LANTRONIX®

N-GXE-xx-02
Gigabit Ethernet 1000BASE-SX
Network Interface Cards
User Guide

Intellectual Property

Patented: patents.lantronix.com; additional patents pending.

Warranty

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

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Disclaimer

Revision History

Date	Rev	Notes
12/13/18	A	Initial release at Rev A.
2/9/22	B	Initial Lantronix re-brand.
1216/22	C	Update product photos.

Contents

Product Description

The N-GXE-xx-02 Series is a Fiber Gigabit Ethernet to PCIe bus adapter that fully complies with all IEEE 802.3z and 1000Base-SX standards. It provides up to 2000 Mbps full-duplex bandwidth capacity to support high-end servers. In addition, with advanced functions like VLAN filtering packet processing, link aggregation, smart load balancing, failover, and Wake-on-LAN, the adapter provides enhanced performance, flexible configuration and secure networking for users in a standard-based environment. An LED indicator on the bracket displays link status, activity and speed.

Ordering Information

Part Number	Description
N-GXE-SC-02	1G Fiber NIC; 1000Base Fiber PCIe NIC; 850 nm multimode SC 62.5/125µm: 220M (722FT)/50/125µm 550m (1804ft). Standard bracket attached; LP bracket included. *
N-GXE-LC-02	1G Fiber NIC; 1000Base Fiber PCIe NIC; 850 nm multimode LC 62.5/125µm: 220M (722FT)/50/125µm 550m (1804ft). Standard bracket attached; LP bracket included. *
N-GXE-ST-02	1G Fiber NIC; 1000Base Fiber PCIe NIC; 850 nm multimode ST 62.5/125µm: 220M (722FT)/50/125µm 550m (1804ft). Standard bracket attached; LP bracket included. *
N-GXE-SFP-02	100/1000 Mbps Fiber PCIe NIC, open SFP. Supports both single mode and multi-mode SFP modules. (SFPs sold separately.) Standard bracket attached; LP bracket included.

* Typical maximum cable distance. Actual distance depends on the physical characteristics of the network installation.

Features

- Available with multimode SC, LC, or ST connector or open SFP cage
- Compliant with PCIe Rev.2.1 Interface
- Supports PCIe x1 bus
- PXE and UEFI boot
- Supports Jumbo Frames up to 9014 bytes
- IEEE 802.1Q VLAN support
- RoHS Compliance
- Supports IPv4 and IPv6

- High bandwidth 1000Mbps Network Speed (100/1000 Mbps with auto-negotiation for SFP version)
- Supports IEEE 802.3x Full-Duplex Flow Control
- IPv6 support for IP/TCP and IP/UDP RX checksum offload
- Fragmented UDP checksum offload for packet reassembly
- Link Aggregation Control Protocol (SLA and 802.3ad DLA)
- Full Wake on LAN (WOL) support
- Smart Load Balancing (SLB) and Failover support
- Supports TCP segmentation offload (up to 256 Kb)

Application Example
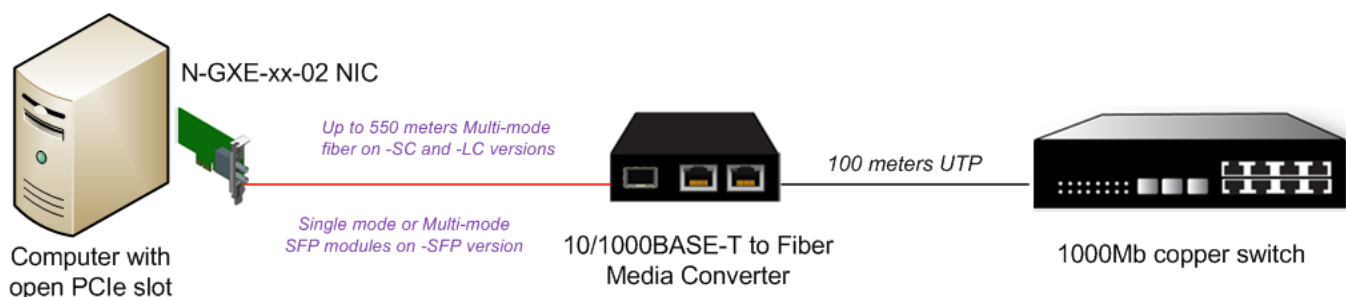
Installation

Package Contents

Before installing the NIC, verify that the package contains the following items:

- ☐ One N-GXE Series NIC with High Profile bracket installed
- ☐ One Low-Profile Bracket
- ☐ One Documentation Postcard

Notify your sales representative immediately if any of the above items are missing or damaged. Please save the packing materials for possible future use.

System Requirements

- PCI Express enabled computer system with available PCI Express slot
- Supported OS
- ACPI aware OS for support of remote wake-up / WOL
- The latest BIOS on your computer
- One open PCI-Express slot (v1.0a or newer), 1x, 4x, 8x, or 16x

Installation Overview

1. Make sure that you have the latest driver software for your NIC. See the online list of supported drivers.
2. Review the System Requirements.
3. Insert the NIC in the computer. See "Hardware Install Procedure" below.
4. Attach the fiber network cable.
5. Install the driver (if required).
6. On Windows systems, install the Intel PROSet software (if required).

If you have problems with the basic installation, see Troubleshooting on page 23.

Changing the Bracket (Optional)

The NIC ships with the Standard bracket attached; an optional low profile bracket is included. Use the following procedure to change brackets.

