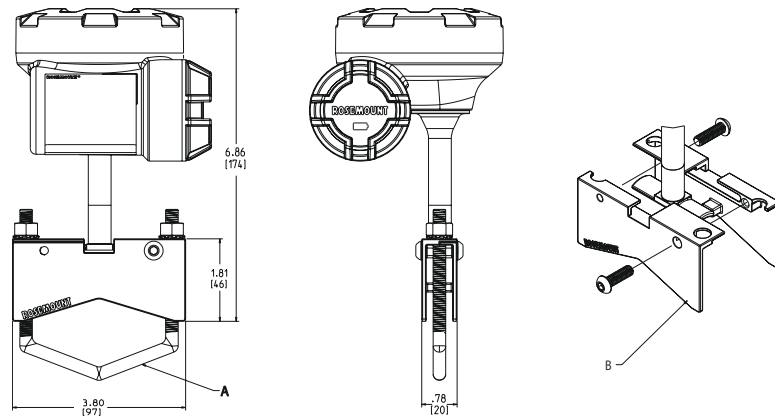


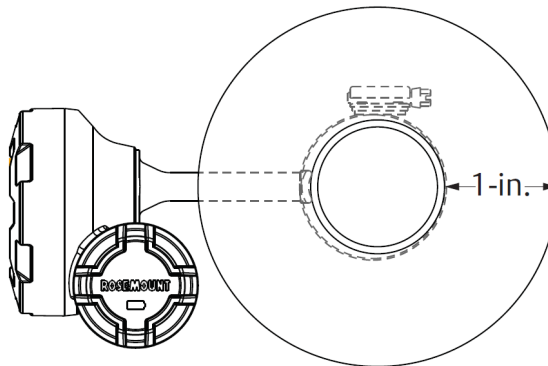
Figure 3-7: Rosemount 708 Transmitter with High Temperature Mounting Kit



- A. For pipe sizes ½ to 1¼-in.
- B. Bracket mounting

Dimensions are in inches (millimeters).

Figure 3-8: Piping, Insulation Side View



4 Commissioning

4.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

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. Verify that the operating environment of the device is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals. Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

4.2 Verify operation

There are three methods available to verify operation:

- Field Communicator
- Gateway's integrated web interface
- AMS™ Suite Wireless Configurator or AMS Device Manager

If the Rosemount 708 Transmitter was configured with the network ID and join key, and sufficient time has passed, the transmitter will be connected to the network. If network ID and join key were not configured, reference [Troubleshooting](#).

Note

It may take several minutes for the device to join the network.

4.2.1 Field Communicator

For WirelessHART® transmitter communication, a Rosemount 708 Device Driver (DD) is required. To obtain the latest DD, visit the Emerson Easy Upgrade site at: [Emerson.com/Rosemount/Device-Install-Kits](https://www.emerson.com/en-us/rosemount-device-install-kits).

The communication status may be verified in the wireless device using the following Fast Key sequence.

Function	Key sequence	Menu items
Communications	3, 4	Join Status, Wireless Mode, Join Mode, Number of Available Neighbors, Number of Advertisements Heard, Number of Join Attempts

4.2.2 Emerson Wireless Gateway

Using the Gateway's web interface, navigate to the Devices page as shown in [Figure 4-1](#). Locate the device in question and verify all status indicators are good (green).

Figure 4-1: Emerson Wireless Gateway Explorer page

The screenshot shows the 'Smart Wireless Gateway Explorer' interface. It features a navigation menu on the left with options like 'Diagnostics', 'Monitor', 'Explorer', and 'Setup'. The main area displays a table of device data with columns for HART Tag, HART status, Last update, PV, SV, TV, QV, and Burst rate. All status indicators are green, indicating good communication.

