

Emerson™ Wireless 1410H Gateway and 781 Field Links



Safety messages

NOTICE

This guide provides basic guidelines for the Emerson™ Wireless 1410H Gateway. It does not provide instructions for diagnostics, maintenance, service, or troubleshooting. Refer to the Emerson Wireless Gateway 1410H Reference Manual for more information and instructions. The manuals and this guide are available electronically on Emerson.com/Rosemount.

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.

⚠ WARNING

Explosion hazard.

Do not make or break any connections to the Gateway while circuits are live unless area is known to be non-hazardous.

Explosions could result in death or serious injury.

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

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

Potential electrostatic charging hazard.

The Gateway enclosure is plastic. Use care in handling and cleaning when in explosive environments to avoid an electrostatic discharge.

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1 Wireless planning

Power up sequence

The Gateway should be installed and functioning properly before power modules are installed in any wireless field devices. Wireless field devices should also be powered up in order of proximity from the Gateway beginning with the closest. This will result in a simpler and faster network installation.

Antenna position

The 781 Field Links should be positioned vertically and be approximately 6 ft. (2 m) from large structures or buildings to allow for clear communication to other devices.

2 PC requirements

Operating system (optional software only)

- Microsoft® Windows™ Server 2008 (Standard Edition), Service Pack 2
- Windows Server 2008 R2 Standard Edition, Service Pack 1
- Windows 7 Professional, Service Pack 1
- Windows 7 Enterprise, Service Pack 1
- Windows 8 Enterprise, Service Pack 1
- Windows 10 Enterprise, Service Pack 1

Applications

Configuration of the Gateway is done through a secure web interface. Recent versions of the following browsers are supported:

- Internet Explorer®
- Chrome™ browser
- Mozilla Firefox®
- Microsoft Edge

Hard disk space

- AMS Wireless Configurator: 1.5 GB
- Gateway Setup CD: 250 MB

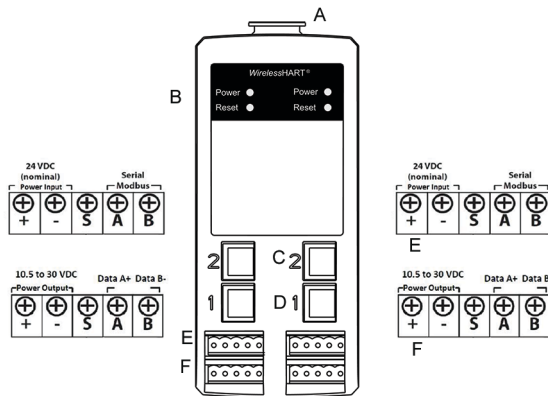
3 Initial connection and configuration

To configure the Gateway, a local connection between a PC/Mac/laptop and the Gateway needs to be established. The *WirelessHART™* networks in the Emerson 1410H are operationally equivalent and the following instructions are applicable to both.

Powering the Gateway

For both of the *WirelessHART™* networks in the 1410H, bench top power will be needed to power the Gateway by wiring a 10.5–30 VDC (20–30 VDC if a 781 is connected with I.S. barriers to the Emerson 1410D) power source, with a capacity of at least 250 mA to the power terminals.

Figure 3-1: Emerson 1410H Gateway Housing



- A. DIN Rail clip
- B. Power light. During normal operation the power indicator will be green.
- C. Ethernet port 2. When this port is activated, the factory IP address is 192.168.2.10.
- D. Ethernet port 1. Use for standard communication to the webserver or other protocols enabled on the Gateway. The factory IP address is 192.168.1.10.
- E. Emerson 1410 power and serial connection. Black terminal included in the box.
- F. Emerson Wireless 781 Field Link power and data connections. Black terminal included in the box.

3.1 Establishing a connection

Connect the PC/laptop to the Ethernet 1 (Primary) receptacle on the Gateway using an Ethernet cable. This process will have to be done for the two *WirelessHART®* networks separately. It is important that the two networks have different IP addresses if you are running two separate networks.

