

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	–30 to +60°C (–30 to +70°C 60MHz reduced performance ④)
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

④ 60MHz model only. Transmit power ≤ 1W. Duty Cycle ≤ 50%. 2FSK modulation

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 148–174 MHz 220–235 MHz 360–512 MHz	0.1–5W 0.1–5W 0.1–5W 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
VH150-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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