SI-IES-111D-LRT and SI-IES-121D-LRT

Unmanaged Hardened PoE+ Injector/Converter

User Guide

Part Number 33585

Revision M February 2023

Intellectual Property

Warranty

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

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For a current list of our domestic and international sales offices, go to the Lantronix web site at www.lantronix.com/about/contact.

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Revision History

Date	Rev	Comments
5/4/17	H	Add MTBF and clarify specs.
8/10/17	I	Add Max Frame Size.
7/13/20	J	Update features, specifications, certifications, and DoC.
9/28/21	K	Update DoC, DIN-rail bracket, and Wall Mount bracket.
6/10/22	L	Initial Lantronix re-brand.
2/14/23	M	Update contact information.

FCC Warning

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CE Mark Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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1 Overview

Product Description

The SI-IES-111D-LRT is a 2-port unmanaged hardened PoE+ injector/converter that adds up to 30 Watts of power from its PoE+ Port onto a network segment. The gigabit speed SFP slot provides the ultimate flexibility by allowing fiber SFP uplink ports with varying communication distances.

The SI-IES-121D-LRT is a 3-port unmanaged hardened PoE+ injector/converter that adds up to 30 Watts of power from its (2) PoE+ ports onto 2 network segments. The gigabit speed SFP slot provides the ultimate flexibility by allowing fiber SFP uplink ports with varying communication distances.

Ordering Information

SKU	Description
SI-IES-111D-LRT	(1) 100/1000Base-X SFP slot + (1) 10/100/1000Base-T PoE+ port
SI-IES-121D-LRT	(1) 100/1000Base-X SFP port + (2) 10/100/1000Base-T PoE+ ports
Optional Accessories (sold separately)	
SFP Modules	See the Lantronix relevant SFP Modules page
25130	Industrial Power Supply for SI-IES-111D-LRT. Input: 88-264VAC, 120-370 VDC. Output: 48-55VDC, 0.83A, 39.8 Watts
25131	Industrial Power Supply for SI-IES-121D-LRT. Input: 85-264VAC, 120-370 VDC. Output: 48-55VDC, 1.6A, 76.88 Watts
OCA-P181610	18x16x10” Polycarbonate Enclosure

Features

- IEEE 802.3at PoE+ to supply 30 Watts on 10/100/1000Base-T port (SI-IES-111D-LRT)
- IEEE 802.3at PoE+ to supply 30 Watts per port on 10/100/1000Base-T ports (SI-IES-121D-LRT)
- Supports IEEE 802.3af
- Supports dual speed for SFP slot
- Compact, space saving size
- IP31 housing protection
- Link Pass Through
- Extended operating temperature (-40°C to +75°C)
- DIN Rail mount / optional wall mount brackets included
- Full/half-duplex flow control
- Auto-MDI/MDIX
- Auto-Negotiation
- 10K byte jumbo frames

Packing List

- One Hardened Injector/ Converter with IEEE 802.3af/IEEE 802.3at PSE
- One Documentation Postcard
- One DIN-rail Clip
- Two Wall Mounting Brackets and Screws

Safety Precaution

If DC voltage is supplied by an external power supply, you must use an isolated power supply.

Product Views

2 Hardware Description

This section provides product views, grounding, wiring, LED, DIP switch, and cabling information.

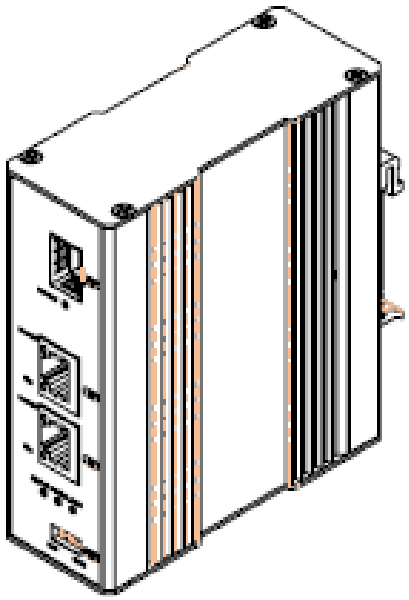
Front Panel

The SI-IES-111D-LRT and SI-IES-121D-LRT front panels are shown below.

