



SI-IES-511D-LRT and SI-IES-521D-LRT

Unmanaged Hardened PoE++ Injector/Converter

User Guide

Part Number 33880
Revision A June 2025

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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
June 2025	A	Initial document release

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 23 for electrical safety warnings translated into multiple languages.

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1. Overview

Product Description

The SI-IES-511D-LRT and SI-IES-521D-LRT are unmanaged hardened multi-Gigabit PoE++ injector/converters that add up to 90 Watts of power from the PoE++ port(s) onto 1 or 2 (depending on model) network segments. The SI-IES-5x1D Series are designed specifically to meet the evolving demands of higher 2.5G bandwidth and higher power (90W) devices such as wireless access points and security cameras in outdoor traffic cabinets, parking garages, or other harsh environments.

The 1G/10G speed SFP slot provides flexibility by allowing fiber SFP uplink ports to extend the distance of security, transportation and telco networks. The SI-IES-5x1D-LRT Series PoE++ injector/converters are built for rugged environments like outdoor cabinets and certified to ensure safe and reliable operation in temperatures between -40°C and +75°C.

Ordering Information

Part Number	Description
SI-IES-511D-LRT	(1) 1G/10GBase-X SFP+ slot + (1) 10M/100M/1G/2.5GBase-T(X) PoE++ Port
SI-IES-521D-LRT	(1) 1G/10GBase-X SFP+ slot + (2) 10M/100M/1G/2.5GBase-T(X) PoE++ Ports
Optional Accessories (sold separately)	
SFP modules	See the Lantronix SFP Modules page
OCA-P181610	18x16x10" polycarbonate enclosure
Industrial Power Supplies (sold separately)	
25105	Input 88-264VAC, 124-370VDC Output 48-55VDC, 2.5A, 120W For detailed information, see https://www.lantronix.com/products/25105-2/
25104	Input 85-264VAC, 124-370VDC Output 48-55VDC, 5.0A, 240W For detailed information, see https://www.lantronix.com/products/25104-2/
PS-DC-DUAL-5624T	Input 100-240VAC Output 56V, 5.7A, 315W For detailed information, see https://www.lantronix.com/products/ps-dc-dual-5624t/

Package Contents

- 1x hardened injector/converter with IEEE 802.3af/IEEE 802.3at PSE
- 1x documentation postcard
- 1x 4-pin terminal block (attached)
- 1x DIN rail clip (attached)
- 2x wall mounting brackets and screws (in bag)

Safety Precaution

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

Specifications

Component	Description
IEEE Standard	<ul style="list-style-type: none"> • IEEE 802.3 10Base-T Ethernet • IEEE 802.3u 100Base-TX Fast Ethernet • IEEE 802.3ab 1000Base-T Gigabit Ethernet • IEEE 802.3bz 2.5GBase-T/5GBase-T Ethernet • IEEE 802.3z 1000Base-X Gigabit Ethernet • IEEE 802.3ae 10Gbps Ethernet • IEEE 802.3x Flow Control and Back Pressure • IEEE 802.3an 10GBase-T Ethernet • IEEE802.3af PoE • IEEE802.3at PoE+ • IEEE802.3bt PoE++
Network Connectors	<ul style="list-style-type: none"> • (1) DATA IN 1G/10GBase-X SFP+ Slot • (1 or 2) DATA OUT PoE++ RJ-45 10M/100M/1000M/2.5GBase-T(X) Ethernet Port with 90W PoE Output Power
Network Cable (not included)	<ul style="list-style-type: none"> • UTP/STP Cat.6a or above Cable • EIA/TIA-568 (100m)
Protocol	CSMA/CD
Status LEDs	<p>(2) Input Power</p> <p>(1 or 2, depending on model) PoE status</p> <p>(1 or 2, depending on model) TX/RJ-45 ports</p> <p>(1) SFP Port</p>
DIP Switch	<p>DIP 1: Remote PD Reset (Enabled/Disabled)</p> <p>DIP 2: Link Pass-through</p>
PoE Pin Assignment	<p>Pin 1 (V-), 2 (V-), 3 (V+), 6 (V+)</p> <p>Pin 4 (V+), 5 (V+), 7 (V-), 8 (V-)</p>
PoE Power	<p>SI-IES-511D-LRT 90W per port; total PoE budget 90W</p> <p>SI-IES-521D-LRT 90W per port; total PoE budget 180W</p>
Power Input	54-56VDC; 4-pin terminal block
Power Consumption	<p>5W @56VDC (No PoE)</p> <p>220W @56VDC (full PoE)</p>
Ingress Protection	IP31
Surge Protection	2kV Surge Immunity
Dimensions	<ul style="list-style-type: none"> • Width: 38.6 mm (1.52 in.) • Depth: 81.5 mm (3.209 in.) • Height: 104.5 mm (4.114 in.) (without terminal block) 114.1 mm (4.492 in.) (with terminal block)