1. Ground yourself to dissipate any static charge.
2. Remove the two screws securing the standard bracket to the back side of the NIC.
3. Slide the standard bracket away from the NIC.
4. Slide the low profile bracket onto the adapter.
5. Attach the low profile bracket to the NIC using the two screws you removed in step 2.
6. Carefully tighten the screws until they are seated. Do not over-tighten the screws.
   You can re-attach the standard bracket later if necessary.
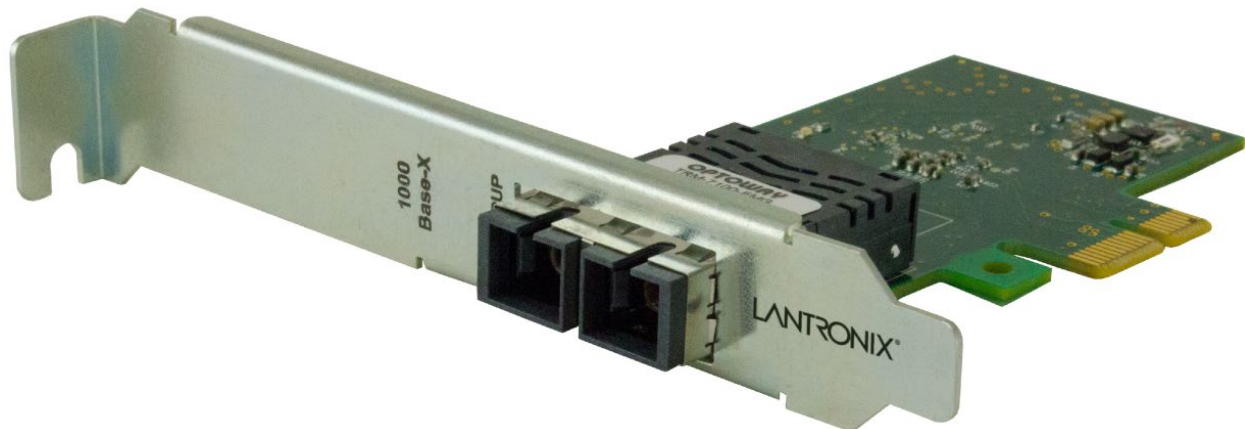
Hardware Install Procedure

Warning: PCI Express cards, like all computer equipment, can be badly damaged by static electricity. Be sure that you are properly grounded before opening your computer case or touching your NIC. We recommend that you wear an anti-static strap when installing any computer component. If an anti-static strap is unavailable, discharge yourself of any static electricity build-up by touching a large grounded metal surface (such as the computer case) for several seconds. Also, be careful to handle the NIC by its edges and not by the gold connectors.

Caution: Only qualified persons should install the NIC. Failure to observe this caution could result in poor performance or damage to the equipment. Before installing the NIC, review the System Requirements and the Installation Overview.

Caution: Wear a grounding device and observe electrostatic discharge precautions when installing the NIC in a system. Failure to observe this caution could result in damage to the NIC. Before installing the NIC, ensure that system power is OFF, the power cord is unplugged from the power outlet, and that proper electrical grounding procedure has been followed.

Warning: High voltage inside the system may present a safety hazard. Make sure that the system power is off before removing the cover. Unplug and disconnect the PC and then wait for 15-20 seconds before plugging the NIC into the PC. When removing the NIC, unplug the Ethernet cable before removing the PC cover.

To install the N-GXE NIC, do the following:

1. Turn Off power to the PC or file server and unplug the power cord.
2. Turn Off any peripherals connected to the computer (Printers, external hard drives, etc.).
3. Remove the cover from the computer case. See your computer system documentation for details. Keep all screws.
4. Locate an open PCI Express slot and remove the metal cover plate on the rear of the computer case See system documentation for PCIe slot location. Remove and retain the faceplate.
5. Remove the network N-GXE NIC from the shipping package and store the packaging material in a safe place.
6. Gently insert the NIC into the open PCI Express slot and fasten the bracket to the rear of the case. **Note**: Replacing the pre-installed installation bracket may be required now depending on the profile of the system it is being installed in. Apply even pressure on the corners of the N-GXE NIC, pushing down until it seats firmly into the PCIe slot.
7. Replace the PC or file server cover and secure it with the screws removed in Step 3 above.
8. Insert the power cable into the socket on the power supply and reconnect all other connectors removed in Step 2.
9. Disconnect any antistatic devices.
10. Power up the PC or file server.

Windows Device Manager reports the fixed optic version NIC as "i210 Gigabit Fiber Connection" in Windows 7, 8, 10. Windows Device Manager reports the SFP version NIC as "i210 Gigabit Network Connection.

Installing SFP Modules and Fiber Cables

The N-GXE-SFP-02 has a 100/1000MBps open SFP cage for connecting fiber-optic cable. See the SFP manual for important cautions and warnings. To install the SFP into the N-GXE-SFP-02 SFP cage:

Warning:

- Visible and invisible laser radiation when open: DO NOT stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.
- Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

1. Locate the SFP to be used.

2. Position the SFP with the SFP cage.

   Caution: It is recommended that you do not install or remove the SFP module with fiber-optic cable attached to it because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module.

3. Insert the SFP fully into the cage.

4. Position the LC fiber cable at the SFP.

5. Insert the LC fiber cable end completely into the SFP.

6. Connect the LC cable at the far end device.

Removing SFP Modules and Fiber Cables

To remove the SFP from the N-GXE-SFP-02 SFP cage:

1. Attach an ESD-preventive wrist strap to your wrist and to a bare-metal grounded surface.

2. Have a replacement SFP or a transceiver-cage plug ready, as well as an antistatic mat and a rubber safety cap for the SFP.

   Caution: Avoid bending fiber-optic cable beyond its minimum bend radius; any arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.

3. Disconnect the LC cable for the SFP.

4. Pull the bale clasp handle out from the SFP to unlock the SFP.

5. Grasp the SFP bale clasp and pull the SFP approximately 0.5 in (1 .3 cm) out of the cage.

6. Using your fingers, grasp the body of the SFP and pull it completely from the cage.

7. Insert the rubber protector, shown right, into the SFP module to protect it.

8. Place the SFP module in an antistatic bag or other protective environment.
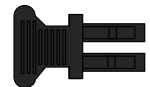
Verify Installation

1. From the Windows main desktop, right-click on "My Computer" ("Computer" in Windows 7/8), then select "Manage".

2. In the new Computer Management window, select "Device Manager" from the left window pane.

3. In Device Manager, under "Network Adapters", you should see the NIC listed as "I210 Gigabit Fiber Connection".

4. **Optional**: at this point you can set up advanced features if desired. The available features and the configuration process vary with the OS / operating environment. For example, in Windows 7 go to Start > Control Panel > Network Adapters > i20 Gigabit Fiber Connection > Properties to display the various tabs (system dependent).

Intel i210 PROSet Drivers from Intel.com

If your PC does not automatically detect the N-GXE-xxx-02 NIC, download and install the standard i210 PROSet drivers from Intel at http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000005686.html.

The Intel® PROSet for Windows* Device Manager is an extension for Windows Device Manager. When you install the Intel PROSet software, tabs are automatically added to the supported Intel adapters in Windows Device Manager.

