

# Rosemount™ Wireless ET410 Corrosion Transmitter

with Rosemount Permasense™ technology



Rosemount™ Wireless 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.

- Weld-free non-intrusive attachment makes sensor easy to deploy and maintain
- Provides facilities with continuous corrosion and erosion monitoring for improved decision making
- *WirelessHART*® technology ensures reliable, robust, and secure data retrieval from the plant devices to a remote office location

# Emerson's wireless solution

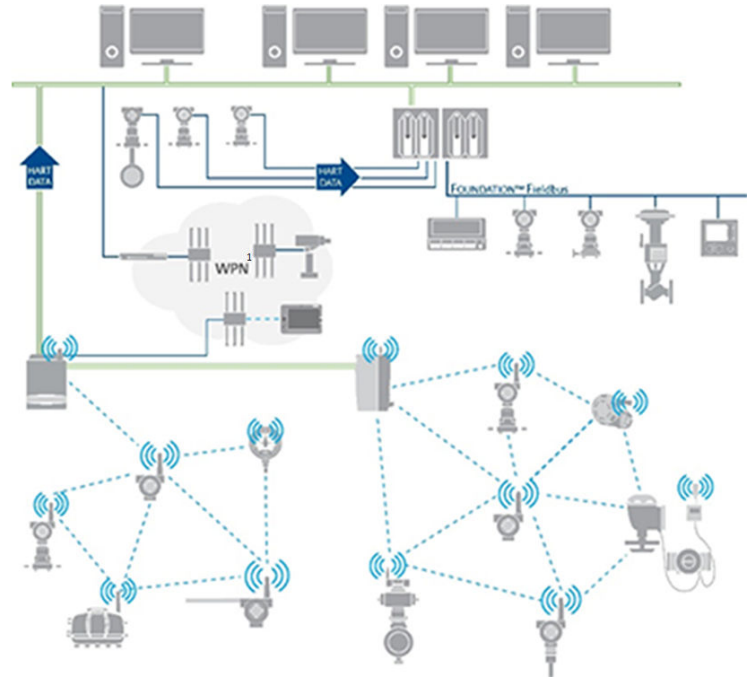
## IEC 62591 (WirelessHART®) ... the industry standard

### 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, then data will continue to flow because the device has other established paths.

### Reliable wireless architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz Industrial, Scientific, and Medical (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 login, password reset requirements, automatic lockout, and password expiration requirements.

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# Rosemount™ Wireless ET410 Corrosion Transmitter

## Corrosion and erosion monitoring

- Reliably detects thinning wall thickness in piping through external coatings using an ultrasonic measurement technology
- Sends measurement using *WirelessHART*® for visualization and analysis at the remote office location

Figure 1:



- A. Antenna
- B. Power module
- C. Transmitter head
- D. Strap slot
- E. Foot

## Reliable data in challenging environments

- Plantweb Insight Non-Intrusive Corrosion 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 providing thickness measurements that are automatically compensated for the effect of ultrasonic velocity change with temperature.
- May be used on metal with continuous service temperatures up to 518 °F (270 °C).
- Rugged and robust design of the transmitter ensures reliable performance in harsh environments.
- *WirelessHART*® protocol creates a self-forming and self-managing wireless mesh, delivering continuous wall thickness measurements of the highest integrity and accuracy.

### Mounting flexibility

- Sensor can be mounted on pipes up to 40-in. diameter with a metal strap and tensioner, and above 80-in. diameter using a magnetic mounting option.

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#### Note

If you are looking to mount on diameters between 40-in and 80-in, please consult your Emerson sales representative for the available solutions.

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- Directly mount to process piping without cutting pipes or changing pipe configurations — allowing a flexible installation.
- Sensor attaches magnetically to piping or vessels secured with a metal strap — deployment is safe, quick and easy in challenging locations.

# Ordering information

[VIEW PRODUCT >](#)

## Specifications and options

Specification and selection of product materials, options, and/or components must be made by the purchaser of the equipment. For more information, see [Material selection](#).

## Model code

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in [Figure 2](#).

