LANTRONIX®

SISPM1242-582-LRT

Managed Hardened Multi-Gigabit Ethernet POE++ Switch, (4) 10/100/1000Base-T + (4) 100M/1G/2.5G PoE++ Ports, (2) 1G/10G SFP+ Slots

Install Guide

Part Number 33884
Revision A January 2026

Intellectual Property

Patented: https://www.lantronix.com/legal/patents/; additional patents pending.

Warranty

For details on the Lantronix warranty policy, go to http://www.lantronix.com/support/warranty.

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Revision History

Date	Rev.	Description
January 2026	A	Initial release

Safety Cautions and Warnings

Cautions indicate that there is the possibility of poor equipment performance or potential damage to the equipment. **Warnings** indicate that there is the possibility of injury to person.

Cautions and Warnings appear here and may appear throughout this manual where appropriate. Failure to read and understand the information identified by this symbol could result in poor equipment performance, damage to the equipment, or injury to persons.

 **Caution**: While installing or servicing the power supply module, wear a grounding device and observe all electrostatic discharge precautions. Failure to observe this caution could result in damage to, or failure of the power module.

 **Warning**: Do not connect the power module to an external power source before installing it into the chassis. Failure to observe this warning could result in an electrical shock, even death.

Warning: Equipment grounding is vital to ensure safe operation. The installer must ensure that the power module is properly grounded during and after installation. Failure to observe this warning could result in an electric shock, even death.

Warning: A readily accessible, suitable National Electrical Code (NEC) or local electrical code approved disconnect device and branch-circuit protector must be part of the building's installed wiring to accommodate permanently connected equipment. Failure to observe this warning could result in an electric shock, even death.

Warning: Turn any external power source OFF and ensure that the power module is disconnected from the external power source before performing any maintenance. Failure to observe this warning could result in an electrical shock, even death.

Warning: Ensure that the disconnect device for the external power source is OPEN *(turned OFF)* before disconnecting or connecting the power leads to the power module. Failure to observe this warning could result in an electric shock, even death.

See *Electrical Safety Warnings* on page *34* for electrical safety warnings translated into multiple languages.

Contents

1. Introduction

The SISPM1242-582-LRT is a managed PoE++ switch suitable for connecting and powering devices in hardened environments. It has (4) 10/100/1000 and (4) 100M/1G/2.5G PoE++ ports with (2) 1G/10G dual speed SFP+ slots. The switch can supply up to 90 Watts per port on (4) ports or 45 Watts per port on (8) ports simultaneously.

The switch includes DMS, accessible by local web manager, which provides advanced configuration and management of all IP addressable devices in the network, including a graphical network topology, floor map creator, device map view, traffic monitoring, and network diagnostics for troubleshooting.

Lantronix's hardened switches are certified to operate reliably in harsh environments such as those found on factory floors, outdoor enclosures or other challenging environments.

Ordering Information

SKU	Description
SISPM1242-582-LRT	Hardened PoE++ Switch. (4) 10/100/1000 and (4) 100M/1G/2.5G PoE++ ports with (2) 1G/10G dual speed SFP+ slots; 52V - 57 VDC.
Optional Accessories (sold separately)	
SFPs	See Lantronix SFP webpage. Sold separately.
25160 Power Supply	Industrial Power Supply. Input 90-264 VAC, 127-370 VDC. Output: 48 ~ 55 VDC, 10A, 480 Watts; sold separately.
25104 Power Supply	Industrial Power Supply. Input: 85-264 VAC, 124-370 VDC. Output: 48 ~ 55 VDC, 5A, 240 Watts; sold separately.
PS-DC-DUAL-5624T	PS-DC-DUAL Power Supply; Input: 100-240 VAC; 56VDC + 24V output. Sold separately.
WMBH-01	Wall Mount Bracket; sold separately.
DRBH-01	DIN Rail Bracket, sold separately.
EDCA-DIO-01	Enclosure Door Contact Alarm, security device option, sold separately.
OCA-P181610	18x16x10" Polycarbonate Enclosure; sold separately.
LEVEL Technical Services	Tiered technical support. See LEVEL Technical Services webpage. Sold separately.

Specifications

Category	Description
Standards	• IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.3ae, IEEE 802.3x, IEEE 802.3ad, IEEE 802.1D, IEEE 802.1w, IEEE 802.1s, IEEE 802.1Q, IEEE 802.1p, IEEE 802.1AB, IEEE 802.3af, IEEE 802.3at, IEEE 802.3bt, IEEE 802.3ah, IEEE 802.1ag, IEEE 802.3az, IEEE 1588 v2 • ITU-T Y.1731, ITU-T G.8031, ITU-T G.8032 • IEC62439-2
Network Interface	• Store-and-forward switching architecture • (4) 10/100/1000 Mbps and (4) 100/1G/2.5G RJ-45 ports; (2) 1G/10G SFP slots; (1) Console RJ-45 port • Protocols: CSMA/CD • MAC Address: 16K MAC Address Table

Category	Description
	• Switching Capacity: 68 Gbps
Port Configuration	• Total ports: 10 • RJ45 (10M/100M/1G): 4 • RJ45 (100M/1G/2.5G): 4 • SFP+ (1G/10G): 2 • Console: RJ45 • Ring Management: DIP • DI/DO: 1/1
Hardware Performance	• Forwarding Capacity (Mbps): 50.595 • Switching Capacity: (Gbps): 68 • Mac Table (K): 16 • Jumbo Frames (Bytes): 10240
Internal Web Server	• Customizable with CGI • Web content on local file system and updatable through ftp
Environmental	• Operating temperature: -40° to +75° C (DC input) • Storage temperature: -40° to +85° C • Operating Humidity: 5% to 95%, non-condensing • Ingress Protection: IP30
Power	• Max PoE Budget: 360 Watts • 45 Watts for (8) ports simultaneously • Up to 90 Watts on (4) ports simultaneously • 52 - 57VDC dual inputs Terminal Block
MTBF	• 75℃ @ 58286 hours • 25℃ @ 317,428 hours
Dimensions	Dimensions (WxHxD): 62 x 168 x 130 mm (2.44 x 6.61 x 5.12 inch) Weight: 0.8 kg (1.7 pounds)
Mounting type	DIN rail Wall (optional)
Certifications	FCC Part 15 Class A; CE; NEMA TS-2, UL 2108 Safety: EN62368-1, UL62368-1
Warranty	5 years

Power Consumption

Model	Power	Non-loading (W)	Non-loading (BTU/hr)	PoE Full-loading (W)	PoE Full-loading (BTU/hr)
SISPM1242-582-LRT	DC 44V	12.32	42.01	144.76	493.63
	DC 50V	13.5	46.04	384	1309.44
	DC 52V	14.04	47.88	388.96	1326.35
	DC 57V	14.25	48.59	387.03	1319.77

Software Features

- DMS web manager for advanced configuration and management: graphical monitoring, Find My Switch, traffic monitoring, troubleshooting, Google Maps API Key
- Management: Web Management, SNMP V1/V2c/V3, SSH, CLI
- LCP Trunking: IEEE 802.3ad Link Aggregation Control Protocol (LACP) Trunking and LACP-on-Air
- Multicast: Support IGMP Snooping V1/ V2/V3, MVR, MLD Snooping V1/V2
- Quality of Service: Supports 8 hardware queues; Classification, Rate Limiting, Scheduling
- Security: ACLs (512 entries), Port Security, IP Source Guard, Storm Control, 802.1x, RADIUS, TACACS+, SSH, TLS, Secured Web, DHCP Snooping, Loop Protection
- Spanning Tree: Supports IEEE 802.1s MSTP, IEEE 802.1w RSTP and IEEE 802.1D STP Compliant
- VLAN: Port Based VLAN, IEEE 802.1Q tag-based, up to 4k VLAN entries, QinQ, MAC-based VLAN, Management VLAN, Voice VLANs, and Private VLAN
- Firmware Update through TFTP and HTTP/HTTPs
- IEEE 1588 v2 PTP
- Media Redundancy Protocol (MRP)
- Static Routing, IPv4/IPv6 Unicast
- Dynamic Routing, RIPv1/v2 and OSPFv2/3

PoE Features

- 802.1AB LLDP-MED Configuration
- PoE Configuration
- PoE Scheduling
- Power Delay
- Auto Power Reset
- DHCP per Port
- Always on PoE

About This Manual

This manual describes how to install, initially configure, and troubleshoot the SISPM1242-582-LRT switch.

Related Manuals

- SISPM1242-582-LRT Quick Start Guide, 33883
- SISPM1242-582-LRT Web User Guide, 33885
- SISPM1242-582-LRT CLI Reference, 33886
- Release Notes (version specific)

For Lantronix Documentation, Firmware, App Notes, etc. go to https://www.lantronix.com/technical-support/. Note that this manual provides links to third party web sites for which Lantronix is not responsible.

2. Product Description

Product Views

The SISPM1242-582-LRT front and back panels are shown below.

