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PXI

NI PXI-1031/PXI-1031DC User Manual

December 2010
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About This Manual

The *NI PXI-1031/PXI-1031DC User Manual* contains information about installing, configuring, using, and maintaining the NI PXI-1031 and PXI-1031DC chassis.

Conventions

The following conventions are used in this manual:

»	The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **Options»Settings»General** directs you to pull down the **Options** menu, select the **Settings** item, and select **General** from the last dialog box.
	This icon denotes a note, which alerts you to important information.
	This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on the product, refer to the *Read Me First: Safety and Electromagnetic Compatibility* document, shipped with the product, for precautions to take.
bold	Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
italic	Italic text denotes variables, emphasis, a cross-reference, a hardware label, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
`monospace`	Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.

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Related Documentation

The following documents contain information that you may find helpful as you read this manual:

- *NI PXI-1031DC DC Cable Kit Installation Guide*
- *CompactPCI Specification PICMG 2.0 R 3.0*
- *PXI Hardware Specification*
- *PXI Software Specification*
- IEEE 1101.1-1991, *IEEE Standard for Mechanical Core Specifications for Microcomputers Using IEC 603-2 Connectors*
- IEEE 1101.10, *IEEE Standard for Additional Mechanical Specifications for Microcomputers Using IEEE 1101.1 Equipment Practice*

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1 Getting Started

This chapter describes the key features of the NI PXI-1031 and PXI-1031DC chassis, and lists the kit contents and optional equipment you can order from National Instruments.

Unpacking

Carefully inspect the shipping container and the chassis for damage. Check for visible damage to the metal work. Check to make sure all handles, hardware, and switches are undamaged. Inspect the inner chassis for any possible damage, debris, or detached components. If damage appears to have been caused during shipment, file a claim with the carrier. Retain the packing material for possible inspection and/or reshipment.

What You Need to Get Started

- ❑ NI PXI-1031 or NI PXI-1031DC chassis
- ❑ Filler panels
- ❑ Power cable, either:
  - AC power cable—refer to Table 1-1 for AC power cables
  - DC power cable
- ❑ *NI PXI-1031/PXI-1031DC User Manual*
- ❑ *Read Me First: Safety and Electromagnetic Compatibility*
- ❑ Driver CD-ROM containing NI PXI chassis software
- ❑ Chassis number labels

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Table 1-1. AC Power Cables

Power Cable	Reference Standards
Standard 120 V (USA)	NEMA 5-15
Switzerland 220 V	SEV
Australia 240 V	AS C112
Universal Euro 230 V	CEE (7), II, IV, VII IEC83
North America 240 V	NEMA 6-15
United Kingdom 230 V	BS 1363/IEC83
Japan 100 V	JIS C8303

If you are missing any of the items listed in Table 1-1, or if you have the incorrect AC power cable, contact National Instruments.

You have the option of powering the PXI-1031DC chassis with a DC power cable through the DC input connector on the rear panel of the chassis. Refer to Figure 1-3 for the location of the DC connector.

Key Features

The PXI-1031/PXI-1031DC combines a 4-slot PXI backplane with a structural design that has been optimized for maximum usability in a wide range of applications.

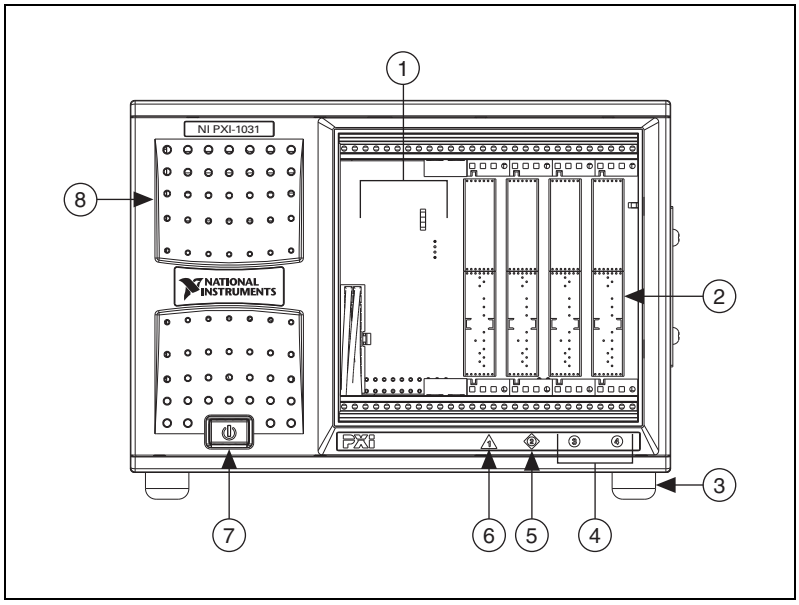
The key features of the chassis include the following:

- Accepts 3U PXI and CompactPCI (PICMG 2.0 R 3.0) modules
- 4-slot chassis with universal AC input, and automatic voltage/frequency ranging
- DC power input (PXI-1031DC only)
- On/Off (Standby) power switch on the front panel for easy access
- AUTO/HIGH temperature-controlled fan speed based on air-intake temperature to minimize audible noise
- (Optional) Carrying handle for portability
- Rack mountable

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Chassis Description

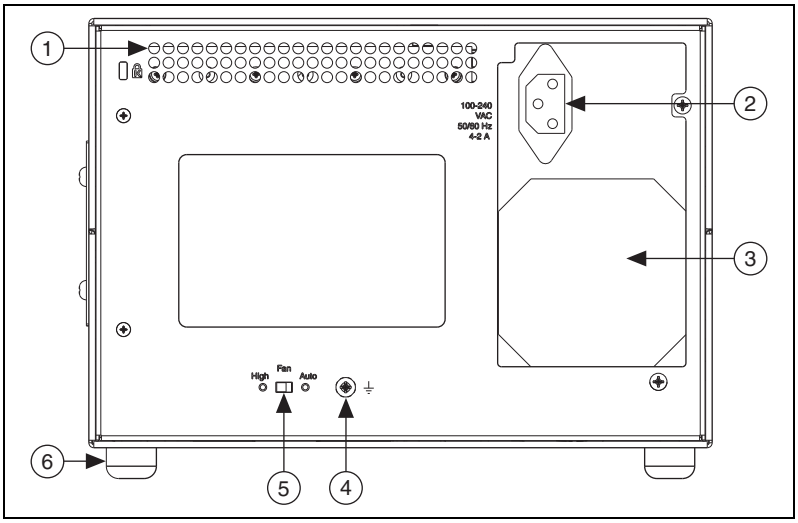
Figure 1-1, Figure 1-2, and Figure 1-3 show the key features of the PXI-1031/PXI-1031DC chassis front and rear panels. Figure 1-1 shows the front view of the PXI-1031 (the PXI-1031DC front panel is identical except for the chassis name stenciled on the face plate). Figure 1-2 shows the rear view of the PXI-1031. Figure 1-3 shows the rear panel of the PXI-1031DC. Figure 1-4 shows the bottom of the chassis (both types of chassis will be identical on the bottom).



1	Controller Expansion Slots	5	Star Trigger Peripheral Slot
2	PXI Backplane	6	Embedded Controller Slot
3	Rubber Foot	7	Power Switch (Standby)
4	PXI Expansion Slots	8	Power Supply Airflow Intake Vents

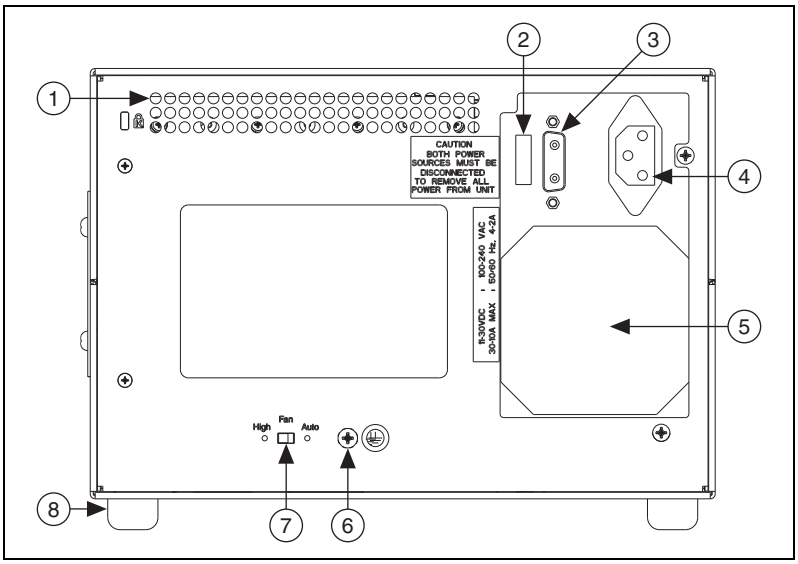
Figure 1-1. Front View of the PXI-1031 Chassis

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1	Rear Exhaust Vents	4	Chassis Ground Screw
2	AC Input	5	Fan Speed Selector Switch
3	Power Supply Fan Exhaust	6	Rubber Foot

