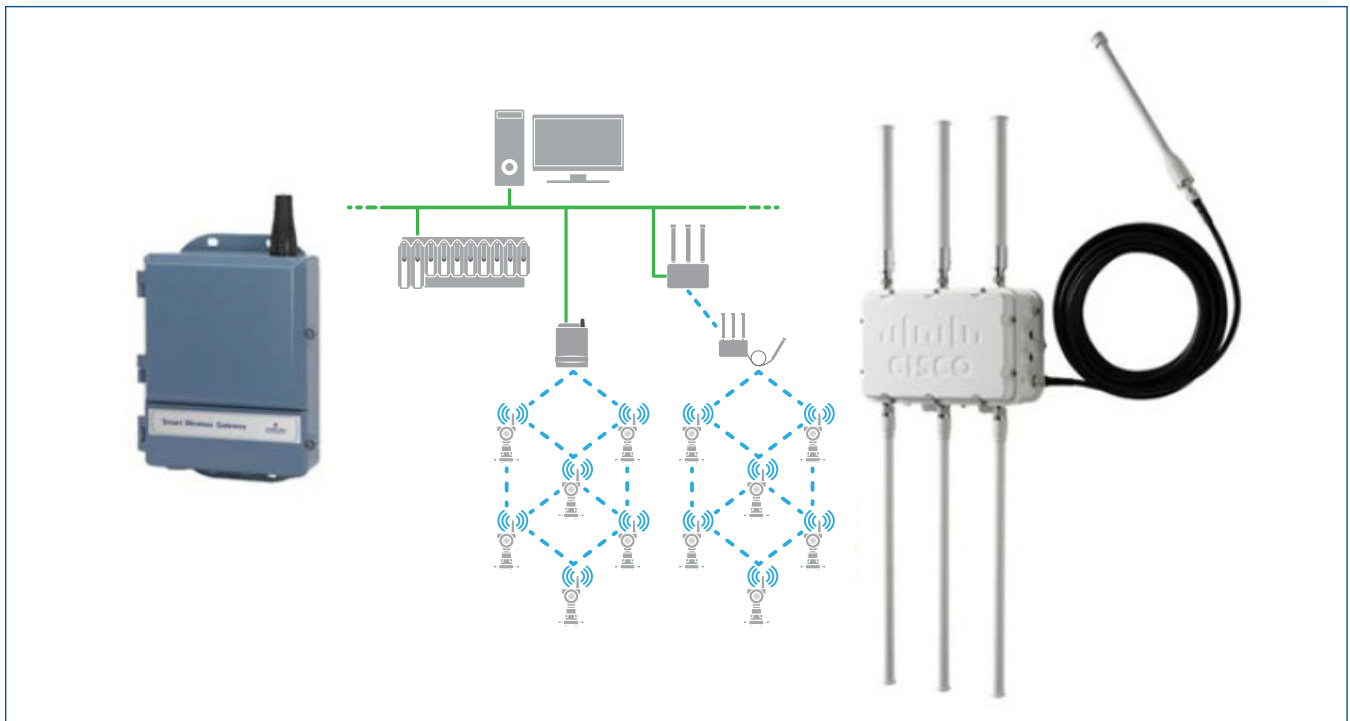


Smart Wireless Gateway



Smart Wireless Gateway.

- Seamless integration with DeltaV™ and AMS software
- Industry-proven security
- The Power of WirelessHART®
- Easy-to-deploy Wi-Fi™ solutions

Introduction

A robust wireless solution is much more than the sum of its parts; it is the result of innovative integration with consideration given to every aspect of the overall system. A Smart Wireless solution consists of the measurement devices, the self-organizing network, and easy integration with the DeltaV system. Emerson offers a full portfolio of wireless solutions enabled by self-organizing WirelessHART networks. Starting at version 10, the DeltaV system and AMS software provide seamless integration with the gateway. WirelessHART devices are the easiest devices to add to your existing control system! All the benefits of HART including HART device alerts for wireless devices are native with the latest DeltaV and AMS software releases.

