Rosemount™ ET210 Wireless Corrosion Transmitter
NOTICE

This guide provides basic guidelines for Rosemount Wireless Corrosion Transmitter. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting or intrinsically safe (I.S.) installations. Refer to the Rosemount Wireless Corrosion Transmitter Reference Manual for more instruction. The manual and this guide are also available electronically on EmersonProcess.com/Rosemount.

Shipping considerations
Each device contains two "D" size primary lithium-thionyl chloride battery cells. 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

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. Review the approvals section of this manual for any restrictions associated with a safe installation.
Before connecting a CC21 in an explosive atmosphere, make sure the instruments in the segment are installed in accordance with intrinsically safe or non-incendive field wiring practices.

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 (8 in.) from all persons.

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 on the wireless device. Care must be taken during transportation to and from the point of installation to prevent a potential electrostatic charging hazard.

Polymer enclosure has surface resistivity greater than one gigaohm. Care must be taken during transportation to and from the point of installation to prevent a potential electrostatic charging hazard.

⚠️ 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.
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1 Overview

Figure 1-1: Rosemount ET210 Wireless Corrosion Transmitter

A. Antenna
B. Power module
C. Head
D. Lanyard hole
E. Strap slot
F. Foot
G. Cap
H. Shoe
1.1 Required equipment - IK220

1.2 Required tooling

Tooling is supplied in the Permasense IK220 Installation Kit:

- Hex key, 2.5mm, for power module retaining bolts
- Strap tightening tool - HCL SM-FT-2000

1.3 What's in the box

- Permasense ET210 sensor, complete with protective cap
- Lanyard kit, 316 stainless steel lanyard 6.5ft. (2m) in length, Gripple No.2, release key
- Silicone rubber shoe
- Strap kit, comprising polymer strap and buckle
- Permasense BP20E power module
- M3 x 16mm stainless steel retaining bolts, two per sensor
2 Wireless considerations

Power up sequence

The Emerson Smart Wireless Gateway should be installed and functioning properly before any wireless devices are powered. Commission the Rosemount ET210 and install the BP20E power module to power the device only (following instructions below) after the gateway has been installed and functioning. This results in a simpler and faster network installation. Enabling active advertising on the Gateway ensures new devices are able to join the network faster. For more information see the Smart Wireless Gateway Manual (document number 00809-0200-4420).

Antenna position

The antenna is internal to the ET210 transmitter. The antenna should also be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.
3 Field communicator connections

The CC21 commissioning cable is connected and removed from the transmitter in the same way as BP20E power module. The USB connector is plugged in to the tablet PC as shown in Figure 3-1.

Figure 3-1: IK220 Commissioning Kit

A. Tablet PC  
B. CC21  
C. USB cable plugged into USB port  
D. WT210/ET210 sensor
4 Physical installation

4.1 Mounting the sensor

Procedure

1. Identify the location where the sensor should be fixed. Clean the area where the sensor will touch the pipe, mainly to remove any particles which might keep the transducer away from the pipe surface or damage the face of the transducer. Use a permanent marker to show exactly where each sensor is to be placed.

2. Remove the protective cap from the sensor. Ensure tools and fastenings are kept away from the sensor when the cap is removed. Ensure the metal ring and the rubber shoe are fitted before installing the sensor. If either part is missing, do not proceed with the installation.

3. Place the sensor in the required location on the pipe.

Note
The magnets used in the sensors have a high pull force. To avoid damage, and to get the precise location for each sensor, put the sensor at an angle to the pipe and then gently lower the shoe onto the pipe.

4. Cut the strap to a suitable length. This will depend on the diameter of the pipe. If the diameter of the pipe is \(D\) cm / inches, the length can be approximated by \(3 \times (D + 10)\) cm (or \(3 \times (D + 4)\) inches).
5. Attach a buckle to one end of the strap. Ensure the strap teeth are on the outside of the strap, and are fully engaged with the buckle.

