

# Smart Wireless Gateway

- Gateway connects wireless 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<sup>®</sup> Device Manager and DeltaV<sup>™</sup> automation system
- Greater than 99% reliability with industry proven security
- Smart Wireless capabilities extends the full benefit of PlantWeb<sup>®</sup> architecture to previously inaccessible locations



**WirelessHART**

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# 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

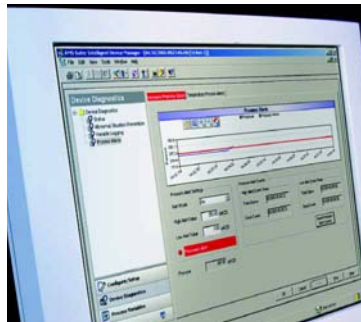


### Flexible Integration

- 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



### Device Specifications

- Update rate: User Selectable 4, 8, 16, 32 second or 1 to 60 minutes
- Network Size: Up to 100 devices
- Output: Ethernet, Modbus, OPC, Serial, HART-IP
- Approvals: FM, CSA, ATEX, IECEx



**WirelessHART**

### 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

## Product Data Sheet

00813-0200-4420, Rev CA

September 2010

# Smart Wireless Gateway

## IEC 62591 (*WirelessHART™*)... The Industry Standard

### Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, network automatically finds 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

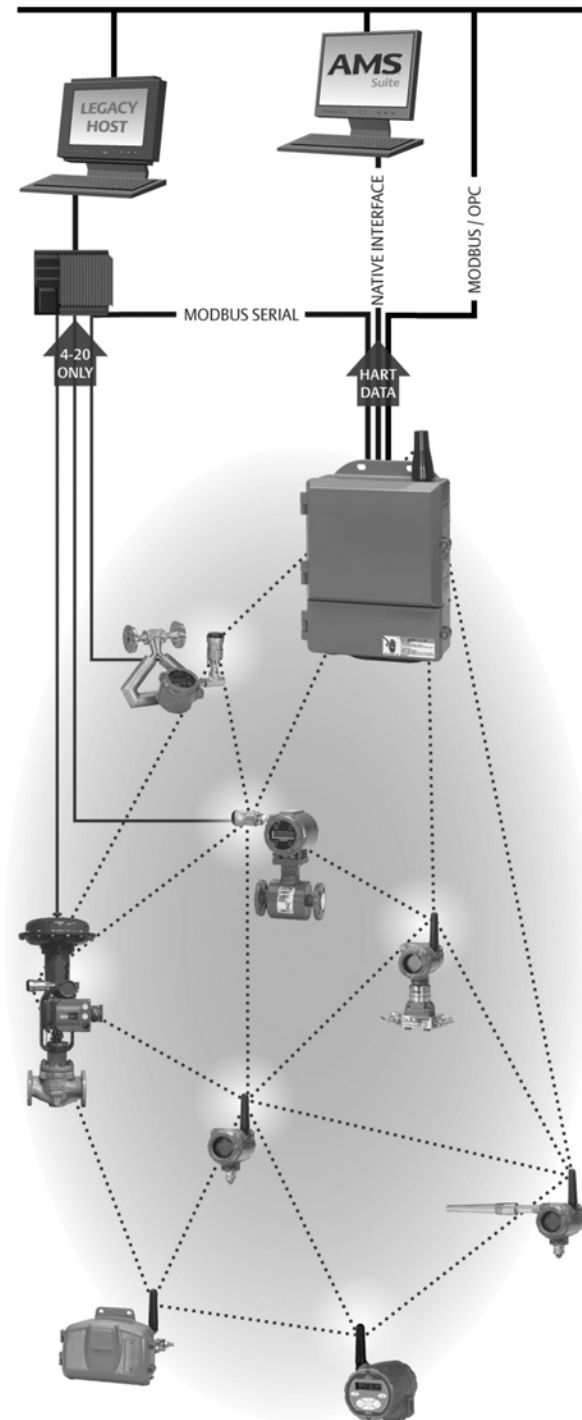
- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels
- Time Synchronized Channel Hopping to avoid interference and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

### Self-Healing Network

- 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.