**Figure 2: Model code example**



1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

## Optimizing lead time

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

## Required model components

### Model

Code	Description	
ET410	Rosemount™ Corrosion Transmitter	★

### Performance class

Code	Description	
A	Standard	★

### Transmitter output

Code	Description	
X	Wireless	★

## Measurement type

Code	Description	
1	Insight	★

## Product certifications

Code	Description	
NA	No approvals	★
I1	ATEX Intrinsic Safety	★
I4	Japan Intrinsic Safety	★
I5	USA Intrinsically Safe	★
I6	Canada Intrinsically Safe	★
I7	IECEX Intrinsic Safety	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
IP	Korea Intrinsic Safety	★
IW	India Intrinsic Safety	★

## Wireless update rate, operating frequency and protocol

Code	Description	
WA3	User configurable update rate, 2.4 GHz, <i>WirelessHART</i> ®	★

## Omni-directional wireless antenna and SmartPower™ solutions

Code	Description	
WP6	Internal antenna, compatible with BP20E Power Module (Standard Power Module included)	★

## Mounting hardware

Code	Description	
T01	Pipe strap up to 40-in pipe diameter, 1 strap tensioner	★
B02	ET410 magnetic fixture, vessel mount	

## 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-5100-0006	BP20E power module (Korea)	
IK220-2000-0101	Commissioning kit (SGSus-c)	
IK220-2000-0102	Commissioning kit (ATEX, IECEX, IA)	
IK220-2000-0103	Commissioning kit (EAC)	

Part number	Description	
IK220-2000-0104	Commissioning kit (CML)	
IK220-2000-0106	Commissioning kit (KCS)	
PERMA-2006-0001	ET310/ET410 strap (per meter)	
PERMA-2006-0002	ET310/ET410 strap, 137.8 inches (3.5 m)	
PERMA-2005-0004	ET410 magnetic fixture	
PERMA-2000-0001	Stainless steel lanyard, 78.7 inches (2 m)	

**In the box**

Mounting hardware option T01 <sup>(1)</sup>	Mounting hardware option B01 <sup>(2)</sup>
<ul style="list-style-type: none"> <li>▪ Rosemount ET410 Transmitter</li> <li>▪ BP20E power module</li> <li>▪ 137.8-in. (3.5 m) stainless steel 316 retaining strap</li> <li>▪ Strap tensioner</li> <li>▪ Lanyard (for safely securing sensor)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rosemount ET410 Transmitter with bracket pre-fitted</li> <li>▪ BP20E power module</li> <li>▪ Magnetic mount</li> <li>▪ 4x lanyards (for safely securing sensor)</li> </ul>

(1) Pipe strap up to 40-in. diameter pipe and one strap tensioner.

(2) Magnetic fixture, vessel mount.

# Specifications

## Wireless specifications

### Output

IEC 62591 (*WirelessHART*<sup>®</sup>) 2.4 GHz

### Transmit rate

Every 12 hours by default

### Radio frequency power output from antenna

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

## Performance specifications

### Thickness measurement

Measurement repeatability:  $\pm 0.0001$ -in. (2.5  $\mu\text{m}$ )<sup>(1)</sup>

Resolution: 0.00004-in. (1  $\mu\text{m}$ )<sup>(2)</sup>

### Surface temperature

Accuracy: 18 °F (10 °C)

Repeatability: within 4 °F (2 °C)

### Power module service life

Nine years at reference conditions with supplied BP20E module<sup>(3)</sup>

Power module is replaceable in hazardous area.

### Humidity limits

0 to 100 percent relative humidity

### Temperature limits

Ambient limit for operation: -40 to 185 °F (-40 to 75 °C)<sup>(4)</sup>

Storage limit: -58 to 185 °F (-50 to 75 °C)

Measurement location continuous temperature: Up to 518 °F (270 °C)

### Pipe diameter

Minimum NPS 4 (nominal 4-in. pipe) on straight pipe or outside of an elbow<sup>(5)</sup>

### Wall thickness

Minimum: 0.16-in. (4 mm)

Maximum: 1.96-in. (50 mm)

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- (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) Reference conditions are 68 °F (20 °C), transmit rate of 12 hours, and routing data for three additional network devices.
  - (4) See [Product certifications](#) section for temperature limits of intrinsic safety.
  - (5) Contact your Emerson representative for special order options.