3.2 Windows 7

Procedure

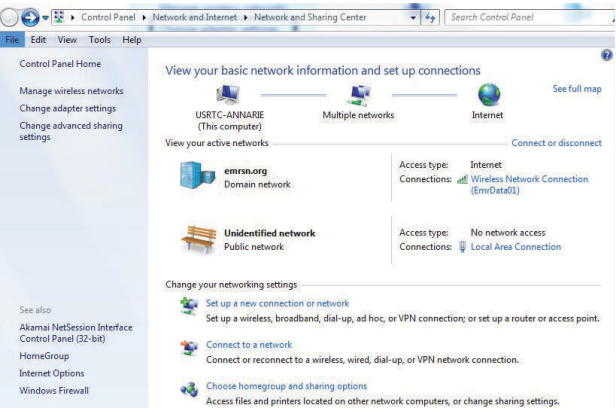
1. Click the **Internet Access** icon on the bottom right of the screen.

Figure 3-2: Internet Access



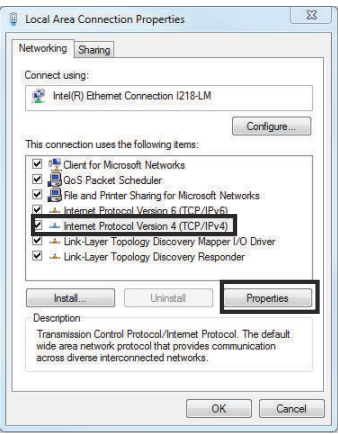
2. Select the **Network and Sharing Center**.
3. Select **Local Area Connection**.

Figure 3-3: Local Area Connection



- 4. Select Properties.
- 5. Select **Internet Protocol Version 4 (TCP/IPv4)** then select **Properties**.

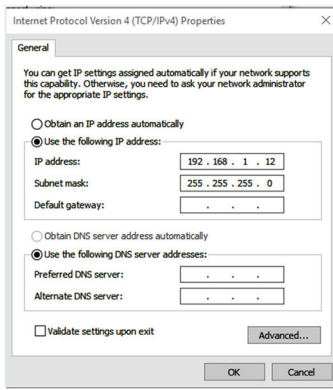
Figure 3-4: Internet Protocol Version 4 (TCP/IPv4)



Note

If the PC/laptop is from another network, record the current IP address and other settings so the PC/laptop can be returned to the original network after the Gateway has been configured.

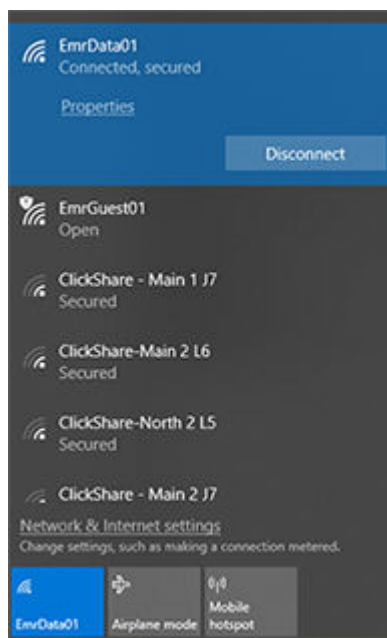
- 6. Select the **Use the following IP address** button.

Figure 3-5: IP Address

7. In the *IP address* field, enter 192.168.1.12 (DeltaV Ready enter 10.5.255.12).
8. In the *Subnet mask* field, enter 255.255.255.0.
9. Select **OK** for both the *Internet Protocol (TCP/IP) Properties* window and the *Local Area Connection Properties* window.

3.3 Windows10

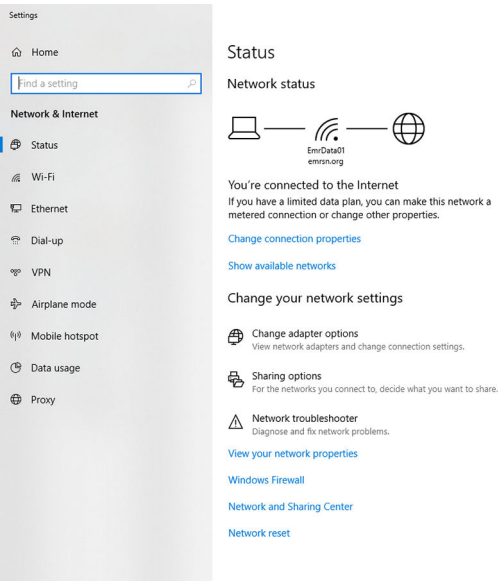
Figure 3-6: Network Settings



Procedure

1. Select the network icon in the lower right corner.
2. Select the **Network settings** link.
3. Select **Change adapter options**.

