



N-GXE-POE-xx-01 Series

PCIe Gigabit Ethernet Fiber NIC with PoE+
1000Base-X and 10/100/1000Base-T PoE+

User Guide

Part Number 33599
Revision F September 2022

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Revision History

Date	Rev	Notes
9/16/15	A	Initial release. Add LPT and Sleep mode fixes, PXE boot updates, PCB 11483 Rev. 05, and revised bracket.
11/11/15	B	Change default bracket to standard and added a note on Jumper J6.3 – J6.5.
8/23/16	C	Add N-GXE-POE-SC-01, update driver install link, grounding, and jumper information, and clarify VLAN tagging scenario, Utility, LED, and contact information. Update SKUs to GXE-POE-SC-01(S) and N-GXE-POE-SC-02(L).
10/3/16	D	Add information on how to add PXE boot/“Boot Agent” into NVM.
2/9/22	E	Add Linux to the software support spec.
9/7/22	F	Update DoC. Initial Lantronix rebrand.

Contents

Safety Warnings and Cautions	4
Product Description	5
Ordering Information	5
Optional Accessories (order separately)	5
Application Scenarios	6
Scenario 1 – Tag from Phone Only	6
Scenario 2 – Tag from Phone and Host PC	7
Scenario 3 -Tags Stripped to Phone (and Host)	8
Standard (High-Profile) Bracket	9
Low-Profile (LP) Bracket (included option on some models)	9
OS Support	10
Features	10
Specifications	10
Dimensions	11
Installation Example	11
Cable Descriptions	12
Copper Cable Requirements	13
Standard PoE Parameters	13
Cisco IP Phones' PoE	13
802.3at Summary of Electrical Isolation Requirement	14
N-GXE-POE-xx-01 PoE	14
802.3af Classification	15
DC Disconnect	15
N-GXE-POE Behavior when PC enters a specific Power State	15
Determining the PC Sleep State	16
Unpacking	17
Package Contents	17
System Requirements	18
Pre-Installation Checklist	18
Safety Precautions	18
Replacing HP Bracket with LP Bracket (Optional on N-GXE-POE-LC-01 & N-GXE-POE-SFP-01)	19
LED Descriptions	19
Jumper Locations and Settings	21
PCB 11483-05 Jumper Locations	21
PCB 11502-02 Jumper Locations	21
Jumper Settings	22
J6 –PoE Reset Action on Fiber Link Loss	22
Grounding / Connections	22
Installation	23

Connect the Network Cables	24
Connect a Fiber Optic Network Cable to the NIC	24
Connect a Twisted-Pair Copper Cable to the NIC	24
Install the Driver Software	25
Teaming/Channel Bonding Feature(s)	25
QoS on VoIP Traffic	26
PXE (Preboot eXecution Environment) Boot Option	27
Troubleshooting	28
Troubleshooting Procedure.....	28
Testing Network Connectivity	29
Recording Model and System Information.....	29
Compliance Information	30
Declaration of Conformity	30
FCC regulations.....	30
Canadian regulations	30
European regulations	31
Translated Electrical Safety Warnings	32

Safety Warnings and Cautions

These products are not intended for use in life support products where failure of a product could reasonably be expected to result in death or personal injury. Anyone using this product in such an application without express written consent of an officer of Lantronix does so at their own risk and agrees to fully indemnify Lantronix for any damages that may result from such use or sale.



Attention: This product, like all electronic products, uses semiconductors that can be damaged by ESD (electrostatic discharge). Always observe appropriate precautions when handling.



Note: Emphasizes important information or calls your attention to related features or instructions.



Caution: Alerts you to a potential hazard that could cause loss of data or damage the system or equipment.



Warning: Alerts you to a potential hazard that could cause personal injury.

Product Description

The N-GXE-POE-xx-01 Network Interface Card (NIC) provides connectivity to a secure fiber network while also delivering power to a PoE Powered Device (PD), such as a VoIP phone with a copper UTP interface. It fully complies with all IEEE 802.3z and 1000Base-SX standards, providing up to 2000 Mbps full-duplex bandwidth capacity.

The N-GXE-POE-xx-01 is a Gigabit Ethernet Fiber PCIe NIC with one 1000Base-X fiber network interface port, and one 10/100/1000 RJ-45 PoE 100m port. The NIC is offered with standard profile and/or low-profile brackets (dependent upon part number). The N-GXE-POE-xx-01 lets your PC power a VoIP phone or other traditional copper Powered Device (PD) over a secure fiber network. The N-GXE-POE-xx-01 also can provide traffic switching functions between the copper and fiber ports, even when the PC is in a sleep mode.

The combined functions of PC connectivity and VoIP phone connectivity in one device saves installation time, expense, and the space of having two devices at the desktop. When VoIP traffic is filtered and prioritized by third-party devices like an Ethernet switch and IP phone, the N-GXE-POE-xx-01 will pass all tagged traffic, ensuring a high level of quality of service.

The N-GXE-POE-xx-01 works in environments where:

- the VoIP Phone system is capable of VLAN tagging, and
- the Host PC can pass un-tagged data traffic or it can generate a Tag.

Ordering Information

Part Number	Description
N-GXE-POE-LC-01	1000Base-SX 850nm Multimode LC [50/125um fiber: 550 m/1804 ft.] [62.5/125 um fiber: 220 m/722 ft.] Link Budget: 8.0 dB; plus 10/100/1000Base-T PoE+. N-GXE-POE-LC-01 ships with a standard profile bracket attached and an optional low-profile bracket included.
N-GXE-POE-SFP-01	Gigabit Ethernet PCIe NIC with a 1000Base-X Open SFP fiber port, plus a 100/1000Base-t PoE+ port. N-GXE-POE-SFP-01 ships with a standard profile bracket attached and an optional low-profile bracket included.
N-GXE-POE-SC-01(S)	Gigabit Ethernet PCIe NIC with (1) 1000Base-X fiber network interface port and (1) switched 10/100/1000Base-T port. N-GXE-POE-SC-01(S) ships only with a standard profile bracket attached.
N-GXE-POE-SC-02(L)	Gigabit Ethernet PCIe NIC with (1) 1000Base-X fiber network interface port and (1) switched 10/100/1000Base-T port. N-GXE-POE-SC-02(L) ships only with a low-profile bracket attached.

Optional Accessories (order separately)

Part Number	Description
N-POE-CBLKIT	Three piece cable kit for 12V power input connectivity options (Includes 27246, 28582, 28583)
28582	Cable assembly, 4 pin Molex to SATA 15 pin Female Power Adapter
28583	6 inch SATA Power Y Splitter Cable Adapter-M/F
27246	Cable assembly, 4 pin Molex to ATX Power Cable Adapter
SFP+ Modules	See the Lantronix SFP webpage for our MSA compliant SFPs and SFP+

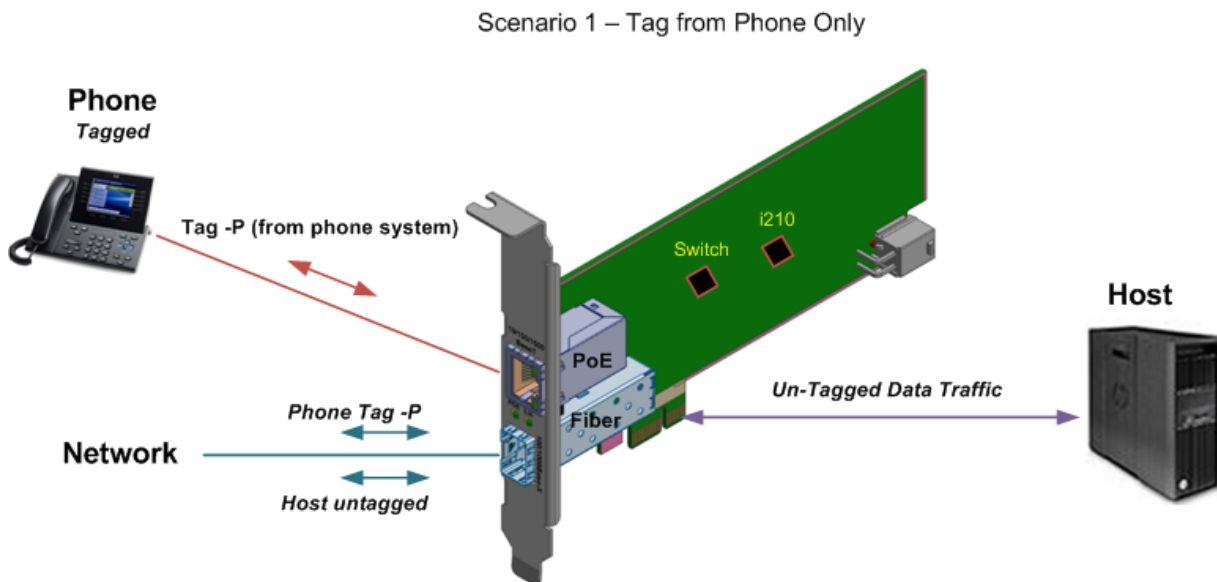
Application Scenarios

The N-GXE-POE-xx-01 is installed in a PC to connect the PC to the Ethernet network through the Fiber port, and connects a PD through the PoE copper (RJ-45) port. This turns a PC with the N-GXE-POE-xx-01 installed into a PSE device.