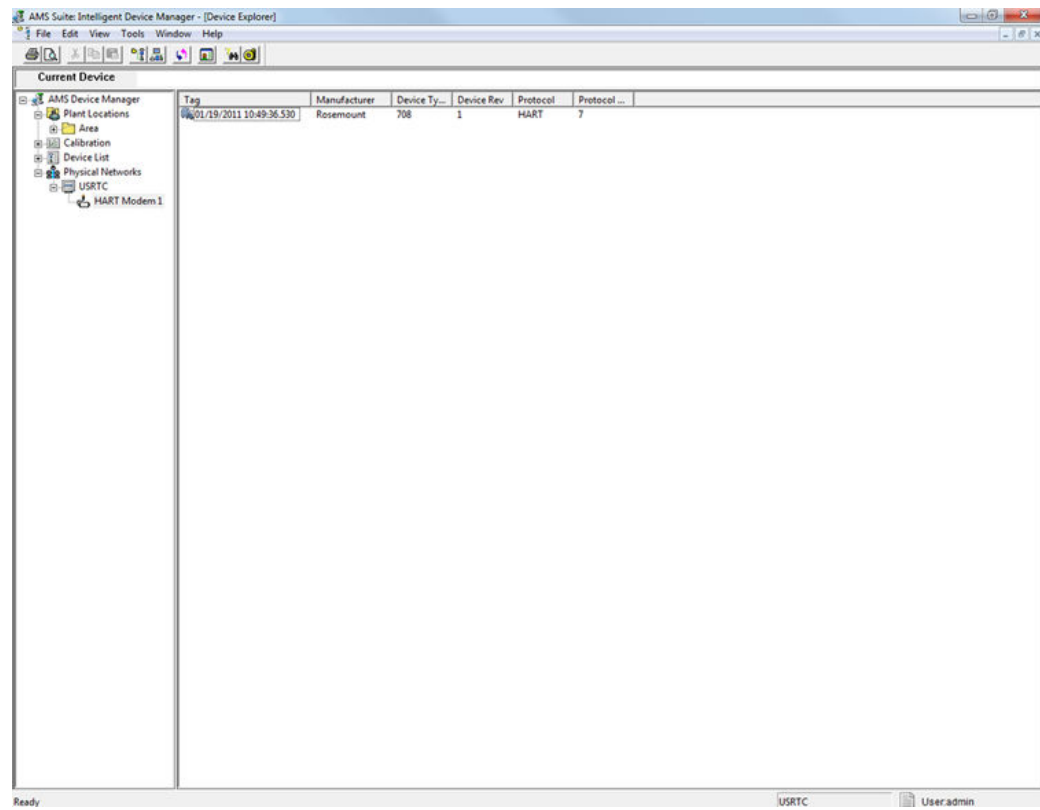
HART Tag	HART status	Last update	PV	SV	TV	QV	Burst rate
2160	●	01/26/11 15:10:53	1.000	1524.358 Hz	73.400 DegF	7.212 V	8
3051S Pressure	●	01/26/11 15:10:53	-0.025 InH2O 68F	22.567 DegC	22.500 DegC	8.082 V	8
648 Temperature	●	01/26/11 15:10:51	23.192 DegC	23.173 DegC	23.000 DegC	8.467 V	8
702 - Discrete 2	●	01/26/11 15:10:50	0.000	0.000	22.750 DegC	8.906 V	4
702 Discrete	●	01/26/11 15:10:55	0.000	0.000	22.500 DegC	8.085 V	4
708 Acoustic	●	01/26/11 15:10:41	1.000 User Defined (240)	24.071 DegC	24.250 DegC	3.432 V	8
8732-INST	●	01/26/11 15:10:01	30.005 ft/s	10001.571 Hz	302646500.000 ft	0.000 ft	00:01:00
8732-THUM	●	01/26/11 15:10:01	27.500 DegC				00:01:00
PT-222A-THUM	●	01/26/11 15:09:53	23.500 DegC				00:01:00
VORTEX	●	01/26/11 15:10:53	23.440 DegC	827.839 gal	0.000 m/s	0.000 Hz	8...16
rcc-rev4	●	01/26/11 15:10:04	10.000	0.000	31.500 DegC	32.000 DegC	

AMS Device Manager

When the device has joined the network, it will appear in the AMS Device Manager as illustrated in [Figure 4-2](#). For WirelessHART transmitter communication, a Rosemount 708

DD is required. To obtain the latest DD, visit the Emerson Easy Upgrade site at: Emerson.com/Rosemount/Device-Install-Kits.

Figure 4-2: AMS Device Manager



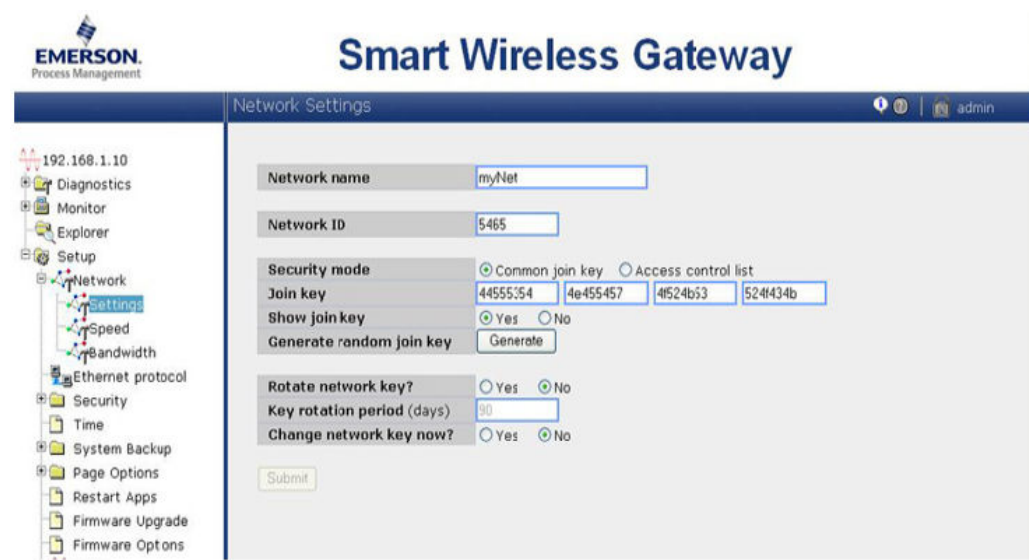
Troubleshooting

If the device is not joined to the network after power up, verify the correct configuration of the network ID and join key, and that Active Advertising has been enabled on the Gateway. The network ID and join key in the device must match the network ID and join key of the Gateway.

The network ID and join key may be obtained from the Gateway on the System Settings>Network> Network Settings page of the web server (see [Figure 4-3](#)). The network ID and join key may be changed in the wireless device by following the Fast Key sequence shown below.

