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 to PLC/HMI connection and operation
- Data-bus cable replacement
- Smart instrument interface and connection (such as gas analyzers)
- Multi I/O data concentrator/repeater for large networks

Specifications

SPECIFICATION	DESCRIPTION
Transmitter and Receiver	
Frequency	865–867 MHz ①, 902–928 MHz ②, 915–928 MHz ③
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 ② ③
Data rate	19.2 kbps
Range (LoS)	20 miles (32 kms) @ 4W ERIP ④ 9.3 miles (15+ km) @ 1W EIRP (other countries)
Antenna connector	1 x female SMA standard polarity
Input and Output	
Discrete I/O ⑤	8 input voltage-free/NPN, wetting current 0.5 mA 8 ouput FET 30 Vdc/500 mA
Ethernet Port	
Ethernet port	10/100Base-T, RJ-45 connector, IEEE 802.3
Link activity	Link, 100Base-T via LED
Serial Port	
RS-232	9-pin DB-9 female connector
RS-485	2-pin terminal block, nonisolated ⑥
Data rate (bps)	300, 600, 1200, 2400, 4800, 9600, 14400, 19200
Serial settings	7/8 data bits, stop/start/parity (configurable)
Protocols and Configuration	
System address	Configurable system address
Protocols supported	Model specific
905U-G-MD1	Modbus RTU (master/slave), or Allen Bradley DF1 Up to 4300 I/O points: analog and/or discrete I/O 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) On-board file system for downloadable Web pages via FTP server; email (SMTP) 2048 bytes input/2048 bytes output: up to 4300 DI/O or 1024 AI/1024 AO10/100 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 up to 122 AI/122 AO) RS-485 optically isolated with on-board DC/DC converter Automatic baud rate detection: 9600 bps to 12 Mbps
905U-G-PR2	Profibus DP master to EN 50170 standard 2048 bytes input/2048 bytes output: up to 4300 DI/O or 1024 AI/1024 AO RS-485 optically isolated with on-board DC/DC converter Automatic baud rate detection: 9600 bps to 12 Mbps
905U-G-DE1	DeviceNet™ slave 512 bytes input/512 bytes output (up to 4300 DI/O or 256 AI/256 AO) Register size 16 bit, number of remote addresses 500 RS-422 optically isolated (selectable baud rate between 125, 250, 500 kbps)
905U-G-M+1	Modbus+slave Global database transactions: routing up to six networks 2048 bytes input/2048 bytes output (up to 4300 DI/O or 1024 AI/1024 AO) RS485 optically isolated: standard baud rate 1 Mbps
User configuration	E-series configuration utility
Configurable parameters	Individual I/O mappings, update time, data bus mappings, protocol settings
Security	64-bit encryption on radio and serial

SPECIFICATION	DESCRIPTION
LED Indication and Diagnostics	
LED indication	Active, OK, serial TX and RX, radio TX and RX, I/O LED status Refer to the product manual for further information.
Reported diagnostics	RSSI, comms logging, I/O status, battery voltage
Power Supply	
Nominal supply	12–24 Vac/9–30Vdc, 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/DE1/M+1: 270 mA @ 12V, 170mA @ 24V, add 5 mA per I/O
Transmit current draw	600 mA @ 13.8 Vdc (1W)
Battery supply	11.5–15.0 Vdc (nattery dupply volts internal I/O value)
Battery charge circuit	Suitable for 12 Vdc sealed lead acid batteries Max. charge current 2.0A (5W), 0.9A (500 mW)
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 0.1 $in.^2$ (2.5 mm^2)
Temperature rating	905U-G-MD1: –40 to 140°F (–40 to +60°C) 905U-G-ET1/PR1/PR2/DE1/M+1: –32 to 140°F (0 to +60°C)
Humidity rating	905U-G-MD1: RH noncondensing 0–99% 905U-G-ET1/PR1/PR2/DE1/M+1: RH noncondensing 0–95%
Weight	2.2 lbs (1 kg)

Note: Specifications are subject to change.

① Available in selected Asian countries
② Configured for US
③ Configured for Australia
④ Typical maximum line-of-sight range (single hop, repeaters will extend)
⑤ Configurable as inputs/outputs
⑥ Maximum distance 1200m

Ordering

PRODUCT CODE	DESCRIPTION	FREQUENCY	RF POWER
Industrial Protocol - DeviceNet Slave			
905U-G-DE1-900-1W	Gateway, DeviceNet slave	902–928 MHz	1W
905U-G-DE1-866-1W	Gateway, DeviceNet Slave	865–867 MHz	1W
Industrial Protocol - Ethernet/IP, Modbus TCP			
905U-G-ET1-900-1W	Gateway, Ethernet	902–928 MHz	1W
905U-G-ET1-866-1W	Gateway, Ethernet	865–867 MHz	1W
Industrial Protocol - Modbus Plus Slave			
905U-G-M+1-900-1W	Gateway, Modbus Plus slave	902–928 MHz	1W
905U-G-M+1-866-1W	Gateway, Modbus Plus slave	865–867 MHz	1W
Industrial Protocol - Modbus RTU/DF1			
905U-G-MD1-900-1W	Gateway, Modbus/DF1	902–928 MHz	1W
905U-G-MD1-866-1W	Gateway, Modbus/DF1	865–867 MHz	1W
Industrial Protocol - Profibus Master/Slave			
905U-G-PR1-900-1W	Gateway, Profibus	902–928 MHz	1W
905U-G-PR1-866-1W	Gateway, Profibus	865–867 MHz	1W
905U-G-PR2-900-1W	Gateway, Profibus	902–928 MHz	1W
905U-G-PR2-866-1W	Gateway, Profibus	865–867 MHz	1W

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

Accessories

PRODUCT CODE	DESCRIPTION
Antennas - 900 MHz	
DG900-1	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 N-type/SMA male
CCTAIL-SMA-F/M	Coaxial cable tail, 24" (0.6m), SMA to N-type female or male

PRODUCT CODE	DESCRIPTION
SER-DB9	Serial RS-232 cable, DB-9 male to DB-9 female, straight through
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/SI	Power supply surge diverter, 110 Vdc/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/2.5A
PSG60E	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

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