

## Smart Wireless Gateway

- Gateway connects WirelessHart™ 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
- Seamless integration into AMS® Device Manager and DeltaV™
- Greater than 99% reliability with industry proven security
- WirelessHART™ capabilities extends the full benefit of PlantWeb® to previously inaccessible locations



**WirelessHART**  
Expanding the Possibilities

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## Success With Smart Wireless

### Self-Organizing Networks

With reliability and ease of use, self-organizing networks are perfect in any environment. Multiple communication paths and automatic path configuration result in over 99% reliability and allows you to deploy your instrumentation without a site survey, saving you time and money.

### Open Integration

With a variety of options, the Smart Wireless Gateway gives you the freedom to choose the Smart Wireless Solutions best suited for your installation:

**Flexible:** Using OPC or Modbus TPC allows flexible integration of your wireless network with any host system.

**Serial:** The Smart Wireless Gateway supports Modbus RTU for integration into legacy host systems.

**PlantWeb:** The Smart Wireless Gateway natively integrates into any PlantWeb® architecture for ease of use in commissioning your wireless network.

**Stand Alone:** Every Gateway comes with a web interface that provides a stand alone host interface to manage your wireless network, without a dedicated host system.

### Layered Security Keeps Your Network Safe

Emerson Process Management's layered approach to wireless network security ensures that your network stays protected. The network devices implement Encryption, Authentication, Verification, Anti-Jamming and Key Management methods to ensure that data transmissions are secure.

### AMS Wireless Configurator

AMS Wireless Configurator uses the power of Enhanced EDDL to assist in the setup and configuration of your Smart Wireless Field Devices and is shipped with every Smart Wireless Gateway.

### Powers PlantWeb



The Smart Wireless Gateway powers *PlantWeb*® by giving you access to intelligent devices using WirelessHART technology and seamlessly integrating them into AMS™ Suite software and the DeltaV™ or Ovation™ systems.

### Rugged Housing

The Smart Wireless Gateway is suitable for field mounting in any Zone 2/Division 2, general purpose area and is NEMA 4x/IP65 rated. So, the Gateway can be mounted directly in the process environment.

## SMART WIRELESS SOLUTIONS

### Smart Wireless Field Devices

Emerson Process Management has a family of Smart Wireless products to integrate different measurement types into a self-organized network that optimizes plant performance and reduces risk to personnel. The different measurement types offered include pressure, temperature, discrete, position monitoring, pH, and vibration.

### Smart Wireless THUM™ Adapter

The Smart Wireless THUM Adapter incorporates data from any wired HART™ device into the self-organizing network, enhancing plant performance and extending asset life.

### AMS® Wireless SNAP-ON™

The AMS Wireless SNAP-ON application helps to plan and validate your wireless network using best practices. It allows for viewing of communication details graphically in real time, and helps maintain the health of your entire self-organizing network.

## WirelessHART... The Industry Standard

### Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, devices automatically find the best communication paths
- Network continuously monitors paths for degradation and repairs itself
- Adaptive behavior provides reliable, hands-off operation and simplifies network deployments, expansion and reconfiguration
- Supports both star and mesh topologies

