OmniConverter® GLPoE/Sx

Unmanaged
Single Pair Power over Ethernet Switch

User Manual

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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.

OmniConverter® GLPoE/Sx
User Manual

Product Overview

The OmniConverter GLPoE/Sx is an unmanaged Single Pair Power over Ethernet (SPoE) switch that is IEEE 802.3cg compliant and features copper or fiber uplink ports and four single-pair 10BASE-T1L copper SPoE user ports.

The Single Pair Power over Ethernet switch features four IEEE 802.3cg compliant 10BASE-T1L 3-pin terminals or IEC 63171-2 SPE ports and two 10/100/1000 RJ-45 or 100/1000 fiber SFP uplink ports.

The GLPoE/Sx SPoE user ports detect and classify 30VDC class 10 - 12 and 58VDC class 13 -15 powered devices through DIP-switch selection.

The GLPoE/Sx functions can be configured using easily accessible DIP-switches

Front Panel

The front of the GLPoE/Sx provides access to the RJ-45 or SFP uplink ports and the four single-pair 10BASE-T1L Ethernet copper user ports.

Uplink and Single-Pair Ports

The four IEEE 802.3cg compliant 10BASE-T1L Ethernet ports feature either a 3-pin terminal or an IEC 63171-2 connector, depending on the model number.

The switch is available with two SFP transceiver uplink port or two 10/100/1000BASE-T RJ-45 copper uplink ports. The SFP transceiver receptacle port supports 10/100/1000BASE-T and 1000BASE-T copper transceivers and 100Mbps and 1000Mbps standard, CWDM and DWDM fiber transceivers in a variety of distances and fiber types.
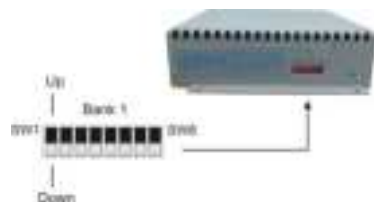

Front Panel Layout

Installation Procedure

1) Configure DIP-switches

2) Installing the Switch

3) Apply Power

4) Connect Cables

5) Verify Operation

1) Configure DIP-switches

DIP-switches are located on the side of the OmniConverter GLPoE/Sx.

DIP-switch Bank Locations

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

Switch	Description
SW1	Mode of Operation
SW2	
SW3	Uplink Redundancy
SW4	
SW5	MAC Learning
SW6	Reserved
SW7	SPoE Voltage Selection
SW8	SPoE Reset

DIP-switch Definitions

SW1 and SW2: Mode of Operation

The switch 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
UP	DOWN	Dual Device Mode - Switch Mode
UP	UP	Dual Device Mode - Directed Switch Mode

Modes of Operation

NOTE: Product label may show RESERVED for the UP UP position, however the UP UP position is as indicated in the table above.
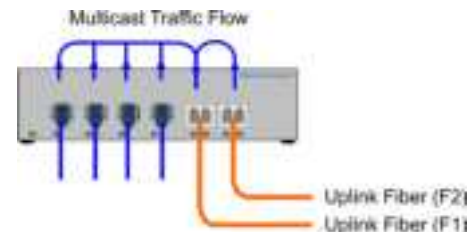
Switch Mode

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

Directed Switch Mode

When configured for Directed Switch Mode, traffic from the user ports and uplink port F2 is only forwarded to the uplink port F1, preventing the broadcast traffic from flooding other network ports. Incoming traffic from uplink port F1 is flooded to all user ports and uplink port F2.

The illustrations below show fiber uplink ports. The switch is available with copper uplink ports and operate in the same manner as shown below.

Directed Switch Mode

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).
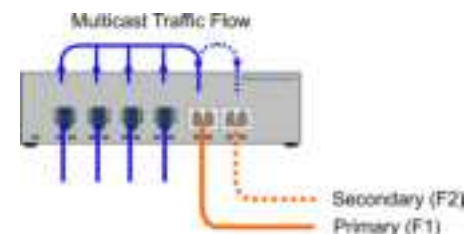

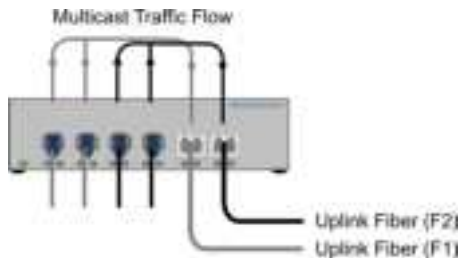*Directed Switch Mode with Uplink Redundancy*

Dual Device Mode

Dual Device Mode is only supported on models with two uplink ports.

