

CSI 9420 Wireless Vibration Transmitter

Quick Installation Guide



Precautions

WARNING!

Explosions could result in death or serious injury:

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review the Product Certifications section for any restrictions associated with a safe installation.

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

Electrical shock can result in death or serious injury.

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

Note

This installation guide provides basic guidelines for the CSI 9420. It does not provide instructions for detailed configuration, diagnostics, maintenance, or service. Refer to the CSI 9420 Reference Manual (document number MHM-97408) for more instruction. The manual and this QIG are also available electronically on www.mhm.assetweb.com.

Note

The CSI 9420 and all other wireless devices should be installed only after the Smart Wireless Gateway has been installed and is functioning properly. Wireless devices should also be powered up in order of proximity from the Smart Wireless Gateway, beginning with the closest. This will result in a simpler and faster network installation.

Note

Shipping considerations for wireless products (Lithium Batteries):

Shipping considerations for wireless products: The unit was shipped to you without the power module installed. Please remove the power module prior to shipping the unit. 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. Please consult current regulations and requirements before shipping.

Installing the CSI 9420: Wire, Join, Configure

Topics covered in this chapter:

- *Scope*
- *CSI 9420 sensor*
- *Remote Mount*
- *Wire the CSI 9420*
- *Power the CSI 9420*
- *Provision and Join a CSI 9420 Device to a Wireless Network using AMS Device Manager*
- *Provision and Join a CSI 9420 Device to a Wireless Network using the Field Communicator*
- *Verify Operation*
- *CSI 9420 Quick Configuration with Field Communicator*
- *Troubleshooting*
- *Product Certifications*

Scope

This Quick Installation Guide applies to the 2.4 GHz *WirelessHART* version of the CSI 9420.

CSI 9420 sensor

Note

The word “sensor” applies to both an accelerometer and an accelerometer with embedded temperature. The word “accelerometer” refers to a sensor that measures only acceleration.

The CSI 9420 utilizes special low-power sensors available from Emerson. Refer to the Reference Manual for detailed sensor mounting instructions.

Remote Mount

Mounting instructions for the CSI 9420.

1. Install sensor or accelerometers according to standard sensor installation practices. Use thread sealant on all connections.

2. Run wiring (and conduit if necessary) from the sensor to the CSI 9420.
3. Pull the wiring through the threaded conduit entry of the CSI 9420. If not using conduit, use an appropriate grommet or cable-gland to provide both strain relief for the cable and environmental isolation for the CSI 9420.

Note

Prior to wiring the sensor, if you are using armor-jacketed cable, you must attach the ferrites. See [Attach Ferrites to Armor-jacketed Cable](#)

4. Attach the sensor wiring to the terminals as indicated in [Wire the CSI 9420](#).
5. Plug in the power pack module. Refer to the Reference Manual for details on other power options.
6. Close the housing cover and tighten to safety specification. Always ensure a proper seal by installing the electronics housing covers so that metal touches metal, but do not over tighten.
7. Vertically position the antenna, pointing upwards for optimal performance.

Wire the CSI 9420

Note

To maximize signal quality, tie the ground shield of the sensor/accelerometer to the ground screw in the CSI 9420. Connect the CSI 9420 housing to ground.

Note

Prior to wiring the sensor, if you are using armor-jacketed cable, you must attach the ferrites. See [Attach Ferrites to Armor-jacketed Cable](#)