When you connect VoIP phones to your network PCs, you must separate Voice traffic from Data traffic using a VLAN, since Voice traffic needs a higher priority than Data traffic. Note that you can use Windows' Device Manager to access the Intel utility to set the VLAN ID for the PC; this will forward traffic to any port with the same VLAN ID.

Scenario 1 – Tag from Phone Only

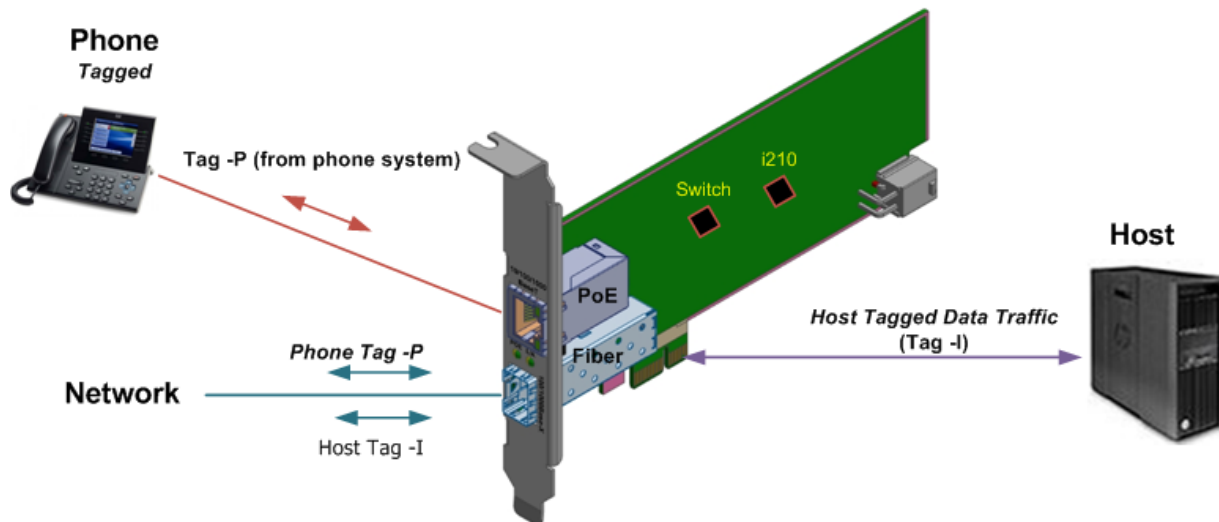
The figure below shows a VoIP environment, with the Tag (labeled “Tag –P” below) coming from the IP phone system.



Scenario 2 – Tag from Phone and Host PC

The figure below shows a VoIP environment, with possible VLAN configuration, with the Tag (labeled “Tag -P” below) coming from the IP phone system and the Tag (labeled “Tag -I”) coming from the PC Host.

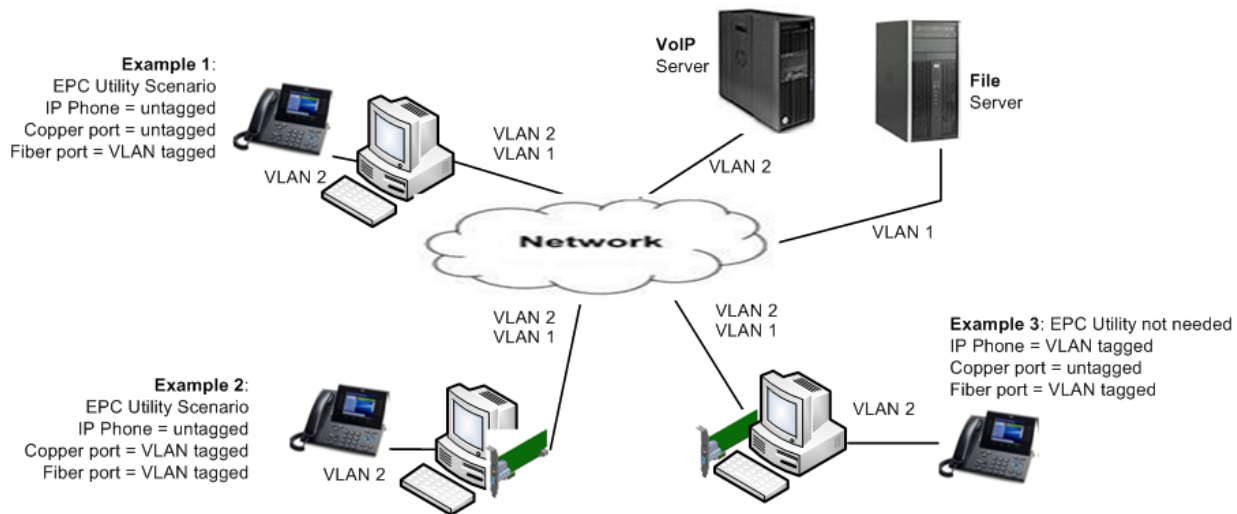
Scenario 2 – Tag from Phone and Host PC



Tagging from the fiber NIC (N-GXE-POE-xx-01) is an option provided using the EPC (Ethernet Packet Controller) Utility, N-POE-EPC, which can be downloaded from the Lantronix [website](https://www.lantronix.com/) (login required). This utility is required for applications that use VoIP phones that don't tag traffic, but whose traffic needs to be VLAN tagged.

Scenario 3 -Tags Stripped to Phone (and Host)

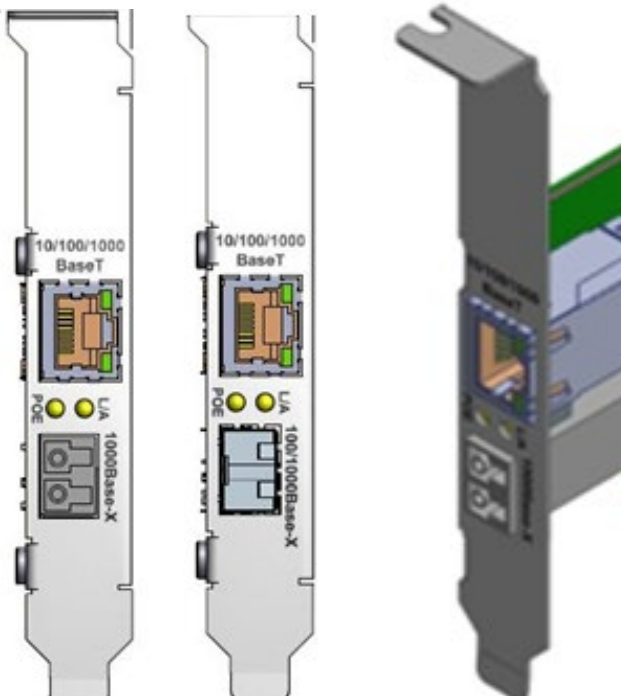
The figure below shows a VoIP environment, with possible VLAN configurations (using the optional EPC Utility to send Ethernet frames to the switch).



The EPC (Ethernet Packet Controller) Utility, N-POE-EPC, which can be downloaded from the Lantronix [website](https://www.lantronix.com/) (login required). This utility is required for applications that use VoIP phones that don't tag traffic, but whose traffic needs to be VLAN tagged.

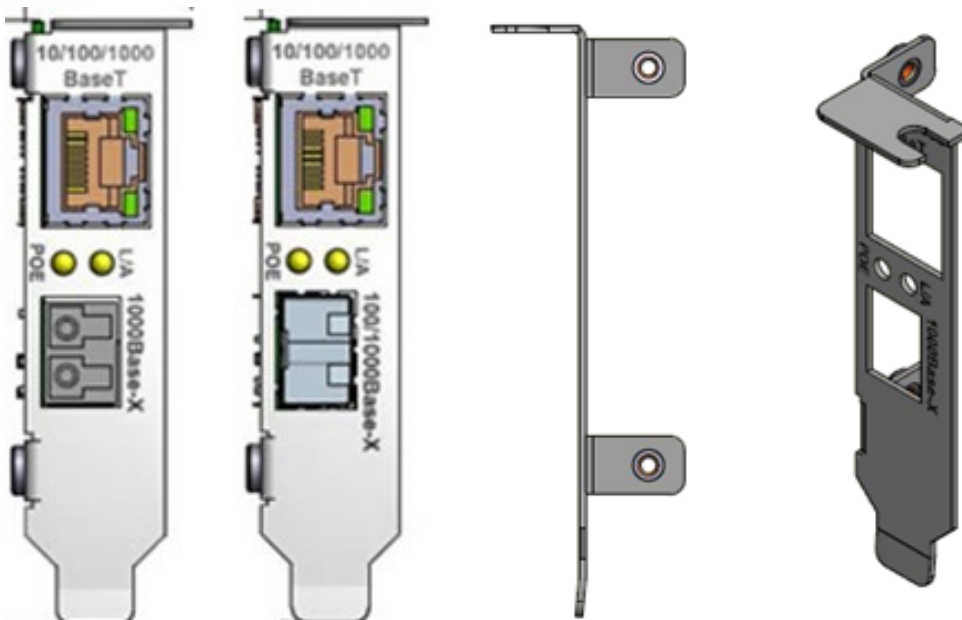
Standard (High-Profile) Bracket

N-GXE-POE-LC-01, N-GXE-POE-SFP-01 and N-GXE-POE-SC-01(S) ship with a standard profile bracket attached.



