Installation Instructions

Original Instructions

GuardShield Safety Light Curtain EtherNet/IP Network Interface

Catalog Number 450L-ENETR

ATTENTION: You must familiarize yourself with the installation and wiring instructions and requirements of all applicable codes, laws, and standards. In accordance with applicable codes of practice, suitably trained personnel are required to install, adjust, put into service, use, assemble, disassemble, and/or maintain this equipment. If this equipment is used in a manner that the manufacturer does not specify, the protection that is provided by the equipment can be impaired.
Module is designed to meet IEC 61496.

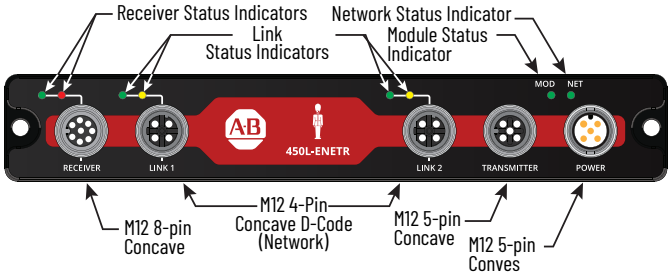
Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

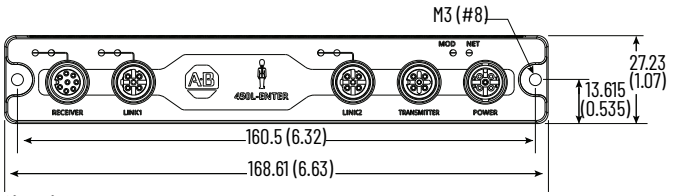
Topic	Page
Updated Table 7	3

Product Overview and Approximate Dimensions

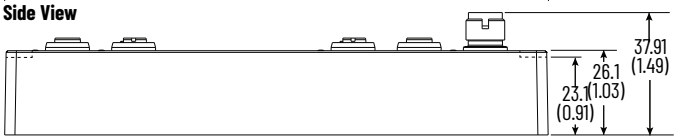
450L-ENETR Network Interface [mm (in.)]



Front View

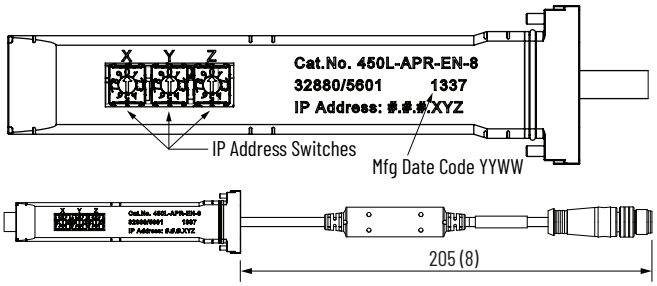


Side View



450L-APR-EN-8 Plug-in Module [mm (in.)]

IMPORTANT The plug-in module is purchased separately.



Install the Network Interface

Assign IP Address

Assign the 450L-ENETR network interface a fixed (static) IP address to maintain continued communication with the network. The IP address is set on the 450L-APR-EN-8 plug-in module.

Value	Description
000	Clear explicit protective mode
001...254	Private address (#.#.#.XYZ)
888	Factory reset
900	Set explicit protective mode (1)
999	DHCP
All others	Do not use

(1) When explicit protective mode is set, explicit messages that affect the operation of the device are blocked. Examples of blocked messages are changes to the IP address, reset of the module, and update of the firmware. Explicit messages can still fetch diagnostic information.

There are four ways of assigning a fixed IP address:

- Use the XYZ rotary switches to set a private IP address.
- Use the Rockwell Automation® BootP/DHCP tool, version 2.3 or later, which ships with the Studio 5000® environment (RSLogix 5000® software).
- Use RSLinx® software.
- Have your network administrator configure the ENETR network interface via the network DHCP server.

If you replace the 450L-ENETR network interface, use the BOOTP/DHCP tool to assign the IP address to the MAC ID of the new network interface.

Perform the steps in Reset to Factory Default and Protective Mode on page 2 before you change the IP address from a private address to a non-private address or vice versa.

Reset to Factory Default and Protective Mode

At any time, you can set the 450L-ENETR network interface to the factory default or use the following steps to set/cleared the protective mode:

1. Turn off power to the 450L-ENETR network interface.
2. Remove the 450L-APR-EN-8 plug-in module from the receiver stick.
3. Set the XYZ rotary switches on the 450L-APR-EN-8 plug-in module:
   - 888 to reset to factory default
   - 900 to set explicit protective mode
   - 000 to clear explicit protective mode
4. Insert the 450L-APR-EN-8 plug-in module into the receiver stick.
5. Apply 24V DC to the 450L-ENETR network interface.
6. Wait at least 5 seconds. After 5 seconds, the MOD status indicator flashes red. All other status indicators are off.
7. Remove power from the 450L-ENETR network interface.
8. Remove the 450L-APR-EN-8 plug-in module from the receiver stick.
9. Assign the new IP address by setting the XYZ rotary switches.
10. Insert the 450L-APR-EN-8 plug-in module into the receiver stick.
11. Apply 24V to the 450L-ENETR network interface.

Wire the Module

WARNING: Disconnect power to the system before you attempt installation or device wiring.

ATTENTION:
- Calculate the maximum current in each power and common wire.
- Observe all electrical codes that dictate the maximum current allowable for each wire size.
- Current above the maximum ratings can cause wiring to overheat, which can cause damage.

