Omnitron Systems

OmniConverter® 10GPoEBT/Sx

Unmanaged 6-Port
60/100W IEEE 802.3bt
10Gigabit Ethernet Switches

User Manual

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ATTENTION: Observe precautions for handling electrostatic discharge sensitive devices.

WARNING: Potential damage to equipment and personal injury.

WARNING: Risk of electrical shock.

OmniConverter® 10GPoEBT/Sx
User Manual

Product Overview

The OmniConverter 10GPoEBT/Sx is a compact High-Power PoE Ethernet switch that feature SFP/SFP+ uplink ports and four 10/100/1000 RJ-45 copper Power Sourcing Power-over-Ethernet user ports.

The 10GPoEBT/Sx is an IEEE 802.3bt compliant PoE switch featuring 60W and 100W per user port.

The module functions can be configured using easily accessible DIP-switches.

OmniConverter 6 Port Modules

The modules automatically negotiate and deliver the power level (PoE, PoE+, or up to 100W per 802.3bt) required by a Powered Device (PD) partner. Depending on the model of the OmniConverter PoE switch, the switch can deliver up to 60 or 100 Watts of power per RJ-45 port.

Front Panel

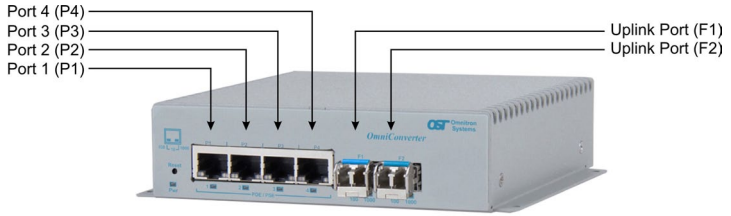
The front of the module provides access to the RJ-45 PoE and uplink ports.

RJ-45 PoE and Uplinks Ports

The RJ-45 PoE Ethernet user port supports 10BASE-T, 100BASE-TX and 1000BASE-T protocols, auto-negotiation, auto MDI/MDI-X crossover and can be manually forced to a specific speed and duplex mode.

The module supports two 1/10G SFP/SFP+ transceiver uplink ports.

The SFP/SFP+ ports support SERDES 10GBASE-X and 1000BASE-X copper and fiber transceivers, and SGMII 10/100/1000BASE-T copper transceivers.



Front Panel Layout

Reset Button

A reset button is available on the front of the module to restore the module to factory default values and clearing buffers and memory. Press and hold the reset button for more than 5 seconds to restore the module to factory default values.

Installation Procedure

1) Configure DIP-switches

2) Installing the Module

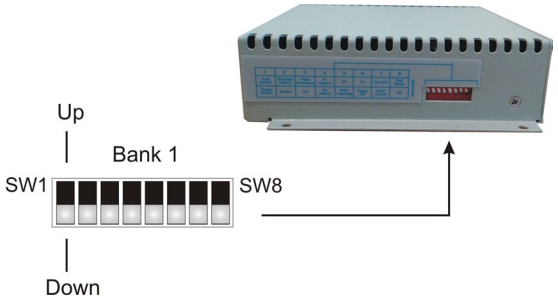
3) Apply Power

4) Connect Cables

5) Verify Operation

1) Configure DIP-switches

The DIP-switches are located on the side of the module. The DIP-switches are used to configure modes of operation, networking features and PoE reset.



DIP-switch Bank Locations

The table below provides a description of each DIP-switch position and function.

Switch	Position	Legend	Function
SW1	DOWN	Single Switch	Mode of Operation
	UP	Dual Switch	
SW2	DOWN	Switch	
	UP	Directed Switch	
SW3	DOWN	Off	Uplink Redundancy
	UP	Link Protection	
SW4	DOWN	No Return	
	UP	F1 Return	
SW5	DOWN	MAC Learning	MAC Learning Enabled (factory default)
	UP	Off	MAC Learning Disabled
SW6	DOWN	Off	PoE Forced Disabled (factory default)
	UP	PoE Force	PoE Forced Enabled
SW7	DOWN	L2CP Tunnel	L2CP Tunnel (factory default)
	UP	Discard	L2CP Tunnel Discard
SW8	DOWN	Off	PoE Reset Disabled (factory default)
	UP	PoE Reset	PoE Reset Enabled

DIP-switch Definitions

SW1 and SW2: Mode of Operation

The module supports Switch, Directed Switch and Dual Device modes.

