Product Data Sheet
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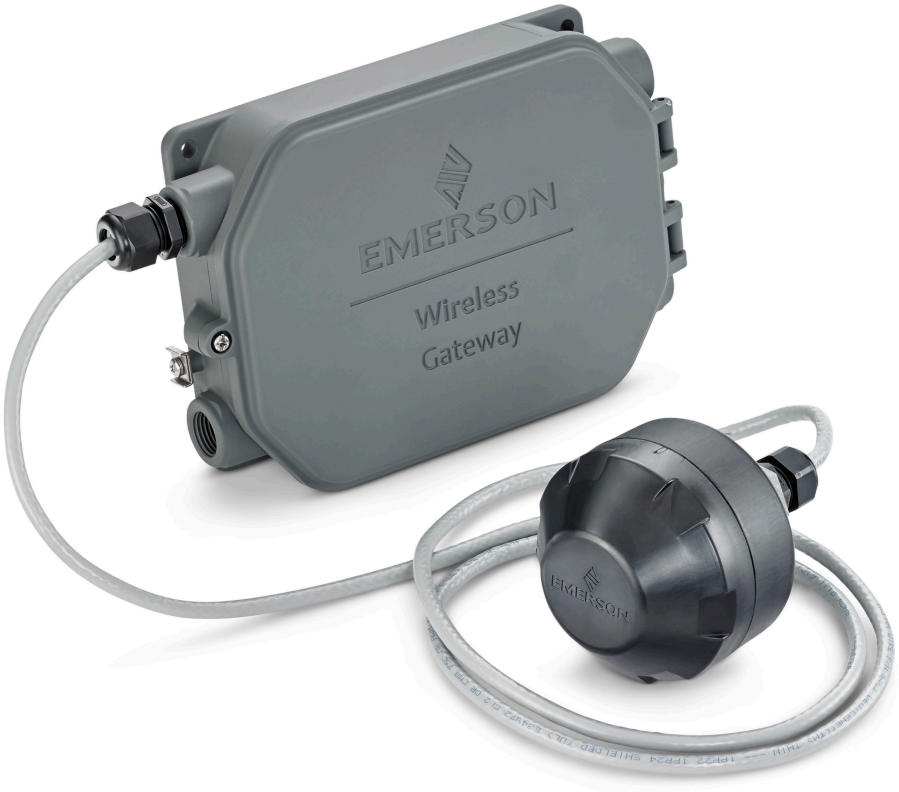
Emerson Wireless 1410S Gateway with 781S Smart Antenna



- Gateway connects the *Wireless*HART® self-organizing networks with any host system
- Easy configuration and management of self-organizing networks
- Easy integration into control systems and data applications through serial and Ethernet connections
- Greater than 99 percent data reliability with industry proven security
- Ability to leverage sensor data from critical assets to eliminate blind spots, and improve productivity and safety of operations
- Integration to the new Cisco® Catalyst IW6300 Heavy Duty Access Point providing the latest Wi-Fi® technology

EMERSON

Emerson Wireless solution

IEC62591(*Wireless*HART)...the industry standard

Self-organizing, adaptive mesh routing

- No wireless expertise required, network automatically establishes the best communication paths
- 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 already has other established paths. The network will then lay in more communication paths as needed for that device

Reliable wireless architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 15 radio-channels
- Time-Synchronized Channel Hopping for increased reliability and avoidance of interference from other radios, Wi-Fi, and EMC sources
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

Emerson wireless

Seamless integration via LAN or serial communications to other existing host systems

- Native integration into Ovation™ and DeltaV™ is transparent and seamless
- Gateways interface with existing host systems via Local Area Network (LAN) or serial communications using industry standard protocols including OPC DA, Modbus® TCP/IP, Ethernet/IP & HART®-IP, and Modbus RTU

Layered security keeps your network safe

- All wireless data is 128 bit AES encrypted so your data is kept safe
- All wireless devices are authenticated so you know exactly what is on your network
- Third party security certifications including Achilles and FIPS-197 certification demonstrate Emerson's commitment to security
- Complete control of your network using the Gateway secure web interface

