

Power over Ethernet Single Port Injector

Installation and User's Guide



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Using This Guide

Purpose of Guide

This document provides information and procedures for the product installation and operation of the LP2521 Single Port Power over Ethernet Injector.

Who Should Use this Guide

This document is intended for technical personnel responsible for installing and operating Power over Ethernet products in a Local Area Network (LAN) environment.

To use this document effectively, you should have a working knowledge of Local Area Networking (LAN) concepts and hardware installation. In addition, you should be familiar with the following:

- Connection of Patch Cables with RJ45 connectors
- LAN addressing map for your particular Network
- Mounting of Network hardware in a 19" equipment rack
- Local practices for power cord connections

If You need Help

For additional support related to the contents of this document, pre-installation of product or post installation support, please contact LPS using one of the following methods:

Phone	1-510-275-4572
Fax	1-510-661-0855
Email	support@lan-power.com
Web Address	www.lan-power.com
Mail	LAN Power Systems 47835 Westinghouse Drive Fremont, CA 94539

Before contacting LPS for technical support, please have the following information ready:

- Your LPS product model number and unit serial number
- A description of the failure or symptoms of problem
- A description of any action(s) already taken to resolve the problem (e.g., changing ports , rebooting the unit, etc...)
- The type of End device being powered including Manufacturer name and part number
- Powering requirements of the End device
- A description of your Network environment (layout, Ethernet switch description, cable type, etc...)
- The unit history (i.e., have you returned the unit before, is this a recurring problem, etc...)

Functions and Features

The LPS Model LP2521 Single Port Power over Ethernet (PoE) Injector supports powering applications in which AC Power is difficult or costly to access, such as VoIP Phones, Wireless LAN Access Points, Internet Security Cameras, or other Network devices.

The Single Port PoE Injector acts as a “patch panel” and adds ~48 VDC to unused (non-data) wires in a standard Category 5, 5e, or 6 Ethernet cable. The LP2521 delivers both data and power over a single standard Ethernet cable to an End device designed to receive both Data and Power through its RJ45 connector.

Key features of the Single Port PoE Injector include:

- Exceeds IEEE 802.3af Power over Ethernet Standards
- Supports Data links at 10Mbps, 100Mbps or 1000Mbps
- Output Wattage is up to 28W continuously
- Non-Conducting plastic case
- Over voltage current and Short circuit protected

Functions and Features continued

- Removable Power Cord w/IEC-320-C7 connector
- Data and Power carried on same Ethernet cable
- Ships with wall mounting bracket - use if needed

LED indicators and functions

The LP2521 PoE Injector has two LED's which assist with understanding unit operation.

- LED #1 - Unit Power - The LED glows GREEN if input power is being received properly from AC outlet - This indicates the unit is capable of forwarding power to the End device.
- LED #2 - Connection to End device and Power forwarding - The LED glows GREEN if detection is achieved with the End device and power is being forwarded out over the Ethernet cable.

See Section 3, Troubleshooting, if Ethernet and Power cords are properly attached and if both LED's are not on in a steady GREEN condition.

Installation and Connection



Electrical Hazard: Only qualified personnel should install this unit. Read instructions before attempting to install this unit.

Verifying Contents of Package

Unpack the PoE Injector and verify that you have all of the following items:

- Single Port Power over Ethernet Injector
- Power Cord
- Wall Mounting bracket and screws



Technical Considerations

Before you mount the PoE Injector to a fixed location, consider all of the following:

- Determine optimal placement, check patch cord routing and AC outlet location.
- Collect and document Network information as required.
- Ensure the cable length from the Ethernet Network Switch to the Powered End device does not exceed 100 meters total length.

Note: The PoE Injector is not a repeater and does not amplify the Ethernet data signal. The Injector must be used in conjunction with an Ethernet Switch.

Caution: Observe the following considerations when installing the Single Port PoE Injector.