- The maximum receiver cable length is 2 m (6.6 ft).
- Do not run signal or communications wiring and power wiring in the same conduit. Route wires with different signal characteristics by separate paths.
- Separate wiring by signal type. Bundle wiring with similar electrical characteristics together.
- Label wiring to all devices in the system. Use tape, shrink-tubing, or other means to label wires. Also use colored insulation to identify wires based on signal characteristics. For example, use blue for DC wiring and red for AC wiring.
- Use the M12 protective cap (two provided) to maintain the IP65 seal and help protect unused ports.

IMPORTANT Fault exclusions for conductors and wiring must follow the requirements of EN ISO 13849-2 Table D.3 and D.4.
A fault exclusion can reduce the overall safety rating of the related safety function to a maximum of PLd per EN ISO 13849-1.

Pinouts

Table 1 - Receiver (Concave)

Pin	Description
1	Comm Rx
2	+24V DC
3	Functional Earth, FE
4	Comm Tx
5	14V from light curtain
6	NC
7	0V (GND)
8	Safety interrupt

Table 2 - Transmitter (Concave)

Pin	Description
1	+24V DC
2	NC
3	0V (GND)
4	NC
5	Functional Earth, FE

Table 3 - Link (Concave)

Pin	Description
1	Tx Data+
2	Rx Data+
3	Tx-
4	Rx-

Table 4 - Power Connector (Convex)

Pin	Description
1	+24V DC
2	NC
3	0V (GND)
4	NC
5	Functional Earth, FE

Status Indicators

Indicator	Status	Description
Module status (MS)	Off	Module is not powered
	Alternate flashing (red-green)	Module is not configured
	Flashing green	Module is configured, but not in Run mode
	Steady green	Module is powered, configured, and operating correctly (Run mode)
	Flashing red	Flash update in progress. (Configuration mode)
	Steady red	Unrecoverable fault detected (Critical Fault mode)
EtherNet/IP Network Status	Off	The module does not have an IP address and is operating in DHCP mode
	Flashing green	The module has an IP address, but no CIP™ connections are established
	Steady green	The module has an IP address and CIP connections (any transport class) are established
	Flashing red	An exclusive owner connection has timed out
LINK1 or LINK2 Status	Off	No link/no activity
	Steady green	Link
	Flashing yellow	Port activity
450L-RX Status	Green	Communication OK
	Flashing red	Light curtain is in lockout state
	Red	No communication

Specifications

Table 5 - General Specifications

Attribute	450L-ENETR
Communication power supply voltage	24.0V DC±15% [Class 2 PELV]
Communication current consumption	340 mA/24V
Communication rate	EtherNet/IP™ 10/100 Mbps
Internet Protocol	IPv4 Addressing
CIP Sync	CIP Sync™ /IEEE 1588 end-to-end transparent clock supported
CIP (safety) standards	IEC 61784-3-2: Functional safety fieldbusses - Additional specifications for CPF 2 regarding the following standards: • IEC 61158-1: Overview and guidance for the IEC 61158 and IEC 61784 series • IEC 61158-3-2: Datalink layer service definition - Type 2 elements • IEC 61158-4-2: Datalink layer protocol specification - Type 2 elements • IEC 61158-5-2: Application layer service definition - Type 2 elements • IEC 61158-6-2: Application layer protocol specification - Type 2 elements

Table 6 - Environmental Specifications

Attribute	450L-ENETR
Operating temperature	-10...+55 °C (14...131 °F)
Storage temperature	-25...+75 °C (-13...+167 °F)
Relative humidity	Up to 95% (noncondensing)
Enclosure type rating	• IP20 (unplugged) • IP65 (plugged)
Vibration	10...55 Hz with amplitude of 0.35 mm (0.01 in.)
Shock, operating	1000 shocks with 10 g and 16 ms pulse duration
Emissions	CISPR 11 Group 1, Class A
ESD Immunity	IEC 61000-4-2 and 61496-1 section 4.3.2 • Normal Operation: 6 kV contact discharge, 8 kV air discharge • No Dangerous Fail: 8 kV contact discharge, 15 kV air discharge
Radiated RF immunity	IEC 61000-4-3: • 10.0V/m (80 MHz...1 GHz) • 3.0V/m (1.4...2 GHz) • 3.0V/m (2.0...2.7 GHz)
EFT Immunity	IEC 61000-4-4, section 5 and IEC61000-6-7 and 61496-1 section 4.3.2 • Normal Operation: ±1 kV • No Dangerous Fail: ±2 kV and severity level 3
Surge transient immunity	IEC 61000-4-5, section 5 and 61000-6-7 and 61496-1 section 4.3.2 • Normal operation: ±1 kV (Line to GND) • No dangerous failure: ±2 kV and severity level 3
Conducted RF Immunity	IEC 61000-4-6, section 5 and 61000-6-7

Table 7 - Certifications (when product is marked) (1)

Attribute	450L-ENETR
cULus	UL Listed Industrial Control Equipment, certified for US and Canada.
CE	European Union compliant with applicable directives: • 2014/30/EU EMC Directive • 2006/42/EC Machinery Directive • 2011/65/EU RoHS Directive (RoHS)
UKCA	UKCA compliant with relevant UK Statutory Instruments: • 2016 No. 1091 Electromagnetic Compatibility Regulations • 2008 No. 1597 Supply of Machinery (Safety) Regulations • 2012 No. 3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Emissions
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of the Radio Waves Act, Clause 3

(1) For declarations of conformity, certificates, and other certification details, see rok.auto/certifications.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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