Hardened PoE+ Devices Front Panels

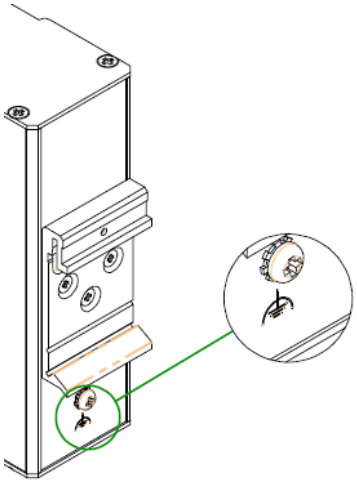
Top View

Consistent with the IP31 rating, the terminal block connector for the DC power input is located on the bottom of the device.



Top Panel of the Hardened PoE+ Devices

Grounding



After the Injector is mounted and connected, the back panel grounding screw can be used for grounding. Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI).

Note: Run the ground connection from the ground screw to the grounding surface before connecting devices.

Caution: Avoid Improper Grounding

Required:

Isolated DC Supply

Connect chassis to earth ground

Do not connect earth ground to:

Negative input terminal

Positive input terminal

DIP Switch

The front panel DIP Switch is used to configure the SFP operating speed. The default position is Mode 2, 1000M.

DIP Switch Definition

Status	Description
Mode 1	100M
Mode 2	1000M

The SFPs are hot-swappable. However, you must cycle device power whenever the DIP switch is changed (i.e., whenever changing SFP mode/speed).

Ports

RJ45 ports (Auto MDI/MDIX): The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX or 1000Base-T device connections. Auto MDI/MDIX means that you can connect to another switch or workstation without changing straight through or crossover cabling. See information below for straight through and crossover cable PIN assignments.

RJ-45 Pin Assignments

Pin Number	Assignment
1	Tx+
2	Tx-
3	Rx+
6	Rx-

Note: The "+" and "-" signs represent the polarity of the wires that make up each wire pair.

All ports on this Hardened PoE injector support automatic MDI/MDI-X operation, so you can use straight-through cables (see below) for all network connections to PCs, servers, or to other switches or hubs. In straight-through cables, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below shows the 10BASE-T/ 100BASE-TX /1000Base-T MDI and MDI-X port pin outs.

Pin MDI-X	Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)

Signals for 1000Base-T

Pin	Signal name	Signal definition
1	TRD+(0)	Transmit and receive data 0 (positive lead)
2	TRD-(0)	Transmit and receive data 0 (negative lead)
3	TRD+(1)	Transmit and receive data 1 (positive lead)
4	TRD+(2)	Transmit and receive data 2 (positive lead)
5	TRD-(2)	Transmit and receive data 2 (negative lead)
6	TRD-(1)	Transmit and receive data 1 (negative lead)
7	TRD+(3)	Transmit and receive data 3 (positive lead)
8	TRD-(3)	Transmit and receive data 3 (negative lead)

Cabling

A twisted-pair segment can use unshielded twisted pair (UTP) or shielded twisted pair (STP) cabling. The cable between the powered device and the injector must be less than 100 meters (328 ft.) long and comply with the IEEE 802.3ab 1000Base-T standard for Category 5e or above.

The Fiber segment using a single-mode connector type must use 9/125µm single-mode fiber cable. You can connect two devices at a distance of 10 km. Fiber segment using multi-mode connector type must use 50/125 or 62.5/125µm multi-mode fiber cable. You can connect two devices at a distance of 550m.

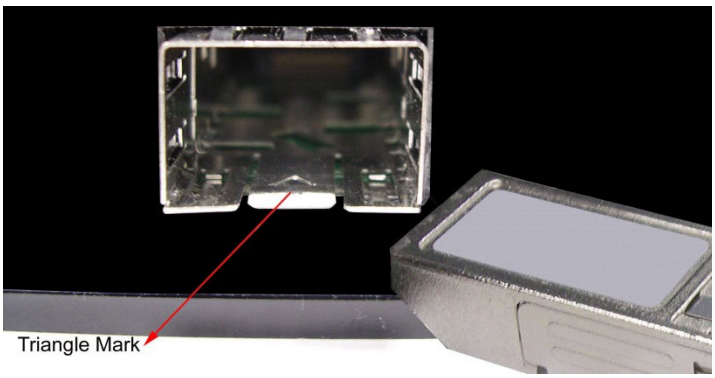
The small form-factor pluggable (SFP) is a compact optical transceiver used in optical communications for both telecommunication and data communication applications.

See the Lantronix SFP web page for more small form factor pluggable (SFP) transceivers information.