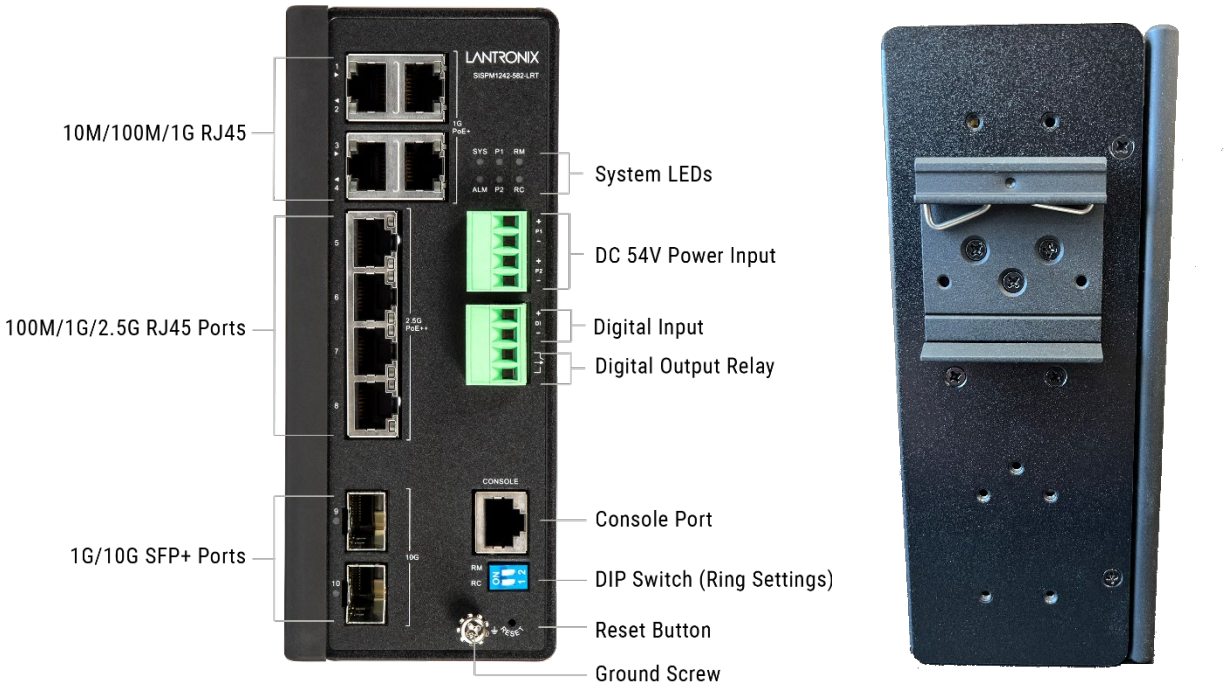


Figure 2-1 SISPM1242-582-LRT Product Views

The SISPM1242-582-LRT back panel provides for mounting the switch in a 19-inch rack or on a wall. See Mounting Instructions for more information.

LED Indicators

The front panel LEDs provide for monitoring switch status. It includes LEDs for the following functions:

- **Power (P1/P2):** indicate if the switch is powered up correctly or not.
- **System (SYS)**: indicates if the system is ready or not ready.
- **Alarm (ALM)**: indicates if the system is normal or not.
- **Ring Master(RM)** and **Rapid Chain (RC)**: indicate if the Rapid Ring is ready or not ready.
- **RJ45 Ports (1-4 1G PoE+, 5-8 2.5G PoE++)**: indicate the status of each RJ45 port.
- **SFP Ports (9-10 1G/10G)**: indicate the status of each SFP port

The following table describes the various LED functions.

LED	Color	State	Description
P1 (power)	Green	On	The switch is powered ON correctly.
		Off	The switch is not receiving power from power 1.
P2 (power)	Green	On	The switch is powered ON correctly.
		Off	The switch is not receiving power from power 2.
SYS (system)	Green	On	The switch is ready.
		Off	The switch is not ready.

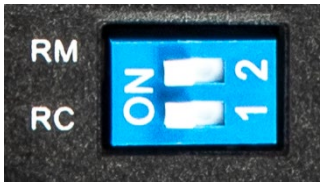
LED	Color	State	Description
ALM (alarm)	Red	On	An abnormal state, such as temperature, voltage or DC power1/2, has been detected in the switch.
		Off	The system state is normal.
RJ45 Ports upper LED	Green	On	The port is enabled and established a link to connected device, and the connection speed is 1000Mbps.
	Green	Blinking	The port is transmitting/receiving packets, and the connection speed is 1000Mbps.
	Amber	On	The port is enabled and established a link to connected device, and the connection speed is 10/100Mbps.
	Amber	Blinking	The port is transmitting/receiving packets, and the connection speed is 10/100Mbps.
	-	Off	The port has no active network cable connected, or it is not established a link to connected device. Otherwise, the port may have been disabled through the switch user interface.
RJ45 Ports lower LED	Green	On	The port is enabled and supplying power to connected device.
	Amber	On	An abnormal state, such as overload status, has been detected in the switch.
	-	Off	The port has no active network cable connected, or it is not connected a PoE PD device. Otherwise, the port may have been disabled through the switch user interface.
SFP Ports	Green	On	The port is enabled and has established a link to the connected device, and the connection speed is 1000Mbps.
	Green	Blinking	The port is transmitting/receiving packets, and the connection speed is 1000Mbps.
	Amber	On	The port is enabled and established a link to connected device, and the connection speed is 100Mbps.
	Amber	Blinking	The port is transmitting/receiving packets, and the connection speed is 100Mbps.
	-	Off	The port has no active network cable connected, or it is not established a link to connected device. Otherwise, the port may have been disabled through the switch user interface.
RM (Ring Master)	Green	On	Ring Master has been detected in the switch.
	Amber	On	Ring Member has been detected in the switch.
	-	Off	Disable
RC (Rapid Chain)	Green	On	Rapid Chain has been detected in the switch (Active path).
	Amber	On	Rapid Chain has been detected in the switch (Backup path).

LED	Color	State	Description
		Blinking	Error: There is no corresponding Rapid Chain switch found.
	-	Off	Disable

DIP Switch for Ring Settings

ERPS (Ethernet Ring Protection Switching) is defined in ITU/T G.8032. It provides fast protection and recovery switching for Ethernet traffic in a ring topology while also ensuring that the Ethernet layer remains loop-free.

The two-position DIP switch is labeled **RC** (1) (Rapid Chain) and **RM** (2) (Ring Master).



The DIP switch lets you manually set ring settings and not have to access the Web UI or the CLI to configure a ring. The table below shows DIP switch settings for Ring Master and Rapid Chain setup via the DIP switch.

RM	RC	Rapid Ring Setting	Ring Port 1	Ring Port 2	RM (Ring Master) LED	RC (Rapid-Chain) LED
Off	Off	Rapid Ring Slave	The maximum odd Port number	The maximum even Port number	Lit Amber	Off
ON	Off	Rapid Ring Master	The maximum odd Port number	The maximum even Port number	Lit Green	Off
Off	ON	Rapid-Chain	The maximum odd Port number	The maximum even Port number	Off	Lit Green (Active Path). Lit Amber (Backup Path)
ON	ON	Rapid Ring settings by Software	--	--	--	--

Reset Button

The hardware Reset button provides the following functions:

- Reset the switch – power off and power on the switch to reload the startup-configuration.
- Restore the switch to factory defaults – power cycle the switch and reload the default-configuration to the switch.

The RESET button is on the front panel beside the ground screw. See *Figure 2-1 SISPM1242-582-LRT Product View*.

The following table describes the Reset button behavior.

Task	Press Reset button for	SYS LED behavior	Port Status LED behavior
Reset the switch	2 ~ 7 seconds	Blinking Green	All LEDs are OFF
Restore to defaults	7 ~ 12 seconds	Blinking Green	All LEDs are ON

3. Installation

This chapter describes the installation procedures.

Package Contents

Carefully unpack the package contents in their final location. Verify that you have received the following items:

- 1x switch with terminal block attached
- 1x DB-9 to RJ-45 console cable
- 1x printed Quick Start Guide
- 1x DIN Rail mounting kit with 3 screws

Contact your sales representative if any parts are missing or damaged.

Caution: The switch is an indoor device. If it is to be used with outdoor devices such as outdoor IP cameras or outdoor Wi-Fi APs, then you are strongly suggested to install a surge protector or surge suppressor to protect the switch.

Compliant with 802.3at in Environment A when using an isolated power supply. For 802.3at Environment B applications, i.e., building to building, copper to copper endpoint connections: 1) use an Ethernet network isolator module (PoE disabled), or 2) use mid-span injector(s) between this switch's PSE port and link partner PD port.

Warning: Safety First: Turn the power off before connecting or disconnecting modules or wires. The correct power supply voltage is listed on the product label. Check the voltage of your power source to make sure that you are using the correct voltage. Do NOT use a voltage greater than what is specified on the product label.

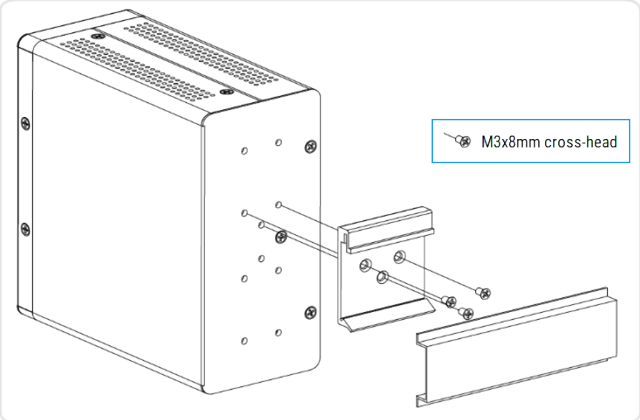
Mounting Instructions

Follow the mounting instructions according to your requirements.

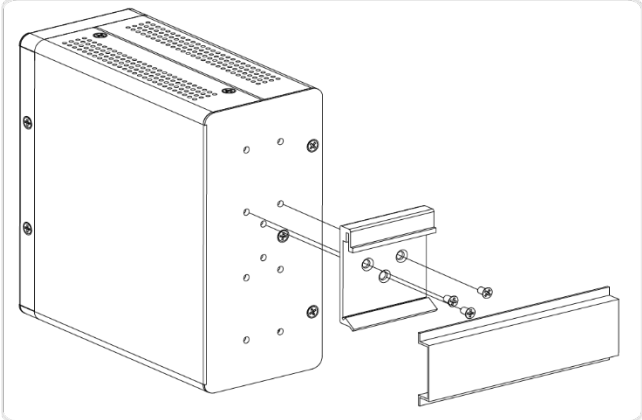
Note that the wall mounting plates must be ordered separately.

