Product Data Sheet
00813-0100-4211, Rev BB
March 2022

Rosemount™ Wireless Permasense ET210 Corrosion Transmitter

Rosemount Wireless Permasense Sensors provide direct measurement of wall thickness, the most accurate indication of asset integrity. The transmitter utilizes patented signal processing to handle internal surface roughness caused by some corrosion mechanisms and best-in-class material and temperature compensation. These features combine to offer industry-leading measurement repeatability and sensitivity in field conditions.

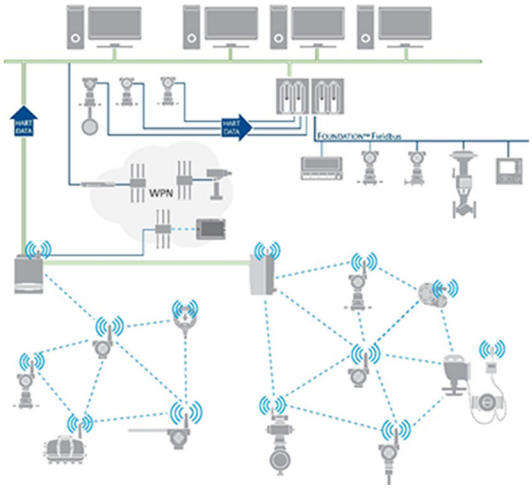
- Simple to deploy and maintain, being non-intrusive with wireless data delivery
- Provides facilities with continuous corrosion and erosion monitoring for improved decision making
- Uses unique ultrasonic technology enabling ultra-fast installation and measurement through external coatings
- *Wireless*HART® technology ensures reliable, robust, and secure data retrieval from the plant devices to a remote office location

Emerson's Wireless solution

IEC 62591 (*Wireless*HART®) ... the industry standard

Self-organizing, adaptive mesh routing

- Backed by Emerson's proven experience in Wireless field instrumentation and expert technical support.
- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, data will continue to flow because the device has other established paths.



Reliable wireless architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 15 radio-channels
- Time Synchronized Channel Hopping
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

Emerson's Wireless

- Seamless integration to all existing host systems
- Native integration into DeltaV™ and Ovation™ is transparent and seamless
- Gateways interface with existing host systems using industry standard protocols including OPC, Modbus® TCP/IP, Modbus RTU, and EtherNet/IP™

Layered security keeps your network safe

- Ensures data transmissions are received only by the wireless Gateway.
- Network devices implement industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management.
- Third party security verification including Achilles and FIPS197, with password strength monitoring, user-based log in, password reset requirements, automatic lockout, password expiration requirements.

Contents

Rosemount Wireless Permasense ET210 Corrosion Transmitter

Corrosion and erosion monitoring

- Reliably detects thinning wall thickness in piping through external coatings using an ultrasonic sensor.
- May be used on metal with continuous service temperatures up to 248 °F (120 °C).

Reliable data in challenging environments

- Plantweb Insight software application provides long term pipe thickness status and trending, allowing for proactive maintenance with actionable alerts based on pipe condition.
- Built-in thermocouple monitors pipe surface temperature and allows compensation in the thickness measurement for the most reliable measurement, even in high temperature environments.

Mounting flexibility

- Directly mount to process piping without cutting pipes or changing pipe configurations - allowing for a flexible installation.
- Magnetic design with a stabilization strap means deployment is safe and easy in challenging locations.

Reliable transmitter performance

- Rugged and robust design of the transmitter ensures reliable performance in harsh environments.
- *Wireless*HART® creates a self-forming and self- managing wireless mesh, delivering continuous wall thickness measurements of the highest integrity and accuracy.

Ordering information

Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our website to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

Specifications and options

See the Specifications and options section for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See the Material selection section for more information.

Optimizing lead time

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.