When configured for Dual Device Mode, the switch 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.
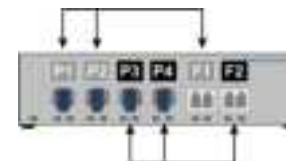
Dual Device Mode

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 switch will send data to all ports.

SW3	SW4	Function
DOWN	DOWN	Switch Mode (factory default)
DOWN	UP	Switch Mode (factory default)
UP	DOWN	Uplink Redundancy Mode - no return to primary (F1)
UP	UP	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.
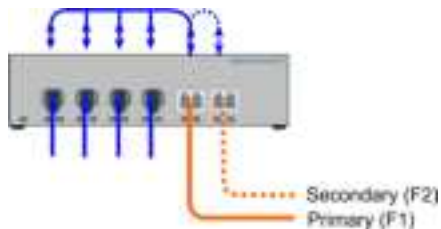
Redundant Uplink

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 switch will return to the primary Port F1 after the failure condition has been restored.

SW5: MAC Learning - "ON/OFF"

When this DIP-switch is in the DOWN "ON" position (factory default), all ports on the switch 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 switch. 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: Reserved

This DIP-switch is reserved and must be left in the DOWN default position.

SW7: SPoE Voltage Selection - "58/30"

When this DIP-switch is in the DOWN "58" position, the SPoE ports will apply 58 VDC to the attached device after the device has been detected as a valid PD.

When this DIP-switch is in the UP "30" position, the SPoE ports will apply 30 VDC to the attached device after the device has been detected as a valid PD.

SW8: SPoE Reset - "No/Yes"

The switch can be configured to disable (reset) the SPoE 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 "No" position (factory default), SPoE output power does not reset on a loss of receive link on any uplink port. When this DIP-switch is in the UP "Yes" position, the switch will disable SPoE output power for 5 seconds following a loss of receive link on uplink port F1.

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.

Pause

Pause frames will be configured to advertise Symmetrical and Asymmetrical Pause capability on all ports.

L2CP

All Layer 2 Control Protocol (L2CP) frames will be tunneled.

2) Installing the Switch

Wall Mounting

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

Installation of the switch 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 switch.

Rack Mounting

The switch 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.

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 barrel connector at the end of the wire on the AC/DC adapter to the barrel connector on the switch. Connect the AC/DC adapter to the AC outlet. Confirm that the switch has powered up properly by checking the Power LED located on the front of the switch.
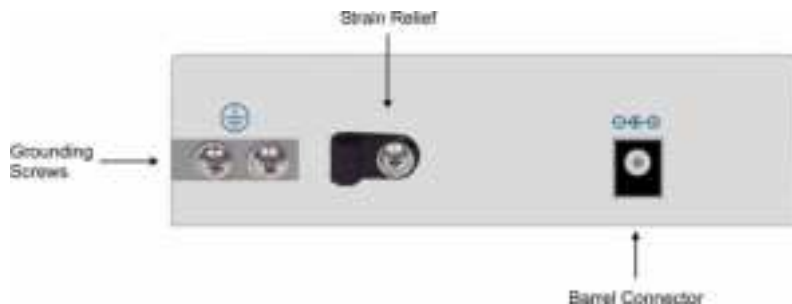
AC Models Rear View: Barrel Connector for AC/DC Power Adapter

> **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.
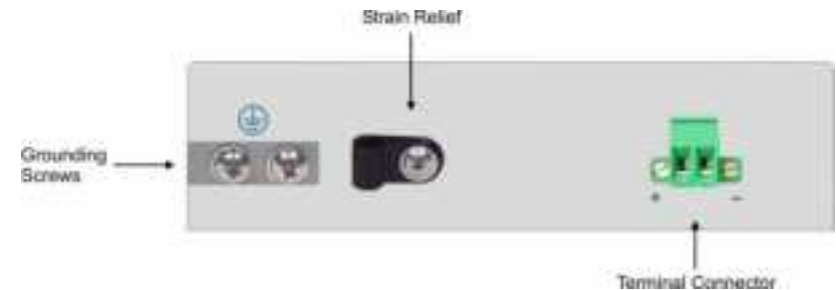
DC Power

This switch 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.

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

The GLPoE/Sx requires +50 to +58VDC inclusive of tolerances (5.80A @ 56VDC max rated power). See specification table for specific 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:**
> o 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.
> o 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.
> o The DC supply source is to be located within the same premises as this equipment.
> o 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 switch.