### Seamless Integration to Existing Hosts

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



## Ordering Information

Table 1. 1420 Smart Wireless Gateway Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
1420	Smart Wireless Gateway	
<b>Power Input</b>		
<b>Standard</b>		<b>Standard</b>
A	24 Vdc	★
<b>Ethernet Communications - Physical Connection</b>		
<b>Standard</b>		<b>Standard</b>
1 <sup>(1)(2)</sup>	Ethernet	★
2 <sup>(3)(4)</sup>	Dual Ethernet	★
<b>Expanded</b>		
3 <sup>(5)(6)</sup>	Fiber Optic Ethernet	
<b>Wireless Update Rate, Operating Frequency, and Protocol</b>		
<b>Standard</b>		<b>Standard</b>
A3	User Configurable Update Rate, 2.4 GHz DSSS, WirelessHART	★
<b>Serial Communication</b>		
<b>Standard</b>		<b>Standard</b>
N	None	★
A <sup>(7)</sup>	Modbus RTU via RS485	★
<b>Ethernet Communication - Data Protocols</b>		
<b>Standard</b>		<b>Standard</b>
2	Webserver, Modbus TCP/IP, AMS Ready	★
4	Webserver, Modbus TCP/IP, AMS Ready, OPC	★
5 <sup>(8)</sup>	DeltaV Ready	★
6 <sup>(8)</sup>	Ovation Ready	★
7 <sup>(9)</sup>	HART-IP	★

### Options (Include with selected model number)

<b>Product Certifications</b>		
<b>Standard</b>		<b>Standard</b>
N5	FM Division 2, Non-incendive	★
N6	CSA Division 2, Non-incendive	★
N1	ATEX Type n	★
ND	ATEX Dust	★
N7	IECEX Type n	★
NF	IECEX Dust	★
KD	FM & CSA Division 2, Non-incendive and ATEX Type n	★
N3	China Type n	★
N4	TIIS Type n	★
<b>Adapters</b>		
<b>Standard</b>		<b>Standard</b>
J1	CM 20 Conduit Adapters	★
J2	PG 13.5 Conduit Adapters	★
J3	<sup>3</sup> / <sub>4</sub> NPT Conduit Adapters	★
<b>Antenna Options<sup>(10)</sup></b>		
<b>Standard</b>		<b>Standard</b>
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	★
<b>Typical Model Number: 1420 A 2 A3 A 2 N5</b>		

## Product Data Sheet

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# Smart Wireless Gateway

- (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) 1300 nm Multimode Optical fiber connection with separate SC connectors for Rx and Tx.
- (6) Includes features of Option 1.
- (7) Convertible to RS232 via adaptor, not included with Gateway.
- (8) Includes Webserver, Modbus TCP, AMS Ready, and OPC.
- (9) Includes Webserver, Modbus TCP, and AMS Ready.
- (10) The WL2 - WL4 options require minor assembly.

## ACCESSORIES AND SPARE PARTS

Table 2. Accessories

Item Description	Part Number
AMS® Wireless SNAP-ON™, 1 Gateway License	01420-1644-0001
AMS Wireless SNAP-ON, 5 Gateway Licenses	01420-1644-0002
AMS Wireless SNAP-ON, 10 Gateway Licenses	01420-1644-0003
AMS Wireless SNAP-ON, 5-10 Upgrade Licenses	01420-1644-0004
Serial Port HART Modem and Cables only	03095-5105-0001
USB Port HART Modem and Cables only	03095-5105-0002

Table 3. Spare Parts

Item Description	Part Number
Spare Kit, WL2 Replacement <sup>(1)</sup> , Remote Antenna, 50 ft. (15,2 m) Cable, and Lightning Arrestor	01420-1615-0302
Spare Kit, WL3 Replacement <sup>(1)</sup> , Remote Antenna, 20/30 ft. (6,1/9,1 m) Cables, and Lightning Arrestor	01420-1615-0303
Spare Kit, WL4 Replacement <sup>(1)</sup> , Remote Antenna, 10/40 ft. (3,0/12,2 m) Cables, and Lightning Arrestor	01420-1615-0304

- (1) Can not upgrade from integral to remote antenna.

## Specifications

### Functional Specifications

#### Input Power

19.2 - 28.8 Vdc  
250 mA startup  
150 mA continuous

#### Radio Frequency Power Output from Antenna

Maximum of 10 mW (10 dBm) EIRP

#### Environmental

Operating Temperature Range:  
-40 to 158 °F (-40 to 70 °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 up to 4,000 ft. (1,524 m)

#### Ethernet

10/100base-TX Ethernet communication port  
Protocols: Modbus TCP, OPC, HART-IP, 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, HART-IP, 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 v2, v3

### Self-Organizing Network Specifications

#### Protocol

IEC 62591 (*WirelessHART*), 2.4 - 2.5 GHz DSSS.

#### Maximum Network Size

100 wireless devices @ 8 sec.  
50 wireless devices @ 4 sec.

#### Supported Device Update Rates

4 sec. to 60 min.

