105U-1,2,3,4 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 ① 220–235 MHz ① 360–512 MHz ① 869.525 MHz ① 869.875 MHz ①
Transmit power	148–174 MHz, 0.1–5W ① 220–235 MHz, 0.1–5W ① 360–512 MHz, 10 mW to 5W ① 869.525 MHz, 500 mW ① 869.875 MHz, 5 mW ①
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) ② 869.525 MHz: 6.2 miles (10 km) 500 mW ② 869.875 MHz: 0.6 miles (1 km) 5 mW ②
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 3937' (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
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

SPECIFICATION	DESCRIPTION
Input and Output	
Digital input	Voltage-free/NPN, wetting current 0.5 mA Surge protected (non-isolated) 105U-1: 4 105U-2: 4 105U-3: 0 105U-4: 4–16 inputs ③
Digital output	105U-1: 4 relay contacts. AC 50V: 5A/DC 30V: 2A 105U-2: 1 FET output 30 Vdc/500 mA 105U-3: 8 FET output 30 Vdc/500 mA 105U-4: 4–16 FET outputs ③
Analog input	Floating differential inputs, common mode, voltage 27V 24 Vdc for external loops provided, digital filtering 1 second 105U-1: 2 current, 4–20 mA, 15-bit resolution, accuracy 0.1% , over range indication 2–25 mA 105U-2: 6 current, 0–20 mA, 12-bit resolution, accuracy 0.1% Over range indication 0–25 mA
Analog output	Current sink to common, max. loop voltage 27V, max. loop resistance 1000 ohms 105U-1: 2 current, 4–20 mA, 15-bit resolution, accuracy 0.1%, over range indication 0.5–25 mA **Note:** 105U-3: 8 current, 0–20 mA, 12-bit resolution, accuracy 0.1%, over range indication 0–20.5 mA
Pulse input	As per the digital input specifications, max. pulse rate 1000 Hz, pulse width min 5 ms 105U-1: 1 pulse input, terminated at DI 1 105U-2: 4 pulse inputs, terminated at DI 1–4 105U-2: first DI/PI max. 1000 Hz, pulse width min 0.5 ms; 2, 3, 4 DI/PI max. 100 Hz, pulse width 5 ms 105U-4: 4 pulse inputs, terminated at DI 1–4 105U-4: first digital inputs/pulse inputs max. 1000 Hz, pulse width min 0.5 ms; 2, 3, 4 DI/PI max. 100 Hz, pulse width 5 ms
Pulse output	As per FET digital outputs specifications FET DO/PO 30 Vdc/500 mA, max. pulse rate 100 Hz 105U-1: 1 pulse output 105U-3: 4 pulse outputs, terminated at DO 1–4 105U-4: 4 pulse outputs, terminated at DO 1–4
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.

① Specify RF power and frequency at time of order.

② Typical maximum line-of-sight range (single hop, repeaters will extend)

③ The 105U-4 has 12 digital I/O which are selectable inputs or outputs.

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 ②	0.1–5W
105U-1-220-5W	Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO	220–235 MHz ②	0.1–5W
105U-1-xxx-5W ①	Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO	360–512 MHz ②	0.5–5W
05U-1-xxx-500M ①	Wireless I/O 4 DI, 4 DO, 2 AI, 2 AO, 1 PO	360–512 MHz ②	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
105U-2-150-5W	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	148–174 MHz ②	0.1–5W
105U-2-220-5W	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	220–235 MHz ②	0.1–5W
105U-2-xxx-5W ①	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	360-512 MHz ②	0.5–5W
105U-2-xxx-500M ①	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	360–512 MHz ②	10–500 mW
105U-2-868-500M	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	869.525 MHz	500 mW
105U-2-868-5M	Wireless I/O 4 DI, 1 DO, 6 AI, 4 PI	869.875 MHz	5 mW
105U-3-150-5W	Wireless I/O, 8 DO, 8 AO, 4 PO	148–174 MHz ②	0.1–5W
105U-3-220-5W	Wireless I/O, 8 DO, 8 AO, 4 PO	220–235 MHz ②	0.1–5W
105U-3-xxx-5W ①	Wireless I/O, 8 DO, 8 AO, 4 PO	360-512 MHz ②	0.5–5W
105U-3-xxx-500M ①	Wireless I/O, 8 DO, 8 AO, 4 PO	360–512 MHz ②	10–500 mW
105U-3-868-500M	Wireless I/O, 8 DO, 8 AO, 4 PO	869.525 MHz	500 mW
105U-3-868-5M	Wireless I/O, 8 DO, 8 AO, 4 PO	869.875 MHz	5 mW
105U-4-150-5W	Wireless I/O, 16 DIO, 4 DO, 4 DI	148–174 MHz ②	0.1–5W
105U-4-220-5W	Wireless I/O, 16 DIO, 4 DO, 4 DI	220–235 MHz ②	0.1–5W
105U-4-xxx-5W ①	Wireless I/O, 16 DIO, 4 DO, 4 DI	360–512 MHz ②	0.5–5W
105U-4-xxx-500M ①	Wireless I/O, 16 DIO, 4 DO, 4 DI	360–512 MHz ②	10–500 mW
105U-4-868-500M	Wireless I/O, 16 DIO, 4 DO, 4 DI	869.525 MHz	500 mW
105U-4-868-5M	Wireless I/O, 16 DIO, 4 DO, 4 DI	869.875 MHz	5 mW

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

① The "xxx" represents the frequency band (370, 390, 410, 430, 440, 460, 480, 500).

② 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
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/2.5A
PSG60E	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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