Emerson™ 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 LAN 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
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 via a LAN applications through Ethernet, Modbus®, Serial, OPC, EtherNet/IP™, 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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www.rosemount.com
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, Wi-Fi, 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 via LAN to all existing host systems

- Native integration into DeltaV and Ovation is transparent and seamless
- Gateways interface with existing host systems via a LAN, 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 Smart Wireless Gateway
- Network devices implement industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management
- Third party security verification including Achilles and FIPS197- User based login and enforced password strength. Password strength monitoring, user based log in, password reset requirements, automatic lockout, password expiration requirements. Based on guidelines from ISA99.03.03 standard approved level two.

SmartPower™ solutions

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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 6 for more information on Material Selection.

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.

<table>
<thead>
<tr>
<th>Model</th>
<th>Product description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1420</td>
<td>Smart Wireless Gateway</td>
</tr>
</tbody>
</table>

Power input

<table>
<thead>
<tr>
<th>★</th>
<th>Power input</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24 VDC nominal (10.5-30 VDC)</td>
</tr>
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</table>

Ethernet communications - physical connection

<table>
<thead>
<tr>
<th>★</th>
<th>Ethernet communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(2)</td>
<td>Ethernet</td>
</tr>
<tr>
<td>2(3)(4)</td>
<td>Dual Ethernet</td>
</tr>
</tbody>
</table>

Wireless update rate, operating frequency, and protocol

<table>
<thead>
<tr>
<th>★</th>
<th>Wireless update rate, operating frequency, and protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3</td>
<td>User configurable update rate, 2.4 GHz DSSS, WirelessHART</td>
</tr>
</tbody>
</table>

Serial communication

<table>
<thead>
<tr>
<th>★</th>
<th>Serial communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>None</td>
</tr>
<tr>
<td>A(5)</td>
<td>Modbus RTU via RS485</td>
</tr>
</tbody>
</table>

Ethernet communication - data protocols

<table>
<thead>
<tr>
<th>★</th>
<th>Ethernet communication - data protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Webserver, Modbus TCP/IP, AMS ready, HART-IP™</td>
</tr>
<tr>
<td>4</td>
<td>Webserver, Modbus TCP/IP, AMS ready, HART-IP, OPC</td>
</tr>
<tr>
<td>5(6)</td>
<td>DeltaV ready</td>
</tr>
<tr>
<td>6(6)</td>
<td>Ovation ready</td>
</tr>
<tr>
<td>8</td>
<td>Webserver, EtherNet/IP, AMS ready, HART-IP</td>
</tr>
<tr>
<td>9</td>
<td>Webserver, EtherNet/IP, Modbus TCP/IP, AMS ready, HART-IP</td>
</tr>
</tbody>
</table>

Options (include with selected model number)

<table>
<thead>
<tr>
<th>★</th>
<th>Options (include with selected model number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product certifications</td>
<td></td>
</tr>
<tr>
<td>N5</td>
<td>U.S.A. Division 2</td>
</tr>
<tr>
<td>N6</td>
<td>CSA Division 2, Non-incendive</td>
</tr>
<tr>
<td>N1(7)</td>
<td>ATEX Type n</td>
</tr>
<tr>
<td>ND(7)</td>
<td>ATEX Dust</td>
</tr>
<tr>
<td>N7(7)</td>
<td>IECEx Type n</td>
</tr>
<tr>
<td>NF(7)</td>
<td>IECEx Dust</td>
</tr>
<tr>
<td>KD(7)</td>
<td>FM &amp; CSA Division 2, Non-incendive and ATEX Type n</td>
</tr>
<tr>
<td>N3(7)</td>
<td>China Type n</td>
</tr>
<tr>
<td>N4(7)</td>
<td>TIIS Type n</td>
</tr>
<tr>
<td>NM</td>
<td>Technical Regulation Customs Union (EAC) Type N</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Redundancy options&lt;sup&gt;(8)(9)(10)&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>Gateway redundancy ★</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adapters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>CM 20 conduit adapters ★</td>
</tr>
<tr>
<td>J2</td>
<td>PG 13.5 conduit adapters ★</td>
</tr>
<tr>
<td>J3</td>
<td>3/4 NPT conduit adapters ★</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antenna options&lt;sup&gt;(11)&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WL2</td>
<td>Remote antenna kit, 50-ft. (15.2 m) cable, lightning arrestor ★</td>
</tr>
<tr>
<td>WL3</td>
<td>Remote antenna kit, 20-ft. (6.1 m) and 30-ft. (9.1 m) cables, lightning arrestor ★</td>
</tr>
<tr>
<td>WL4</td>
<td>Remote antenna kit, 10-ft. (3.0 m) and 40-ft. (12.2 m) cables, lightning arrestor ★</td>
</tr>
<tr>
<td>WN2&lt;sup&gt;(12)&lt;/sup&gt;</td>
<td>High-gain, remote antenna kit, 25-ft. (7.6 m) cable, lightning arrestor</td>
</tr>
</tbody>
</table>