Figure 1: CSI 9420 wiring with one accelerometer



Connecting One Accelerometer

Screw Terminal 1 Sensor Power Red Wire	Screw Terminal 2 Sensor Signal White Wire	Screw Terminal 3 Unused	Screw Terminal 4 Sensor Common Black Wire
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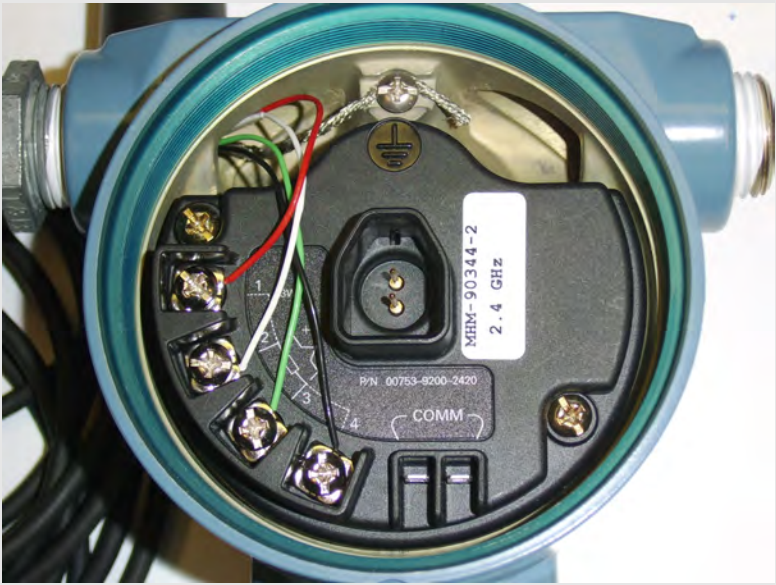
Figure 2: CSI 9420 wiring with two accelerometers



Two Accelerometers

Screw Terminal 1 Sensor Power 2 Red Wires	Screw Terminal 2 Sensor 1 Signal White Wire	Screw Terminal 3 Sensor 2 Signal White Wire	Screw Terminal 4 Sensor Common 2 Black Wires
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Figure 3: CSI 9420 wiring with one accelerometer with embedded temperature



Screw Terminal 1
Sensor Power
Red Wire

Screw Terminal 2
Vibration Signal
White Wire

Screw Terminal 3
Temperature Signal
Green Wire

Screw Terminal 4
Sensor Common
Black Wire

Note

If the device is not ready to be commissioned, you should remove the power module to extend operating life. After the sensor and network have been configured, disconnect the communication leads, remove the power module, and replace the transmitter cover. The power module should be inserted only when the device is ready to be commissioned.

Power the CSI 9420

The CSI 9420 and all other wireless devices should be installed only after the Smart Wireless Gateway has been installed and is functioning properly.

1. Remove the rear cover of the device to access the power connections. For the battery powered version, simply plug in the power module. For the externally powered version, connect a 10...28V DC (24V nominal) power supply to the bottom two screw terminals on the right (see Figure 3).
2. Pull the wiring through the threaded conduit entry.

When selecting the power supply, note that each CSI 9420 has a peak current draw of 40 mA when awake and powering sensors.

Note

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

Provision and Join a CSI 9420 Device to a Wireless Network using AMS Device Manager


Configure the Smart Wireless Gateway in the AMS Device Manager Network Configuration.

1. Connect the CSI 9420 device to the HART modem.
2. In AMS Device Manager, drag and drop the CSI 9420 on the Smart Wireless Gateway icon.

The device joins the network.

3. Using a browser, access the Smart Wireless Gateway's home page, and verify the device has a green indicator.

Example:

HART Tag	Node state	A nei
CSI-9420-SystemEng		usrtc- Rosem Lo

4. Remove the HART modem.

Provisioning will not complete until the modem is removed.

5. In Device Explorer or Device Connection view, right-click the Smart Wireless Gateway icon, and select Rebuild and Identify Hierarchy.
6. Right-click the Smart Wireless Gateway icon, and select Scan Device.

Provision and Join a CSI 9420 Device to a Wireless Network using the Field Communicator

If you are connecting a Field Communicator directly to the device, make sure you are in a location that allows you to remove the CSI 9420 cover.

1. With a Field Communicator, connect to the comm terminals on the device.
2. Close the housing cover and tighten to safety specification. Always ensure a proper seal by installing the electronics housing covers so that metal touches metal, but do not over tighten.
3. Join Device to 2.4 GHz network.

Table 1: Join CSI 9420 device to 2.4 GHz wireless network

Function	Fast Key Sequences	Menu Items
Wireless	2,2,2 (Manual Setup)	Network Identifier, Join Device to Network
Wireless	2,1,2 (Guided Setup)	Join Device to Network, Configure Publishing, Publish Rate

Verify Operation

You can verify proper operation of the CSI 9420 using several methods; the Local Operator Interface (screen) of the device, the Field Communicator, the Smart Wireless Gateway web interface, or AMS Device Manager (or other compatible HART-enabled host).