Figure 3-7: Change Adapter Options



- 4. Right click the network interface connection that the Gateway is plugged into, and click on **Properties**.
- 5. See steps 5-10 from [Windows 7](#) instructions.

Note

Connecting to the Gateway's secondary Ethernet port will require different network settings.

Table 3-1:

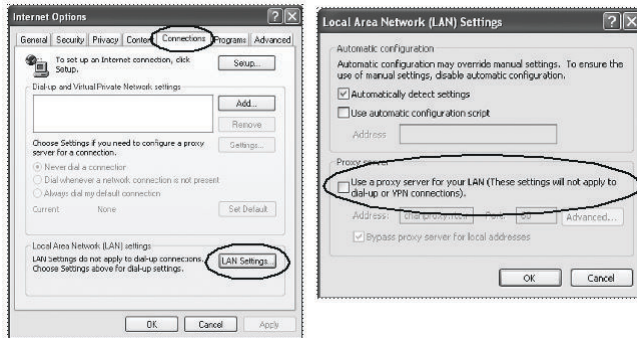
	Gateway	PC/laptop/tablet	Subnet
Ethernet 1	192.168.1.10	192.168.1.12	255.255.255.0
Ethernet 2	192.168.2.10	192.168.2.12	255.255.255.0

3.4 Disable proxies

Procedure

- 1. Open web browser.
- 2. Navigate Tools >Internet Options > Connections > LAN Settings (may be a different process for other browsers).
- 3. Under Proxy server, uncheck the Use a proxy server... box.

Example



3.5 Configure the Gateway

To complete initial configuration for the Gateway, follow the steps below. This will have to be done be done for both networks.

Procedure

1. Access the default web page for the Gateway at <https://192.168.1.10>
 - a) Log on as Username: admin
 - b) Type in password: default

Example

Unlock?

Please enter your password to unlock this section.

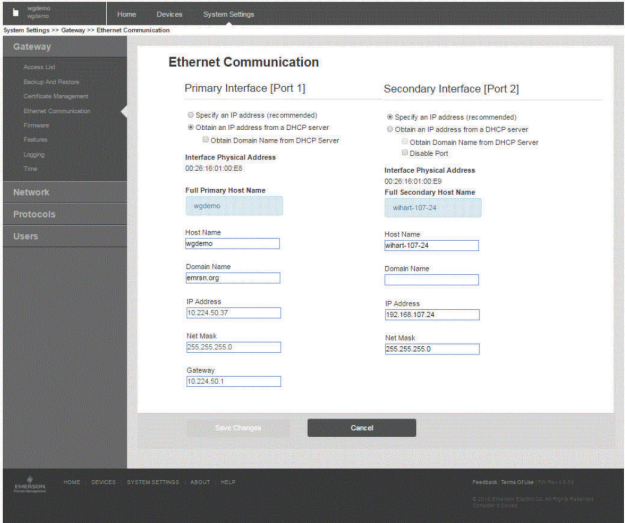
Username

Password

Do not attempt to log on unless you are an authorized user. Unauthorized access will be prosecuted to the fullest extent of the law.

2. Navigate to *System Settings > Gateway > Ethernet Communication* to enter the Network Settings.
 - a) Configure a static IP Address or set for DHCP and enter a Hostname.

Example



- 3. Restart application at *System Settings > Gateway > Backup and Restore > Restart Apps.*

Note

Resetting applications will temporarily disable communications with field devices.

- 4. Disconnect the power and Ethernet cable from the Gateway.

4 Physical installation

4.1 Emerson 1410H mounting

The unit can be snapped onto a DIN TS35/7.5 or TS35/15 rail system. To clip the unit onto the DIN rail, see [Figure 4-1](#).