Mounting the Switch on a DIN Rail

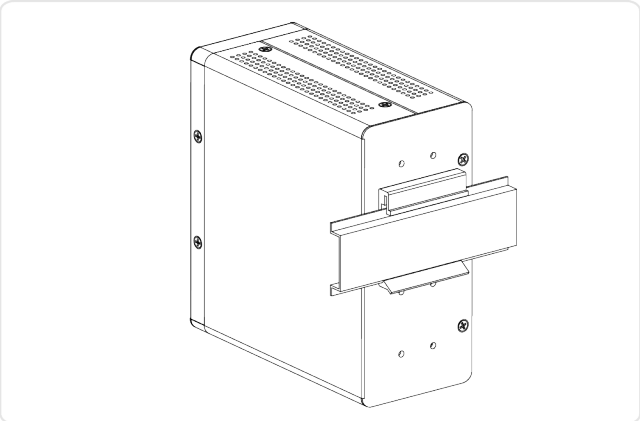
1. Attach the DIN Rail mounting kit to the rear panel of the chassis. Insert three M3x8mm screws and tighten then with a screwdriver to secure the kit.



2. Insert the upper lip of the DIN rail into the DIN-rail mounting kit and press the switch towards the DIN rail until it snaps into place.

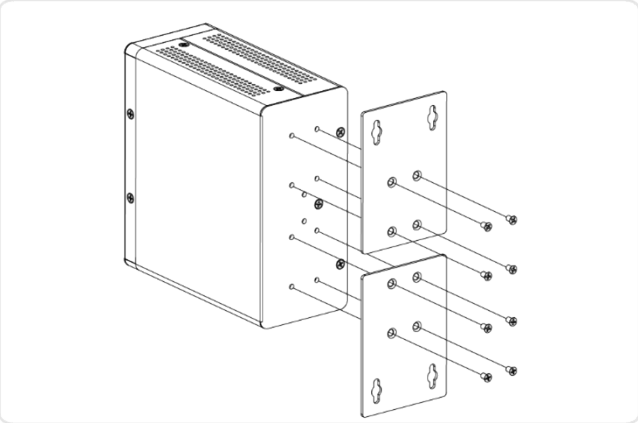


3. Make sure that the switch is attached securely to DIN Rail.

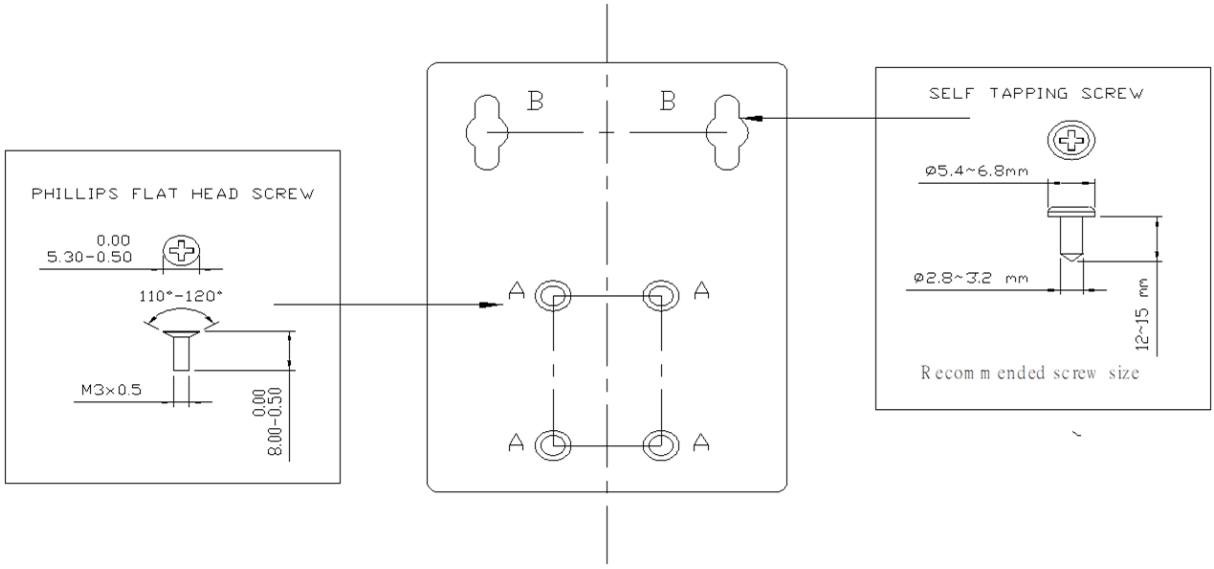


Mounting the Switch on a Wall (Option)

1. Attach the wall mounting plates to rear panel of the chassis. Fasten each wall mount plate to the unit using 4 M3*8mm flat head screws at the holes marked as A in the drawing under step 2. Tighten them with a screwdriver to secure the plates.



2. Install user-supplied screws on the appropriate location on the wall, which will align with the holes marked as B in the drawing below. It's suggested to use self-tapping screws.



3. Make sure that the switch is attached securely to the wall.

Grounding Screw

Carefully read the following warnings and recommendations:

ATTENTION: This case must be earth grounded. No DC input may be earth grounded. Use Isolated Power Supply.

Grounding the Switch helps limit the effects of noise due to electromagnetic interference (EMI) via proper grounding. Always run the ground connection from the ground screw to a grounding surface before connecting the Switch to a power source.

CAUTION: The Switch is intended to be grounded to a well-grounded mounting surface such as a metal plate. Install the grounding wire prior to connecting any other device to the Switch.

CAUTION: Be sure to disconnect the Switch from the power source before installing and wiring the device.

Wiring Recommendations:

- Signal lines must not be directly connected to outdoor wiring.
- Use separate paths or conduits to route wiring for power and device data cables. To avoid interference, wires with different signal characteristics route separately. If power wiring and device data cables must cross, make sure that the wires are perpendicular at the intersection point.
- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is wiring that shares similar electrical characteristics can be bundled together.
- Keep input and output wiring separated.

Power Recommendations:

1. This equipment is to be connected to Power in PoE networks which would be not routing to outside plants.
2. This product is intended to be supplied by a Listed Power Adapter or DC power source, rated 44-57Vdc, 8.55A minimum, Tma = 75 degree C minimum and altitude of operation up to 4000 m minimum. If you need further assistance, please contact Lantronix Technical Support for further information."
3. If using Class I adapter, power cord shall be connected to a socket-outlet with earthing connection.
4. Restricted access location.
5. This product is intended to be mounted to a wall-grounded mounting surface. Use the green-and-yellow cable type min. 18 AWG (-.75 mm^2) for grounding.

Installing SFP Modules

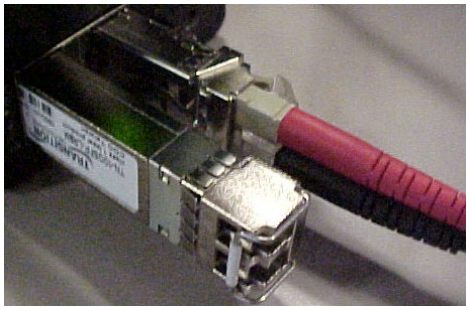
You can install or remove a mini-GBIC SFP module from an SFP port without having to power off the switch.

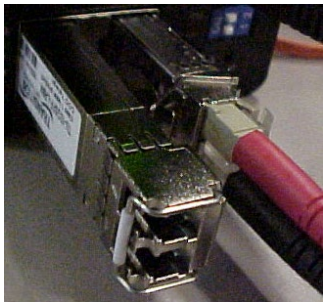
Note: The SFP ports should use UL Listed Optional Transceiver product, Rated 3.3Vdc, Laser Class 1.

See the SFP manual for important information.

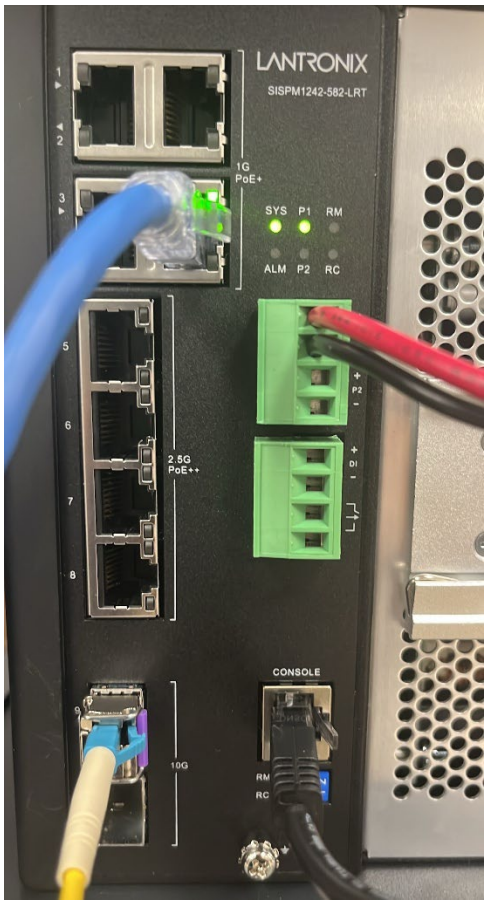
See the Fiber Optic Association for fiber optics standards and certification.

1. Note the proper orientation and insert the module into the SFP port.
2. Press firmly to ensure that the module seats into the connector.

