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PCIe-8253

Getting Started with the NI PCIe-8253

The NI PCIe-8253 (NI 8253) is an IEEE 1394a¹ and IEEE 1394b interface device for PCI Express (PCIe). This document describes how to install and configure the necessary hardware and software to use the NI 8253.

What You Need to Get Started

You need the following items to set up and use the NI 8253:

- NI 8253 device
- IEEE 1394 camera
- 9-pin IEEE 1394 cable for connecting to IEEE 1394b cameras
- 6-pin to 9-pin cable or 6-pin to 9-pin adapter for connecting to IEEE 1394a cameras
- Computer running Microsoft Windows Vista/XP/2000 with at least one available PCIe slot



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*—Contains information about new functionality, minimum system requirements, and installation instructions for the NI-IMAQdx driver software.
- *Measurement & Automation Explorer Help for NI-IMAQdx*—Describes how to configure the NI-IMAQdx driver software, NI image acquisition devices, and cameras using Measurement & Automation Explorer (MAX).
- *NI-IMAQdx Help*—Contains fundamental programming concepts for the NI-IMAQdx driver software and terminology for using NI image acquisition devices.

¹ To connect an IEEE 1394a camera to the NI 8253, you need a 6-pin to 9-pin cable or a 6-pin to 9-pin adapter.

Safety Information

The following section contains important safety information that you must follow when installing and using the hardware.

Do not operate the hardware in a manner not specified in this document and in the user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to National Instruments for repair.

Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Do not substitute parts or modify the hardware except as described in this document. Use the hardware only with the chassis, modules, accessories, and cables specified in the installation instructions or specifications. You must have all covers and filler panels installed during operation of the hardware.

Do not operate the hardware in an explosive atmosphere or where there may be flammable gases or fumes unless the hardware is UL (U.S.) or Ex (EU) Certified and marked for hazardous locations. The hardware must be in a suitably rated IP 54 minimum enclosure for hazardous locations. Refer to the hardware's user documentation for more information.

You must insulate signal connections for the maximum voltage for which the hardware is rated. Do not exceed the maximum ratings for the hardware. Do not install wiring while the hardware is live with electrical signals. Do not remove or add connector blocks when power is connected to the system. Avoid contact between your body and the connector block signal when hot swapping hardware. Remove power from signal lines before connecting them to or disconnecting them from the hardware.

Operate the hardware only at or below Pollution Degree 2. Pollution is foreign matter in a solid, liquid, or gaseous state that can reduce dielectric strength or surface resistivity. The following is a description of pollution degrees:

- Pollution Degree 1 means no pollution or only dry, nonconductive pollution occurs. The pollution has no influence. Typical level for sealed components or coated PCBs.
- Pollution Degree 2 means that only nonconductive pollution occurs in most cases. Occasionally, however, a temporary conductivity caused by condensation must be expected. Typical level for most products.
- Pollution Degree 3 means that conductive pollution occurs, or dry, nonconductive pollution occurs that becomes conductive due to condensation.

Operate the hardware at or below the measurement category¹ marked on the hardware label. Measurement circuits are subjected to working voltages² and transient stresses (overvoltage) from the circuit to which they are connected during measurement or test. Measurement categories establish standard impulse withstand voltage levels that commonly occur in electrical distribution systems. The following is a description of measurement categories:

- Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS³ voltage. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal

¹ Measurement categories, also referred to as overvoltage or installation categories, are defined in electrical safety standard IEC 61010-1 and IEC 60664-1.

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

³ MAINS is defined as a hazardous live electrical supply system that powers hardware. Suitably rated measuring circuits may be connected to the MAINS for measuring purposes.

levels, special hardware, limited-energy parts of hardware, 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 (MAINS³). This category refers to local-level electrical distribution, such as that provided by a standard wall outlet (for example, 115 AC voltage for U.S. or 230 AC voltage for Europe). Examples of Measurement Category II are measurements performed on household appliances, portable tools, and similar hardware.
- Measurement Category III is for measurements performed in the building installation at the distribution level. This category refers to measurements on hard-wired hardware such as hardware 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 typically outside buildings. Examples include electricity meters and measurements on primary overcurrent protection devices and on ripple control units.

To obtain the safety certification(s) for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility Information

This hardware has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC) as indicated in the hardware's Declaration of Conformity (DoC)¹. These requirements and limits are designed to provide reasonable protection against harmful interference when the hardware is operated in the intended electromagnetic environment. In special cases, for example when either highly sensitive or noisy hardware is being used in close proximity, additional mitigation measures may have to be employed to minimize the potential for electromagnetic interference.

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC¹.