The modes are described with MAC learning enabled. When MAC learning is disabled, unicast packets are forwarded to all ports.

SW1	SW2	Function
DOWN	DOWN	Switch Mode (factory default)
DOWN	UP	Directed Switch Mode (AKA Camera Mode)
UP	DOWN	Dual Device Mode - Switch Mode
UP	UP	Dual Device Mode - Directed Switch Mode

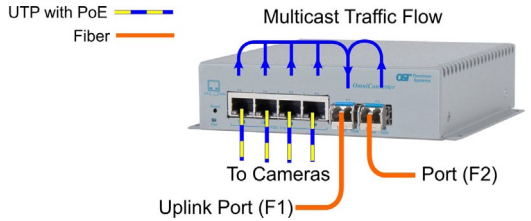
Modes of Operation

Switch Mode

When configured for Switch Mode (factory default), the module operates as a standard layer 2 switch. Data flow will follow MAC address mapping.

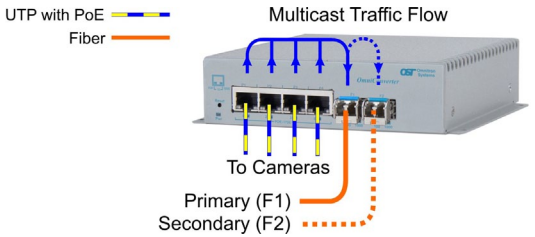
Directed Switch Mode (AKA Camera Mode)

When configured for Directed Switch Mode, traffic from ports P1 - P4 is only forwarded to uplink port F1, preventing the broadcast traffic from flooding other network ports. The data traffic on uplink port (F2) is also forwarded to port F1. Incoming traffic from F1 follows MAC address mapping.



Directed Switch Mode Dual Uplink Ports

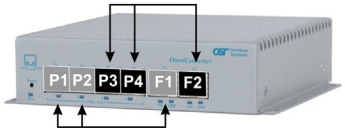
When configured for Directed Switch Mode and Uplink Redundancy (per DIP-switches 3 and 4), traffic is forwarded to both the primary and secondary uplink ports. The secondary port will block all traffic while the primary port is active. When the primary port goes down, the secondary port will be active and all traffic will be forwarded out the secondary port (F2).



Directed Switch Mode with Uplink Redundancy

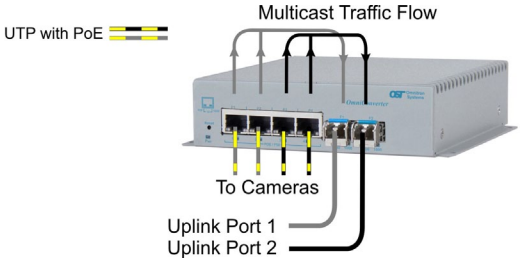
Dual Device Mode

When configured for Dual Device Mode, the module is configured as two logically independent Layer 2 switches. Port F1 is associated with ports P1 and P2 and Port F2 is associated with ports P3 and P4. Data flow will follow MAC address mapping.



Dual Device Mode

When configured for Dual Device Mode and Directed Switch Mode, the traffic from ports P1 and P2 is only forwarded to uplink port F1 and ports P3 and P4 are only forwarded to uplink port F2. This prevents broadcast traffic from flooding other network ports. Incoming traffic from F1 and F2 follows MAC address mapping.



Dual Device with Directed Switch Mode

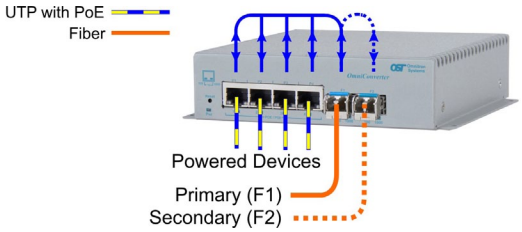
SW3 and SW4: Uplink Redundancy

The modes are described with MAC learning enabled. When MAC learning is disabled, the module will send data to all ports.

SW3	SW4	1 Uplink Port	2 Uplink Ports
		Function	
DOWN	DOWN	Reserved	Switch Mode (factory default)
DOWN	UP	Reserved	Switch Mode (factory default)
UP	DOWN	Reserved	Uplink Redundancy Mode - no return to primary (F1)
UP	UP	Reserved	Uplink Redundancy Mode - return to primary (F1)

Uplink Redundancy

When configured for Uplink Redundant Mode “no return to primary”, the uplink ports operate as redundant links. A fault on the primary Port F1, will cause a fail over to the secondary Port F2 within 50msec. Port F1 will become the secondary port once the failure condition has been restored because “no return to primary” has been selected.



