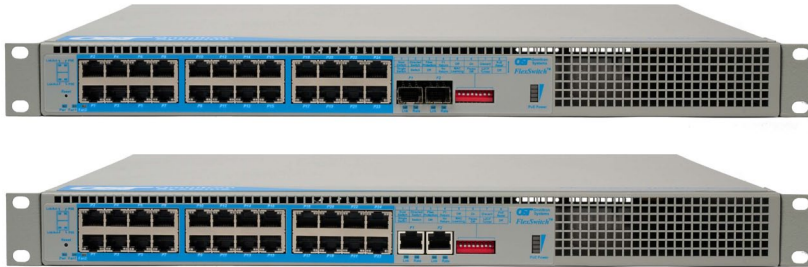


## FlexSwitch® 10GRPoE+/Sx

### Unmanaged 16 and 24 Port PoE/PoE+ Ethernet Switch



## User Manual Guide

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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.

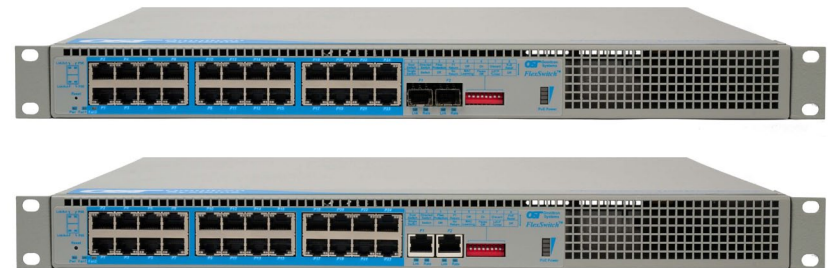
# FlexSwitch® 10GRPoE+/Sx User Manual

## Product Overview

The FlexSwitch 10GRPoE+/Sx is an unmanaged PoE/PoE+ Ethernet switch that features two 1/10G SFP/SFP+ or multi-gigabit/multi-rate RJ-45 uplink ports and sixteen or twenty-four 10/100/1000 PoE/PoE+ RJ-45 copper ports. This layer 2 switch is ideal for transmitting power and data to IP cameras, wireless access points, VoIP phones, surveillance systems, or other PoE powered devices.

Configurations include sixteen 10/100/1000 PoE/PoE+ RJ-45 user ports and eight 10/100/1000 RJ-45 user ports or twenty-four 10/100/1000 PoE/PoE+ RJ-45 user ports. Both models provide full PoE+ power simultaneously to all PoE/PoE+ RJ-45 user ports.

The RJ-45 uplink ports support multi-gigabit/multi-rate speeds of 100Mbps, 1Gbps, 2.5Gbps, 5Gbps and 10Gbps.



*FlexSwitch 10GRPoE+/Sx 24 Port Models*

The 10GRPoE+/Sx is a Power Sourcing Equipment (PSE) that provides up to 30W PoE+ (IEEE 802.3at) per RJ-45 port and supports frame sizes up to 10,240 bytes.

## Front Panel

The front of the switch provides access to the RJ-45 user ports, uplink ports and DIP-switches.

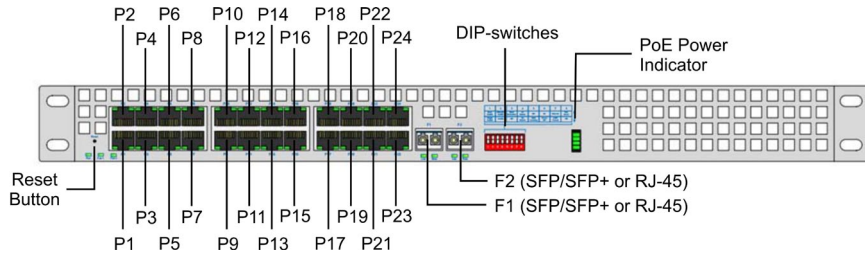
## RJ-45 PoE and Uplinks Ports

The RJ-45 PoE Ethernet user port supports speeds of 10/100/1000, auto-negotiation, and auto MDI/MDI-X crossover. Models are available with an RJ-45 or SFP/SFP+ uplink port.

The SFP/SFP+ transceiver receptacle port supports a variety of copper and fiber transceivers. It supports 10/100/1000BASE-T, 1000BASE-T, copper transceivers and 1G and 10G multimode or single-mode fiber, dual or single-fiber transceivers in standard, CWDM and DWDM wavelengths.

