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# PXI

## PXI™-1000B User Manual

NATIONAL INSTRUMENTS™

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# Compliance

## FCC/DOC Radio Frequency Interference Class A Compliance

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual, may cause interference to radio and television reception. Classification requirements are the same for the Federal Communications Commission (FCC) and the Canadian Department of Communications (DOC). This equipment has been tested and found to comply with the following two regulatory agencies:

### Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Notices to User:** ***Changes or modifications not expressly approved by National Instruments could void the user's authority to operate the equipment under the FCC Rules.***

***This device complies with the FCC rules only if used with shielded interface cables of suitable quality and construction. National Instruments used such cables to test this device and provides them for sale to the user. The use of inferior or nonshielded interface cables could void the user's authority to operate the equipment under the FCC rules.***

If necessary, consult National Instruments or an experienced radio/television technician for additional suggestions. The following booklet prepared by the FCC may also be helpful: *Interference to Home Electronic Entertainment Equipment Handbook.* This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

### Canadian Department of Communications

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

# For Your Safety

**Caution** ***Before undertaking any troubleshooting, maintenance, or exploratory procedure, read carefully the WARNING and CAUTION notices.***

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

- **Mainframe Grounding**—The PXI-1000B mainframe requires a connection from the premise wire safety ground to the PXI-1000B 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 of Chapter 2, *Installation, Configuration, and Operation*, for instructions on connecting safety ground.
- **Live Circuits**—Operating personnel and service personnel must not remove protective covers when operating or servicing the PXI-1000B. 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 mainframe in conditions where flammable gases are present. Under such conditions this equipment is unsafe and may ignite the gases or gas fumes.
- **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 mainframe. Furthermore, damage or fire may occur if replacement parts are unsuitable.
- **Modification**—Do not modify any part of the mainframe from its original condition. Unsuitable modifications may result in safety hazards.

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# About This Manual

The *PXI-1000B User Manual* describes the features of the PXI-1000B mainframe and contains information about configuring the mainframe, installing the modules, and operating and using the PXI-1000B.

## Organization of This Manual

This manual is organized as follows:

- Chapter 1, *Getting Started*, describes the key features of the PXI-1000B mainframe, lists the contents of your kit, and lists optional equipment you can order from National Instruments.
- Chapter 2, *Installation, Configuration, and Operation*, describes how to prepare and operate your PXI-1000B mainframe.
- Chapter 3, *Maintenance*, describes basic maintenance procedures you can perform on the PXI-1000B mainframe.
- Appendix A, *Specifications*, contains complete specifications for the PXI-1000B mainframe.
- Appendix B, *Pinouts*, describes the P1 and P2 connector pinouts for the PXI-1000B backplane.
- Appendix C, *Customer Communication*, contains forms you can use to request help from National Instruments or to comment on our products and manuals.
- The *Glossary* lists abbreviations, acronyms, metric prefixes, mnemonics, symbols, and terms.
- The *Index* contains an alphabetical list of key terms and topics used in this manual, including the page where you can find each one.

## Conventions Used in This Manual

The following conventions are used in this manual:



This icon to the left of bold italicized text denotes a note, which alerts you to important information.



This icon to the left of bold italicized text denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash.

| | |
|---|---|
|  | This icon to the left of bold italicized text denotes a warning, which advises you of precautions to take to avoid being electrically shocked. |
| ***bold italic*** | Bold italic text denotes a note, caution, or warning. |
| *italic* | Italic text denotes emphasis, a cross reference, or an introduction to a key concept. This font also denotes text from which you supply the appropriate word or value, as in Windows 3.*x*. |
| `monospace` | Text in this font denotes text or characters that are to be literally entered 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, device names, functions, variables, filenames, and extensions. |

# Related Documentation

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

- *Compact PCI Specification PICMG 2.0 R2.1*
- *PXI Specification Revision 1.0*
- IEEE 1101.1-1991, *IEEE Standard for Mechanical Core Specifications for Microcomputers Using IEC 603-2 Connectors*
- IEEE 1101.10 and P1101.11, *IEEE Standard for Additional Mechanical Specifications for Microcomputers Using IEEE 1101.1 Equipment Practice*

# Customer Communication

National Instruments wants to receive your comments on our products and manuals. We are interested in the applications you develop with our products, and we want to help if you have problems with them. To make it easy for you to contact us, this manual contains comment and configuration forms for you to complete. These forms are in Appendix C, *Customer Communication*, at the end of this manual.

