905U-G Wireless Gateway

Data bus interface and conversion



Description

ELPRO wireless gateways provide the interface and communication between industrial data-bus devices and field devices (such as Modbus® to Profibus to EtherNet/IP: PLCs to SCADA/DCS, and so on). Connected via RS-232/RS-485/RJ-45, register-allocated data-bus values are transmitted and received by radio to and from field and control room devices.

ELPRO 905U-G series products can multi-hop repeat up to four times and support a variety of industrial protocols. They can be combined with ELPRO 905U I/O and 115S series products to create powerful I/O and data-bus networks.

Features

- 865–867 MHz/902–928 MHz 1W, 19.2 kbps radio communications to 20 miles (32 km)
- Multi-hop repeater function provides increased communication distance
- Able to connect similar and dissimilar industrial protocols and vendor devices (incorporating master/slave, slave/slave, and master/master networks)
- Simple to complex networks, high reliability point-to-multipoint communications with forward error correction (FEC), data integrity check (CRC), and data encryption
- Eight configurable digital onborad I/O with I/O expansion via ELPRO 115S I/O expansion range
- AC/DC/battery power options with UPS battery charger
- Module diagnostics including read/write of register I/O, reporting of signal strength indication (RSSI), communications logging, and internal measurement of low/normal and battery supply voltages
- Class I Div 2 hazardous area approval (US/Canada)

Applications

- Data bus SCADA/DCS to PLC-PLC communications
- Moving machinery PLC-PLC/HMI connection/operation
- Data bus cable replacement
- Smart instrument interface and connection (for example, gas analyzer)
- Multi-I/O data concentrator/repeater for large networks

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Specifications

SPECIFICATION	DESCRIPTION
Transmitter and Receiver	
Frequency	865–867 MHz [a], 902–928 MHz [b], 915–928 MHz [c]
Transmit power	1W
Transmission	Frequency hopping spread spectrum (FHSS)
Modulation	Frequency shift keying
Receiver sensitivity	–106 dBm @ 19.2 kbps
Channel spacing	50 x 250 kHz
Data rate	19.2 kbps
Range (LoS)	20 miles (32 kms) @ 4W EIRP [d] 9.3 miles (15 kms) @ 1W EIRP (other countries)
Antenna connector	1 x SMA female standard polarity
Input/Output	
Discrete I/O [c]	8 input voltage-free/NPN, wetting current 0.5 mA; 8 output FET, 30 Vdc/500 mA
Ethernet Port	
Ethernet port	10/100Base-T; RJ45 connector (IEEE 802.3)
Link activity	Link, 100Base-T via LED
Serial settings	7/8 data bits; no parity, 1 stop bit
Serial Port	
RS-232	9-pin DB9 female connector
RS-485	2-pin terminal block, non-isolated to 4000' (1200 m)
Data rate (bps)	300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400
Serial settings	7/8 data bits; stop/start/parity (configurable)
Protocols and Configuration	
System address	Configurable system address
Radio Protocols:	ELPRO WIBnet™ auto acknowledgement up to four retries, CRC error checking
Fieldbus Protocols:	
905U-G-MD1	Modbus RTU (master/slave), DF1 up to 4300 I/O points: analog and/or discrete
	Modbus, RS-232/RS-485, 300–38400 bps DF1 (full duplex), RS-232, 300–38400 bps
905U-G-ET1	EtherNet/IP (Level 2 I/O server)
	Modbus/TCP (Class 0, 1, partially Class 2 slave)
	TCP/IP functions; embedded web system (dynamic HTTP); onboard file system for downloadable web pages via FTP server; email (SMTP) 2048 bytes input/2048 bytes output; up to 4300 DIO or 1024 AI/1024 AO; 10/100 Mbps, RJ-45 connector
905U-G-PR1	Profibus DP slave to EN 50170 standard; 416 I/O bytes (up to 1952 DI/1952 DO or 122 AI/122 AO)
	RS-485 optically isolated with onboard DC/DC converter, automatic baud rate detection: 9600 bps–12 Mbps
905U-G-PR2	Profibus DP master to EN 50170 standard; 2048 bytes input/ 2048 bytes output (up to 4300 DIO or 1024 AI/1024 AO), RS-485 optically isolated with onboard DC/DC converter, automatic baud rate detection: 9600 bps–12 Mbps
User configuration	E-Series configuration utility
Configurable parameters	Individual I/O mappings, update time, databus mappings, protocol settings
Security	64-bit encryption on radio and serial

