

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



**WirelessHART™**

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## Smart Wireless Gateway

# Emerson Smart Wireless Gateway

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

- The Smart Wireless Gateway automatically manages wireless communications in constantly changing environments
- Native integration with DeltaV and Ovation automation systems provides simple and fast commissioning for wireless field networks
- Connect to data historians, legacy host systems, and other applications through Ethernet, Modbus, Serial, OPC, and HART outputs



### Guarantee system availability with redundant Smart Wireless Gateways

- Never lose the wireless network with hot standby capability and automatic fault detection
- Smart Wireless Gateways function as a single system, eliminating the need for duplicate host integration
- One click configuration and plug-and-play architecture

### 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 devices and view diagnostic data
- Drag and Drop device provisioning enables a secure method to add new wireless devices to the wireless field network



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# Smart Wireless Gateway

## Emerson's Smart Wireless Solution

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

#### Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, network automatically finds 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 to avoid interference from other radios, WiFi, and EMC sources and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

### Emerson's Smart Wireless

#### Seamless Integration to All Existing Host Systems

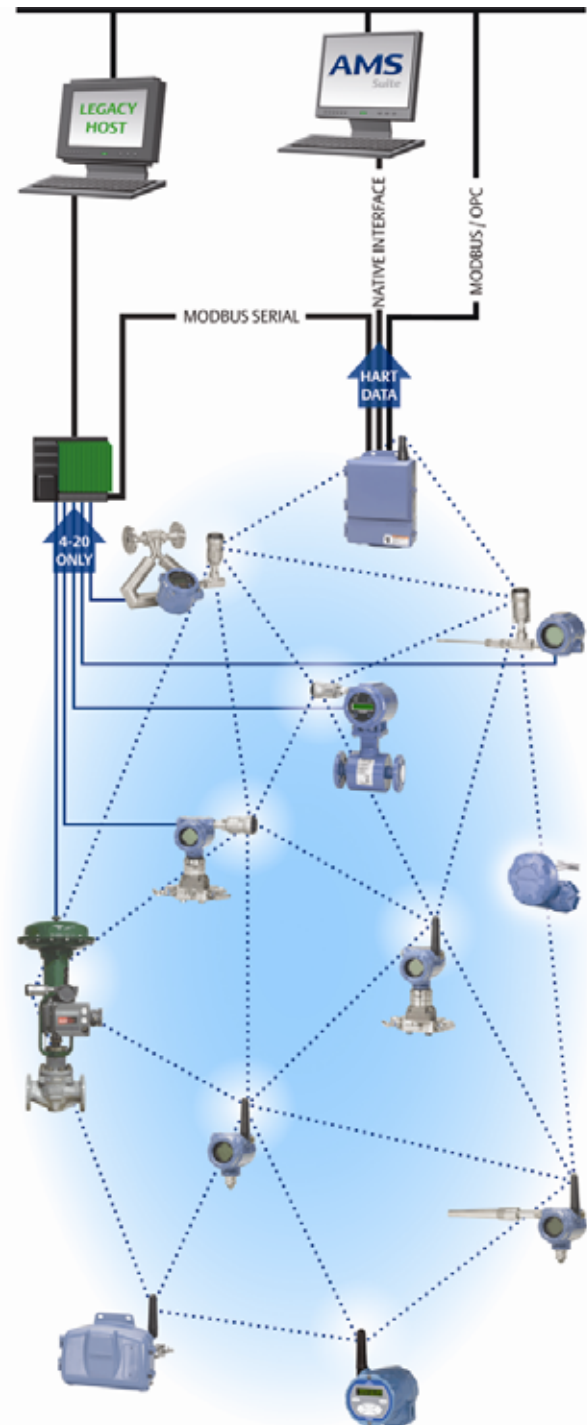
- Native integration into DeltaV and Ovation is transparent and seamless
- Gateways interface with existing host systems using industry standard protocols including OPC, Modbus TCP/IP, and Modbus RTU

#### Layered Security Keeps Your Network Safe

- Ensures that data transmissions are received only by the Smart Wireless Gateway
- Network devices implement industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management
- Third party security verification including Achilles and FIPS197.

#### SmartPower™ Solutions

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



# Smart Wireless Gateway

## Ordering Information

Table 1. 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 Nominal (10.5-30 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>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>(5)</sup>	Modbus RTU via RS485	★
<b>Ethernet Communication - Data Protocols</b>		
<b>Standard</b>		<b>Standard</b>
2	Webserver, Modbus TCP/IP, AMS Ready, HART-IP	★
4	Webserver, Modbus TCP/IP, AMS Ready, HART-IP, OPC	★
5 <sup>(6)</sup>	DeltaV Ready	★
6 <sup>(6)</sup>	Ovation Ready	★

### 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>Redundancy Options</b>		
<b>Standard</b>		<b>Standard</b>
RD <sup>(7)(8)</sup>	Gateway Redundancy	★
<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	★

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# Smart Wireless Gateway

Table 1. 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.