Procedure

1. Push the DIN rail lever downwards so the spring compresses, and hold.
2. While holding the lever downwards, place the Gateway so it rests the top lip of the bigger chassis on the DIN rail.
3. Release the DIN rail lever, and make sure the Gateway is secured.

Figure 4-1: Installing the Emerson 1410H



-
4. To remove the unit, press the DIN rail lever, and hold while pulling the bottom half of the Gateway from the DIN rail.
 5. Release the lever, and lift the Gateway away from the DIN rail.
 6. To remove the unit, press the DIN rail lever, and hold while pulling the bottom half of the gateway form the DIN rail.
 7. Release the lever, and lift the Gateway away from the DIN rail.

NOTICE

When mounting the unit in an electrical enclosure or other location, comply with the appropriate local and national installation codes. Verify that the installer, associated hardware, and installation equipment used have the proper certifications for the specific type of installation being performed. Before installation, verify if local codes require a permit and/or an inspection before energizing. When planning the installation, account for routing the antenna cable within the enclosure.

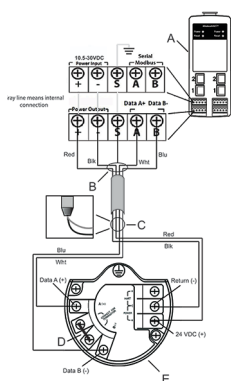
4.2 Connecting the Emerson 1410H with 781 Field Links

There are two main connection configurations for the Emerson 1410H and 781 Field Links: with and without barriers. The location and hazardous approval option of the Emerson 781s determine whether it needs to be installed with barriers. This connection will have to be done for both networks.

4.3 Installation without barriers

A shielded twisted-pair cable is needed for connecting the Emerson 1410H and 781 Field Links. Each Emerson 781 can be located up to 656 ft. (200m) from the Emerson 1410H. This will need to be done twice for the two networks.

Figure 4-2: Emerson 1410H and 781 Field Links without Barriers Installation



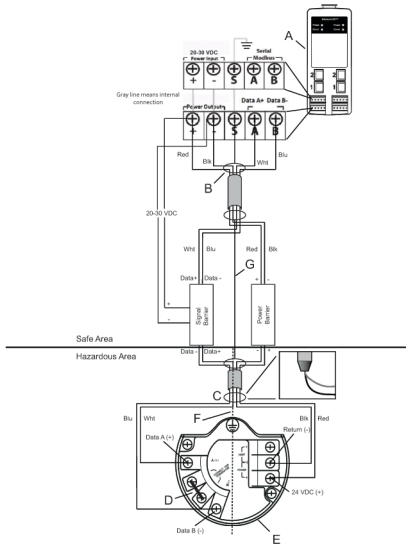
- A. Emerson Wireless 1410H Gateway
- B. Attach shield pair cable (Belden 3084A or equivalent)
- C. Tape back shield wire and foils
- D. Short these terminal for a 250Ω terminating resistor
- E. Emerson Wireless 781 Field Link

4.4 Installation with barriers

When installing the Emerson 781 in a hazardous area there are two I.S. barriers that need to be installed: a power barrier and a signal barrier. The signal and the power are two separate I.S. circuits so they must comply with proper I.S. segregation distance. When using the Emerson recommended barriers the individual input powers of the Gateway should be 20–30 VDC, with current capacity of at least 330 mA per 781. If one power supply is used, the current capacity needs to be at least 660 mA.