# 1

# Getting Started

This chapter describes the key features of the PXI-1000B mainframe, lists the contents of your kit, and lists optional equipment you can order from National Instruments.

## Unpacking

Carefully inspect the shipping container and the mainframe 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 in shipment, file a claim with the carrier. Retain the packing material for possible inspection and/or reshipment.

## What You Need to Get Started

The PXI-1000B kit contains the following items:

- ❑ PXI-1000B mainframe
- ❑ Filler panels
- ❑ AC power cable (see Table 1-1 for AC power cables)
- ❑ *PXI-1000B User Manual*
- ❑ Floppy disk with Chassis Initialization file, `chassis.ini`

**Table 1-1.** AC Power Cables

| Power Cable | Reference Standards |
|---|---|
| Standard 120 V (USA) | ANSI C73.11/NEMA 5-15-P/IEC83 |
| Switzerland 220 V | SEV |
| Australia 240 V | AS C112 |

**Table 1-1.** AC Power Cables (Continued)

| Power Cable | Reference Standards |
|---|---|
| Universal Euro 240 V | CEE (7), II, IV, VII IEC83 |
| North America 240 V | ANSI C73.20/NEMA 5-15-P/IEC83 |
| United Kingdom 240 V | BS 1363/IEC83 |

If you are missing any of the above items or if you have the incorrect power cord, contact National Instruments.

# Optional Equipment

Contact National Instruments to order the following options for your PXI-1000B mainframe.

## Battery Pack and Cable for DC-Capable PXI-1000B

A DC input capable power supply is optionally installed in your PXI-1000B mainframe at the factory. The DC-capable supply can be powered with AC input or 10 to 32 VDC input and has 150 W of output.

If you have purchased a PXI-1000B with the DC-capable power supply, you can install an optional 1.7 Ah NiCd battery pack. The mainframe can draw power from this battery pack and operate when no AC or DC input are present or if the DC input drops below 10 V. The battery can power the PXI-1000B for up to 12 minutes under full load.

A DC input cable is available for the PXI-1000B with the DC-capable power supply. This cable contains an inline fuse and has banana jacks for easy connection to various DC sources.

## Rack-Mount Kit

An optional rack-mount kit is available from National Instruments. You can use this kit to install the PXI-1000B mainframe into a standard 19 in. (482 mm) instrument cabinet.

# Key Features

The PXI-1000B combines a high-performance 8-slot PXI backplane with a high-output power supply and a structural design that has been optimized for maximum usability in a wide range of applications. The mainframe's modular design ensures the highest level of maintainability resulting in a very low mean time to repair (MTTR). The PXI-1000B fully complies with the PXI Specification, Revision 1.0, offering advanced timing and synchronization features.

The key features of the PXI-1000B include:

- PXI and CompactPCI (PICMG 2.0 R 2.1) module compatibility
- Compact 3U-sized, 8-slot chassis
- 300 W of usable power; 150 W for DC-capable supply
- Universal AC input:  auto-voltage and auto-frequency ranging
- Over-current protection via push-reset circuit breaker (no loose fuses to replace)
- Removable modular power supply
- Remote power status and inhibit via a rear panel connector
- On/Off (Standby) switch located on the front panel for easy access
- Selectable fan speed for maximum cooling or quiet operation
- Carrying handle for portability
- Tilt feet for bench-top applications