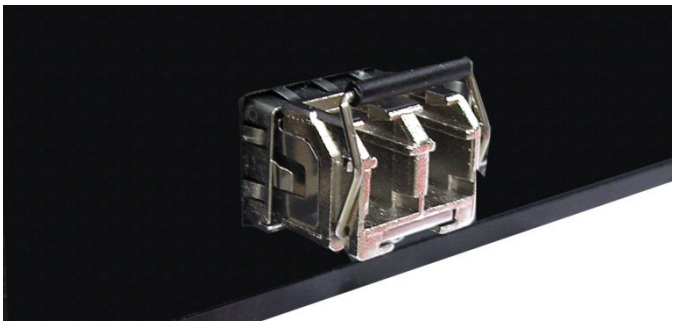
Refer to the SFP manual for important safety information.

To connect the SFP transceiver and LC cable, follow the steps shown below:

1. Insert the transceiver into the SFP module. Notice that the triangle mark is the bottom of the module.

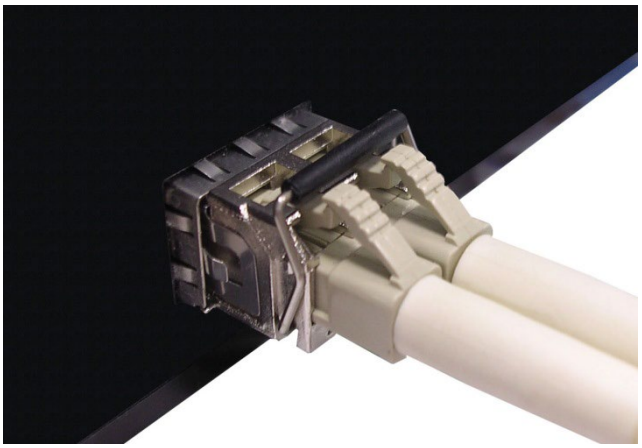


Transceiver to the SFP module



Transceiver Inserted

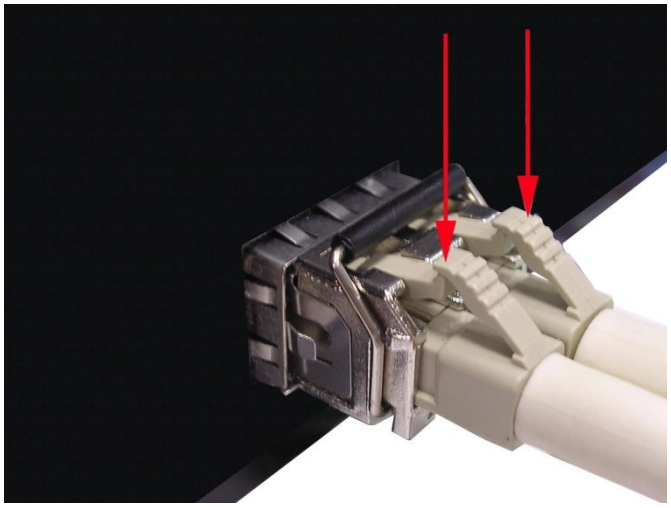
2. Insert the LC connector of the fiber cable into the SFP transceiver.



LC connector to the SFP transceiver

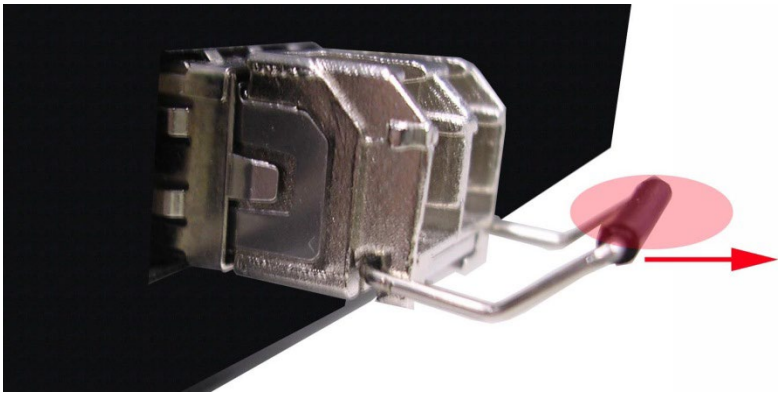
To remove the LC connector from the SFP transceiver, follow the steps below:

1. Press the upper side of the LC connector from the transceiver and pull it out to release.



Remove LC connector

2. Push down on the metal loop and pull the transceiver using the metal loop.



Pull out from the SFP module

Wiring the Power Inputs

Follow the steps below to insert the power wire.