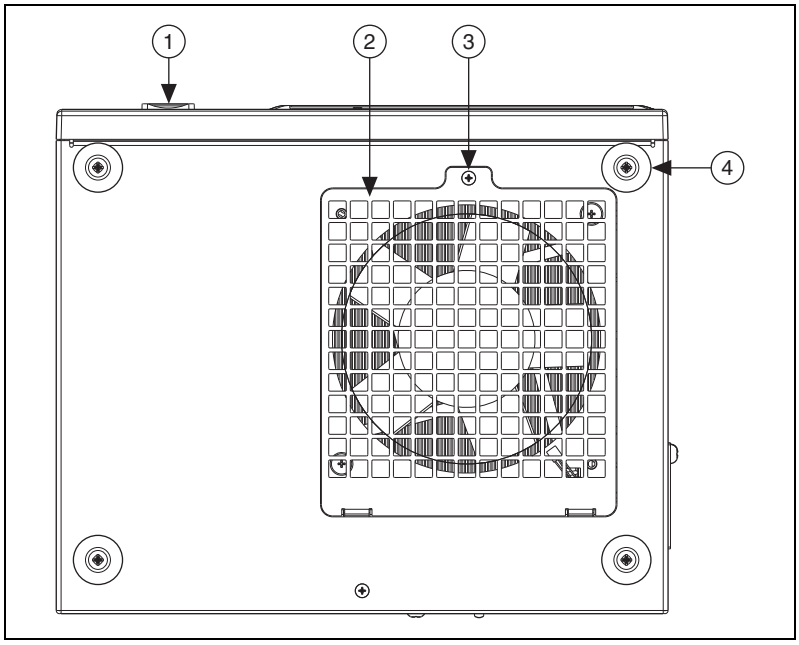
Figure 1-2. Rear View of the PXI-1031 Chassis



1	Rear Exhaust Vents	5	Power Supply Fan Exhaust
2	DC Fuse Socket	6	Chassis Ground Screw
3	DC Input	7	AUTO/HIGH Fan Speed Selector Switch
4	AC Input	8	Rubber Foot

Figure 1-3. Rear View of the PXI-1031DC Chassis

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1	Power Switch (Standby)	3	Fan Cover Screw
2	Fan Cover	4	Rubber Foot

Figure 1-4. Bottom View of PXI-1031/PXI-1031DC Chassis

Optional Equipment

Contact National Instruments to order the following options for the PXI-1031/PXI-1031DC chassis.

EMC Filler Panels

Optional EMC filler panel kits are available from National Instruments.

Rack Mount Kits

A rack mount kit option is available for mounting the PXI-1031 or PXI-1031DC chassis into a 19 in. instrument cabinet.

Handle/Feet Kit

An optional side handle and rubber feet kit is available from National Instruments to provide a handle for portability.

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DC Power Cable (PXI-1031DC Only)

An optional DC power cable is available from National Instruments to provide power through the DC input connector on the rear panel of the chassis.

PXI-1031/PXI-1031DC Backplane Overview

Interoperability with CompactPCI

The PXI-1031/PXI-1031DC backplane is interoperable with 5 V and universal PXI-compatible products and standard CompactPCI products. This is an important feature, because some PXI systems may require components that do not implement PXI-specific features. For example, you may want to use a standard CompactPCI network interface card in a PXI chassis.

The signals on the backplane P1 connectors meet the requirements of the CompactPCI specification for both peripheral and system modules. Refer to Appendix B, *Pinouts*, for pinout information.

The PXI-specific signals are on the backplane P2 connectors and are found only on those signal lines reserved or not used in the CompactPCI 64-bit specification. Therefore, all modules that meet the requirements of the CompactPCI 64-bit specification will function in the PXI-1031/PXI-1031DC. Refer to Appendix B, *Pinouts*, for pinout information.



Note The PXI-1031 backplane is 32-bit PCI. 64-bit CompactPCI cards will operate in 32-bit mode in this chassis.

The chassis backplane has +5 V V(I/O). Refer to the *CompactPCI Specification PICMG 2.0 R 3.0* for details regarding V(I/O).

System Controller Slot

The system controller slot is slot 1 of the chassis as defined by the PXI specification. It has three controller expansion slots for system controller modules that are wider than one slot. As defined in the PXI specification, these slots allow the controller to expand to the left to prevent the controller from using peripheral slots.

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Star Trigger Slot

The star trigger (ST) slot is slot 2. This slot has dedicated equal-length trigger lines between slot 2 and peripheral slots 3 and 4 (refer to Figure 1-5). Slot 2 is intended for modules with ST functionality that can provide individual triggers to all other peripheral modules. However, if you do not require advanced trigger functionality, you can install any standard peripheral module in this slot.

The star trigger slot can also be used to provide a PXI_CLK10 signal to the backplane. For more information regarding PXI_CLK10, refer to the *System Reference Clock* section.

Peripheral Slots

There are three peripheral slots, including the star trigger slot.

Local Bus

The PXI backplane local bus is a daisy-chained bus that connects each peripheral slot with adjacent peripheral slots to the left and right (refer to Figure 1-5). For example, the right local bus of slot 2 connects to the left local bus of slot 3, and so on.

The left local bus signal lines on slot 2 are used for star trigger and do not connect to slot 1. The right local bus signal lines on slot 4 are not routed anywhere.

Each local bus is 13 lines wide and can pass analog signals up to 42 V between cards or provide a high-speed TTL side-band digital communication path that does not reduce the PXI bus bandwidth.

Initialization software uses the configuration information specific to adjacent peripheral modules to evaluate local bus compatibility.

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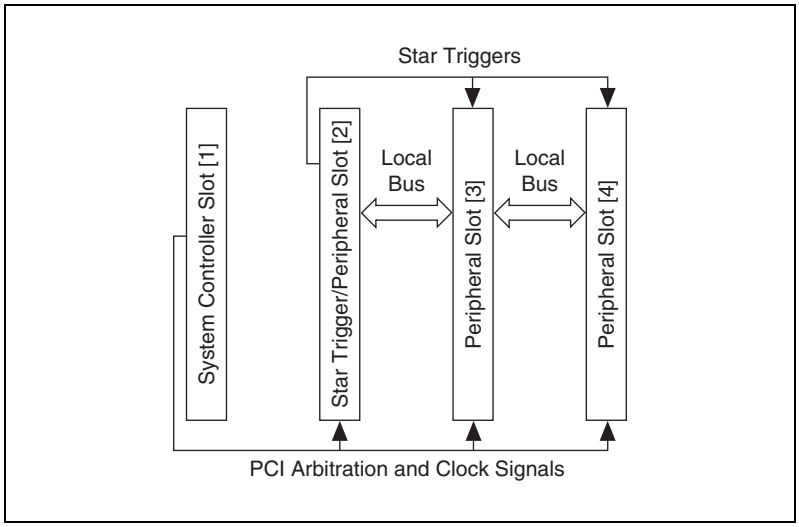


Figure 1-5. PXI Star Trigger and Local Bus Routing

Trigger Bus

All slots share eight PXI trigger lines. You can use these trigger lines in a variety of ways. For example, you can use triggers to synchronize the operation of several different PXI peripheral modules. In other applications, one module located in slot 2 can control carefully timed sequences of operations performed on other modules in the system. Modules can pass triggers to one another, allowing precisely timed responses to asynchronous external events the system is monitoring or controlling.

System Reference Clock

The PXI-1031/PXI-1031DC supplies the PXI 10 MHz system clock signal (PXI_CLK10) independently to each peripheral slot. An independent buffer (having a source impedance matched to the backplane and a skew of less than 250 ps between slots) drives the clock signal to each peripheral slot. You can use this common reference clock signal to synchronize multiple modules in a measurement or control system. You can drive PXI_CLK10 from an external source through the PXI_CLK10_IN pin on the P2 connector of the star trigger slot. Refer to Table B-4, *P2 (J2) Connector Pinout for the Star Trigger Slot*. You must manually switch S2 on the chassis backplane to enable or disable routing an external clock to peripheral slots.

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2

Installation and Configuration

This chapter describes how to install, configure, and use the PXI-1031 and PXI-1031DC chassis.

Before connecting the chassis to a power source, read this chapter and the *Read Me First: Safety and Electromagnetic Compatibility* document included with your chassis.

Safety Information

Caution Before undertaking any troubleshooting, maintenance, or exploratory procedure, carefully read the following caution notices.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

- **Chassis Grounding**—The chassis requires a connection from the premise wire safety ground to the chassis ground. The earth safety ground must be connected during use of this equipment to minimize shock hazards. Refer to the *Connecting Safety Ground* section for instructions on connecting safety ground.
- **Live Circuits**—Operating personnel and service personnel *must not* remove protective covers when operating or servicing the chassis. Adjustments and service to internal components must be undertaken by qualified service technicians. During service of this product, the mains connector to the premise wiring must be disconnected. Dangerous voltages may be present under certain conditions; use extreme caution.
- **Explosive Atmosphere**—Do *not* operate the chassis in conditions where flammable gases are present. Under such conditions, this equipment is unsafe and may ignite the gases or gas fumes.

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- **Part Replacement**—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact National Instruments for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the chassis. Furthermore, damage or fire may occur if replacement parts are unsuitable.
- **Modification**—Do *not* modify any part of the chassis from its original condition. Unsuitable modifications may result in safety hazards.