- Connect the Injector to a grounding type AC outlet (100-240 VAC), using the standard power cord supplied.
- Allow for easy access to disconnect the unit from the AC outlet or UPS, if necessary.
- Do not cover the unit or block airflow with any other objects. Keep the unit away from excessive heat, humidity, vibration and dust.
- Installation must at all times conform to local regulations
- There are no user serviceable parts inside the Injector. If support is needed, refer to “If You need Help” on page V.
- SELV - Safety Extra Low Voltage (Connect only to PoE Networks without routing to the outside plant)



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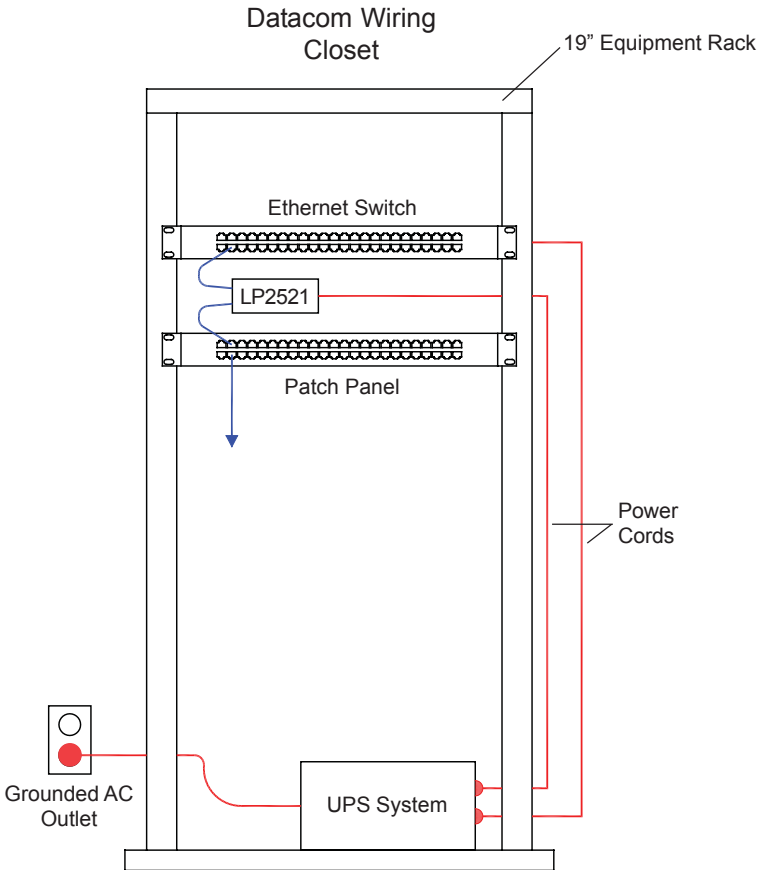
Powering Up the Injector

Plug one end of the power cord into the Injector and the other end into a grounded AC power source. Units are typically connected to a power strip or other power outlet that may be cycled on and off. An uninterruptible power supply (UPS) may be used. This assures uninterrupted power to the End device should there be a loss of building power.

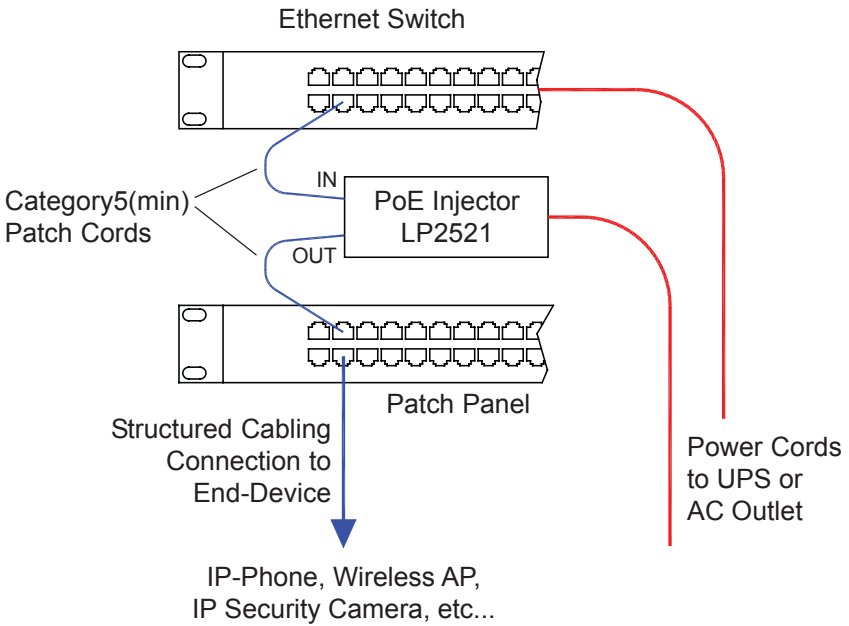
Safety Instructions: The means of connection to the mains supply is the detachable power cord of the equipment. The equipment disconnect device is the appliance inlet. The AC socket outlet shall be installed near the equipment and shall be easily accessible.

