

455U-D Wireless Serial Modem

Multiple-mode, RS-232/RS-485 serial data networking



Description

ELPRO multiple-mode wireless serial modems allow transparent communications between RS-232 and/or RS-485 serial host devices. The modem routes messages in either a broadcast mode (simultaneous transmission of same message) or a controlled mode—for example, specific unit addressing.

The 455U-D is a full-functionality RS-232/RS-485 modem, supporting addressed/broadcast modes and optimal path routing for Modbus® RTU, DF1 and DNP-3.

Features

- Licensed/license-free radio channels, suitable for most countries (60, 150, 220, 360–512 MHz, up to 5W RF power option availability)
- Wireless data rates up to 19.2 kbps
- Separate RS-232 and RS-485 ports
- Diagnostics and configuration via independent RS-232 port
- Remote configuration via wireless channel
- 128-bit AES security encryption
- Configurable, high-redundancy design well suited for repeater networking
- Wireless diagnostics via network management system
- Protocol-optimized modes for greater efficiency

Applications

- PLC networks
- Data logger communications
- Agriculture sprayer control
- Water/wastewater systems
- SCADA networks
- Oil and gas station monitoring
- Weather station reporting
- Factory vehicle tracking
- Irrigation control

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Specifications

| SPECIFICATION | DESCRIPTION |
|---------------------------------------|--|
| Transmitter and Receiver | |
| Modulation | Direct frequency shift keying (DFSK), 4-level FSK |
| Transmit power ① | 58–72 MHz, 100 mW–5W 148–174 MHz, 100 mW–5W 220–235 MHz, 100 mW–5W 360–512 MHz, 100 mW–5W |
| Receiver sensitivity | –114 dBm @ 2.4 kbps (3% BER) |
| Data rate | 19.2 kbps (25 kHz channel), 9.6 kbps (12.5 kHz) |
| Range (LoS) | 34 miles (55 km) @ 5W (single hop with repeater options) ② |
| Antenna connector | SMA female |
| Input/Output | |
| Digital input ③ | 1 voltage-free |
| Digital output ③ | 1 (FET 30 Vdc, 500 mA) |
| Serial Port | |
| RS-232 | DB-9 female DCE; RTS/CTS/DTR/DCD (hardware signals provided) |
| RS-485 | 2-pin terminal block, max. distance 4000' (1.2 km), non-isolated |
| Data rate | 600 bps to 115.2 kbps, 7 or 8 data bits, stop/start/parity bits configurable |
| Protocols and Configuration | |
| Protocols supported | Modbus RTU, DNP3, DF1, PROFIBUS® DP |
| User configuration | Dedicated serial port and remote configuration |
| System address | System, 16-bit value (0–65535) Group address, 7-bit value (0–127) |
| Configurable parameters | Broadcast mode, addressed mode, optimum path routing mode, RF baud rate, serial baud rate |
| Security | 128-bit AES data encryption |
| LED Indication and Diagnostics | |
| LED indicators | Power OK, RX, TX, link, RS-232, RS-485, DIO |
| Reported diagnostics | RSSI/background noise (dBm), bit error ratio (BER), duty cycle, temperature, supply voltage |
| Network management | Optional network management system |
| General | |
| Size | 5.5" x 4.5" x 1.2" (115 mm x 141 mm x 32 mm) |
| Housing | Powder-coated aluminum |
| Mounting | DIN rail |
| Terminal strip | Removable, up to 0.1 in. ² (2.5 mm ²), 14 AWG |
| Temperature rating | –22 to +140°F (–30 to +60°C) |
| Humidity rating | 0–99% RH noncondensing |
| Weight | 1.1 lbs (0.5 kg) |
| Compliance | |
| EMC | CE, EN 301 489, FCC Part 15 |
| RF (Radio) | FCC Part 90, EN 300 220, EN 300 113, RSS-119, AS/NZS 4295 |
| Safety | IEC 60950 |
| Power Supply | |
| Nominal supply | 11–30 Vdc, under/over voltage protection |
| Quiescent current | Normal: 110 mA @ 13.5 Vdc Power saving mode: 40 mA @ 13.5 Vdc |
| Transmit current | 450 mA (<0.5W), 800 mA (1W), 1.25A (2W), 2A (5W) |
| Battery charger | Floating charge voltage to 13.8 Vdc, current limit set to 1.6A with minimum supply voltage 17V |

Note: Specifications are subject to change.