Connect the power cables to the switch by fastening the stripped ends to the DC power connector.
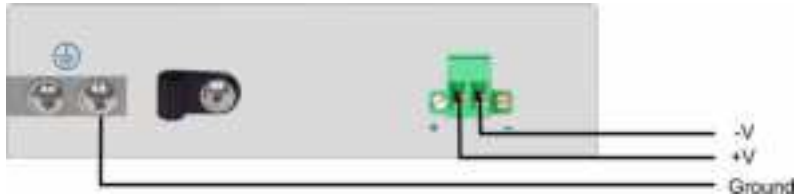
DC Models Rear View: Power Connections

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

The power connections on the switch are isolated. This provides support of positive or negative power connections.

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 turn ON the circuit breaker. If any switch is 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. If the switch supports SFP transceivers,insert the SFP fiber transceiver into the SFP receptacle on the front of the switch (see the SFP Data Sheet 091-17000-001 for supported Gigabit or Fast Ethernet transceivers).

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

b. If the switch supports RJ-45 uplink ports, connect the port using a Category 5 or better cable to an external 10/100/1000 Ethernet device.

c. Connect the 3-Pin Terminal or IEC 63171-2 connector via a single-pair Ethernet (SPE) cable to the IEEE 802.3cg class 10 - 15 powered device. Cable must meet the SPE cable requirements: IEC 61156-13 (fixed) or IEC 61156-14 (flexible) 18AWG cable or better in order to obtain the maximum distance.

5) Verify Operation

Verify the switch is operational by viewing the LED indicators.

Power LED Indicators		
Legend	**Indicator**	**Description**
Pwr	OFF	Switch not powered
	Green - ON	Switch powered

Power LED Indicators

User Ports LED Indicators		
Legend	**Indicator**	**Description**
Lk/Act	OFF	No link
	Green - ON	Port linked at 10Mbps FDx
	Green - Blinking at 10Hz	Port Tx/Rx data activity at 10Mbps FDx
PSE	OFF	10T1L Port PSE inactive
	Green - ON	10T1L Port PSE (SPoE) being supplied
	Amber - ON	PSE failed negotiation
	Amber Blinking (1Hz)	10T1L Port PSE inactive due to Power demand exceeding the Power source capacity, short circuit or resistance low or high

User Port LED Indicators

| Uplink Ports LED Indicators - SFP and Copper Uplink Models		
Legend	Indicator	Description
100	OFF	No link
	Green - ON	Port linked at 100Mbps FDx
	Green - Blinking at 10Hz	Port Tx/Rx data activity at 100Mbps FDx
	Green - Blinking at 1Hz	Port linked at 100Mbps and in redundant standby mode
	Amber - ON	Port linked at 100Mbps HDx
	Amber - Blinking at 10Hz	Port Tx/Rx data activity at 100Mbps HDx
1000	OFF	No link
	Green - ON	Port linked at 1000Mbps FDx
	Green - Blinking at 10Hz	Port data activity at 1000Mbps FDx
	Green - Blinking at 1Hz	Port linked at 1000Mbps and in redundant standby mode
	Amber - ON	Port linked at 1000Mbps HDx
	Amber - Blinking at 10Hz	Port Tx/Rx data activity at 1000Mbps HDx
100+1000	OFF	No link
	Green - ON	Port linked at 10Mbps FDx
	Green - Blinking at 10Hz	Port Tx/Rx data activity at 10Mbps FDx
	Green - Blinking at 1Hz	Port linked at 10Mbps and in redundant standby mode
	Amber - ON	Port linked at 10Mbps HDx
	Amber - Blinking at 115Hz	Port Tx/Rx data activity at 10Mbps HDx

Uplink LED Indicators - SFP and Copper Models

Specifications

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

	OmniConverter® GLPoE58/Sx
Description	10T/T1L to 100/1000 Fiber or 10/100/1000 Copper Uplinks Unmanaged SPoE Ethernet Switch
Standard Compliances	IEEE 802.3, 802.3cg
Environmental	REACH, RoHS, WEEE
SPoE Mode	30 VDC for Class 10 - 12 PDs, max 51 watts 58 VDC for Class 13- 15 PDs, max 316 watts
Frame Size	10BASE-T1L: Up to 2,048 bytes RJ-45: Up to 10,240 bytes SFP: 100M - up to 2,048 bytes 1000M - up to 10,240 bytes
Port Types	10BASE-T1L: 3-Pin Terminal or IEC 63171-2 SPE connector RJ-45: 10/100/1000BASE-T SFP: 10/100/1000BASE-T SGMII or 1000BASE-T SERDES Copper Transceiver, 100BASE-X or 1000BASE-X Fiber Transceiver
Cable Types	10BASE-T1L: Single-Pair Ethernet (SPE) cable, IEC 61156-13 (fixed) or IEC 61156-14 (flexible) 18AWG cable or better RJ-45: 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)	+50 to +58VDC; 5.80A @ 56VDC 2 Pin Terminal (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: 1.5 lb.; 720 grams Module with AC/DC Adapter: 2.0 lbs.; 913 grams
Operating Temperature	Commercial: 0 to 50°C Wide: -40 to 60°C (-20°C AC cold start) Extended: -40 to 75°C (-20°C AC cold start) Storage: -40 to 80°C
Humidity	5 to 95% (non-condensing)
Altitude	-100m to 4,000m (operational)
MTBF (hours)	Module Only: 221,000 AC/DC Adapter: 100,000
Warranty	5 year product warranty with 24/7/365 free Technical Support 2 year AC power adapter warranty