Component	Description
Environment	<ul style="list-style-type: none"> • Operating temperature: -40°C to 75°C • Storage temperature: -40°C to 85°C • Operating humidity: 5% to 95% (Non-condensing)
Weight	0.32 kg (0.7 lb)
MTBF	526,264 hrs Telcordia (Bellcore), GB at 50°C
Certifications	<p>EN62368-1 (LVD)</p> <p>Safety UL62368-1 (MET)</p> <p>Hazardous Loc UL 121201 C1 D2 (MET) (Pending)</p> <p>FCC, CE/UKCA, EN 55032/35 (EMC)</p> <p>EMI CISPR 32, FCC Part 15B Class A</p> <p>IEC61000-4-2 (ESD): Contact 6KV, Air 8KV</p> <p>IEC61000-4-3 (RS)</p> <p>IEC61000-4-4(EFT): Power 2KV, Signal 2KV</p> <p>IEC61000-4-5 (Surge): Power 2KV, Signal 2KV</p> <p>IEC61000-4-6 (CS)</p> <p>IEC61000-4-8 (Magnetic Field)</p> <p>EN50058-2-6 (Vibration)</p> <p>EN60068-2-27 (Shock)</p> <p>EN60068-2-32 (Free Fall)</p>
Warranty	5 years

2. Hardware Description

Product Views

The SI-IES-511D-LRT and SI-IES-521D-LRT front and bottom panels are shown below.



Figure 2-1 SI-IES-511D-LRT and SI-IES-521D front panel



Figure 2-2 SI-IES-511D-LRT and SI-IES-521D bottom panel

LED Indicators

The front panel LEDs display power and network status.

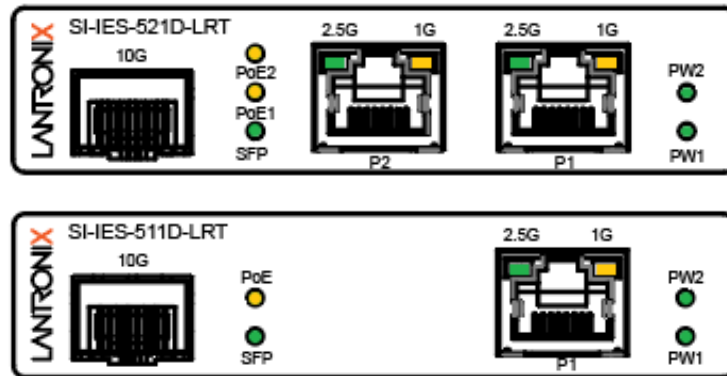


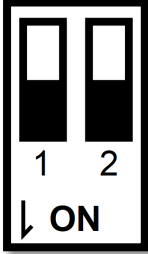
Figure 2-3 Front panel LEDs

LED Indicator	Label	Description	
PoE Power	SI-IES-521D-LRT: PoE1 / PoE2 SI-IES-511D-LRT: PoE	Solid Amber	PD is detected on designated port
		OFF	No PoE power output detected
SFP	SFP	Solid Green	SFP connection detected
		Flashing	FX activity
		OFF	No SFP connection detected
TX/RJ-45	P1 / P2: 1G (LNK/ACT)	Solid Amber	Link to 1G bps network
		OFF	Not connected to network or not working at speed of 1G bps
	P1 / P2: 2.5G (LNK/ACT)	Solid Green	Connected to network
		Blinking Green	TX activity
		OFF	Not connected to network
System Power	PW1 / PW2	Solid Green	Power is detected
		OFF	Power off

DIP Switch

This unit is equipped with DIP switches located on the power input side of the enclosure. The dip switches are used to modify the default functions of the unit. You must power cycle the unit to activate the changed settings.

