

Getting Started with the NI 8234

The NI 8234 is a Gigabit Ethernet (GigE) interface device for PXI Express (PXIe) or CompactPCI Express (cPCIe). This document describes how to install and configure the necessary hardware and software components to begin using the NI 8234.

What You Need to Get Started

You need the following items to set up and use the NI 8234.

- NI 8234 GigE interface device
- GigE Vision compliant camera
- Ethernet cable
- PXIe/cPCIe computer running Microsoft Windows Vista/XP/2000 with at least one available slot



Note The NI 8234 card will work in any standard peripheral slot of a cPCIe chassis adhering to the *PICMG CompactPCI Express EXP.0 R1.0* specification, or in a peripheral slot of a PXIe chassis that is compatible with the *PXI Express Hardware Specification, Revision 1.0* or later.



Note Visit ni.com/info and enter `rdvisionvista` for more information about National Instruments image acquisition device compatibility with Windows Vista.

- NI Vision Acquisition Software 8.2.1 or later, which includes the NI-IMAQdx driver software
- Optional software for developing applications:
 - NI Vision Builder for Automated Inspection
 - NI Vision Development Module
 - LabVIEW
 - LabWindows™/CVI™
 - Microsoft Visual Basic

Related Documentation

The following documents contain additional information that you may find helpful:

- *NI Vision Acquisition Software Release Notes*—Outlines new functionality, system requirements, installation procedures, and descriptions of the documentation included with the NI-IMAQdx driver software.
- *Measurement & Automation Explorer Help for NI-IMAQdx*—Describes how to configure the NI-IMAQdx driver software, NI interface devices, and cameras using Measurement & Automation Explorer (MAX).
- *NI-IMAQdx Help*—Contains fundamental programming concepts for the NI-IMAQdx driver software.

Safety Information



Caution The following paragraphs contain important safety information you *must* follow when installing and operating the device.

Do *not* operate the device in a manner not specified in the documentation. Misuse of the device may result in a hazard and may compromise the safety protection built into the device. If the device is damaged, turn it off and do *not* use it until service-trained personnel can check its safety. If necessary, return the device to National Instruments for repair.

Keep away from live circuits. Do *not* remove equipment covers or shields unless you are trained to do so. If signal wires are connected to the device, hazardous voltages can exist even when the equipment is turned off. To avoid a shock hazard, do *not* perform procedures involving cover or shield removal unless you are qualified to do so. Disconnect all field power prior to removing covers or shields.

If the device is rated for use with hazardous voltages ($>30 V_{\text{rms}}$, $42.4 V_{\text{pk}}$, or $60 V_{\text{dc}}$), it may require a safety earth-ground connection wire. Refer to the device specifications for maximum voltage ratings.

Because of the danger of introducing additional hazards, do *not* install unauthorized parts or modify the device. Use the device only with the chassis, modules, accessories, and cables specified in the installation instructions. All covers and filler panels *must* be installed while operating the device.

Do *not* operate the device in an explosive atmosphere or where flammable gases or fumes may be present. Operate the device only at or below the pollution degree stated in the specifications. Pollution consists of any foreign matter—solid, liquid, or gas—that may reduce dielectric strength or surface resistivity. The following is a description of pollution degrees.

- Pollution Degree 1—No pollution or only dry, nonconductive pollution occurs. The pollution has no effect.
- Pollution Degree 2—Normally only nonconductive pollution occurs. Occasionally, nonconductive pollution becomes conductive because of condensation.
- Pollution Degree 3—Conductive pollution or dry, nonconductive pollution occurs. Nonconductive pollution becomes conductive because of condensation.

Clean the device and accessories by brushing off light dust with a soft, nonmetallic brush. Remove other contaminants with a stiff, nonmetallic brush. The unit *must* be completely dry and free from contaminants before returning it to service.

You *must* insulate signal connections for the maximum voltage for which the device is rated. Do *not* exceed the maximum ratings for the device. Remove power from signal lines before connection to or disconnection from the device.



Caution National Instruments measurement products may be classified as either Measurement Category I or II. Operate products at or below the Measurement Category level specified in the hardware specifications.

Measurement Category¹: Measurement circuits are subjected to working voltages² and transient stresses (overvoltage) from the circuit to which they are connected during measurement or test. Measurement Category establishes standardized impulse withstand voltage levels that commonly occur

¹ Measurement Categories as defined in electrical safety standard IEC 61010-1.

