

105U-G Wireless Gateway

Data bus interface and conversion



Description

ELPRO wireless gateways provide interface and communication between industrial data bus devices and field devices (for example, Modbus to Profibus to EtherNet/IP or PLC to SCADA/DCS). Connected via RS-232/RS-485/RJ-45, register-allocated data bus values are transmitted and received by radio to and from field and control room devices.

ELPRO 105U-G series products can multi-hop repeat up to four times, support a variety of industrial protocols and be combined with ELPRO 105U/505U-K and 115S series products to create powerful I/O and data bus networks.

Features

- 150/220/400/869 MHz, 5 mW–5W, 3.6–19.2 kbps radio communications to 35 miles (55 km) with multi-hop repeating
- Able to connect to similar and dissimilar industrial protocols and vendor devices: master/slave, slave/slave, master/master networks
- Flexible and secure networking, point to multipoint communications with forward error correction (FEC), data integrity check (CRC) and data encryption
- Eight configurable digital onboard I/O with I/O expansion via the ELPRO 115S series products
- AC/DC/battery power options with UPS battery charger
- Module diagnostics including read/write of register I/O, reporting of received signal strength indication (RSSI), communications logging and internal measurement of low/normal and battery supply voltages

Applications

- Data bus SCADA/DCS to PLC-PLC communications
- Moving machinery PLC-PLC/HMI connection/operation
- Data bus cable replacement
- Smart instrument interface and connection (for example, gas analyzer)
- Multi-I/O data concentrator/repeater for large networks

Specifications

| SPECIFICATION | DESCRIPTION |
|------------------------------------|---|
| Transmitter and Receiver | |
| Frequency ^a | 148–174 MHz 200–235 MHz 360–512 MHz 869.525 MHz 869.875 MHz |
| Transmit power ^a | 148–174 MHz, 0.1–5W 220–235 MHz, 0.1–5W 360–512 MHz, 10 mW–5W 869.525 MHz, 500 mW 869.875 MHz, 5 mW |
| 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) ^b | 150/220/400 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) 869.525 MHz: 3.1 miles (5 km) 500 mW 869.875 MHz: 0.6 miles (1 km) 5 mW |
| Antenna connector | 148–512 MHz: BNC female coaxial 869.525, 869.875 MHz: SMA female coaxial, internal gas discharger arrester protection |
| Input/Output | |
| Discrete I/O ^c | 8 input voltage-free/NPN, wetting current 0.5 mA; 8 output FET, 30 Vdc/500 mA |
| Ethernet Port | |
| Ethernet port | 10/100Base-T; RJ45 connector (IEEE 802.3) |
| Link activity | Link, 100Base-T via LED |
| Serial settings | 7/8 data bits; no parity, 1 stop bit |
| Serial Port | |
| RS-232 | 9-pin DB9 female connector |
| RS-485 | 2-pin terminal block, non-isolated to 4000' (1200 m) |
| Data rate (bps) | 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400 |
| Serial settings | 7/8 data bits; stop/start/parity (configurable) |
| Protocols and Configuration | |
| System address | Configurable system address |
| Protocols supported: | |
| 105U-G-MD1 | Modbus RTU (master/slave), DF1 up to 4300 I/O points: analog and/or discrete Modbus, RS-232/RS-485, 300–38400 bps DF1 (full duplex), RS-232, 300–38400 bps |
| 105U-G-ET1 | EtherNet/IP (Level 2 I/O server) Modbus/TCP (Class 0, 1, partially Class 2 slave) TCP/IP functions; embedded web system (dynamic HTTP); onboard file system for downloadable web pages via FTP server; email (SMTP) 2048 bytes input/2048 bytes output; up to 4300 DIO or 1024 AI/1024 AO; 10/100 Mbps, RJ-45 connector |
| 105U-G-PR1 | Profibus DP slave to EN 50170 standard; 416 I/O bytes (up to 1952 DI/1952 DO or 122 AI/122 AO) RS-485 optically isolated with onboard DC/DC converter, automatic baud rate detection: 9600 bps–12 Mbps |
| 105U-G-PR2 | Profibus DP master to EN 50170 standard; 2048 bytes input/2048 bytes output (up to 4300 DIO or 1024 AI/1024 AO), RS-485 optically isolated with onboard DC/DC converter, automatic baud rate detection: 9600 bps–12 Mbps |
| User configuration | E-Series configuration utility |
| Configurable parameters | Individual I/O mappings, update time, databus mappings, protocol settings |

| SPECIFICATION | DESCRIPTION |
|---------------------------------------|--|
| Security | 64-bit encryption on radio and serial |
| LED Indicators and Diagnostics | |
| LED indication | Active, OK, serial TX and RX, radio TX and RX, I/O LED status Refer to product manual for more information. |
| Reported diagnostics | RSSI, communications logging, I/O status, battery voltage |
| Power Supply | |
| Nominal supply | 12–24 Vac/15–30 Vdc: over-voltage/reverse power protected |
| Average current draw | 105U-G-MD1: 150 mA @ 12V; 90 mA @ 24V; add 5 mA per I/O 105U-G-ET1/PR1/PR2: 270 mA @ 12V; 170 mA @ 24V; add 5 mA per I/O |
| 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 | Suitable for 12 Vdc sealed lead acid batteries, max. charge current 2.0A (5W), 0.9A (500 mW) |
| 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 |
| Terminal blocks | Removable; max conductor 14 AWG (2.5 mm ²) |
| Temperature rating | 105U-G-MD1, 150/220/400 MHz: –22 to +140°F (–30 to +60°C), 105U-G-MD1, 869 MHz: –40 to +140°F (–40 to +60°C), 105U-G-ET1/PR1/PR2: –32 to +140°F (0 to +60°C) |
| Humidity rating | 105U-G-MD1: RH noncondensing 0–99% 105U-G-ET1/PR1/PR2: RH noncondensing 0–95% |
| Weight | 1 kg (2.2 lbs) |

Note: Specifications are subject to change.

