

915U-2 Wireless Mesh Networking I/O and Gateway

Long-range, scalable, industrial multiple I/O node and gateway



Description

The ELPRO 915U-2 Wireless Mesh Networking I/O and Gateway is a multiple I/O node that extends communications to sensors and actuators in local, remote, or difficult-to-reach locations. Designed with a long-range, license-free wireless transceiver, the 915U-2 can provide IP-based mesh networking across sprawling industrial environments typical of industrial applications.

Capable of ad-hoc mesh networking, roaming and discovery, as well as deterministic mesh, the 915U-2 can serve as an end node, a routing node, or a network gateway. Scalable to thousands of nodes, its gather-scatter and block mapping technology offers efficient utilization of network resources and eases integration into complex monitoring and control systems. Integrated Modbus® server capability allows further I/O expansion through the use of ELPRO 115S expansion modules.

The 915U-2XM is a factory hardware option that provides 200 MB of extended internal flash memory specifically for use with the logging soft feature key option. Soft feature options are available for the 915U-2 and 915U-2XM, including Modbus TCP and logging. These are purchased separately and can be enabled as required via a code provided.

Features

- 902–928 MHz frequency hopping spread spectrum (FHSS) up to 1W RF Power
- 869 MHz wideband up to 500 mW for Europe
- Self-healing IP-based wireless mesh networking
- Multi-hop repeater and gateway functionality
- Gather-scatter and block mapping
- Serial client/server/multicast Modbus TCP to RTU gateway
- Configurable digital, pulse, and analog I/O to 14-bit resolution
- 10/100Base-T IEEE 802.3 Ethernet
- Secure 256-bit AES encryption
- Modbus RTU and TCP support
- Over-the-air network diagnostics and configuration
- Optional support for logging of register variables (see 915U-LOG data sheet)

Applications

- Oil and gas production and distribution
- Pipeline monitoring and leak detection
- Mining operations infrastructure
- Water treatment facilities
- Water and wastewater systems

Specifications

SPECIFICATION	DESCRIPTION
Transmitter and Receiver	
Frequency	902–928 MHz ^a , 869.525 MHz, 869.875 MHz ^a
Transmit power	1 mW (+0 dBm) to 1W (+30 dBm) ^b 1 mW (+0 dBm) to 500 mW (+27 dBm) ^c
Transmission	Frequency hopping spread spectrum (FHSS) ^b Single frequency ^c
Modulation	Frequency shift keying (FSK)
Receiver sensitivity	–109 dBm @ 19.2 kbps (3% FER) ^b –109 dBm @ 14.4 kbps (3% FER) ^c
Channel spacing	50 x 250 kHz ^{b d} , single 250 kHz ^c
Data rate	19.2–115.2 kbps ^{a b} , 14.4–76.8 kbps ^{a c}
Range (LoS)	20 miles (32 km) @ 4W ERIP ^{b e} 9.3 miles (15 km) @ 1W EIRP ^h 6 miles (10 km) @ 500 mW ERIP ^{c e}
Antenna connector	1 x female SMA standard polarity
Input and Output	
Discrete input	8 digital I/O (1–4 configurable as PI or PO) On-state voltage: <2.1 Vdc Wetting current: 5 mA Max. I/P pulse rate–DI 1/2: 50 kHz, DI 3/4: 1 kHz Max. I/P pulse width–DI 1/2: 10 µs, PI 3/4: 0.2 ms

Specifications (continued)

