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Gigabit Ethernet Interface for PXI

NI PXI-8231



- Gigabit Ethernet interfaces with up to 1000 Mbit/s (1000BASE-T) transfers
- Compatibility with 10BASE-T and 100BASE-TX
- Automatic cable polarity detection
- Support for Windows and LabVIEW Real-Time applications

Overview

The NI PXI-8231 high-performance Gigabit Ethernet interface for PXI is based on the Intel 82541PI Gigabit Ethernet controller. The 1000 Mbit/s Gigabit Ethernet provides a substantial performance increase over 100 Mbit/s Fast Ethernet while remaining completely compatible with 10BASE-T and 100BASE-TX Fast Ethernet networks.

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Requirements and Compatibility

OS Information

- Real-Time OS
- Windows 7 32-bit
- Windows Vista
- Windows XP

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Application and Technology

Real Performance Gains

Gigabit Ethernet theoretically provides a 1000 Mbit/s transmission speed. However, 1000 Mbit/s approaches the limit of PCI bus bandwidth, and, as a result, actual maximum transmission speeds are system specific. Variables such as your CPU speed, other PCI traffic, and Ethernet network configuration determine performance, and, as a practical guideline, you might attain transmission speeds of 500 Mbit/s and receive speeds of 800 Mbit/s. This remains five to eight times the performance of 100BASE-TX Fast Ethernet.

Compatibility and Cabling

The PXI-8231 module is fully compatible with Ethernet standards and cabling. You can continue to use standard Category 5 Ethernet cables and achieve Gigabit Ethernet performance, provided all of the conductor pairs in the cable are connected (4 pairs x 250 Mbit/s per pair = 1000 Mbit/s). Additionally, the Gigabit Ethernet module automatically detects cable polarity, so there is no need to swap between crossover and straight-through cabling for different network configurations. The Gigabit Ethernet port also automatically switches between 10, 100, and 1000 Mbit/s modes, depending on your network's capability as determined by your server speed, switch/router capacity, and wiring capacity.

Operating System Support

Product Name	Windows Support	LabVIEW Real-Time Support
781752-01	Windows 7 (32-bit Only), Vista, XP	LabVIEW Real-Time 2010 and Later

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Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
NI PXI-8231 Products			
NI PXI-8231, GBIT Ethernet Controller, for LV RT 2009 and Earlier	781764-01	No accessories required.	
NI PXI-8231, GBIT Ethernet Controller, for Windows and LV RT	781752-01	No accessories required.	

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Support and Services

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

- **Classroom training in cities worldwide** - the most comprehensive hands-on training taught by engineers.
- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
- **Online instructor-led training** - lower-cost, remote training if classroom or on-site courses are not possible.
- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
- **Training memberships** and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

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Detailed Specifications

The following specifications apply to the NI 8231 interface device. These specifications are typical at 25 °C, unless otherwise stated.

Physical Characteristics	
Dimensions	
NI PXI-8231	10.0 cm × 16.0 cm (3.9 in. × 6.3 in.)

NI PCIe-8231	12.9 cm × 12.0 cm (5.1 in. × 4.725 in.)
Camera Interface	RJ-45
Weight	
NI PXI-8231	140 g (4.9 oz)
NI PCIe-8231	70 g (2.5 oz)

Signaling

Ethernet	1000Base-T compliant on four pairs of Category 5 cable
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Power Requirements

NI PXI-8231	
Typical	788 mA at 3.3 V = 2.6 W maximum 1,330 mA at 3.3 V = 4.4 W maximum
NI PCIe-8231	
Typical	1 A at 3.3 V = 3.3 W maximum 375 mA at 3.3 V _{aux} = 1.24 W maximum

PCI Express Interface (NI PCIe-8231 Only)

PCI Express compliance	Version 1.1
Native link width	x1
Up-plugging link width availability	x4, x8, x16

Operating Environment

The NI 8231 is intended for indoor use only.

Ambient temperature range	0 °C to 55 °C
Operating relative humidity	
NI PXI-8231	10% to 90%, noncondensing
NI PCIe-8231	50% to 85%, noncondensing
Pollution Degree	2



Caution Do *not* use the NI 8231 for connection to signals within Measurement Categories II, III, or IV.

Approved at altitudes up to 2,000 m.

Storage Environment

Ambient temperature range	
NI PXI-8231	–20 °C to 70 °C
NI PCIe-8231	–40 °C to 70 °C
Relative humidity	
NI PXI-8231	5% to 95%, noncondensing
NI PCIe-8231	50% to 85%, noncondensing

Safety

This product is designed to meet the requirements of the following standards of safety:

- IEC 60950-1, EN 60950-01
- UL 60950-1, CSA 60950-1

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- FCC Part 15—Radiated and Conducted Emissions (USA)
- ICES-003—Radiated and Conducted Emissions (Canada)
- CISPR 22—Radiated and Conducted Emissions (International)
- EN55022—Radiated and Conducted Emissions (European Union)
- EN55024—(Immunity) (European Union)
- VCCI—Radiated and Conducted Emissions (Japan)
- CNS13438—Radiated and Conducted Emissions (Taiwan)
- AS/NZS3548—Radiated and Conducted Emissions (Australia/New Zealand)
- MIC notice 1997-41, EMI and MIC notice 1997-42—EMS (Korea)

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC



Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

FCC Class B User Information

This equipment has been tested and found to comply with the limits for the class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

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

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



Caution If the device is changed or modified, the user may void his or her authority to operate the equipment.



Note This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.htm.

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