Low-Profile (LP) Bracket (included option on some models)

The N-GXE-POE-SC-02(L) ships with a low-profile bracket attached; an optional low-profile bracket is included with N-GXE-POE-LC-01 and N-GXE-POE-SFP-01.



OS Support

- Windows 7
- Windows 8
- Windows 8.1
- Windows 10
- Windows Server 2003
- Windows Server 2008
- Linux

Features

- Independent VLAN support for both ports.
- Each port can accept tagged traffic from different VLANs; the two ports act like switch ports, which allow VoIP traffic to be communicated downstream over the fiber network link.
- Supports PCIe x1 bus
- Compliant with PCIe Rev 2.1 Interface
- Supports Jumbo Frames
- Supports High Level VLAN Filtering function
- Supports IP headers and TCP/UDP checksum offload
- Wake-on-LAN (WOL) power management
- PXE 2.1 Boot ROM supported
- ACPI 2.0 Link Status LED for each port
- Link status LED for each port
- Link Pass Through (LPT) is permanently enabled; the loss of the fiber link will cause the loss of the copper link. The copper link will not be established until the fiber port has a valid link.

Specifications

The N-GXE-POE-xx-01 was designed to the following specifications.

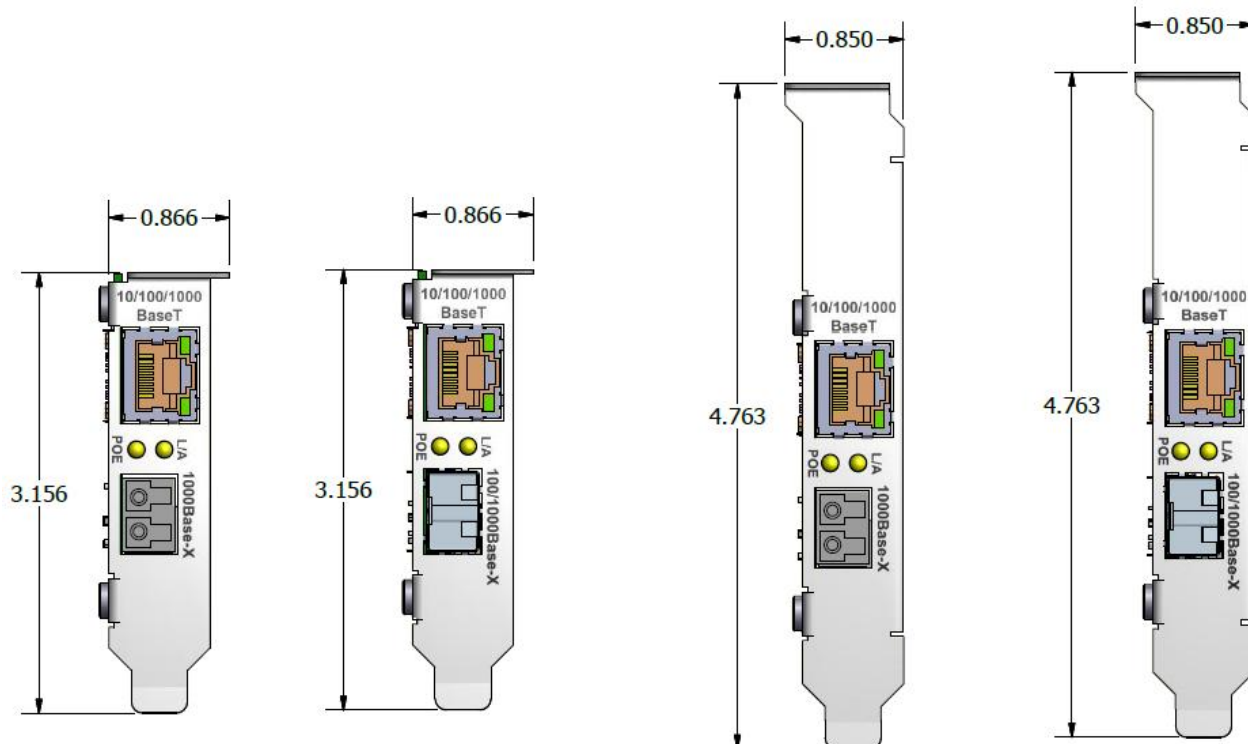
Standards compliance	IEEE 802.3-2000, IEEE 802.3z, IEEE 802.3x, IEEE 802.1Q, IEEE 802.1p, IEEE 802.3ab, IEEE 802.3af, IEEE 802.3at
Regulatory Compliance for Emission	EN55022 Class B, CE
Regulatory Compliance for Immunity	EN55024
Safety Compliance	UL Pending
Power Consumption	3.2W PCIe, 42W PoE+
Power Source	PC power supply, PCIe bus plus 12V aux connector
Size	6.25" x 2.62" x 0.87" (W x L x H) PCB without bracket
Weight	0.55 lbs (0.25 kg)
Operating Temperature	0 to 50 degrees C
Storage Temperature	-15 to 65 degrees C
Altitude	0-10,000 feet
Operating Humidity	5% to 95% (non-condensing)
MTBF	Greater than 260,500 MIL-HDBK-217F Hours; Greater than 716,375 Bellcore Hours

For the most current N-GXE-POE-xx-01 information, see the related [Product Page](#).

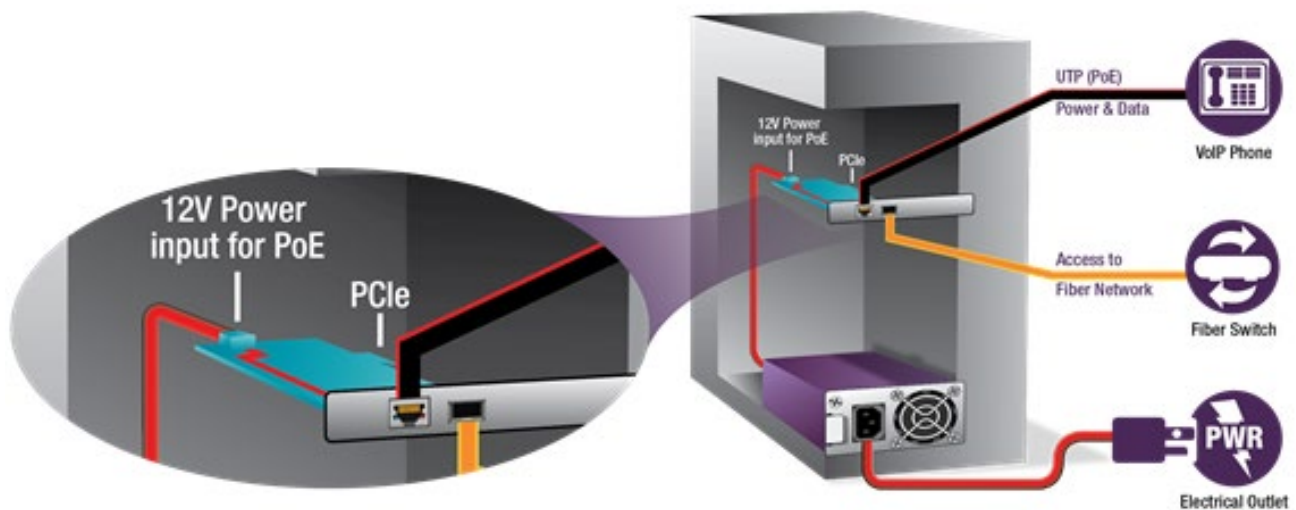
Dimensions

Standard (High-Profile) Bracket: 4.763 in. x 0.850 in. (120.9802 mm x 21.59 mm)

Low-Profile (LP) Bracket: 3.156 in x 0.866 in (80.1624 mm x 21.9964 mm)



Installation Example



Cable Descriptions

Many PCs will already have the necessary cabling and connection needed for the PoE NIC. Optional cable/connection accessories are available in case the PC is not already equipped for the PoE NIC to be installed. The optional cable/connection accessories are described in the [Optional Accessories](#) section on page 5 and are shown below. Note that the N-POE-CBLKIT provides all three cables shown below and is typically used for pre-sales proof-of-concept. After that, just one of the cables is typically needed.