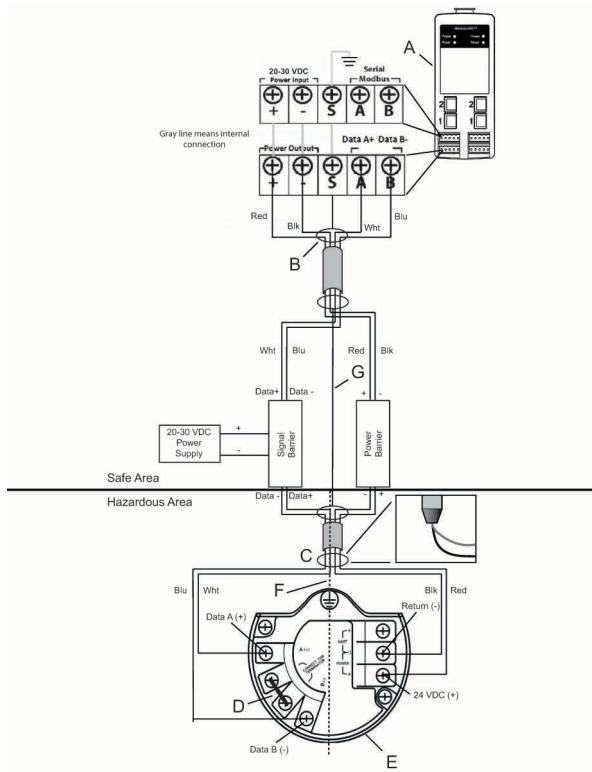
The signal barrier needs additional power. You can wire it to the Emerson 1410H terminals or to a separate power supply. Make sure power supply is rated to handle power drawn for the barrier. [Figure 4-3](#) and [Figure 4-4](#) show the two variations of powering the signal barrier.

Figure 4-3: Emerson 1410H and 781 with Gateway Powered Barrier Installation



- A. Emerson Wireless 1410H Gateway
- B. Attach shield pair cable (Belden 3084A)
- C. Tape back shield wire and foils
- D. Short these terminals for 250Ω
- E. Emerson Wireless 781 Field Link
- F. I.S. segregation

Figure 4-4: Emerson 1410H and 781 with Additional Power Supplied Barrier Installation



- A. Emerson Wireless 1410H Gateway
- B. Attach shield pair cable (Belden 3083A)
- C. Tape back shield wire and foils
- D. Short these terminals for 250Ω
- E. Emerson Wireless 781 Field Link
- F. I.S. segregation

Recommendation

Signal barrier

- GM-International D1016S

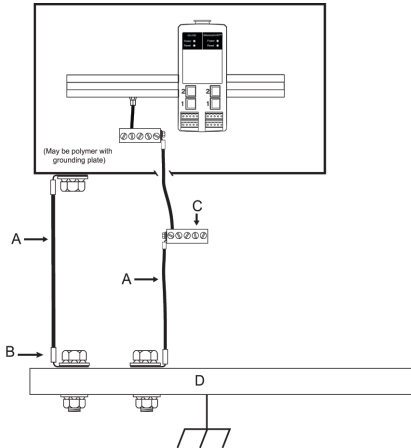
Power barrier

- Stahl 9176 10-16-00

4.5 Shield grounding

The shields of the twisted-pair cables need to be grounded using the grounding terminal on the Emerson 1410H, and it should be taped back on the Emerson 781 side.

Figure 4-5: Emerson 1410H Grounding

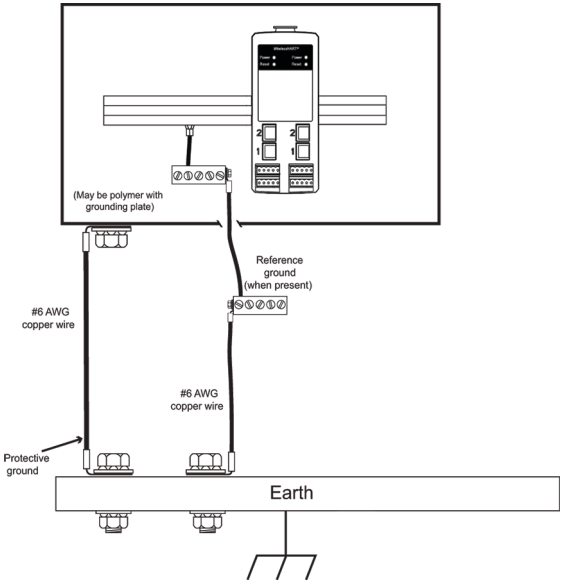


- A. #6 AWG copper wire
- B. Protective ground
- C. Reference ground (when present)
- D. Earth

4.6 Emerson 1410H grounding

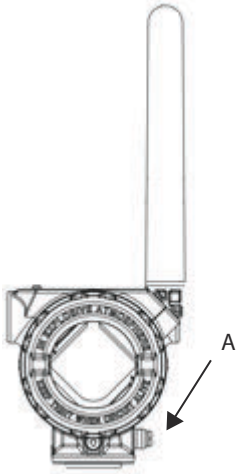
The Emerson 1410H DIN rail cabinet must be grounded as well. A #6 AWG (4.11 mm European) copper wire bonding connector with the shortest length possible, no sharp bends, and no coiling is recommended.