Benefits

Seamless integration with the DeltaV system and AMS software:

The Smart Wireless Gateway is auto-detected on the DeltaV network and WirelessHART devices are auto-sensed as they are added to the network. WirelessHART networks do not require a site survey, making it easy and fast to set up your wireless field instrumentation, saving you time and money. With their reliability and ease of use, self-organizing WirelessHART mesh networks are perfect in any environment. Professional services from Emerson or its Local Business Partner are required to scope, design and commission any of the Wireless Plant Network solutions – for example, Mobile Worker or Safety Mustering.

Industry-proven security: The Emerson 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. Additional measures – such as digital certificates, MAC address authentication, encryption, and integrity protocols – provide a higher level of security for the Wi-Fi network.

The Power of WirelessHART: The Smart Wireless Gateway gives you access to intelligent devices using WirelessHART technology. WirelessHART devices have the same alerts as their wired counterparts, providing a consistent user experience.

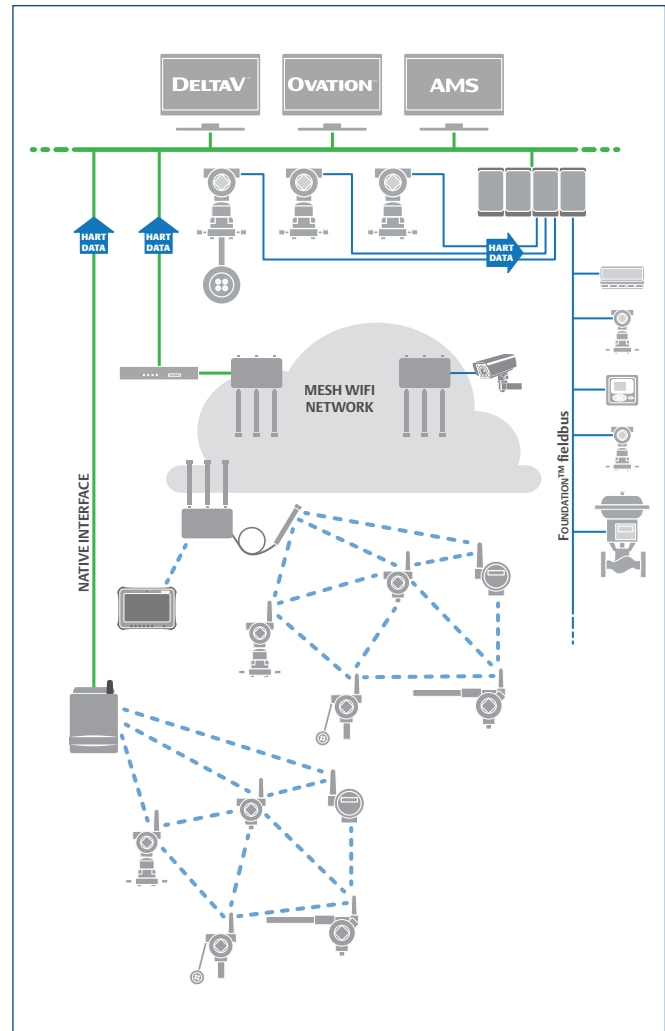
Easy-to-deploy Wi-Fi™ solutions: The Smart Wireless Gateway 1552WU meets the Wi-Fi standards (IEEE802.11.a/b/g/n), to ensure compatibility with your devices and applications today and in the future.

Product Description

WirelessHART Self-Organizing Network

- No wireless expertise is required; devices automatically find the best communication paths with Adaptive Mesh Routing.
- Network continuously monitors paths for degradation and repairs itself.
- Adaptive behavior provides reliable, hands-off operation and simplifies network deployments, expansion, and reconfiguration.

If an obstruction is introduced into the network, data will continue to flow because each device already has other established paths. The network will lay in more communication paths as needed for affected devices.



Self-Organizing WirelessHART Network Diagram.

Mesh vs. Bridged Networks

- Multiple 1552WU Gateways can be deployed to obtain maximum wireless coverage of your site and provide an effective and secure communication backbone for various Wi-Fi solutions as well as pervasive wireless sensing.
- The Wi-Fi Mesh topology allows communications at the edge of the network to have multiple paths back to wired network in the case of single unit failure.
- The bridge topology is meant to address point-to-point or point-to-multipoint applications that required greater isolation of communications – for example: control network communications.