# PXI-1000B Backplane Overview

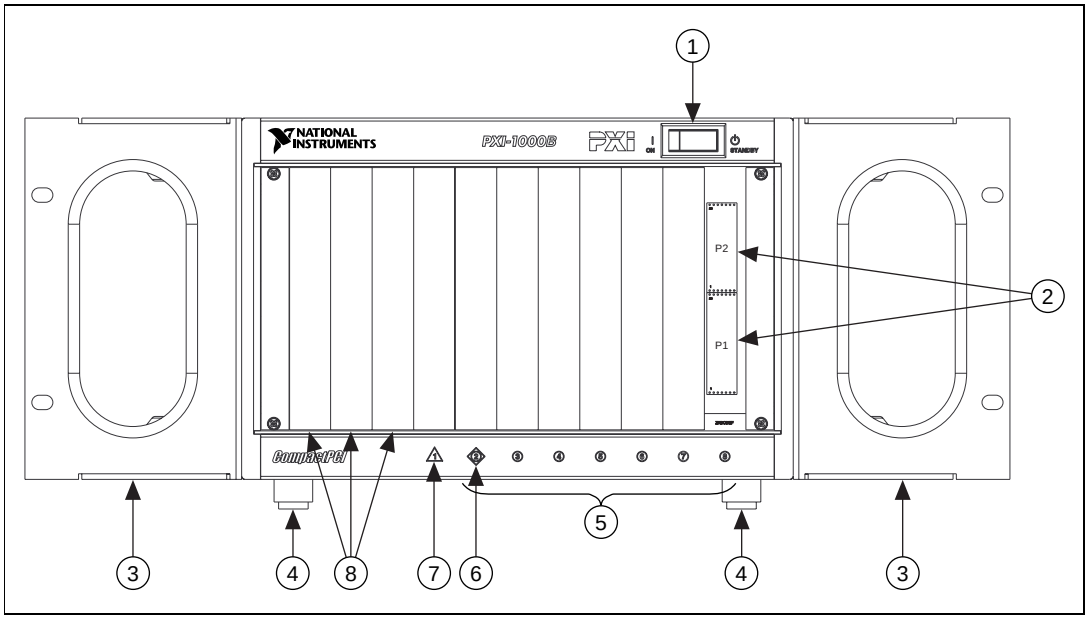
## Interoperability with CompactPCI

The PXI-1000B backplane is interoperable with PXI-compatible products and standard CompactPCI products. This is an important feature, as many PXI-compatible systems may not 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 P1 connector of the backplane meet the requirements of the CompactPCI specification for both the peripheral and system modules.

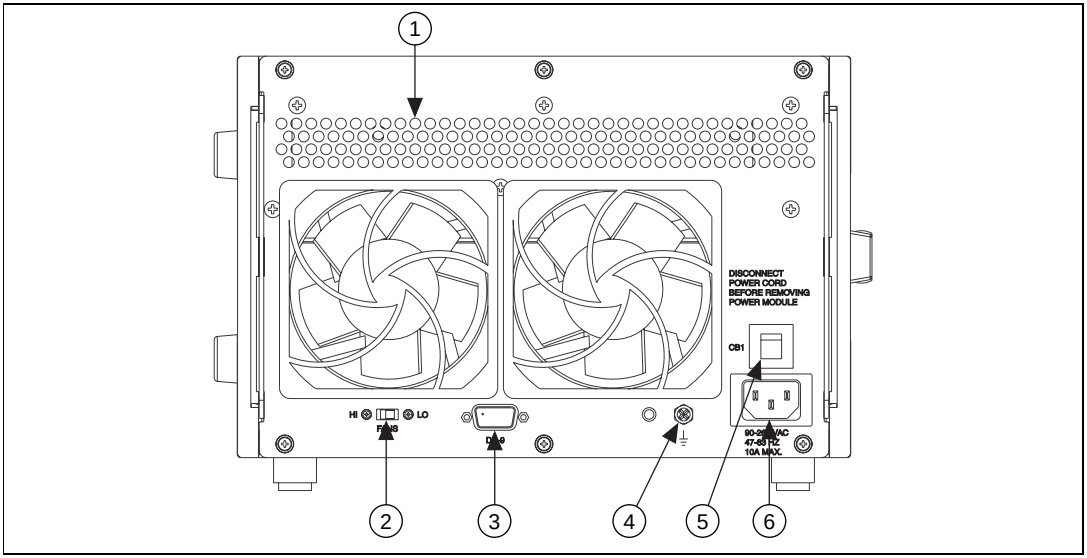
The PXI-specific signals are located on P2 and are only found on the signals that are reserved or not used in the CompactPCI 64-bit specification. Therefore, all modules that meet the requirements of the CompactPCI 64-bit specification will function in the PXI-1000B.