### Industry Standard Radio with Channel Hopping

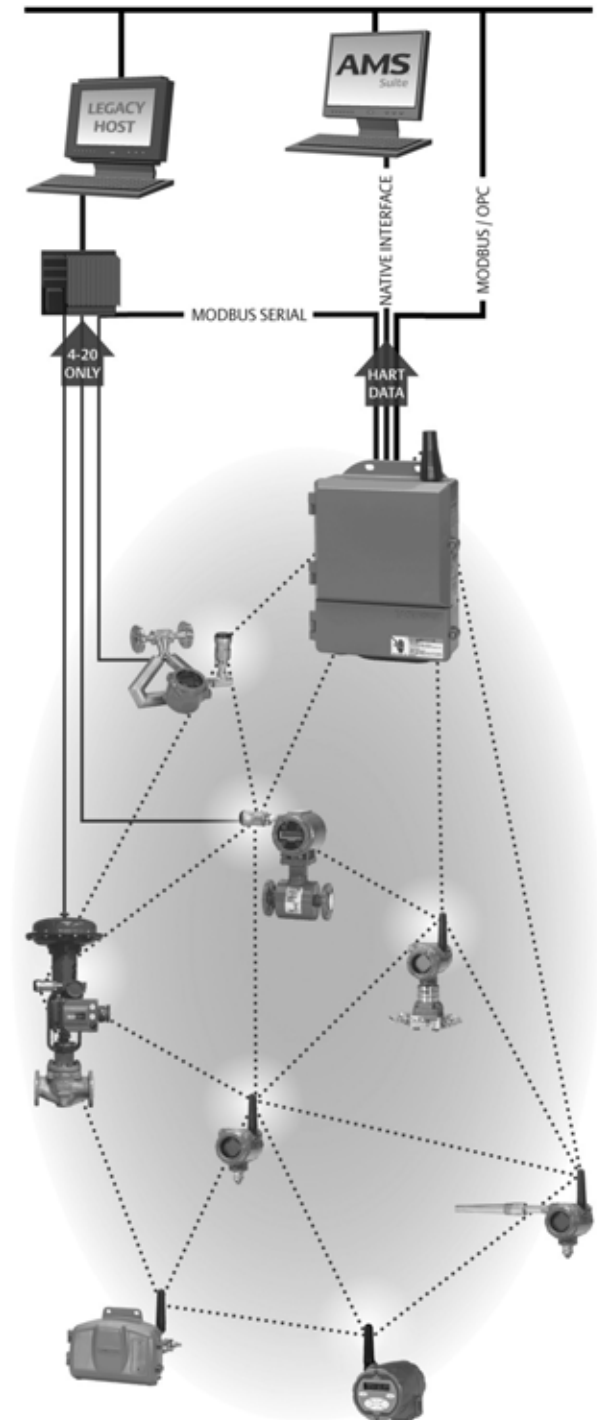
- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels
- Continually “hop” across channels to avoid interference and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

### Self-Healing Network

- If an obstruction is introduced into the mesh network, devices will automatically find the best alternate communication path. This alternate path will be created and the information will continue to flow.

### Seamless Integration to Existing Hosts

- Transparent and seamless integration
- Same control system applications
- Gateways connect using industry protocols



# Smart Wireless Gateway

## Smart Wireless Gateway

### Flexible Connectivity Options and Easy Device Configuration

#### Host Integration with DeltaV™ and Ovation®

- Gain real-time information on process and assets with intuitive operator interface
- Native interface between control system and gateway



#### Device Specifications

- Update rate: User Selectable 8, 16, 32 second or 1 to 60 minutes
- Network Size: Up to 100 devices
- Output: Ethernet, Modbus, OPC, Serial
- Approvals: FM, CSA, ATEX, IECEx

#### Flexible Integration

- Smart Wireless Gateway connects legacy hosts, Serial Modbus®, and Ethernet or OPC output

#### Complete Asset Management with AMS Device Manager

- Manage predictive diagnostics from wired and wireless field devices to identify problems before the process is affected
- Streamline wireless device configuration through Smart Wireless Gateway



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#### Other Interfaces

- Web interface and AMS Wireless Configurator are standard with every gateway for set-up and initial configuration of wireless devices
- Data historian connectivity for documentation and compliance information

## Specifications

### Functional Specifications

#### Input Power

24 V dc  
500 milliamps required to power the Smart Wireless Gateway module.

#### Environmental

Operating Temperature Range:  
-40 to 140 °F (-40 to 60 °C)  
Operating Humidity Range:  
10-90% relative humidity

#### EMC Performance

Complies with EN61326-1:2006.

#### Antenna Options

Integrated Omnidirectional Antenna  
Optional remote mount Omnidirectional Antenna

### Physical Specifications

#### Weight

10 lb (4.54 kg)

#### Material of Construction

##### Housing

Low-copper aluminum, NEMA 4X

##### Paint

Polyurethane

##### Cover Gasket

Silicone Rubber

##### Antenna

PBT/PC integrated Omnidirectional Antenna

#### Certifications

Class I Division 2 (U.S.)  
Equivalent Worldwide

### Communication Specifications

#### Isolated RS485

2-wire communication link for Modbus RTU multidrop connections  
Baud rate: 57600, 38400, 19200, or 9600  
Protocol: Modbus RTU  
Wiring: Single twisted shielded pair, 18 AWG. Wiring distance is approximately 4,000 ft. (1,524 m)

#### Ethernet

10/100base-TX Ethernet communication port  
Protocols: Modbus TCP, OPC, https (for Web Interface)  
Wiring: Cat5E shielded cable. Wiring distance 328 ft. (100 m).