WARNING - Do Not Plug 12V into Connector with PC turned On. This may blow input protection fuse F2 (Bel Fuse C1Q 7).

Note: if you are not using PoE, do not connect a PoE cable, as this will increase power consumption unnecessarily.



PN 28582: Molex 4-Pin Male to SATA 15-Pin Female Power Adapter



PN 28583: SATA Power Y Splitter Cable Adapter - M/F - 6 In.



PN 27246: MOLEX TO 4-PIN 12V CPU POWER ADAPTOR 6" Cable

Copper Cable Requirements

For type 2 loads (25.5W PoE+), Category 5/class D or better cable is required.

Standard PoE Parameters

Property	802.3at Type 2
Power available at PD	25.50 W (1)
Max. power delivered by PSE	30.0 W
Voltage range (at PSE)	50.0–55.0 V
Voltage range (at PD)	42.5–55.0 V
Maximum current	600 mA
Maximum cable resistance	12.5 Ω (Category 5)
Power management	Four power class levels negotiated at initial connection or 0.1 W steps negotiated continuously.
Derating of max. cable ambient operating temp.	5°C with one mode (two pairs) active.
Supported cabling	Category 5. More stringent cable specification allows assumption of more current carrying capacity and lower resistance (20.0 Ohms for Category 3 versus 12.5 Ohms for Category 5).
Supported PoE mode	Mode A

Notes:

1. Most switched power supplies within the powered device will lose another 10 to 25% of the available power.
2. More stringent cable specification allows assumption of more current carrying capacity and lower resistance (20.0 Ohms for Category 3 versus 12.5 Ohms for Category 5).

Cisco IP Phones' PoE

The following link classifies Cisco IP Phones with their PoE requirements:

<http://www.cisco.com/c/en/us/support/docs/voice-unified-communications/unified-ip-phone-7900-series/97869-poe-requirement-faq.html>

802.3at Summary of Electrical Isolation Requirement

This section provides information from IEC Reference number [IEC 60950-21:2002\(E\)](#).

See http://webstore.iec.ch/preview/info_iec60950-21%7Bed1.0%7Den_d.pdf for the full document.

33.4.1 Isolation

PDs and PSEs shall provide isolation between all accessible external conductors, including frame ground (if any), and all MDI leads including those not used by the PD or PSE. Any equipment that can be connected to a PSE or PD through a non-MDI connector that is not isolated from the MDI leads needs to provide isolation between all accessible external conductors, including frame ground (if any), and the non-MDI connector. Accessible external conductors are specified in subclause 6.2.1 b) of IEC 60950-1:2001.

This electrical isolation shall withstand at least one of the following electrical strength tests:

- a) 1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.
- b) 2250 V dc for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.
- c) An impulse test consisting of a 1500 V, 10/700 μ s waveform, applied 10 times, with a 60 s interval between pulses. The shape of the impulses shall be 10/700 μ s (10 μ s virtual front time, 700 μ s virtual time of half value), as defined in IEC 60950-1:2001 Annex N.

There shall be no insulation breakdown, as defined in subclause 5.2.2 of IEC 60950-1:2001, during the test. The resistance after the test shall be at least 2 M Ω measured at 500 V dc.

Conductive link segments that have differing isolation and grounding requirements shall have those requirements provided by the port-to-port isolation of network interface devices (NID).

33.4.1.1 Electrical isolation environments

There are two electrical power distribution environments to be considered that require different electrical isolation properties. They are as follows:

- **Environment A:** When a LAN or LAN segment, with all its associated interconnected equipment, is entirely contained within a single low-voltage power distribution system and within a single building.
- **Environment B:** When a LAN crosses the boundary between separate power distribution systems or the boundaries of a single building.

N-GXE-POE-xx-01 PoE

The N-GXE-POE-xx-01 uses a single power sourcing equipment controller designed for use in IEEE 802.3 Type 1 and Type 2 (high power) compliant Power over Ethernet systems.

The device provides robust protection against external faults, and includes advanced power management features, including current and voltage readback and programmable thresholds. Its PD detection circuitry minimizes false PD detection while supporting legacy phone operation.

802.3af Classification

A PD can optionally present a classification signature to the PSE to indicate the maximum power it will draw while operating. The IEEE specification defines this signature as a constant current draw when the PSE port voltage is in the VCLASS range (between 15.5V and 20.5V), with the current level indicating one of five possible PD classes. For example, a typical PD load line, starting with the slope of the 25kΩ signature resistor below 10V, then transitioning to the classification signature current (e.g., Class 3) in the VCLASS range. The table below shows the possible classification values:

Class	Result
Class 0	No Class Signature Present; Treat Like Class 3
Class 1	3W
Class 2	7W
Class 3	13W
Class 4	25.5W (Type 2)

DC Disconnect

DC Disconnect detection involves measurement of current. A disconnected PD stops consuming current, which can be inspected by the PSE. So the PSE must disconnect power within 300 to 400 ms from when the current flow stops.

DC modulation allows a PD to draw a minimum current so it cannot be identified as disconnected. With DC modulation implemented, the PD can consume no current (and no power) for approximately 80% of the time and still remain powered.

N-GXE-POE Behavior when PC enters a specific Power State

Various PCs support various level of sleep. You may need to configure sleep levels to work with the NIC.

System Power State		N-GXE-POE		
ACPI State	Power State	POE power	NIC Ports with WOL disabled	NIC Ports with WOL enabled
S0	Working	Available	Available	Available
S1	Sleep (CPU clock/Bus clock are off)	Available	Available	Available
S2	Sleep (Processor off/System cache lost)	NA	NA	Available
S3	Sleep(Processor off/Portion of Mother board off)	NA	NA	Available
S4	Hibernate	NA	NA	Available
S5	Soft Off	NA	NA	Available
G3	Mechanical Off	NA	NA	NA

Determining the PC Sleep State

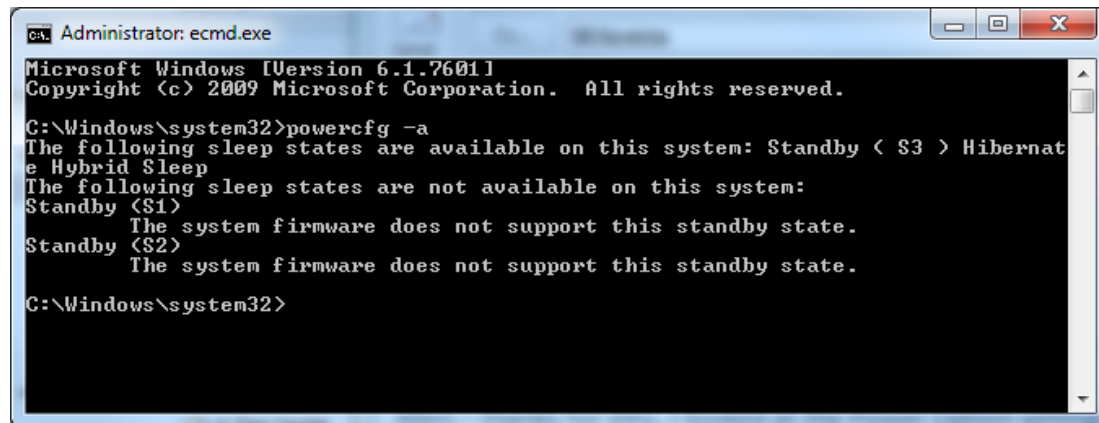
Determining the sleep states of a PC depends on the OS (Windows, Linux).

Windows:

For PC power management information see the Energy Star web page at http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_mgt_users.

For Microsoft Windows information on the Sleep state, Wake-on-LAN behavior, and related topics see the System Power States article at [https://msdn.microsoft.com/en-us/library/windows/desktop/aa373229\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/aa373229(v=vs.85).aspx).