Figures 1-1, 1-2, and 1-3 show some of the key features and components of the PXI-1000B mainframe. Figure 1-1 shows the front view of the PXI-1000B. Figure 1-2 shows the rear view of the AC-only chassis, and Figure 1-3 shows the rear view of the DC-capable chassis.



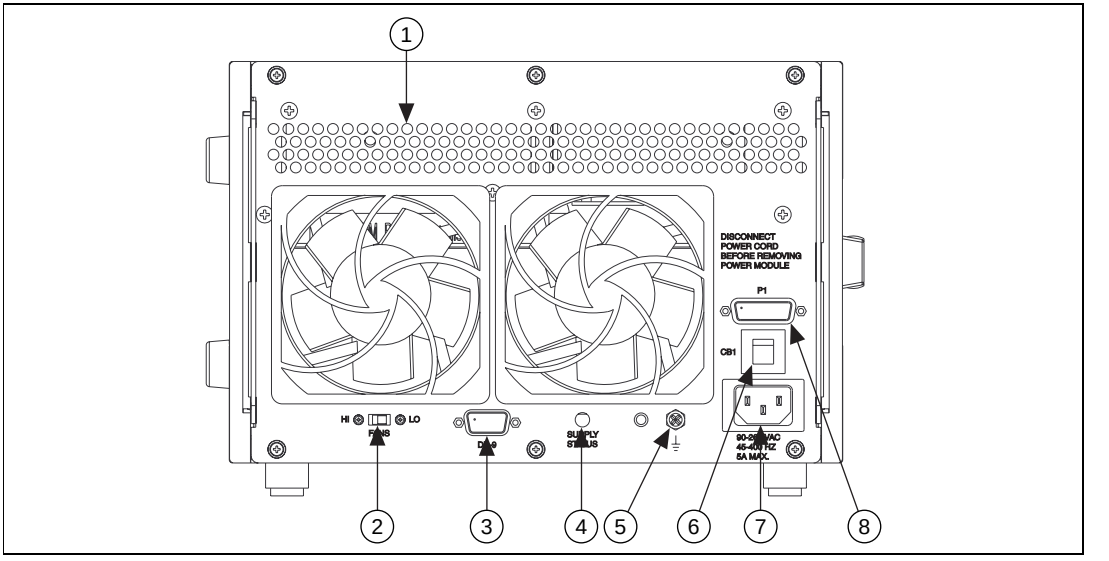

| | | | | | |
|---|---|---|---|---|---|
| 1 | Remote On/Off (Standby) Switch | 3 | Optional Mounting Brackets | 6 | Star Trigger Slot |
| 2 | Backplane Connectors (Located in Slots 1-8) | 4 | Removable Feet | 7 | System Controller Slot |
| | | 5 | Peripheral Slots | 8 | Controller Expansion Slots |

**Figure 1-1.** Front View of the PXI-1000B Mainframe




| | | | | | |
|---|---|---|---|---|---|
| 1 | Module Cooling Air Outlets | 3 | Remote Power Status and Inhibit Connector | 5 | Circuit Breaker |
| 2 | Fan Speed Selector | 4 | Chassis Ground Screw | 6 | Universal AC Input |

**Figure 1-2.** Rear View of the AC-Only PXI-1000B Mainframe




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Module Cooling Air Outlets | 3 | Remote Power Status and Inhibit Connector | 5 | Chassis Ground Screw | 7 | Universal AC Input |
| 2 | Fan Speed Selector | 4 | Power Supply Status LED | 6 | Circuit Breaker | 8 | DC Power Input Connector |

**Figure 1-3.** Rear View of the DC-Capable PXI-1000B Mainframe

## System Controller Slot

The System Controller slot is located in Slot 1 of the chassis as defined by the PXI specification. It has three controller expansion slots, which are used 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 up peripheral slots.

## Star Trigger Slot

The Star Trigger (ST) slot is located at Slot 2. This slot has a dedicated trigger line between each peripheral slot (see Figure 1-4). This slot is intended for modules with ST functionality that can provide individual triggers to all other peripherals. However, if you do not require advanced trigger functionality, you can install any standard peripheral module into this slot.

## Peripheral Slots

There are seven peripheral slots including the Star Trigger controller slot.