1. Locate the labeling on the device indicating the location of V+ and V- power input connections on the device.

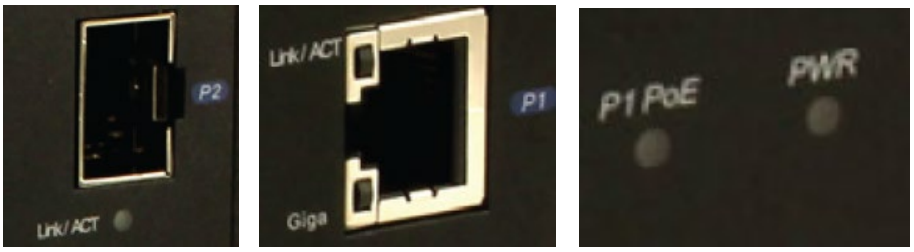
2. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.
3. Tighten the wire-clamp screws on the terminal block, highlighted in red above, to secure the wire connections.

Note: The wire gauge for the terminal block should be 12~ 24 AWG.

Note: Adjust the power supply as required. These devices accept 48~57VDC; higher voltage (50~57VDC) may be required for some high powered PD loads.

LED Indicators

The front panel LEDs display power status and network status.



Each LED state and color has its own specific meaning as defined in the table below.

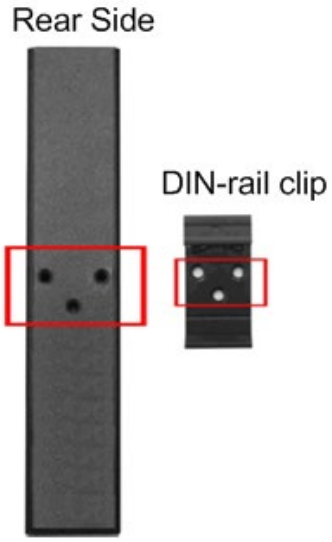
LED Definitions

LED Indicator	Label	Description	
System Power	PWR	Off	Power off
		Solid Green	Power on
PoE Power	PoE	Off	No PoE power output
		Solid Green	PoE power output OK
RJ-45	Giga	Solid Amber	Link to 1000M bps network
		Off	Not connected to network or not working at speed of 1000M
	Link/ACT	Solid Green	Connected to network
		Blinking Green	Networking is active
		Off	Not connected to network
SFP	Link/ACT	Off	No SFP connection detected
		Solid Green	When there is a secure SFP connection
		Blinking Green	When there is transmission or reception of data occurring at speed of 100/1000Mbps

3 Mounting

DIN-Rail Mounting

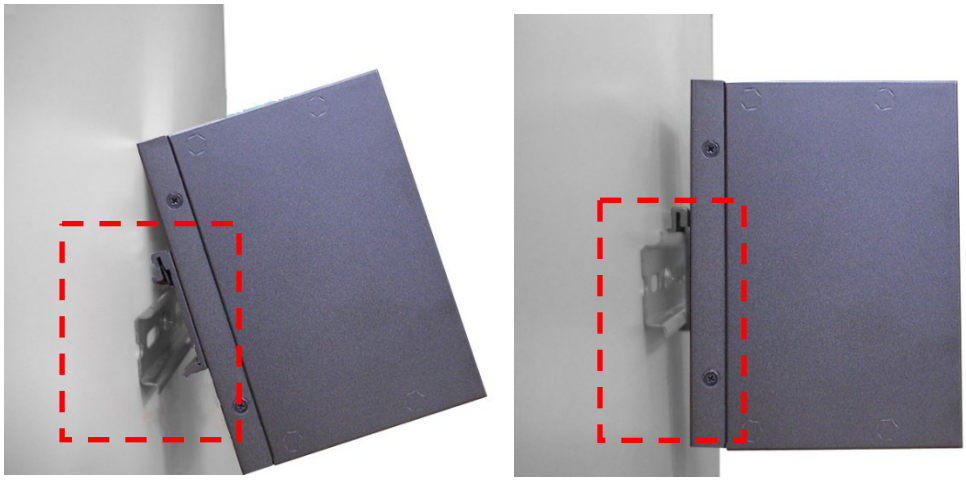
The DIN-rail clip is screwed onto the SI-IES-1x1D-LRT when built at the factory. If the DIN-rail clip is not installed, see the figure below to install the DIN-rail clip onto the switch.