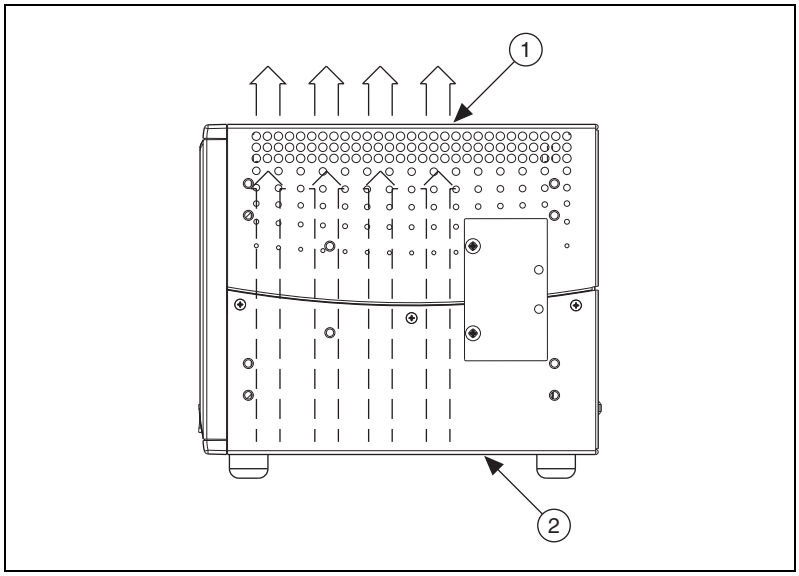
Chassis Cooling Considerations

The chassis is designed to operate on a bench or in an instrument rack. Determine how you want to use the chassis and follow the appropriate installation instructions.

Providing Adequate Clearance

Apertures in the top, bottom, front, rear, and along the right and left sides of the chassis facilitate power supply and module cooling. Air enters through the fan inlet in the bottom of the chassis for module cooling. It then exits through the upper sections at the right side, back, and through the top, as shown in Figure 2-1. Air cooling the power supply enters the front and left side of the chassis, which is shown in Figure 1-1, *Front View of the PXI-1031 Chassis*, then exits through the rear of the chassis, which is shown in Figure 1-2, *Rear View of the PXI-1031 Chassis*, and Figure 1-3, *Rear View of the PXI-1031DC Chassis*. Place the chassis on a bench top or in an instrument rack so that the fans (air inlets) and the air outlet apertures along the right and left sides, the top, and the back of the chassis have adequate ventilation. Provide at least 44.5 mm (1.75 in.) clearance above, behind, and on the sides of the unit for adequate venting. High-power applications may require additional clearance.

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1	Air Outlets	2	Air Intake

Figure 2-1. PXI-1031/PXI-1031DC Module Cooling Airflow Side View

Install the chassis so that you can easily access the bottom panel.

Setting Fan Speed

The AUTO/HIGH fan-speed selector switch is on the rear panel of the PXI-1031 and PXI-1031DC. Refer to Figure 1-2, *Rear View of the PXI-1031 Chassis*, or Figure 1-3, *Rear View of the PXI-1031DC Chassis*, to locate the fan-speed selector switch. Select HIGH for maximum cooling performance (recommended) or AUTO for quieter operation. The fan speed is determined by chassis intake air temperature when set to AUTO.

Installing Filler Panels

To improve module cooling performance, install filler panels (provided with the chassis) in unused or empty slots. Secure with the captive mounting screws provided.

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Rack Mounting

Rack mount applications require the optional rack mount kits available from National Instruments. Refer to Figure A-3, *PXI-1031/PXI-1031DC Rack Mount Kit Components*, and the instructions supplied with the rack mount kits to install your chassis in an instrument rack.

Note You may want to remove the feet from the chassis when rack mounting. To do so, remove the screws holding the feet in place.

Connecting Safety Ground

Caution The PXI-1031/PXI-1031DC chassis is designed with a three-position inlet that connects the cord set ground line to the chassis ground. To minimize shock hazard, make sure the electrical power outlet you use to power the chassis has an appropriate earth safety ground.

For DC powered applications, or if your power outlet does not have an appropriate ground connection, you must connect the premise safety ground to the chassis grounding screw located on the rear panel. Refer to Figure 1-2, *Rear View of the PXI-1031 Chassis*, or Figure 1-3, *Rear View of the PXI-1031DC Chassis*, to locate the chassis grounding screw. Complete the following steps to connect the safety ground.

1. Connect a 10 AWG (2.6 mm) wire to the chassis grounding screw using a grounding lug. The wire must have green insulation with a yellow stripe or must be noninsulated (bare).
2. Attach the opposite end of the wire to permanent earth ground using toothed washers or a toothed lug.

Connecting to Power Source

Cautions Do *not* install modules prior to performing the following power-on test.

To completely remove power, you *must* disconnect the AC power cable (and DC power, if applicable).

If both AC and DC power cables are connected, the chassis will draw power from both sources.

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Connecting to an AC Power Source

Attach input power through the rear AC inlet using the appropriate AC power cable supplied. Refer to Figure 1-2, *Rear View of the PXI-1031 Chassis*, or to Figure 1-3, *Rear View of the PXI-1031DC Chassis*, to locate the AC inlet.

The power switch allows you to power on the chassis or place it in standby mode. Press the power switch to the On position (if not already on). Observe that all fans become operational.

Connecting to a DC Power Source (PXI-1031DC Only)

Table 2-1. DC Power Requirements

Electrical Element	Requirement
Voltage	18–30 VDC
DC Input Current	30–10 A

For full chassis power, the DC source must be capable of providing a minimum of 300 watts of continuous power per feed pair to the P1 connector on the PXI-1031DC power supply.

DC Connector

Figure 2-2 shows the DC connector (P1) that appears on the rear panel of the PXI-1031DC power supply.

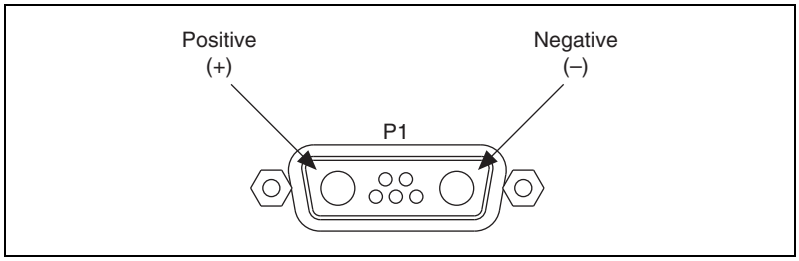


Figure 2-2. The P1 DC Input Connector

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To build a custom DC cable, be sure to note the positive (+) and negative (–) terminals shown in Figure 2-2. Use the following components or their equivalents to mate to the P1 port:

- Positronic connector, part number CBD7W2F0000
- Positronic hood, part number D15000GE0
- Two Positronic contacts, part number FS4008D (choice of solder cup or crimp terminals)
- Use of UL listed AWG #10 wire is recommended (maximum length: 216 in.)

Install an F30A 500 VDC/600 VAC, 1.5 in. × .41 in. (10 mm × 38 mm) Midget fast-acting fuse on the positive (+) wire of the custom cable as close to the power source as practical.

- A Ferraz-Shawmut FEB-81-81 fuse holder, with Ferraz-Shawmut FSB1 insulating boots, and an ATM30 fuse is recommended.

Refer to the *NI PXI-1031DC DC Cable Kit Installation Guide* for information on fuse installation.

Note You can purchase an optional DC cable from National Instruments that incorporates an in-line fuse and the mating connector for the P1 port.

Installing a PXI Controller

This section contains general instructions for installing a PXI controller in the chassis. Refer to your PXI controller user manual for specific instructions and cautions. Complete the following steps to install a controller.

1. Connect the AC or DC power source to the PXI chassis before installing the controller. The AC power cord grounds the chassis and protects it from electrical damage while you install the controller. For DC powered applications, make sure the chassis is properly grounded through the chassis ground screw. Make sure the chassis power switch is in the Off (Standby) position.

Caution To protect both yourself and the chassis from electrical hazards, leave the chassis off until you finish installing the controller.

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2. Install the controller into the system controller slot (slot 1, indicated by the red card guides) by first placing the controller edges into the front controller guides (top and bottom). Slide the controller to the rear of the chassis, making sure that the injector/ejector handle is pushed down as shown in Figure 2-3.