Integration with the DeltaV System and AMS software

Native integration with the DeltaV system enables the user to autosense the gateway and easily commission it for seamless integration with all DeltaV applications: Explorer, Diagnostics, and Control Studio. WirelessHART devices can be easily added to the network with AMS Device Manager and then reconciled through DeltaV Explorer and assigned to Analog DSTs through drag-and-drop assignment.

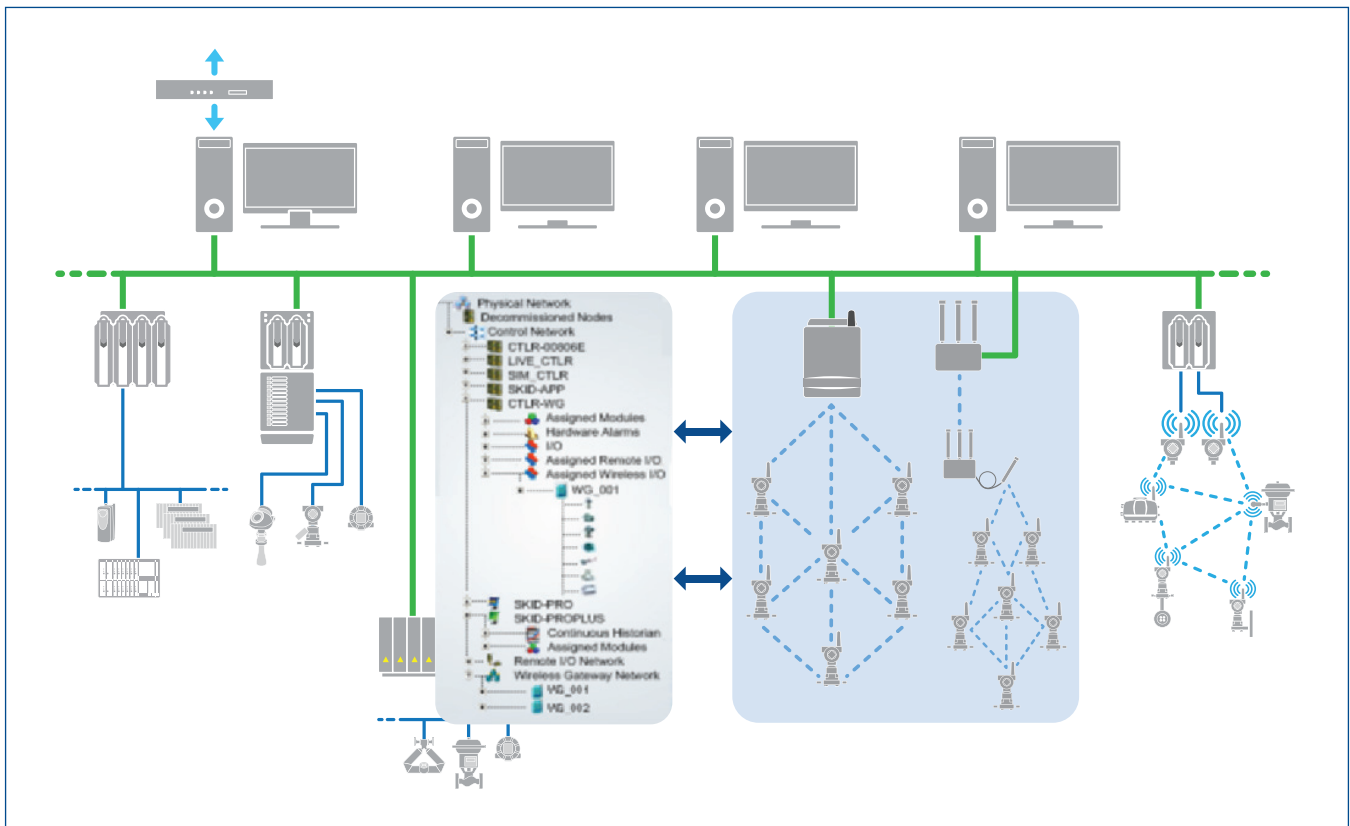
The Network ID and Join Key are easily assigned to the devices using AMS Device Manager. When the device is installed, it automatically and securely joins the network. DeltaV autosenses the new device through DeltaV Explorer.