#### Fiber Optic Ethernet (optional)

100BaseFx optical Ethernet communication port  
Wavelength: 1300 nm center  
Multimode  
SC connectors  
Protocols: Modbus, TCP, OPC, https (for Web Interface)  
Wiring: 50/125 um or 62.5/125 um fiber, 2.48 miles (4.0 k,) maximum distance.

#### Modbus

Supports Modbus RTU and Modbus TCP with 32-bit floating point values, integers, and scaled integers.  
Modbus Registers are user-specified.

#### OPC

OPC server supports OPC DA v1, v2, v3

### Self-Organizing Network Specifications

#### Protocol

WirelessHART, 2.4 - 2.5 GHz DSSS.

#### Maximum Network Size

100 Devices

#### Supported Device Update Rates

8 sec. to 60 min.

#### Network Size/Latency

100 Devices: up to 10 sec.  
50 Devices: up to 5 sec.

#### Data Reliability

>99%

### System Security Specifications

#### Ethernet

Secure Sockets Layer (SSL)- enabled (default) TCP/IP communications

#### Smart Wireless Gateway Access

Role-based Access Control (RBAC) including Administrator, Maintenance, Operator, and Executive. Administrator has complete control of the gateway and connections to host systems and the self-organizing network.

#### Self-Organizing Network

AES-128 Encrypted WirelessHART, including individual session keys. Drag and Drop device provisioning, including unique join keys and white listing.

#### Internal Firewall

User Configurable TCP ports for communications protocols, including Enable/Disable and user specified port numbers. Inspects both incoming and outgoing packets.

## Product Certifications

### Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA  
 Emerson Process Management GmbH & Co. - Karlstein, Germany  
 Emerson Process Management Asia Pacific Private Limited - Singapore  
 Beijing Rosemount Far East Instrument Co., Limited - Beijing, China

### 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 for FM

As standard, the Gateway has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### North American Certifications

N5 FM Division 2, Non-Incendive  
 Certificate Number: 3028321  
 Nonincendive for Class I, Division 2, Groups A, B, C, and D.  
 Dust Ignition-proof for Class II, III, Division 1, Groups E, F, and G; Indoors/outdoor locations;  
 NEMA Type 4X  
 Temperature Code: T4 (-40 °C < T<sub>a</sub> < 60 °C)

### Canadian Standards Association (CSA)

N6 CSA Division 2, Non-Incendive  
 Certificate Number: 1849337  
 Suitable for Class I, Division 2, Groups A, B, C, and D.  
 Dust Ignition-proof for Class II, Groups E, F, and G;  
 Suitable for Class III Hazardous Locations.;  
 Install per Rosemount drawing 01420-1011.  
 Temperature Code: T4 (-40 °C < T<sub>a</sub> < 60 °C)  
 CSA Enclosure Type 4X

### European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting your local sales representative.

#### ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

#### Electro Magnetic Compatibility (EMC) (2004/108/EC)

Emerson Process Management complies with the EMC Directive.

#### Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive



### European Certification

- N1 ATEX Type n  
 See note below  
 Certificate Number: Baseefa 07ATEX0056X  
 ATEX Marking: Ex II 3 G  
 EEx nA NI IIC T4 (-40 °C < T<sub>a</sub> < 60 °C)
- ND ATEX Dust Ignition-proof  
 Certificate Number: Baseefa 07ATEX0057  
 EX tD A 22 IP66 T135 (-40 °C < T<sub>a</sub> < 60 °C)  
 EEx nA nL IIC T4 T4 (-40 °C < T<sub>a</sub> < 60 °C) II 3D  
 V<sub>max</sub> = 28V
- N7 IECEx Type n  
 See note below  
 Certificate Number: IECEx BAS 08.0012X  
 Ex nC IIC T4 (-40 °C =< T<sub>a</sub> <=60 °C)  
 Rated Voltage: 28V
- NF IECEx Dust Ignition-proof  
 Certification Number: IECEx BAS 07.0013  
 Ex tD A22 IP66 T135 (-40 °C < T<sub>a</sub> < 60 °C)  
 V<sub>max</sub> = 28V

