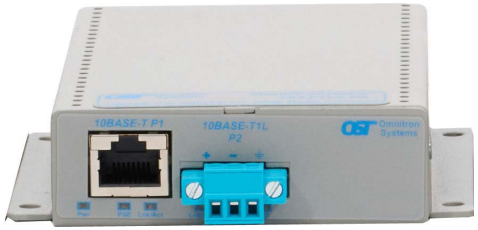
Omnitron Systems

OmniConverter® 10T/APS Single Pair Ethernet Media Converter



User Manual

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This product is warranted to the original purchaser (Buyer) against defects in material and workmanship for a period of two (2) years from the date of shipment. A lifetime warranty may be obtained by the original purchaser by registering this product at www.omnitron-systems.com/support within ninety (90) days from the date of shipment. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective with the same product or with a product with at least the same functionality.

For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

Limitation of Warranty

The foregoing warranty shall not apply to product malfunctions resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

Environmental Notices

The equipment covered by this manual must be disposed of or recycled in accordance with the Waste Electrical and Electronic Equipment Directive (WEEE Directive) of the European Community directive 2012/19/EU on waste electrical and electronic equipment (WEEE) which, together with the RoHS Directive 2015/863/EU, for electrical and electronic equipment sold in the EU after July 2019. Such disposal must follow national legislation for IT and Telecommunication equipment in accordance with the WEEE directive: (a) Do not dispose waste equipment with unsorted municipal and household waste. (b) Collect equipment waste separately. (c) Return equipment using collection method agreed with Omnitron.

The equipment is marked with the WEEE symbol shown to indicate that it must be collected separately from other types of waste. In case of small items the symbol may be printed only on the packaging or in the user manual. If you have questions regarding the correct disposal of equipment go to www.omnitron-systems.com/support or e-mail to Omnitron at intlinfo@omnitron-systems.com.

Safety Warnings and Cautions

ATTENTION: Observe precautions for handling electrostatic discharge sensitive devices.

WARNING: Potential damage to equipment and personal injury.

WARNING: Risk of electrical shock.

Technical Support:

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Description

The OmniConverter 10T/APS Single Pair Ethernet converters are 10BASE-T1L products that convert 10BASE-T Ethernet to 10BASE-T1L Ethernet. They are designed for digital instrumentation solutions used for industrial control processes. They utilize single-pair Ethernet cabling (SPE) to extend the Ethernet link distance up to 200 or 1000 meters depending on the model number.

The 10T/APS converters feature one 10BASE-T1L 3-pin terminal or IEC 63171-2 port and one 10BASE-T RJ-45 port supporting 10Mbps full-duplex data rates.

Product Name	Base Model #	Port 1	Port 2	
10T/APS	2022	10BASE-T	T1L/PSE 0.5W	Class A (1.0V)
10T/APS	2024	10BASE-T	T1L/PSE 1.0W	Class C (1.0V)
10T/APS	2025	10BASE-T	T1L/PSE 36W	Class 3 (1.0V/2.4V)
10T/APS	2027	10BASE-T	T1L/PSE 56W	Class 4 (1.0V/2.4V)

See data sheet for more information and models.

Omnitron 10T/APS converters are interoperable with Ethernet-APL Class A, C, 3 and 4 edge/field devices and act as a Power Source (set as Master) capable of delivering up to 92 watts, depending on the model number. The 10T/APS models 2022 and 2024 support a fixed voltage of 1.0 V peak-to-peak to the field device. Whereas the 2025 and 2027 models support a voltage of 2.4V peak to peak to the field devices.

Power Mode

Secure the ground wire to the grounding screw located on the back of the module.

WARNING REGARDING EARTHING GROUND:

- It is recommended to connect the equipment to the AC power system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the AC power system earthing electrode is connected for surge protection and to eliminate damaging potentials from developing on the isolated chassis.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the AC source and the earthing electrode conductor.