Scalable Smart Wireless Gateway

The Smart Wireless Gateway is capable of supporting up to 99 wireless field devices. Once your initial network has been installed, it is quick and easy to add additional devices, allowing you to plan a large installation and add devices over time.

Powers PlantWeb

The Smart Wireless Gateway works together with the DeltaV system and AMS software to deliver the power of wireless connectivity with Emerson field devices.



Integration of hardware and software within DeltaV.

Specifications for the Smart Wireless Gateway 1420

Functional Specifications for the Smart Wireless Gateway	
Input Power	10.5-30 V DC, 3.6 W average power consumption. Momentary startup current draw up to twice operating current draw.
EMC Performance	Complies with EN 61326-2-3
Antenna Options	Integrated omni-directional antenna. Optional remote mount omni-directional antenna.
Environmental	
Operating temperature*	-40° to 60° C (-40° to 140° F)
Relative humidity	10 to 90%, non-condensing
Physical	
Weight	4.54 kg(10 lb)
Material of Construction	Housing – Low-copper aluminum, NEMA 4X. Paint – Polyurethane. Cover Gasket – Silicone Rubber. Antenna – PBT/PC integrated omni-directional antenna.
Certifications	Class 1 Division 2 (U.S.), Equivalent Worldwide
Communication	
Isolated RS-485	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 is approximately 4,000 ft. (1,524 m).
Ethernet	10/100base-TX Ethernet communication port. Protocols: Modbus TCP, OPC, and 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

*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see [Effects of Heat and Airflow Inside an Enclosure White Paper](#) for more information.

Self-Organizing Network	
Protocol	WirelessHART, 2.4-2.4835 GHz DSSS IEC 62591
Maximum Network Size	Up to 100 Devices
Supported Device Update Rates	WirelessHART, 1 sec., 2 sec., 4 sec., 8 sec... up to 60 min.
Network Size/Latency	100 devices: up to 10 sec. 50 devices: up to 5 sec. 15 devices: up to 2 sec.
System Security	
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.

Specifications for the Smart Wireless Gateway 1552WU

Functional Specifications for the Smart Wireless Gateway	
Input Power	19-30 V DC, 2,500 milliamps (39 Watts). 11.4-15 V DC, for non-hazardous installations only. No V AC or PoE input power options.
EMC Performance	Complies with EN 61326-2-3
Antenna Options	Six external type N connectors for Wi-Fi antennas: three for 2.4 GHz and three for 5 GHz. These IP66 rated antennas can be connected directly, or via an appropriate cable. There is also a dual polarized patch panel antenna for the 5 GHz radio. One external type N connector for WirelessHART antenna. This antenna is supplied with the 1552WU along with its mounting bracket, lightning arrestor and 50' low loss cable.
Environmental	
Operating temperature*	-40° to 55°C (-40° to 131° F) plus Solar Loading
Relative humidity	0 to 100%, condensing
Physical	
Weight	1552WU: 8 kg (17.6 lb) Pole mounting bracket: 2.8 kg (6.1 lb)
Material of Construction	Housing – aluminum, NEMA 4. Paint – powder coat paint over Alodine finish plating. Cover Gasket – silicone tube. Antenna – fiber glass.
Certifications	CSA: Class I, Division 2, Groups A, B, C and D. ATEX: Class I, Zone 2; Ex nA II, T5 .
Communication	
Ethernet	10/100/1000BASE-T Ethernet autosensing port (RJ45). Protocols: Modbus TCP, OPC, and https (for Web Interface). Wiring: Cat5E shielded cable. Wiring distance 328 ft. (100 m).
Modbus	Supports 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

*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper** for more information.

Self-Organizing Network	
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Supported Device Update Rates	WirelessHART, 1 sec., 2 sec., 4 sec., 8 sec... up to 60 min.
Network Size/Latency	100 devices: up to 10 sec. 50 devices: up to 5 sec. 15 devices: up to 2 sec.
Wi-Fi Mesh Network	
802.11n Capabilities	2 x 3 multiple-input multiple-output (MIMO) with two spatial streams Legacy beamforming 20 and 40 MHz channels PHY data rates up to 300Mbps Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Cyclic shift diversity (CSD) support)
WirelessHART Gateway System Security	
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.