The RJ-45 uplink port is a multi-gigabit/multi-rate supporting speeds of 100Mbps, 1Gbps, 2.5Gbps, 5Gbps and 10Gbps.

The 16 Port PoE/PoE+ model supports Power over Ethernet on Ports 1 - 16 and no Power over Ethernet on Ports 17 - 24.



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

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

Switch	Position	Legend	Function
SW1	DOWN	Single Switch	Device Mode
	UP	Dual Switch	
SW2	DOWN	Switch	Switch Mode
	UP	Directed Switch	
SW3	DOWN	Off	Uplink Redundancy
	UP	Link Protection	
SW4	DOWN	No Return	Uplink Redundancy
	UP	F1 Return	
SW5	DOWN	MAC Learning	MAC Learning Enabled (factory default)
	UP	Off	MAC Learning Disabled
SW6	DOWN	Reserved	
	UP		
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

On the front of the switch, SW6 is labeled as PAUSE. The Pause feature is not implemented and the function of the switch is as indicated in the table.

## SW1 and SW2: Device and Switch Mode

The switch supports Switch, Directed Switch and Dual Device mode. The modes are described with MAC learning enabled. When MAC learning is disabled, unicast packets are forwarded to all ports.

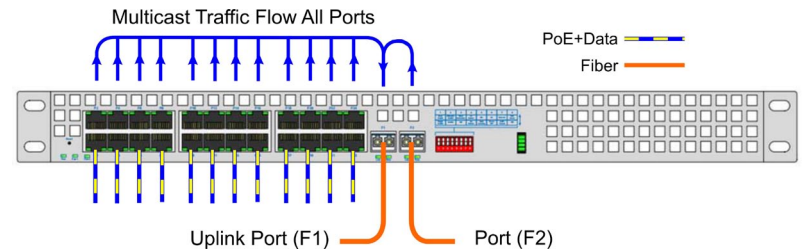
SW1	SW2	Function
DOWN	DOWN	Switch Mode (factory default)
DOWN	UP	Directed Switch Mode (AKA Camera Mode)
UP	DOWN	Dual Device Mode - Switch Mode
UP	UP	Dual Device Mode - Directed Switch Mode

### 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.

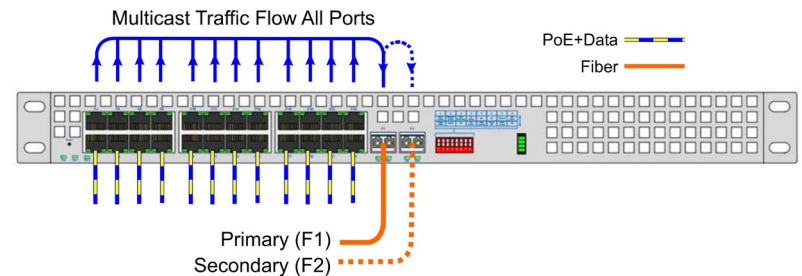
### Directed Switch Mode (AKA Camera Mode)

When configured for Directed Switch Mode, traffic from all the RJ-45 user ports is only forwarded to the uplink port F1, preventing the broadcast traffic from flooding other network ports. The data traffic on the additional uplink port (F2) is also forwarded to port F1. Incoming traffic from F1 follows MAC address mapping.



Directed Switch Mode Dual Uplink Port

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

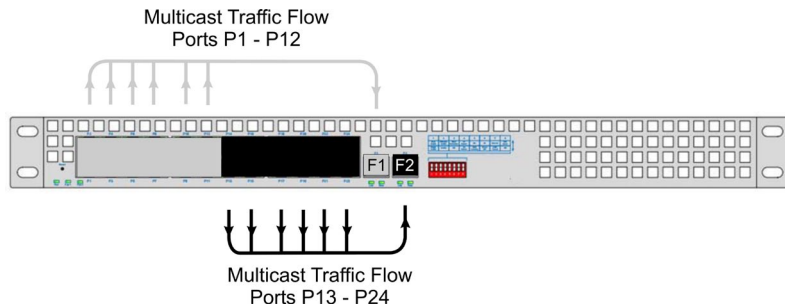
## Dual Device Mode

When configured for Dual Device Mode, the switch is configured as two logically independent Layer 2 switches. Port F1 is associated with ports P1 - P12 and Port F2 is associated with ports P13 - P24. 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- P12 are only forwarded to uplink port F1 and ports P13 - P24 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.