### Conditions of Installing N1 and N7:

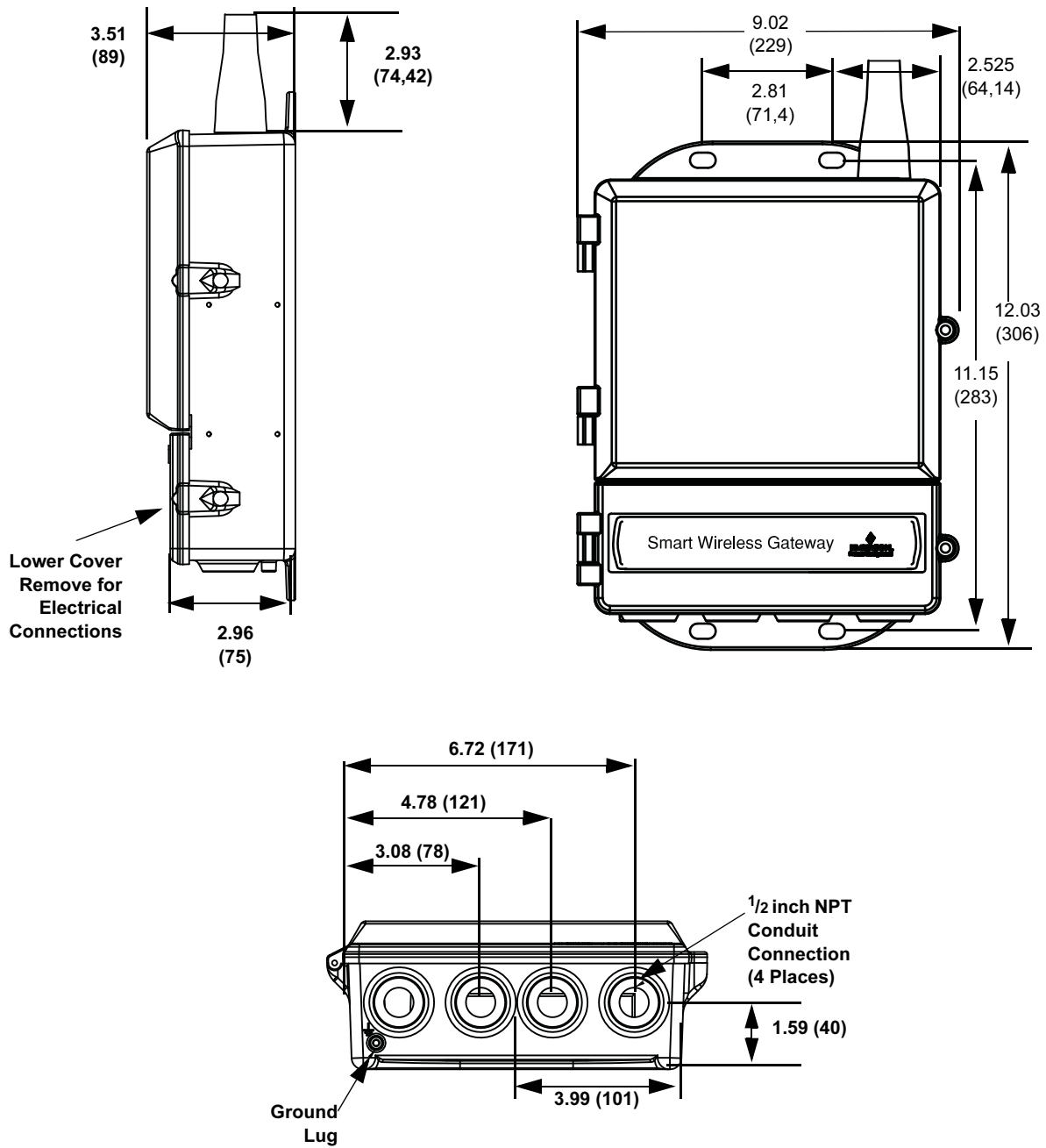
The Apparatus is not capable of withstanding the 500V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