Wi-Fi Security	
Wireless bridging/mesh	X.509 digital certificates; MAC address authentication; Advanced Encryption Standards (AES); Temporal Key Integrity Protocol (TLIP)
Wireless client access	802.11i, Wi-Fi Protected Access (WPA2), WPA 802.1X authentication, including Extensible Authentication Protocol and Protected EAP (EAP-PEAP), EAP Transport Lauer Security (EAP-TLS), EAP-Tunneled TLS (EAP-TTLS), and Cisco LEAP Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TLIP); VPN pass-through; IP Security (IPsec), Layer 2 Tunneling Protocol (L2TP); MAC address filtering

1420 Gateway 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
- Non-incendive for Class I, Division 2, Groups A, B, C, and D
- Dust Ignition-proof for Class II, III, Division 2, Groups E, F, and G; Indoors/outdoor locations
- Type 4X
- Temperature Code: T4 (-40 °C < Ta < 60 °C)

Canadian Standards Association (CSA)

- (N6) CSA Division 2, Non-incendive
- Suitable for Class I, Division 2, Groups A, B, C, D
- Dust Ignition-proof for Class II, Groups E, F, G
- Suitable for Class III Hazardous Locations
- Install per Rosemount drawing 01420-1011
- Temperature Code: T4 (-40 °C < Ta < 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. 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)

EN 61326-1

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
- Special condition for safe use (x)
- ATEX Marking:  II 3 G
- Ex nA nL IIC T4 (-40 °C < Ta < 60 °C)

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. This must be taken into account when installing the apparatus. 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.

Wurdtech

Achilles Communication Certification Level 1
(1420 Gateway versions 4.4.x, 4.5.x, and 4.6.x)

1552WU Product Certifications**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 and Cisco are 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 CSA

As standard, the 1552WU has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by CSA, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North American Certifications

- CSA Division 2, Non-Incendive
- Suitable for Class I Division 2, Groups A, B, C, and D
- Ambient Temperature: T5 (-40 °C to +55 °C)
- CSA Enclosure Type 4

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Emerson website at www.emerson.com. A hard copy may be obtained by contacting your local sales representative.

European Certification

- ATEX Type n
- ATEX Marking: II 3 G
- Ex nA II T5 Gc (Ta = -40°C to +55°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.

Ordering Information – Smart Wireless Gateway 1420

Description	Model Number
Smart Wireless Gateway - Copper Ethernet Connection, Locally mounted antenna	VE4041E1A1
Smart Wireless Gateway - Copper Ethernet Connection, Remote-mounted antenna with 50-foot (15.2-meter) cable and Lightning Arrestor	VE4041E1A2

All models of the Smart Wireless Gateway listed in the above table have all the certifications listed in this product data sheet (where indicated 1420). No other special options are necessary or available.

System Compatibility

- All models of the Smart Wireless Gateway listed in the Ordering Information table come with Modbus Serial, Modbus TCP and OPC communication protocols enabled to allow you to connect the gateway to DeltaV.
- The Smart Wireless Gateway requires v10.3.x software (or higher) with MD Plus, MQ* or MX Controller; or v11.3.x software (or higher) with SD Plus, SQ* or SX Controller; or v12.3.x software (or higher) with SZ Controllers.
- The Smart Wireless Gateway is not supported on any M- and S-series Migration Controllers for PROVOX and is not supported on any M-series Migration Controller for RS3.

* The MQ and SQ Controllers can be used on these versions by applying a hotfix to the DeltaV system.

Ordering Information – Smart Wireless Gateway 1552WU

For inquiries and ordering information, please contact your local Emerson sales office. Prior to order acceptance, Emerson will issue a written proposal for your review and approval to ensure that scope, deliverables, timing, and budget meet your needs and expectations.

Professional services from Emerson or its Local Business Partner are required to scope, design and commission the solution.

For more information, please visit our website at <http://www.emerson.com/wireless>.

Emerson

North America, Latin America:

+1 800 833 8314 or
+1 512 832 3774

Asia Pacific:

+65 6777 8211

Europe, Middle East:

+41 41 768 6111

www.emerson.com/deltav

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