315-WH-GT WirelessHART Gateway

WirelessHART-compliant infrastructure gateway for wireless sensor networks

Description

The 315-WH-GT WirelessHART™ Gateway establishes the connection between wireless field instrumentation and asset management or distributed control systems. Serving as the central controller and security manager for low-power wireless mesh field instruments operating under the WirelessHART standard, the 315-WH-GT ensures performance through dynamic network optimization and intelligent routing to achieve high reliability, lower latency, and deterministic power management. The embedded security manager protects the plant network through secure device authentication, end-to-end encryption and message integrity checking to create one of the most secure wireless mesh networks available.

Operating with a low-power WirelessHART 802.15.4 RF link to the sensors, connectivity to the host system can be provided either via hardwired LAN connection or secure wireless LAN (802.11b/g or 802.11a). The 315-WH-GT Gateway can also be coupled with the 315-WH-DC WirelessHART Data Concentrator to create a high performance wireless backbone that offers reliable and secure connectivity from multiple WirelessHART sensor networks, as well as allowing secure, non-disruptive expansion of the network as needed.

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Features

- WirelessHART gateway supporting up to 250 field instruments
- Compliant to WirelessHART (IEC 62591) for multi-vendor interoperability
- IEEE 802.15.4, 2.4 GHz, direct sequence spread spectrum
- Integrated IEEE 802.11b/g or 802.11a wireless backbone support
- Ethernet or serial (RS-232) for network connectivity
- Modbus® TCP or RTU interface for complete access to process variables
- WirelessHART authentication and security support
- 128-bit AES encryption with multiple keys and synchronized key management
- Field device network management ensures auto-formation and self-healing
- Complete diagnostics to provide detailed network status

Applications

- Factory automation and safety interlocks
- Process monitoring and control
- Water treatment facilities
- Tank and equipment monitoring
- Environmental monitoring
- Energy management
- Asset management
- Valve position monitoring

Specifications

SPECIFICATION	DESCRIPTION
Transmitter and Receiver	
Frequency	2.405–2.483 GHz ①, 2.412–2.472 GHz ②, 5.150–5.825 GHz ③
Transmit power	250 kbps: 6.3 mW (8 dBm) ① Up to 24 Mbps: 400 mW (+26 dBm), 36 Mbps: 250 mW (+24 dBm), 48 Mbps: 160 mW (+22 dBm), 54 Mbps: 125 mW (+21 dBm) ② ③
Transmission	Direct sequence spread spectrum (DSSS) ① ② ③
Modulation	Offset quadrature phase shift keying (O-QPSK) ① Orthogonal frequency data modulation (OFDM) ② ③
Receiver sensitivity	–92 dBm @ 250 kbps ① –100 dBm @ 250 kbps, –74 dBm @ 108 Mbps (8% FER) ② –94 dBm @ 6 Mbps, –74 dBm @ 108 dBm (8% FER) ③
Channel spacing	5 Mhz ① ⑧ 5 MHz, 10 MHz, 20 MHz or 40 MHz channel bandwidth ② 20 MHz or 40 MHz channel bandwidth ③
Data rate	250 kbps ①, 256 kbps to 54 Mbps/turbo: 108 Mbps ②, 6–54 Mbps/turbo: 108 Mbps ③ Auto mode selects fastest rate possible relative to RSSI
Range (LoS)	Indoor 328' (100m), outdoor 984' (300m) ① ④ 6 miles (10 km) @ 400 mW ② ④ 3 miles (5 km) @ 400 mW ③ ④
Antenna connector	1 x female SMA standard polarity ① 2 x female SMA standard polarity ② ③ ⑤
Input and Output	
Discrete I/O	Input voltage-free contact ⑥, output FET 30 Vdc 500 mA ⑥

Specifications (continued)

SPECIFICATION	DESCRIPTION
Ethernet Port	
Ethernet port	10/100BaseT, RJ-45 connector, IEEE 802.3
Link activity	Link, 100BaseT via LED
Serial Port	
RS-232	DB-9 female DCE, RTS/CTS/DTR/DCD
RS-485	2-pin terminal block, non-isolated ⑦
Data rate (bps)	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200, 230400, 460800
Serial settings	7/8 data bits, stop/start/parity bits, flow control (configurable)
Protocols and Configuration	
System address	ESSID; 1–31 character text string
Protocols supported	WirelessHART, TCP/IP, UDP, ARP, RADIUS/802.1x, DHCP, DNS, ICMP, HTTP, FTP, TFTP, TELNET, MODBUS RTU/TCP
User configuration	User configurable parameters via HTTPS embedded Web server
Configurable parameters	Access point/client/bridge/router Point to point, point to multipoint Wireless distribution system (AP-to-AP repeater) Simultaneous RS-232/RS-485 connection Modbus slave for I/O transfer
Security	Data encryption, 802.11i (WPA) with CCMP 128-bit AES Support for 802.1x Radius server Secure HTTP protocol
Bandwidth protection	MAC address, whitelist/blacklist IP filtering, whitelist/blacklist ARP/GARP filtering, whitelist/blacklist
LED Indication and Diagnostics	
LED indication	Power/OK, RX, TX/link, RS-232, LAN, RS-485, WirelessHART connection active Refer to product manual for further information
Reported diagnostics	RSSI measurements (dBm), connectivity information and statistics, system log file
Network management	Optional network management system
Power Supply	
Nominal supply	9 to 30 Vdc, under/over voltage protection
Average current draw	330 mA @ 12V (idle), 210 mA @ 24V (idle)
Transmit current draw	490 mA @ 12V (400 mW), 310 mA @ 24V (400 mW)
Compliance	
EMC	FCC Part 15; EN 301 489–17; AS/NZS CISPR22
RF (radio)	FCC Part 15; EN 300 328; RSS 210
Hazardous area	CSA Class I, Division 2; ATEX Zone 2; IECEx nA IIC
Safety	IEC 60950-1
UL	UL listed
General	
Size	4.5" x 5.5" x 2.5" (114 mm x 140 mm x 63 mm)
Housing	Powder-coated aluminum
Mounting	DIN rail
Terminal blocks	Removable, max. conductor 12 AWG 0.1 $in.^2$ (2.5 mm^2)
Temperature rating	–40 to +140°F (–40 to +60°C)
Humidity rating	0–99% RH noncondensing
Weight	1.5 lb (0.6 kg)