² Working voltage is the highest rms value of an AC or DC voltage that can occur across any particular insulation.

in electrical distribution systems. The following is a description of Measurement (Installation¹) Categories:

- Measurement Category I is for measurements performed on circuits *not* directly connected to the electrical distribution system referred to as MAINS² voltage. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.
- Measurement Category II is for measurements performed on circuits directly connected to the electrical distribution system. This category refers to local-level electrical distribution, such as that provided by a standard wall outlet (e.g., 115 V for U.S. or 230 V for Europe). Examples of Measurement Category II are measurements performed on household appliances, portable tools, and similar products.
- Measurement Category III is for measurements performed in the building installation at the distribution level. This category refers to measurements on hard-wired equipment such as equipment in fixed installations, distribution boards, and circuit breakers. Other examples are wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and stationary motors with permanent connections to fixed installations.
- Measurement Category IV is for measurements performed at the primary electrical supply installation (<1,000 V). Examples include electricity meters and measurements on primary overcurrent protection devices and on ripple control units.

Unpacking

The NI 8234 ships in an antistatic package to prevent electrostatic discharge from damaging device components. To avoid such damage in handling the device, take the following precautions:

1. Ground yourself using a grounding strap or by touching a grounded object, such as the computer chassis.
2. Touch the antistatic package to a metal part of the chassis before removing the device from the package.



Caution *Never* touch the exposed pins of connectors.

3. Remove the device from the package and inspect the device for loose components or any sign of damage. Notify NI if the device appears damaged in any way. Do *not* install a damaged device into the PXIe/cPCIe chassis.

Store the NI 8234 in the antistatic package when not in use.

Installation

The following instructions are for general installation. Refer to the documentation provided by your computer manufacturer for specific instructions and warnings. Refer to the [Specifications](#) section for a list of the typical power requirements for the NI 8234.

1. Install the NI Vision Acquisition Software before installing the NI 8234. Refer to the *NI Vision Acquisition Software Release Notes* for specific installation instructions.
2. Power off and unplug the PXIe/cPCIe chassis.

¹ Measurement Category is also referred to as Installation Category.

² MAINS is defined as the (hazardous live) electrical supply system to which equipment is designed to be connected for the purpose of powering the equipment. Suitably rated measuring circuits may be connected to the MAINS for measuring purposes.



Caution To protect yourself and the computer from electrical hazards, the chassis *must* remain unplugged until the installation is complete.



Note If you are using a PXIe chassis, the NI 8234 must be installed in a PXIe or hybrid peripheral slot. Consult your PXI chassis manual for the location of these slots.

3. Touch a metal part of the chassis to discharge any static electricity that might be on your clothes or body. Static electricity can damage the device.
4. Make sure the injector/ejector handle is in its downward position. Be sure to remove all connector packaging and protective caps from retaining screws on the module. Align the NI 8234 with the card guides on the top and bottom of the peripheral slot.



Caution Do *not* raise the injector/ejector handle as you insert the NI 8234. It will not insert properly unless the handle is in its downward position so that it does not interfere with the injector/ejector rail on the chassis, as shown in Figure 1.

5. Hold the handle as you slowly slide the module into the chassis until the handle catches on the injector/ejector rail.



Caution Installing a PXIe/cPCIe device into a non-PXIe/cPCIe slot can damage both the chassis motherboard and the device. If you are unsure of the differences between the connector types, do *not* install the device. Refer to the documentation provided by your chassis manufacturer to determine the correct slot in which to install the NI 8234.