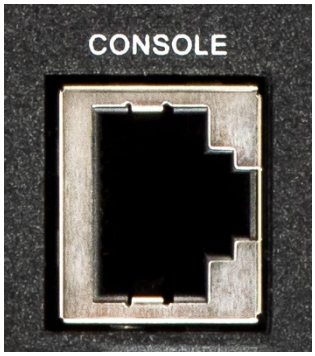




Connecting Devices



All



CONSOLE

RJ-45

Connecting Powered Devices (PDs)

Note that this device does not comply with IEEE 802.3at at 48-51.4 VDC, or with IEE 802.3bt at 48-53.4 VDC. The old device label states 48-57 VDC. The latest device label indicates:

- 802.3af: 48-57VDC
- 802.3at: 52-57VDC
- 802.3bt: 54-57VDC

This device drops ~1.3V from Vin to PSEout. IEEE requires PSEout voltages at the PSE output into the cable:

- 802.3af: 44VDC
- 802.3at: 50VDC
- 802.3bt: 52VDC

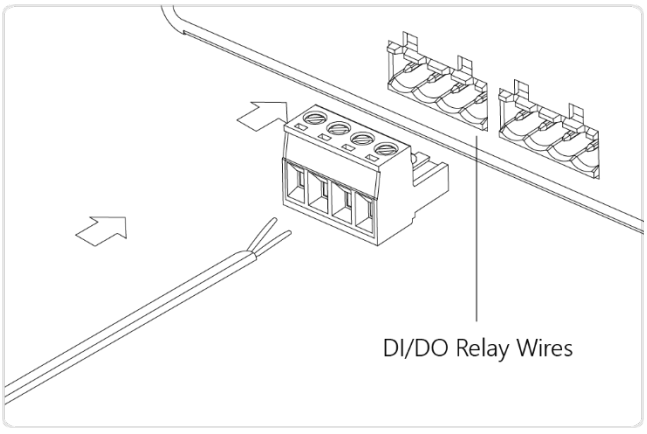
Not meeting this PSEout requirement may cause power up failures or power cycling with devices drawing the maximum power with maximum cable loss.

Caution: PoE device components may fail due to transient voltage spikes on the PoE line. It is strongly suggested that surge suppressors be used on each PoE port, especially in areas with frequent lightning and other types of interference.

Caution: using PoE 'Force' mode to force the switch to send PoE to non-PoE devices can physically damage those devices.

Connecting the DI/DO Relay

1. Insert the negative (ground)/positive DI/DO Relay wires into the **+** and **-** terminals, respectively.
2. To keep the DI/DO Relay wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the Terminal Block connector.
3. Insert the terminal block connector prongs into the terminal block receptor.



Note:

Digital output (relay): 24VDC/1A

Digital input: level 0 (Low) -> 0V to 6V, level 1 (High) -> 10V to 24V

FAULT: The two contacts of the terminal block connector are used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the fault circuit remains closed.

Connecting DC Power Input

For compatible power supply specifications, see Appendix C: Power Supply Specifications.

Power Connection Warning: Connect the power supply to the switch first, and then connect the power supply to power. Otherwise, catastrophic product failure may occur.

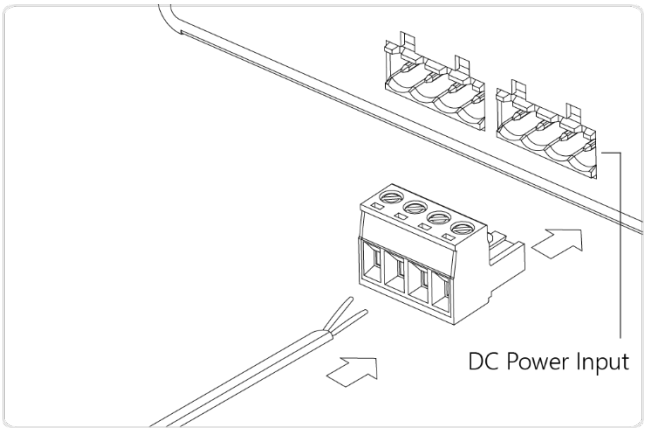
1. Verify that power is off to the DC circuit that you are going to attach to the switch PoE DC-input connector. This can be either of the two power supplies (AC-input or DC-input) or site source DC.

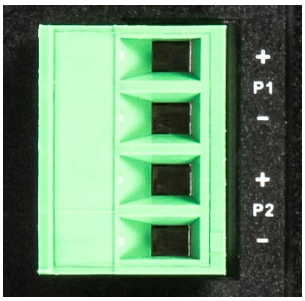
2. As an added precaution, place an appropriate safety flag and lockout device at the source power circuit breaker, or place a piece of adhesive tape over the circuit breaker handle to prevent accidental power restoration while you are working on the circuit.

PoE++ Note: The Meanwell 25160 (and other) power supplies may be shipped set to 48VDC. If you unbox the PS, plug it into the SISPM1242-582-LRT and then connect 60W cameras to the switch, the cameras will not power up by POE. The SISPM1242-582-LRT needs 52-57VDC to power all 8 ports. Use a small Phillips screwdriver to turn up the PS potentiometer to get the VDC up to 52-57VDC. **Note**: Meanwell 25160 power supplies shipped after Sept. 2019 have the default setting changed from 48vdc to 54vdc to provide for additional power required in POE++ environments.

To connect the DC power inputs:

1. Insert the negative/positive DC wires into the **V-** and **V+** terminals, respectively.
2. To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the Terminal Block connector.
3. Insert the Terminal Block connector prongs into the terminal block receptor.
4. Check the **SYS** LED. If it is ON, the power connection is correct.





Power Disconnection: To disconnect power from the switch after a successful boot:

1. Turn off power to the switch.
2. Disconnect the cables.

Wire type: Cu

Only use 28-18 AWG wire size and a torque value of 0.5 N-m.

DC Operating Range: 44 to 57 Vdc

PoE output:

- 44-57Vdc, 0.35-0.27A, per port 15.4W Max., total 123.2W (For input 44-57Vdc)
- 50-57Vdc, 0.6-0.53A, per port 30W Max., total 240W (For input 50-57Vdc)
- 50-57Vdc, 1.2-1.05A, per port 60W Max., total 240W (For input 50-57Vdc)
- 52-57Vdc, 1.15-1.05A, per port 60W Max., total 360W (For input 52-57Vdc)
- 52-57Vdc, 1.73-1.58A, per port 90W Max., total 360W (For input 52-57Vdc)

4. Initial Switch Setup

Default Configuration Settings

- IP address: 192.168.1.77
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.254
- Username: admin
- Password: admin

To prevent unauthorized access, change the default password on first use and periodically.

Serial settings:

- Baud rate=115200bps
- Data bits=8
- Parity=None
- Stop bits=1
- Flow control=none

Initial Switch Setup via Web Browser

After powering up the switch for the first time, you can perform the initial switch configuration using a web browser. To begin the initial configuration stage, you need to reconfigure your PC's IP address and subnet mask to make sure the PC can communicate with the switch. After changing PC's IP address (for example, 192.168.1.250), then you can access the Web interface of the switch using the switch's default IP address and Subnet Mask.

To connect and login using the Web browser:

1. Power up the PC that you will use for the initial configuration. Make sure the PC has the Ethernet RJ45 connector to be connected to the switch via standard Ethernet LAN cable.
2. Reconfigure the PC's IP address and Subnet Mask so that it can communicate with the switch.
3. Power up the switch for its initial configuration and wait until it has finished its start-up processes.
4. Connect the PC to any port on the switch using a standard Ethernet cable and check the port LED on the switch to make sure the link status of the PC's is OK.
5. Run your Web browser on the PC, and enter the factory default IP address, to access the switch's Web interface. If your PC is configured correctly, the Login page of the switch displays.

Web UI login page

- If you do not see the above Login page, perform these steps:
  - Refresh the web page.
  - Check if there is an IP conflict issue.
  - Clear browser cookies and temporary Internet files.
  - Check your PC settings again and repeat step 2.

6. Enter the factory default Username (**admin**) and Password (**admin**) on the Login page (case-sensitive).
7. Click "Login" to log into the switch. The First Time Wizard displays; see the *Web User Guide*.

Initial Switch Setup through the Console Port

The switch can be accessed and configured using a direct serial connection between the switch and your computer and terminal emulation software on your computer. Use a standard serial cable (RJ-45 to DB9). You will need a USB to serial adapter if your computer doesn't have a serial port.

To access the CLI through the console port:

1. Connect the serial cable to the console port (RJ45) on the switch and to the serial port on the computer (DB9) or use a DB9 to USB adapter if your computer lacks a serial port.
2. Use a terminal emulator program such as PuTTY or Tera Term to start a serial session.
3. Select Serial connection type, select the COM port, and enter the speed.
   a. To find out which COM port to select, go to Device Manager > Ports to view the COM ports in use. (Windows)
4. At the terminal window, enter the factory default username (admin) and password (admin).
5. Perform initial switch configuration using the CLI. IP configuration can be done with the commands below:

```
SISGM1040-284-LRT# enable
SISGM1040-284-LRT# configure terminal
SISGM1040-284-LRT(config-if-vlan)# ip address 172.16.100.123 255.255.255.0
SISGM1040-284-LRT(config-if-vlan)# exit
SISGM1040-284-LRT(config)#
```

Access the CLI using an SSH or Telnet Connection

The switch can be remotely accessed and configured through the Command Line Interface (CLI) using SSH or Telnet. Use a terminal emulator program such as PuTTY or Tera Term to establish the connection.

Your computer should have an IP address on the same network as the switch and be able to reach the switch's configured management IP address. SSH or Telnet service must be enabled on your switch. Telnet is disabled by default.

Note: *Telnet is not secure and can expose data to potential eavesdroppers. SSH should be used for more secure communication.*

To access the CLI using SSH or Telnet:

1. Launch the terminal emulator program on your computer .
2. Select SSH or Telnet as the session type.
3. Enter the hostname or IP address of the switch. SSH port = 22, Telnet port = 23.
4. At the terminal window, enter the factory default username (admin) and password (admin).
5. Perform switch configuration using the CLI.

Login to the CLI

Access the CLI through a direct serial connection to the device or using an SSH or Telnet session.
The default username and password are:

- Username: admin
- Password: admin

After you login successfully, the prompt displays as "<sys_name>**#**". The # prompt indicates that you have administrator privilege for setting the managed switch.

If you're logged in as other than the administrator, the prompt displays as "<sys_name>**>**". The > prompt indicates that you have guest privileges and are allowed only a subset of administrator privilege commands. Each CLI command has a particular privilege level.