Antenna Options <sup>(9)</sup>		
Standard		Standard
WL2	Remote Antenna Kit, 50 ft. (15.2 m) cable, Lightning Arrestor	★
WL3	Remote Antenna Kit, 20 ft. (6.1 m) and 30 ft. (9.1 m) cables, Lightning Arrestor	★
WL4	Remote Antenna Kit, 10 ft. (3.0 m) and 40 ft. (12.2 m) cables, Lightning Arrestor	★
Expanded		
WN2	High-Gain, Remote Antenna Kit, 25 ft. (7.6m) cable, Lightning Arrestor	
<b>Typical Model Number: 1420 A 2 A3 A 2 N5</b>		

(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) Convertible to RS232 via adaptor, not included with Gateway.

(6) Includes Webserver, Modbus TCP, AMS Ready, HART-IP, and OPC.

(7) Requires the selection of Dual Ethernet option code 2.

(8) Not available with DeltaV Ready option code 5.

(9) The WL2, WL3, WL4, and WN2 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
Spare Kit, WN2 Replacement <sup>(1)</sup> , High Gain, Remote Antenna, 25 ft. (7.6 m) Cable, and Lightning Arrestor	01420-1615-0402

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

## Specifications

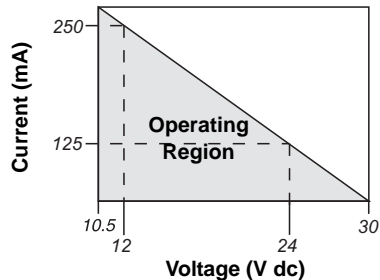
### Functional Specifications

#### Input Power

10.5 - 30 VDC

#### Current Draw

Operating Current Draw is based on 3.6 Watts average power consumption. Momentary startup Current Draw up to twice Operating Current Draw.



#### Radio Frequency Power Output from Antenna

Maximum of 10 mW (10 dBm) EIRP

Maximum of 40 mW (16 dBm) EIRP for WN2 High Gain option

#### 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

Integrated Antenna: PBT/PC

Remote Antenna: Fiber Glass

#### 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).

#### 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.

25 wireless devices @ 2 sec.

12 wireless devices @ 1 sec.

#### Supported Device Update Rates

1, 2, 4, 8, 16, 32 seconds or 1 - 60 minutes

#### Network Size/Latency

100 Devices: less than 10 sec.

50 Devices: less than 5 sec.

#### Data Reliability

>99%

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## 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.

### Third Party Certification

Wurldtech: Achilles Level 1 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)