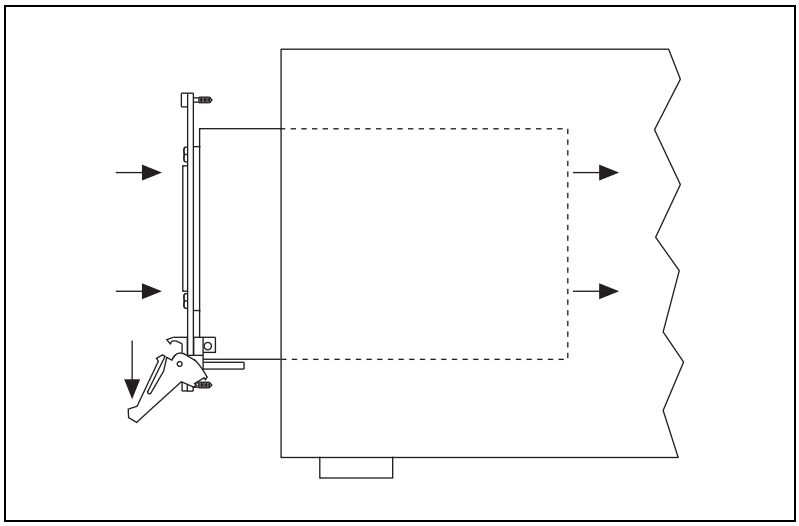
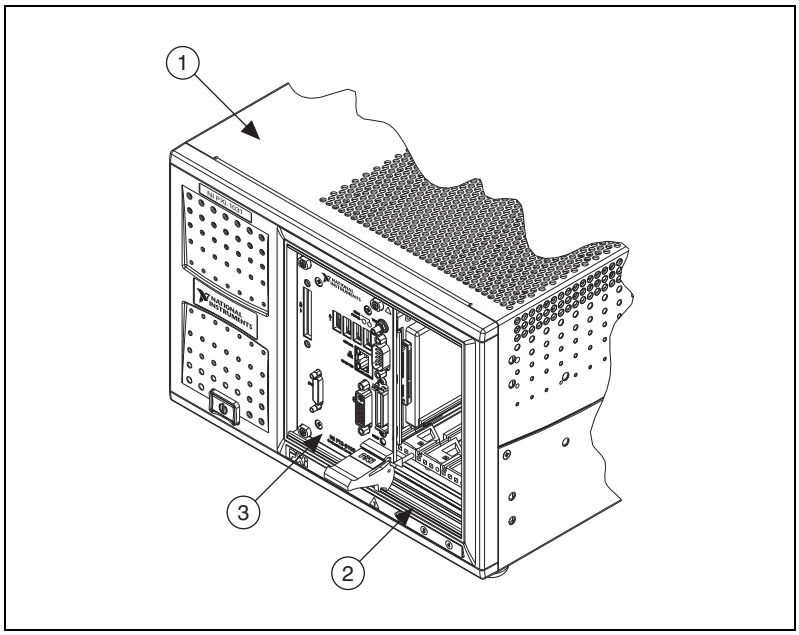


Figure 2-3. Injector/Ejector Handle Position during Controller or Peripheral Module Insertion

3. When you begin to feel resistance, push up on the injector/ejector handle to inject the controller fully into the chassis frame. Secure the controller front panel to the chassis using the controller front-panel mounting screws.
4. Connect the keyboard, mouse, and monitor to the appropriate connectors. Connect devices to ports as required by your system configuration.
5. Power on the chassis. Verify that the controller boots. If the controller does not boot, refer to your controller user manual.

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Figure 2-4 shows a PXI controller installed in the system controller slot of a PXI-1031/PXI-1031DC chassis. You can place CompactPCI or PXI modules in any other slot.



1	PXI-1031/PXI-1031DC Chassis	3	NI PXI Controller
2	Injector/Ejector Rail		

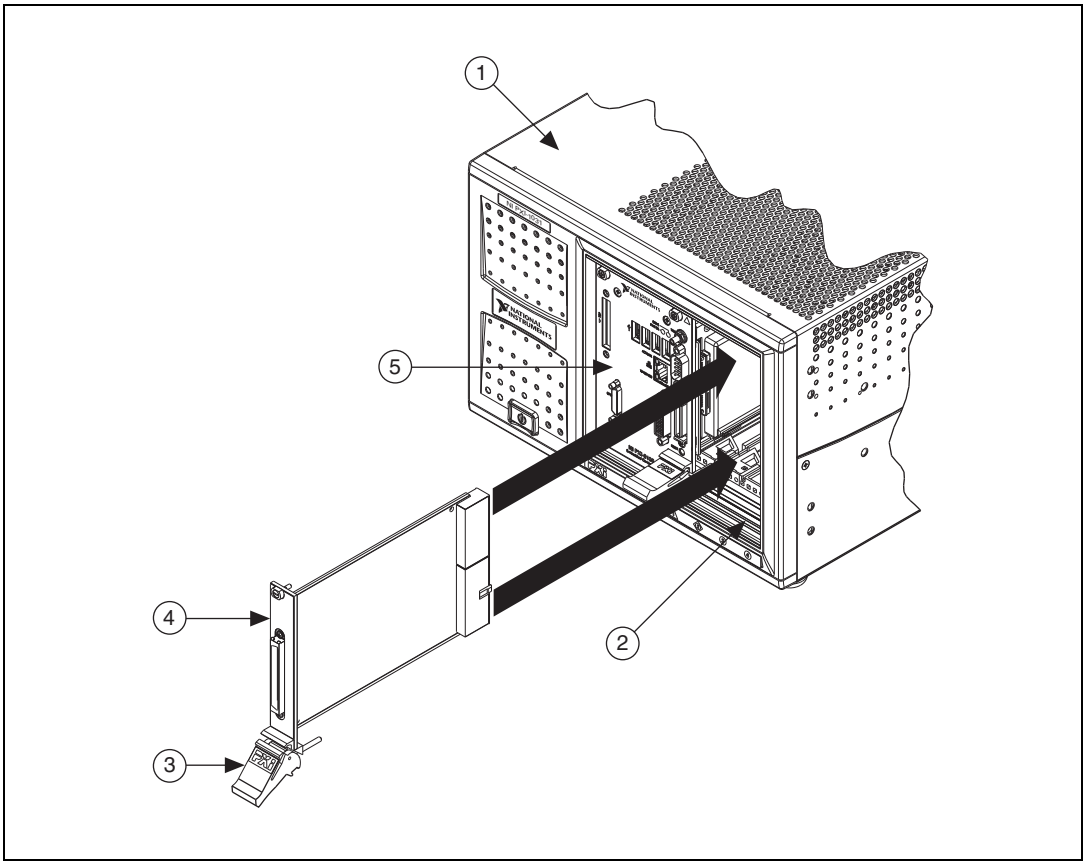
Figure 2-4. NI PXI Controller Installed in a PXI-1031/PXI-1031DC Chassis

Installing PXI Modules

Complete the following steps to install a module.

1. Make sure the power switch is in the Off (Standby) position.
2. Install a module into a chassis slot by first placing the module card edges into the front module guides (top and bottom), as shown in Figure 2-5. Slide the module to the rear of the chassis, making sure that the injector/ejector handle is pushed down as shown in Figure 2-3.
3. When you begin to feel resistance, push up on the injector/ejector handle to fully inject the module into the chassis frame. Secure the module front panel to the chassis using the module front-panel mounting screws.

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1 PXI-1031/PXI-1031DC Chassis	3 Injector/Ejector Handle	5 NI PXI Controller
2 Injector/Ejector Rail	4 PXI Module	

Figure 2-5. Installing PXI or CompactPCI Modules

PXI System Configuration with MAX

Configuration of the PXI system is handled through Measurement & Automation Explorer (MAX), included on the NI Driver CD-ROM packaged with your kit. MAX creates the `pxisys.ini` file that defines the layout and parameters of your PXI system. After installing the software on the NI Driver CD-ROM, the MAX icon will be present on the desktop. The configuration steps for single or multiple chassis systems are the same.

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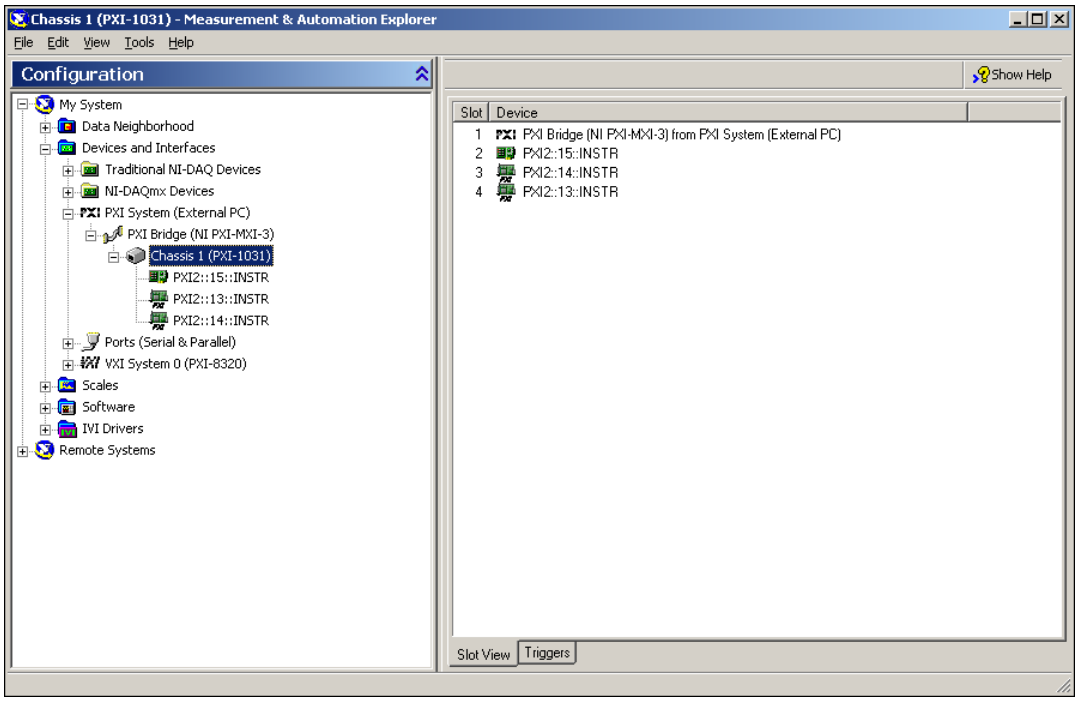


Figure 2-6. Chassis Configuration in MAX

Basic PXI System Configuration

Refer to Figure 2-6 while completing the following steps:

1. Launch MAX.
2. In the **Configuration** tree, click the **Devices and Interfaces** branch to expand it.
3. If the PXI system controller has not yet been configured, it will be labeled `PXI System (Unidentified)`. Right-click this entry to display the context menu and then select the appropriate controller model from the **Identify As** submenu.
4. Click the **PXI System** controller, and the chassis (or multiple chassis, in a multi-chassis configuration) will be listed below it. Identify each chassis by right-clicking its entry and then selecting the appropriate chassis model through the **Identify As** submenu. Further expanding the **PXI System** branch will show all of the devices in the system that can be recognized by NI-VISA. After your controller and all of your chassis have been identified, the required `pxisys.ini` file will be complete.