### Compatible pipe materials

All metals (with exception of austenitic stainless steels (e.g., 316, 304) for which we recommend [Rosemount Wireless WT210 Product Data Sheet](#))

### External coating thickness

Maximum: 0.040-in. (1 mm)

### Compatible external coatings

Common coatings, including zinc coatings, etc.<sup>(6)</sup>

### Mounting

Transmitters are directly attached to process piping with a choice of mounting solutions (see [Ordering information](#)).

- For pipes up to 40-in. diameter by using a 138-in. (3.5 m) stainless steel 316 strap
- For pipes, vessels, columns, etc. over 80-in. diameter by using a magnetic mount

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#### Note

If you are looking to mount on diameters between 40-in and 80-in, please consult your Emerson sales representative for the available solutions.

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- For other sizes, contact your Emerson representative

## Physical specifications

### 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

### Commissioning

Commission the device using IK220 installation kit with BP20E not installed

### Materials of construction

Transmitter housing: PBT/PC

Transmitter legs: 316 stainless-steel

Transmitter foot: 316 stainless-steel

Transducer housing: Titanium alloy

Retaining strap: 316 stainless-steel

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(6) Contact your Emerson representative for compatibility of other coatings.

Strap tensioner (exc. Spring): 316 stainless-steel

Strap tensioner spring : 17-7PH Stainless steel

Power module housing: PBT/PC

## Sensor type

Single electro-magnetic acoustic transducer (no Couplant required)

## Weight

Rosemount ET410 with BP20E power module: 4.19 lb. (1,900 g)

Rosemount ET410 without BP20E power module: 3.42 lb. (1,550 g)

## Enclosure ratings

IP67<sup>(7)</sup>

## Wireless output specifications

### Range

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

## Electromagnetic compatibility (EMC)

Meets all relevant requirements of EN 61326-1: 2013

## Software compatibility

- The device is compatible with Plantweb Insight Non-Intrusive Corrosion application 1.4.1 and later; and Installation tool 2.4.6 and later (included in the IK220 installation kit).
- Can be supported on Data Manager 8.2.
- Contact your Emerson representative to upgrade from earlier software versions.

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(7) When transmitter is mated to the power module.

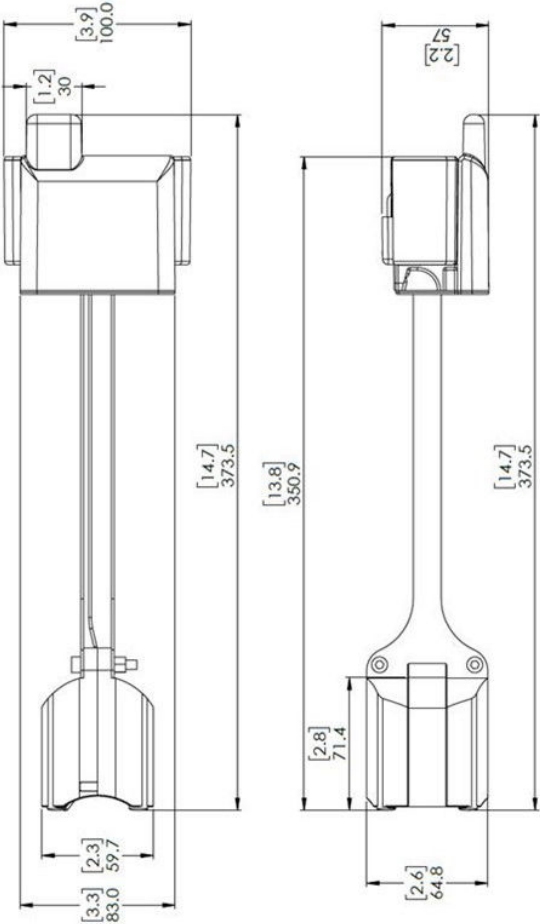
## Product certifications

Rev 0.1

For Rosemount Wireless ET410 Corrosion Transmitter product certifications, see the [Rosemount Wireless ET410 Corrosion Transmitter Quick Start Guide](#).

# Dimensional drawing

Dimensions are in millimeters (inches).









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

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