Note: Specifications subject to change.

① IEEE 802.15.4 WirelessHART (15 channels)
② Order option for 802.11b/g (13 overlapping channels EU and AU, 11 channels U.S. at 20 MHz)
③ Order option for 802.11a (21 channels AU, 24 channels U.S., 16 channels EU at 20 MHz)
④ Typical maximum line-of-sight range
⑤ Supports signal diversity or high gain antenna
⑥ Indicates WirelessHART connectivity
⑦ Maximum distance 0.74 miles (1200m)
⑧ Channel usage selectable to avoid 802.11b/g channels

Ordering

PRODUCT CODE	DESCRIPTION	FREQUENCY	RF POWER
315-WH-GT-G	WirelessHART to 802.11b/g gateway	2.4GHz DSSS	400 mW
315-WH-GT-A	WirelessHART to 802.11a gateway	5.8GHz DSSS	400 mW
315-WH-GT	WirelessHART gateway to LAN connectivity only	N/A	N/A

Note: Available RF power and frequency may vary depending on country of application.

Accessories

PRODUCT CODE	DESCRIPTION	DATA SHEET
Antennas - 2.4 GHz		
MD2400-EL	Dipole antenna, 15' (4.6m) cellfoil/SMA, mounting bracket, 0 dBi gain	TD032053EN
SG2400-EL	Collinear antenna, N-type, mounting bracket, 5 dBi	TD032054EN
Z2400-EL	Collinear antenna, N-type mounting bracket, 10 dBi	TD032055EN
Y2400-18EL	Yagi antenna, N-type connector, 18 dBi	TD032056EN
WH2400-SMA	Whip antenna, 2.1" (54 mm), SMA male, –2 dBi gain	TD032052EN
Antennas - 5.8 GHz		
COL5806	Collinear antenna, N-type female, mounting bracket, 6 dBi gain	TD032057EN
COL5810	Collinear antenna, N-type female, mounting bracket, 10 dBi gain	TD032058EN
Cables		
CC3/10/20-SMA	Coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m), N-type to SMA	TD032023EN
CCTAIL-SMA-F/M	Coaxial cable tail, 24' (0.6m), SMA to N-type female or male	TD032023EN
ETH-C5X	Ethernet cable, 6' (1.8m), crossover, RJ-45 to R-J45	TD032025EN
ETH-C5A	Ethernet cable, 6' (1.8m), direct, RJ-45 to RJ-45	TD032024EN
Surge Diverters		
CSD-SMA-2500	SMA surge diverter for use with CC10, CC20–SMA	TD032029EN
CSD-N-6000	Coaxial surge diverter, bulkhead N female to N female	TD032031EN
MA15/D/1/SI	Power supply surge diverter, 110 Vdc/15A	TD032029EN
IOP32	Surge protection device 30V single loop or 2-wire protection, DIN rail mount	TD032032EN
Power Supplies		
PS-DINAC-12DC-OK	DIN rail power supply, 100–250 Vac, 12 Vdc/2.5A	TD032033EN
PSG60E	DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A	TD032034EN
Mounting Brackets		
BR-COL-KIT	Mounting bracket kit for collinear antenna	TD032071EN

Eaton's wireless business
www.eaton.com/wireless

North America & Latin America
5735 W. Las Positas Suite 100
Pleasanton, CA 94588
United States
Telephone: +1 925 924 8500

Australia, New Zealand
9/12 Billabong Street
Stafford Queensland 4053
Australia
Telephone: +61 7 3352 8600

China
955 Shengli Road
East Area of Zhangjiang High-Tech Park
Shanghai, 201201
China
Telephone: +86 21 2899 3600

Southeast Asia
2 Serangoon North Avenue 5
06-01 Fu Yu Building, 554911
Singapore
Telephone: +65 6645 9888

Europe
Hein-Moeller-Straße 7-11
53115 Bonn, Germany
Telephone: +49 228 602 5573

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

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