Redundant Uplink with Switch Mode

When configured for Uplink Redundant Mode “return to primary’, a fault on the primary Port F1, will cause a fail over to the secondary Port F2 within 50msec. The module will return to the primary Port F1 after the failure condition has been restored for 6 seconds.

SW5: MAC Learning - “MAC Learning/Off”

When this DIP-switch is in the DOWN “MAC Learning” position (factory default), all ports on the module will learn the source MAC address of each received packet and store the address so packets destined for the stored addresses can be forwarded to the appropriate port on the module. When the DIP-switch is in the UP “Off” position, learning is turned off and all received unicast packets are forwarded to all ports.

SW6: Forced PoE - “Off/ PoE Forced”

This DIP-switch allows the PoE power to be forced ON when connected to a PD with non-standard detection characteristics. The DIP-switch controls the forced capability for the RJ-45 user ports on the module.

When this DIP-switch is in the DOWN “Off” position, all RJ-45 user ports will automatically perform the detection, classification and powering functions for the attached PD. When this DIP-switch is in the UP “PoE Forced” position, all RJ-45 user ports will provide a maximum of 60 or 100 watts of power (depending on the model) to the PD.

SW7: L2CP - “L2CP Tunnel/Discard”

When this DIP-switch is in the DOWN “L2CP Tunnel” position (factory default), all L2CP frames will be tunneled through the module. When this DIP-switch is in the UP “Discard” position, all L2CP frames will be discarded with the exception of the frames listed below.

Multicast Destination Address	Name	SW7 L2CP DOWN / UP
01-80-C2-00-00-00	Bridge Group Address	Tunnel
01-80-C2-00-00-01	IEEE Std 802.3 Full Duplex PAUSE	Based on PAUSE
01-80-C2-00-00-0B	Reserved for future standardization	Tunnel
01-80-C2-00-00-0C	Reserved for future standardization	Tunnel
01-80-C2-00-00-0D	Provider Bridge GVRP Address	Tunnel
01-80-C2-00-00-0F	Reserved for future standardization	Tunnel
01-80-C2-00-00-10	All Bridges	Tunnel
01-80-C2-00-00-2X	GARP	Tunnel
01-80-C2-00-00-3X	802.1ag CFM	Tunnel

If SW6 is in the DOWN “Pause Off” position, all PAUSE frames are TUNNELED. If SW6 is in the UP “On” position, the module is participating in the PAUSE function.

SW8: PSE Reset - “Off/PoE Reset”

The module can be configured to disable (reset) the PoE output power for 5 seconds after a loss of receive link on any uplink port. This feature is typically used to allow a PD to re-initialize after a failure on the incoming uplink.

When this DIP-switch is in the DOWN “Off” position (factory default), PoE output power does not reset on a loss of receive link on any uplink port. When this DIP-switch is in the UP “PoE Reset” position, the module will disable PoE output power for 5 seconds following a loss of receive link on any uplink port.

When uplink redundancy is enabled, the loss of link on either F1 or F2 will not cause the PD to be re-initialized even though the PSE Reset is enabled. The PD will be re-initialized on a loss of receive link on both uplink ports.

When Dual Device Mode is enabled, the loss of receive link on a uplink port will re-initialize the PDs associated with the that uplink port. Ports P1 and P2 will drop PoE power when a loss of receive link on F1 is detected and ports P3 and P4 will drop PoE power when a loss of receive link on F2 is detected.

2) Installing the Module

Wall Mounting

The wall mounting height of the module should be less than or equal to 2 meters (6.6 feet) from the floor. Use the four mounting holes on the module to secure the module to the wall. The module can accommodate #6 screws (not included).

Installation of the module should be such that the air flow in the front, back, side and top vents of the switch are not compromised or restricted.

The accessory cables should have their own strain relief and do not pull down on the module.

Rack Mounting

The module can be rack mounted using the optional Rack Mount Shelf (8260-0). Refer to the Rack Mount Shelf user manual (040-08260-001x) for the proper installation guidelines.

Follow the same guidelines above when rack mounting the module.

