

# 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

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## Specifications

SPECIFICATION	DESCRIPTION
<b>Transmitter and Receiver</b>	
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 (DFS)
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
<b>Serial Port</b>	
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
<b>Protocols and Configuration</b>	
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
<b>LED Indication and Diagnostics</b>	
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
<b>Power Supply</b>	
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
<b>Input and Output</b>	
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 <b>Note:</b> 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
<b>Compliance</b>	
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
<b>General</b>	
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. <sup>2</sup> (2.5 mm <sup>2</sup> )
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	DATA SHEET
<b>Antennas 148–174 MHz</b>		
UDP150-5	150 MHz dipole antenna, N-type male, 2 dBi	TD032065EN
<b>Antennas 220–235 MHz</b>		
UDP200-C/3	200 MHz dipole antenna, N-type female, 2 dBi gain	TD032066EN
<b>Antennas 360–512 MHz</b>		
UDP400-C/3	400 MHz dipole antenna, N-type female, 2 dBi gain	TD032037EN
YU3-400	Yagi antenna, 3 element, N-type, 10 dBi gain	TD032040EN
YU6-400	Yagi antenna, 6 element, N-type, 9 dBi gain	TD032041EN
YU16-400	Yagi antenna, 16 element, N-type, 5 dBi gain	TD032044EN
BU3-400	400 MHz collinear antenna, N-type female, 5 dBi gain	TD032038EN
BU6-400	400 MHz collinear antenna, N-type female, 8 dBi gain	TD032039EN
<b>Antennas 869 MHz</b>		
CFD890EL	Dipole antenna, SMA male, mounting bracket, 2 dBi gain, 16' (5m) coaxial cable	TD032048EN
SG900EL	Collinear antenna, N-type female, 5 dBi gain	TD032049EN
SG900-6	Collinear antenna, N-type female, 8 dBi gain	TD032050EN
DG800-5	Whip antenna: SMA male, –2 dBi gain, 16' (5m) RG-174, bracket	TD032046EN
YU6-900	Yagi antenna, N-type female, 9 dBi gain	TD032042EN
<b>Cables</b>		
CC3/10/20-SMA/BNC	Coaxial cable kit, 9.8' (3m)/32' (10m)/65' (20m), N-type to N-type/SMA male/BNC male	TD032019EN TD032020EN TD032021EN
CCTAIL-SMA-F/M	Coaxial cable tail, 24" (600 mm), SMA to N-type female or male	TD032023EN
CCTAIL-BNC-F/M	Coaxial cable tail, 24" (600 mm), BNC to N-type female or male	TD032022EN
SER-DB9	Serial RS-232 cable, DB-9 male to DB-9 female straight through	TD032026EN
<b>Surge Diverters</b>		
CSD-SMA-2500	SMA surge diverter for use with CC10/CC20-SMA	TD032030EN
CSD-N-6000	Coaxial surge diverter, bulkhead N-type female to N-type female	TD032031EN
MA15/D/1/S1	Power supply surge diverter, 110 Vac/15A	TD032029EN
MA15/D/2/S1	Power supply surge diverter, 240 Vac/15A	
IOP32D	Signal surge diverter, 2 x 2-wire/1 x 4-wire	TD032032EN
<b>Power Supplies</b>		
PS-DINAC-12DC-OK	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
<b>Mounting Brackets</b>		
BR-YAGI-KIT	Mounting bracket kit for Yagi antenna	TD032072EN
BR-COL-KIT	Mounting bracket kit for collinear antenna	TD032071EN

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