To power the module using a DC power source, prepare a power cable using a two-conductor insulated wire (not supplied) with 12AWG to 14AWG thickness. Cut the power cable to the length required. Strip approximately 3/8 of an inch of insulation from the power cable wires.

WARNING REGARDING EARTHING GROUND:

- This equipment shall be connected to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment shall be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source is to be located within the same premises as this equipment.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the earthing electrode conductor.

Connect the power cables to the unit by fastening the stripped ends to the DC power connector.

Connect the power wires to the DC power source. The Power LED should indicate the presence of power.

WARNING: Note the wire colors used in making the positive and negative connections. Use the same color assignment for the connection at the DC power source.

Mounting and Cable Attachment

The modules are available with integrated wall-mount brackets. Attach the unit to a wall, backboard or other flat surfaces. Make sure the module is placed in a safe, dry and secure location.

The module requires proper air flow and all vents holes must not be compromised or restricted. It is normal for the module to run at a slightly elevated temperature.

Connect the RJ-45 uplink port via an Ethernet Category 3 or better cable to a 10BASE-T Ethernet switch.

Connect the 3-Pin Terminal or IEC 63171-2 connector via a single-pair Ethernet (SPE) cable to an Ethernet-APL device based on the model number.

Connector	+	-	Gnd
IEC	Pin 1	Pin 2	Shield
3 Pin	Pin 1	Pin 2	Pin 3

Cable must meet the SPE cable requirements: IEC 61156-13 (fixed) or IEC 61156-14 (flexible) 18AWG cable or better.

Hazardous Area Use Disclaimer:

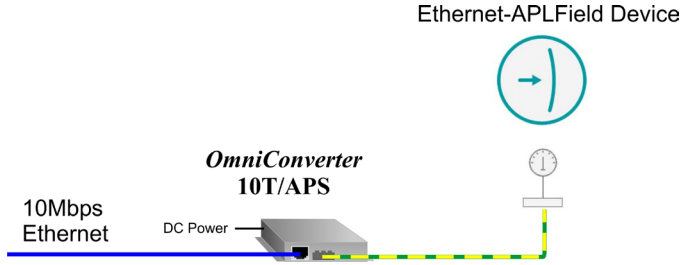
This product is not certified for use in hazardous (classified) locations, including Zone 0, Zone 1, or Zone 2 as defined by IEC 60079-10-1 or equivalent national standards.

It is intended for installation in non-hazardous (safe) areas only.

The product supports interoperability with Ethernet-APL networks and devices, including those installed in hazardous zones, provided that all connections are made through certified intrinsically safe interfaces as part of a compliant system architecture.

When connecting to devices located in hazardous areas, appropriate energy-limiting devices, field switches, or barriers must be used to ensure compliance with all applicable safety standards.

The diagrams below show an example of a typical installation.



It is important to use the correct model for the class of field device being installed. See the table on page 1 for Class and voltage information.

LED Indicators

LED	Color	Description
Power "PWR"	Green	OFF: No power ON: Module has power
P1 Link Activity "Lnk/Act"	Green	OFF: No RJ-45 link ON: Port linked at 10M Blinking: Data activity
P2 Link Activity "Lnk/Act"	Green	OFF: No link ON: Port linked at 10M Blinking: Data activity
P2 PSE Power "PSE"	Green	OFF: Not connected to PD ON: Connected to PD and providing power
	Amber	OFF: No error condition ON: Input voltage level mismatch