① Specify RF frequency and power when ordering

② Typical maximum line of sight

③ Digital input and output use the same connection

Ordering

| PRODUCT CODE | DESCRIPTION | FREQUENCY | RF POWER |
|--------------|--|-------------|-----------|
| 455U-D-H | 455U-D, serial RS-232/RS-485, 12.5/25 kHz spacing, licensed applications | 58–72 MHz | 0.1–5W |
| | | 148–174 MHz | 0.1–5W |
| | | 220–235 MHz | 0.1–5W |
| | | 360–512 MHz | 0.5–5W |
| 455U-D-L | 455U-D, 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.

Accessories

| PRODUCT CODE | DESCRIPTION | DATA SHEET |
|-----------------------------|---|--|
| Antennas 148–174 MHz | | |
| UDP150-5 | Dipole antenna, BNC male, 0 dBi gain, 16' (5m) coaxial cable | TD032065EN |
| WH150-SMA/BNC | Whip antenna, SMA male, 2 dBi gain | TD032064EN |
| Antennas 220–235 MHz | | |
| UDP200-C | Dipole antenna, N-type female, 0 dBi gain | TD032066EN |
| UDP200-3 | Dipole antenna, BNC male, 0 dBi gain, 9' (3m) coaxial cable | TD032066EN |
| Antennas 360–512 MHz | | |
| UDP400-C | Dipole antenna, N-type female, 2 dBi gain | TD032037EN |
| UDP400-3 | Dipole antenna, BNC male, 0 dBi gain, 9' (3m) coaxial cable | TD032037EN |
| BU3-400 | Colinear antenna, N-type female, 5 dBi gain | TD032038EN |
| BU6-400 | Colinear antenna, N-type female, 8 dBi gain | TD032039EN |
| YU3/6/9/16-400 | Yagi antenna, 3/6/9/16 element, N-type female, 6/9/12/15 dBi gain | TD032040EN TD032041EN TD032043EN TD032044EN |
| Cables | | |
| CC3/10/20-SMA | CC3/10/20-SMA coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m), N-type to SMA | TD032019EN TD032020EN TD032021EN |
| CCTAIL-SMA-F/M | Coaxial cable tail, 24" (600 mm), SMA to N-type (female/male) | TD032023EN |
| SER-DB9 | Serial RS-232 cable, DB-9 male to DB-9 female, straight through | TD032026EN |
| SER-RJ45 | Configuration cable (serial RS-232 cable), DB-9 female to RJ-45 | TD032027EN |
| Surge Diverters | | |
| CSD-SMA-2500 | SMA surge diverter for use with CC10/20-SMA | TD032030EN |
| CSD-N-6000 | Coaxial surge diverter, bulkhead N-female to N-female | TD032031EN |
| MA15/D/1/S1 | Power supply surge diverter, 110 Vac/15A | TD032029EN |
| IOP32/32D | Signal surge diverter, 2 x 2-wire/1 x 4-wire | TD032032EN |
| Power Supplies | | |
| PS-DINAC-12DC | DIN rail power supply, 100–250 Vac, 12 Vdc/2.5A | TD032033EN |
| PSG60E | DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A | TD032034EN |
| Mounting Brackets | | |
| BR-COL-KIT | Mounting bracket kit for dipole and colinear antennas | TD032072EN |
| BR-YAG-KIT | Mounting bracket kit for Yagi antenna | TD032072EN |

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