Mechanical
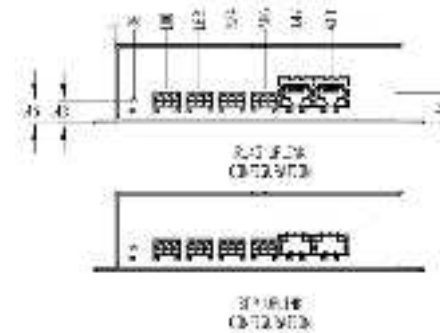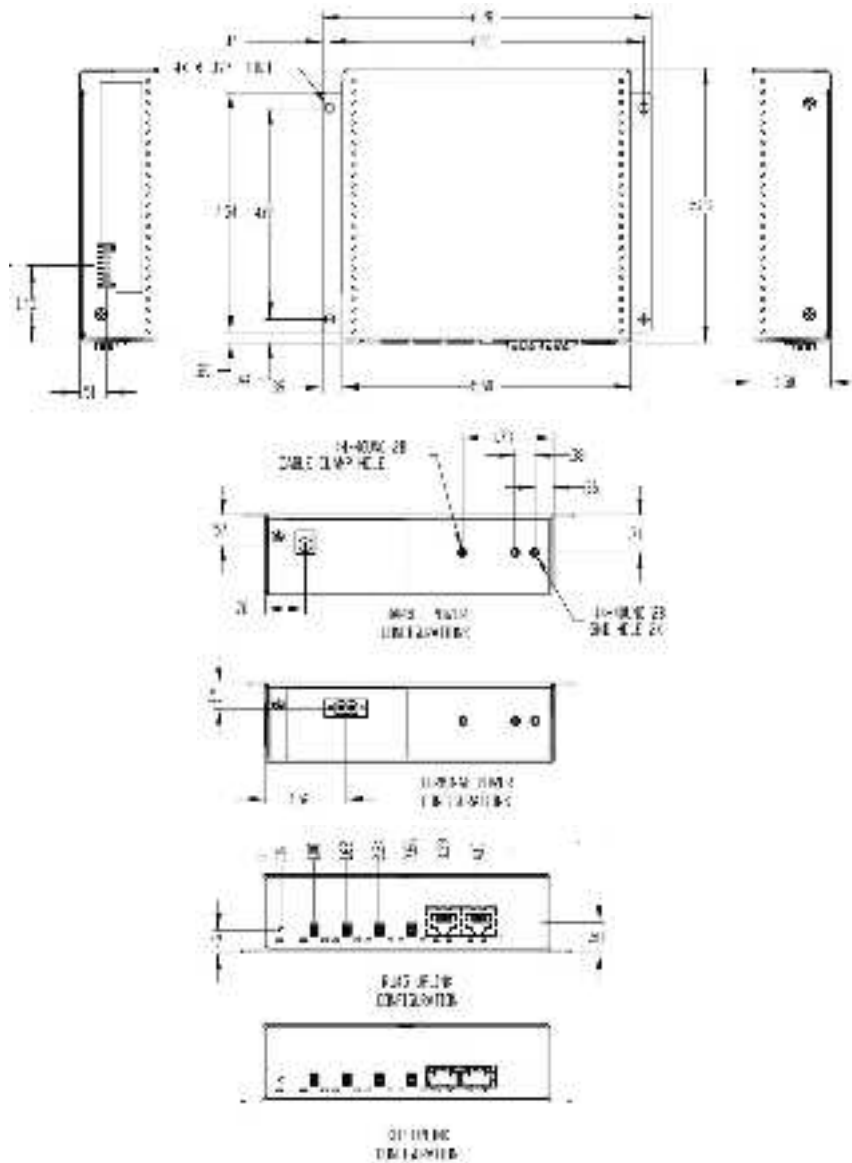
Customer Support Information

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

Phone:	(949) 250-6510
Fax:	(949) 250-6514
Address:	Omnitron Systems Technology, Inc.
	38 Tesla
	Irvine, CA 92618, USA
Email:	support@omnitron-systems.com
URL:	www.omnitron-systems.com

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