DIN-Rail Mounting

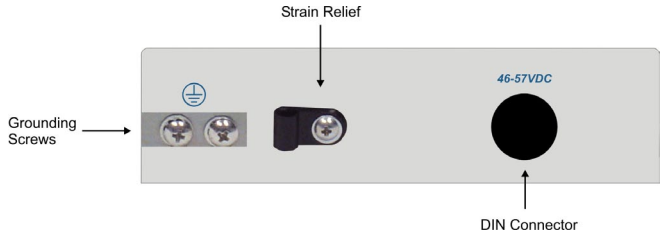
The module can be DIN-rail mounted using the optional DIN-Rail Mounting Clips (8251-1). Refer to the DIN-Rail Mounting Clips user manual (040-08251-001x) for the proper installation guidelines.

3) Apply Power

AC Power

Secure the ground wire to the ground screw. See the figure below for the location of the grounding screws.

Route the power cord through the provided strain relief for additional support and connect the DIN connector at the end of the wire on the AC/DC adapter to the DIN connector on the module. Connect the AC/DC adapter to the AC outlet. Confirm that the module has powered up properly by checking the Power LED located on the front of the switch.



AC Models Rear View: DIN Connector for AC/DC Power Adapter

Make sure to disconnect the power and ground cables before removing the module.

WARNING!!!

NEVER ATTEMPT TO OPEN THE CHASSIS OR SERVICE THE POWER SUPPLY. OPENING THE CHASSIS MAY CAUSE SERIOUS INJURY OR DEATH. THERE ARE NO USER REPLACEABLE OR SERVICEABLE PARTS IN THIS UNIT.

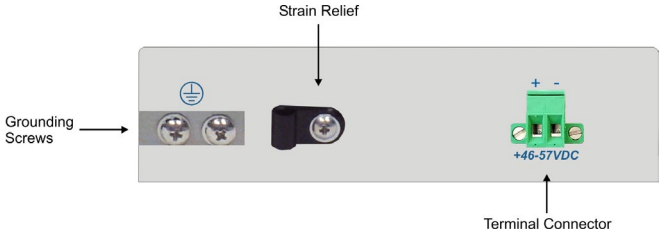
DC Power

This module is intended for installation in restricted access areas. (“Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT”). A restricted access area can be accessed only through the use of a special key, or other means of security.

The over current protection for connection with centralized DC shall be provided in the building installation, and shall be a UL listed circuit breaker rated 20 Amps, and installed per the National Electrical Code, ANSI/NFPA-70.

The 10GPoEBT/Sx (60W models) requires +50 to +57VDC inclusive of tolerances (4.47A @ 56VDC max rated power) and the 10GPoEBT/Sx (100W models) requires +52 to +57VDC inclusive of tolerances (7.33A @ 56VDC max rated power). See specification table for specific model requirements.

Appropriate overloading protection should be provided on the DC power source outlets utilized.



DC Models Rear View: 2-Pin Terminal for DC Power

WARNING: Only a DC power source that complies with safety extra low voltage (SELV) requirements can be connected to the DC-input power supply.

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.

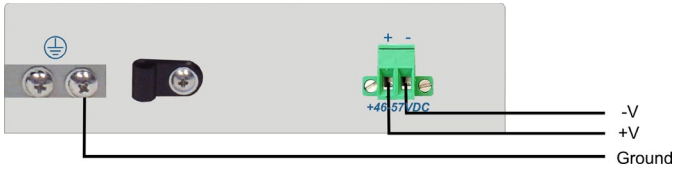
Locate the DC circuit breaker of the external power source, and switch the circuit breaker to the OFF position.

Prepare a power cable using a three 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.

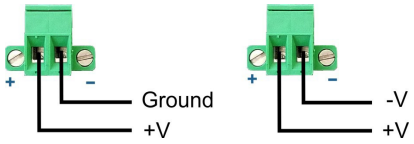
Connect the ground wire to the grounding screws on the back of the module.

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



DC Models Rear View: Power Connections

WARNING: The positive lead of the power source must be connected to the "+" terminal on the module and the negative lead of the power source to the "-" terminal on the module as shown above.



Power Options

WARNING: Note the wire colors used in making the positive, negative and ground connections. Use the same color assignment for the connection at the circuit breaker.

Connect the power wires to the circuit breaker and switch the circuit breaker ON. If any module are installed, the Power LED will indicate the presence of power.

During the installation, ensure that the ground potentials are maintained throughout the system connections. This includes but not limited to the power source ground and any shielded cabling grounds.

WARNING!!!