## 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 ATEX 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

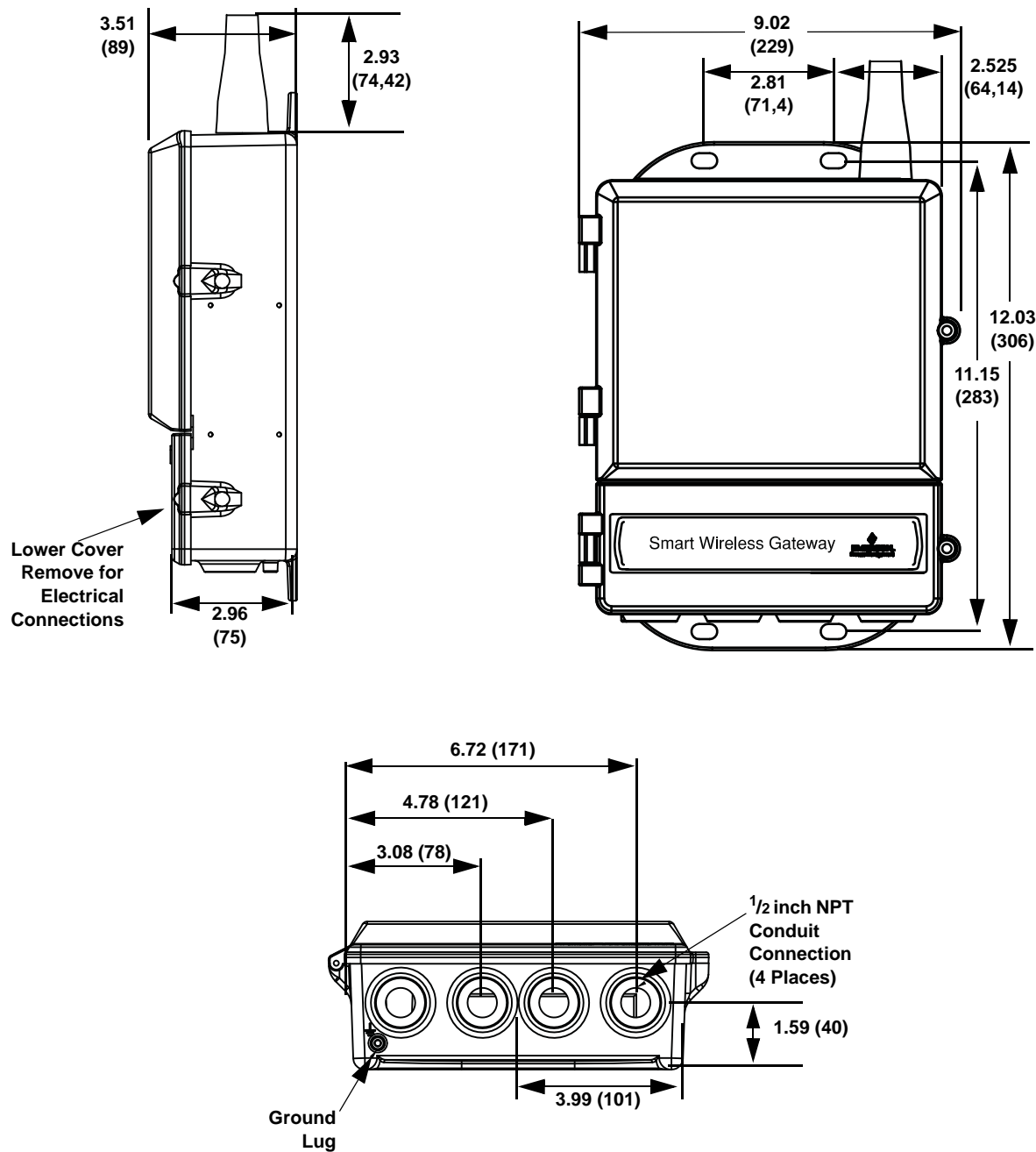
### Combinations of Certifications

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



## Dimensional Drawings

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



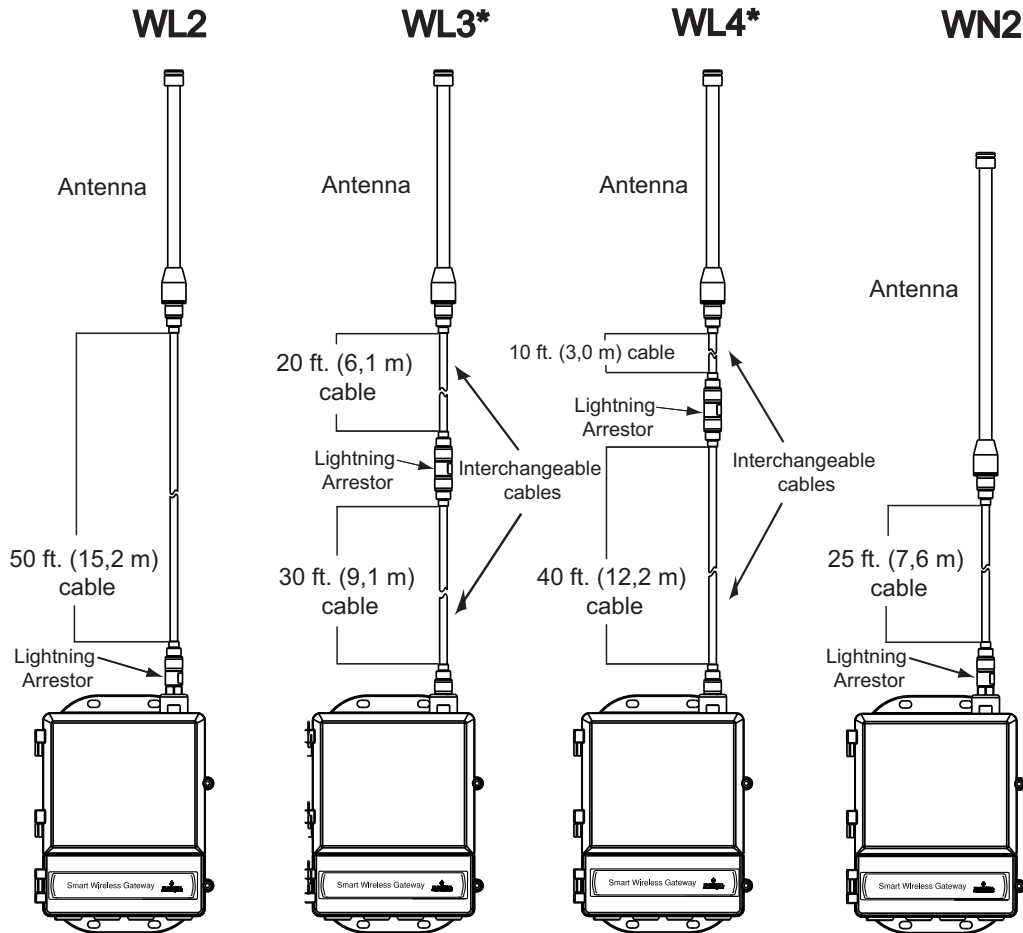
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## Remote Antenna Kit



The Remote 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.**

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

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