## Local Bus

The PXI backplane's local bus is a daisy-chained bus that connects each peripheral slot with its adjacent peripheral slots to the left and right, as shown in Figure 1-4.

For example, a given peripheral slot's right local bus connects to the adjacent slot's left local bus and so on. Each local bus is 13 lines wide and can pass analog signals between cards or provide a high-speed side-band communication path that does not affect the PXI bandwidth.

Local Bus signals may range from high-speed TTL signals to analog signals as high as 42 V. Initialization software keys adjacent boards to prohibit the use of incompatible boards. This software uses the configuration information specific to each peripheral board to evaluate compatibility. This method is a flexible way to define local bus functionality that is not limited by hardware keying.

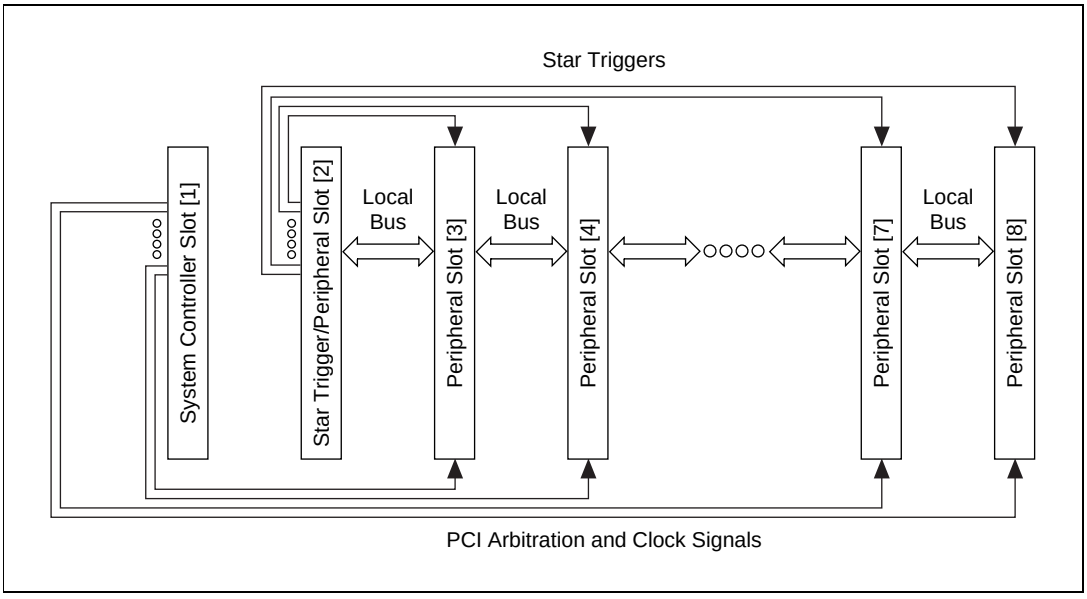



**Figure 1-4.** PXI Local Bus and Star Trigger Routing

## Trigger Bus

The eight PXI trigger lines are bused to each slot. You can use the 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 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-1000B 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 1 ns 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. (See Table B-1, *P1 (J1) Connector Pinout for the System Controller Slot*, in Appendix B, *Pinouts*.) Sourcing an external clock on this pin automatically disables the backplane's 10 MHz source.