Intel PROSet for Windows Device Manager is an advanced configuration utility that incorporates additional configuration and diagnostic features into the device manager.

You must install Intel PROSet for Windows Device Manager if you want to use Intel ANS teams or VLANs.

Intel PROSet for Windows Device Manager is installed by default when you install the device drivers.
Intel PROSet for Windows Device Manager is installed with the same process used to install drivers.
You must have administrator rights to install or use Intel PROSet for Windows Device Manager.
Upgrading Intel PROSet for Windows Device Manager may take a few minutes.

These features allow you to test and configure wired Intel® Ethernet Adapters.
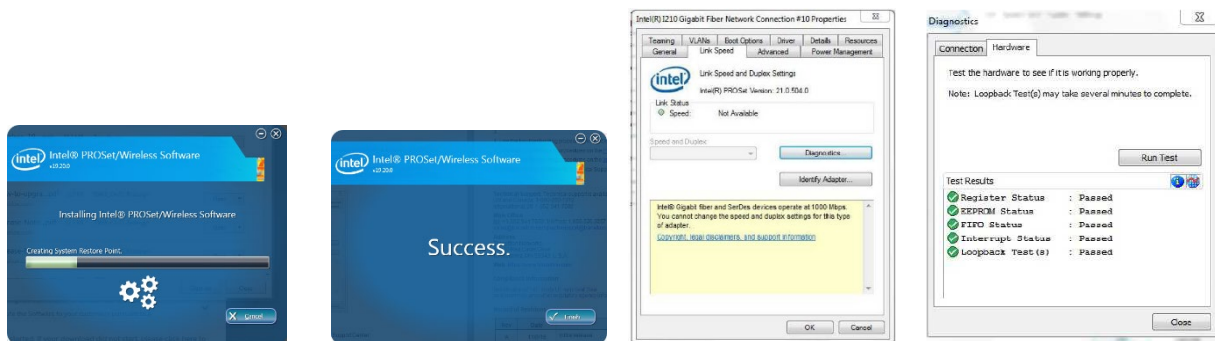
For each of the N-GXE-xxx-02 links below there is a 32-bit and a 64-bit download:

Intel® Network Adapter Driver for Windows* 7.

Intel® Network Adapter Driver for Windows* 8.1.

Intel® Network Adapter Driver for Windows® 10.

The full set of Intel Network Adapter Drivers for download (e.g., for Linux, Windows Server, etc.) is available at https://www.intel.com/content/www/us/en/support.html.

The Lantronix Resources page has Drivers (ZIP format) for Windows 10 32bit Driver, Windows 10 64bit Driver, Windows 7 32bit Driver, Windows 7 64bit Driver, Windows 8 32bit Driver, and Windows 8 64bit Driver.

If you are not sure which is the right driver, run the Intel® Driver & Support Assistant to automatically detect driver or software updates.

Intel PROSet for Windows Device Manager on Older Operating Systems

On systems running Microsoft Windows 7 and Microsoft Windows Server 2008 R2, you must install the legacy version of Intel PROSet for Windows Device Manager.

If it is available on your install media, Autorun.exe will detect your operating system and install the correct drivers and software. For manual installs, the software and installers are on your install media in these directories.

.\APPS\PROSETDX\Win32Legacy, .\APPS\PROSETDX\Winx64Legacy
.\APPS\SETUP\SETUPBD\Win32Legacy, and .\APPS\SETUP\SETUPBD\Winx64Legacy

Note that the legacy version of the software will not change on every release.

Installing Drivers and Intel(R) PROSet for Windows* Device Manager

You must have administrator rights to install or use Intel PROSet for Windows Device Manager. Intel recommends the following procedure for installing drivers:

1) Cancel any Found New Hardware Wizard screens that open.

2) Start the autorun located on the CD or in your download directory.

3) Click "Install Drivers and Software" and follow the instructions in the install wizard.

Intel(R) PROSet functionality is integrated with the Windows Device Manager. To configure Intel(R) Ethernet Adapters and Controllers, open the Windows Device Manager. Do not open adapter, team, or VLAN properties from the network control panel as you may be prompted to reboot your system.

You must upgrade PROSet when upgrading drivers. Failure to do so will result in instability and missing tabs in Windows Device Manager. For software and driver versions prior to Release 16.2, if you have Fibre Channel over Ethernet (FCoE) boot enabled on any devices in the system, you will not be able to upgrade your drivers. You must disable FCoE boot before upgrading your ethernet drivers. This issue is resolved in Release 16.2 and beyond.

Note: Support for the Intel PROSet command line utilities (prosetcl.exe and crashdmp.exe) has been removed. This functionality has been replaced by the Intel Netcmdlets for Microsoft* Windows PowerShell*. Please transition all of your scripts and processes to use the Intel Netcmdlets for Microsoft Windows PowerShell. Microsoft* Windows* 8.1 and Windows Server* 2012 R2 are the last operating systems to support the Intel PROSet command line utilities.

Driver Installation

1. When you start Windows, if the "Found New Hardware" wizard displays on the screen.
2. Go into "My Computer" to the download location and access the folder for your OS version.
3. Double-click the file "Setup.exe" to start the driver installation program.
4. Complete the wizard to automatically install the drivers/software. Restart the computer if prompted.

Driver Install Example

The Windows 7 64-bit installation procedure is as follows.

1. Download the Drivers [ZIP] file from https://www.lantronix.com/products/n-gxe-xx-02-series-2/.

2. Unzip the driver to your computer (e.g., for Windows 7 64 bit OS, the driver should be unzipped in the *C:\WINDOWS7\64* directory.
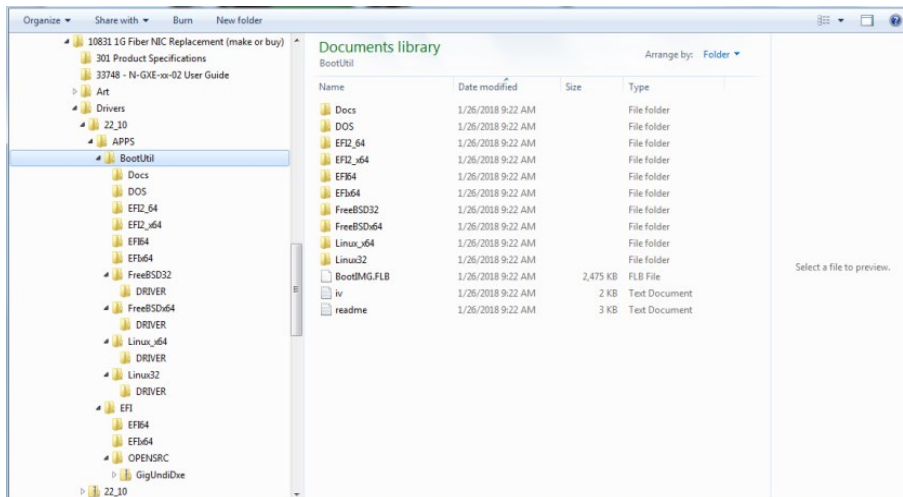
3. Shut down the computer and then remove the N-GXE NIC from the computer.