Function	Key sequence	Menu items
Join Device to Network	2, 1, 2	Network ID, Set Join Key

Figure 4-3: Emerson Wireless Gateway Network Settings



4.2.3 Field Communicator use

Note

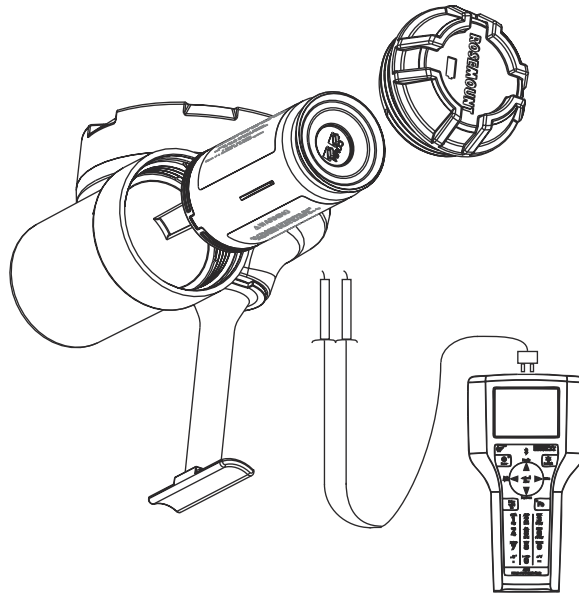
In order to establish communication with a Field Communicator, power the Rosemount 708 Transmitter by connecting the power module. For more information on the power module, refer to Emerson SmartPower™ Solutions [Product Data Sheet](#).

Table 4-1 includes Fast Key sequences frequently used to interrogate and configure the device.

Table 4-1: Rosemount 708 Fast Key Sequence

Function	Key sequence	Menu items
Device Information	2, 2, 5	Tag, Long Tag, Descriptor, Message, Date, Country, SI Unit Control
Guided Setup	2, 1	Basic Setup, Join Device to Network, Configure Update Rates, Alert Setup
Manual Setup	2, 2	Wireless, Sensor, HART, Security, Device Information, Power
Wireless	2, 2, 1	Network ID, Join Device to Network, Broadcast Information

Figure 4-4: Field Communicator Connections



5 Operation and Maintenance

5.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

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Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals. Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

5.2 Operation

The Rosemount 708 Acoustic Wireless Transmitter measures ultrasonic acoustic energy and waveguide temperature. The acoustic level is reported in 'counts,' which are a relative indication of the magnitude. The sensor used in the Rosemount 708 Transmitter is sensitive to a broad range of frequencies to work in many different applications. The acoustic measurement or "count" in the transmitter is an average of the broad range of frequencies. No additional signal processing is performed to isolate specific frequencies.

This count information is used to determine the state of a steam trap, pressure relief valve, or other mechanical system. The device works similarly to a discrete device, looking for a large change in noise level occurs during a leak or release. In the case of steam traps, Plantweb™ Insight Steam Trap application calculates the steam trap state based on the acoustic and temperature information published by the Rosemount 708 Transmitter. See [Product Data Sheet](#) for further information.

When monitoring other equipment, the Rosemount 708 Transmitter may be configured with alerts to detect and communicate changes in the state of the system being monitored.

5.3 Alerts

The Rosemount 708 Transmitter can be configured to report alerts based on the acoustic and temperature level measured. The Rosemount 708 also reports diagnostic alerts when there is a device malfunction. For information on these alerts, refer to [Troubleshooting](#). The following figures show how the AMS™ Device Manager overview screen looks for each of the alert conditions.

Figure 5-1: AMS Device Manager Overview Screen, Normal Conditions

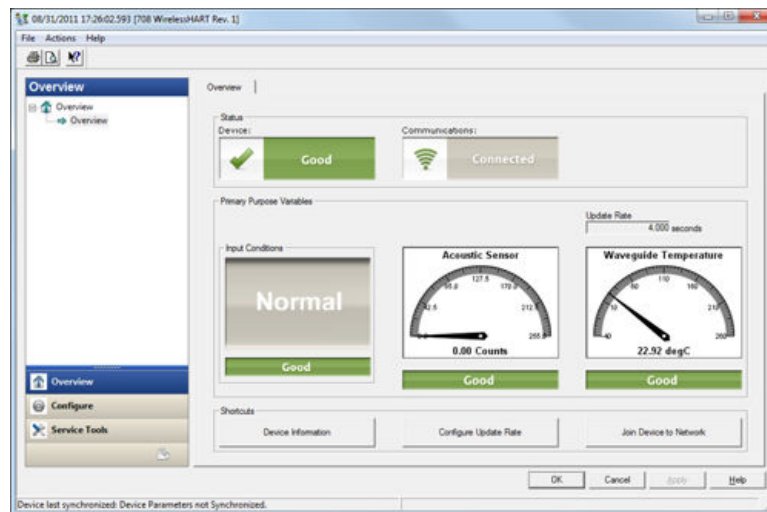
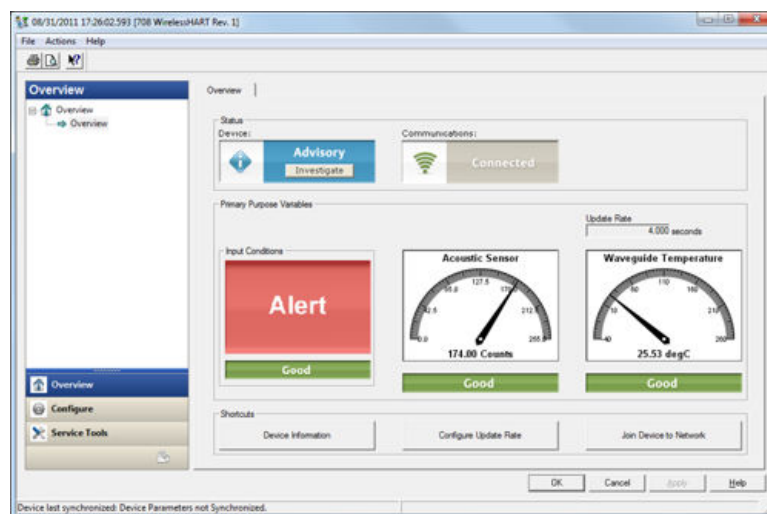