SmartPower solutions

- Optimized Emerson instrumentation, both hardware and software, to extend power module life
- SmartPower™ technologies enable predictable power life

Contents

Features and benefits

Gain real-time process information with greater than 99 percent wireless data reliability

The Emerson Wireless 1410S Gateway with 781S Smart Antenna automatically manages wireless communications in constantly changing environments. With the flexibility of installation, optimal network design and best practices can be easily implemented to achieve maximum data reliability. Connect to data historians, legacy host systems, and other applications via Ethernet using Modbus TCP, OPC, EtherNet/IP™, and HART-IP™ protocols, or serial Modbus™ RTU (RS485).

Simultaneous operation of two protocols on one gateway with leading wireless standards

- One wireless Gateway with the capabilities of two Smart Antennas connections for optimal network design and flexibility
- *Wireless*HART® gives users the ability to form large networks that self-form a wireless mesh giving the user an easy path to build and grow networks
- To support the transition from legacy protocols to *Wireless*HART, a separate 781S Smart Antenna can be used to connect to IEC 62734 instrumentation
- Connect to 200 *Wireless*HART devices at a single point of communication with the upgraded Emerson 781S Smart Antenna technology

Complete wireless network configuration tools provided with each Gateway

- The integrated web interface allows easy configuration of the wireless network and data integration without the need to install additional software
- Complimentary AMS Wireless Configurator software provides Emerson Device dashboards to configure *Wireless*HART® devices and view diagnostic data
- Drag and drop device provisioning enables a secure method to add new wireless devices to the wireless field network

Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account
- Improve mean time to repair and maintain efficiency
- Ensure confidence that you have located the correct device
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information

Emerson Wireless 1410S Gateway ordering information

VIEW PRODUCT >

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.

Model code example

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 1.

Figure 1: Model Code Example

XXX X XXX X X XX (1) XXX XXX XX (2)

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 best delivery. The non-starred offerings are subject to additional delivery lead time.

Required model components

Model

Code	Description	
1410S	Wireless Gateway, 2.4 GHz DSSS, web server, AMS ready, HART-IP® protocol	★

Installation area

Code	Description	
2	Outdoor rated housing (aluminum)	★

Intrinsically safe outputs

Code	Description	
A	Zone 0 / Div 1: Emerson 781S Smart Antenna may be installed in Zone 0/1/2 & Class I Div 1/2	★
B	Zone 2 / Div 2: Emerson 781S Smart Antenna may be installed in Zone 2 & Class I Div 2	★

Wireless configuration

Code	Description	
A3(1)	*Wireless*HART® protocol	★
A6(1)(2)	*Wireless*HART protocol and ISA100	★

(1) *Must order the Emerson 781SA WirelessHART Smart Antenna. Reference Emerson Wireless 781S Ordering Information for details.*
(2) *Must order the Emerson 781SC ISA100 Smart Antenna. Reference Emerson Wireless 781S Ordering Information for details*

Ethernet communications – physical connection

Code	Description	
1	Single Ethernet connection	★
2	Dual Ethernet connection	★

Serial communication

Code	Description	
N	None	★
A	Modbus® RTU via RS485	★

Ethernet communications – data protocols

Code	Description	
D1	Modbus® TCP/IP	★
D2	OPC DA	★
D3	EtherNet/IP™	★
D4	Modbus TCP/IP, OPC DA	★
D5	EtherNet/IP, Modbus TCP/IP	★
D6	EtherNet/IP, OPC DA	★
E1	DeltaV™ Ready	★
E2	Ovation ready	★
E3	Web server ready	★

Product certifications

Code	Description	
N5	USA Division 2 Non-Incendive & Zone 2 Type ec	★

Code	Description	
N6	Canada Division 2 Non-Incendive & Zone 2 Type ec	★
N1	ATEX Type ec	★
N7	IECEx Type ec	★
ND	ATEX Dust	★
NF	IECEx Dust	★
NA	No approvals	★