**Typical model number:** 1420 A 2 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. Convertible to RS232 via adaptor, not included with Gateway.
6. Includes Webserver, Modbus TCP, AMS Ready, HART-IP, and OPC.
7. Options may or may not come with PoE. See terminal block configuration for determination if the device is compatible with PoE or see the 1420 Manual.
8. Requires the selection of Dual Ethernet option code 2.
12. Not available in all countries.

Accessories and spare parts

Table 2. Spare Parts

<table>
<thead>
<tr>
<th>Item description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spare kit, WL2 replacement&lt;sup&gt;(1)&lt;/sup&gt;, remote antenna, 50-ft. (15.2 m) cable, and lightning arrestor</td>
<td>01420-1615-0302</td>
</tr>
<tr>
<td>Spare kit, WL3 replacement&lt;sup&gt;(1)&lt;/sup&gt;, remote antenna, 20/30-ft. (6.1/9.1 m) cables, and lightning arrestor</td>
<td>01420-1615-0303</td>
</tr>
<tr>
<td>Spare kit, WL4 replacement&lt;sup&gt;(1)&lt;/sup&gt;, remote antenna, 10/40-ft. (3.0/12.2 m) cables, and lightning arrestor</td>
<td>01420-1615-0304</td>
</tr>
<tr>
<td>Spare kit, WN2 replacement&lt;sup&gt;(1)&lt;/sup&gt;, high gain, remote antenna, 25-ft. (7.6 m) cable, and lightning arrestor&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>01420-1615-0402</td>
</tr>
</tbody>
</table>

1. Can not upgrade from integral to remote antenna.
2. Not available in all countries.
Specifications

Functional specifications

Input power
10.5 - 30 VDC

Current draw
For non-POE enabled Gateways, the operation current draw is based on 3.6 Watts average power consumption.

Momentary startup Current Draw up to twice Operating Current Draw.

Power and Ethernet

PSE mode
50v - 57 vDC Output 9per IEEE 802.3at-2009)
25.5 W maximum

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 Omni-directional Antenna
Optional remote mount Omni-directional Antenna

Physical specifications

Material selection
Emerson provides a variety of Rosemount product 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 Process Management 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.

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 multi drop 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: EtherNet/IP 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

EtherNet/IP
Supports EtherNet/IP protocol with 32 bit Floating Point values and Integers.
EtherNet/IP Assembly Input-Output instances are user configurable.
EtherNet/IP specifications are managed and distributed by ODVA.

Self-organizing network specifications

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

Maximum network size
100 wireless devices @ 8 sec or higher.
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%

PoE
Supports IEEE 802.11 PoE as a PD or a PSE on either Port; jumper selectable. PSE ratings: IEEE 802.11af for 12VDC input and IEEE 802.11at for 24VDC input

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.
Product Certifications
Rev 1.1

European Directive Information
A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at www.rosemount.com.