Figure 5-2: AMS Device Manager Overview Screen, Alert Conditions



5.3.1 Device alert configuration

Alert levels

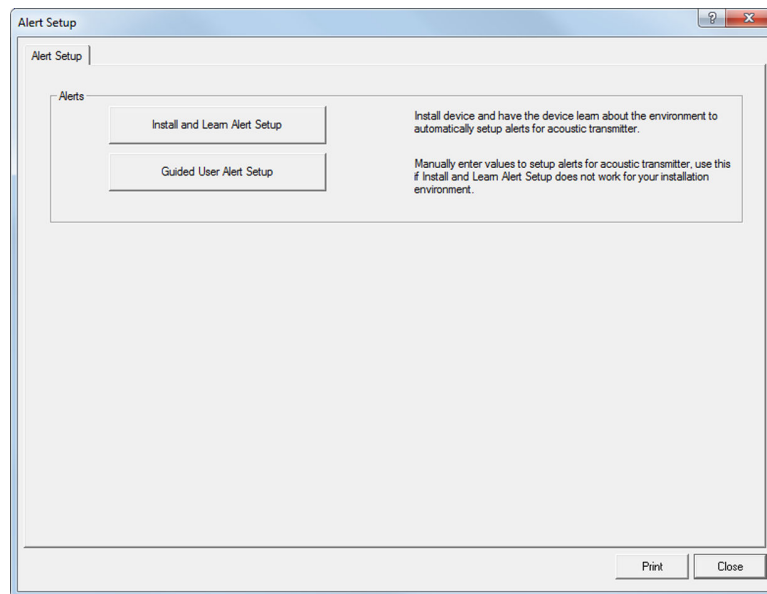
The Rosemount 708 Transmitter provides the following four user-configurable alerts:

- Acoustic High - triggers when acoustic level exceeds a user configured threshold
- Acoustic Low - triggers when acoustic level falls below a user configured threshold
- Temperature High - triggers when temperature level exceeds a user configured threshold
- Temperature Low - triggers when temperature level falls below a user configured threshold

Alert setup

The alerts are configured using AMS Device Manager or a Field Communicator.

Figure 5-3: Alert Setup Screen



Install and learn

To use the install and learn function, the device must be installed and the equipment being monitored must be in its normal state.

Procedure

1. After configuration and operating conditions have been confirmed, go to the configuration menu under guided setup and select **Alert Setup**. This will launch a dialog menu (Figure 5-3).
2. Select **Install and Learn Alert Setup**.

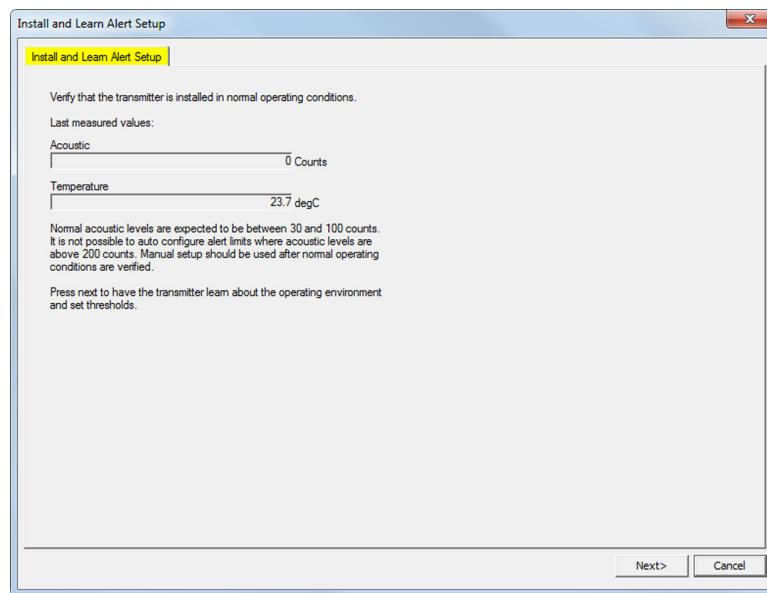
The application will go through a series of steps to determine the current input conditions and set alerts based on this normal operation (Figure 5-4).

Example

Note

If the input conditions are too close to the high or low measurement device limits, the install and learn function will not be a good method to set the alert levels. In this case, check configuration conditions and verify the status is before continuing. If current input conditions do not allow for the install and learn function, use the [Manual](#) or [Guided user alert setup](#) to set alerts.