4. Run "WinUinst64.exe" (under *C:\WINDOWS7\64*) and make sure the old version driver is deleted completely.

5. Run "Winsetup64.exe" (under *C:\WINDOWS7\64*) and pre-install the new driver.

6. Insert the N-GXE NIC into the computer and after you make sure it is installed properly, restart the computer. The computer should detect the network adapter and automatically install the driver.

Notes: 1. If a message displays saying that the driver is not digitally signed by Microsoft, click **Yes**.

2. If the message "*Windows has finished installing the software for this device*" displays, click **Finish** to complete the installation, and then restart Windows if needed.

View Driver Details, Update Driver, Disable Device, Uninstall Device

1. Navigate to the appropriate system control (system dependent). For example, in Windows 7/8, from the Windows main desktop, right-click on "My Computer" ("Computer" in Windows 7/8), then select "Manage".

2. In the new Computer Management window, select "Device Manager" from the left window pane.

3. In Device Manager, under "Network Adapters", you should see the NIC listed as "Intel® I210 Gigabit Fiber Network Connection".

4. Navigate to the required tab (e.g., the Driver tab).

5. Select the desired function and follow the on-screen instructions.
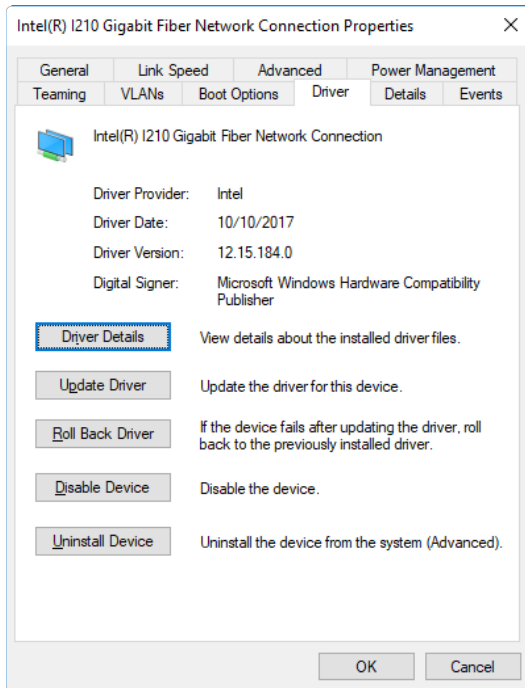
For More Information

See the documentation that accompanied your driver.

PXE Boot Loader from Intel.com

PXE boot loader image pre-loaded: https://downloadcenter.intel.com/download/19186/Intel-Ethernet-Connections-Boot-Utility-Preboot-Images-and-EFI-Drivers.

Go to the Intel® Ethernet Connections Boot Utility, Preboot Images, and EFI Drivers webpage.

Features

- Supports PCIe x1 bus
- High bandwidth 1000 Mbps network speed (100/1000 Mbps with auto-negotiation for SFP version)
- Supports full-duplex mode
- Supports IEEE 802.3x and 802.3z Full-Duplex Flow Control
- Compliant with PCIe Rev 2.1 Interface
- IEEE 802.1Q VLAN Support
- Link Aggregation Control Protocol (LACP)
- Link Aggregation Smart Switch
- Smart Load Balancing (SLB) and Failover
- Full Wake-on-LAN Support
  - Advanced Power Management (APM) Support
  - Advanced Configuration and Power Interface (ACPI) Specification v2.0c
  - Magic Packet Wake-up enable
- Jumbo frames support up to 9014 bytes
- IPv4 and IPv6
  - IPv4 checksum offloading TCP/UDP
  - IPv6 support for IP/TCP and IP/UDP receive checksum offload
  - Transmit Segmentation Offloading (TSO)
- Interrupt Handling
  - Interrupt Throttling Control
  - Legacy and Message Signaling Interrupt/Extension (MSI/MSI-X)
  - Intelligent Interrupt Generation
  - Low Latency Interrupts
- PXE and UEFI Boot
- RoHS Compliance
- Standard bracket attached; low-profile bracket included
- Supports identification of NIC when multiple cards are installed
- Software Support: Windows 7, 8, 8.1,10 Pro, Linux, Windows Server 2008, 2008 R2, FreeBSD

Feature Descriptions

Windows' Device Manager tabs (I210 Gigabit Fiber Connection): General, Link Speed, Advanced, Power Management, Teaming, VLANs, Boot Options, Driver, Details, Events. **Note** that the tabs vary by OS.

Advanced tab properties: Flow Control, Interrupt Moderation, IPv4 Checksum Offload, Jumbo Packet, Log Status Messages, Max IRQ per Sec, Network Address, Receive Buffers, Speed & Duplex, TCP Checksum Offload (IPv4), Transmit Buffers, UDP Checksum Offload (IPv4), and Wake-Up Capabilities. **Note** that the properties vary by OS.
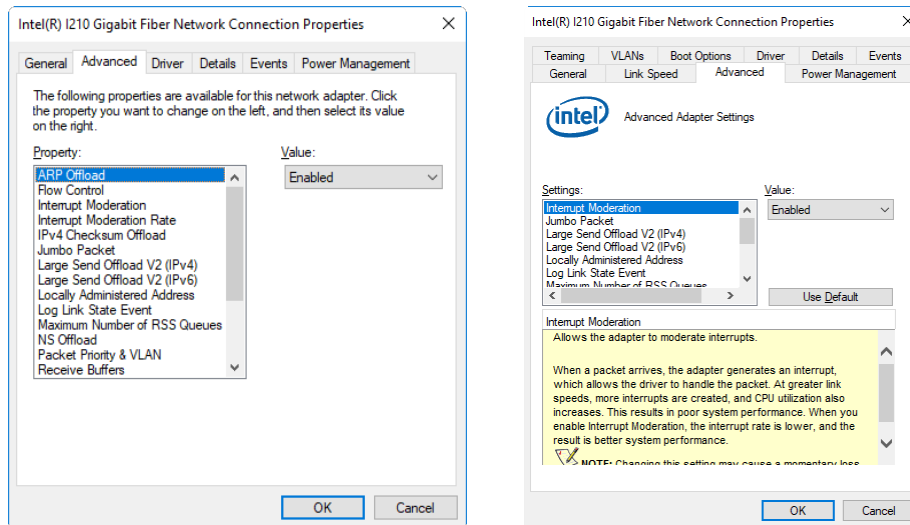
Wake On LAN (WOL)