Example:

```
Username: admin
Password: admin
SM12XPA#
```

You should change the password as soon as possible to prevent unauthorized access.

5. Troubleshooting and Support

General Troubleshooting

Most problems are caused by the following situations. Check for these items first when starting troubleshooting:

1. Make sure your switch model supports the feature or function attempted. See Introduction.
2. Verify the install process. See Installation.
3. Troubleshoot connected network devices to pinpoint the problem to the switch.
4. Connecting to devices that have a fixed full- duplex configuration. Make sure all devices connected to the Switch devices are configured to auto negotiate or are configured to connect at half duplex.
5. Faulty or loose cables. Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.
6. Non-standard cables. Non-standard and mis-wired cables may cause network collisions and other network problems and can seriously impair network performance. Use a new correctly wired cable. A cable tester is a recommended tool for every Ethernet network installation.
7. Improper Network Topologies. Make sure you have a valid network topology. If you no longer experience the problems, the new topology is probably at fault. Also, make sure your network topology contains no data path loops.
8. Check the port configuration. A port on your Switch may not be operating as you expect because it has been put into a “blocking” state by Spanning Tree, GVRP (automatic VLANs), or LACP (automatic trunking). Note that the normal operation of the Spanning Tree, GVRP, and LACP features may put the port in a blocking state. Make sure the port was not configured as disabled via software.
9. SYS LED is Off. Check connections between the switch, the power cord and the wall outlet. Contact Tech Support for assistance. See LED Troubleshooting.
10. Link LED is Off. Verify that the switch and attached device are powered on. Be sure the cable is plugged into the switch and corresponding device. If the switch is installed in a rack, check the connections to the punch-down block and patch panel. Verify that the proper cable type is used, and its length does not exceed specified limits. Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.
11. For PD power up failures or power cycling, verify that the power supply is set to Vout of 57 VDS. See Connecting Powered Devices (PDs).
12. Check the Release Notes for known issues; check the SISPM1242-582-LRT product page for the latest firmware release.
13. Contact Tech Support for assistance.

LED Troubleshooting

The following table provides information for users to easily troubleshoot problems by taking actions based on the suggested solutions within.

Symptom	Possible Cause	Suggested Solutions
SYSTEM LED is Off	The switch is not receiving power.	1. Check if correct power cord is connected firmly to the switch and to the DC outlet socket. 2. Perform power cycling the switch by unplugging and plugging the power cord back into the switch. 3. If the LED is still off, try to plug power cord into different DC outlet socket to make sure correct DC source is supplied.
Port Up Status LED is Off	The port is not connected, or the connection is not working.	1. Check if the cable connector plug is firmly inserted and locked into the port at both the switch and the connected device. 2. Make sure the connected device is up and running correctly. 3. If the symptom still exists, try a different cable or different port, to identify if it is related to the cable or specific port. 4. Check if the port is disabled in the configuration settings via Web user interface.
Port Down Status LED is Off	The port is not supplying power	1. Check if the cable connector plug is firmly inserted and locked into the port at both the switch and the connected device. 2. Make sure the correct Ethernet cables are used. 3. If the symptom still exists, try a different cable or different port, to identify if it is related to the cable or specific port. 4. Check if the port is disabled in the configuration settings via Web user interface.

Recording Device and System Information

After performing the troubleshooting steps, and before calling or emailing Technical Support, please record as much information as possible to help the Tech Support Specialist.

1. Select the **Configuration** > **System** > **Information** menu path. From the CLI, use the **show** commands needed to gather the information below or as requested by the Support Specialist.

2. Model Name: _____ Serial Number: _____

Firmware Version: _____ Power Supply: _____

3. Record the LED Status: _____

_____

_____

4. Provide additional information to your Tech Support Specialist. See the "Troubleshooting" section above.

Your Lantronix service contract number: _____

Describe the failure: _____

_____

_____

Describe any action(s) already taken to resolve the problem (e.g., changing mode, rebooting, etc.): _____

_____

_____

_____

The serial and revision numbers of all involved Lantronix products in the network: _____

_____

_____

_____

Describe your network environment (layout, cable type, etc.): _____

_____

_____

_____

Network load and frame size at the time of trouble (if known): _____

_____

The device history (i.e., have you returned the device before, is this a recurring problem, etc.):

_____

_____

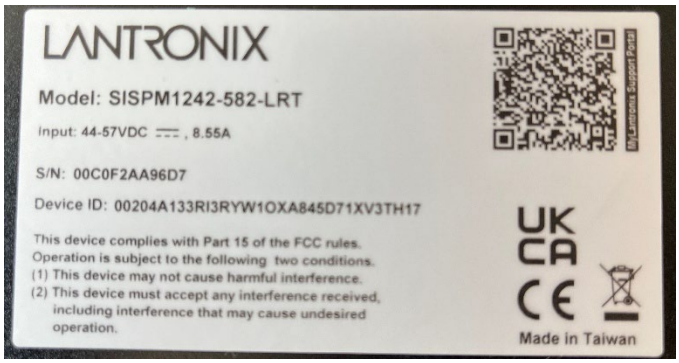
_____

Any previous Return Material Authorization (RMA) numbers:

_____

Product Labels

The device label also provides information you can record to help the Lantronix Tech Support Engineer.



6. Compliance Information TBD

Regional Certifications

TBD

FCC Regulations

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

NDAA, RoHS, REACH, and WEEE Compliance

See https://www.lantronix.com/legal/rohs/

EU Declaration of Conformity (DoC)

pending

UK Declaration of Conformity (DoC)

pending

High Risk Activities Disclaimer

Components, units, or third-party products used in the product described herein are NOT fault-tolerant and are NOT designed, manufactured, or intended for use as on-line control equipment in the following hazardous environments requiring fail-safe controls: the operation of Nuclear Facilities, Aircraft Navigation or Aircraft Communication Systems, Air Traffic Control, Life Support, or Weapons Systems ("High Risk Activities"). Lantronix and its supplier(s) specifically disclaim any expressed or implied warranty of fitness for such High Risk Activities.

Safety Statements

CAUTION: Circuit devices are sensitive to static electricity, which can damage the delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your device:

1. Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.
2. Pick up the device by holding it on the left and right edges only.
3. If you need to use an outdoor device connected to this device with cable, then you must use an arrester on the cable between the outdoor device and this device.

Note: This switch is an indoor device; if it will be used in an outdoor environment or to connect with an outdoor device, then it must use a lightning arrester to protect the switch.

WARNING:

- **Self-demolition of this product is strictly prohibited. Damage caused by self-demolition will be charged for repairing fees. See the US EPA Electronics Donation and Recycling website.**
- **Do not place product outdoors.**
- **Before installation, make sure input power supply and product specifications are compatible.**
- **To reduce the risk of electric shock, disconnect all AC or DC power cord and PS cables to completely remove power from the unit.**
- **Before importing / exporting a configuration verify the firmware version.**
- **After a firmware upgrade, the switch will automatically set the configuration to the latest version.**

Cautions and Warning

Definitions

Cautions indicate that there is the possibility of poor equipment performance or potential damage to the equipment. **Warnings** indicate that there is the possibility of injury to person.

Cautions and Warnings appear here and may appear throughout this manual where appropriate. Failure to read and understand the information identified by this symbol could result in poor equipment performance, damage to the equipment, or injury to persons.

Cautions

While installing or servicing the power module, wear a grounding device and observe all electrostatic discharge precautions. Failure to observe this caution could result in damage to, or failure of the power module.

Warnings

Warning: Do not connect the power module to an external power source before installing it into the chassis. Failure to observe this warning could result in an electrical shock, even death.

WARNING: The power module has a provision for grounding. Equipment grounding is vital to ensure safe operation. The installer must ensure that the power module is properly grounded during and after installation. Failure to observe this warning could result in an electric shock, even death.

WARNING: A readily accessible, suitable National Electrical Code (NEC) or local electrical code approved disconnect device and branch-circuit protector must be part of the building's installed wiring to accommodate permanently connected equipment. Failure to observe this warning could result in an electric shock, even death.

WARNING: Turn the external power source OFF and ensure that the power module is disconnected from the external power source before performing any maintenance. Failure to observe this warning could result in an electrical shock, even death.

WARNING: Ensure that the disconnect device for the external power source is OPEN *(turned OFF)* before disconnecting or connecting the power leads to the power module. Failure to observe this warning could result in an electric shock, even death.

WARNING HOT SURFACE DO NOT TOUCH

See Electrical Safety Warnings below for Electrical Safety Warnings translated into multiple languages.

Electrical Safety Warnings

Electrical Safety	**IMPORTANT**: This equipment must be installed in accordance with safety precautions.
Elektrische Sicherheit	**WICHTIG**: Für die Installation dieses Gerätes ist die Einhaltung von Sicherheitsvorkehrungen erforderlich.
Elektrisk sikkerhed	**VIGTIGT**: Dette udstyr skal installeres i overensstemmelse med sikkerhedsadvarslerne.
Elektrische veiligheid	**BELANGRIJK**: Dit apparaat moet in overeenstemming met de veiligheidsvoorschriften worden geïnstalleerd.
Sécurité électrique	**IMPORTANT**: Cet équipement doit être utilisé conformément aux instructions de sécurité.
Sähköturvallisuus	**TÄRKEÄÄ**: Tämä laite on asennettava turvaohjeiden mukaisesti.
Sicurezza elettrica	**IMPORTANTE**: questa apparecchiatura deve essere installata rispettando le norme di sicurezza.
Elektrisk sikkerhet	**VIKTIG**: Dette utstyret skal installeres i samsvar med sikkerhetsregler.
Segurança eléctrica	**IMPORTANTE**: Este equipamento tem que ser instalado segundo as medidas de precaução de segurança.
Seguridad eléctrica	**IMPORTANTE**: La instalación de este equipo deberá llevarse a cabo cumpliendo con las precauciones de seguridad.
Elsäkerhet	**OBS!** Alla nödvändiga försiktighetsåtgärder måste vidtas när denna utrustning används.