SPECIFICATION	DESCRIPTION
LED Indicators and Diagnostics	
LED indication	Active, OK, serial TX and RX, radio TX and RX, I/O LED status Refer to product manual for more information.
Reported diagnostics	RSSI, communications logging, I/O status, battery voltage
Power Supply	
Nominal supply	12–24 Vac/15–30 Vdc: over-voltage/reverse power protected
Average current draw	905U-G-MD1: 150 mA @ 12V; 90 mA @ 24V; add 5 mA per I/O 905U-G-ET1/PR1/PR2: 270 mA @ 12V; 170 mA @ 24V; add 5 mA per I/O
Transmit current draw	600 mA @ 13.8 Vdc (1W)
Battery supply	11.5–15.0 Vdc (battery supply volts, internal I/O value)
Battery charging circuit	Suitable for 12 Vdc sealed lead acid batteries, max. charge current, 0.9A
Compliance	
EMC	FCC Part 15
RF (radio)	FCC Part 15.247, RSS 210, AS/NZS4268
Hazardous area	CSA Class I, Division 2
Safety	EN 60950
General	
Size	5.1" x 7.3" x 2.4" (130 mm x 185 mm x 60 mm)
Housing	Extruded aluminum
Mounting	DIN rail
Terminal blocks	Removable; max conductor 14 AWG (2.5 mm^2)
Temperature rating	905U-G-MD1, –40 to +140°F (–40 to +60°C), 905U-G-ET1/PR1/PR2: –32 to +140°F (0 to +60°C)
Humidity rating	905U-G-MD1: RH noncondensing 0–99% 905U-G-ET1/PR1/PR2: RH noncondensing 0–95%
Weight	1 kg (2.2 lbs)

Note: Specifications are subject to change.

[a] Available in selected Asian contries

[b] Configured for US

[c] Configured for Australia

[d] Typical maximum line-of-sight range (single hop, repeaters will extend)

[e] Configurable as inputs/outputs

[f] Maximum distance 1200m

Ordering

PRODUCT CODE	DESCRIPTION	FREQUENCY	RF POWER
Industrial Protocol–Ethernet/IP, Modbus TCP			
905U-G-ET1-900-1W	Gateway, Ethernet/IP	900-928 MHz	1W
905U-G-ET1-866-1W	Gateway, Ethernet/IP	865-867 MHz	1W
Industrial Protocol–Modbus RTU/DF1			
905U-G-MD1-900-1W	Gateway, Ethernet/IP	900-928 MHz	1W
905U-G-MD1-866-1W	Gateway, Ethernet/IP	865-867 MHz	1W
Industrial Protocol–Profibus Master/Slave			
905U-G-PR1-900-1W	Gateway, Profibus Slave	900-928 MHz	1W
905U-G-PR1-866-1W	Gateway, Profibus Slave	865-867 MHz	1W
905U-G-PR2-900-1W	Gateway, Profibus Master	900-928 MHz	1W
905U-G-PR2-866-1W	Gateway, Profibus Master	865-867 MHz	1W

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

Accessories

PRODUCT CODE	DESCRIPTION
Antennas 900 MHz	
DG900-1/5	Whip antenna, SMA male, angle bracket, –2 dBi gain, 3’ (1m) coaxial cable
WH900-SMA	Whip antenna, SMA male, –2 dBi gain
CFD890EL	Dipole antenna, SMA male, mounting bracket, 2 dBi gain, 16’ (5m) coaxial cable
SG900EL	Collinear antenna, N-type female, 5 dBi gain
SG900-6	Collinear antenna, N-type female, 8 dBi gain
YU6-900	Yagi antenna, N-type female, 9 dBi gain
YU16-900	Yagi antenna, N-type female, 15 dBi gain
Cables	
CC3/10/20-SMA	Coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m), N-type to SMA
CCTAIL-SMA-F/M	Coaxial cable tail, 24" (600 mm), SMA to N-type female/male
ETH-C5X	Serial cable, 6' (1.8m), crossover, RJ-45 to RJ-45
ETH-C5A	Serial cable, 6' (1.8m), direct, RJ-45 to RJ-45
SER-DB9	Serial RS-232 cable, DB-9 male to DB-9 female, straight through
SER-RJ45	RS-232 serial cable, DB-9 female to RJ-45
Surge Diverters	
CSD-SMA-2500	SMA surge diverter for use with CC10/CC20-SMA
CSD-N-6000	Coaxial surge diverter, bulkhead N-female to N-female
MA15/D/1/S1	Power supply surge diverter, 110 Vac/15A
Power Supplies	
PS-DINAC-12DC-OK	DIN rail power supply, 100–250 Vac, 12 Vdc/5A
PS-DINAC-24DC-OK	DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A
Mounting Brackets	
BR-COL-KIT	Mounting bracket kit for collinear antenna
BR-YAG-KIT	Mounting bracket kit for Yagi antenna
MA15/D/1/S1	Power supply surge diverter, 110 Vac/15A
MA15/D/2/S1	Power supply surge diverter, 240 Vac/15A
IOP32D	Signal surge diverter, 2 x 2-wire/1 x 4-wire
Power Supplies	
PS-DINAC-12DC-OK	DIN rail power supply, 100–250 Vac, 12 Vdc/5A
PS-DINAC-24DC-OK	DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A
Mounting Brackets	
BR-YAGI-KIT	Mounting bracket kit for Yagi antenna
BR-COL-KIT	Mounting bracket kit for collinear antenna

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Publication No. DS_EL-915U-2
July 2021

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