

105U-1 Wireless Multi-I/O

Simple-to-deploy, long-range, reliable wireless I/O connectivity



Description

The ELPRO 105U Wireless Multi-I/O 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 or licensed wireless transceiver, the ELPRO 105U module provides a simple-to-deploy solution to transfer process I/O signals reliably over long distances or within an industrial plant.

Capable of transferring analog or discrete I/O points, in point-to-point or point-to-multi-point situations. Each 105U product can also provide repeater functionality to extend the distance of the network and capture remote I/O points. The I/O is scalable using 115S serial expansion units at each 105U unit.

Features

- 148–174 MHz, 220–235 MHz, 360–512 MHz, 869.525 MHz and 869.875 MHz frequency, and 10 mW to 5W RF power options
- Link I/O inputs to single or multiple I/O outputs (peer to peer)
- Reliable point-to-multi-point two-way communications combining exception reporting, self-checking, and data encryption
- Multiple I/O channels for monitoring and controlling field devices with set point, pulse count and rate available. Additional internal I/O points provided for health monitoring
- Communication failure notification and diagnostics, including radio path measurement, communications logging, verification of I/O values
- Low voltage AC/DC/battery power options, UPS battery charger and solar regulator
- User-friendly configuration software

Applications

- High-level alarms
- Security gate control
- Emergency shower notification
- Flow meter monitoring
- Storage tank monitoring
- Pipeline cathodic protection
- Pump stop-start
- Lighting bank control
- Weather station reporting
- Bearing condition monitoring

Specifications

| SPECIFICATION | DESCRIPTION |
|---------------------------------------|--|
| Transmitter and Receiver | |
| Frequency | 148–174 MHz ^a 220–235 MHz ^a 360–512 MHz ^a 869.525 MHz ^a 869.875 MHz ^a |
| Transmit power | 148–174 MHz, 0.1–5W ^a 220–235 MHz, 0.1–5W ^a 360–512 MHz, 10 mW to 5W ^a 869.525 MHz, 500 mW ^a 869.875 MHz, 5 mW ^a |
| Transmission | Frequency modulation (FM) |
| Modulation | Digital frequency shift key (DFSK) |
| Receiver sensitivity | 148–512 MHz: –114 dBm 869.525 MHz, 869.875 MHz: –106 dBm |
| Channel spacing | 148–512 MHz: 12.5 kHz 869.525 MHz, 869.875 MHz: 250 kHz |
| Data rate | 400 MHz: 3.6 kbps 869.525 MHz, 869.875 MHz: 19.2 kbps, forward error correction |
| Range (LoS) | 400 MHz: 10 mW EIRP to 1.2 miles (2 km), 500 mW EIRP to 6.2 miles (10 km) 5W EIRP to 34 miles (55 km) ^b 869.525 MHz: 6.2 miles (10 km) 500 mW ^b 869.875 MHz: 0.6 miles (1 km) 5 mW ^b |
| Antenna connector | 148–512 MHz: BNC female coaxial 869.525, 869.875 MHz: SMA female coaxial internal gas discharger arrestor protection |
| Serial Port | |
| RS-232 | 9-pin DB-9 female connector |
| RS-485 | Terminal connector, serial expansion only, cable to 4000' (1200m) |
| Data rate (Bps) | 9600 |
| Serial settings | 7/8 data bits, no parity, 1 stop bit |
| Protocols and Configuration | |
| System address | Configurable system address |
| Protocols supported | ELPRO WIBnet™ auto acknowledgement up to four retries, CRC error checking |
| User configuration | E-series configuration utility |
| Configurable parameters | Individual I/O mappings, analog and digital debounce, update time, analog set points and sensitivities, output reset times |
| Security | 64-bit encryption on radio and serial |
| LED Indication and Diagnostics | |
| LED indication | Power/OK, I/O status, OK/module OK, TX, RX Refer to the product manual for further information. |
| Reported diagnostics | RSSI, comms logging, I/O status |