Additional options

Conduit adapters

Code	Description	
J1	CM 20 Conduit adapters	★
J2	PG 13.5 Conduit adapters	★
J3	¾ NPT Conduit adapters	★
J5	CM 20, PG 13.5, & ¾ NPT Conduit adapters	★

Gateway redundancy options

Code	Description	
RD	Gateway redundancy	★

Cisco® Wi-Fi® access point spectrum domain

Code	Description	
A63	Argentina, Bolivia, Canada, Chile, Columbia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Paraguay, Peru, Philippines, Uruguay	
E63	Albania, Algeria, Armenia, Austria, Bahamas, Belgium, Bosnia and Herzegovina, Bulgaria, Burundi, Cameroon, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Gabon, Germany, Ghana, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Jamaica, Jordan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Mauritius, Monaco, Mongolia, Montenegro, Morocco, Netherlands, Nigeria, Norway, Oman, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Trinidad, Turkey, UK, Tanzania	
Z63	Australia, Brazil, New Zealand	
S63	Brunei, Hong Kong, Macau, Singapore, Thailand, Vietnam	
C63	Egypt	
N63	Barbados, Fiji, Mexico, Panama	
G63	Pakistan	
B63	Puerto Rico, US	

Code	Description	
M63	Kuwait, Qatar, Saudi Arabia, UAE	
I63	Bahrain, Belarus, Israel, Tunisia, Uzbekistan	
R63	Russian Federation	
D63	India	
Q63	Japan	
F63	Indonesia	
T63	Taiwan	
H63	China	
K63	Korea	
L63	Malaysia	

Note
By selecting a Cisco spectrum domain, you are selecting an IW6300 Wi-Fi access point and will need to also select an option from the following Cisco option tables.

Cisco Wi-Fi access point power options

Code	Description	
P1	High DC power: 44 – 57 VDC	
P2	Low DC power: 10.8 – 36 VDC	
P3	AC power: 100 – 200 VAC	

Cisco Wi-Fi access point dual band antenna options

Further antenna options can be purchased through the spare parts page.

Code	Description	
D4	Dual band - 1 port, omnidirectional antenna with 4 dBi of gain	
D0	No antenna, ordered separately through spare parts	

Cisco Wi-Fi access point mounting options

Code	Description	
M1	Pole mount	

Cisco Wi-Fi access point services

Code	Description	
SN1	Cisco SmartNET Service Agreement (one year)	

Emerson Wireless 781S Smart Antenna ordering information

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Figure 2: Model Code Example

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2. Additional options (variety of features and functions that may be added to products)

Optimizing lead time

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Required model components

Model

Code	Description	
781S	Wireless Smart Antenna	

Wireless protocol and operating frequency

Code	Description	
A	*Wireless*HART®, user configurable transmit rate, 2.4 Hz DSSS, IEC 62591	★
C	ISA100, user configurable transmit rate, 2.4 GHz DSSS, IEC 62734	★

Communication

Code	Description	
1	Legacy RS485 communication	★

Housing style

Code	Description	
P	Engineered polymer	★

Product certifications

Code	Description	
I5	USA Intrinsically Safe	★
I6	Canada Intrinsically Safe	★
I1	ATEX Intrinsic Safety	★
I7	IECEx Intrinsic Safety	★
KD	USA & Canada Intrinsically Safe, ATEX Intrinsic Safety	★
KL	USA & Canada Intrinsically Safe, ATEX & IECEx Intrinsic Safety	★
NA	No approvals	★

Wireless network capacity

Code	Description	
NA1	200 device *Wireless*HART® network	★
NA5	25 device *Wireless*HART network	★
NC1	99 device ISA network	★

Wireless antenna options

Code	Description	
WP3	Internal antenna	★

Specifications

Emerson Wireless 1410S Gateway

Functional specifications

Power	Intrinsically Safe Output Option A: 24 VDC Intrinsically Safe Output Option B: 10.5-30 VDC For best results, use a high quality industrial galvanically isolated power supply.
Current draw: Intrinsically Safe Output Option A	Operating current draw is based on 7 Watts power consumption.
Current draw: Intrinsically Safe Output Option B	Operating current draw is based on 5 Watts power consumption. At start-up, the power supply must be capable of momentarily sourcing at least twice the operating current indicated in the figure below. The Gateway may draw significantly more current momentarily at start-up if not limited by the power supply.
Power over Ethernet (PoE)	Gateway supports IEEE 802.11 PoE as a Powered Device (PD) on either port.
Environmental	Operating temperature range: Intrinsically Safe Output Option A: -40 to 149 °F (-40 to 65 °C) Intrinsically Safe Output Option B: -40 to 149 °F (-40 to 65 °C)
Operating humidity range	0 to 99 percent relative humidity
Antenna options	See Wireless antenna options.