Figure 5-4: Install and Learn Alert Setup Screen



Guided user alert setup

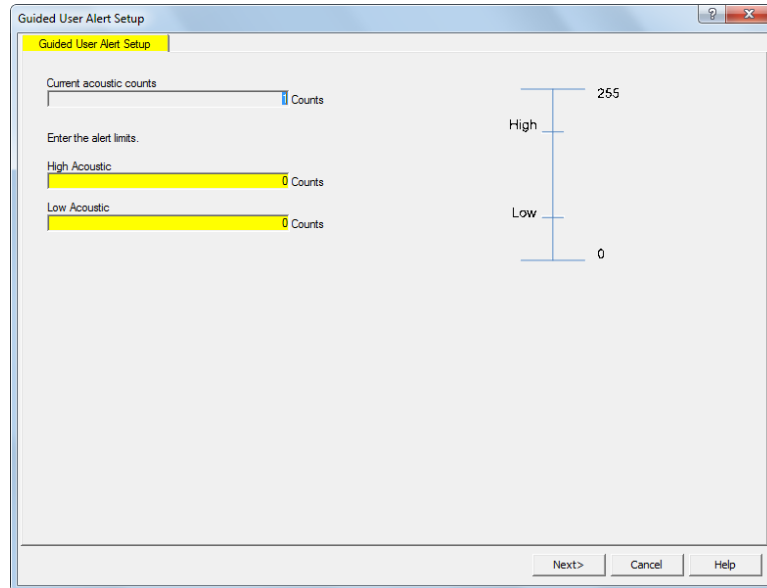
Guided user alert setup cycles through on-screen prompts to set the alert levels. At each screen, the current level will be shown along with a field to enter the desired alert level as seen in Figure 5-5.

Procedure

1. To use the guided alert setup, navigate to the configuration menu under guided setup and select **Alert Setup**, then **Guided User Alert Setup**.
2. Follow the on-screen prompts and enter the desired alert levels.

Example

Figure 5-5: Guided User Alert Setup Screen

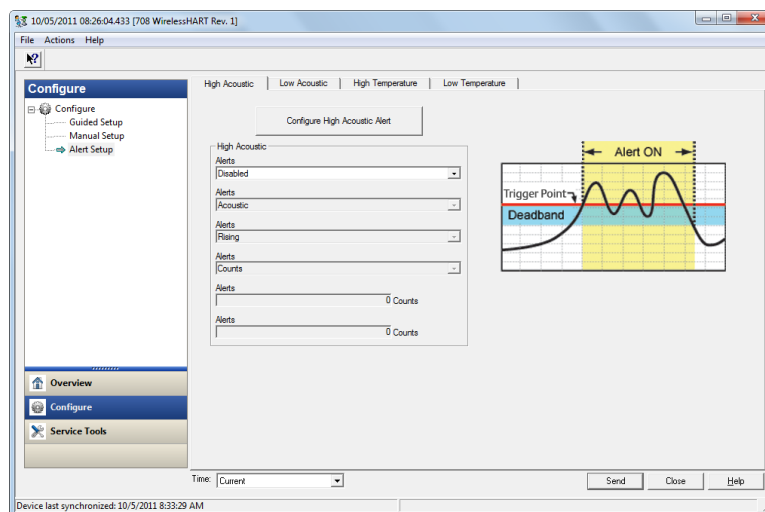


Manual

Procedure

1. To manually set the alert levels, navigate to alerts the configuration menu and select **Alert Setup** under the main configuration menu.
2. Enter the desired alert levels for each alert as shown in [Figure 5-6](#).

Figure 5-6: Manual Alert Setup Screen



3. If a device is installed and shows an unexpected alert, verify the configuration conditions.

5.4 Power module replacement

Expected power module life is ten years at reference conditions.

Note

Reference conditions are 21 °C (70 °F), transmit rate of once per minute, and routing data for three additional network devices.

Procedure

1. Remove the power module cover and power module (SmartPower™ Solutions, model number 701PGN Green Power Module).
2. Replace the power module and the cover.
3. Ensure the power module cover is fully tightened to prevent moisture ingress. The lip of the polymer power module cover contact the surface of the polymer enclosure to ensure a proper seal. Do not over tighten.

5.4.1 Handling considerations

The green power module contains one “D” size primary lithium/thionyl chloride battery. Each battery contains approximately 5.0 grams of lithium. Under normal conditions, the battery materials are self-contained and not reactive as long as the batteries and battery pack integrity are maintained. Be careful to prevent thermal, electrical, or mechanical damage. Protect contacts to prevent premature discharge.

CAUTION

Use caution when handling the power module; it may be damaged if dropped from heights in exceeding 6.1 meters (20 feet).

Battery hazards remain when cells are discharged.

Environmental considerations

As with any battery, local environmental rules and regulations should be consulted to properly manage spent batteries. If no specific requirements exist, recycling through a qualified recycler is encouraged. Consult the materials safety data sheet for battery-specific information.

Shipping considerations

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

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

6 Troubleshooting

6.1 Overview

Table 6-1 provides summarized maintenance and troubleshooting suggestions for the most common operating problems.

If you suspect malfunction without diagnostic messages displayed, follow the procedures in this section to verify transmitter hardware and process connections are in good working order. Always verify the most likely checkpoints first.

6.2 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

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. Verify that the operating environment of the device is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals. Device must be installed to ensure a minimum antenna separation distance of 8 in. (20 cm) from all persons.