1. Use the screws to install the DIN-rail clip on the SI-IES-1x1D-LRT.
2. To remove the DIN-rail, uninstall by removing the screws.

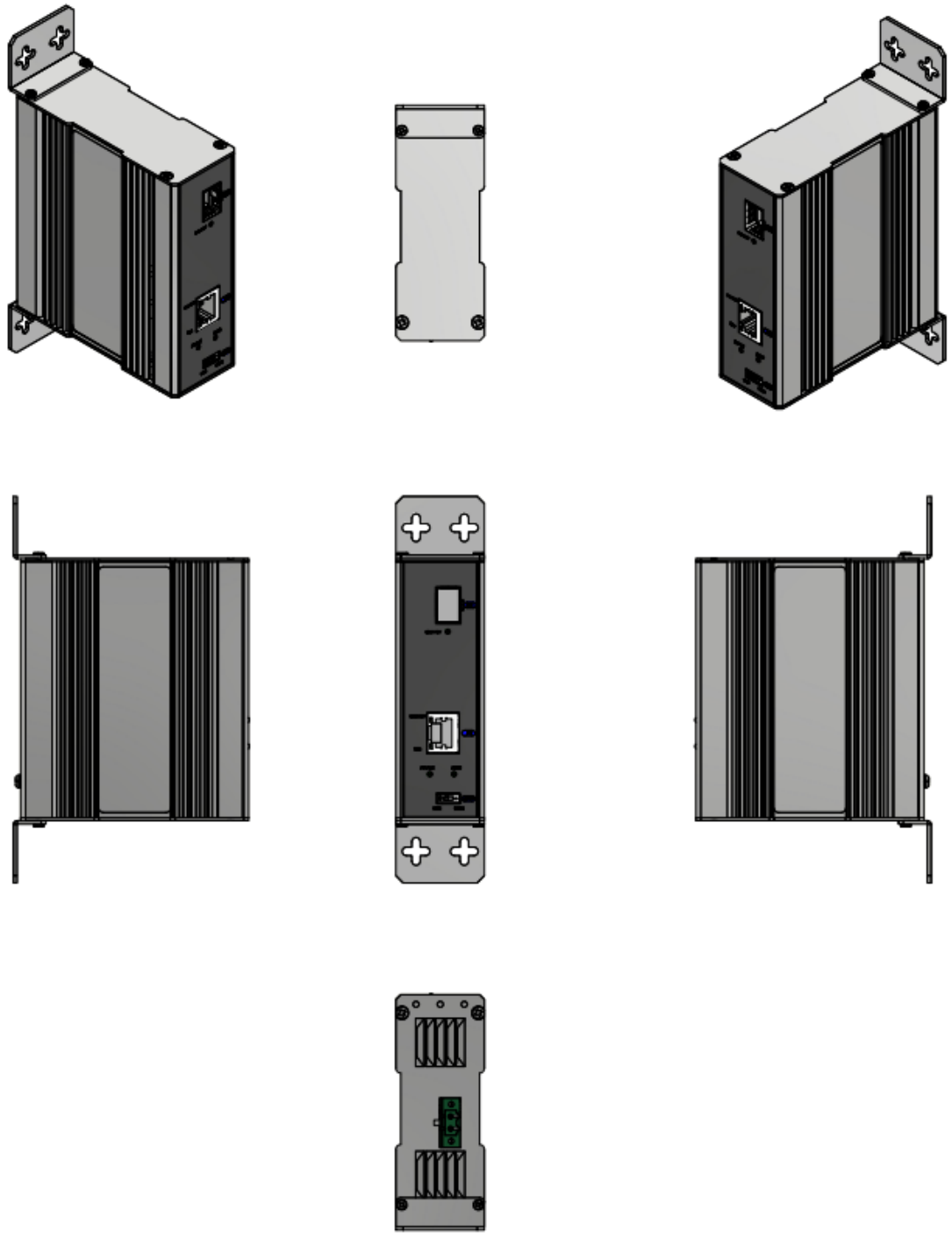
Follow the steps below to hang the Hardened PoE injector on the DIN-rail track.

1. Insert the top of DIN-rail clip over the top edge of the DIN-rail track.



2. Lightly push down on the SI-IES-1x1D-LRT until the bottom of DIN-rail clip snaps onto the bottom edge of the DIN-rail track.
3. Check that the SI-IES-1x1D-LRT is securely mounted on the track.
4. To remove the SI-IES-1x1D-LRT from the track, reverse the steps above.