Refer to the table below for the default DIP switch settings and their corresponding functions.

	LPT	OFF (Default)	Link Pass Through (LPT) – Disabled
		ON	Link Pass Through (LPT) – Enabled
	PDR	OFF (Default)	Remote PD Reset (PDR) – Disabled
		ON	Remote PD Reset (PDR) – Enabled

Note: Allow about 15 seconds for the device to initialize its settings upon power-up before operating the LPT or PDR functions.

Remote PD Reset (PDR)

When the PDR function is enabled, disconnecting the fiber cable from your central switch will initiate the PDR function, prompting the PoE port to power cycle and reboot the remote powered device (PD).

Note: Once the SFP signal is restored, the PoE connection will take 6-8 seconds to successfully reboot.

Link Pass Through (LPT)

Link Pass Through (LPT) ensures that a loss of link on one side of a media converter is passed through to the other side, so that upstream equipment can see fault conditions that would otherwise be hidden by the media converters.

The behavior is as follows:

LPT disabled	All SFP and Copper links come up independently of each other and stay up independently of each other.
LPT enabled	<p>When the SFP link goes down, it forces the copper link on the other side down.</p> <p>When the copper link goes down, it forces the SFP link on the other side down.</p> <p>When the SFP link is restored, the copper link on the other side is restored.</p> <p>When the copper link is restored, the SFP link on the other side is restored.</p>

Ports

RJ45 ports (Auto MDI/MDIX): The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX, 1000Base-T or 2.5GBase-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 (10/100M)

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 tables below show the 10BASE-T/ 100BASE-TX /1000Base-T and 2.5GBase-T MDI and MDI-X port pin outs.

MDI and MDI-X Signals (10/100M)

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 and 2.5G connections

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)

Wiring the Power Inputs

Note: This device is recommended for Environment A. Use of an isolated power supply is recommended.

The SI-IES-5x1D-LRT device supports two power inputs. It provides a 4-pin pluggable terminal block on the power input side of the enclosure. It can be operated using 54-56VDC power sources. Always make sure your input voltage is within this supported voltage range.



Figure 2-4 Power Input with 4-pin terminal block

Terminal Block Requirements

- Wire range: 0.34mm² to 2.5mm²
- Solid wire (AWG):12-24/14-22
- Stranded wire (AWG): 12-24/14-22
- Torque:5lb-In/0.5Nm/0.56Nm
- Wire Strip length: 7-8mm

Follow the steps below to wire power lines from the terminal block to a compliant external DC power source.

To connect power:

Warning: Always SHUT OFF the power source to connect the power wire.

1. Pull out the 4-pin terminal block.
2. Connect wire to V1+, V1-, V2+, V2- and Ground. Follow the printed polarity for +V1-, +V2- and ground. Connect positive wires to V1(2)+, connect negative wires to V1(2)-, and connect a wire from the unit's chassis ground to the earth ground.
3. Plug the connected 4-pin terminal block back to its place.

Grounding the PoE Injector

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

Warning: Always ground the power source to maintain a clean power input. Cheaply made power supplies create too much noise and will cause the power input to fluctuate when connected to this unit. To avoid this, always ground the power source to maintain a clean power input.

Warning: Grounding is required to activate all protection circuitries. Failure to ground will void the product warranty.

Required:

Isolated DC Supply
Connect chassis to earth ground

Do not connect earth ground to:

Negative input terminal
Positive input terminal

Connect a wire from the PoE injector chassis ground to the earth ground.

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

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 9/125 μ m single-mode fiber cable. You can connect two devices up to 10 km. The fiber segment using multi-mode connector type must use 50/125 or 62.5/125 μ m multi-mode fiber cable. You can connect two devices up to 550m.