Next, attach a LAN data cable patch cord of minimum Cat5 cable grade from the Ethernet Switch port to the RJ45 connector on PoE Injector marked "IN". Then attach a second patch cable from the "OUT" RJ45 connector on the PoE Injector to the structured wiring connection leading to the device to be powered. Turn on power source. The "IN" LED on the Injector will glow "GREEN". If End device to be powered is already installed on Network, the "OUT" LED will glow "GREEN". The PoE Injector is now correctly installed and operating.

Typical Installation of PoE Injector



Typical Installation of PoE Injector (continued)



Troubleshooting

Refer to the Troubleshooting Checklist for a list of problems and recommended actions to resolve the problem. If additional support is needed, refer to “If You need Help” on page V.

Following the Troubleshooting procedures below will usually resolve a Power over Ethernet Installation problem. The LAN Power Support Team has found that these are the most often encountered trouble items when adding Single Port PoE Injectors to an existing Ethernet Network.

Troubleshooting Checklist:

Problem 1:

The Single Port PoE Injector is plugged in but “Power In” LED is not lit (Green).

Recommended Actions:

Verify the power cord is plugged in all the way into the PoE Injector.

Verify the AC connection is “hot” by plugging in some other device and making sure there is actually power at the outlet. Input voltage must be from 90-264 VAC and 50-60Hz.

If the “Power In” LED will not light with the unit plugged in, call or write to LAN Power Systems for Tech. Support.

Problem 2:

The Single Port PoE Injector is plugged in and “Power In” LED is lit (Green). But the “Power Out” LED is not lit and End device is not being powered.

Recommended Actions:

Verify use of working patch cables of at least Category 5 grade. Verify they are Straight-through patch cables and NOT Cross-over cables. Verify connection of good patch cable from Ethernet Switch port to “IN” RJ-45 connection on PoE Injector. Verify connection of good patch cable from “OUT” RJ-45 connection on PoE Injector to Patching panel connection linking to End device to be powered.

-continued on next page-

Troubleshooting Checklist (continued)

IF “OUT” LED on PoE Injector is still not lit (Green), continue with these steps.

Bring End device to be powered into the same room (wiring closet) where you are working and connect it directly to the patch cable already attached to “OUT” RJ-45 Connector on PoE Injector. If “OUT” LED lights up (Green) and power light is now lit on the End device, the PoE Injector is working fine.

The problem must be then in the Cable link going out to where the End device was first located. PoE requires the use of all 8 wires in the LAN Data cable. It is possible not all 8 wires are available or terminated in that particular link in the Structured Cabling System. Try using a different Cable link to a nearby or similar location and see if the PoE Injector can now power the End device remotely using that Cable link. OR the patch cord from the end of the Cable link to the End device could be bad, try replacing with another known good patch cable.

If You have the End device to be powered connected locally to the PoE Injector, with known good patch cords, and the “OUT” LED on the PoE Injector does not light up and power the End device, check the following. Verify that the Make and Model of End device you are trying to power is actually made from the Manufacturer to accept PoE. If so, verify that the style of PoE (protocol) that the End device wants to receive is the same style that the PoE Injector is putting out.