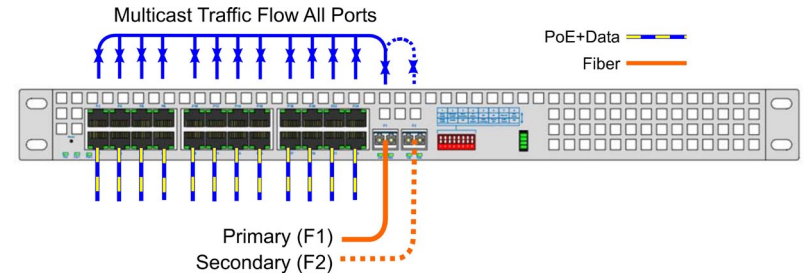
*Dual Device with Directed Switch Mode*

## 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	Redundant Mode - no return to primary (F1)
UP	UP	Redundant Mode - return to primary (F1)

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 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 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

Leave the DIP-switch in the default DOWN position.

**On the front of the switch, SW6 is labeled as PAUSE. The Pause feature is not implemented.**

## 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 switch. 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	Based on RSTP / MSTP
01-80-C2-00-00-01	IEEE Std 802.3 Full Duplex PAUSE	Based on PAUSE
01-80-C2-00-00-03	IEEE Std 802.1X PAE Address	Based on AAA 802.1X
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-C2-00-00-0E	IEEE Std 802.1AB LLDP	Based on LLDP
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

## SW8: PSE Reset - “Off/PoE Reset”

The switch 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 switch 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. The even ports will drop PoE power when a loss of receive link on F1 is detected and the odd ports will drop PoE power when a loss of receive link on F2 is detected.

## 2) Installing the Switch

### Rack Mounting

Verify the rack is properly grounded to Earth ground. When rack mounting the switch to a 19” standard rack, first attach the two enclosed “L” shaped rack mounting brackets to the chassis using the enclosed screws.

Mount and attach the switch (after the mounting brackets are installed) to the rack using the appropriate rack mounting screws (not provided).

The operating temperature of this equipment is 0 to 50 degrees C, -40 to 60 degrees C or -40 to 75 degrees C depending on the model number. If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack must not exceed the maximum rated temperature for the chassis used.

Installation of the equipment should be such that the air flow in the front and back of the unit is not compromised or restricted

## 3) Apply Power

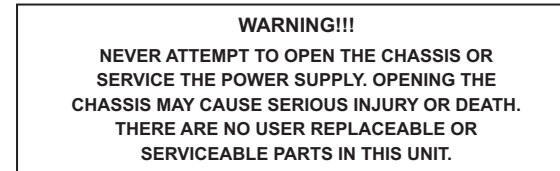
### AC Power

Connect the AC power cord 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*

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



### DC Power

This switch is intended for installation in restricted access areas. (“Les matériels sont destinés à être installés dans des EMBLEMES 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 16 Port PoE+ model requires +46 to +57VDC; 9.38A @ 56VDC max rated power) and the 24 Port PoE+ model requires +46 to +57VDC; 13.86A @ 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*

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

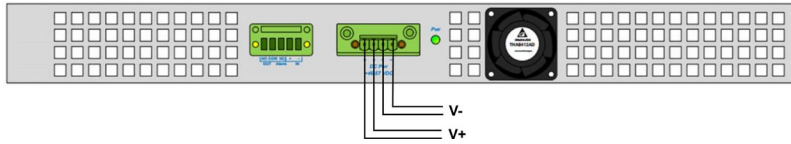
#### **WARNING REGARDING EARTHING GROUND:**

- 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 five conductor insulated wire (not supplied) with 14AWG to 16AWG thickness (16AWG is preferable). 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 all four power cables to the switch (two V+ and two V-) by fastening the stripped ends to the DC power connector.



*DC Models Rear View: Power Connections*

**WARNING:** The positive leads of the power source must be connected to the “+” terminal on the switch and the negative leads of the power source to the “-“ terminal on the switch as shown above.

All four power leads must be used in order to provide the necessary power to the switch.