#### Network Size/Latency

100 Devices: less than 10 sec.  
50 Devices: less than 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.  
Suitable for Class II, III, Division 1,  
Groups E, F, and G; Indoors/outdoor locations;  
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

## CE

### European Certification

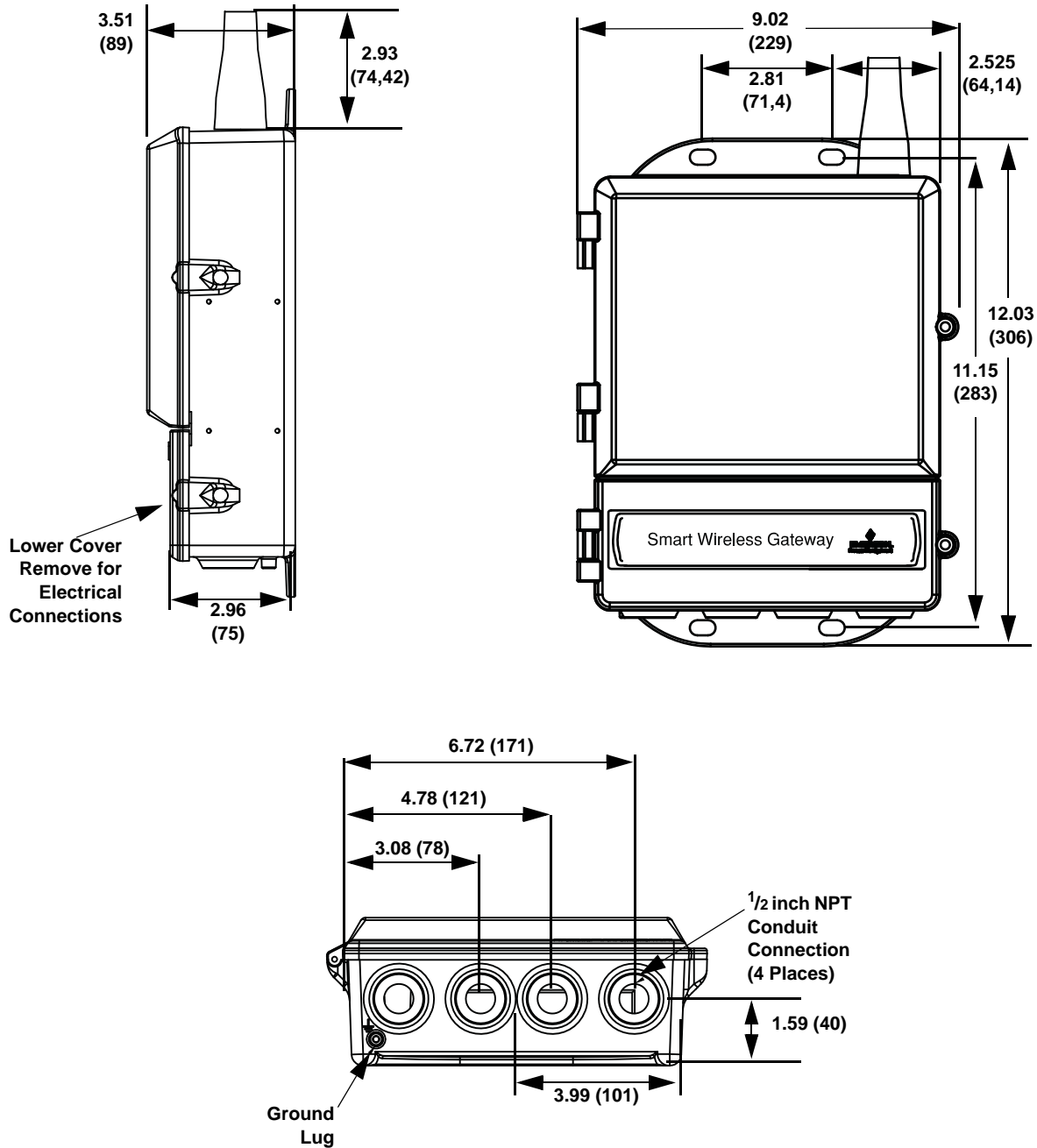
- N1 ATEX Type n  
Certificate Number: Baseefa 07ATEX0056X  
ATEX Marking: Ⓜ II 3 G  
Ex nA nL IIC T4 (-40 °C < T<sub>a</sub> < 60 °C)  
**Special condition for safe use (X):**  
The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.  
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.
- ND A TEX Dust  
Certificate Number: Baseefa 07ATEX0057  
ATEX Marking: Ⓜ II 3 G  
Ex tD A 22 IP66 T135 (-40 °C < T<sub>a</sub> < 60 °C)  
Maximum working Voltage = 28 V
- N7 IECEx Type n  
Certificate Number: IECEx BAS 07.0012X  
Ex nA nL IIC T4 (-40 °C =< T<sub>a</sub> <=60 °C)  
Maximum working voltage = 28 V  
**Special condition for safe use (X):**  
The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.  
The Apparatus is not capable of withstanding the 500 V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.
- NF IECEx Dust  
Certification Number: IECEx BAS 07.0013  
Ex tD A22 IP66 T135 (-40 °C < T<sub>a</sub> < 60 °C)  
Maximum working voltage = 28 V