The N-GXE-xx-02 NIC supports Full Wake-on-LAN (Advanced Power Management (APM) Support, Advanced Configuration and Power Interface (ACPI) Specification v2.0c, and Magic Packet Wake-up enable). The N-GXE-xx-02 NIC supports Wake-on-LAN (WOL) Wake from sleep (**S1** and **S3**).

Wake-on-LAN (WOL) is a hardware/software solution allowing a computer to be woken up remotely. Being able to power up a remote computer lets an administrator perform off-hours maintenance at a remote site without having to send a technician.

Computers with ACPI support many power states. Each state sets a different level of power, from fully powered (S0) up to completely powered down (S5), with partial levels of power in each intermediate state (S1, S3, S4). Below is a summary of the power states:

- S0 - On and fully operational.
- **S1** - System is in low-power mode (**Sleep** mode). The CPU clock stops, but RAM powers on and refreshes.
- **S3** - Suspend to RAM (**Standby** mode). Most components shut down except RAM.
- S4 - Suspend to disk (**Hibernate** mode). The memory contents swap to the disk drive, and then reload into RAM when the system wakes.
- S5 - Power off.

ACPI aware operating systems support remote wake-up from Standby mode (S3) or Hibernate mode (S4). The Intel Support article Remote Wake up Basics for Intel® Ethernet Products describes how to configure remote wake up on your computer. See also the Microsoft article "Wake on LAN" (WOL) behavior in Windows 8, Windows 8.1 and Windows 10.

Jumbo Frames

Jumbo Frames are Ethernet frames larger than 1518 bytes. Jumbo Frames can be used to reduce server CPU utilization and increase throughput. Note, however, that using Jumbo Frames may introduce latency. Also, end-to-end network devices must support Jumbo Frames, otherwise packets will be dropped. Jumbo Frames also require compatible switch connections that can forward Jumbo Frames; see the switch user guide or contact your network administrator. Jumbo Frames supported protocols include TCP and UDP only. The N-GXE-xx-02 supports Jumbo Frames up to 9014 bytes.

TCP Segmentation Offload (up to 256 Kb)

This networking technology helps transfer the workload from the CPU to a network adapter during network data transfer. In Windows Server 2008, TCP Segmentation Offload enables the Windows networking subsystem to offload the processing of a TCP/IP connection to a network adapter that includes special support for TCP/IP offload processing. TCP Segmentation Offload is available in all versions of Windows Server 2008 and Windows Vista. TCP Segmentation Offload will work only if it is enabled in both locations.

IPv6 support for IP/TCP and IP/UDP RX Checksum Offload

When enabled, the checksum is calculated by the NIC instead of the system CPU. This reduces CPU load and can improve system performance in high-traffic environments. There is typically no need to disable checksum offload.

Fragmented UDP Checksum Offload for Packet Reassembly

When enabled, the checksum is calculated by the NIC instead of the system CPU. This reduces CPU load and can improve system performance in high-traffic environments. There is typically no need to disable checksum offload.

PXE Boot

This specification describes a standardized client-server environment that boots a software assembly, retrieved from a network, on PXE-enabled clients. On the client side it requires only a PXE-capable NIC and uses a small set of industry-standard network protocols.

UEFI Boot

The Unified Extensible Firmware Interface (UEFI) specification defines a software interface between an OS and platform firmware. UEFI replaces the BIOS firmware interface originally present in all IBM PC-compatibles. Most UEFI firmware implementations provide legacy support for BIOS services. The Unified EFI Forum is the industry body that manages the UEFI specification.

Smart Load Balancing (SLB) and Failover

In a Smart Load Balance and Failover team, a standby member handles the traffic if all of the load balance members fail (considered a failover event). All load balance members must fail before the standby member takes over. When one or more of the load balance members is restored (fallback), the restored team member(s), resume handling traffic.

Static Link Aggregation (SLA)

This feature provides increased transmission and reception throughput in a team of two to eight adapters. This team replaces these types of teams from prior releases: Fast EtherChannel/Link Aggregation (FEC) and Gigabit EtherChannel/Link Aggregation (GEC). This type also includes adapter fault tolerance and load balancing (only routed protocols). This teaming type requires a switch with Intel Link Aggregation, Cisco FEC or GEC, or IEEE 802.3ad Static Link Aggregation capability.

All adapters in a Link Aggregation team running in static mode must run at the same speed and must be connected to a Static Link Aggregation capable switch. If the speed capability of adapters in a Static Link Aggregation team are different, the speed of the team depends on the lowest common denominator.

IEEE 802.3ad Dynamic Link Aggregation

This feature creates one or more teams using Dynamic Link Aggregation with mixed-speed adapters. Like the Static Link Aggregation teams, 802.3ad Dynamic teams increase transmission and reception throughput and provide fault tolerance. This teaming type requires a switch that fully supports the IEEE 802.3ad standard.

IEEE 802.1Q VLAN Support

The VLANs tab lets you configure Virtual LANs (VLANs) for an adapter. After creating the VLAN, the adapter associated with the VLAN may have a momentary loss of connectivity. A VLAN cannot be removed if a virtual NIC is bound to it. The VLANs tab includes:

      Name column: Displays the name assigned to the VLAN.

      ID Column: Displays the VLAN's ID.

      Status Column: Indicates if the VLAN is Enabled or Disabled.

      New: Creates a new VLAN.

      Remove: Removes the selected VLAN.