**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 switch 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.

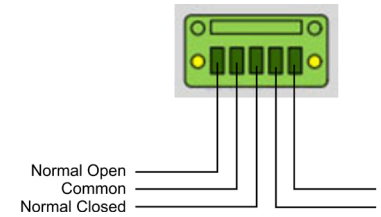
#### 4) Connect Cables

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. When using RJ-45 uplink port models, connect the multi-gigabit/multi-rate RJ-45 Ethernet port using a cable type as specified in the Speciation Table (Cable Type).
- d. Connect the PoE/PoE+ RJ-45 Ethernet 10/100/1000 ports using a Category 5 or better cable to an external PoE/PoE+ PD Ethernet device.
- e. For non PoE/PoE+ RJ-45 ports, connect the 10/00/1000 ports using a Category 5 or better cable to an external Ethernet device.
- f. An alarm relay is available to detect a user configured event. The three contacts closure pins can be configured for normally open (pin 1 and 2) or normally closed (pin 3 and 2) operation. The relay contacts support 110VDC/125VAC Maximum Voltage at a maximum current of 2 amps. Use the supplied connector to attach the wire to the external alarm. Use 16 - 24 AWG wire.

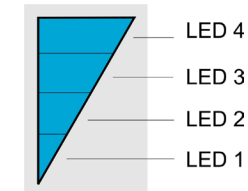


- g. An alarm input is available for detecting external events such as door open or closed (pin 4 and 5). The alarm input provides 3.3VDC @ 2.0ma to detect an external open or shorted condition. Use the supplied connector to attach the wire to the external alarm. Use 16 - 24 AWG wire.

#### 4) Verify Operation

Verify the switch is operational by viewing the LED indicators.

##### PoE Power Indicator



The PoE Power Indicator is a quad stacked LED representing the total amount of power being delivered to the PoE Ports. The approximate percentages are based on the model. The 24 port model provides 720 watts max and the 16 port model provides 480 watts max. This provides a visual indication of the amount of power being delivered and the amount of power remaining.

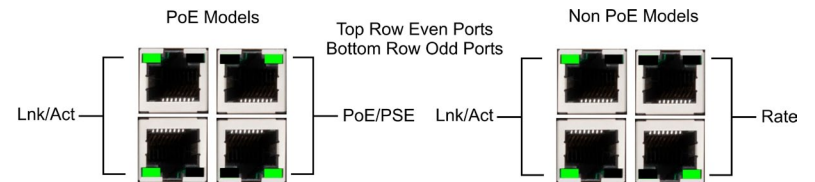
Percentage of Power	LED	24 Port		16 Port	
		Delivered	Remaining	Delivered	Remaining
25%	LED 1	180 watts	540 watts	120 watts	360 watts
50%	LED 1 and 2	360 watts	360 watts	240 watts	240 watts
75%	LED 1, 2 and 3	540 watts	180 watts	360 watts	120 watts

PoE Power Indicator		
PoE Power Indicator	Indicator	Description
LED 4	Green/Amber OFF	Power Consumption less than 75%
	Green - ON	Power Consumption between 75% and 90%
	Green - Blinking	Power Consumption between 90% and 95%
	Amber - Blinking	Power Consumption between 95% and 100%
	Amber - ON	Power Consumption 100% or greater
LED 3	Green - OFF	Power Consumption less than 50%
	Green - ON	Power Consumption greater than 50%
LED 2	Green - OFF	Power Consumption less than 25%
	Green - ON	Power Consumption greater than 25%
LED 1	Green - OFF	Power Consumption less than 0%
	Green - ON	Power Consumption greater than 0%

Power and Fan LED Indicators		
Legend	Indicator	Description
Pwr	OFF	Unit not powered
	Green - ON	Unit powered
Fan 1	OFF	Fan OFF
	Green - ON	Fan ON
	Amber - ON	Fan not operating within specification
Fan 2	OFF	Fan OFF
	Green - ON	Fan ON
	Amber - ON	Fan not operating within specification

Uplink LED Indicators (SFP/SFP+ or RJ-45)		
Legend	Indicator	Description
Link	OFF	Port not linked
	Green - ON	Port linked at the speed indicated by the Rate LED
	Green - Blinking at 10Hz	Port is linked and transmitting or receiving data
	Green Blinking at 1Hz	Port is in redundant standby mode
	Amber Blinking at 1Hz	Port receiving FEF1
Speed/Rate	OFF	Port not linked
	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
	Green Blinking at 1Hz	Port is in redundant standby mode

Multi-Gigabit/Multi-Rate RJ-45 Port LED Indicators		
Legend	Indicator	Description
Link	OFF	Port not linked
	Green - ON	Port linked at the speed indicated by the Rate LED
	Green - Blinking at 10Hz	Port is linked and transmitting or receiving data
	Green - Blinking at 1Hz	Port is in redundant standby mode
Speed/Rate	OFF	Port not linked
	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
	Green - Blinking at 1Hz	Port is in redundant standby mode