### Combinations of Certifications

**KD** Combination of N5, N6, and N1.

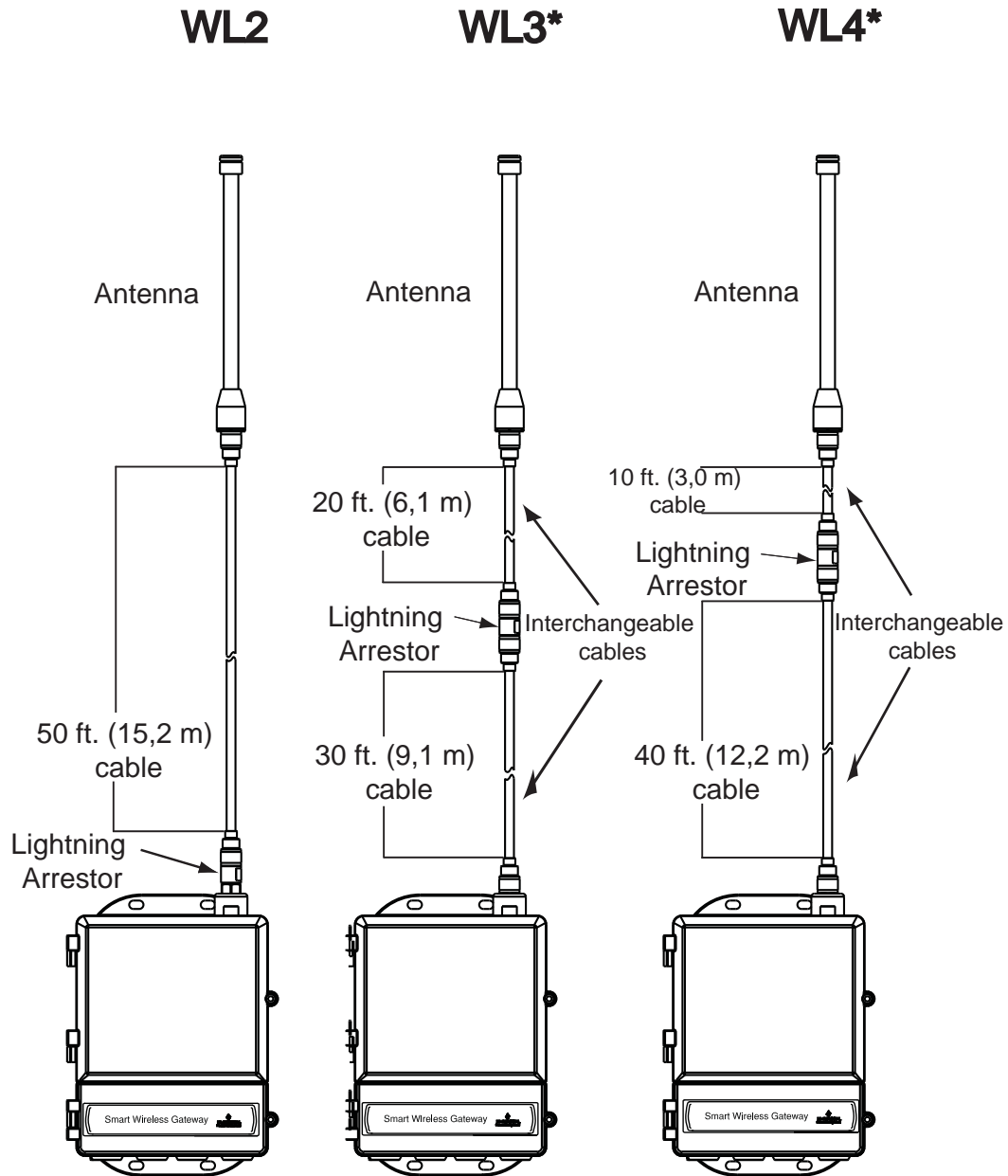
## Dimensional Drawings

FIGURE 1. Smart Wireless Gateway (Dimensions are in inches (millimeters))



# Smart Wireless Gateway

## Remote Omni-Antenna Kit



The Remote Omni-Antenna kit includes sealant tape for remote antenna connection, as well as mounting brackets for the antenna, Lightning Arrestor, and the Smart Wireless Gateway.