      Modify: Changes a VLAN's settings.

If VLANs are assigned to an adapter, the Priority & VLANs option will be enabled and cannot be disabled until all VLANs are removed from the adapter.

- To set up IEEE VLAN membership, the adapter must be attached to a switch with IEEE 802.1Q VLAN capability.
- A maximum of 64 VLANs per network or team are supported by Intel software.
- VLANs can co-exist with teaming. If you do this, the team must be defined first, and then you can set up your VLAN.
- You can set up only one untagged VLAN per adapter or team. You must have at least one tagged VLAN before you can set up an untagged VLAN.
- When using IEEE 802.1Q VLANs, settings must match between the switch and those adapters using the VLANs.
- In Microsoft Windows, you must use Intel PROSet to set up and configure VLANs.
- **Caution**: VLANS cannot be used on teams that contain non-Intel network adapters.
- **Caution**: Use Intel PROSet to add or remove a VLAN. Do not use the Network and Dial-up Connections box to enable or disable a VLAN. Otherwise, the VLAN driver may not be correctly enabled or disabled.
- The VLAN keyword is supported. The VLAN ID must match the VLAN ID configured on the switch.
- If you change a setting under the Advanced tab for one VLAN, it changes the settings for all VLANs using that port.

Teaming

The Teaming tab lets you specify whether a network connection will participate in a team. If not checked this adapter is not part of a team. Advanced Networking Services (ANS) teaming is a feature of the Intel® Advanced Networking Services component that lets you group multiple adapters in a system into a team. ANS teams offer features such as load balancing, increased throughput, and fault tolerance.

The network configuration as well as the type of adapters installed in your computer affect which team types can be set up on the computer.

Cable Specifications

Fiber cable

Multimode fiber (recommended):	62.5/125 µm
Multimode fiber (optional):	50/125 µm

N-GXE-SC-02	850 nm multimode
Fiber optic transmitter power:	min: -9.5 dBm max: -4.0 dBm
Fiber optic receiver sensitivity:	min: -17.0 dBm max: -17.0 dBm
Link budget:	8.0 dB

N-GXE-LC-02	850 nm multimode
Fiber optic transmitter power:	min: -9.5 dBm max: -4.0 dBm
Fiber optic receiver sensitivity:	min: -17.0 dBm max: 3.0 dBm
Link budget:	8.0 dB

N-GXE-ST-02	850 nm multimode
Fiber optic transmitter power:	min: -9.5 dBm max: -4.0 dBm
Fiber optic receiver sensitivity:	min: -17.0 dBm max: -17.0 dBm
Link budget:	8.0 dB

N-GXE-SFP-02	Supports both Single mode and Multi-mode SFP modules

The fiber optic transmitters on the device meet Class I Laser safety requirements per IEC-825/CDRH standard and comply with 21CRF1040.10 and 21CRF1040.11.

Network Parameters

Multimode Fiber Cable and Modal Bandwidth

Per IEEE 802.3z Gigabit Ethernet 1000SX 850nm

Multimode: 62.5/125um
Modal Bandwidth 160Mhz-km: Distance: 220m
Modal Bandwidth 200Mhz-km: Distance: 275m

Multimode: 50/125um
Modal Bandwidth 400Mhz-km: Distance: 500m
Modal Bandwidth 500Mhz-km: Distance: 550m

Technical Specifications

Standards Compliance	IEEE 802.3, 2006 Edition; IEEE 802.3z; IEEE 802.3x; IEEE 802.1Q, IEEE 802.3ad; Class 1 Laser Product. Complies with 21CFR(J).
Data rate	1000Mbps fiber media
Emissions Compliance	EN55022 Class B, CE
Immunity Compliance	EN55024
Safety Compliance	U.L. listed, CE mark, ROHS
Power Consumption	2.0W PCI-E / ~1 watt
Power Source	PCI-E slot
Bus Slot	PCIe 2.1 x1 compliant
Weight	0.55 lbs. (0.25 kg)
Power Requirements	Fixed Optic Versions: 0.87 Watts (approximately), 264 mA @ 3.3 VDC SFP Version: 1.66 Watts (approximately), 503mA x 3.3 VDC
Operating Temperature	0 to +50 degrees C
Storage Temperature	-15 to +65 degrees C (+5°*F to +149°F*)
Operating Humidity	5% to 95% (non-condensing)
Altitude	0-10,000 feet
MTBF (-SC, –LC, and -ST)	N-GXE-xx-02 @ 25C = 1246,176 Bellcore7 V5.0 Hours N-GXE-xx-02 @ 40C = 658,260 Bellcore7 V5.0 Hours
MTBF (-SFP)	N-GXE-SFP-02 @ 25C = 1246,176 Bellcore7 V5.0 (Hours) N-GXE-SFP-02 @ 40C = 658,260 Bellcore7 V5.0 (Hours)
Warranty	Lifetime

WARNING: Visible and invisible laser radiation when open: DO NOT stare into the beam or view directly with optical instruments. Failure to observe this warning could result in damage to your vision or blindness.