RJ-45 PoE/PoE+ User Ports LED Indicators		
Legend	Indicator	Description
Lnk/Act	OFF	No link
	Green - ON	Port linked
	Green - Blinking at 10Hz	Port data activity
PoE/PSE	OFF	Port PSE inactive
	Green - ON	Power being provided
	Amber - ON	Failed PoE negotiation
	Amber - Blinking at 10Hz	Can not supply requested current

RJ-45 User Ports LED Indicators		
Legend	Indicator	Description
Lnk/Act	OFF	No link
	Green - ON	Port linked
	Green - Blinking at 10Hz	Port data activity
Speed/Rate	OFF	No link
	Green - single blink	Port linked at 10M
	Green - two blinks	Port linked at 100M
	Green - three blinks	Port linked at 1G

## Specifications

<b>PoE Modes</b>	IEEE Alternate A (Alt A)	
<b>Frame Size</b>	Up to 10,240 bytes	
<b>Port Types</b>	Copper:	RJ-45 Uplink Ports 100/1000BASE-T, 2.5GBASE-T/5GBASE-T/10GBASE-T RJ-45 User Ports 10/100/1000BASE-T
	SFP/ SFP+:	10GBASE-X Fiber Transceivers, 10GBASE-T Copper Transceivers 1000BASE-X Fiber Transceivers, 1000BASE-T Copper Transceivers 10/100/1000BASE-T SGMII Copper Transceivers
<b>Cable Types</b>	Copper:	RJ-45 User Ports EIA/TIA 568A/B, Cat 5 UTP and higher RJ-45 Uplink Ports 10BASE-T: Cat 3, 4, 5, 5e, 6, 6A 100BASE-TX: Cat 5, 5e, 6, 6A 1G/2.5G: 4-pair Cat 5e, 6, 6A, 7 5G: 4-pair Cat 6, 6A, 7 10G: 4-pair Cat 6A, 7
	Fiber:	Multimode: 50/125, 62.5/125µm Single-mode: 9/125µm
<b>AC Power Requirements</b>	100 - 240VAC/50 - 60Hz 12.8A max at 115VAC, 6.4A max at 230VAC IEC 320 Socket	
<b>DC Power Requirements</b>	16 PoE/PoE+: +46 to +57VDC; 9.38A @ 56VDC 4 Pin Terminal (isolated)	24 PoE/PoE+ RJ-45 Ports: +46 to +57VDC; 13.86A @ 56VDC 4 Pin Terminal (isolated)
	<b>Alarm Contact (Output)</b> 2 form C Relay for Normally Open and Normally Closed Operation 110VDC/125VAC Maximum Voltage, 2A Maximum Current	
<b>Alarm Sensor (Input)</b>	2.0ma @ 3.3VDC Closure Detection	
<b>Dimensions (W x D x H)</b>	17.375" x 14" x 1.75" (441.3 mm x 355.6 mm x 44.45 mm)	
<b>Weight</b>	9.8 lbs. (4899 grams)	10.8 lbs. (4445 grams)
	<b>Operating Temperature</b> Commercial: 0 to 50°C Wide: -40 to 60°C (-20°C AC cold start) Extended: -40 to 75°C Storage: -40 to 80°C	
<b>Humidity</b>	5 to 95% (non-condensing)	
<b>Altitude</b>	-100m to 4,000m (operational)	
<b>MTBF (hours)</b>	AC Model:	36,600 (24-ports); 42,100 (16+8 ports)
	DC Model:	68,500
<b>Warranty</b>	5 year product warranty with 24/7/365 free Technical Support	

<b>Regulatory Compliances (*Pending)</b>	<b>Safety*:</b>	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
	<b>EMC:</b>	EN 55032/24 CE Emissions/Immunity, IEC 61000-6-4 Industrial Emissions, IEC 61000-6-2 Industrial Immunity
	<b>EMI:</b>	CISPR 32, FCC 47 Part 15 Subpart B Class A
	<b>EMS:</b>	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)
	<b>IP Rating:</b>	IP20 Protection
	<b>ACT:</b>	TAA, BAA, NDA

## Customer Support Information

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

Phone: (949) 250-6510

Fax: (949) 250-6514

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38 Tesla

Irvine, CA 92618, USA

Email: support@omnitron-systems.com

URL: www.omnitron-systems.com