**Lightning protection is included on all the options. WL3 and WL4 provide lightning protection along with the ability to have the gateway mounted indoors, the antenna mounted outdoors, and the lightning arrester mounted at the building egress.**

**\*Note that the coaxial cables on the remote antenna options WL3 and WL4 are interchangeable for installation convenience.**

## Ordering Information

Model	Product Description
1420	Smart Wireless Gateway
Code	Power Input
A	24 VDC, 500 mA
Code	Ethernet Communications - Physical Connection
1	Ethernet <sup>(1)</sup> (2)
2	Dual Ethernet <sup>(3)</sup> (4)
3	Fiber Optic Ethernet <sup>(5)</sup> (6)
Code	Wireless Update Rate, Operating Frequency, and Protocol
A3	User Configurable Update Rate, 2.4 GHz DSSS, WirelessHART™ <sup>(7)</sup>
Code	Serial Communication
N	None
A	Modbus RTU via RS485 <sup>(7)</sup>
Code	Ethernet Communication - Data Protocols
2	Webserver, Modbus TCP/IP, AMS Ready
4	Webserver, Modbus TCP/IP, AMS Ready, OPC
5	DeltaV Ready <sup>(8)</sup>
Code	Other Options
Product Certifications	
N5	FM Division 2, Non-incendive
N6	CSA Division 2, Non-incendive
N1	ATEX Type n
ND	ATEX Dust Ignition-proof
N7	IECEX Type n
NF	IECEX Dust Ignition-proof
KD	FM & CSA Division 2, Non-incendive and ATEX Type n
Adapters	
J1	CM 20 Conduit Adapter
J2	PG 13.5 Conduit Adapter
J3	3/4 NPT Conduit Adapter
Antenna Options <sup>(9)</sup>	
WL2	Remote Omni-Antenna Kit, 50 ft. (15.2 m) cable, Lightning Arrestor
WL3	Remote Omni-Antenna Kit, 20 ft. (6.1 m) and 30 ft. (9.1 m) cables, Lightning Arrestor
WL4	Remote Omni-antenna Kit, 10 ft. (3.0 m) and 40 ft. (12.2 m) cables, Lightning Arrestor
Typical Model Number: 1420 A 1 A3 A 2 N5	

(1) Single active 10/100 baseT Ethernet port with RJ45 connector.

(2) Additional ports disabled.

(3) Dual active 10/100 baseT Ethernet ports with RJ45 connectors.

(4) Multiple active ports have separate IP addresses, firewall isolation, and no packet forwarding.

(5) 1300nm Multimode Optical fiber connection with separate SC connectors for Rx and Tx.

(6) Includes features of Option 1

(7) Convertible to RS232 via adaptor

(8) Includes Webserver, Modbus TCP/IP, AMS Ready, OPC,

(9) The WL2 - WL4 options require minor assembly.

## Accessories and Spare Parts

TABLE 1. Accessories

Item Description	Part Number
AMS® Wireless SNAP-ON™, 1 Gateway License	01420-1344-0001
AMS Wireless SNAP-ON, 5 Gateway Licenses	01420-1344-0002
AMS Wireless SNAP-ON, 10 Gateway Licenses	01420-1344-0003
AMS Wireless SNAP-ON, 5-10 Upgrade Licenses	01420-1344-0004
Serial Port HART Modem and Cables only	03095-5105-0001
USB Port HART Modem and Cables only	03095-5105-0002



## Product Data Sheet

00813-0200-4420, Rev AA

January 2009

# Smart Wireless Gateway

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**Emerson Process Management  
Rosemount Inc.**  
8200 Market Boulevard  
Chanhassen, MN 55317 USA  
T (U.S.) 1-800-999-9307  
T (International) (952) 906-8888  
F (952) 949-7001

**Emerson Process Management**  
Blegistrasse 23  
P.O. Box 1046  
CH 6341 Baar  
Switzerland  
T +41 (0) 41 768 6111  
F +41 (0) 41 768 6300

**Emerson FZE**  
P.O. Box 17033  
Jebel Ali Free Zone  
Dubai UAE  
T +971 4 883 5235  
F +971 4 883 5312

**Emerson Process Management  
Asia Pacific Pte Ltd**  
1 Pandan Crescent  
Singapore 128461  
T +65 6777 8211  
F +65 6777 0947  
Service Support Hotline: +65 6770 8711  
Email: [Enquiries@AP.EmersonProcess.com](mailto:Enquiries@AP.EmersonProcess.com)



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