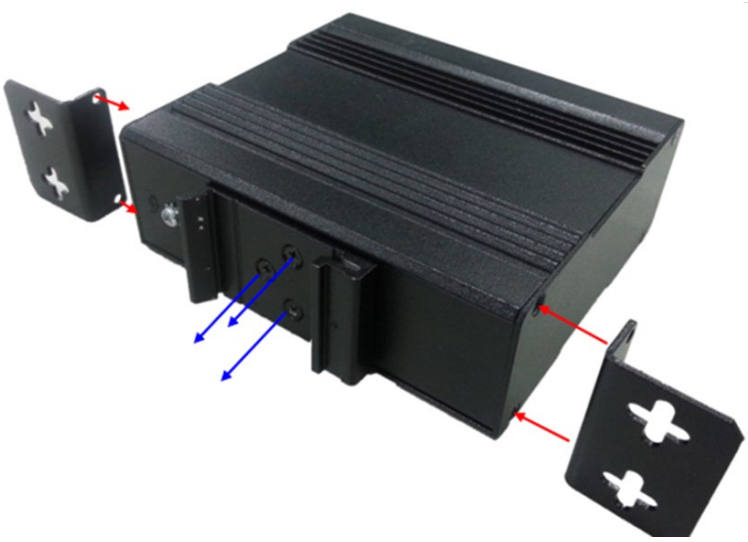
Wall Mounting (Optional)



Follow the steps below to mount the SI-IES-1x1D-LRT with the wall mount brackets.

1. Remove the DIN-rail clip from the SI-IES-1x1D-LRT by removing the three mounting screws as shown below.
2. Place the wall mount brackets on the rear panel of the PoE Injector/Converter.
3. Use the existing screws to install the wall mount plates on the PoE Injector/Converter.

4. Use the hook holes at the corners of the wall mount brackets to hang the PoE Injector/Converter on the wall.
5. To remove the wall mount brackets, reverse the steps above.



4 Troubleshooting

- Select the proper UTP cable to construct your network. Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ45 connections: 100Ω Category 3, 4 or 5 cable for 10Mbps connections, 100Ω Category 5 cable for 100Mbps, or 100Ω Category 5e/above cable for 1000Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- **Diagnosing LED Indicators:** To help identify problems, monitor the SI-IES-1x1D-LRT front panel LED indicators that provide the device's current status. These LEDs can help diagnose common problems you may encounter during installation.
- Verify that you are using the right power cord and power adapter.
- If the SI-IES-1x1D-LRT is not producing full PoE+ output, ensure the power supply is adjusted to provide the required input power. The converters accept 48~57VDC; higher voltage (53~57VDC) required for some high powered PD loads. See Wiring the Power Inputs on page 13.
- If the power LED does not light when the power cord is plugged in, you may have a problem with the power cord or power source. Check for loose power connections, power losses and power at the power outlet. If you still cannot resolve the problem, contact Lantronix technical support for assistance.
- If the Injector/Converter LEDs are normal, the connected cables are correct, and the device fails to transmit data, check your system's Ethernet devices' configuration or status.
- Check the DIP switch setting. The devices ship defaulted to 1000Base-T on the DIP switch. When changing the speed from 1000Base-T to 100Base-T, the unit must be power cycled after installing the 100Base-T SFP and setting the DIP switch to 100 Mbps. Then it will link at 100Base-T. See DIP Switch on page 8.

Specifications

SI-IES-1x1D-LRT technical specifications are listed below. Note that specifications are subject to change without further notification.

Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3ab, IEEE 802.3at, IEEE 802.3z, IEEE 802.3af Compliant with 802.3at in Environment A when using an isolated power supply
Max Frame Size	10K byte jumbo frames
Connectors	1 x SFP slot 1 x RJ45 (SI-IES-111D-LRT) 2 x RJ45 (SI-IES-121D-LRT) 2-pin removable terminal block
Status LEDs	Copper port: Link/ACT Copper port: Gigabit transmission SFP (Fiber) port: Link/ACT PoE1: Power PoE2: Power (SI-IES-121D-LRT) PWR: Input power
Dimensions	Width: 1.44” [36.7 mm] Depth: 3.72” [94.5 mm] Height: 4.26” [108.4 mm]
Power Consumption	3.53 Watts (No PoE) 32.725 Watts (1 port PoE) 63.5 Watts (2 ports PoE)
Power Input	48-57VDC Higher Voltage (50-53VDC) may be required for some high powered PD loads
Ingress Protection	IP31
Environment	Operating: -40°C to +75°C Storage: -40°C to +85°C Humidity: 10% to 95% (non-condensing) Altitude: 0 – 10,000 ft.
Weight	1.3 lbs. [0.59 kg]
Mounting	DIN-rail, Wall-mount