# 2

# Installation, Configuration, and Operation

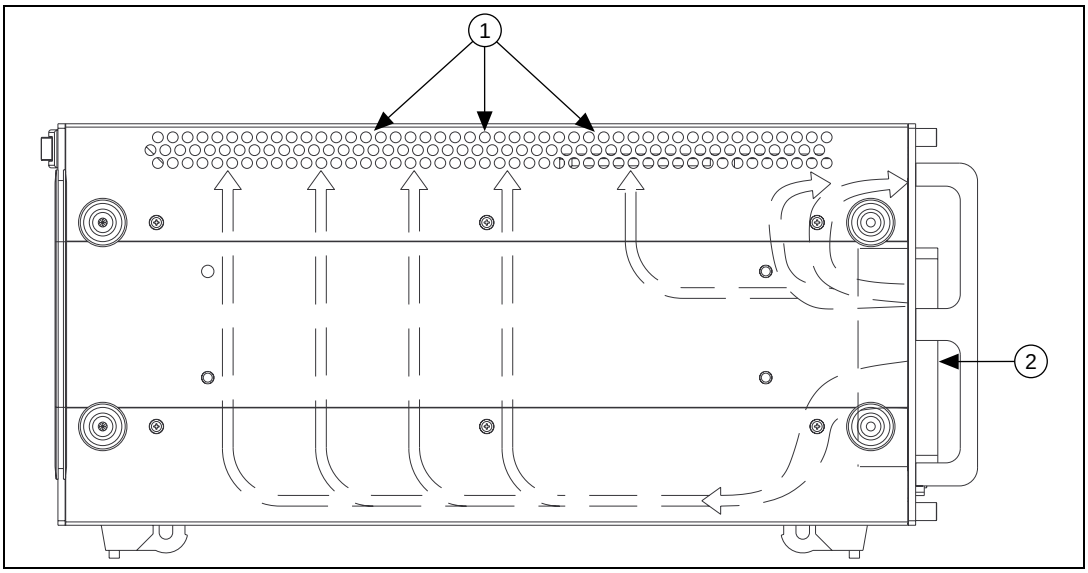
This chapter describes how to prepare and operate your PXI-1000B mainframe.

Before connecting the mainframe to a power source, read this chapter and the *For Your Safety* section located at the beginning of this manual.

## Site Considerations

The PXI-1000B is designed to operate on a bench or in an instrument rack. Determine how you want to use your PXI-1000B and follow the appropriate installation instructions.

Apertures in the rear and along both sides of the mainframe facilitate power supply and module cooling. Air enters through filters and fan inlets located in the lower rear of the mainframe and exits through the upper sections on both sides and through the rear, as shown in Figure 2-1. Place your PXI-1000B on a bench top or in an instrument rack so that the fans (air inlets) and the air outlet apertures along both sides of the mainframe have adequate ventilation. Keep other equipment a minimum of 3.0 in. (76.2 mm) away from the air inlets and outlets.




| | |
|---|---|
| 1 Module Cooling Air Outlets | 2 Module Cooling Air Intake |

**Figure 2-1.** PXI-1000B Mainframe Airflow Side View

Install your mainframe so that you can easily access the rear panel. This simplifies the replacement of the air filters or power supply/fan assembly, if necessary.

# Rack Mounting

Rack-mount applications require the optional rack-mount kit available from National Instruments. Refer to the instructions supplied with the rack-mount kit to install your PXI-1000B in an instrument rack.

**Note** ***You may wish to remove the feet from your PXI-1000B when rack mounting. To do so, remove the screws holding the feet in place.***

# Setting Fan Speed

The fan speed selector switch is located on the rear panel of the PXI-1000B. Refer to Figure 1-2, *Rear View of the AC-Only PXI-1000B Mainframe*, or Figure 1-3, *Rear View of the DC-Capable PXI-1000B Mainframe*, for a diagram of the fan speed selector. Select HI for maximum cooling effectiveness (recommended) or LO for quiet operation.

# Connecting Safety Ground

**Warning** ***The PXI-1000B chassis is designed with a three-position NEMA 15-5 style plug that connects the ground line to the chassis ground. To minimize shock hazard, make sure your electrical power outlet has an appropriate earth safety ground that is connected whenever you power up the chassis.***

If your power outlet does not have an appropriate ground connection, you must connect the premise wire safety ground to the chassis grounding screw located on the rear panel. Refer to Figure 1-2, *Rear View of the AC-Only PXI-1000B Mainframe*, or Figure 1-3, *Rear View of the DC-Capable PXI-1000B Mainframe*, for a diagram of the chassis grounding screw. To connect the safety ground, complete the following steps:

1. Connect a 16 AWG (1.3 mm) wire to the chassis grounding screw using a toothed grounding lug. The wire must have green insulation with a yellow stripe or must be non-insulated (bare).
2. Attach the opposite end of the wire to permanent earth ground using toothed washers or a toothed lug.