Windows users can tell what power states their system supports with the following command line:



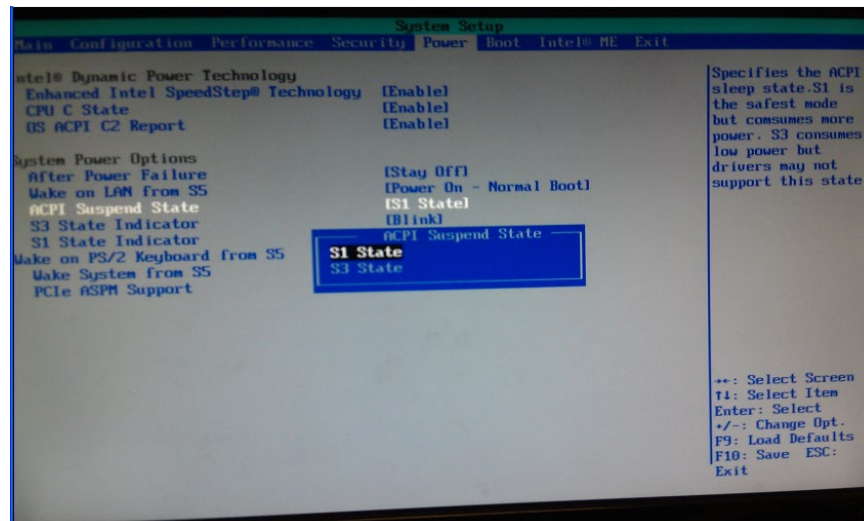
```

Administrator: cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\system32>powercfg -a
The following sleep states are available on this system: Standby (S3) Hibernat
e Hybrid Sleep
The following sleep states are not available on this system:
Standby (S1)
    The system firmware does not support this standby state.
Standby (S2)
    The system firmware does not support this standby state.

C:\Windows\system32>
  
```

A sample BIOS screen is shown below:



Linux:

Check the manual page provided with your distro. For additional information see:

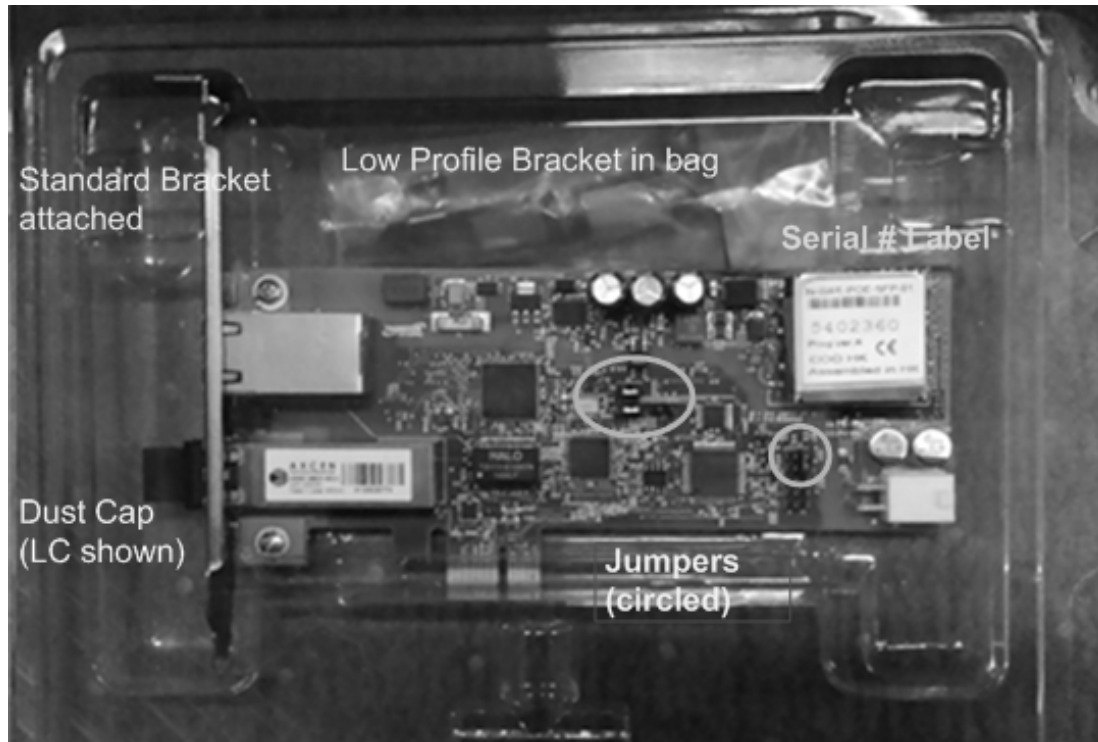
<https://www.kernel.org/doc/Documentation/power/states.txt>

<http://acpi.sourceforge.net/documentation/sleep.html>

<http://stackoverflow.com/questions/1475683/linux-process-states>

Unpacking

The N-GXE-POE-xx-01 is shipped in an ROHS-compliant anti-static clamshell as shown below.



Package Contents

Check with your sales representative if you did not receive:

- ❑ One N-GXE-POE-xx-01 PCIe NIC with the appropriate bracket (see Note below)
- ❑ One Documentation Postcard

You may also have received one or more optional cable/connection accessories. See [Cable Descriptions](#) on page 12 for details. Save the packaging for possible future use.

Note: the appropriate bracket is model dependent:

N-GXE-POE-LC-01 ships with a standard profile bracket attached and an optional low-profile bracket included.

N-GXE-POE-SFP-01 ships with a standard profile bracket attached and an optional low-profile bracket included.

N-GXE-POE-SC-01(S) ships only with a standard profile bracket attached.

N-GXE-POE-SC-02(L) ships only with a low-profile bracket attached.



System Requirements

Before installing the N-GXE-POE-xx-01, make sure your system meets these requirements:

- ☐ PC with a supported OS installed
- ☐ One open PCIe slot
- ☐ At least 128 MB RAM (minimum)
- ☐ Power supply that can provide PoE requirement of 12V/3A on the mini-4 pin power connector

Pre-Installation Checklist

Before installing your N-GXE-POE-xx-01, verify the following:

1. Check that your computer has an appropriate open PCIe slot.
2. Check that the power supply on your computer has a 12V power connector.
3. Verify that your system is using the latest BIOS.
4. When you download the driver software and WinPcap from the Lantronix website, record the path.
5. If your system is active, shut it down. **Do not** install the NIC until system power is completely removed. When system shutdown is complete, power OFF and unplug your system.
6. Check if your system already has the necessary cabling and connection needed for the PoE NIC. If not, see [Cable Descriptions](#) on page 12.
7. Holding the N-GXE-POE-xx-01 by the edges, remove it from its shipping package and place it on an antistatic surface.
8. Check the N-GXE-POE-xx-01 for signs of damage, particularly on the PCB edge connector.

Caution: Never attempt to install a damaged NIC card. If the N-GXE-POE-xx-01 is damaged, report it to Lantronix.

Safety Precautions



Warning: Risk of Electrical Shock. Disconnect power before installing the NIC. Failure to observe this warning could result in an electrical shock.



CAUTION Only qualified persons should install the NIC. Failure to observe this caution could result in poor performance or damage to the equipment.



CAUTION Install the NIC in an operating environment where the temperature range is from -40°C to $+50^{\circ}\text{C}$ (-104°F to $+122^{\circ}\text{F}$), with relative humidity of 5% to 90% non-condensing. Failure to observe this caution could result in poor equipment performance.



CAUTION DO NOT install the NIC in areas where strong electromagnetic fields (EMF) exist. Failure to observe this caution could result in poor equipment performance and data corruption.



WARNING Disconnect power before installing and wiring the NIC for power. Failure to observe this warning could result in an electrical shock.



Attention: this product, like all electronic products, uses semiconductors that can be damaged by ESD (electrostatic Discharge). Always observe appropriate precautions when handling.

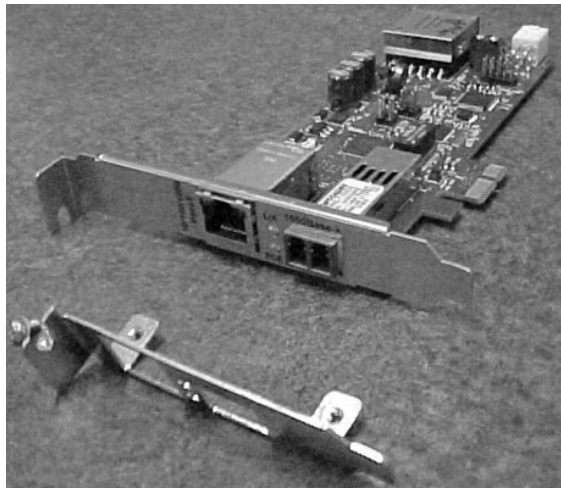
Replacing HP Bracket with LP Bracket (Optional on N-GXE-POE-LC-01 & N-GXE-POE-SFP-01)

The N-GXE-POE-LC-01 and N-GXE-SFP-01 ship with the High-Profile (HP) bracket attached. If your system requires a low-profile bracket, you may need to replace the bracket.

The procedure below describes how to remove the HP bracket from the N-GXE-POE-LC-01 or N-GXE-POE-SFP-01 and replace it with the low-profile (LP) bracket. You can also use this procedure to remove the LP bracket and replace it with the HP bracket.

To replace the HP bracket with the LP bracket, perform these steps. See the figure below.