CAUTION: Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

FCC Regulations: This equipment has been tested and found to comply with the limits for a class B computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.
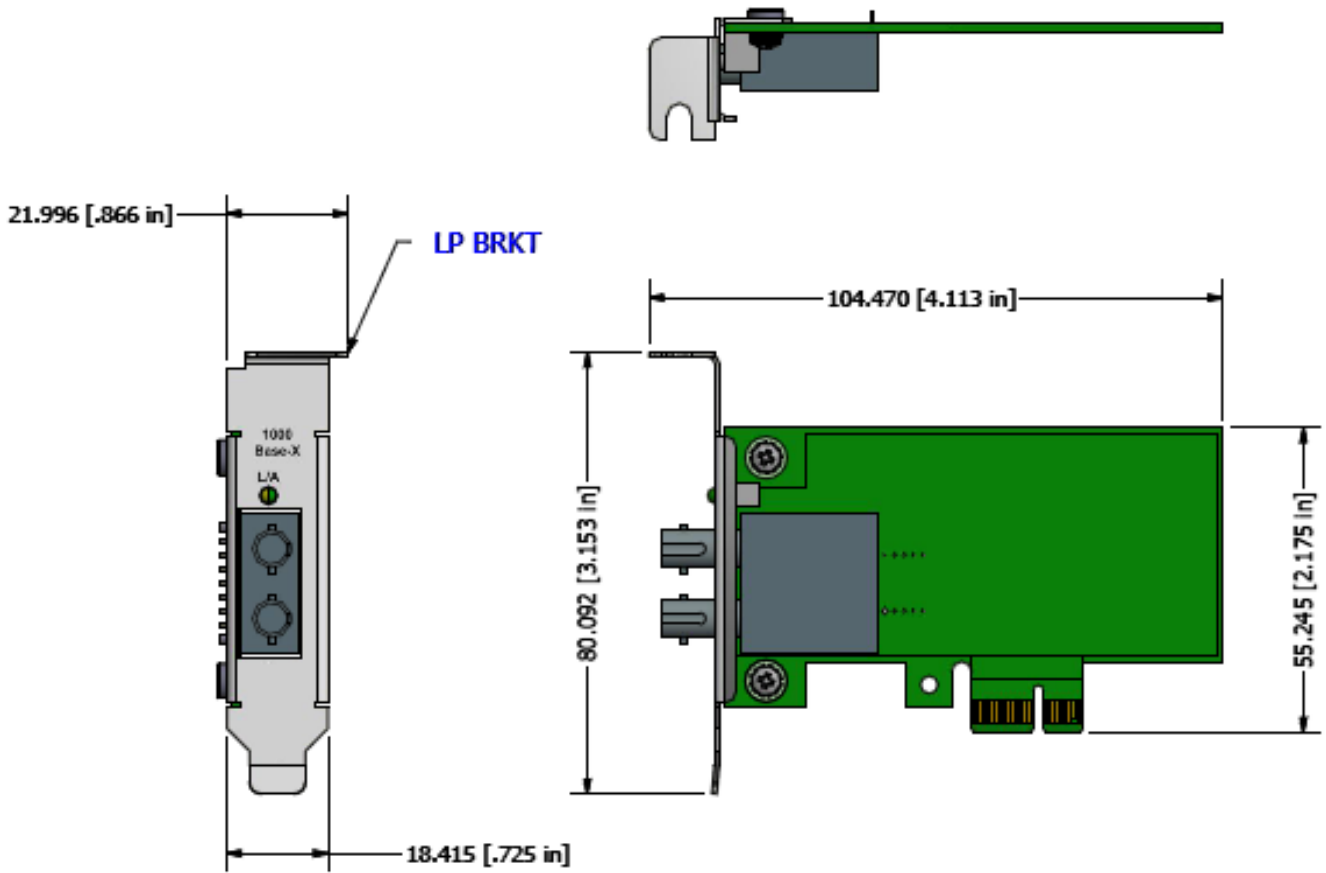
This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN61000-3 and the Generic European Immunity Standard EN55024.
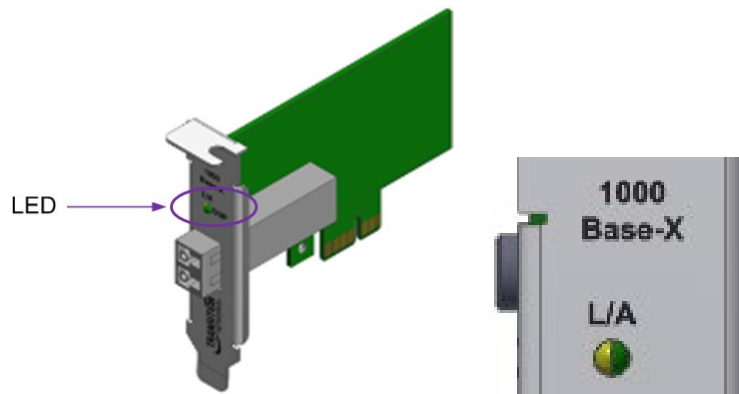
Dimensions