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

^b Typical maximum LoS sight range (single hop, repeaters will extend)

^c Configurable as inputs/outputs

Ordering

| PRODUCT CODE | DESCRIPTION | FREQUENCY | RF POWER |
|--|-------------------------|--------------------------|----------|
| Industrial Protocol–Ethernet/IP, Modbus TCP | | | |
| 105U-G-ET1-150-5W | Gateway, Ethernet/IP | 148-174 MHz ^b | 0.1–5W |
| 105U-G-ET1-220-5W | Gateway, Ethernet/IP | 220-235 MHz ^b | 0.1–5W |
| 105U-G-ET1-xxx-5W ^a | Gateway, Ethernet/IP | 360-512 MHz ^b | 0.5–5W |
| 105U-G-ET1-xxx-500M ^a | Gateway, Ethernet/IP | 360-512 MHz ^b | 10–500mW |
| 105U-G-ET1-868-500M | Gateway, Ethernet/IP | 869.525 MHz | 500mW |
| 105U-G-ET1-868-5M | Gateway, Ethernet/IP | 869.875 MHz | 5 mW |
| Industrial Protocol–Modbus RTU/DF1 | | | |
| 105U-G-MD1-150-5W | Gateway, Modbus RTU/DF1 | 148-174 MHz ^b | 0.1–5W |
| 105U-G-MD1-220-5W | Gateway, Modbus RTU/DF1 | 220-235 MHz ^b | 0.1–5W |
| 105U-G-MD1-xxx-5W ^a | Gateway, Modbus RTU/DF1 | 360-512 MHz ^b | 0.5–5W |
| 105U-G-MD1-xxx-500M ^a | Gateway, Modbus RTU/DF1 | 360-512 MHz ^b | 10–500mW |
| 105U-G-MD1-868-500M | Gateway, Modbus RTU/DF1 | 869.525 MHz | 500mW |
| 105U-G-MD1-868-5M | Gateway, Modbus RTU/DF1 | 869.875 MHz | 5mW |
| Industrial Protocol–Profibus Master/Slave | | | |
| 105U-G-PRx-150-5W ^c | Gateway, Profibus | 148-174 MHz ^b | 0.1–5W |
| 105U-G-PRx-220-5W ^c | Gateway, Profibus | 220-235 MHz ^b | 0.1–5W |
| 105U-G-PRx-xxx-5W ^{a c} | Gateway, Profibus | 360-512 MHz ^b | 0.5–5W |
| 105U-G-PRx-xxx-500M ^{a c} | Gateway, Profibus | 360-512 MHz ^b | 10–500mW |
| 105U-G-PRx-868-500M ^c | Gateway, Profibus | 869.525 MHz | 500 mW |
| 105U-G-PRx-868-5M ^c | Gateway, Profibus | 869.875 MHz | 5mW |

Note: Available RF power and frequency may vary depending on country.

^a xxx represents frequency band (370, 390, 410, 430, 440, 460, 480, 500)

^b Typically licensed. Specify TX/RX frequencies.

^c x is 1 for Profibus slave or 2 for Profibus master

Accessories

| PRODUCT CODE | DESCRIPTION |
|-----------------------------|--|
| Antennas 148–174 MHz | |
| UDP150-5 | Dipole antenna, BNC male, 0 dBi gain, 5m (16') coaxial cable |
| Antennas 220–235 MHz | |
| UDP200-C | Dipole antenna, N-type female, 0 dBi gain |
| Antennas 360–512 MHz | |
| UDP400-C | Dipole antenna, BNC male, 0 dBi gain, 3m (9') coaxial cable |
| UDP400-3 | Dipole antenna, N-type female, 0 dBi gain, 3m (9') coaxial cable |
| 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 female, 15 dBi gain |
| BU3-400 | 400 MHz colinear antenna, N-type female, 5 dBi gain |
| BU6-400 | 400 MHz colinear antenna, N-type female, 8 dBi gain |
| Antennas 869 MHz | |
| CFD890EL | Dipole antenna, SMA, 2 dBi, 5m (16') RG-58, bracket |
| SG900EL | Colinear antenna, N-type female, 5 dBi gain |
| SG900-6 | Colinear antenna, N-type female, 8 dBi gain |
| DG800-5 | Whip antenna, SMA male, –2 dBi gain, 5m (16') RG-174, bracket |
| YU6-870 | Yagi antenna, 6-element, N-type, 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), SMA to N-type female or male |
| SER-DB9 | Serial RS-232 cable, DB9 male to DB9 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 |
| 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 |
| Power Supplies | |
| BR-YAGI-KIT | Mounting bracket kit for Yagi antenna |
| BR-COL-KIT | Mounting bracket kit for colinear antenna |

ELPRO Technologies
29 Lathe St
Virginia, QLD 4014
Australia
www.elpro.com.au

Telephone:
Global:+61 7 3352 86
USA: +1 855 443 5776

© 2021 ELPRO
All Rights Reserved
Publication No. DS_EL-915U-2
July 2021

ELPRO Technologies Inc
2028 East Ben White Blvd,
#240-5656 Austin, TX 78741-6931
USA

Telephone:
USA: +1 855 443 5776

© 2021 ELPRO
All Rights Reserved
Publication No. DS_EL-915U-2
July 2021

ELPRO Technologies is a registered trademark.

All other trademarks are property
of their respective owners.