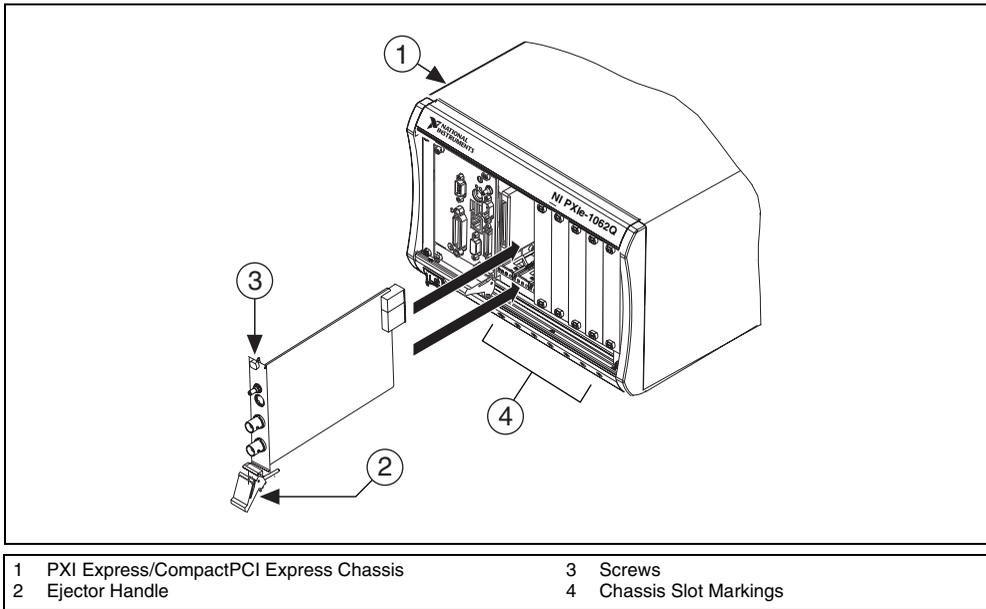


Figure 1. NI 8234 Installation

6. Raise the injector/ejector handle until the module firmly seats into the backplane receptacle connectors. The front panel of the NI 8234 should be even with the front panel of the chassis.
7. Tighten the bracket-retaining screws on the top and bottom of the front panel to secure the NI 8234 to the chassis.

8. Connect the Ethernet cable to your camera. Refer to your camera manufacturer documentation for specific instructions about how to connect the cable to your camera.
9. Connect the Ethernet cable to one of the RJ-45 connectors on the NI 8234 front panel.
10. Plug in and power on the PXIe/cPCIe chassis.

The NI 8234 is now installed and the camera is connected.

Configuring the NI 8234

After you have installed the NI 8234 and powered on your computer, Windows will recognize the device and assign resources to it. Use Measurement & Automation Explorer (MAX), the National Instruments configuration utility, to configure a GigE Vision compliant camera connected to the NI 8234 for acquisition. Refer to the *Measurement and Automation Explorer Help for NI-IMAQdx* for more information about how to configure the NI 8234.



Note Before configuring the device in MAX, ensure that you installed the NI-IMAQdx driver software.

Specifications

The following specifications apply to the NI 8234 interface device. These specifications are typical at 25 °C, unless otherwise stated.

Physical Characteristics

| | |
|------------------------------------|--|
| Dimensions | 10.0 cm × 16.0 cm (3.9 in. × 6.2 in.) |
| Camera interface | Two RJ-45 connectors |
| Slot requirements | One peripheral slot supporting a x4 PCIe connection (either PXIe/cCPIe slot or PXIe hybrid slot) |
| CompactPCI Express compliance..... | Version 1.0a |
| Compatibility | <i>PXI Express Specification 1.0</i> <i>CompactPCI Express Specification 1.0</i> |
| Weight | 158 g (5.5 oz) |
| Native link width..... | x4 |

Signaling

| | |
|---------------|--|
| Ethernet..... | 1000Base-T compliant on four pairs of Category 5 cable |
|---------------|--|

Power Requirements

| | |
|--------------|-----------------|
| Typical..... | 0.375 A at 3.3V |
| | 0.36 A at 5V |
| | 1.19 A at 1.8V |
| | 5.2 W maximum |

Environment

The NI 8234 is intended for indoor use only.

Ambient temperature range0 to 50 °C

Operating relative humidity10 to 90%, noncondensing

Pollution Degree2



Caution Do *not* use the NI 8234 for connection to signals within Measurement Categories II, III, or IV.

Approved at altitudes up to 2,000 m.

Storage Environment

Ambient temperature range-40 to 70 °C

Relative humidity10 to 90%, 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:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A



Note For EMC compliance, operate this device to product documentation.

CE Compliance

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

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



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.



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.

Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.htm.

电子信息产品污染控制管理办法（中国 RoHS）



中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electronic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting ni.com/certification. If your product supports calibration, you can obtain the calibration certificate for your product at ni.com/calibration.

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