6.3 Maintenance and troubleshooting suggestions

Table 6-1: Maintenance and Troubleshooting Suggestions

Symptom	Corrective actions
Device troubleshooting	
Electronics Failure	<ol style="list-style-type: none"> 1. Reset the device. 2. Reconfirm all configuration items in the device. 3. If the condition persists, replace the device.

Table 6-1: Maintenance and Troubleshooting Suggestions (continued)

Symptom	Corrective actions
Acoustics Failure	<ol style="list-style-type: none"> 1. Reset the device. 2. If the condition persists, replace the device.
Waveguide Temperature Failure	<ol style="list-style-type: none"> 1. Reset the device. 2. If the condition persists, replace the device.
Radio Failure	<ol style="list-style-type: none"> 1. Reset the device. 2. If the condition persists, replace the device.
Supply Voltage Failure	<ol style="list-style-type: none"> 1. Replace the power module. 2. If the condition persists, replace the device.
Electronics Warning	<ol style="list-style-type: none"> 1. Reset the device. 2. Reconfirm all configuration items in the device. 3. If the condition persists, replace the device.
Acoustics exceeded the limits	<ol style="list-style-type: none"> 1. Check process for possible saturation condition. 2. Reset the device. 3. If the condition persists, replace the device.
Electronics Temperature exceeded the limits	<ol style="list-style-type: none"> 1. Verify ambient temperature is within the transmitter's range. 2. Reset the device. 3. If the condition persists, replace the device.
Waveguide Temperature exceeded the limits	<ol style="list-style-type: none"> 1. Verify process temperature is within the transmitter's range. 2. Reset the device. 3. If the condition persists, replace the device.
Supply Voltage Low	<ol style="list-style-type: none"> 1. Replace the power module.
Database Memory Warning	<ol style="list-style-type: none"> 1. Reset the device. 2. Reconfirm all configuration items in the device. 3. If logging dynamic data not needed, this advisory can be safely ignored.
Simulation Active	<ol style="list-style-type: none"> 1. Verify that simulation is no longer required. 2. Disable Simulation mode in Service Tools. 3. Reset the device.
Short Battery Life	<ol style="list-style-type: none"> 1. Check that Power Always On mode is off. 2. Verify device is not installed in extreme temperatures. 3. Verify that device is not a network pinch point.

Table 6-1: Maintenance and Troubleshooting Suggestions (continued)

Symptom	Corrective actions
Configuration troubleshooting	
Cannot configure the device with Field Communicator or AMS Device Manager	<ol style="list-style-type: none"> 1. Power cycle the device. 2. Verify/replace power module. 3. Refer to AMS Wireless Configurator and/or handheld configuration tool manual for further troubleshooting.
Wireless troubleshooting	
Poor wireless connectivity	<ol style="list-style-type: none"> 1. Verify device oriented for optimal connections. 2. Verify wireless network best practices are followed (See Recommended Wireless Network Practices for more information).
Acoustic Transmitter not joining network	<ol style="list-style-type: none"> 1. Verify the device has power. 2. Verify the device is within effective communications range. 3. Verify the proper Network ID has been entered into the device. 4. See troubleshooting section of the Emerson Wireless Gateway Reference Manual for more information.
Limited Bandwidth Error	<ol style="list-style-type: none"> 1. Use the slowest acceptable update rate. 2. Increase communication paths by adding more wireless points. 3. Check that the device has been online for at least an hour. 4. Create a new network with an additional Emerson Wireless Gateway.

6.4 Opening the lid (cover)

Before opening the lid for maintenance reasons observe following items:

- Do not remove the lid while circuits are live.
- No dust deposits or whirlings are present.
- No rain can enter into the housing.

A Specifications and Reference Data

A.1 Functional specifications

A.1.1 Output

IEC 62591 (WirelessHART®) 2.4 GHz DSSS

A.1.2 Humidity limits

0–100 percent relative humidity

A.1.3 Transmit rate

User selectable one second to 60 minutes

A.1.4 Radio frequency power output from antenna

Internal (WP option) antenna: Maximum of 10 mW (10 dBm) EIRP

A.2 Physical specifications

A.2.1 Electrical connections/power module

- Replaceable, non-rechargeable, Intrinsically Safe Lithium-Thionyl Chloride power module pack with PBT/PC enclosure
- Ten year power module life at reference conditions

Note

Reference conditions are 21 °C (70 °F), transmit rate of once per minute, and routing data for three additional network devices.

A.2.2 Field Communicator connections

Communication Terminals - Clips permanently fixed to power module

A.2.3 Materials of construction

Housing

PBT/PC

Cover O-ring

Silicone

Wave guide

Machined 316L SST

A.2.4 Mounting

Transmitters are directly attached to process piping using two stainless steel mounting bands.

A.2.5 Weight

Rosemount™ 708 Acoustic Wireless Transmitter with power module - 0.595 kg (1.31 lb)
Rosemount 708 Transmitter without power module - 0.445 kg (0.98 lb)

A.2.6 Enclosure ratings

NEMA® 4X and IP66/67

A.3 Performance specifications

A.3.1 Vibration effect

Tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10–60 Hz 0.21 mm displacement peak amplitude/60–2000 Hz 3g)

A.3.2 Temperature limits

Ambient Limit: –40 to 85 °C (–40 to 185 °F)

Storage Limit: –40 to 85 °C (–40 to 185 °F)

Table A-1: Temperature Derating

Process temperature (°C)	Max ambient (°C)
260	41
240	45
220	49
200	53
180	57
160	61
140	64
120	58
100	72
85	75

Table A-2: High Temperature

Process temperature (°C)	Max ambient (°C)
550	41
520	45
490	47
460	49
430	51
400	53
370	56
340	58
310	60
280	62
260	63

A.3.3 Electromagnetic Compatibility (EMC)

All models meet all relevant requirements of EN 61326-2-3:2006.