The small form-factor pluggable (SFP) is a compact optical transceiver used in optical communications for both telecommunication and data communication applications. Refer to the Lantronix [SFP web page](#) for information about Lantronix's SFP transceiver modules.

To connect the SFP transceiver and LC cable:

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

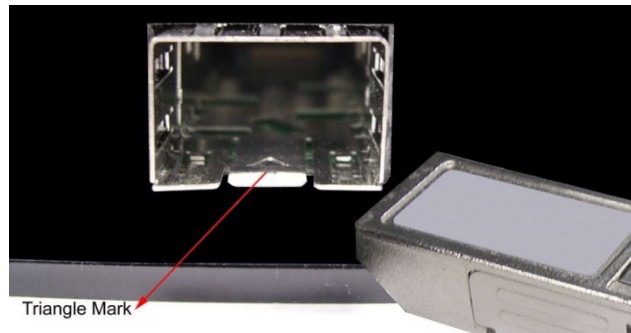


Figure 2-5 Transceiver to the SFP module



Figure 2-6 Transceiver inserted

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

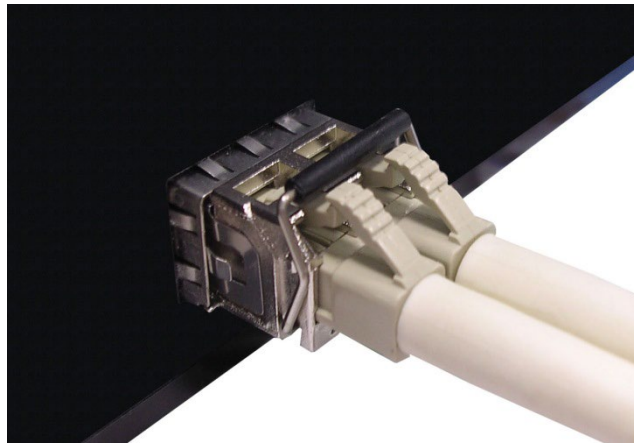


Figure 2-7 LC connector to the SFP transceiver

To remove the LC connector from the SFP transceiver:

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

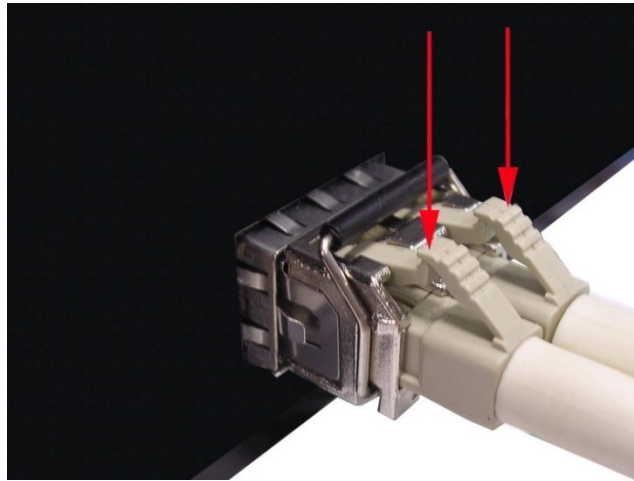


Figure 2-8 Remove LC connector

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

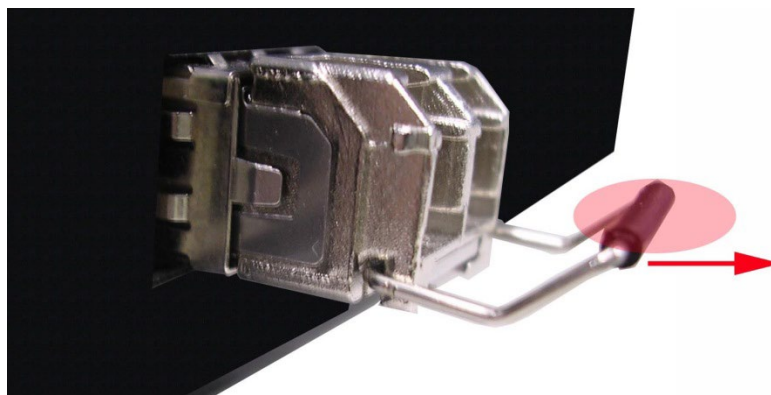


Figure 2-9 Pull out from the SFP module

3. Mounting

The SI-IES-5x1D-LRT unit can be DIN-rail mounted or wall-mounted. DIN-rail brackets and wall-mount brackets are included. The DIN-rail clip is screwed onto the SI-IES-5x1D-LRT when built at the factory.