| SPECIFICATION | DESCRIPTION |
|--------------------------|--|
| Power Supply | |
| Nominal supply | 12–24 Vac/15–30 Vdc, over-voltage/reverse power protected |
| Average current draw | At 12 Vdc: 85 mA +10 mA per active digital input +25 mA per active digital output +2 per analog I/O loop (mA) |
| Transmit current draw | 450 mA @ 13.8 Vdc (0.5W) 600 mA @ 13.8 Vdc (1W) 800 mA @ 13.8 Vdc (2W) 1.25A @ 13.8 Vdc (5W) |
| Battery supply | 11.5–15.0 Vdc (battery supply volts internal I/O value) |
| Battery charging circuit | 1.2–12 AHR battery: max. charge current 0.7A @ >12V |
| Solar regulator | Direct connection solar panel (to 30W)/solar battery 100 Ah |
| Loop supply | Internal DC/DC converter: 24 Vdc/150 mA current limited |
| Input and Output | |
| Digital input | 4 x Voltage-free/NPN, wetting current 0.5 mA Surge protected (non-isolated) |
| Digital output | 4 relay contacts. AC 50V: 5A/DC 30V: 2A |
| Analog input | Floating differential inputs, common mode, voltage 27V 24 Vdc for external loops provided, digital filtering 1 second 2 current, 4–20 mA, 15-bit resolution, accuracy 0.1% , over range indication 2–25 mA |
| Analog output | Current sink to common, max. loop voltage 27V, max. loop resistance 1000 ohms 2 current, 4–20 mA, 15-bit resolution, accuracy 0.1%, over range indication 0.5–25 mA |
| Pulse input | As per the digital input specifications, max. pulse rate 1000 Hz, pulse width min 5 ms 1 pulse input, terminated at DI 1 |
| Pulse output | As per FET digital outputs specifications FET DO/PO 30 Vdc/500 mA, max. pulse rate 100 Hz 1 pulse output |
| Compliance | |
| EMC | CE, FCC Part 15, AS3548, EN 301 489 |
| RF (radio) | EN 300 220, EN 300 113, FCC Part 90, RSS 119, AS4295, AS4768.1 |
| Safety | EN 60950 |
| General | |
| Size | 5.1" x 7.3" x 2.4" (130 mm x 185 mm x 60 mm) |
| Housing | Extruded aluminum |
| Mounting | DIN rail mounting |
| Terminal blocks | Removable; max. conductor 14 AWG 0.1 in. ² (2.5 mm ²) |
| Temperature rating | 148–512 MHz: –22 to +140°F (–30 to +60°C) 869 MHz: –40 to +140°F (–40 to +60°C) |
| Humidity rating | 0–99% RH noncondensing |
| Weight | 2.2 lbs (1 kg) |

Note: Specifications are subject to change.

^a Specify RF power and frequency at time of order.

^b Typical maximum line-of-sight range (single hop, repeaters will extend)

Ordering

| PRODUCT CODE | DESCRIPTION | FREQUENCY | RF POWER |
|------------------------------|---|--------------------------|-----------|
| 105U-1-150-5W | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 148–174 MHz ^b | 0.1–5W |
| 105U-1-220-5W | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 220–235 MHz ^b | 0.1–5W |
| 105U-1-xxx-5W ^a | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 360–512 MHz ^b | 0.5–5W |
| 105U-1-xxx-500M ^a | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 360–512 MHz ^b | 10–500 mW |
| 105U-1-868-500M | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 869.525 MHz | 500 mW |
| 105U-1-868-5M | Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO | 869.875 MHz | 5 mW |

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

^a The “xxx” represents the frequency band (370, 390, 410, 430, 440, 460, 480, 500).

^b Typically licensed. Specify TX/RX frequencies, RF power and channel spacing.

Accessories

| PRODUCT CODE | DESCRIPTION |
|-----------------------------|--|
| Antennas 148–174 MHz | |
| UDP150-5 | 150 MHz dipole antenna, N-type male, 2 dBi |
| Antennas 220–235 MHz | |
| UDP200-C/3 | 200 MHz dipole antenna, N-type female, 2 dBi gain |
| Antennas 360–512 MHz | |
| UDP400-C/3 | 400 MHz dipole antenna, N-type female, 2 dBi gain |
| YU3-400 | Yagi antenna, 3 element, N-type, 10 dBi gain |
| YU6-400 | Yagi antenna, 6 element, N-type, 9 dBi gain |
| YU16-400 | Yagi antenna, 16 element, N-type, 5 dBi gain |
| BU3-400 | 400 MHz collinear antenna, N-type female, 5 dBi gain |
| BU6-400 | 400 MHz collinear antenna, N-type female, 8 dBi gain |
| Antennas 869 MHz | |
| CFD890EL | Dipole antenna, SMA male, mounting bracket, 2 dBi gain, 16' (5m) coaxial cable |
| SG900EL | Collinear antenna, N-type female, 5 dBi gain |
| SG900-6 | Collinear antenna, N-type female, 8 dBi gain |
| DG800-5 | Whip antenna: SMA male, –2 dBi gain, 16' (5m) RG-174, bracket |
| YU6-900 | Yagi antenna, N-type female, 9 dBi gain |
| Cables | |
| CC3/10/20-SMA/BNC | Coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m), N-type to N-type/SMA male/BNC male |
| CCTAIL-SMA-F/M | Coaxial cable tail, 24" (600 mm), SMA to N-type female or male |
| CCTAIL-BNC-F/M | Coaxial cable tail, 24" (600 mm), BNC to N-type female or male |
| SER-DB9 | Serial RS-232 cable, DB-9 male to DB-9 female straight through |

| PRODUCT CODE | DESCRIPTION |
|--------------------------|---|
| Surge Diverters | |
| CSD-SMA-2500 | SMA surge diverter for use with CC10/CC20-SMA |
| CSD-N-6000 | Coaxial surge diverter, bulkhead N-type female to N-type female |
| MA15/D/1/S1 | Power supply surge diverter, 110 Vac/15A |
| MA15/D/2/S1 | Power supply surge diverter, 240 Vac/15A |
| IOP32D | Signal surge diverter, 2 x 2-wire/1 x 4-wire |
| Power Supplies | |
| PS-DINAC-12DC-OK | DIN rail power supply, 100–250 Vac, 12 Vdc/5A |
| PS-DINAC-24DC-OK | DIN rail power supply, 85–264 Vac, 24 Vdc/2.5A |
| Mounting Brackets | |
| BR-YAGI-KIT | Mounting bracket kit for Yagi antenna |
| BR-COL-KIT | Mounting bracket kit for collinear antenna |

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