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5. Apply the chassis number labels (shown in Figure 2-7) included with your kit to each chassis in your PXI system, and write in the chassis number accordingly in the white space.

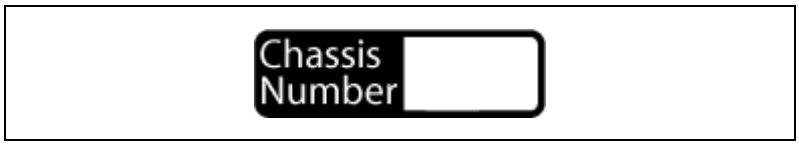


Figure 2-7. Chassis Number Label

Trigger Configuration in MAX

Each chassis has one or more trigger buses, each with eight lines numbered 0 through 7 that can be reserved and routed statically or dynamically. Static reservation "pre-allocates" a trigger line to prevent its configuration by a user program. Dynamic reservation/routing/deallocation is performed *on the fly* within a user program based upon National Instruments APIs such as NI-DAQmx. Static reservation of trigger lines can be implemented by the user in MAX through the **Triggers** tab. Reserved trigger lines will not be used by PXI modules dynamically configured by programs such as NI-DAQmx. This prevents the instruments from double-driving the trigger lines, possibly damaging devices in the chassis.

Complete the following steps to reserve these trigger lines in MAX.

1. In the **Configuration** tree, click the PXI chassis branch you want to configure.
2. Click the **Triggers** tab at the bottom of the right-hand pane.
3. Select which trigger lines you want to statically reserve.
4. Click the **Apply** button.

Note For more information about routing and reserving PXI triggers refer to KnowledgeBase **3TJDOND8** at `ni.com/support`.

Using System Configuration and Initialization Files

The PXI specification allows many combinations of PXI chassis and system modules. To assist system integrators, the manufacturers of PXI chassis and system modules must document the capabilities of their products. The minimum documentation requirements are contained in `.ini` files, which consist of ASCII text. System integrators, configuration utilities, and device drivers can use these `.ini` files.

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The capability documentation for the PXI-1031/PXI-1031DC chassis is contained in the `chassis.ini` file on the software media that comes with the chassis. The information in this file is combined with information about the system controller to create a single system initialization file called `pxisys.ini` (PXI System Initialization). The system controller manufacturer either provides a `pxisys.ini` file for the particular chassis model that contains the system controller or provides a utility that can read an arbitrary `chassis.ini` file and generate the corresponding `pxisys.ini` file. System controllers from National Instruments use MAX to generate the `pxisys.ini` file from the `chassis.ini` file.

Device drivers and other utility software read the `pxisys.ini` file to obtain system information. Device drivers should have no need to directly read the `chassis.ini` file. For detailed information regarding initialization files, refer to the PXI specification at `www.pxisa.org`.

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3

Maintenance

This chapter describes basic maintenance procedures you can perform on the PXI-1031 and PXI-1031DC chassis.

Caution Disconnect the power cables prior to servicing the chassis.

DC Fuse Replacement (PXI-1031DC Only)

The PXI-1031DC is protected against over-current by a 30 A fuse on the rear of the chassis, as shown in Figure 1-3, *Rear View of the PXI-1031DC Chassis*. The fuse should only be replaced with a Wickmann 162.6385.530, Littlefuse 257 030, or equivalent. To remove the fuse, pull *straight out* from the chassis.

Service Interval

Clean dust from the chassis exterior (and interior) as needed, based on the operating environment. Periodic cleaning increases reliability.

Preparation

The information in this chapter is designed for use by qualified service personnel. Read the *Read Me First: Safety and Electromagnetic Compatibility* document included with your kit before attempting any procedures in this chapter.

Caution Many components within the chassis are susceptible to static discharge damage. Service the chassis only in a static-free environment. Observe standard handling precautions for static-sensitive devices while servicing the chassis. Always wear a grounded wrist strap or equivalent while servicing the chassis.

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Cleaning

Caution *Always* disconnect the AC power cable (and the DC power cable, if you are working with a PXI-1031DC chassis) before cleaning or servicing the chassis.

Cleaning procedures consist of exterior and interior cleaning of the chassis. Refer to your module user documentation for information on cleaning individual CompactPCI or PXI modules.

Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the chassis. Use a soft-bristle brush for cleaning around components.

Exterior Cleaning

Cautions Avoid getting moisture inside the chassis during exterior cleaning, especially through the top vents. Use just enough moisture to dampen the cloth.

Do *not* wash the front- or rear-panel connectors or switches. Cover these components while cleaning the chassis.

Do *not* use harsh chemical cleaning agents; they may damage the chassis. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Clean the exterior surfaces of the chassis with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, wipe with a cloth moistened in a mild soap solution. Remove any soap residue by wiping with a cloth moistened with clear water. Do *not* use abrasive compounds on any part of the chassis.

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A

Specifications

Caution If the PXI-1031/PXI-1031DC chassis is used in a manner inconsistent with the instructions or specifications listed by National Instruments, the protective features of the chassis may be impaired.

Note Specifications are subject to change without notice.

This appendix contains specifications for the PXI-1031 and PXI-1031DC chassis.

PXI-1031 Chassis

Electrical

Caution Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

AC Input

Input voltage range..... 100–240 VAC

Operating voltage range[1]..... 90–264 VAC

Input frequency ..... 50/60 Hz

Operating frequency range[1] ..... 47–63 Hz

Input current rating..... 4–2 A

Efficiency ..... >70% at full load, normal input voltage

[1] The operating range is guaranteed by design.

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Power disconnect.....The AC power cable provides main power disconnect. The front-panel power switch controls the internal chassis power supply that provides DC power to the CompactPCI/PXI backplane.

DC Output

DC current capacity (I_{MP})

Voltage	0–50 °C
+3.3 V	12 A
+5 V	17 A
+12 V	2 A
–12 V	0.8 A

Over-current protection .....All outputs protected from short circuit

Over-voltage protection

Over-voltage at	Active Range	
	Minimum	Maximum
+3.3 V	3.76 V	4.3 V
+5 V	5.74 V	7.0 V
+12 V	13.4 V	15.6 V

Chassis Cooling

Per slot cooling capacity.....25 W

Slot airflow direction .....P1 to P2, bottom of module to top of module

Module cooling

System .....Forced air circulation (positive pressurization) through a 101.1 CFM fan with HIGH/AUTO speed selector

Intake .....Bottom of chassis

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Exhaust..... Along rear, right side, and top of chassis

Power supply cooling

System..... Forced air circulation through integrated fan

Intake ..... Front and left side of chassis

Exhaust..... Rear side of chassis

Environmental

Operating location..... Indoor use

Maximum altitude..... 2,000 m

Measurement Category II

Pollution Degree 2

Operating Environment

Ambient temperature range..... 0 to 50 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and high temperature limit.)

Relative humidity range..... 20 to 80%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Storage Environment

Ambient temperature range..... –20 to 70 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 limits.)

Relative humidity range..... 10 to 95%, noncondensing (Tested in accordance with IEC-60068-2-56.)

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Shock and Vibration

Operational shock .....30 g peak, half-sine, 11 ms pulse
(Tested in accordance with IEC-60068-2-27. Meets MIL-PRF-28800F Class 2 limits.)

Random Vibration

Operating .....5 to 500 Hz, 0.3 g_{rms}

Nonoperating .....5 to 500 Hz, 2.4 g_{rms}
(Tested in accordance with IEC-60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Acoustic Emissions

Sound Pressure Level (at Operator Position)

Tested in accordance with ISO 7779. Meets MIL-PRF-28800F requirements.

PXI-1031

Auto fan (at 25 °C ambient) .....35.0 dBA

High fan .....51.7 dBA

Sound Power

Tested in accordance with ISO 7779.