Performance specifications

EMC performance	Meet all industrial environment requirements of EN61326. Maximum deviation less than one percent span during EMC disturbance.

Note
During surge event, device may exceed maximum EMC deviation limit or reset; however, device will self-recover and return to normal operation within specified start-up time. For best results, use a high quality industrial galvanically isolated power supply.

Vibration effect	No effect when tested per the requirements of IEC60770-1 (1999): High vibration level - field or pipeline (10 to 60 Hz 0.21 mm displacement peak amplitude/60 to 2000Hz 2g)

Physical specifications

Weight	2.76 lb. (1.25 kg)
Housing size	6.25-in. x 8.8-in. x 2.5-in. (15.9 cm x 22.4 cm x 6.4 cm)
Housing	Low-copper aluminum
Paint	Polyurethane
Mounting style	Pole mount

Network specifications

Self-organizing IEC 62591 (*Wireless*HART®)	2.4 to 2.5 GHz DSSS
Maximum size for each *Wireless*HART network	Up to 200 devices
Capacity load	200 wireless devices at 16 seconds 100 wireless devices at 8 seconds 50 wireless devices at 4 seconds 25 wireless devices at 2 seconds 12 wireless devices at 1 second
Supported device update rates	1, 2, 4, 8, 16, 32 seconds or 1 to 60 minutes
Data reliability	Greater than 99 percent
Self-organizing IEC 62734 (ISA100)	2.4 to 2.5 GHz DSSS
Maximum size for each ISA100 network	Up to 99 devices

System security specifications

EtherNet	Transport Layer Security (TLS) enabled (default) TCP/IP communications
Emerson Wireless Gateway access	Customizable Role-Based Access Control including Administrator, Maintenance, Operator, and Executive. Administrator has complete control of the Gateway and connections to host systems and the self-organizing network.
Internal port and protocol firewall	User configurable TCP ports for communications protocols, including Enable/Disable and user specified port numbers.
Third-party certification	Wurldtech: Achilles certified for network resiliency National Institute of Standards and Technology (NIST): Advanced Encryption Standard (AES) Algorithm conforming to Federal Information Processing Standard Publication 197 (FIPS-197).

Emerson Wireless 781S Smart Antenna

Functional specifications

Wireless output	IEC 62591 (*Wireless*HART), 2.4 GHz DSSS IEC 62743 (ISA100), 2.4 GHz DSSS
Environmental	0 to 99 percent non-condensing relative humidity
Radio Frequency power output from antenna	Internal antenna (WP3 option): Maximum of 40 mW (16 dBm) EIRP
Smart Antenna wiring distance	Wiring distance between Smart Antenna and Gateway: Up to 400 m using single twisted shielded pair, 22-24 AWG 30 ft. (9 m) of Belden 3084a comes attached to Emerson 781S

Physical specifications

Material selection

Emerson provides a variety of 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.

Materials of construction

Enclosure housing	Engineered polymer
Mounting	Mounting brackets also permit remote mounting
Size	Diameter 3.7-in. (9.4 cm)
Weight	2.4 lb. (1.1 kg)
Enclosure ratings (Emerson 781S)	Type 4X and IP66/67 rated

Performance specifications

EMC performance	Meet all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation less than 1% span during EMC disturbance.
Vibration effect	No effect when tested per the requirements of IEC60770-1 (1999): High vibration level - field or pipeline (10 to 60 Hz 0.21 mm displacement peak amplitude/60 to 2000Hz 2g)

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