Certifications	Safety: UL508 Class 1, Division 2, Groups A,B,C and D Hazardous Locations CE, FCC Class A EN55011 EN55022/EN61000-6-4 (EMC) EN55024/EN61000-6-2 (Immunity) IEC/EN61000-4-2 (ESD) IEC/EN61000-4-3 (RS) IEC/EN61000-4-4 (EFT) IEC/EN61000-4-5 (Surge) IEC/EN61000-4-6 (CS) IEC/EN61000-4-8 (Magnetic Field) IEC60068-2-27 (Shock) IEC60068-2-32 (Free Fall) IEC60068-2-6 (Vibration)
MTBF	SI-IES-111D-LRT: 743,594 Hours Bellcore Ground Benign, Controlled; Temp 30°C. 653,092 Hours Bellcore Ground Fixed, Uncontrolled; Temp 30°C. SI-IES-121D-LRT: 717,339 Hours Bellcore Ground Benign, Controlled; Temp 30°C. 613,639 Hours Bellcore Ground Fixed, Uncontrolled; Temp 30°C.

Power Supply Specifications

Power supply option 25131 and 25130 specs are provided below (subject to change). Options for SI-IES-111D-LRT include either 25130 or 25131 The option for the SI-IES-121D-LRT is 25131.

25131 Features and Specifications

The 25131 power supply is a 48VDC, 75 Watts, Industrial DIN-rail Mounted Power Supply.
The 25131 power supply is for use with SI-IES-121D-LRT.

Features

- Auto-Negotiation
- Variable AC input range
- Overload, Over Voltage, and Over Temperature Protection
- Convection air cooling
- UL 508 approved
- RoHS compliant
- MTBF 481.9Khrs

Specifications

Output:
Output Voltage: 48VDC
Current Rating: 1.6A
Power Rating: 76.8 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: 3000ms, 60ms
Hold Up Time: 20ms/115VAC

Input
Voltage Range Switch Selectable: 88~264VAC, 124~370VDC
Frequency Range: 47~63Hz
Efficiency: 90%
AC Current (Typical): 1.4A@115VAC, .85A@230VAC
Inrush Current (Cold): 30A@115VAC, 50A@230VAC
Leakage Current: <1mA@240VAC

Protection
Overload: 110~150%
Overvoltage: 56~65.8V

Environment
Operating: -30°C to +70°C
Storage: -40°C to +85°C
Humidity: 20% to 95% (non-condensing)

Weight: 1.12 lbs. [0.51 kg]

Compliance
Safety: UL508, TUV EN60950-1, IEC60068-2-6 (Vibration); EN55022, CISPR22, EN61204-3 Class B, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, N61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN55024, EN61000-6-2, EN50082-2, EN61204-3 A, IEC60068-2-6 (Vibration)

Dimensions: Width: 1.26” [32 mm] x Depth: 4.02” [102 mm] x Height: 4.93” [125.2 mm]

Warranty: Lifetime

25130 Features and Specifications

Power supply option 25130 is for use with SI-IES-111D-LRT or SI-IES-121D-LRT. This power supply provides the isolation recommended for Environment A.

Features

- Variable AC input range
- Protected against Overload and Over Voltage
- Convection air cooling
- DIN rail mountable
- UL 508 approved
- Full load burn in test
- RoHS Compliant
- MTBF 301.7Khrs

Specifications

Output:

- Output Voltage: 48VDC
- Current Rating: 0.83A
- Power Rating: 39.8 Watts
- Ripple & Noise Max: 200mVp-p
- Voltage Range: 48~56VDC
- Voltage Tolerance: ±1.0%
- Line Regulation: ±1.0%
- Load Regulation: ±1.0%
- Setup, Rise Time: 500ms, 30ms
- Hold Up Time: 20ms/115VAC

Input:

- Voltage Range Switch Selectable: 88~264VAC,
- 120~370VDC
- Frequency Range: 47~63Hz
- Efficiency: 88%
- AC Current (Typical): 1.1A@115VAC, 0.7A@230VAC
- Inrush Current (Cold): 30A@115VAC, 60A@230VAC
- Leakage Current: <1mA@240VAC
- Protection Overload: 105~150%
- Overvoltage: 57.6~64.8V