PXI-1031

Auto fan (at 25 °C ambient) .....43.4 dBA

High fan .....59.5 dBA

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PXI-1031DC Chassis

Electrical

Caution Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

AC Input

Input voltage range..... 100–240 VAC

Operating voltage range[1]..... 90–264 VAC

Input frequency ..... 50/60 Hz

Operating frequency range[1] ..... 47–63 Hz

Input current rating..... 4–2 A

Over-current protection..... 6.3 A fuse in power supply (no user-serviceable components inside chassis)

Efficiency ..... 65% minimum

Power disconnect ..... The AC power cable provides main power disconnect. The front-panel power switch controls the internal chassis power supply that provides DC power to the CompactPCI/PXI backplane.

DC Input

Input voltage range..... 18–30 VDC

Input current rating..... 30–10 A

Efficiency ..... 65% typical

[1] The operating range is guaranteed by design.

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Power disconnect.....The DC power cable provides main power disconnect. The front-panel power switch controls the internal chassis power supply that provides DC power to the CompactPCI/PXI backplane.

DC Output

DC current capacity (I_{MP})

Voltage	0–50 °C
+3.3 V	12 A
+5 V	17 A
+12 V	2 A
–12 V	0.8 A

Notes The output power is derated –5 W/°C above 45 °C.

The combined loading on +5 VDC and +3.3 VDC must not exceed 112 W.

For AC powered applications, the combined loading must not exceed 145.6 W.

Overcurrent protection.....All outputs protected from short circuit and overload

Overvoltage protection .....All outputs protected from overvoltage. Cycle the primary power and front power switch to restart.

Chassis Cooling

Per slot cooling capacity.....25 W

Slot airflow direction .....P1 to P2, bottom of module to top of module

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Module cooling

- System ..... Forced air circulation (positive pressurization) through a 101.1 CFM fan with HIGH/AUTO speed selector
- Intake ..... Bottom of chassis
- Exhaust ..... Along rear, right side, and top of chassis

Power supply cooling

- System ..... Forced air circulation through integrated fan
- Intake ..... Front and left side of chassis
- Exhaust ..... Rear side of chassis

Environmental

Operating location ..... Indoor use

Maximum altitude ..... 2,000 m

Installation Category II

Pollution Degree 2

Operating Environment

Ambient temperature range ..... 0 to 50 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)

Storage Environment

Ambient temperature range ..... –20 to 70 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)

Relative humidity range ..... 5 to 95%, noncondensing (Tested in accordance with IEC-60068-2-56.)

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Shock and Vibration

Operational shock .....30 g peak, half-sine, 11 ms pulse
(Tested in accordance with IEC-60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)

Random Vibration

Operating .....5 to 500 Hz, 0.3 g_{rms}

Nonoperating .....5 to 500 Hz, 2.4 g_{rms}
(Tested in accordance with IEC-60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Acoustic Emissions

Sound Pressure Level (at Operator Position)

Tested in accordance with ISO 7779.

PXI-1031DC

Auto fan (at 25 °C ambient) .....45.5 dBA

High fan .....49.4 dBA

Sound Power

Tested in accordance with ISO 7779.

PXI-1031DC

Auto fan (at 25 °C ambient) .....54.3 dBA

High fan .....58.2 dBA

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Common Specifications

Safety

This product is designed to meet the requirements of the following standards of safety for information technology equipment:

- 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 device with shielded cabling.

CE Compliance CE

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)

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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

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and 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 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 and Electronic Equipment, visit `ni.com/environment/weee`.

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`.)

Backplane

Size .....3U-sized; one system slot (with three system expansion slots) and three peripheral slots. Compliant with IEEE 1101.10 mechanical packaging. *PXI Hardware Specification*, Revision 2.2 compliant. Accepts both PXI and CompactPCI 3U modules.

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V(I/O)[1] ..... +5 V

Backplane bare-board material ..... UL 94 V-0 recognized

Backplane connectors ..... Conform to IEC 917 and IEC 1076-4-101, and are UL 94 V-0 rated

10 MHz System Reference Clock (10 MHz REF)

Maximum clock skew between slots ..... 250 ps

Built-in 10 MHz clock

Accuracy ..... ±25 ppm (guaranteed over the operating temperature range)

Mechanical

Overall dimensions (standard chassis)

Height..... 177 mm (6.97 in.)

Note 12.7 mm (0.50 in.) is added to height when feet are installed.

Width ..... 257.1 mm (10.12 in.)

Depth..... 212.8 mm (8.38 in.)

Weight..... 5 kg (11.0 lbs)

Chassis materials..... Sheet Aluminum, Extruded Aluminum, Cold Rolled Steel, Nylon

Finish..... Clear Chromate Conversion Coat on Aluminum
Electrodeposited Nickel Plate on Cold Rolled Steel
Polyester Urethane Powder Paint

[1] V(I/O) is connected to the +5 V DC power plane, so the same specifications apply to V(I/O) and +5 V.

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Figure A-1 and Figure A-2 show the PXI-1031/PXI-1031DC dimensions. The holes shown are for the installation of the optional rack-mount kits as shown in Figure A-3. Notice that the front and rear rack mounting holes (size M4) are symmetrical.

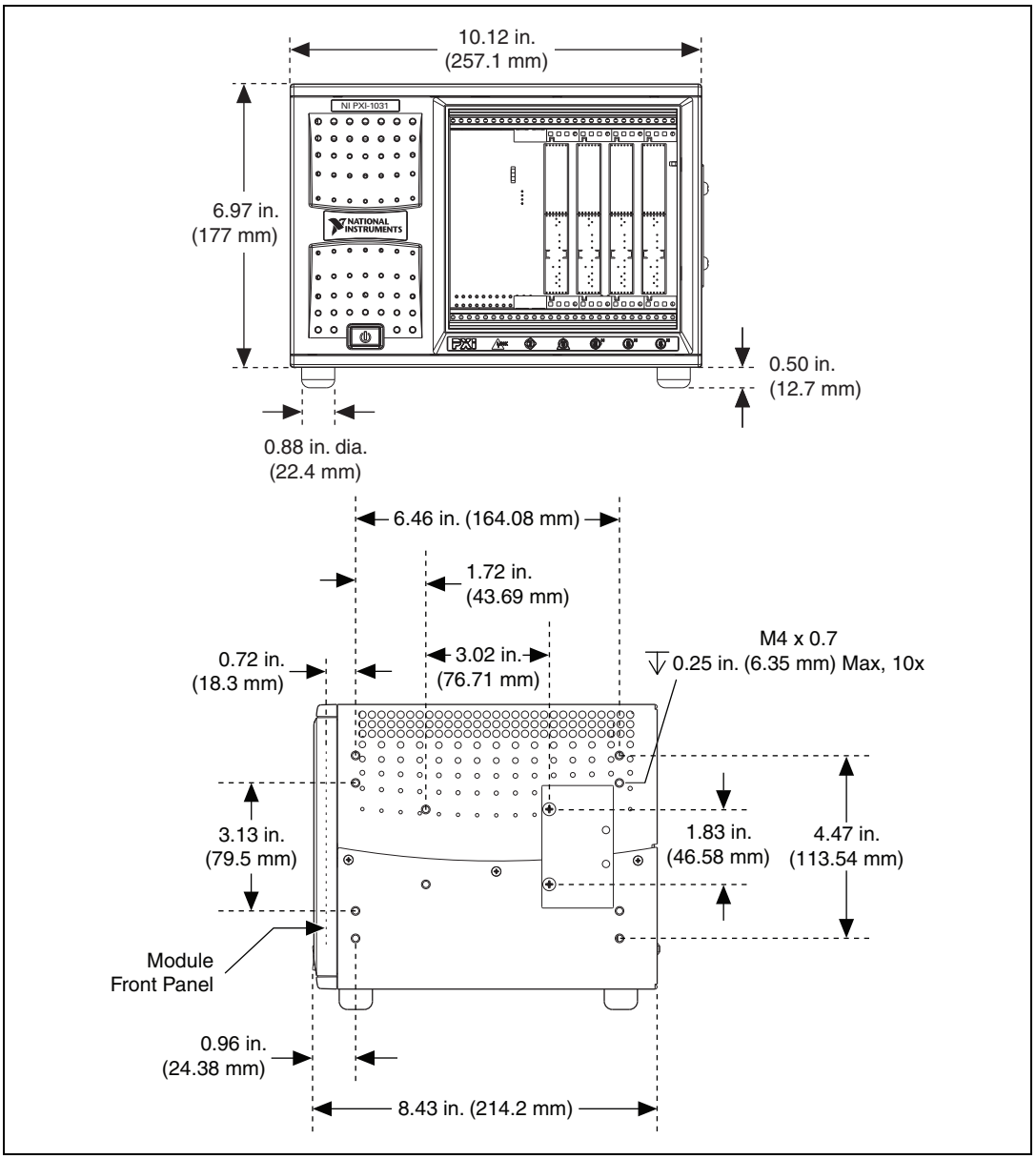


Figure A-1. PXI-1031/PXI-1031DC Dimensions (Front and Side) in Inches (mm)