Figure 3-1 PoE Injector with DIN rail clip

DIN Rail Mounting

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-5x1D-LRT until the bottom of DIN-rail clip snaps onto the bottom edge of the DIN-rail track.
3. Check that the SI-IES-5x1D-LRT is securely mounted on the track.

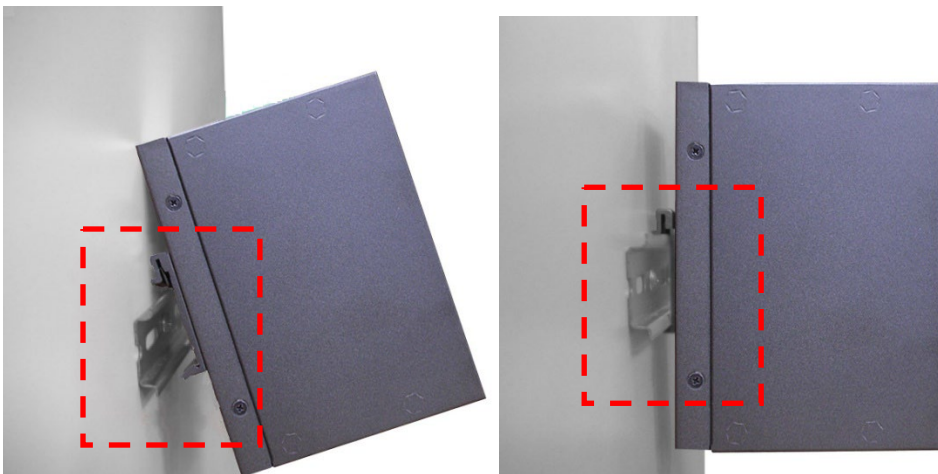


Figure 3-2 DIN-rail mount

Wall Mounting (optional)

To mount the SI-IES-5x1D-LRT with the wall mount brackets:

1. Remove the DIN-rail clip from the SI-IES-5x1D-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.



Figure 3-3 PoE Injector wall mount

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-5x1D-LRT front panel LED indicators that provide the device's 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-5x1D-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 (54~56VDC) required for high powered PD loads. See [Wiring the Power Inputs](#).
- 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.

Product Labels



Figure 4-1 Product labels for SI-IES-511D-LRT and SI-IES-521D-LRT

Note: C1D2 certification pending.

Package Labels



Figure 4-2 Package labels for SI-IES-511D-LRT and SI-IES-521D-LRT

5. Compliance

(According to ISO/IEC Guide and EN 45014)


Manufacturer's Name & Address:

Lantronix, Inc. 48 Discovery, Suite 250, Irvine, CA 92618 USA

Product Family:

SI-IES-511D-LRT and SI-IES-521D-LRT

Conforms to the following standards or other normative documents:

Country	Specification
USA 	Part 15 Subpart B Class A
EU	See EU Declaration of Conformity
United Kingdom	See UK Declaration of Conformity
Safety	EN 62368-1, UL62368-1(MET)
Hazardous Location	UL121201 C1D2(MET) - Pending

FCC Statement

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.

EU Declaration of Conformity

This section will be updated when available.

UK Declaration of Conformity

This section will be updated when available.

NDA, RoHS, REACH and WEEE Compliance

See the compliance webpage at <https://www.lantronix.com/legal/rohs/>.

Trade Agreement Act (TAA) Compliant Products

See the TAA webpage at <https://www.lantronix.com/legal/rohs/taa-compliant-products/>.

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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.