Appendix A. PoE Modes and Compliance

PoE History

PoE first emerged to solve the problem of powering Voice over Internet Protocol (VoIP) phones. PoE gained momentum in 2001 and 2002, when WAP makers, and other manufacturers took advantage of the technique. IEEE 802.3af can use a single standard RJ45 connector and CAT 5 (or even CAT 3) cable.

PoE+ (PoE Plus) provides extended support for new end devices with higher power requirements. The IEE 802.3at standard provides up to 30 W of power to include newer end devices such as IEEE 802.11n wireless access points, surveillance cameras, etc.

PoE++ (IEEE 802.3bt): As manufacturers continued to advance the use of PoE, another option became available for PoE with greater output. PoE++ delivers up to 60 watts of power using the 802.3bt standard. PoE++ is delivered using the simultaneous transmission of Mode A and Mode B. PoE++ is ideal for IP surveillance cameras that require more throughput or a various other equipment such as LCD displays, computer workstations, and biomedical equipment. Min. cable type Cat5e; recommend Cat 6A cabling.

PoE Standards Comparison

Property	802.3af PoE (Type 1)	802.3at PoE+ (Type 2)	802.3bt Type 3	802.3bt Type 4
Power Available at PD	Up to 12.95 W	Up to 25.50 W	51 W	71 W
Max. Power from PSE	15.40 W	30.0 W	60 W	100 W
Voltage Range (at PSE)	44.0 – 57.0 V	50.0 – 57.0 V	50.0 – 57.0 V	52.5 – 57.0 V
Voltage Range (at PD)	37.0 – 57.0 V	42.5 – 57.0 V	42.5 – 57.0 V	41.1 – 57.0 V
Max. current	350 mA	600 mA per mode	1200 mA	1371 mA
Max. cable resistance	20 ohms (Cat 3)	12.5 ohms (Cat 5)	6.25 ohms	6.25 ohms
Power management	3 power class levels negotiated by signature	4 power class levels negotiated by signature or 0.1 W steps negotiated by LLDP	3 power class levels negotiated by signature or 0.1 W steps negotiated by LLDP	0.1 W steps negotiated by LLDP
Supported cabling	Cat 3 and Cat 5	Cat 5	Cat 5e	Cat5e or Cat 6; Cat 6A recommended
Supported modes	Mode A (endspan), Mode B (midspan)	Mode A, Mode B	Mode A, Mode B, 4-pair mode	4-pair mode
Classes	2 pairs class 1-2	2 pairs class 3-4	4 pairs class 5-6	4 pairs class 7-8

PoE Type 1 : Also known as PoE, 2-pair PoE. Related standard: IEEE 802.3af. Maximum power to port: 15.4W. PoE Type 1 utilizes two pairs to connect many types of lower-powered devices to the network. Based on the initial IEEE 802.3af-2003 standard, it provides up to 15.4W of DC power to each PoE port (up to 12.95W of power for each device). PoE Type 1 can support devices such as VoIP phones, sensors/meters, wireless access points with two antennas and simple, static surveillance cameras (no pan, tilt or zoom).

PoE+ Type 2 : Also known as PoE+, PoE Plus. Related standard: IEEE 802.3at. Maximum power to port: 30W. Higher-powered devices are connected to the network using PoE Type 2, based on the IEEE 802.3at-2009 standard. It is backward compatible (supports PoE Type 1 devices) and provides 30W of DC power to each PoE port (up to 25.5W of power for each device). PoE Type 2 can support devices such as more complex surveillance cameras that pan, tilt or zoom, as well as wireless access points with six antennas, LCD displays, biometric sensors, and tablets.

802.3bt Type 3 : Also known as 4-pair PoE, 4P PoE, PoE++, UPOE. Related standard: IEEE 802.3bt. Maximum power to port: 60W. PoE Type 3 uses all four pairs in a copper cable. Currently in development with IEEE 802.3bt Type 3 Work Group, it is projected to be ratified in early 2017. It provides 60W of DC power to each PoE port (up to 51W of power for each device). PoE Type 3 can support devices such as videoconferencing system components and building management devices.

802.3bt Type 4: Also known as higher-power PoE. Related standard: IEEE 802.3bt. Maximum power to port: 100W. Growing power requirements of network devices are pushing the need for higher power delivered through network cabling – which is where PoE Type 4 comes into play. It provides up to 100W of DC power to each PoE port (up to 71W of power for each device). PoE Type 4 can support devices such as laptops and TVs.

PoE Classes

PoE Classification is where the PSE detects the PD's power requirements by using Physical Layer Classification or LLDP. The IEEE 802.3bt draft standard specifies mutual identification to address four-pair operation. Additional clauses were added, defining the following:

Class	PSE Output Power[W]	PD Input Power[W]	PD Type	Standard
0	15.4	12.95	1	IEEE 802.3af
1	4	3.84	1	
2	7	6.49	1	
3	15.4	12.95	1	
4	30	25.5	2	IEEE 802.3at
5	45	40	3	IEEE 802.3bt
6	60	51	3	
7	75	62	4	
8	90	73	4	

PoE Deployment Environments A and B

IEEE802.3at-2009 defines two deployment environments in section 33.4.1:

Environment A: when both PSE and PD are located indoors, inside the same building. In this environment, there has to be electrical isolation between the PoE circuitry and the data circuitry inside a PSE. Multi-port PSE's can all

share the same ground isolation. Environment A is therefore an *indoor PSE – indoor PD* environment (a.k.a. *indoor/indoor*).

Environment B: when the PSE and PD are not located in the same building. In this environment there needs to be electrical isolation between PoE and data, as well as between every port in a multi-port PSE. This isolation between ports requirement de facto determines a completely separate power supply per port, which makes multi-port PSE's for outdoor PD deployment impractical. Environment B is therefore an *indoor PSE - outdoor PD* (a.k.a. *indoor/outdoor*) or outdoor PSE-outdoor PD (a.k.a. outdoor/outdoor) environment.

This means only single-port PSE's should normally be used when PD's are deployed outdoors. In summary, the PD-PSE environment is one of these three combinations:

1. PoE Source is indoor, PD is indoor (Env. A)
2. PoE Source is indoor, PD is outdoor (Env. B)
3. PoE Source is outdoor, PD is outdoor (Env. B)

Option 3 is the most challenging environment since both the PD and PSE are installed outdoors. **Caution**: The switch is an indoor device. If it is to be used with outdoor devices such as outdoor IP cameras or outdoor Wi-Fi APs, then you are strongly suggested to install a surge protector or surge suppressor in order to protect the switch. The switch is compliant with 802.3at in Environment A when using an isolated power supply. For 802.3at Environment B applications, i.e. building to building, copper to copper endpoint connections: 1) use an Ethernet network isolator module (PoE disabled), or 2) use mid-span injector(s) between this switch's PSE port and link partner PD port.

Mode A vs. Mode B

Alternative A, also known as Mode A, uses the data pairs of an Ethernet link to deliver power. Data Pairs include pins 1,2 and 3,6. PSEs using Mode A supply a positive voltage to pins 1 and 2. Alternative B, also known as Mode B, uses the spare pairs to deliver power. Spare Pairs include pins 4,5 and 7,8.

802.3af/at Standard "compliant" vs "compatible" PDs

Knowing the difference between PoE "compliant" devices and "compatible" devices can help avoid interoperability and connectivity issues. Compliant and compatible PoE devices are not held to the same 802.3af/at standard:

- 802.3af/at "compliant" PDs fulfill the IEEE strict requirement to support both Mode A and Mode B power modes.
- 802.3af/at "compatible" PDs typically can provide power using only Mode B.

Typical PD Power Requirements

- 1.8 Watts: Lantronix M/GE-ISW-SFP-01-PD (Class 1 Powered Device (0.44 Watts - 3.84 Watts).
- 13W: IP Camera, VoIP Phone, Wireless Access Point, Networked Audio.
- 30W: IP Telephone, WiMAX Access Point, PTZ Camera, Remote Computer Terminal.
- 60W : Door Access System, Video Phone, Thin Client.
- 100W: Digital Signage Display, Point-of-Sale System, LCD TV, Computer Monitor.
- 200W: Larger TV, Larger Display, Larger Monitor, Laptop.

After eliminating basic network factors, ask your PD vendor for the PD's power supply mode and polarities supported and exact power consumption.

Calculate PoE Power Budget

To calculate how many 802.3at devices the unit supports, divide the Total PoE Budget (130 Watts) by 30 Watts.

To calculate the maximum number of 802.3af devices, divide the Total PoE Budget (130 Watts) by 15.4 Watts.

Mixing POE and Non-POE Devices

You can mix POE and non-POE devices on the same POE switch (i.e., you can put PCs on the same POE switch as a SIP phone or a VOIP phone). The PSE (your switch) will only send power if requested by the PD.

Ethernet and PoE Intra-Building Cabling Warnings

1. Ethernet cables are intended for intrabuilding use only. Connecting your switch directly to Ethernet cables that run outside the building in which the switch is housed will void the user's warranty and could create a fire or shock hazard.
2. PoE cables are intended for intrabuilding use only. Connecting your switch directly to PoE cables that run outside the building in which the switch is housed will void the user's warranty and could create a fire or shock hazard.
3. For outdoor PoE applications, we recommend using Lantronix SI-IES-1200-LRT Unmanaged Hardened PoE+ Injector or SI-IES-111D-LRT Unmanaged Hardened PoE+ Injector/Converter Use of any other PoE injector will void the user's warranty and could create a fire or shock hazard.

Legacy PD Detection / Capacitor Detection

Legacy PDs refers to powered devices manufactured before the IEEE standard was finalized and do not have the expected PD signature required by the PSE's detection signal. Such PDs usually feature large capacitance as the detection signature that does not completely comply with the 802.3af specs. By enabling this option, the switch will probe for legacy PDs and if a legacy PD is detected, the switch will provide power to the PD.