### Combinations of Certifications

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

## Dimensional Drawings

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



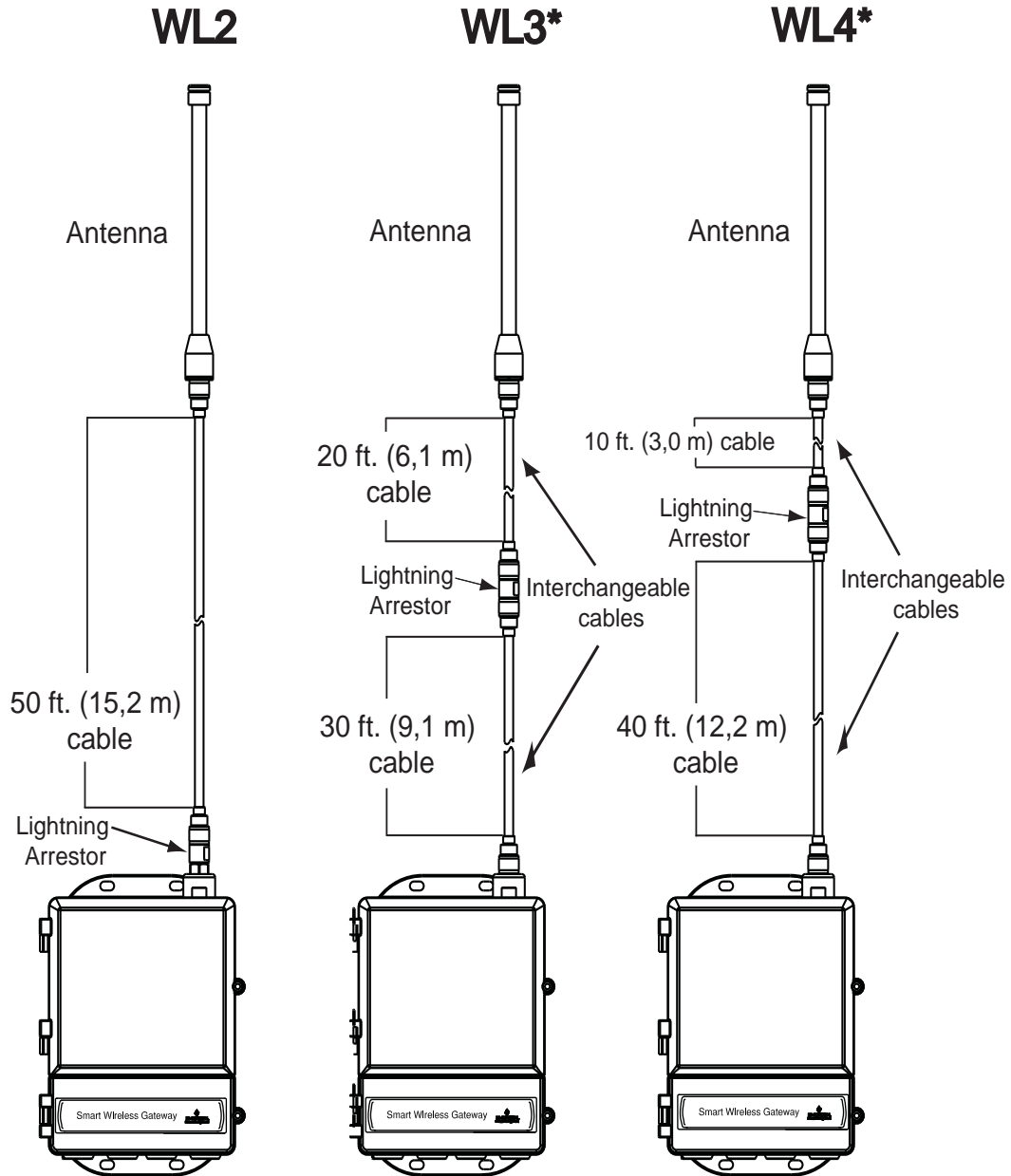


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# Smart Wireless Gateway

**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 arrestor mounted at the building egress.**

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

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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  
[www.rosemount.com](http://www.rosemount.com)

**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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