If this hardware does cause interference with licensed radio communications services or other nearby electronics, which can be determined by turning the hardware off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the antenna of the receiver (the device suffering interference).
- Relocate the transmitter (the device generating interference) with respect to the receiver.
- Plug the transmitter into a different outlet so that the transmitter and the receiver are on different branch circuits.

Some hardware may require the use of a metal, shielded enclosure (windowless version) to meet the EMC requirements for special EMC environments such as, for marine use or in heavy industrial areas. Refer to the hardware's user documentation and the DoC¹ for product installation requirements.

¹ The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer. 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.

When the hardware is connected to a test object or to test leads, the system may become more sensitive to disturbances or may cause interference in the local electromagnetic environment.

Operation of this hardware in a residential area is likely to cause harmful interference. Users are required to correct the interference at their own expense or cease operation of the hardware.

Changes or modifications not expressly approved by National Instruments could void the user's right to operate the hardware under the local regulatory rules.

Unpacking

The NI 8253 ships in an antistatic package to prevent electrostatic discharge from damaging device components. To avoid such damage in handling your 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 computer 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 it for loose components or any other signs of damage. Notify National Instruments if the device appears damaged in any way. Do *not* install a damaged device in the computer.

Store the NI 8253 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 typical power requirements for the NI 8253.

1. Install the NI Vision Acquisition Software before installing the NI 8253. Refer to the *NI Vision Acquisition Software Release Notes* for specific installation instructions.
2. Power off and unplug the computer.



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

3. Remove the computer cover to expose the expansion slots.



Caution Installing a PCIe device into a PCI, PCI-X, AGP, or any non-PCIe slot can damage both the computer motherboard and the device. If you are unsure of the difference between connector types, do not install the device. Refer to the documentation provided by your computer manufacturer to determine the correct slot in which to install the NI 8253.

4. Touch a metal part of the computer to discharge any static electricity that might be on your clothes or body. Static electricity can damage the device.
5. Choose an unused x1 or larger PCIe slot, and remove the corresponding expansion slot cover on the back panel of the computer.



Note The NI 8253 is intended for an x1 PCIe slot. The NI 8253 fits into, and can be used in, an x4, x8, or x16 PCIe slot.

6. Remove the NI 8253 device from the antistatic package and gently rock the device into the slot. The connection may be tight, but do *not* force the device into place.



Note Check that the bracket of your device aligns with the hole in the back panel rail of the computer chassis.

7. Secure the device mounting bracket to the back panel rail of the computer.
8. To provide auxiliary power for your cameras, connect an unused power connector from the ATX power supply on your computer to the camera power ATX connector on your NI 8253.
9. Replace the computer cover.
10. Connect the IEEE 1394 cable to the camera. Refer to your camera manufacturer documentation for specific instructions about how to connect the cable to your camera.
11. Connect the IEEE 1394 cable to the IEEE 1394 connector on the NI 8253 front panel.
12. Plug in and power on the computer.

The NI 8253 is now installed, and the camera is connected.

Configuring the NI 8253

After you have installed the NI 8253 and powered on the computer, the computer will recognize the device and assign resources to it. Use Measurement & Automation Explorer (MAX), the National Instruments configuration utility, to configure the NI 8253 for acquisition. Refer to the *Measurement & Automation Explorer Help for NI-IMAQdx* for additional information about configuring the NI 8253.



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

Specifications

The following specifications apply to the NI PCIe-8253 image acquisition device. These specifications are typical at 25 °C unless otherwise specified.

IEEE 1394 Interface

Number of ports 3
 Speed..... 100, 200, 400, or 800 Mbps

PCI Express Interface

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

Power Requirements

IEEE 1394 bus power¹ 18 W, maximum (shared by all ports)
 Camera interface²..... IEEE 1394b, compatible with IEEE 1394a cameras

Physical Characteristics

Dimensions 9.9 cm × 12.2 cm (3.9 in. × 4.8 in.)
 Weight 50 g (1.8 oz)

¹ The bus power specification assumes that power is provided to the NI 8253 device from the host computer power supply using the ATX power connector. If power is not supplied through the ATX power connector, camera power is supplied by the PCIe bus and should be limited to 9 W, shared by all ports.

² To connect an IEEE 1394a camera to the NI 8253, you will need a 6-pin to 9-pin cable or a 6-pin to 9-pin adapter.

Environment

The NI 8253 is intended for indoor use only.

Operating temperature 0 °C to 55 °C

Storage temperature -20 °C to 70 °C

Relative humidity 5% to 80%, noncondensing

Pollution Degree 2



Caution Do *not* use the NI 8253 for connection to signals within Measurement Categories II, III, or IV.

Measurement Category I

Approved at altitudes up to 2,000 m.

Safety

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1



Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.



Note For EMC compliance, operate this product according to the documentation.

CE Compliance

This product meets the essential requirements of applicable European Directives as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and 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)



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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.

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