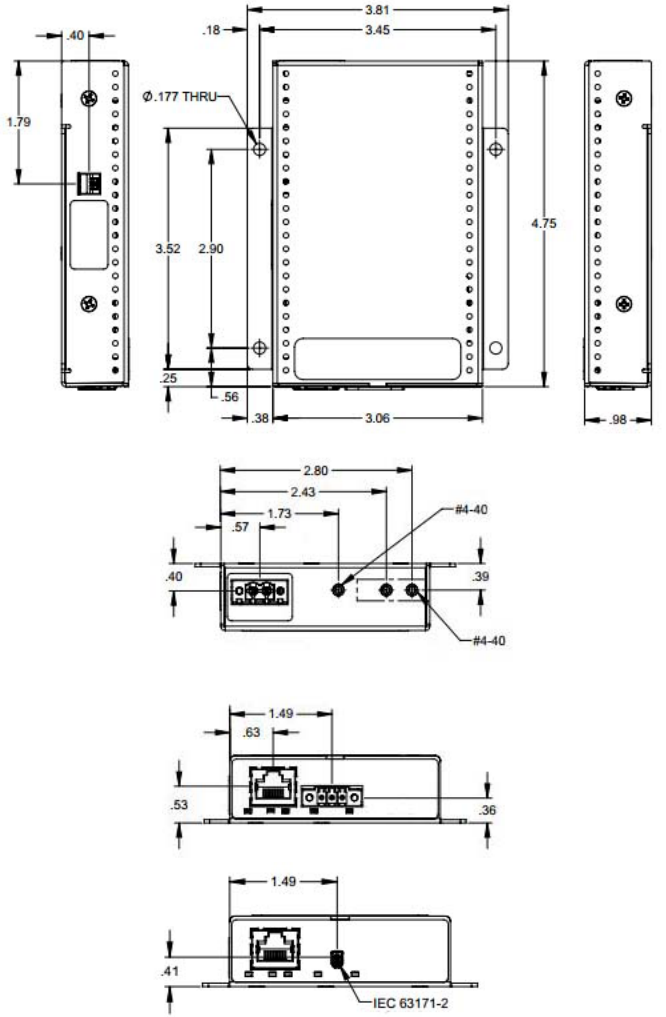
Common Specifications

Frame Size	Up to 1518 bytes	
Port Types	10BASE-T (RJ-45) 10BASE-T1L (3-Pin Terminal or IEC)	
Cable Types	10BASE-T Ethernet, EIA/TIA 568A/B, Cat 3 or better 10BASE-T1L SPE cable, IEC 61156-13 (fixed) or IEC 61156-14 (flexible) 18AWG cable or better	
Dimensions W x D x H	3.8” x 4.8” x 1.0” (96.5 mm x 121.9 mm x 25.4 mm)	
Weight	Module Only: Module w/ Adapter:	1.0 lbs. (453.6 grams) 1.9 lbs. (852.6 grams)
Temperature	Extended: Storage:	-40 to 75°C -50 to 85°C
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4,000m	
Warranty	Lifetime warranty with 24/7/365 free Technical Support	

Model #	**2022 - For Class A Field Devices**
PSE Mode	9.6 to 15 VDC for Class A field/edge devices 1.0 V peak-to-peak; 0.5 W
DC Power Requirements	+9 to +15VDC; 0.222A @ 12VDC 2 Pin Terminal
MTBF (hrs)	1,642,000

Model #	**2024 - For Class C Field Devices**
PSE Mode	11.61 to 15 VDC for Class C field/edge devices 1.0 V peak-to-peak; 1.0 W
DC Power Requirements	+11.61 to +15VDC; 0.261A @ 12VDC 2 Pin Terminal
MTBF (hrs)	1,637,000

Model #	**2025 - For Class 3 Field Devices**
PSE Mode	46 to 50 VDC for Class 3 field/edge devices 1.0/2.4 V peak-to-peak, 36 W
DC Power Requirements	+46 to +50VDC; 1.359A @ 48VDC 2 Pin Terminal
MTBF (hrs)	1,637,000

Model #	**2027 - For Class 4 Field Devices**
PSE Mode	46 to 50 VDC for Class 4 field/edge devices 1.82 Amps Max 1.0/2.4 V peak-to-peak, 56 W
DC Power Requirements	+46 to +50VDC; 2.109A @ 48VDC 2 Pin Terminal
MTBF (hrs)	1,631,000

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