Required model components

Model

Code	Description	
ET210	Rosemount Wireless Permasense Corrosion Transmitter	★

Transmitter output

Code	Description	
X	Wireless	★

Measurement type

Code	Description	
1	Insight	★

Product certifications

Code	Description	
NA	No approval	★
I1	ATEX Intrinsic Safety	★
I5	USA Intrinsically Safe	★
I6	Canada Intrinsically Safe	★
I7	IECEx Intrinsic Safety	★

Code	Description	
I2	Brazil Intrinsic Safety	★
I3	China Intrinsic Safety	★
I4	Japan Intrinsic Safety	★
IM	EAC Intrinsic Safety	★
IP	Korea Intrinsic Safety	★

Wireless update rate, operating frequency and protocol

Code	Description	
WA3	User configurable update rate, 2.4 GHz, *Wireless*HART®	★

Omni-directional wireless antenna and SmartPower™ solutions

Code	Description	
WP6	Internal antenna, compatible with Corrosion Power Module (Standard Power Module included)	★

Spare parts and accessories

Part number	Description	
BP20E-5100-0001	BP20E Power Module, SGSus-c	★
BP20E-5100-0002	BP20E Power Module, ATEX, IECEx	★
BP20E-5100-0003	BP20E Power Module, EAC EX	
BP20E-5100-0004	BP20E Power Module, Japan	
BP20E-5100-0005	BP20E Power Module, Brazil	
BP20E-5100-0006	BP20E Power Module, Korea	
BP20E-5100-0007	BP20E Power Module, China	
IK220-2000-0101	Commissioning kit (SGSus-c)	
IK220-2000-0102	Commissioning kit (ATEX, IECEx, IA)	
IK220-2000-0103	Commissioning kit (EAC)	
IK220-2000-0104	Commissioning kit (CML)	
IK220-2000-0105	Commissioning Kit (Brazil)	
IK220-2000-0107	Commissioning Kit (China)	

Specifications

Functional specifications

Output

IEC 62591 (*Wireless*HART®) 2.4 GHz

Humidity limits

0-100 percent relative humidity

Transmit rate

Every 12 hours by default

Radio frequency power output from antenna

Internal (WP option) antenna: Less than 10 mW (10 dBm) EIRP

Thickness measurement

Measurement repeatability: 0.0004-in. (10 μm)(1)

Resolution: 0.00004-in. (1μm)(2)

Surface temperature

Accuracy: 18 °F (10 °C)

Repeatability: within 4 °F (2 °C)

Physical specifications

Pipe diameter

Minimum NPS 2 (nominal 2-in. pipe) on straight pipe or outside of an elbow

Wall thickness	Minimum: 0.16-in. (4 mm) Maximum(3): 3.94-in. (100 mm)
Compatible pipe materials:	Carbon steel Duplex stainless steel Super duplex stainless steel
External coating thickness:	Maximum .040-in. (1 mm)
Compatible external coating materials:	Common coatings, including zinc coatings, etc. Consult factory for special coating compatibility

(1) Repeatability is defined as the standard deviation of repeated thickness measurements at a location experiencing no metal loss and at constant temperature over the measurements.
(2) Resolution is defined as the resolution of the thickness measurement stored in the software.
(3) For wall thickness greater than 2-in. (50 mm), parameter adjustment at installation is required.

Material selection

Emerson provides a variety of Rosemount products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product materials, options, and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product options, configuration, or materials of construction selected.

Electrical connections/power module

- Replaceable, non-rechargeable, Intrinsically Safe lithium-thionyl chloride power module
- Nine-year power module life at reference conditions with BP20E module(4)

Field Communicator connections

Commission the ET210 using CC21 with BP20E not installed

Materials of construction

Transmitter housing:	PBT/PC
Power module housing:	PBT/PC

Sensor type

Single electro-magnetic acoustic transducer (no couplant required)

Mounting

Transmitters are directly attached to process piping a magnetic foot. A 3 ft. (0.91 m) strap is included to secure the sensor to the pipe.