# Connecting to Power Source and Testing Power up

**Caution** ***Do not install modules prior to performing the first power-on test.***

If your PXI-1000B has an AC-only input power supply, attach input power through the rear AC inlet using the appropriate line cord supplied. Refer to Figure 1-2, *Rear View of the AC-Only PXI-1000B Mainframe*, for a diagram of the IEC 320 inlet.

If your PXI-1000B has a DC-capable power supply, you can attach an AC line cord or a DC cord if a DC power source is available.

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

**Caution** ***When connecting digital voltmeter probes to the rear D-sub connector, be careful not to short the probe leads together. Doing so could damage the power supply.***

You can use a digital voltmeter to ensure all voltage levels in your PXI-1000B are within the allowable limits. Referring to Table 2-1, connect one lead of the voltmeter to a supply pin on the remote power monitoring

connector (9-pin D-sub) located on the rear panel. Refer to Table 2-2 for a pinout diagram of the remote power monitoring connector. Connect the reference lead of the voltmeter to one of the ground pins. Compare each voltage reading to the values listed in Table 2-1.

☞ **Note** ***Use the rear-panel D-sub connector to check voltages only. Do not use the connector to supply power to external devices.***

**Table 2-1.** Power Supply Voltages at Power Monitoring Connector (DB-9)

| Pin | Supply | Acceptable Voltage Range |
|---|---|---|
| 2 | +5 V | 4.75 to 5.25 V |
| 4 | +3.3 V | 3.135 to 3.465 V |
| 6 | +12 V | 11.4 to 12.6 V |
| 8 | –12 V | –12.6 to –11.4 V |
| 1, 9 | Logic Ground | N/A |

If the voltages fall within the specified ranges, the mainframe complies with the CompactPCI voltage limit specifications. Notice that the rear-panel D-sub connector is to be used to check voltages only. Do not use these voltages to supply power to external devices.

☞ **Note** ***If the fans or power unit fail to function properly, refer to the Troubleshooting the PXI-1000B section of Chapter 3, Maintenance.***

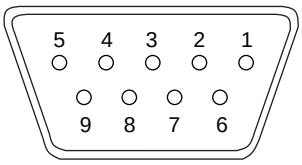
# Remote Power Monitoring and Inhibiting Interface

The PXI-1000B mainframe supports remote power monitoring and inhibiting via a 9-pin D-sub connector located on the rear panel. Table 2-2 shows the pinout of the DB-9 connector.

**Table 2-2.** DB-9 Connector Pinout

| DB-9 Pin | Signal |
|---|---|
| 1 | Logic Ground |
| 2 | +5 V |
| 3 | Inhibit Return (DC-capable supply only) |
| 4 | +3.3 V |

**Table 2-2.** DB-9 Connector Pinout (Continued)

| DB-9 Pin | Signal |
|---|---|
| 5 | Inhibit* |
| 6 | +12 V |
| 7 | Reserved |
| 8 | –12 V |
| 9 | Logic Ground |
|  | |



You can use the Inhibit signal (active low) to turn off the power supply outputs. To use this feature, connect the Inhibit pin (pin 5) to a Logic Ground pin (pin 1 or 9) on the AC-only input power supply or Inhibit Return (pin 3) for the DC-capable power supply. Make sure the front (standby) switch is in the ON position. As long as the connection is made, the power supply inhibits its DC outputs. DC output resumes when Inhibit is no longer connected. Note that the power (standby) switch, located on the front of the chassis, uses this inhibiting feature. For remote reset, connect a momentary switch between pin 5 and pin 1 (or pin 9) on the AC-only input power supply or between pin 5 and pin 3 for the DC-capable power supply.

# Power Supply Status Indication (DC-Capable Power Supply Only)

If your PXI-1000B has a DC-capable power supply refer to the following table for power supply indications provided by the Power Supply Status LED. Refer to Figure 1-3, *Rear View of the DC-Capable PXI-1000B Mainframe*, for a diagram of the Power Supply Status LED.

**Table 2-3.** Power Supply Status Indication, DC Only

| Power Source | Power Switch Mode | Status LED |
|---|---|---|
| AC or External DC Input | Standby | Green |
| AC or External DC Input | On | Bright Green |

**Table 2-3.** Power Supply Status Indication, DC Only (Continued)

| Power Source | Power Switch Mode | Status LED |
|---|---|---|
| Optional Battery Pack | On | Yellow |
| Optional Battery Pack (Discharged) | On | Red |

# Input Voltage Priority (DC-Capable Power Supply Only)

If more than one power source is connected at the same time, the priority of the power sources is as follows.