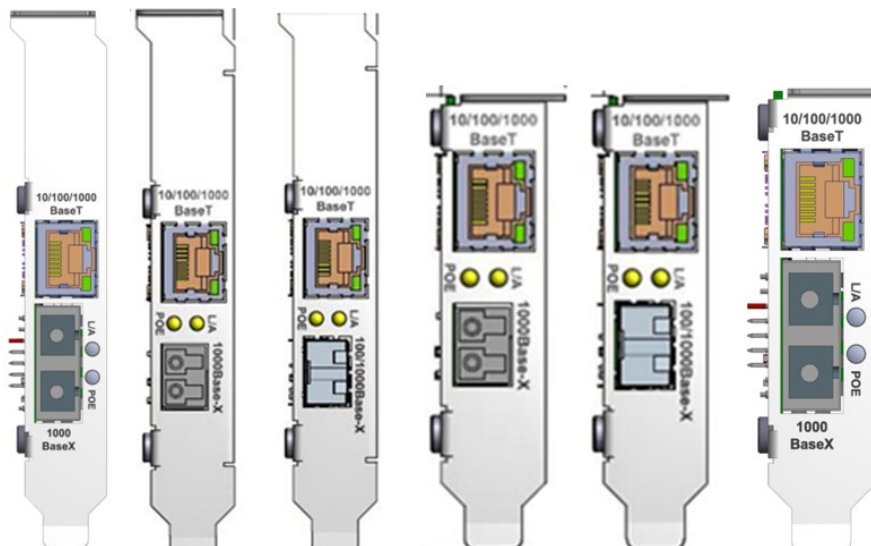
1. Remove and save the screws that attach the bracket to the N-GXE-POE-LC-01 or N-GXE-POE-SFP-01.
2. Carefully place the bracket on the NIC.
3. Replace the screws removed in step 1.

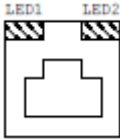



Bracket Attachment

LED Descriptions

The N-GXE-POE-xx-01 diagnostic LEDs are shown and described below.



LED	Color	Function
L/A	Bi-color (green/yellow)	Fiber Link/Activity.
POE	Bi-color (green/yellow)	<p>POE blink code:</p> <p>Green LED: Solid - POE source power on the NIC is good and available for use by a valid PD; PD Signature is good and PD is Powered. OFF - POE power is not present (Amber is OFF all the time). See Amber LED blink code below.</p> <p>Amber LED: Blink Off 1 time - PD Signature is too Low. Blink Off 2 times - PD Signature is too High. Blink Off 3 times - Reserved. Blink Off 4 times - PD Signature Capacitance is too high. Blink Off 5 times - Problem with POE 54V or PD error detected. 12 Volts not detected. Blink Off 6 times - Reserved. Blink Off 7 times - Over current. OFF - PD Signature is shorted (non- POE device connected) or is open (not a PD device).</p>
LED1	Bi-color (green/yellow)	<p>TP Link/Activity/Speed: ON = Link, OFF = No link BLINK = Activity Green = 1000Mbps, Yellow = 100Mbps, OFF = 10Mbps</p> 
LED2	Bi-color (green/yellow)	<p>TP Duplex: Green = Full duplex Yellow = Half duplex</p> 

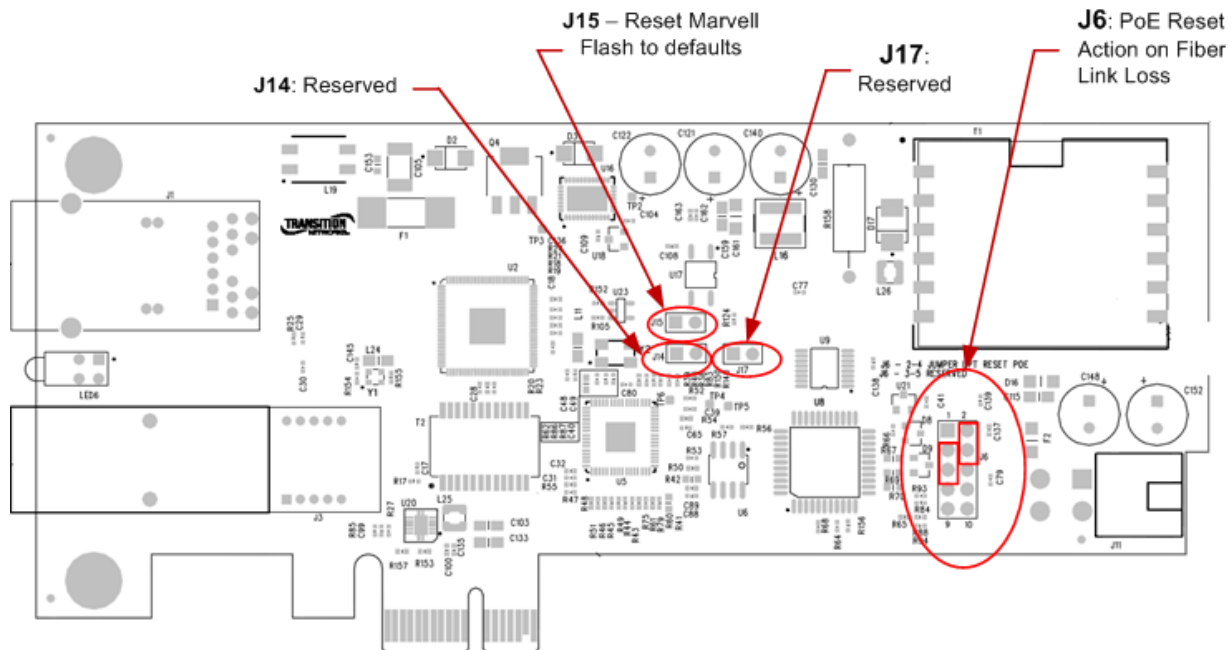
The PSE status LED will Alternate the Green Status and the Amber LED Status every 4-5 seconds when conditions do not meet the Solid Green LED criteria above.

The **Green** LED indicates the status of the PSE Ports ability to power a PD device and PD device is good.

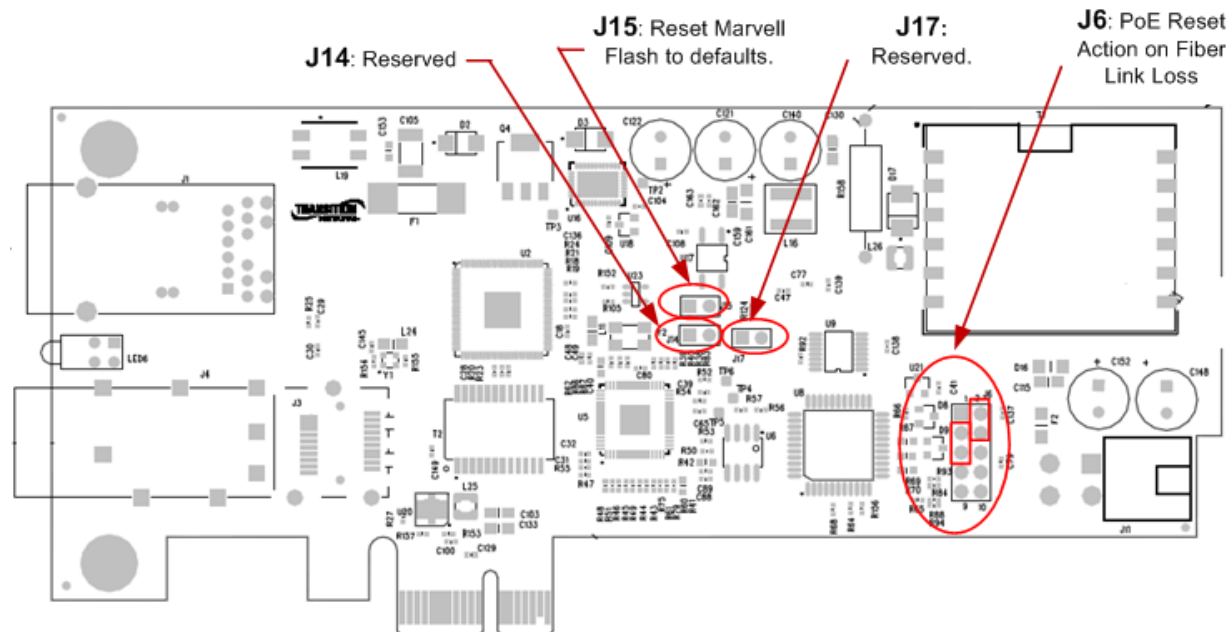
The **Amber** LED indicates any error status as seen by the PSE Port.

Jumper Locations and Settings

PCB 11483-05 Jumper Locations



PCB 11502-02 Jumper Locations



Jumper Settings

J6 –PoE Reset Action on Fiber Link Loss

Jumper J6.2-J6.4: 0-LPT normal 1- LPT reset POE (default).

With Jumper J6.2-J6.4 installed and fiber port loses link, the PoE power will be cycled on the copper (TP) port.

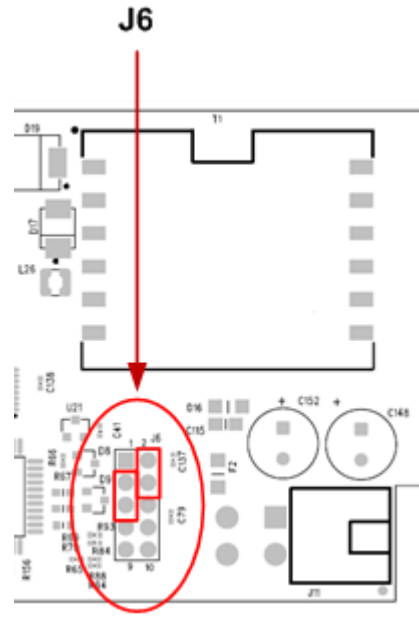
With jumper J6.2-J6.4 removed, and fiber port loses link, the PoE power will not be cycled on the copper (TP) port (PoE power not affected).