Standard Bracket
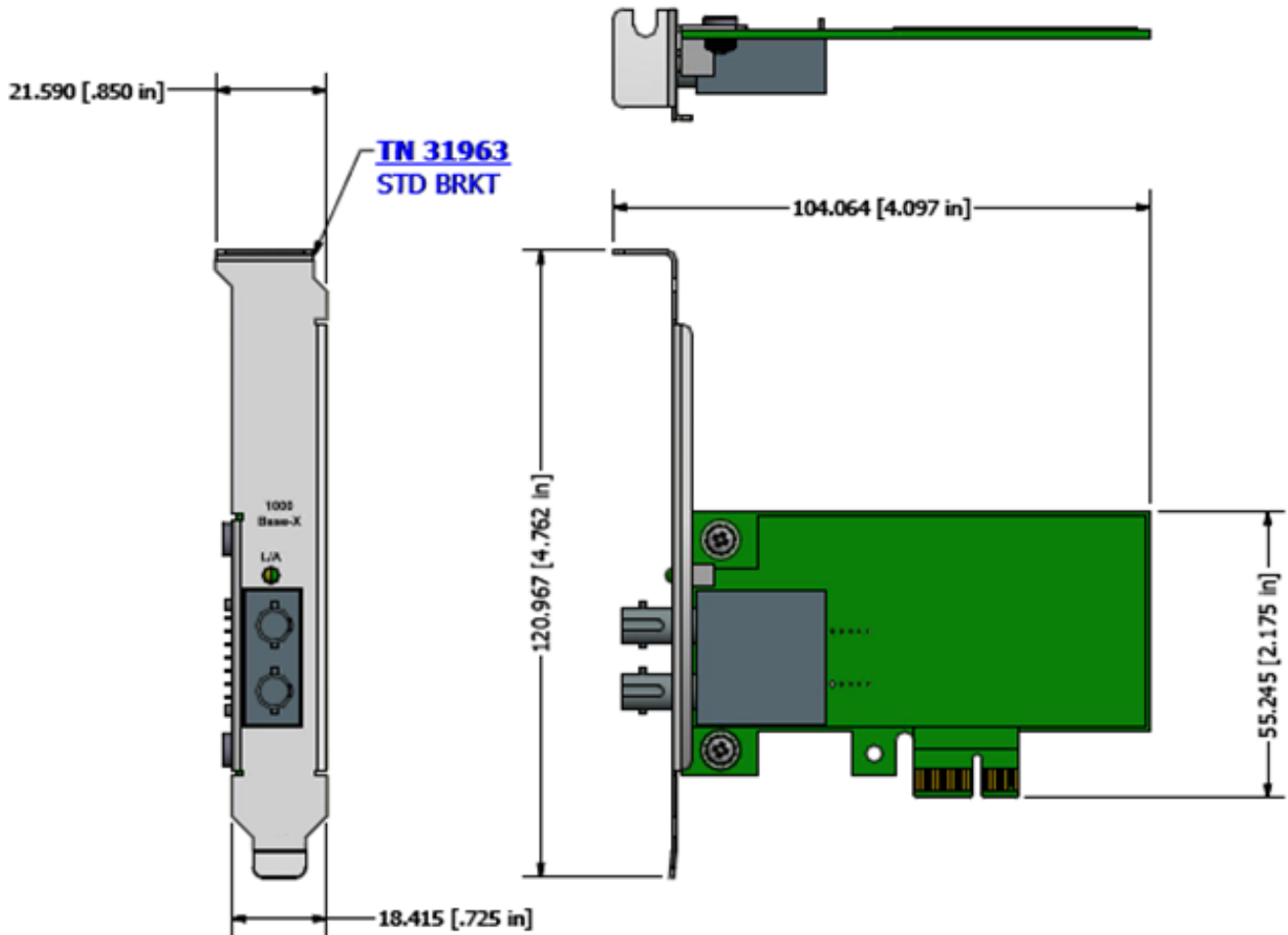
LP Bracket

Troubleshooting

Diagnostics LEDs

There is one LED located on the bracket and one LED on the PCB. The dual-purpose LED located on the bracket shows network/NIC link, activity, and full-duplex status.


LED	Description
PWR	Power, on indicates power is on; located on PCB.
L/A Link /Activity (Fixed Optic Versions)	Fiber port link status: On = link OK; Off = link fail; Flash = link OK & activity Green = Full duplex, Yellow = Half duplex
L/A Link /Activity (SFP Version)	On = Communication link Off = Link Fail Flash = Link OK and Activity Green = 1 Gbps; Yellow = 100 Mbps

Identify Adapter Feature

The Amber LED has an "Identify" option. In an OS, you can choose to "Identify" an Adapter, which makes the NIC's Green/Amber LEDs blink in a unique alternating pattern. This is useful for PCs that have more than one NIC installed.

For example, click "Identify Adapter" and then click the Start button to flash the L/A LED's alternating pattern. The alternating pattern that displays depends on the computer system.
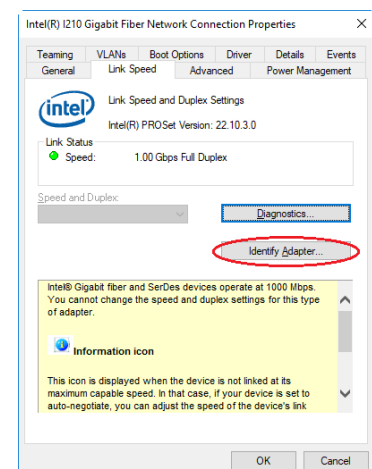
Troubleshooting Performance Issues

This section lists some components to check for peak performance.

Cable length/quality: Do not exceed the max recommended length for your cable type. Use shorter lengths where possible for better performance. Check both ends for damaged or loose connectors. Check cables for kinks or damaged segments.

Bus speed/traffic: the PCI bus accommodates the slowest PCI card installed. Check if you have a card that is slowing down your system.

Processor and memory: Check your performance monitoring programs and see if traffic is being affected by your processor speed, available memory, or other processes.

Transmission frame size: try adjusting or maximizing the transmission frame size. Note that OSes, switches, and NICs each impose different limits on max fame size (MTU). Check your OS documentation for Jumbo frames support.

Operating System: Network feature implementations (e.g., WOL, Jumbo frames, segmentation) vary by OS.

Known Issues

Teaming - Dynamic Link Aggregation (802.3ad): a recent Windows update apparently broke Teaming with numerous Intel NICs, including the i210. Try re-installing a fresh copy of Windows 10 with the latest Intel drivers.

Device and Box Labels

The Product ID, MAC Address, Serial #, Board PN and Rev. are printed on the Box Label and on the Device Label.

Box Label

Device Label

Troubleshooting Procedure

This section lists some common problems, their causes, and potential recovery steps.

1. Confirm that the function you are trying is supported by the device; see Feature Descriptions on page 15.

2. Verify the System Requirements on page 4.

3. Check the LEDs; see Diagnostics LEDs on page 23.

4. Check for recent changes (hardware, software, network) that may have disrupted communications.

5. Check that the cabling is securely attached at both ends. Make sure the cable length does not exceed specifications. Run a cable test and replace the cable if necessary.

6. Check for a mismatch of speed, duplex, protocol, or cable type with the link partner.

7. Reseat the NIC. Try the NIC in another slot.

8. Use the troubleshooting procedures in the computer's user guide.

9. Use the troubleshooting procedures on the PXE Boot Loader webpage as required.

10. Use the troubleshooting procedures on the Intel i210 PROSet Drivers webpage as required.

11. 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. Check for incompatible or conflicting devices / settings.

12. Run Windows Device Manager and scan for changes.

13. Check if the PC's BIOS version is appropriate and update to the latest. See the PC documentation.

14. Run the PC diagnostics.

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

16. Replace the NIC.

17. Record information and contact Technical Support. See Recording Model and System Information below.

Record Model and System Information

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

1. Product ID: _____ MAC Address: _____

Serial #: _____ Board PN and Rev: _____

LED status: _____
_____

2. Record the System information: Check your computer documentation for support information.

PC make and model: _____

Operating System: _____

BIOS version: _____

Intel i210 Driver version: _____

PC's Icon Tray indication: _____

Connected Device(s): _____

Cable type: _____

3. Your service contract number: _____

4. Describe the failure: _____
_____
_____
_____
_____

5. Describe any action(s) already taken to resolve the problem: _____
_____
_____
_____
_____
_____

The Product ID, MAC Address, Serial #, Board PN and Rev. are printed on the Box Label and on the Device Label.

Compliance Information

Declaration of Conformity

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

Declares that the product:
N-GXE-xx-02

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

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

Achtung !

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

Attention !

Ceci est un produit de Classe B. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures 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 öffentlickes Telekommunikationsnetz in den EGMitgliedstaaten verstösst gegen die jeweligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

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www.lantronix.com/about/contact.