![Buckle Image]

**Note**
A small flat screwdriver can be used to disengage the buckle, if required.

6. Slide the strap through the sensor(s), pass the strap through the buckle. Where possible position the buckle opposite the middle sensor to ensure both sides of the strap are tightened evenly.

![Strap Through Buckle Image]

7. Tighten the strap by hand to gently hold the sensor in place. If necessary, adjust the position of the sensor to ensure correct alignment around the circumference of the pipe. With multiple sensors on a strap, there should be a gap between the shoes of adjacent sensors.

8. Prepare the lanyard kit and decide how it will be positioned. Wrap the lanyard around the circumference of the pipe. The 7 ft. (2m) length will accommodate a maximum diameter of 24 in. When it is not possible to wrap the lanyard around a pipe, find an alternative attachment point for the lanyard.

9. Thread the bare end of the wire through the loop in the lanyard to secure it to the pipe.

![Wire Through Loop Image]

10. Feed the bare end of the lanyard into the ‘gripple’ and push the ‘gripple’ 6 in. (15 cm) up from the bare end.
11. Feed the bare end through the lanyard hole in each sensor and then into the return hole of the ‘gripple’.

**Note**
The wire can be released from the ‘gripple’ using the release key.
5 Commissioning device

5.1 Provisioning wireless network

For instructions on how to re-provision and re-install the sensor, refer to the ET210 Reference Manual.

Procedure

1. Power up the rugged tablet PC and connect the CC21.
2. Double-click the Permasense ET210 installation app desktop icon. Within ~10 seconds, the Permasense installation tool software should open.
3. Attach the CC21 to the sensor.
4. In the ET210 installation app software:
   a. The sensor ID and MAC address of the sensor should be displayed at the top of the screen within 10 seconds.
   b. Select the Provision tab.
   c. Enter the five-digit network ID and the 32 hexadecimal (numbers 0-9 and letters A-F) join key.
   d. Click the Provision button. Confirmation is given when provisioning is complete.
   e. Check in the Network Discovery panel to confirm that the sensor can hear a device with the network ID you wish the sensor to join.

Note
Joining the device to the network could take several minutes.

Figure 5-1: Install Tool
5.2 Completing sensor installation

Complete the following in the ET210 installation app software on the Installation tab:

**Procedure**

1. Press the Start button. Wait for an Ultrasonic waveform to download from the sensor.

   **Note**
   Waveforms are automatically downloaded every 10 seconds. When a new waveform arrives, the lines briefly become thicker.

2. Check the quality of the waveform. The first one or two reflections must be well defined above the noise in the signal. Only one reflection is needed to calculate a thickness. If the signal is poor, move the sensor to a slightly different position.

3. Check the measured thickness displayed is inline with expectations.

4. Tighten the strap using the tensioning tool provided so that the rubber shoe is compressed slightly and the sensor is held in place securely. On small diameter pipes the curved part of the shoe should touch the pipe. Overtightening the strap will deform the shoe and could damage the sensor.

   **Note**
   For the same tension in the strap, more force is exerted on the shoe on smaller diameter pipes.

5. Wait for a new waveform to display and check the ultrasonic waveform quality is still good after tightening the strap.

6. Press the Complete button. Verify that the Install State is Off and Installed is ticked in the footer of the application.

7. Remove the CC21 and fit the power module, tightening the two power module retaining bolts. When the power module is fitted, the sensor will restart and try to join the WirelessHART® gateway.
large network of 100 sensors this can often take 2 hours, and sometimes up to 6 hours.

8. Sensor installation is complete.
6  **Product certifications**

Rev: 0.1

6.1  **European 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.

6.2  **Telecommunications Compliance**

All wireless devices require certification to ensure 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.

6.3  **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.

6.4  **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).

6.5  **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.