NEVER ATTEMPT TO OPEN THE CHASSIS OR SERVICE THE POWER SUPPLY. OPENING THE CHASSIS MAY CAUSE SERIOUS INJURY OR DEATH. THERE ARE NO USER REPLACEABLE OR SERVICEABLE PARTS IN THIS UNIT.

Make sure to disconnect the power and ground cables before removing the equipment.

4) Connect Cables

a. Insert the SFP/SFP+ transceiver into the SFP receptacle on the front of the module (see the SFP Data Sheet 091-17000-001 for supported Gigabit transceivers or 091-17400-001 for supported 10G transceivers).

   NOTE: The release latch of the SFP fiber transceiver must be in the closed (up) position before insertion.

b. Connect an appropriate multimode or single-mode fiber cable to the fiber port on the front of the module. It is important to ensure that the transmit (TX) is attached to the receive side of the transceiver at the other end and the receive (RX) is attached to the transmit side. When using single-fiber (SF) models, the

TX wavelength must match the RX wavelength at the other end and the RX wavelength must match the TX wavelength at the other end.

c. Connect the Ethernet 10/100/1000 RJ-45 port using a Category 5 or better cable to an external 10BASE-T, 100BASE-TX or 1000BASE-T Ethernet device.

Description	15W IEEE 802.3af PoE	30W IEEE 802.3at PoE+	60W IEEE 802.3.bt PoE (Type 3)	100W IEEE 802.3bt PoE (Type 4)
Power Supply Voltage Range	46.0 to 57.0 VDC	51.0 to 57.0 VDC	51.0 to 57.0 VDC	53.0 to 57.0 VDC
Voltage Range at PSE port Output	44.0 to 56.0 VDC	50.0 to 56.0 VDC	50.0 to 56.0 VDC	52.0 to 56.0 VDC
Maximum Power from PoE/PSE port	15.4 watts	30 watts	60 watts	100 watts
Minimum Voltage at PoE/PD port input*	37.0 VDC	42.5 VDC	42.5 VDC	41.1 VDC
Minimum Power at PoE/PD port*	12.95 watts	25.5 watts	51 watts	71 watts
* at 100 meters using Cat5				

PoE, PoE+ and 803.2bt Requirements

5) Verify Operation

Verify the module is operational by viewing the LED indicators.

NOTE: The PSE LED may turn Amber (ON) when a non-PD device is connected to the port.

Power LED Indicators		
Legend	**Indicator**	**Description**
Pwr	OFF	Unit not powered
	Green - ON	Unit powered
	Green - Blinking at 1Hz	Indicates reset button has been pressed for more than 5 seconds and the module is ready to be restored to factory default values

Power LED Indicator

Uplink LED Indicators		
Legend	**Indicator**	**Description**
1000 (Link)	OFF	Port not linked
	Green - ON	Port linked at the speed indicated by the Speed LED
	Green - Blinking at 10Hz	Port is transmitting or receiving data
	Green - Blinking at 1Hz	Port in redundant secondary mode
10G (Speed)	OFF	Port not linked
	Amber - Blinking at 1Hz	Port not linked and receiving remote fault or FEFI
	Green - single blink	Port linked at 10M, 100M or 1G
	Green - two blinks	Port linked at 2.5G
	Green - three blinks	Port linked at 5G
	Green - four blinks	Port linked at 10G

SFP/Uplink Ports LED Indicators LED Indicators

RJ-45 User Ports LED Indicators		
Legend	**Indicator**	**Description**
100 	OFF	No link
	Green - ON	Port linked at 100Mbps
	Green - Blinking at 10Hz	Port data activity at 100Mbps
	Amber -ON	Port linked at 100Mbps Half-duplex
	Amber - Blinking at 10Hz	Port data activity at 100Mbps Half-duplex
1000 	OFF	No link
	Green - ON	Port linked at 1000Mbps
	Green - Blinking at 10Hz	Port data activity at 1000Mbps
	Amber -ON	Port linked at 1000Mbps Half-duplex
	Amber - Blinking at 10Hz	Port data activity at 1000Mbps Half-duplex
10 	OFF	No link
	Green - ON	Port linked at 10Mbps
	Green - Blinking at 10Hz	Port data activity at 10Mbps
	Amber -ON	Port linked at 10Mbps Half-duplex
	Amber - Blinking at 10Hz	Port data activity at 10Mbps Half-duplex
PoE/PSE	OFF	Port PSE inactive
	Amber - ON	Port PSE inactive - exceeding the power source
	Green - single blink	Powered by 802.3af PoE 15W
	Green - two blinks	Powered by 802.3at PoE 30W
	Green - three blinks	Powered by High-Power PoE 60W
	Green - four blinks	Powered by High-Power PoE 100W