Weight

Rosemount ET210 with BP20E power module:	1.8 lb. (805 g)
Rosemount ET210 without BP20E power module:	1 lb. (450 g)

Enclosure ratings

IP67(5)

Performance specifications

Temperature limits

Ambient limit:	–40 to 167 °F (–40 to 75 °C)
Storage limit:	–58 to 167 °F (–50 to 75 °C)

Application continuous temperature: up to 248 °F (up to 120 °C)

Electro Magnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326-1: 2013

(4) Reference conditions are 68 °F (20 °C), transmit rate of 12 hours, and routing data for three additional network devices.
(5) When mated to the power module.

Wireless output specifications

Range

Up to 160 ft. (50 m) line of sight

Product certifications

Rev 0.1

European Directive information

A copy of the EU Declaration of Conformity can be found at the end of this guide. The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount.

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.

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 FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

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

I5 USA Intrinsically Safe (IS)

Certificate:	SGSNA/17/SUW/00281
Standards:	UL 913 - 8th Edition, Revision Dec 6 2013
Markings:	CLASS I, DIV 1, GP ABCD, T4, Tamb = -50 °C to +75 °C, IP67

Canada

I6 Canada Intrinsically Safe (IS)

Certificate:	SGSNA/17/SUW/00281
Standards:	CAN/CSA C22.2 No. 157-92 (R2012) +UPD1 +UPD2
Markings:	CLASS I, DIV 1, GP ABCD, T4, T_{amb} = -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⟩ II 1 G, Ex ia IIC T4 Ga, T_{amb} = -50 °C to +75 °C, IP67

Specific Conditons For Safe Use (X):

1. The plastic mounting foot may present a potential electrostatic ignition risk and must not the 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 Safety (IS)

Certificate:	BAS 15.0098X Issue 5
Standards:	IEC 60079-0:2017 Edition 7.0, IEC 60079-11: 2011 Edition 6.0
Markings:	Ex ia IIC T4 Ga, T_{amb} = -50 °C to +75 °C, IP67

Specific Conditons For Safe Use (X):

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3. The enclosure may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.

Brazil

I2 INMETRO Intrinsically Safe (IS)

Certificate:	UL-BR 19.1701X
Standards:	ABNT NBR IEC 60079-0:2013 ABNT NBR IEC 60079-11:2013
Markings:	Ex ia IIC T4 Ga (-50 °C ≤ T_{amb} ≤ +75 °C)

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. Enclosures may present a potential electrostatic charging ignition hazard and must not be rubbed or cleaned with a dry cloth.

China

I3 China NEPSI Intrinsic Safety

Certificate:	GYJ18.1089X
Standards:	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings:	Ex ia IIC T4 Ga

Specific Condition For Safe Use (X):

See certificate for specific conditions of safe use.

EAC - Kazakhstan and Russia

IM (EAC) Intrinsic Safety

Certificate:	C-GB.МЮ62.B.05220
Standards:	TP TC 012/2011
Markings:	0Ex ia IIC T4 Ga X

Specific Condition For Safe Use (X)

See certificate for specific conditions of safe use.

India

India (PESO) Intrinsic Safety

Certificate:	A/P/HQ/MH/104/6455 (P474307)
Markings:	Ex ia IIC T4 Ga

Specific Condition For Safe Use (X):

See certificate for specific conditions of safe use.

Japan

I4 CML Intrinsically Safe (IS)

Certificate:	CML 19JPN2339X
Standards:	JNIOSH-TR-46-1:2015 JNIOSH-TR-46-6:2015
Markings:	Ex ia IIC T4 Ga

Specific Conditions for Safe Use (X):

1. The plastic enclosure and 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. Enclosures may present a potential electrostatic charging ignition hazard and must not be rubbed or cleaned with a dry cloth.
4. The CC21 Commissioning Cable must only be used in a non-hazardous area – it provides an interface between unspecified non-hazardous area equipment and a Mesh Sensor. It must not be used to provide power whilst located in a hazardous area.