6.6  **Product certifications**

**USA**

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

**Certificate:** SGSNA/17/SUW/00281
Markings: CLASS I, DIV 1, GP ABCD, T4, Tamb = -50 °C to +75 °C, IP67

Europe
I1 ATEX Intrinsically Safe (IS)
Certificate: Baseefa15ATEX0146X Issue 3
Standards: EN IEC 60079-0:2018
       EN 60079-11: 2012
Markings: Ex ia IIC T4 Ga, Tamb = -50 °C to +75 °C, IP67
Specific conditions for safe use (X):
1. The plastic mounting foot may present a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. When fitted with the appropriate high-temperature mounting foot, the equipment may be attached to process pipework at a temperature of up to 120 °C.
3. The enclosure may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.

International
I7 IECEx Intrinsically Safe (IS)
Certificate: BAS 15.0098X Issue 5
Markings: Ex ia IIC T4 Ga, Tamb = -50 °C to +75 °C, IP67
Specific conditions for safe use (X):
1. The plastic mounting foot may present a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. When fitted with the appropriate high-temperature mounting foot, the equipment may be attached to process pipework at a temperature of up to 120 °C.
3. The enclosure may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.
6.7 Declaration of Conformity

Figure 6-1: Declaration of Conformity

EU Declaration of Conformity

We, Permasense Ltd
Alexandra House
Newton Road
Manor Royal
Crawley
RH10 9TT
UK

declare under our sole responsibility that the product,
ET210 wireless corrosion transmitter

is in conformity with the relevant Union harmonisation legislation:

Electromagnetic compatibility directive (EMC) 2014/30/EU
Radio equipment directive (RED) 2014/53/EU
Equipment for explosive atmospheres directive (ATEX) 2014/34/EU

The following harmonised standards and reference standards have been applied:


RED: EN 300 328 v2.1.1
EN 301 489-1 v1.9.2:2011 in accordance with EN 301 489-17 v2.2.1:2012
with reference to:
EN 61000-4-2:2009
EN 61010-1:2010

ATEX: EN IEC 60079-0:2018
EN 60079-11:2012

ATEX notified body:
SGS Baseefa Ltd (notified body number 1180) performed an EU-type examination and issued certificate number Baseefa15ATEX0146X
with coding Ⅲ ll G, Ex ia IIIC T4 Ga

ATEX notified body for quality assurance:
SGS Baseefa Ltd (notified body number 1180)

Signed for and on behalf of Permasense Ltd.

Dr Jonathan Allin – Chief Technical Officer
Crawley, UK – 1 May 2019
6.8 China RoHS

China RoHS 2 - Chinese order No. 32, 2016: administrative measures for the restriction of hazardous substances in electrical and electronic equipment

As a strategic business unit of Emerson Electric Co., St. Louis, Missouri and part of Emerson Process Management (“Emerson”), is aware of and has a program to meet its relevant obligations of the Chinese Order No. 32, 2016: Administrative Measures for the Restriction of Hazardous Substances in Electrical and Electronic Equipment (China RoHS 2), which entered into force on 1 July 2016.

Emerson understands there are numerous requirements with the regulation regarding, among others, marking of product and communications for purpose of the Phase I implementation of China RoHS 2. As a supplier of electrical and electronic equipment, Emerson has determined that the captioned product supplied to your company is within scope of China RoHS 2.

According to the information provided by suppliers and to Emerson’s best knowledge, the following China RoHS substances are present at a concentration above the Maximum Concentration Values (“MCVs”), have been identified in the following parts, and the product is marked to reflect this.

<table>
<thead>
<tr>
<th>Component</th>
<th>Lead (Pb)</th>
<th>Mercury (Hg)</th>
<th>Cadmium (Cd)</th>
<th>Hexavalent Chromium (Cr+6)</th>
<th>Polybrominated biphenyls (PBB)</th>
<th>Polybrominated diphenyl ethers (PBDE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor assembly</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

This table is prepared in accordance with the Provision of SB/T 10464, and this information is subject to change. O: Indicates that said hazardous substance is not the hazardous material for this part is below the limit requirement of GB/T 24672. X: Indicates that said hazardous substance is not the hazardous material for this part is above the limit requirement of GB/T 24672.