Jumper J6.3 – J6.5: Reserved. Default = jumper removed.

J14 – default = jumpered/enabled. Removing jumper disables possibility to change switch configuration through the EPC host software utility, which configures the switch to tag VLAN ID's for untagged VoIP phone applications. Contact Lantronix for additional information.

J15 – reset Marvell Flash to defaults, **on** = normal (supplied header), **off** = reset

J17 – Reserved.



Grounding / Connections

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), e.g., MIL-L100i, L1000i-at, between this switch's PSE port and link partner PD port.

Installation

The following instructions apply to installing the N-GXE-POE-xx-01 in most systems. Refer to the manuals that were supplied with your system for details about performing these tasks on your particular system. Ensure that the PC enclosure provides sufficient airflow, especially if PoE+ loads will be powered over extended periods.

Caution: Wear a grounding device and observe electrostatic discharge precautions when installing the N-GXE-POE-xx-01 in a system. Failure to observe this caution could result in damage to the N-GXE-POE-xx-01.

To install the N-GXE-POE-xx-01, perform the following procedure:

1. Review the “[Pre-Installation Checklist](#)” and “[Safety Precautions](#)” sections of this manual.
2. Before installing the N-GXE-POE-xx-01, ensure that system power is OFF, the power cord is unplugged from the power outlet, and that proper electrical grounding procedures have been followed.

Warning: High voltage inside the system presents a safety hazard. Make sure that the system power is off before removing the cover. **Caution:** [unplug and disconnect the PC and then wait for 15-20 seconds before plugging the PoE NIC into the PC.](#)

3. Remove the system cover and select an empty PCIe slot. If you do not know how to identify a PCIe slot, refer to your system documentation.
4. Select an empty, non-shared PCIe slot and remove the blank faceplate from the PC chassis. Keep the faceplate in a safe place as you may need it for future use.

Note: If you cannot locate or know how to find a PCIe slot, refer to the manual that came with your system.

5. Remove the N-GXE-POE-xx-01 from the shipping package and store the packing material in a safe location.
6. If a power cable not available in the PC, refer to the Optional N-POE-CBLKIT. If required, connect one of the three optional power cables from the power supply on your system to the 4-pin mini-fit junior power connector receptacle on the N-GXE-POE-xx-01.
7. Applying even pressure at both corners of the N-GXE-POE-xx-01, push the N-GXE-POE-xx-01 until it is firmly seated in the PCIe slot. Make sure the N-GXE-POE-xx-01 is securely seated.

Caution: Do not use excessive force when seating the N-GXE-POE-xx-01, as the force may damage the system or the N-GXE-POE-xx-01. If the N-GXE-POE-xx-01 resists seating, remove it from the system, realign it, and try again.

8. Secure the N-GXE-POE-xx-01 to the chassis with a Phillips-head screw (not provided).
9. Replace the system's cover and secure it with the screws removed in step 3 of this procedure.
10. Disconnect any personal antistatic devices.
11. Power the system on.

Note: If you installed the N-GXE-POE-xx-01 before installing the driver software, the *Found New Hardware Wizard* may launch. For more information, see [Install the Driver Software](#) on page 25.

When the system returns to proper operation, the adapter hardware is fully installed. Next, connect the network cables. See [Connect the Network Cables](#) below.

Connect the Network Cables

The N-GXE-POE-xx-01 is equipped with a fiber optic port and a copper port. The fiber optic port is to connect to the network; the copper port is to connect to a PoE Powered Device (PD), such as a VoIP phone. To connect the N-GXE-POE-xx-01 to the network and PD, you must have a fiber optic cable with the appropriate connector and a twisted-pair copper cable. Connect the fiber cable first for better PC status message reporting.

POE NIC Port Operation: by default, the RJ45 POE port on the NIC is a controlled port and will only be functional when the LC fiber port is connected to a link source. The fiber port must have a link partner in order for link to appear on PC (and for software RMU to work). Connecting a link partner to the TP/copper interface will always indicate link LED on the RJ45, but link will not appear on PC until Fiber cable link partner established

Connect a Fiber Optic Network Cable to the NIC

To connect a fiber optic network cable to the NIC, perform the following steps:

1. Prepare a fiber optic cable with an appropriate connector.

Warning: The fiber optic port contains a Class 1 laser device. When the ports are disconnected, always cover them with the provided plug. Exposed fiber optic ports may cause skin or eye damage.

2. Remove a rubber plug from the N-GXE-POE-xx-01.
3. Connect one end of the cable to the N-GXE-POE-xx-01.
4. Connect the other end of the cable to the appropriate Ethernet network port or fiber optic port.

Note: After the cable is properly connected at both ends, the N-GXE-POE-xx-01 LED should be functional. See LED Descriptions on page 19 for a description of LED operation.

Connect a Twisted-Pair Copper Cable to the NIC

To connect a twisted-pair copper cable to the NIC, perform the following procedure:

1. Prepare a twisted-pair copper cable.
2. Connect one end of the cable to the N-GXE-POE-xx-01.
3. Connect the other end of the cable to a PD, such as a VoIP phone.

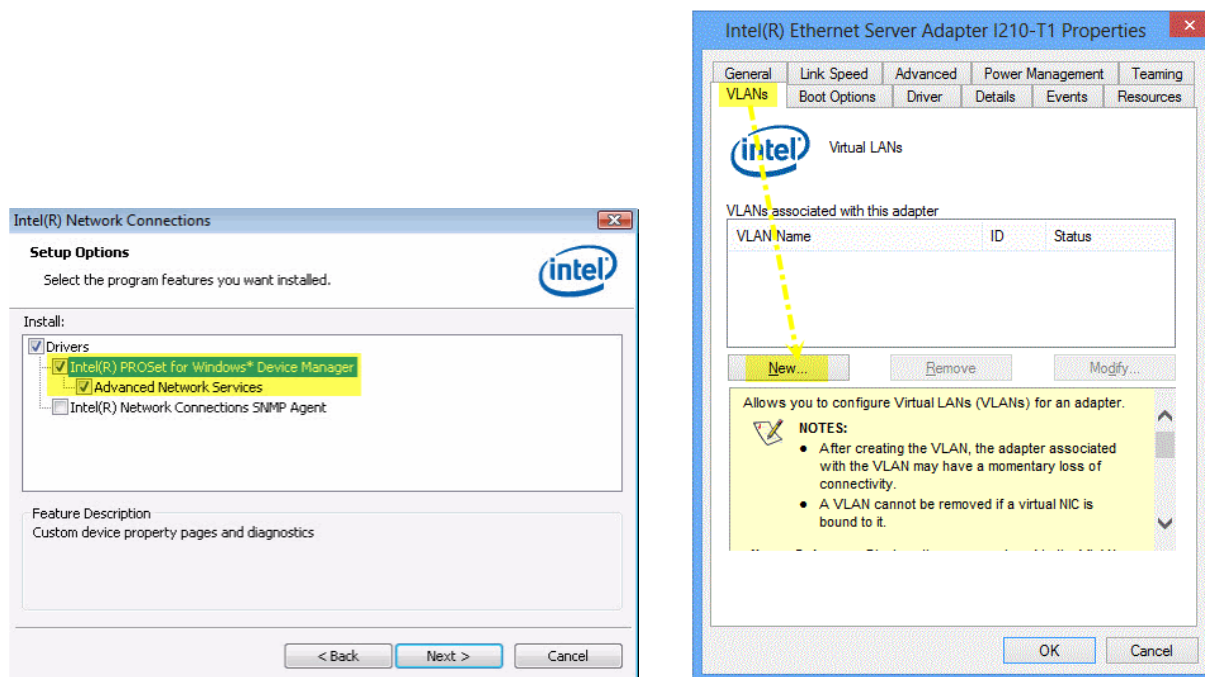
Note: After the cable is properly connected at both ends, the N-GXE-POE-xx-01 LED should be functional. See [LED Descriptions](#) on page 19 for a description of LED operation.

Install the Driver Software

To install the provided driver, see the related Readme file from the [download source](#). Topics include:

- ☐ Overview
- ☐ Download the Driver Software
- ☐ Access the Device Manager
- ☐ Install the Driver Software
- ☐ Update the Driver Software
- ☐ Perform the Silent Installation
- ☐ Modifying Advanced Properties
- ☐ Uninstalling the Driver Software
- ☐ Uninstalling the Driver Software Using Device Manager
- ☐ Uninstalling the Driver Software Silently

The “Intel® Advanced Network Services (ANS) VLANs” Article ID: 000005677 at <http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000005677.html> has a good introduction to ANS, VLANs, software downloads, VLAN types (Tagged and Untagged), and Implementation considerations. Sample screens are provided below.



