## SPOTCOM LTD.

Wireless Solutions and Support Services.

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# 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

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## 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 | DATA SHEET |
|---|---|---|
| **Antennas 360–512 MHz** | | |
| UDP400-C | 400 MHz dipole antenna, N-type female, 2 dBi gain | TD032037EN |
| BU3-400 | Collinear antenna, N-type female, 5 dBi gain | TD032038EN |
| BU6-400 | Collinear antenna, N-type female, 8 dBi gain | TD032039EN |
| YU3/6/9/16-400 | Yagi antenna, 3/6/16 element, N-type, 10/9/12/15 dBi gain | TD032040EN TD032041EN TD032043EN TD032044EN |
| **Cables** | | |
| CC3/10/20-SMA | Coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m) , N-type to SMA | TD032019EN |
| CCTAIL-SMA-F/M | Coaxial cable tail, 24" (600 mm), SMA to N-type female or male | TD032023EN |
| ETH-C5X | Ethernet cable, 6' (1.8m), crossover, RJ-45 to RJ-45 | TD032025EN |
| ETH-C5A | Ethernet cable, 6' (1.8m), straight through, RJ-45 to RJ-45 | TD032024EN |
| SER-DB9 | RS-232 serial cable, DB-9 male to DB-9 female | TD032026EN |
| SER-RJ45 | Configuration cable, RS-232 serial, DB-9 female to RJ-45 | TD032027EN |
| **Surge Diverters** | | |
| CSD-SMA-2500 | SMA surge diverter for use with CC10, CC20-SMA | TD032030EN |
| CSD-N-6000 | Coaxial surge diverter, bulkhead N female to N female | TD032031EN |
| MA15/D/1/SI | Power supply surge diverter, 110 Vac/15A | TD032029EN |
| IOP32D | Signal surge diverter, 2 x 2-wire/1 x 4-wire | TD032032EN |
| **Power Supplies** | | |
| 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 |
| BR-YAG-KIT | Mounting bracket kit for Yagi antenna | TD032072EN |

## 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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