Korea

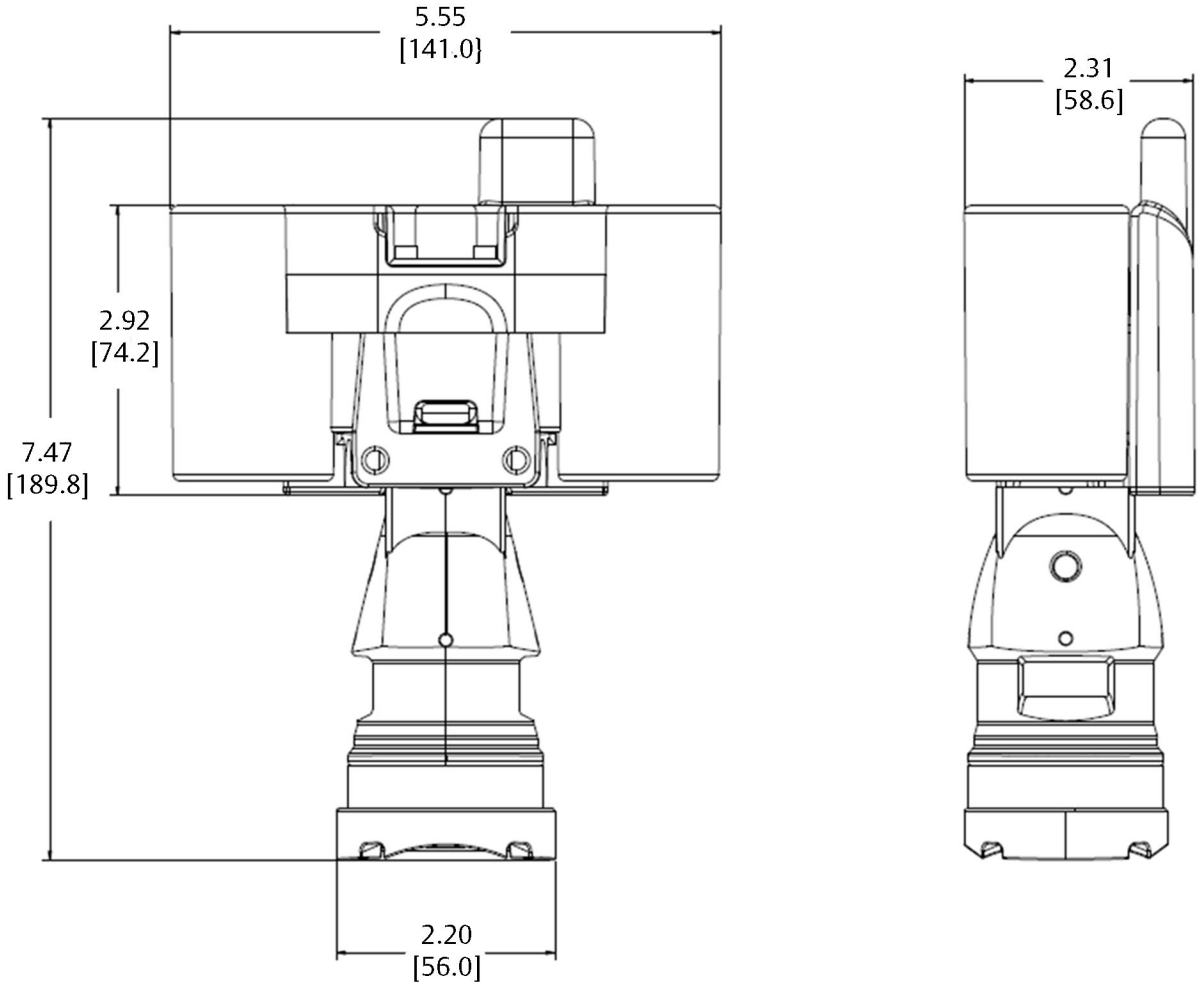
IP Korea (KCS) Intrinsic Safety

Certificate:	17-KA4BO-0663X (when supplied from UK) 20-KA4BO-0505X (when supplied from Singapore)
Markings:	Ex ia IIC T4

Specific Condition For Safe Use (X):

See certificate for specific conditions of safe use

Dimensional drawing



Dimensions are in inches (millimeters).

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For more information: **Emerson.com**

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