SPECIFICATION	DESCRIPTION
Discrete output	8 digital I/O (1–4 configurable as PI or PO) On-state voltage—DO max.: 30 Vdc Wetting current—DO max.: 200 mA Max O/P pulse rate—PO max. rate: 1 kHz
Analog inputs	4 AI (2 differential, 2 single ended) Current range: 0–24 mA Current resolution: 14 bits Accuracy (current): 0.1% Voltage input range: AI 1/2: 0–25V, AI 3/4: 0–5V Voltage resolution: 14 bits Accuracy (voltage): 0.1%
Analog output	2 AO (sourcing) Current range: 0–24 mA Current resolution: 13 bits Accuracy (current): 0.1%
Ethernet Port	
Ethernet port	10/100Base-T, RJ-45 connector, IEEE 802.3
Link activity	Link, 100Base-T via LED
Serial Port	
RS-232	EIA-562 (R-45 connector)
RS-485	2-pin terminal block, non-isolated f
Data rate (bps)	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200, 230400
Serial settings	7/8 data bits, stop/start/parity (configurable)
Protocols and Configuration	
System address	ESSID, 1 to 31-character text string
Protocols supported	TCP/IP, UDP, HTTP, FTP, TFTP, TELNET, Modbus, Modbus TCP
User configuration	All user-configurable parameters via HTTPS
Configurable parameters	Unit details, I/O mappings and parameters, radio settings (for more information, refer to the user manual) Modbus TCP/ RTU gateway Embedded Modbus master/slave for I/O transfer
Security	Data encryption, 128/192/256-bit AES, secure HTTP protocol
LED Indication and Diagnostics	
LED indication	Power/OK, TX/RX, RS-232, RS-485, digital I/O, analog I/O status
Reported diagnostics	RSSI measurements (dBm), connectivity information/statistics, system log file
Network management	Optional network management system
Compliance	
EMC	FCC Part 15; EN 301 489; AS 3548
RF (radio)	FCC Part 15.247; EN 300 220; AS 4268.2; RFS29 NZ
Hazardous area	UL/CSA Class I, Division 2; ATEX; IECEx Na IIC
Safety	IEC 60950 (RoHS compliant)
UL	UL listed
General	
Size	5.91" x 7.09" x 1.38" (180 mm x 150 mm x 35 mm)
Housing	IP20 rated high-density thermoplastic
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)

SPECIFICATION	DESCRIPTION
Humidity rating	0–99% RH noncondensing
Weight	1.1lb (0.5 kg)
Power Supply	
Nominal supply	10.8–30 Vdc, under/over voltage protection
Average current draw	220 mA @ 12V (idle), 110 mA @ 24V (idle)
Transmit current draw	500 mA @ 12V (1W), 250 mA @ 24V (1W)

Note: Specifications are subject to change.

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| a Country-specific configuration (specified at time of order) | e Typical maximum line-of-sight range (check local conditions of use) |
| b 900 MHz ISM band (North America) | f Maximum distance 3937' (1200m) |
| c 869 MHz ISM band (Europe) | g Optional, see 915U-TCP datasheet |
| d 18 channels (New Zealand) | h 900 MHz ISM band (Australia) |

Accessories

PRODUCT CODE	DESCRIPTION	DATA SHEET
Soft Feature Keys		
915U-LOG	Data logging feature key	EL-915U-LOG
Interface		
915U-TCADP	T-type TCP thermocouple adapter, uses two analog inputs and two analog outputs	EL-915U-TCADP
Antennas - 900 MHz		
DG800-1/5 DG900-1/5	Whip antenna, SMA male, angle bracket, –2 dBi gain, 3' (1m) or 16.4' (5m) coaxial cable	ANTDG800 ANTDG900
CFD890EL	Dipole antenna, SMA male, mounting bracket, 2 dBi gain, 16' (5m) coaxial cable	ANTCFD890EL
SG900EL	Collinear antenna, N-type female, 5 dBi gain	ANTSG900EL
SG900-6	Collinear antenna, N-type female, 8 dBi gain	ANTSG900-6
Cables		
ETH-C5A	Ethernet cable, 6' (1.8m), straight through, RJ-45 to RJ-45	CBLETH-C5A
SER-RJ45	Configuration cable, RS-232 serial, DB-9 female to RJ-45	CBLSER-RJ45
Surge Diverters		
CSD-SMA-2500	SMA surge diverter for use with CC10/CC20-SMA	CSD-SMA-2500
CSD-N-6000	Coaxial surge diverter, bulkhead N female to N female	SURCSD-N-6000
MA15D1SI/D2SI	Power supply surge diverter, 110 Vac/15A or 240 Vac/15A	TD032029EN
IOP32D	Signal surge diverter, 2 x 2-wire/1 x 4-wire	SURIOP32D
Power Supplies		
PS-DINAC-12DC-OK	DIN rail power supply, 85–264 Vac, 12 Vdc/4A	PS-DINAC-12DC-OK
PS-DINAC-24DC-OK	DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A	PS-DINAC-24DC-OK

Note: More accessories are available for this product including antennas, cables, and mounting brackets. Refer to our Website for details.

Ordering

PRODUCT CODE	DESCRIPTION	FREQUENCY	RF POWER
EL-915U-2-900US	Wireless mesh I/O	902–928 MHz	1W
EL-915U-2-900AU	Wireless mesh I/O	915–928 MHz	1W
EL-915U-2-900NZ	Wireless mesh I/O	921.5–928 MHz	1W
EL-915U-2-869EU	Wireless mesh I/O	869.525 MHz	500 mW
EL-915U-2L-869EU	Wireless mesh I/O	869.875 MHz	5 mW

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

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