Example: the LP2521 is putting out IEEE 802.3af PoE. The End device must be built ready to accept IEEE 802.3af PoE. Some products in the marketplace are not, some accept other PoE styles like legacy Cisco CDP style PoE (see Support section, Compatible Products listing at www.lan-power.com). Others need 24v or 12v or 5 volts input. LAN Power Systems has Voltage Adapters and Power Pin and Data cables available for these low voltage PoE applications (see Products section of LAN Power Website at www.lan-power.com).

Troubleshooting Checklist (continued)

Problem 3:

PoE Injector has Input and Output LEDs both lit (Green), End device is being powered, but End device has no Data link from the Ethernet Switch (is not responding to the Network).

Recommended Actions:

Verify Ethernet Switch port is good, turned on, and not being blocked for traffic forwarding by either a hard set or soft set in Network Management Software.

Check or change out patch cord from Switch port to PoE Injector, making sure a Straight-through patch cord is being used and NOT a Crossover cable.

Verify Cable link to End device is at least Category 5 and has a distance of no more than 100 meters total length, including patch cables. If a Cable testing unit is available, wring out the data link to make sure there are no hidden breaks or damage to any of the cable's 8 wires and that all RJ-45 connection points along the data link are good.

Try using a different End device. If the new End device works and the Data link works correctly, the problem is with the End device. Speak with that Manufacturer for Technical support or return of the problem End device.

If these actions have all been taken and you still are not getting a functional Power and Data link to your End device, please call or write to LAN Power Systems for additional support and troubleshooting ideas.

Hardware Specifications

This appendix lists the LP2521 Single Port Power over Ethernet Injector hardware and electrical specifications.

Regulatory Compliance Standards

This equipment meets the following electromagnetic compatibility (EMC) requirements:

Electromagnetic Compatibility (EMC)	VCCI 2001 ClassB, 47 CFR Parts 2 and 15, EN55022, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11
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Safety Approvals

The equipment meets the following safety approvals:

FCC



CE



VCCI



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Hardware Specifications continued

Physical Specifications

Height: 1-3/8" (34.9mm)

Width: 2-3/16" (55.5mm)

Length: 5-1/16" (128.6mm)

Unit Weight: 5.1 oz. (0.15 kg)

Package Weight: 11.5 oz. (0.33 kg)

Unit Mounting: Shelf mount or wall mount with included bracket

LED Indicators

2 for Single PoE Output port

Left hand side(IN): Power available to forward (Green)

Right hand side(OUT): Detect and power forwarding (Green)

Environmental Specifications

Operating Temperature: 40° to 185° F / -40° to 85° C

Storage Temperature: 40° to 185° F / -40° to 85° C

Relative Humidity: 10% to 90% non-condensing

Operating Altitude: -1,000 to 10,000 feet above Sea level
-305 to 3,048 meters above Sea level

Ethernet Data Throughput Speeds

10 Mbs Ethernet, 100 Mbs Fast Ethernet
or 1000 Mbs Gigabit Ethernet supported

Connector Type

Non-Shielded RJ-45, meets EIA 568A and 568B



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Hardware Specifications continued

Electrical Specifications and Properties

AC Power Input

Power Cord type:	Removable with IEC 320-C7 connector on Single Port Injector end, North American 2-Pin on outlet end
Power Supply:	Single, Internal
Voltage Range:	90 - 264VAC
Voltage Rating:	100 - 240VAC
Frequency Range:	47 - 63Hz
Frequency Rating:	50 - 60Hz
Input Current:	1.0A (rms) Max. @Voltage Range and Voltage Rating

DC Power Output

PoE Protocol:	IEEE 802.3af Standard
Power on Data Pins:	4 & 5 (+), 7 & 8 (-) (unused pairs)
Output Voltage:	48VDC (+10%-0)
Max. Power on Port:	28W (exceeds PoE Standard)
Load:	0A (Min.) 0.35A (Max.)
Regulation (Line/Load):	± 4%
Efficiency:	>75%
Hold-up Time:	20mS Min. @ 240VAC Input

Ripple and Noise*	Vp-p*
<500Hz	0.50
500Hz-150KHz	0.15
150KHz-500KHz	0.15
500KHz-1MHz	0.10

* As per IEEE802.3af Table 33-5

Thermal Output 15 BTUs