Press the DIAG button to cycle through the display of the Tag, Device ID, Network ID, Network Join Status, and Device Status screens.

To access the DIAG button, remove the front cover of the CSI 9420. Make sure the safety rating of the area allows this operation.

CSI 9420 Quick Configuration with Field Communicator

Table 2: CSI 9420 quick configuration key sequences for 2.4 GHz wireless network

Function	Fast Key Sequences	Menu Items
Initial Setup	2,1,1 (Guided Setup)	Configure Sensors, Change Variable Mapping, Change Units, Alert Limits
Device Setup	2,2,1 (Manual Setup)	Units, Sensors, Variable Mappings
Alert Setup	2,3	Dependent on sensor configuration

Troubleshooting

Are the Network ID and Join Key set correctly?

The Network ID and Join Key values in the device must match those in the Smart Wireless Gateway exactly.

The Network ID and Join Key can be found on the **Setup > Network > Settings** page of the Smart Wireless Gateway web server.

Have you disconnected your HART modem or Field Communicator after joining the Wireless network?

Disconnect your HART modem or Field Communicator immediately after joining the wireless network.

Does the device's configuration match the connected sensors?

Insure your configured parameters reflect the sensors installed on the device.

Product Certifications

The CSI 9420 has a number of certifications and approvals including CE, FCC, R&TTE, FM, CSA, and ATEX. Refer to the Reference Manual for a complete list of product certifications. The Reference Manual is included on the media that ships with the device or it may be downloaded from the web at www.mhm.assetweb.com. A printed copy of the Reference Manual (MHM-97408) may be ordered by contacting your local sales representative, or it can be printed out from the media.

Ferrite Installation

Topics covered in this appendix:

- [Additional Ferrite Installation](#)
- [Accelerometer Ferrites](#)
- [Attach Ferrites to Accelerometer Cable](#)
- [Attach Ferrites to Armor-jacketed Cable](#)

Additional Ferrite Installation

To maintain compliance with the CE directive, additional ferrites are required on any accelerometer cables that are longer than 3 meters and on the external power cable (if the external DC power option is used).

From a compliance perspective, it is not necessary to attach any additional ferrites if the cables are in ferromagnetic conduit (e.g., galvanized steel) because of the additional shielding this type of conduit provides. The conduit entry of the device is ½" NPT. If the ferrites are attached to conduit, a wider conduit (e.g., ¾" NPT or M20) is required to accommodate the ferrites, and an adapter is required at the conduit entry of the device.

Accelerometer Ferrites

All low-power sensors used with the CSI 9420 are shipped with ferrites installed at the accelerometer end. To maintain the stated performance of the accelerometer in noisy RF or electrical environments, these ferrites must not be removed.

The sensor package also contains additional ferrites which must be attached on the "transmitter" end of the cable.

Attach Ferrites to Accelerometer Cable

Cables longer than 3 meters must have ferrites attached to meet CE directives.

1. After cutting the accelerometer cable to the required length, make the standard connections to the CSI 9420 terminal block and grounding screw.

2. Snap the first of three attenuator ferrites at the location on the cable approximately 1 inch from the point where the cable enters the gland.
3. Snap the second ferrite onto the cable adjacent to the first; then snap the remaining ferrite adjacent to the second.
4. When attaching the ferrites, take care that adequate force is applied in their closure so that the keeper latches fully engage, thereby assuring the ferrites remain securely fastened to the cable.



Attach Ferrites to Armor-jacketed Cable

Cables longer than 3 meters must have ferrites attached to meet CE directives.

1. After cutting the accelerometer cable to the required length, slide the first of the three ferrites at the location on the cable approximately four inches from the point where the cable will enter the gland.
2. Secure the ferrite using wire ties, heat-shrink, or other method approved for your location.
3. Slide the second and third ferrites onto the cable adjacent to the first and secure in place. When all three ferrites are attached, they should be located about one inch from the point where the cable enters the transmitter housing.
4. Run the accelerometer cable(s) through the cable gland and make the standard connections to the CSI 9420 terminal block and grounding screw.



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