A.4 Wireless output specifications

Acoustic level output

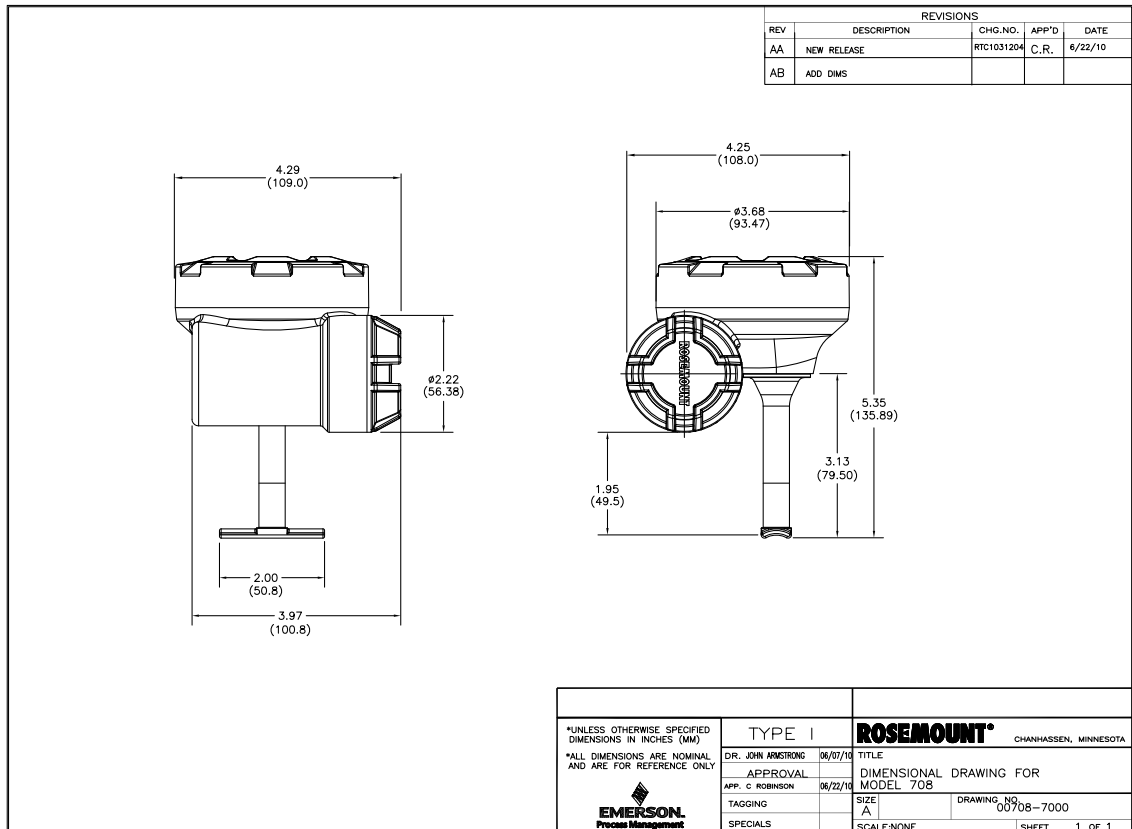
0–255 counts

Temperature output

–40 to 260 °C (–40 to 500 °F)

A.5 Dimensional drawings

Figure A-1: Rosemount 708 Transmitter Direct Mount



Dimensions are in inches (millimeters).

A.6 Ordering information

Table A-3: Rosemount 708 Acoustic Transmitter Ordering Information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description	
708	Acoustic Transmitter	★
Output protocol		
X	Wireless	★
Measurement		
1	Steam Traps with Steam Trap Monitoring Software (order with 7001X)	★
2	Other Measurements	★

Table A-3: Rosemount 708 Acoustic Transmitter Ordering Information (continued)

Housing		
P	Engineered Polymer	★
Waveguide configuration		
A1	Acoustic Waveguide	★
Product certifications		
NA	No Hazardous Location Approval	★
I1	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I5	FM Intrinsically Safe	★
I6	CSA Intrinsically Safe	★
I7	IECEX Intrinsic Safety	★
Mounting hardware		
NA00	No Mounting Hardware	★
HC01	Stainless Steel Mounting Band, Pipe size 1/2 - to 2 1/2-in.	★
HC02	Stainless Steel Mounting Band, Pipe size 3- to 4-in.	★
HC03	Stainless Steel Mounting Band, Pipe size 4- to 10-in.	★
HT01	High Temperature Stainless Steel Mounting Hardware, Pipe size 1/2 - to 2 1/2-in. (260 to 550 °C).	