PoE++ Connectivity, Arcing, and Temperature Issues

- PoE is not live until powered device (PD) and powered sourcing equipment (PSE) handshake.
- When unplugging live PoE, an arc (or spark) occurs between plug and jack contacts.
- Arcing occurs with ALL mated PoE connections.
- Ensure jack meets IEC 60512-99-001 for compliance.
- Ambient jack temperature must be 5 deg. C below maximum jack operating temperature. To operate in 60 deg. C ambient, you need a 65 deg. C rated jack.

See the BICSI webpage for your particular type of PoE (e.g., for PoE++). See the ANSI/NECA/BICSI 568-2006 Standard for Installing Commercial Building Telecommunications Cabling. ANSII/NECA/BICSI 568 describes minimum requirements and procedures for installing the infrastructure for telecoms, including balanced twisted-pair copper cabling and optical fiber cabling that transport telecommunications signals (e.g., voice, data, and video). The 2008 NEC standard is a safety code widely adopted in the USA as minimum required safety rules for

the electrical industry. The 2008 NEC points to the ANSII/NECA/BICSI 568 standard as a best practices source document.

PoE/PoE+/PoE++ Comparison Chart

The table below compares the three types of PoE supported.

Type	Standards	Max. Current	Twisted pairs used	Power at Source	Power at Device	Max. Data Rate	Standard Ratified
PoE	IEEE 802.3af (802.3at Type 1)	350 mA	2 pairs	15.4 W	13 W	1000Base-T	2003
PoE+	802.3at Type 2	600 mA	2 pairs	30 W	25.5 W	1000Base-T	2009
PoE++	Proposed IEEE 802.3bt Type 3 / Proposed IEEE 802.3bt Type 4	600 mA / 900 mA	4 pairs	60 W / 90 W	51 W / 71.3 W	10GBase-T	Coming in 2018

Notes from Draft Standard for Ethernet Amendment 2: PoE over 4 Pairs (IEEE 802.3bt)

See IEEE 802.3, Clause 145. IEEE Draft and approved standards are copyrighted by IEEE under U.S. and international copyright laws.

Amendment 2 – This amendment includes changes to IEEE Std. 802.3-2018 and adds Clause 145, Annex 145A, and Annex 145B. This amendment adds power delivery using all four pairs in the structured wiring plan, resulting in greater power being available to end devices and adds a mechanism to better manage the available power budget.

1.4.491a Type 3 PD: A single-signature PD that requests Class 1 to Class 6, or a dual-signature PD that requests Class 1 to Class 4 on both Modes, during Physical Layer classification. Additionally, the PD implements Multiple-Event classification and accepts power on both Modes simultaneously.

1.4.491b Type 3 PSE: A PSE that supports up to Class 6 power levels, supports short MPs, and may support 4-pair power.

1.4.491c Type 4 PD: A single-signature PD that requests Class 7 or Class 8, or dual-signature PD that requests Class 5 on at least one Mode, during Physical Layer classification. Additionally, the PD implements Multiple-Event classification, is capable of Data Link Layer classification, and accepts power on both Modes simultaneously.

1.4.491d Type 4 PSE: A PSE that supports at least Class 7 power levels, in addition to lower PD Classes, short MPs, and 4-pair power.

IEEE 802.3bt Power Input Ripple and Noise Specification

f< 500 Hz	V_{Noise}	V_{pp}	0.5
500 Hz to 150 kHz			0.2

150 kHz to 500 kHz			0.15
500 kHz to 1 MHz			0.1

Term Definitions

From Draft Standard for Ethernet Amendment 2: Power over Ethernet over 4 Pairs (IEEE 802.3bt) (See IEEE 802.3, Clause 145.)

Ampacity: the maximum current, in ampere, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

Dual-signature PD: A PD that has independent detection signatures, class signatures, and maintains power signatures on each pairset.

Link section: the portion of the link between the PSE Power Interface (PI) and the PD PI.

Pairset: Either of two valid 4-conductor connections, Alternative A or Alternative B, as listed in IEEE 802.3, 145.2.4. The PSE Alternative A and Alternative B connections are referred to as Mode A and Mode B, respectively, at the PD.

Power Sourcing Equipment (PSE): A DTE or midspan device that provides power to a single link section which may also carry data.

Single-signature PD: A PD that simultaneously shares the same detection signature, class signature, and maintains power signature between both pairsets.

Type 1 PD: A PD that requests Class 0 to Class 3 during Physical Layer classification and that is not a PoDL PD.

Type 1 PSE: A PSE that supports Class 0 to Class 3 power levels and provides power over 2 pairs.

Type 2 PD: A PD that requests Class 4 during Physical Layer classification, supports 2-Event Classification, and supports Data Link Layer classification.

Type 2 PSE: A PSE that supports Class 0 to Class 4 power levels and provides power over 2 pairs.

Type 3 PD: A single-signature PD that requests Class 1 to Class 6, or a dual-signature PD that requests Class 1 to Class 4 on both Modes, during Physical Layer classification. Additionally, the PD implements Multiple-Event classification and accepts power on both Modes simultaneously.

Type 3 PSE: A PSE that supports up to Class 6 power levels, supports short MPs, and may support 4-pair power.

Type 4 PD: A single-signature PD that requests Class 7 or Class 8, or a dual-signature PD that requests Class 5 on at least one Mode during Physical Layer classification. Additionally, the PD implements Multiple-Event classification, is capable of Data Link Layer classification, and accepts power on both Modes simultaneously.

Type 4 PSE: A PSE that supports at least Class 7 power levels, in addition to lower PD Classes, short MPS, and 4-pair power.

General Safety

All equipment subject to this clause shall conform to IEC 60950-1 or IEC 62368-1. In particular, the PSE shall be classified as a Limited Power Source in accordance with IEC 60950-1 or IEC 62368-1 Annex Q.

Equipment shall comply with all applicable local and national codes related to safety.

Network Safety

This subclause sets forth several recommendations and guidelines related to safety concerns. The list is neither complete nor does it address all possible safety issues. The designer is urged to consult the relevant local, national, and international safety regulations to verify compliance with the appropriate requirements. LAN cabling systems described in this clause are subject to at least four direct electrical safety hazards during their installation and use. These hazards are as follows:

a) Direct contact between LAN components and power, lighting, or communications circuits.

b) Static charge buildup on LAN cabling and components.

c) High-energy transients coupled onto the LAN cabling system.

d) Voltage potential differences between safety grounds to which various LAN components are connected.

Such safety hazards should be avoided or appropriately protected against for proper network installation and performance. In addition to provisions for proper handling of these conditions in an operational system, special measures should be taken to verify that the intended safety features are not negated during installation of a new network or during modification of an existing network.

Patch Panel Considerations

It is possible that the current carrying capability of a cabling cross-connect may be exceeded by a PSE. The designer should consult the manufacturer's specifications to verify compliance with the appropriate requirements.

Electromagnetic Emissions

The PD and PSE powered cabling link shall comply with applicable local and national codes for the limitation of electromagnetic interference.

Temperature and Humidity

The PD and PSE powered cabling link segment is expected to operate over a reasonable range of environmental conditions related to temperature, humidity, and physical handling. Specific requirements and values for these parameters are beyond the scope of the standard.

Labeling

From Approved Draft Standard for Ethernet Amendment 2: Power over Ethernet over 4 Pairs (**IEEE 802.3bt**):

It is recommended that the PSE or PD (and supporting documentation) be labeled in a manner visible to the user with at least the following parameters:

a) Power classification and power level in terms of maximum current drain over the operating voltage range, 36 V to 57 V, *applies for PD only*.

b) Port type (e.g., 100BASE-TX, TIA Category, or ISO Class).

c) Any applicable safety warnings.

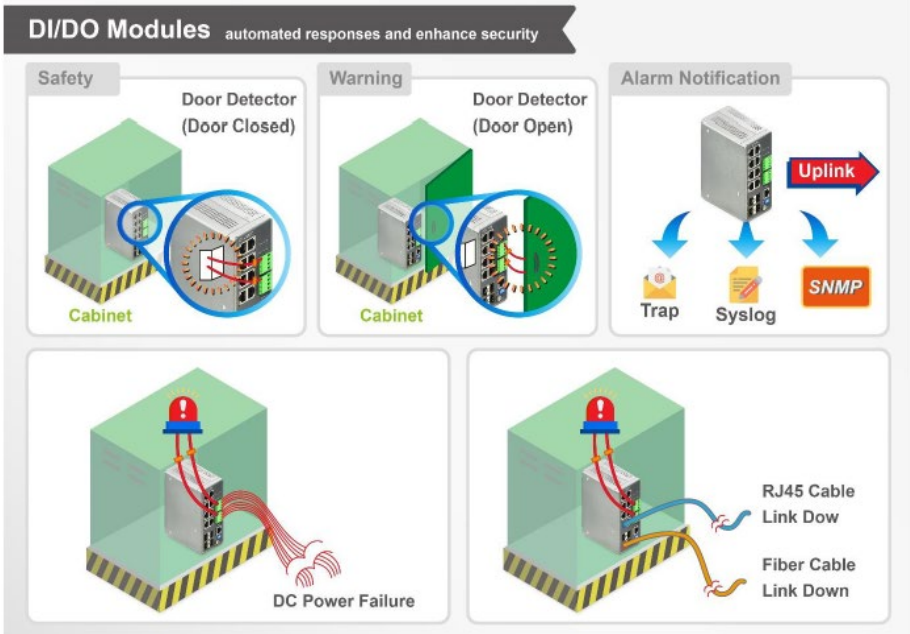
d) "PSE" or "PD" as appropriate.

e) Indicate "single-signature PD" or "dual--signature PD" as appropriate.

f) Type (e.g., "Type 3" or "Type 4").