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

Installing Equipment in North America
The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA
N5 U.S.A. Division 2
Certificate: CSA 70010780
Markings: NI CL 1, DIV 2, GP A, B, C, D T4;
Suitable for use in CL II, III, DIV 2, GP F, G T4;
T4(-40 °C ≤ Ta ≤ +60 °C);
Nonincendive outputs to remote antenna when connected per Rosemount drawing 01420-1011; Type 4X

Special Condition for Safe Use:
1. Explosion Hazard. Do not disconnect equipment when a flammable or combustible atmosphere is present.

Canada
N6 Canada Division 2
Certificate: CSA 70010780
Markings: Suitable for Class 1, Division 2, Groups A, B, C, and D, T4; when connected per Rosemount drawing 01420-1011; Type 4X

Special Condition for Safe Use:
1. Explosion Hazard. Do not disconnect equipment when a flammable or combustible atmosphere is present.

Europe
N1 ATEX Type n
Certificate: Baseefa07ATEX0056X
Standards: EN 60079-0: 2012, EN 60079-15: 2010
Markings: II 3 G Ex nA IIC T4 Gc,
T4(-40 °C ≤ Ta ≤ +65 °C), VMAX = 28 Vdc

Special Conditions for Safe Use (X):
1. The equipment is not capable of withstanding the 500V insulation test required by clause 6.5.1 of EN 60079-15:2010. This must be taken into account when installing the equipment.
2. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed with a dry cloth or cleaned with solvents.
ND  ATEX Dust
Certificate: Baseefa07ATEX0057X
Standards: EN 60079-0: 2012, EN 60079-31: 2009
Markings:  II 3 D Ex tc IIC T135 °C Dc,
(-40 °C ≤ Ta ≤ +65 °C)

Special Condition for Safe Use (X):
1. The surface resistivity of the antenna is greater than 1GΩ.
To avoid electrostatic charge build-up, it must not be
rubbed with a dry cloth or cleaned with solvents.

International

N7  IECEx Type n
Certificate: IECEx BAS 07.0012X
Markings:  Ex nA IIC T4 Gc, T4(-40 °C ≤ Ta ≤ +65 °C).
VMAX = 28 Vdc

Special Conditions for Safe Use (X):
1. The apparatus is not capable of withstanding the 500 V
electrical strength test as defined in Clause 6.5.1 of IEC
60079-15:2012. This must be taken into account during
installation.
2. The surface resistivity of the antenna is greater than 1GΩ.
To avoid electrostatic charge build-up, it must not be
rubbed with a dry cloth or cleaned with solvents.

NF  IECEx Dust
Certificate: IECEx BAS 07.0013
Markings:  Ex tc IIC T135 °C Dc, (-40 °C ≤ Ta ≤ +65 °C)

Special Condition for Safe Use (X):
1. The surface resistivity of the antenna is greater than 1GΩ.
To avoid electrostatic charge build-up, it must not be
rubbed with a dry cloth or cleaned with solvents.

Brazil

N2  INMETRO Type n
Certificate: CEPEL 09.1844X
Standards: ABNT NBR IEC 60079-0:2008,
IEC 60079-15:2010,
ABNT NBR IEC 60529:2009;
Markings:  Ex nA nl IIC T4 Gc

Special Condition for Safe Use (X):
1. See certificate for special conditions.

China

N3  China Type n
Certificate: CNEx13.1929X
Standards: GB3836.1 – 2010, GB3836.8 - 2003
Markings:  Ex nA nl IIC T4 Gc

Special Condition for Safe Use (X):
1. See certificate for special conditions.

Japan

N4  TIIS Type n
Certificate: T64855
Markings:  Ex nA nl IIC T4

EAC – Belarus, Kazakhstan, Russia

NM  Technical Regulation Customs Union (EAC) Type n
Certificate: RU C-US.GB05.8.00578
Markings:  2Ex nA IIC T4 X;
T4(-40 °C ≤ Ta ≤ +65 °C)
IP66;

Combinations

KD  Combination of N1, N5, and N6
Figure 1. Smart Wireless Gateway

A. Lower cover (remove for electrical connections)
B. Ground lug
C. 1/2-in. NPT conduit connection (4 places)

Dimensions are in inches (millimeters).
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
The cables lengths on the remote antenna options WL3 and WL4 are interchangeable for installation convenience.