Environment:

- Operating Temp: -20°C to +70°C
- Storage Temp: -40°C to +85°C
- Humidity: 20% to 90% (non-condensing)
- Weight: 0.66 lbs. [0.3 kg]

Compliance:

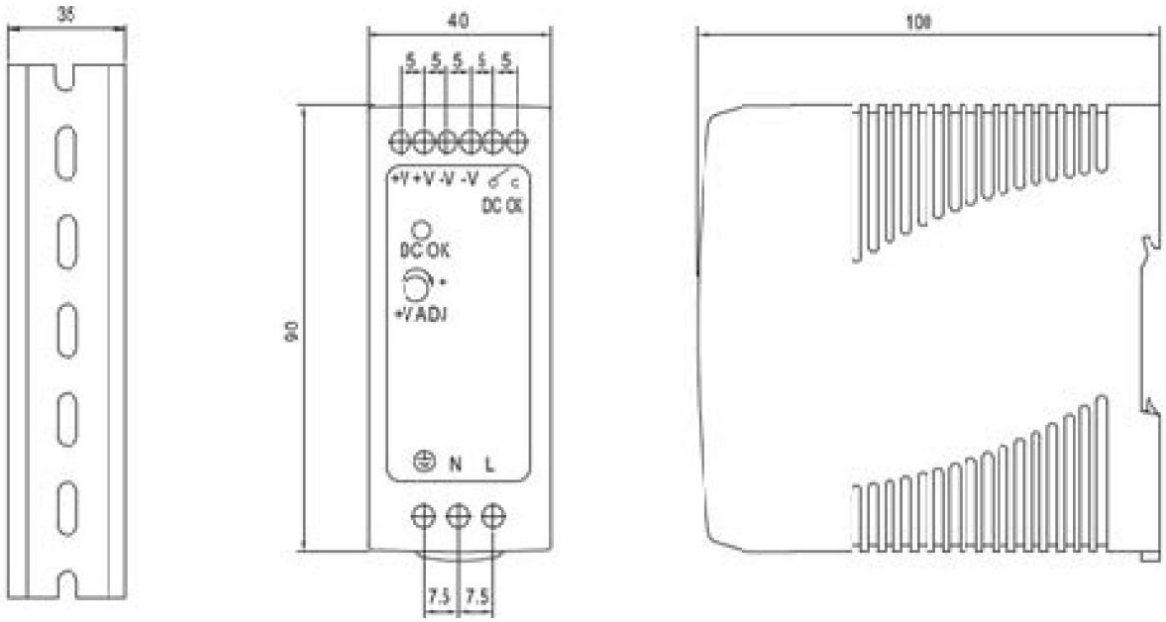
- Safety: UL508, TUV EN60950-1, NEC Class 2, LPS Compliant, UL60950-1, EN55011, EN55022
- CISPR22, EN61204-3 Class B
- EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN55024, EN61000-6-2, EN50082-2, EN61204-3 A
- IEC60068-2-6 (Vibration)

Warranty: Lifetime

25130 Dimensions

Dimensions:

- Width: 1.57” [40 mm]
- Depth: 3.94” [100 mm]
- Height: 3.54” [90 mm]



Declaration of Conformity

Manufacture's Name: Lantronics, Inc.
Manufacture's Address: 48 Discovery, Suite 250, Irvine, California 92618

Declares that the products: SI-IES-111D-LRT and SI-IES-121D-LRT

Conform to the following Product Regulations:

FCC Part 15 Class A, EN 55032:2012, EN 55024:2010
Directive 2014/30/EU, Directive 2015/863/EU
Low-Voltage Directive 2014/35/EU
2011/65/EU EN 50581:2012
EN55011: 2009+A1: 2010 (Group 1. Class A)
EN55022/EN61000-6-4, EN55024/EN6100-6-2, EN55024/EN6100-4-2, , EN55024/EN6100-4-3, IEC/EN61000-4-4, IEC/EN61000-4-5, EN55024/EN6100-4-6, EN55024/EN6100-4-8, IEC60068-2-27, IEC60068-2-32, and IEC60068-2-6

With the technical construction on file at the above address, this product carries the CE Mark I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Place: Irvine, California
Date: April 27, 2022
Signature: *Fathi Hakam*
Full Name: Fathi Hakam
Position: Vice President of Engineering

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Technical Support

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Sales Offices

For a current list of our domestic and international sales offices, go to the Lantronix web site at www.lantronix.com/about/contact.