Appendix B. Digital Input and Digital Output Use Case

The switch supports Digital Input and Digital Output. The Digital Input enables the switch to detect and log external device status (such as door intrusion detector). The Digital Output could be used to tell administrators if the switch port shows link down, link up or power failure.



Digital Output (relay): 24VDC/1A

Digital Input:

- Level 0 (Low): 0V to 6V
- Level 1 (High): 10V to 24V

DI: Use for receiving external signal and trigger DO. You may set the voltage input as high or low as DI normal, when DI stays in normal (assume it's set as low), then DO will not respond. But the voltage input change to high, DI will show high/ abnormal and at the same time, DO will automatically switch to "abnormal" and send a signal to connected devices, switch will have system recorded.

For example, a water level application:

Setting: low water level: DI normal. High water level: DI abnormal, DIO connected to external alarm notification.

DI will show "normal" when the water level is low. DI will not send signal to DO.

DI will show "abnormal" when sensor senses high water level and will send signal to DO at the same time. DO will turn to abnormal and send signal to external alarm notification to trigger the alarm LED.

DI is used for connecting external alarm devices and once it is triggered the switch can send the trap. An external alarm device (for example: power supply, IP camera) can activate this input pin.

Level 0 (Low): 0V to 6V

Level 1 (High): 10V to 24V

For DO, it's similar but the switch is the alarm device; when the switch has temperature or voltage alarm, it will trigger the digital output (24V/1A) to the external device such as a contact relay.

Appendix C. Power Supply Specifications

Power Supplies are sold and packaged separately.

480W DIN Rail Power Supply (25160)

Part number: 25160; see the 25160 webpage for product details.

- Rated Power: 480W
- Input 90 – 264VAC or 127 – 370VDC
- Output 48 – 55V
- Operating temp. – 25 - +70◦C
- Description : AC-DC Industrial DIN rail power supply; Output 48Vdc at 10A; Metal casing; Ultra slim width 85.5mm
- Net weight (grams) : 1820
- Format : DIN rail
- Application : Installation UL 508; ITE EN/UL/IEC 60950
- Output Power (W) : 480
- Output Voltage (V) : 48
- Output Current (A) : 10
- Input Voltage (V) : 90-264V; Universal Input 110/230V
- IP Rating : No IP
- Format : DIN rail
- Control Signals : DC OK
- Dimming Technology : No Dimming

DC OK Relay Contact

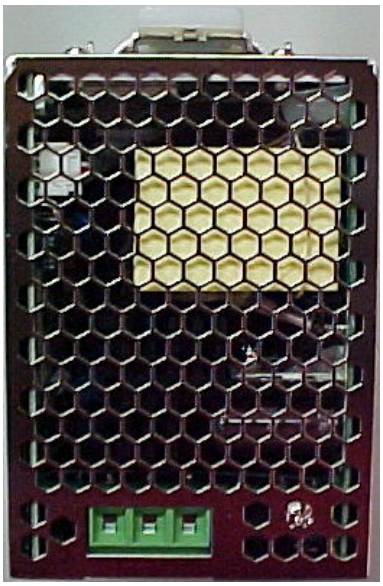
- Contact Closed : PSU turns on / DC OK.
- Contact Open : PSU turns off / DC Fail.
- Contact Ratings (max.) 30V/1A resistive load.

Power Supply Views (25160)

Front:

Back:

Top: 

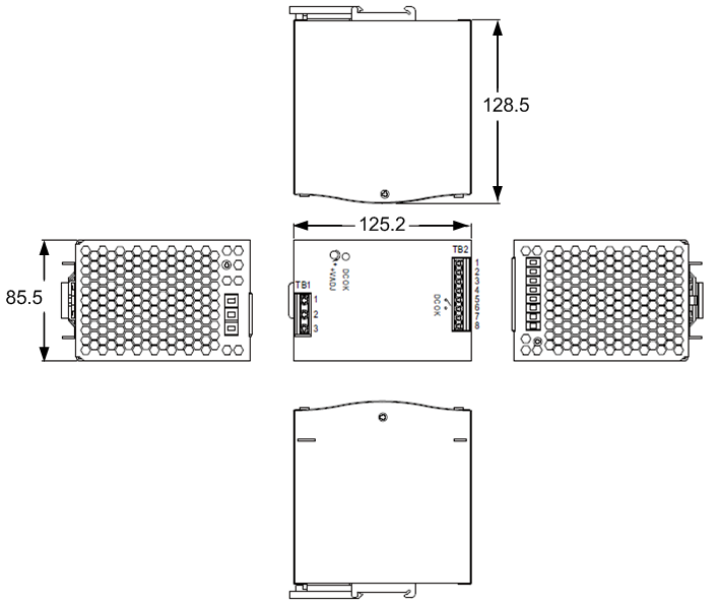
Bottom: 

Power Supply Dimensions (25160)

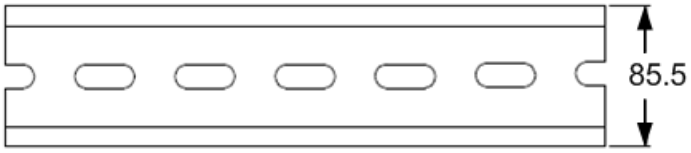
Width : 85.5 mm (3.36 in.)

Height : 125.2 mm (4.92 in.)

Depth : 128.5 mm (5.05 in.)



ADMISSIBLE DIN-RAIL: TS35/7.5 OR TS35/15



Power Supply Pin Descriptions (25160)

Terminal Pin No. Assignment (TB1)

Pin No.	Assignment
1	FG ⏚
2	AC/N
3	AC/L

Terminal Pin No. Assignment (TB2)

Pin No.	Assignment
1,2	DC OUTPUT +V
3,4	DC OUTPUT -V
5,6	Relay Contact
7,8	NC

DC OK Relay Contact

Contact Close	PSU turns on / DC OK.
Contact Open	PSU turns off / DC Fail.
Contact Ratings (max.)	30V/1A resistive load.

240W Din Rail Power Supply (25104)

Part number: 25104. See the 25104 webpage for product details.

Input: 85-264 VAC, 124-370 VDC

Output: 48 ~ 55 VDC, 5A, 240 Watts

Power Supply Features (25104)

94% High Efficiency

150% Peak Load

Protected against: Short Circuit, Overload, Over Voltage, and Overheating.

Convection air cooling

DIN rail mountable

UL 508 approved

Full load burn in test

RoHS compliant

MTBF 169.3 Khrs

Power Supply Specifications (25104)

Power Output:

Output Voltage 48VDC

Current Rating 5A

Power Rating 240 Watts

Ripple & Noise Max 120mVp-p

Voltage Range 48~55VDC

Voltage Tolerance ±1.0%

Line Regulation ±0.5%

Load Regulation ±1.0%

Setup, Rise Time 300ms, 60ms

Hold Up Time 20ms

Protection:

Overload 105~160%

Overvoltage 56~65V

Dimensions:

Width: 2.48” [63 mm]

Depth: 5.26” [113.5 mm]

Height: 4.93” [125.2 mm]

Environment:

Operating Temp: -25°C to +60°C

Storage Temp: -40°C to +85°C

Humidity: 20% to 95% (non-condensing)

Power Input:

Voltage Range Switch Selectable

88~132VAC

124~370VDC

Frequency Range 47~63Hz

Efficiency 94%

AC Current (Typical) 2.6A@115VAC

1.3A@230VAC

Inrush Current (Cold) 33A@115VAC

65A@230VAC

Weight:

2.27 lbs. [1.03 kg]

Compliance:

Safety: UL508, TUV EN60950-1, IEC60068-2-6 (Vibration) EMC Emission: EN55022, CISPR22 Class B, EN61000-3-2, EN61000-3-3; EMC Immunity: EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN55024, EN61000-6-2, EN50082-2, EN61204-3, SEMI F47, GL Approved, UKCA

Warranty

Lifetime

PS-DC-DUAL-5624 Power Supply

Compact, stand-alone or DIN Rail mountable power supply designed to offer dual DC power output in extended temperature environments.

Ordering Information

PS-DC-DUAL-5624T: 345 Watt Isolated Power Supply with 56VDC and 24VDC dual output.

Features

- Dual Output: 315W at 56VDC and 30W at 24VDC or 12VDC, Terminal Block Connectors
- Maximum output: 345 Watts
- Full compliance with IEEE 2250VDC PoE isolation requirements
- Active fan speed control based on temperature
- Front panel LED to indicate the status of power supply, fan faults and temperature
- 2-Pin alarm DC relay output with 5 event monitoring:
  - Fan tachometer monitoring for low speed or lock conditions
  - Over or under temperature
  - 12/24V output out of spec

Output 1	Voltage 56V (terminal block)	
	Regulation	+/- 2%
	Current Rating	5.7A
	Power Rating	315W
Output 2	Voltage 24V (terminal block) (5624T), 12V (terminal block) (5612T)	
	Regulation	+/- 5%
	Current Rating	1.25A
	Power Rating	30W

Input Voltage Range	100-240VAC, with externally accessible fuse
Input Frequency Range	47 - 63 HZ
Power Consumption	4A at 120 VAC (typical)
Dimensions	Width: 6.25” [159 mm] x Depth: 6.45” [164 mm] x Height: 1.75” [44 mm]
Weight	1.8 lbs. [0.82 kg]
MTBF	623,377 hrs
Operating Temp.	-20°C to +70°C (restricted); -20°C to +50°C (unrestricted)
Storage Temp.	-30°C to +70°C
Operating Humidity	5% to 95% (non-condensing)
Certifications	EMI: EN55032 Class A, EN55024. Safety: EN60950, UL 60950
Warranty	5 Years

Power Cord Included: To order the corresponding country-specific power cord, add the extension to the end of the SKU: PS-DC-DUAL-5624T-NA= North America, AL = North America locking right angle, LA = Latin America, EU = Europe, UK = United Kingdom, SA = South Africa, JP = Japan, OZ = Australia, BR = Brazil.