Table A-4: Wireless options (include with selected model number)

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Wireless update rate, operating frequency and protocol		
WA3	User Configurable Update Rate, 2.4 GHz DSSS, IEC 62591 (WirelessHART)	★
Omni-directional wireless antenna and SmartPower™ Solutions⁽¹⁾		
WP5	Internal Antenna, Compatible with green power module (I.S. power module sold separately)	★
Configuration		
C1	Factory Configure Date, Descriptor, Message Fields and Wireless Parameters	★
Typical model number: 708 X 1 P A1 NA HC01 WA3 WP5		

⁽¹⁾ Power module must be shipped separately, order 701PGN.

B Product Certifications

Rev 2.1

B.1 European Union Directive Information

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

B.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.

B.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. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

B.4 Ordinary Location Certification

As standard, the transmitter 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).

B.5 Installing in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

B.6 USA

I5 U.S.A. Intrinsically Safe (IS)

Certificate: (FM) 3043245

Standards: FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3810 – 2005, NEMA 250 – 2003, ANSI/IEC 60529 – 2004

Markings: IS CL I, DIV 1, GP A, B, C, D T4; CL 1, Zone 0 AEx ia IIC T4; T4($-40\text{ °C} \leq T_a \leq +70\text{ °C}$) when installed per Rosemount drawing 00708-1000; Type 4X

Special Conditions for Safe Use (X):

1. The Rosemount 708 Wireless Acoustic Transmitter shall only be used with the 701PGNKF Rosemount SmartPower battery pack.
2. Potential Electrostatic charging Hazard – See instructions.

B.7 Canada

I6 Canada Intrinsically Safe

Certificate: (CSA) 2439890

Standards: CAN/CSA C22.2 No. 0-M91, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, CSA Std C22.2 No. 60529:05

Markings: I.S. CL I, DIV 1, GP A, B, C, D when installed per Rosemount drawing 00708-1001; T3C; Type 4X

B.8 Europe

I1 ATEX Intrinsic Safety

Certificate: Baseefa11ATEX0174X

Standards: EN 60079-0: 2012, EN 60079-11: 2012

Markings: Ⓢ II 1 G Ex ia IIC T4 Ga, T4 ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Conditions for Safe Use (X):

1. The plastic enclosure of the Rosemount 708 may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than $1\text{ G}\Omega$ 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.

B.9 International

I7 IECEx Intrinsic Safety

Certificate:	IECEX BAS 11.0091X
Standards:	IEC 60079-0:2011, IEC 60079-11:2011
Markings:	Ex ia IIC T4 Ga, T4(-40 °C ≤ T _a ≤ +70 °C)

Special Condition for Safe Use (X):

1. The plastic enclosure of the Rosemount 708 may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.

B.10 Brazil

I2 INMETRO Intrinsic Safety

Certificate:	UL-BR 16.0128X
Standards:	ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-11:2009
Markings:	Ex ia IIC T4 Ga, T4(-40 °C ≤ T _a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

B.11 China

I3 China Intrinsic Safety

Certificate:	GYJ13.1445X
Standards:	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings:	Ex ia IIC Ga T4, -40 ~ +70 °C

Special Condition for Safe Use (X):

1. See certificate for special conditions.

B.12 Japan

I4 TIIS Intrinsically Safe

Certificate:	TC20395
Markings:	Ex ia IIC T4 X (-20 ~ +60 °C)

B.13 EAC - Belarus, Kazakhstan, Russia

IM Technical Regulation Customs Union (EAC) Intrinsic Safety

Certificate: RU C-US.Gb05.B.00643
Markings: 0Ex ia IIC T4 Ga X
T4 ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

B.14 Korea

IP Korea Intrinsic Safety

Certificate: 13-KB4BO-0145X
Markings: Ex ia IIC T4
T4 ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

C Recommended Wireless Network Practices

Follow all recommended practices to ensure highest data reliability. Deviation from these best practices may require device repeaters in the network to maintain 99 percent data reliability. Follow these guidelines to achieve the best possible Emerson Wireless Network:

1. Scope each wireless network field to a single process unit.
2. Minimize the number of hops to the Gateway to reduce latency. Contain a minimum of five wireless instruments within effective range of the Emerson Wireless Gateway.
3. Have at least three devices with potential communication paths. For stronger performance, increase the required number of wireless neighbor devices to four or five. This increases the number of potential paths and optimizes network performance.
4. Have 25 percent of wireless instruments in the network within range of Emerson Wireless Gateway. Other enhancing modifications include creating a higher percentage of devices within effective range of the Gateway to 35 percent or more. This clusters more devices around the gateway and ensures fewer hops and more bandwidth available to WirelessHART® devices with fast scan rates.
5. Minimize the path distance from the gateway. For better performance, the path is typically within range of one or two hops. This will utilize path redundancy and create very short transit times.
6. Determine effective range by type of process unit and density of the infrastructure surrounding the network.

C.1 Effective range

Heavy Obstruction: 100 ft. (30 m)–Typical heavy density plant environment; a truck or equipment cannot be driven through this. Medium Obstruction: 250 ft. (76 m)–Typical light process areas; lots of space between equipment and infrastructure. Light Obstruction: 500 ft. (152 m)–Typical of tank farms; despite tanks being big obstructions themselves, lots of space between and above makes for good RF propagation. Line of Sight: 750 ft. (230 m)–No obstructions between WirelessHART® devices and devices mounted a minimum of 6 ft. (2 m) above ground or obstructions.

For examples and complete explanations, refer to the IEC62591 *WirelessHART System Engineering Guide*.

For more information: [Emerson.com](https://www.emerson.com)

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