RJ-45 LED Indicators

Specifications

Description	**OmniConverter® 10GPoEBT/Sx** 10/100/1000BASE-T with 1G or 10G Uplinks Unmanaged 6 Port IEEE 802.3bt PoE Ethernet Switch	
Standard Compliances	IEEE 802.3, IEEE 802.3af (15.40 watts max), IEEE 802.3at (30 watts max) IEEE 802.3bt (60 and 100 watts max)	
Environmental	REACH, RoHS and WEEE	
PoE Modes	IEEE Alternate A (Alt A) 4-Pair	
Frame Size	Up to 10,240 bytes	
Port Types	Copper: 10/100/1000BASE-T (RJ-45) SFP/SFP+: 10GBASE-X Fiber Transceivers 10GBASE-T Copper Transceivers 1000BASE-X Fiber and Copper Transceivers 10/100/1000BASE-T SGMII Copper Transceivers	
Cable Types	Copper: EIA/TIA 568A/B, Cat 5 UTP and higher Fiber: Multimode: 50/125, 62.5/125µm Single-mode: 9/125µm	
AC Power Requirements (Models with AC/DC Adapters)	100 - 240VAC 50/60Hz 3.5A max at 115VAC 2.5A max at 230VAC	
DC Power Requirements (Models with DC Terminals)	60W Models: +46 to +57VDC; inclusive of tolerance 4.47A @ 56VDC 2 Pin Terminal (non-isolated)	100W Models: +46 to +57VDC; inclusive of tolerance 7.33A @ 56VDC 2 Pin Terminal (non-isolated)
Dimensions (W x D x H)	6.28” x 5.2” x 1.5” 159.5 mm x 132.1 mm x 38.1 mm	
Weight	Module Only: 1.6 lbs.; 735 grams Module with AC/DC Adapter: 3.7 lbs.; 1703 grams	
Operating Temperature (See Temperature Derating Table)	Commercial: 0 to 50°C Wide: -40 to 60°C (-20°C AC cold start) Extended: -40 to 75°C - not available for models with AC/DC power adapter Storage: -40 to 80°C	
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4,000m (operational)	
MTBF (hours)	Module Only: 285,000 AC/DC Adapter: 100,000	
Warranty	5 year product warranty with 24/7/365 free Technical Support 2 year AC power adapter warranty	

AC/DC Adapter Temperature Derating Total Available Wattage to RJ-45 Ports				
Model	Watts Required	40°C	50°C	60°C
10GPoEBT/Sx 60W	240 watts	Full Power	175 watts	115 watts
10GPoEBT/Sx 100W	400 watts	240 watts	175 watts	115 watts

The AC/DC Adapter Temperature derating table is not applicable to models with DC Terminal (see Ordering table for Direct DC -9 option). The DC Terminal models will provide full PoE power over the operating temperature range of the module as long as the DC input power meets the requirements stated in the specification table.

Regulatory Compliances (*Pending)	Safety*:	UL 62368-1, UL 60950-1, IEC 62368-1, IEC 60950-1, EN 62368-1, EN 60950-1, CAN/CSA C22.2 No. 62368-1-14, CAN/CSA C22.2 No. 60950-1, CE Mark, UKCA
	EMC:	EN 55032/24 CE Emissions/Immunity, IEC 61000-6-4 Industrial Emissions, IEC 61000-6-2 Industrial Immunity
	EMI:	CISPR 32, FCC 47 Part 15 Subpart B Class A
	EMS:	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV, IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m, IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV (DC models), IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV (AC models), IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV (DC models), IEC 61000-4-5 Surge: Power: 1 kV Line/Line; 2 kV Line/Gnd; Signal: 2 kV (AC models), IEC 61000-4-6 CS: Signal: 10 V, IEC 61000-4-8 (Magnetic Field) 30A/m, IEC 61000-4-11 (Voltage Dips, interrupts)
	IP Rating:	IP20 Protection
	ACT:	TAA, BAA, NDAA

Customer Support Information

If you encounter problems while installing this product, contact Omnitron Technical Support:

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Fax: (949) 250-6514

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