Figure 4-6: Emerson 1410H Grounding



4.7 Emerson 781 grounding

Grounding of the electronics enclosure should be done in accordance with local and national installation codes. Grounding is accomplished through the external case grounding terminal.



A. Grounding lug

4.8 Terminating resistors

Three DIP switches are provided to enable various terminating resistors to the RS-485 data bus. The switches are found inside the electronics housing, located behind an access slot on the upper right side. The switches number bottom to top 1 through 3 and the upward position is ON.

4.9 Connect to the host system

Procedure

1. Wire the Gateway's Ethernet 1 (Primary) or Serial Output connection to the Host System Network or Serial I/O (see Figure 1 and Figure 2 for hardware drawings). This will have to be done for both networks. You can route the networks to different locations if necessary.
2. For serial connections, make sure all terminations are clean and secure to avoid wiring connection problems.

4.10 Best practice

Twisted shielded pair cable is generally used to wire the serial connection, and it is standard practice to ground the shield on the serial host side leaving the shield floating on the Gateway side. Insulate the shield to avoid grounding issues.

In accordance with Emerson *WirelessHART*® security guidelines ([Emerson Wireless Security Whitepaper](#)), the Gateway should be connected to the Host System via a LAN (Local Area Network) and not a WAN (Wide Area Network).

5 Software installation (optional)

The 2-disk software pack contains the Security Setup Utility (only required for secure host connections or OPC communications) and AMS Wireless Configurator. The Security Setup Utility is located on Disk 1. To install the software:

Procedure

1. Exit/close all Windows programs, including any running in the background, such as virus scan software.
2. Insert Disk 1 into the CD/DVD drive of the PC.
3. If the setup program does not appear, go into the disc's file and run **autorun.exe**.
4. Follow the prompts.

AMS Wireless Configurator is located on Disk 2. To install the software:

5. Exit/close all Windows programs, including any running in the background, such as virus scan software.
6. Insert Disk 2 into the CD/DVD drive of the PC.
7. Select **Install** from the menu when the AMS Wireless Configurator setup begins.
8. Follow the prompts.
9. Allow AMS Wireless Configurator to reboot PC.
10. Do not remove the disk from the CD/DVD drive.
11. Installation will resume automatically after login.
12. Follow the prompts.

Note

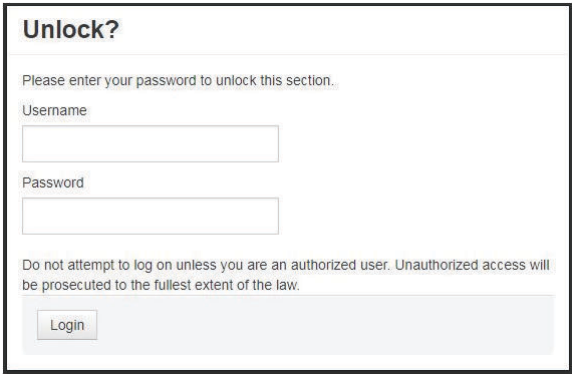
If the autorun function is disabled on the PC, or installation does not begin automatically, double click D:\SETUP.EXE (where D is the CD/DVD drive on the PC) and select **OK**.

For more information about the Security Setup Utility and AMS Wireless Configurator, see the Emerson 1410H Gateway and 781 Field Links Reference Manual.

6 Verify operations

Operation is verified through the web interface by opening a web browser from any PC on the host system network and entering the Gateway IP address or DHCP host name in the address bar. If the Gateway has been connected and configured properly, the security alert will be displayed followed by the log in screen. This will need to be done for both networks.

Figure 6-1: Gateway Log In Screen

The image is a screenshot of a web-based login interface. At the top, the heading "Unlock?" is displayed in a bold, black font. Below this heading, a message reads: "Please enter your password to unlock this section." There are two input fields: the first is labeled "Username" and the second is labeled "Password". Below these fields, a warning message states: "Do not attempt to log on unless you are an authorized user. Unauthorized access will be prosecuted to the fullest extent of the law." At the bottom of the form, there is a button labeled "Login". The entire form is enclosed in a thin black border.

