450U-E Wireless Ethernet Modem

Ultra-long range Ethernet for reliable connectivity

Description

The ELPRO 450U-E Wireless Ethernet Modem is a robust, licensed and license-free wireless transceiver capable of ultra long-range communications. Operating at 360–512 MHz, and up to 5.0W RF power, the ELPRO 450U-E is optimized for throughputs of up to 19.2 kbps, which provides robust and secure two-way wireless communications in extremely challenging outdoor environments over obstructed paths typical of remote monitoring and control applications.

Capable of operating in access point client configuration, functioning as a network bridge/router, or serving as a serial server (RS-232/RS-485), the ELPRO 450U-E uses over-the-air data compression to ensure maximum throughput. Integrated Modbus® server capability allows seamless integration with smart sensors, RTUs, or I/O expansion through the use of ELPRO 115S expansion modules.

Features

- 360–512 MHz frequency licensed and unlicensed options
- 10 mW to 5W RF power
- Radio data rates from 4800 bps to 19.2 kbps
- 12.5 kHz and 25.0 kHz channel bandwidth options
- Access point/client and bridge/router configuration
- Deterministic AP-to-AP multi-repeater (WDS)
- 10/100Base-T Ethernet port
- Spanning tree (self-healing) support
- MAC and IP address filtering
- Analog input, digital I/O, and RS-232/RS-485 serial
- Design for industrial, high-noise environments
- Over-the-air network diagnostics and configuration
- VLAN tagging supported for bridging and routing modes
- Network management capabilities

Applications

- Remote wellhead monitoring
- Pipeline leak detection
- PLC networks
- Environmental monitoring
- Water treatment facilities
- Mining operations infrastructure
- Tank farm monitoring

Effective November 2018

Specifications

SPECIFICATION	DESCRIPTION
Transmitter and Receiver	
Frequency	360–380 MHz, 380–400 MHz, 400–420 MHz, 420–440 MHz, 430–450 MHz, 450–470 MHz, 470–490 MHz, 490–512 MHz
Transmit power	0.5–5.0W ① (+27 to +37 dBm) 10–500 mW② (+10 to +27 dBm)
Modulation	2-level FSK or 4-level FSK
Receiver sensitivity	12.5 kHz: –100 dBm (9600 bps), –111 dBm (4800 bps) ③ 25.0 kHz: –99 dBm (19.2 kbps), –110 dBm (9600 bps) ③
Channel spacing	12.5 kHz, 25.0 kHz (supports 5 or 6.25 kHz frequency steps)
Data rate	12.5 kHz: 4800 bps, 9600 bps 25.0 kHz: 9600 bps, 19.2 kbps
Range (LoS)	31 miles (50 km) @ 5W ④ 6 miles (10 km) @ 0.5W ④
Antenna connector	Single SMA connector for receive and transmit
Input and Output	
Discrete input	2.0 Vdc (on), 3.0 Vdc (off), 30 Vdc max. ⑤
Discrete output	FET to ground to activate external circuits Max. voltage 30 Vdc, max. current 500 mA ⑤
Analog inputs	Single analog input range 0–25 mA, accuracy +/– 0.5%
Ethernet Port	
Ethernet port	10/100Base-T, auto MDX
Link activity	Ethernet link with flash for activity
100M LED	100Base-T connection
Serial Port	
RS-232	DB-9 female DCE
RS-485	2-pin terminal block (configurable termination)
Data rate (bps)	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 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, ARP, Radius/802.1x, DHCP, DNS, PPP, ICMP, HTTP, FTP, TFTP, TELNET, Modbus RTU and Modbus TCP
Network parameters	Single point to point, central master with multiple slaves, large fixed network, network with roaming stations, redundant radio paths, automatic selection of radio paths, prioritization of traffic flows, bandwidth efficiency features, bandwidth utilization, routing, bridging, VLAN
User configuration	Remote access: over the air Local access: USB Network access: Ethernet
Security	WPA-PSK, WPA-Enterprise, password protected
Address filtering	IP address, whitelist/blacklist MAC address, whitelist/blacklist ARP/GARP filtering, whitelist/blacklist
LED Indication and Diagnostics	
LED indication	Power/OK, RX, TX/link, RS-232, LAN, RS-485, digital I/O Refer to the product manual for further information.
Reported diagnostics	Diagnostics are available through Web pages or optional network management system.
Network management	Optional network management system
Compliance	
EMC	FCC CFR47 Part 15; EN 301 489-3; EN 301 489-5
RF (radio)	FCC CFR47 Part 90; IC RSS 119; EN 300 113; EN 300 220; AS/NZS4295
Hazardous area	Class I, Division 2; IEC EX Zone 2; ATEX Zone 2
Safety	EN/IEC 60950-1
UL	UL listed
Power Supply	
Nominal supply	9–30 Vdc, under/over voltage protection
Average current draw	120 mA @ 13.8V (idle), 70 mA @ 24V (idle)
Transmit current draw	1.5A @ 13.8V (5W), 650 mA @ 24V (5W)

SPECIFICATION	DESCRIPTION
General	
Size	6.7" x 4.5" x 1.2" (168 mm x 114 mm x 30 mm)
Housing	Powder-coated aluminium
Mounting	DIN rail
Terminal blocks	Removable, max. conductor 14 AWG 0.1 in.^{2} (2.5 mm^2)
Temperature rating	–22 to +140°F (–30 to +60°C)
Humidity rating	0–99% noncondensing
Weight	1.2 lb (0.55 kg)

Note: Specifications are subject to change.

① Licensed model
② Unlicensed model
③ BER = 1 x 10-5

④ Typical maximum line-of-sight range (repeaters will extend)
⑤ Discrete I/O and analog share a single terminal

Accessories

PRODUCT CODE	DESCRIPTION
Antennas 360–512 MHz	
UDP400-C	400 MHz dipole antenna, N-type female, 2 dBi gain
BU3-400	Collinear antenna, N-type female, 5 dBi gain
BU6-400	Collinear antenna, N-type female, 8 dBi gain
YU3/6/9/16-400	Yagi antenna, 3/6/16 element, N-type, 10/9/12/15 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 or male
ETH-C5X	Ethernet cable, 6' (1.8m), crossover, RJ-45 to RJ-45
ETH-C5A	Ethernet cable, 6' (1.8m), straight through, RJ-45 to RJ-45
SER-DB9	RS-232 serial cable, DB-9 male to DB-9 female
SER-RJ45	Configuration cable, RS-232 serial, 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/SI	Power supply surge diverter, 110 Vac/15A
IOP32D	Signal surge diverter, 2 x 2-wire/1 x 4-wire
Power Supplies	
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

Ordering

PRODUCT CODE	DESCRIPTION	FREQUENCY	RF POWER
450U-E-H	Ethernet modem, serial RS-232/RS-485, 12.5/25 kHz spacing, licensed applications	360–512 MHz	0.5–5W
450U-E-L	Ethernet modem, serial RS-232/RS-485, 12.5/25 kHz spacing, unlicensed applications	360–512 MHz	10–500 mW

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

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