Teaming/Channel Bonding Feature(s)

Teaming: used to group multiple physical ports to allow fault tolerance, load balancing, or link aggregation features to a group of ports.

Linux bonding driver: provides a method for aggregating multiple network interfaces into a single logical "bonded" interface. The behavior of the bonded interfaces depends upon the mode; generally speaking, modes provide either hot standby or load balancing services. Also, link integrity monitoring may be performed.

References:

1) N-GXE-POE-xx-01 will appear as an "Intel® I210 Gigabit Network Connection" and will behave as described in the following Intel adapter support page, documentation, drivers/utilities:

<https://downloadcenter.intel.com/search?keyword=i210-at>.

Note: Intel provides 32- or 64-bit installer called PROWinxx.exe, which installs the appropriate Windows driver. Individual drivers for all supported operating systems are available from the Intel "CD" release, following the instructions provided. For Linux drivers/Readme see the Intel [download center](#).

2) How to aggregate multiple cards (teaming): <http://www.intel.com/support/network/sb/cs-009747.htm> .

3) BIOS - UEFI references: <http://uefi.org/uefi>. The UEFI Forum is a community effort by many companies in the personal-computer industry to modernize the booting process. UEFI stands for "Unified Extensible Firmware Interface". The UEFI specification defines a new model for the interface between personal-computer operating systems and platform firmware.

QoS on VoIP Traffic

The default behavior if the NIC's switch chip is not configured:

- If the packet enters the NIC with an 802.1Q tag it will use it to assign the internal QPRI (Queue Priority).
- If the packet does not have an 802.1Q tag the NID will use the diffserve priority to assign the QPRI.
- If there is no layer 2 or layer 3 priority assigned to the frame the NIC can internally assign a priority based on the ingress port. Internally, that priority will be used to assign the QPRI. If the NIC adds a tag, the priority of the tag will be the priority assigned by the ingress port.

PXE (Preboot eXecution Environment) Boot Option

Overview

The UEFI network driver for Intel® Ethernet Network Connection enables network connectivity under UEFI. It can be used in conjunction with UEFI software components available from other sources to perform network functions in the UEFI environment. Intel's UEFI network driver supports Intel's FLB3 file format. This format extends the header information in the FLB file, enabling more than 16 image types, including a combined Option ROM and NVM image. **Note:** If you update your adapter's NVM image, you must completely power cycle your system, including removing main power, for the update to take effect.

Supported UEFI Implementations

The UEFI network driver supports UEFI platforms based on the following UEFI/EFI specifications:

- UEFI 2.3 (<http://www.uefi.org>)
- UEFI 2.2
- UEFI 2.1
- UEFI 2.0
- EFI 1.10 (<http://www.intel.com/technology/efi>)

UEFI driver binaries are provided for 64-bit (x86-64), and Itanium processor family platforms.

Installing the UEFI Network Driver Option ROM Using PROSet

Intel® PROSet for Windows Device Manager can install the UEFI network driver on an Intel network adapter's option ROM. The UEFI network driver will load automatically during system UEFI boot when installed in the option ROM. UEFI specific*.FLB images are included on the CD release media. The "Boot Options" tab in Intel® PROSet for Windows Device Manager will allow the UEFI*.FLB image to be installed on the network adapter.

These FLB files are included on the release media:

- BAxyzX3.flb - Version x.y.zz of the PCI-E gigabit driver for x86-64
- BAxyzI3.flb - Version x.y.zz of the PCI-E gigabit driver for Itanium

Intel® PROSet for Windows Device Manager can only be used to program add-in Intel PCI-E network adapters. Refer to the PROSet documentation for detailed instructions.

Open Source option alternative: <http://ipxe.org/howto/romburning/intel>.

Add PXE boot/"Boot Agent" into NVM

To add PXE boot/"Boot Agent" into NVM, on top of the Intel template, see:

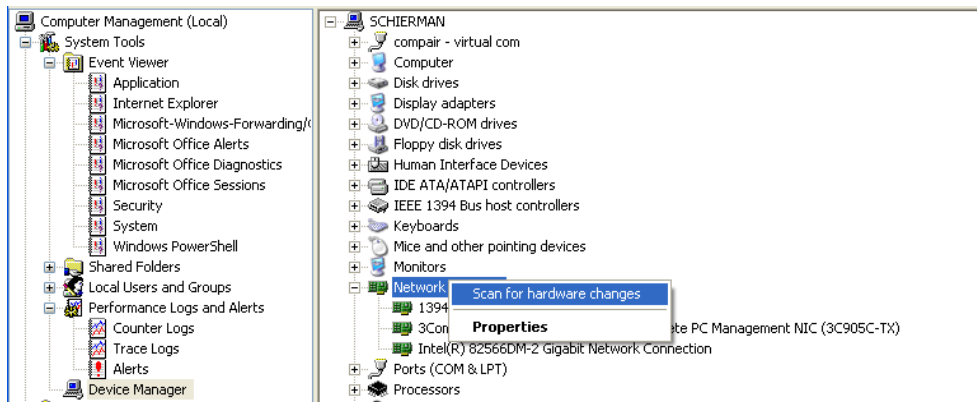
<http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000005992.html>
<https://downloadcenter.intel.com/download/19186/Intel-Ethernet-Connections-Boot-Utility-Preboot-Images-and-EFI-Drivers>

Troubleshooting

Troubleshooting Procedure

This section provides basic N-GXE-POE-xx-01 troubleshooting procedures. **Note:** hot swap 12V may result in blown fuse.

1. Verify the Product Description, Models, Features, and Specifications in the “[Introduction](#)” section starting on page 4.
2. Verify the procedures in the [Installation](#) section starting on page 21.
3. Make sure your particular model supports the function attempted. See [Features](#) on page 10.
4. Check the LEDs. See LED Descriptions on page 19.
5. Check the Jumper settings. See [Jumper Locations and Settings](#) on page 21.
6. Verify the Installation. Check the [System Requirements](#) on page 18.
7. Check that the cabling is appropriate, securely attached, and within cable length specs. See [Cable Descriptions](#) on page 11.
8. Reseat the NIC; insert NIC in another slot; check for incompatible or conflicting devices / settings.
9. Run Windows Device Manager and scan for changes.



10. Check that the PC's BIOS version is appropriate and update to the latest. See the PC documentation.
11. Check if the Driver version is appropriate and update to the latest. See [Install the Driver Software](#) on page 25.
12. PC power supply/cables with multiple power connector splices may cause issues by not capably delivering full 30W of power. Verify that the required power is being delivered to the NIC.
13. Verify that the link partner is active and can send/receive traffic; make sure partner settings match; verify that the port is enabled; try connecting to another port or link partner.
14. Run the PC diagnostics (e.g., HP PC diagnostic testing tool “lanconf”).
15. Record any specific error condition. See “[Recording Model and System Information](#)” below.
16. During PC boot up, if an error displays indicating a problem with the LAN adapter's NVM configuration. This is related to the PXE option ROM not being implemented and will not cause functional issues. This message can be ignored.
17. Contact Tech Support.

Testing Network Connectivity

Automatically detect and update drivers and software if you are connected to the Internet from the computer that needs updated drivers from <http://www.intel.com/support/network/sb/CS-031482.htm>.

Minimize the number of splices and the distance to the splice in the 12 V cable if PoE power is not being applied to the PD.

Recording Model and System Information

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

1. Record N-GXE-POE-xx-01 **model** information: Product ID: _____
Serial #: _____ Board Rev: _____
PCB Version: _____ MAC Address: _____
LED status: _____
2. Record the **System** information: Check your computer documentation for support information.
PC make and model: _____
Operating System: _____
BIOS version: _____
Configuration: _____
LED Status: _____
PC's Icon Tray indication: _____
PoE Powered Device(s): _____
3. Provide your **service contract** number: _____
4. Describe the failure: _____

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

6. What VoIP phone make and model? _____
7. What i210 driver version? _____
8. What ECP Utility VLAN settings/driver VLAN setting? _____



Compliance Information

Declaration of Conformity

Manufacture's Name: Lantronics, Inc.

Manufacture's Address: 48 Discovery, Suite 250, Irvine, California 92618 USA

Declares that the products: N-GXE-POE-SC-01(S), N-GXE-POE-SC-01(L), N-GXE-POE-SFP-01, N-GXE-POE-LC-01

Conforms to the following Product Regulations: FCC Part 15 Class B, EN 55032:2012, EN 55024:2010 Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU, IEC/EN 60950-1:2006+A2:2013, 2011/65/EU EN 50581:2012

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

FCC regulations

This equipment has been tested and found to comply with the limits for a Class B 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.

Canadian regulations

This digital apparatus does not exceed the Class B 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 B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European regulations

Warning

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

Achtung !

Dieses ist ein Gerät der Funkstörgrenzwertklasse B. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fall ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe B. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.



In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Lantronix will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.



CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.

Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EGMitgliedstaaten

verstösst gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

Translated 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 32nstallers 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 32nstallers 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

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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.