The Gateway is now ready to be integrated into the host system. Make sure the field devices to be used with each network have the Network ID and Join Key that is on the Gateway (found on the Network Setting page). Once the field devices are powered, they will appear on the wireless network and communications can be verified under the Explore tab using the web interface. The time needed for the network to form will depend on the number of devices.

7 Product certifications

7.1 Emerson 1410H Product Certifications

Rev. 2.0

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at Emerson.com/Rosemount.

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

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.

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).

Installing Equipment 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.

USA

N5 U.S.A. Division 2

Certificate CSA 2646342

Standards ANSI/ISA-12.12.01-2012 UL 61010-1

Markings NI CL 1, DIV 2, GP A, B, C, D T4; Suitable for use in CL II, III, DIV 2, GP F, G T4; T4($-40^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$);

Special Conditions for Safe Use (X):

1. When installed as Division 2 equipment, the Model 1410 Smart Wireless Gateway shall be mounted within a tool-secured enclosure which meets the requirements of ANSI/ISA 61010-1 and be capable of accepting the applicable wiring methods per the NEC.

Canada

N6 Canada Division 2

Certificate 2646342 (CSA)

Standards CAN/CSA C22.2 No. 0-10, CSA C22.2 No. 213-M1987 (R2013), CSA C22.2 No. 61010-1 – 2012, ANSI/ISA-12.12.01 – 2012, UL61010-1, 3rd Edition

Markings Suitable for CL I, DIV 2, GP A, B, C, D; T4 ($-40^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)

- Shall be powered by a class 2 power supply.
- Suitable for dry indoor locations only.
- Equipment must be installed in a suitable tool accessible enclosure subject to the end use application.
- Using the 1410H and the 781 Field Links in a hazardous location requires barriers between the two units.

Europe

N1 ATEX Type n

Certificate Baseefa14ATEX0125X

Standards EN 60079-0: 2012, EN 60079-15: 2010

Markings II 3 G Ex nA IIC T4 Gc, T4($-40^{\circ}\text{C} \leq T_a \leq +75^{\circ}\text{C}$), $V_{MAX} = 30\text{Vdc}$

Special Conditions for Safe Use (X):

1. The equipment must be installed in an area of not more than Pollution Degree 2 as defined in IEC 60664-1, and in an enclosure that provides a degree of protection of at least IP54 and meets the relevant requirements of EN 60079-0 and EN 60079-15.

2. External connections to the equipment must not be inserted or removed unless either the area in which the equipment is installed is known to be non-hazardous, or the circuits connected have been de-energised.

3. The equipment is not capable of withstanding the 500V electrical strength test as defined in clause 6.5.1 of EN 60079-15: 2010. This must be taken into account during installation.
4. When fitted, the surface resistivity of the remote antenna is greater than 1G. To avoid electrostatic charge build up, it must not be rubbed with a dry cloth or cleaned with solvents.

International

N7 IECEx Type n

Certificate IECEx BAS 14.0067X

Standards IEC 60079-0: 2011, IEC 60079-15: 2010

Markings Ex nA IIC T4 Gc, T4(-40 °C ≤ Ta ≤ +75 °C), V_{MAX} = 30Vdc

Special Conditions for Safe Use (X):




1. The equipment must be installed in an area of not more than Pollution Degree 2 as defined in IEC 60664-1, and in an enclosure that provides a degree of protection of at least IP54 and meets the relevant requirements of EN 60079-0 and EN 60079-15.
 2. External connections to the equipment must not be inserted or removed unless either the area in which the equipment is installed is known to be nonhazardous, or the circuits connected have been de-energised.
 3. The equipment is not capable of withstanding the 500V electrical strength test as defined in clause 6.5.1 of EN 60059-15: 2010. This must be taken into account during installation.
 4. When fitted, the surface resistivity of the remote antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed with a dry cloth or cleaned with solvents.
- Currently not available for 1410H option.



Quick Start Guide
00825-0300-4410, Rev. AA
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