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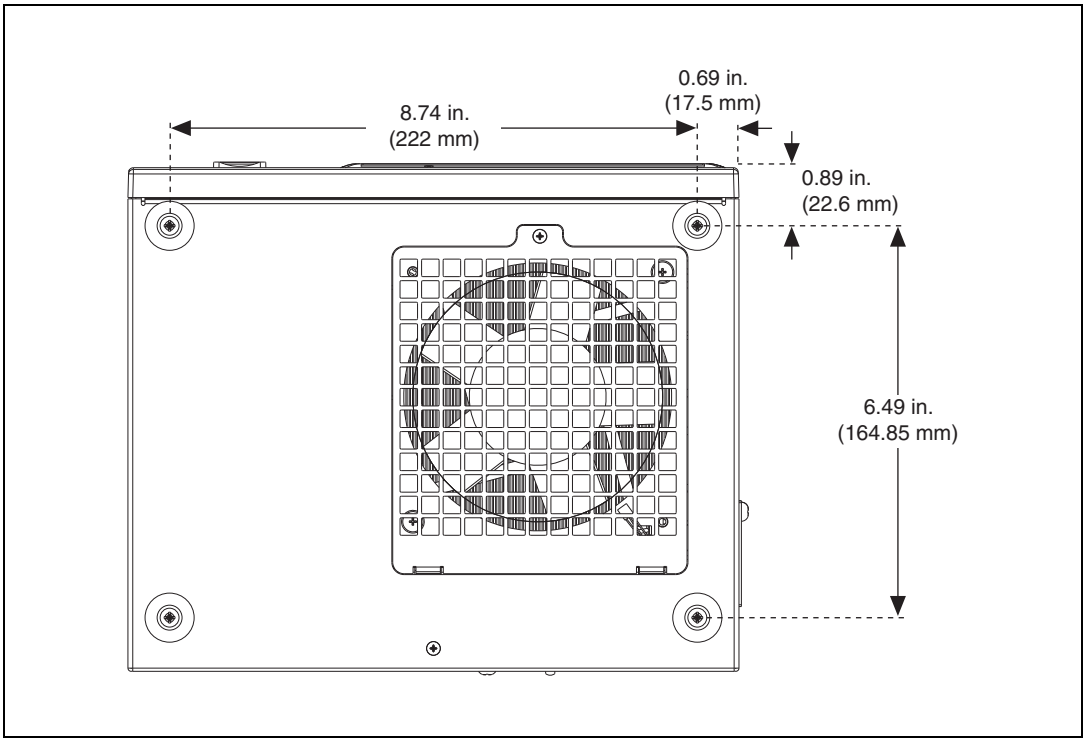
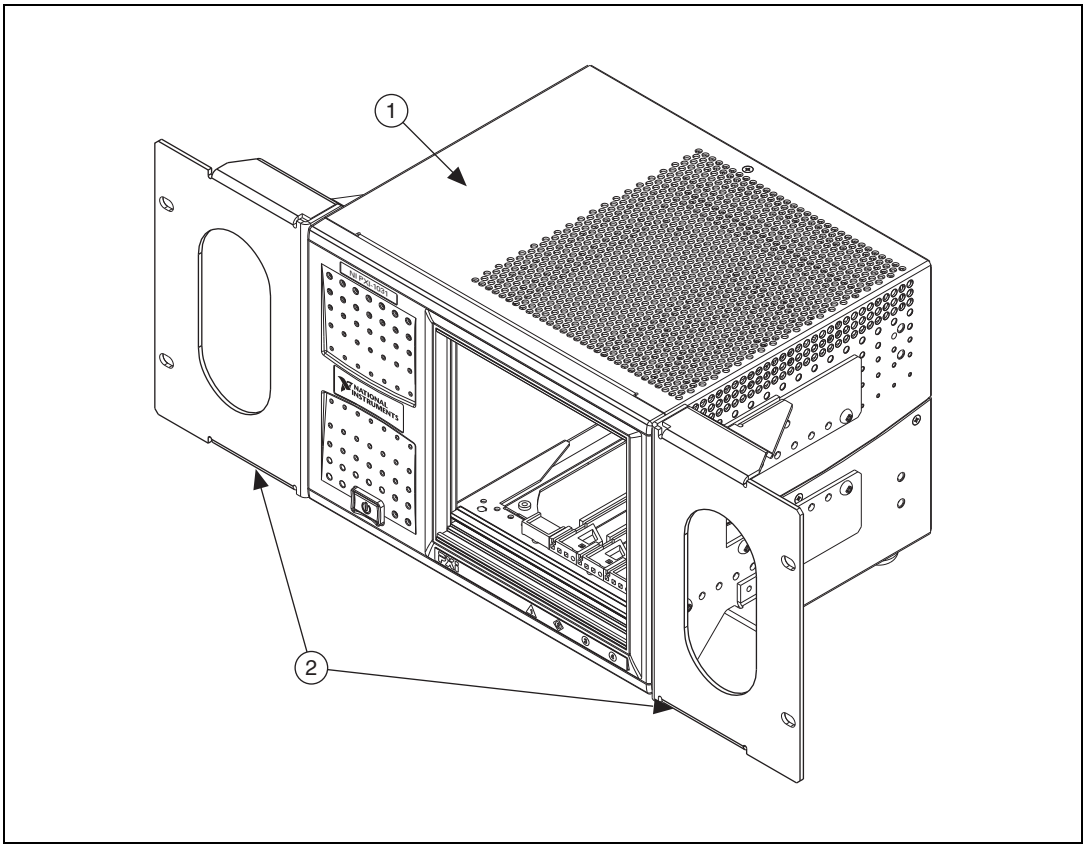


Figure A-2. PXI-1031/PXI-1031DC Dimensions (Bottom) in Inches (mm)

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Figure A-3 shows the PXI-1031/PXI-1031DC rack mount kit components.



1	PXI-1031/PXI-1031DC Chassis	2	Rack Mount Kit

Figure A-3. PXI-1031/PXI-1031DC Rack Mount Kit Components

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B

Pinouts

This appendix describes the P1 and P2 connector pinouts for the PXI-1031/PXI-1031DC backplane.

Table B-1 shows the P1 (J1) connector pinout for the System Controller slot.

Table B-2 shows the P2 (J2) connector pinout for the System Controller slot.

Table B-3 shows the P1 (J1) connector pinout for the star trigger slot.

Table B-4 shows the P2 (J2) connector pinout for the star trigger slot.

Table B-5 shows the P1 (J1) connector pinout for the peripheral slots.

Table B-6 shows the P2 (J2) connector pinout for the peripheral slots.

Note PXI signals are shown in bold.

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Table B-1. P1 (J1) Connector Pinout for the System Controller Slot

Pin	Z	A	B	C	D	E	F
25	GND	5 V	REQ64#	ENUM#	3.3 V	5 V	GND
24	GND	AD[1]	5 V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3 V	AD[4]	AD[3]	5 V	AD[2]	GND
22	GND	AD[7]	GND	3.3 V	AD[6]	AD[5]	GND
21	GND	3.3 V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3 V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3 V	PAR	C/BE[1]#	GND
17	GND	3.3 V	SDONE	SBO#	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3 V	FRAME#	IRDY#	GND	TRDY#	GND
12–14	Key Area						
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3 V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	3.3 V	CLK	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND
4	GND	BRSVP1A4	GND	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5 V	INTD#	GND
2	GND	TCK	5 V	TMS	TDO	TDI	GND
1	GND	5 V	–12 V	TRST#	+12 V	5 V	GND

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Table B-2. P2 (J2) Connector Pinout for the System Controller Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	SMB_SDA	SMB_SCL	SMB_ALERT#	GND
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND
17	GND	**PXI_TRIG2**	GND	PRST#	REQ6#	GNT6#	GND
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	DEG#	GND	**PXI_TRIG7**	GND
15	GND	**PXI_BRSVA15**	GND	FAL#	REQ5#	GNT5#	GND
14	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	BP(I/O)	GND
13	GND	BP(I/O)	GND	V(I/O)	BP(I/O)	BP(I/O)	GND
12	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	BP(I/O)	GND
11	GND	BP(I/O)	GND	V(I/O)	BP(I/O)	BP(I/O)	GND
10	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	BP(I/O)	GND
9	GND	BP(I/O)	GND	V(I/O)	BP(I/O)	BP(I/O)	GND
8	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	BP(I/O)	GND
7	GND	BP(I/O)	GND	V(I/O)	BP(I/O)	BP(I/O)	GND
6	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	BP(I/O)	GND
5	GND	BP(I/O)	64EN#	V(I/O)	BP(I/O)	BP(I/O)	GND
4	GND	V(I/O)	**PXI_BRSVB4**	BP(I/O)	GND	BP(I/O)	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

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Table B-3. P1 (J1) Connector Pinout for the Star Trigger Slot

Pin	Z	A	B	C	D	E	F
25	GND	5 V	REQ64#	ENUM#	3.3 V	5 V	GND
24	GND	AD[1]	5 V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3 V	AD[4]	AD[3]	5 V	AD[2]	GND
22	GND	AD[7]	GND	3.3 V	AD[6]	AD[5]	GND
21	GND	3.3 V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3 V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3 V	PAR	C/BE[1]#	GND
17	GND	3.3 V	SDONE	SBO#	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3 V	FRAME#	IRDY#	GND	TRDY#	GND
12–14	Key Area						
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3 V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	3.3 V	CLK	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND
4	GND	BRSVP1A4	GND	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5 V	INTD#	GND
2	GND	TCK	5 V	TMS	TDO	TDI	GND
1	GND	5 V	–12 V	TRST#	+12 V	5 V	GND

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Table B-4. P2 (J2) Connector Pinout for the Star Trigger Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	**PXI_LBR0**	RSV	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND
20	GND	**PXI_LBR4**	**PXI_LBR5**	**PXI_STAR0**	GND	**PXI_STAR1**	GND
19	GND	**PXI_STAR2**	RSV	**PXI_STAR3**	**PXI_STAR4**	**PXI_STAR5**	GND
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND
17	GND	**PXI_TRIG2**	GND	RSV	**PXI_CLK10_IN**	**PXI_CLK10**	GND
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	RSV	GND	**PXI_TRIG7**	GND
15	GND	**PXI_BRSVA15**	GND	RSV	**PXI_STAR6**	**PXI_LBR6**	GND
14	GND	RSV	RSV	RSV	GND	RSV	GND
13	GND	RSV	GND	V(I/O)	RSV	RSV	GND
12	GND	RSV	RSV	RSV	GND	RSV	GND
11	GND	RSV	GND	V(I/O)	RSV	RSV	GND
10	GND	RSV	RSV	RSV	GND	RSV	GND
9	GND	RSV	GND	V(I/O)	RSV	RSV	GND
8	GND	RSV	RSV	RSV	GND	RSV	GND
7	GND	RSV	GND	V(I/O)	RSV	RSV	GND
6	GND	RSV	RSV	RSV	GND	RSV	GND
5	GND	RSV	64EN#	V(I/O)	RSV	RSV	GND
4	GND	V(I/O)	**PXI_BRSVB4**	RSV	GND	RSV	GND
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND
2	GND	**PXI_LBR11**	**PXI_LBR12**	UNC	**PXI_STAR7**	**PXI_STAR8**	GND
1	GND	**PXI_STAR9**	GND	**PXI_STAR10**	**PXI_STAR11**	**PXI_STAR12**	GND

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Table B-5. P1 (J1) Connector Pinout for the Generic Peripheral Slot

Pin	Z	A	B	C	D	E	F
25	GND	5 V	REQ64#	ENUM#	3.3 V	5 V	GND
24	GND	AD[1]	5 V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3 V	AD[4]	AD[3]	5 V	AD[2]	GND
22	GND	AD[7]	GND	3.3 V	AD[6]	AD[5]	GND
21	GND	3.3 V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3 V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3 V	PAR	C/BE[1]#	GND
17	GND	3.3 V	SDONE	SBO#	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3 V	FRAME#	IRDY#	GND	TRDY#	GND
12–14	Key Area						
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3 V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	3.3 V	CLK	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND
4	GND	BRSVP1A4	GND	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5 V	INTD#	GND
2	GND	TCK	5 V	TMS	TDO	TDI	GND
1	GND	5 V	–12 V	TRST#	+12 V	5 V	GND

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Table B-6. P2 (J2) Connector Pinout for the Generic Peripheral Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	**PXI_LBR0**	RSV	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND
20	GND	**PXI_LBR4**	**PXI_LBR5**	**PXI_LBL0**	GND	**PXI_LBL1**	GND
19	GND	**PXI_LBL2**	RSV	**PXI_LBL3**	**PXI_LBL4**	**PXI_LBL5**	GND
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND
17	GND	**PXI_TRIG2**	GND	RSV	**PXI_STAR**	**PXI_CLK10**	GND
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	RSV	GND	**PXI_TRIG7**	GND
15	GND	**PXI_BRSVA15**	GND	RSV	**PXI_LBL6**	**PXI_LBR6**	GND
14	GND	RSV	RSV	RSV	GND	RSV	GND
13	GND	RSV	GND	V(I/O)	RSV	RSV	GND
12	GND	RSV	RSV	RSV	GND	RSV	GND
11	GND	RSV	GND	V(I/O)	RSV	RSV	GND
10	GND	RSV	RSV	RSV	GND	RSV	GND
9	GND	RSV	GND	V(I/O)	RSV	RSV	GND
8	GND	RSV	RSV	RSV	GND	RSV	GND
7	GND	RSV	GND	V(I/O)	RSV	RSV	GND
6	GND	RSV	RSV	RSV	GND	RSV	GND
5	GND	RSV	64EN#	V(I/O)	RSV	RSV	GND
4	GND	V(I/O)	**PXI_BRSVB4**	RSV	GND	RSV	GND
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND
2	GND	**PXI_LBR11**	**PXI_LBR12**	UNC	**PXI_LBL7**	**PXI_LBL8**	GND
1	GND	**PXI_LBL9**	GND	**PXI_LBL10**	**PXI_LBL11**	**PXI_LBL12**	GND

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Glossary

Symbol	Prefix	Value
p	pico	10^{-12}
n	nano	10^{-9}
µ	micro	10^{-6}
m	milli	10^{-3}
k	kilo	10^{3}
M	mega	10^{6}
G	giga	10^{9}
T	tera	10^{12}

Symbols

°	Degrees
≥	Equal or greater than
≤	Equal or less than
%	Percent
Ω	Ohms

A

A	Amperes
AC	Alternating current
ANSI	American National Standards Institute
AUTO	Automatic fan speed control
AWG	American Wire Gauge

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B

backplane	An assembly, typically a printed circuit board, with connectors and signal paths that bus the connector pins

C

C	Celsius
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
cm	Centimeters
CompactPCI	An adaptation of the Peripheral Component Interconnect (PCI) Specification 2.1 or later for industrial and/or embedded applications requiring a more robust mechanical form factor than desktop PCI. It uses industry standard mechanical components and high-performance connector technologies to provide an optimized system intended for rugged applications. It is electrically compatible with the PCI Specification, which enables low-cost PCI components to be utilized in a mechanical form factor suited for rugged environments.
CSA	Canadian Standards Association

D

daisy-chain	A method of propagating signals along a bus, in which the devices are prioritized on the basis of their position on the bus
DC	Direct current
DoC	Declaration of Conformity

E

efficiency	Ratio of output power to input power, expressed as a percentage
EIA	Electronic Industries Association

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embedded system controller	A module configured for installation in slot 1 of a PXI chassis. This device is unique in the PXI system in that it performs the system controller functions, including clock sourcing and arbitration for data transfers across the backplane. Installing such a device into any other slot can damage the device, the PXI backplane, or both.
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference

F

FCC	Federal Communications Commission
filler panel	A blank module front panel used to fill empty slots in the chassis

G

g	(1) grams; (2) a measure of acceleration approximately equal to 9.8 m/s^2
GPIB	General Purpose Interface Bus (IEEE 488)
g_{rms}	A measure of random vibration; the root mean square of acceleration levels in a random vibration test profile

H

hr	Hours
Hz	Hertz; cycles per second

I

IEC	International Electrotechnical Commission; an organization that sets international electrical and electronics standards
IEEE	Institute of Electrical and Electronics Engineers
I_{MP}	Mainframe peak current

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in.	Inches
inhibit	To turn off

J

jitter	A measure of the small, rapid variations in clock transition times from their nominal regular intervals. Units: seconds RMS.

K

kg	Kilograms
km	Kilometers

L

lb	Pounds
load regulation	The maximum steady-state percentage that a DC voltage output will change as a result of a step change from no-load to full-load output current

M

m	Meters
MAX	NI Measurement & Automation Explorer, the utility that allows you to configure and test your PXI system
MHz	Megahertz. One million Hertz; one Hertz equals one cycle per second.
ms	Millisecond, one thousandth of a second (10^{-3})

N

NEMA	National Electrical Manufacturers Association
NI	National Instruments

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NI-DAQmx	National Instruments driver that controls the operation of National Instruments data acquisition (DAQ) devices
NI-VISA	National Instruments implementation of the VISA (Virtual Instrument System Architecture) I/O standard. NI-VISA provides support for the VISA API, and also provides VISAIC, a utility for instrument configuration and I/O function execution.
ns	Nanosecond, one billionth of a second (10^{-9})

P

ppm	Parts-per-million
PXI	PCI eXtensions for Instrumentation. PXI is an implementation of CompactPCI with added electrical features that meet the high performance requirements of instrumentation applications by providing triggering, local buses, and system clock capabilities.
PXI_CLK10	10 MHz PXI system reference clock

R

RMS	Root mean square

S

s	Seconds
skew	Deviation in signal transmission times
slot blocker	An assembly installed into an empty slot to improve the airflow in adjacent slots
ST	Star trigger
standby	The backplane is unpowered (off), but the chassis is still connected to AC power mains.

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star trigger slot	This slot is located at slot 2 and has a dedicated trigger line between each peripheral slot. Use this slot for a module with ST functionality that can provide individual triggers to all other peripherals.
system reference clock	A 10 MHz clock, also called PXI_CLK10, that is distributed to all peripheral slots in the chassis, as well as a BNC connector on the rear of chassis labeled *10 MHz REF OUT*. The system reference clock can be used for synchronization of multiple modules in a measurement or control system. The 10 MHz REF IN and OUT BNC connectors on the rear of the chassis can be used to synchronize multiple chassis to one reference clock. The PXI backplane specification defines implementation guidelines for PXI_CLK10.

T

TTL	Transistor-transistor logic

U

UL	Underwriter's Laboratories

V

V	Volts
VAC	Volts alternating current, or V_{rms}
V_{pp}	Peak-to-peak voltage

W

W	Watts

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