1. AC Module
2. DC Input
3. Internal Battery Pack

# Installing the Battery Pack (DC-Capable Power Supply Only)

If you purchased a DC-capable PXI-1000B and an optional 1.7 Ah NiCd battery pack, install it according to the following steps.

1. Remove the power supply module by loosening the six captive screws on the rear of the PXI-1000B and pulling on the rear handles.
2. Connect the two cables on the battery pack to the two cables in the opening in the rear of the power supply module.
3. Insert the battery pack into the opening in the rear of the power supply module (batteries facing inward) and install the four screws provided.
4. Reinstall the power supply module and tighten the six captive screws.

# Charging the Battery Pack (DC-Capable Power Supply Only)

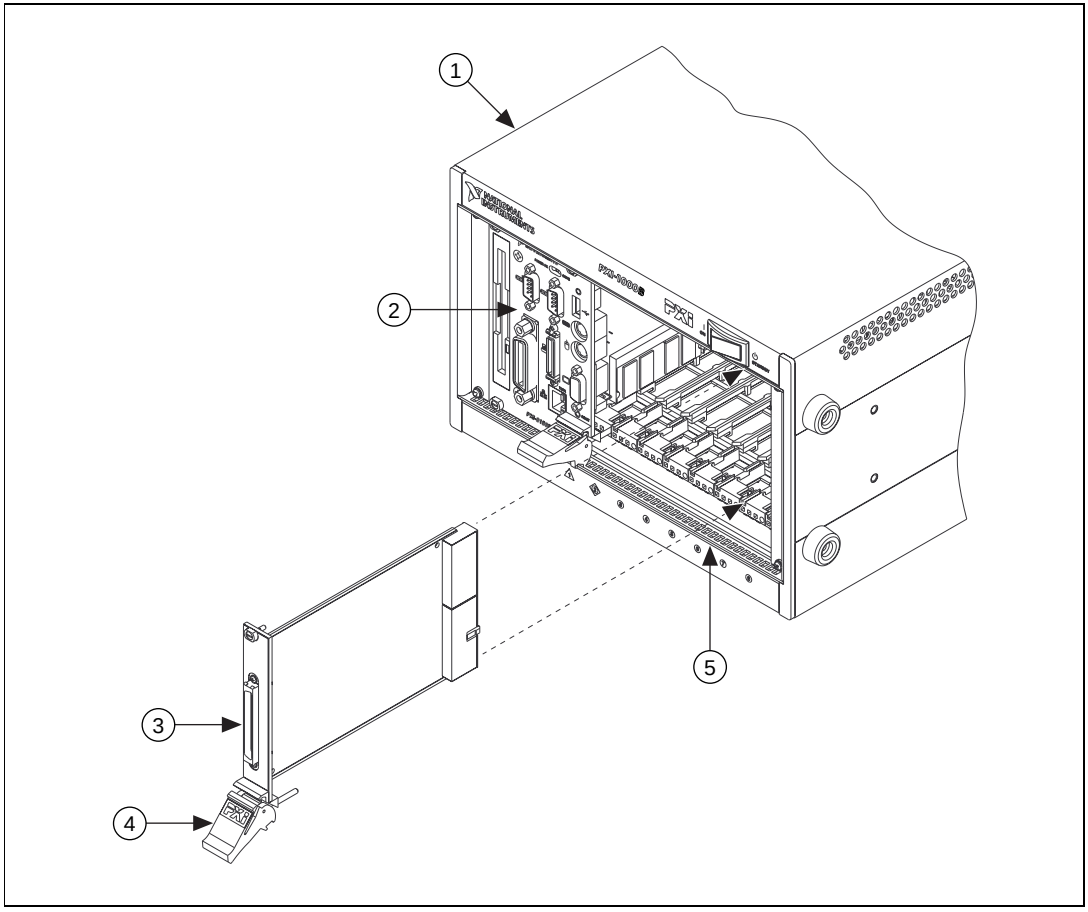
The optional battery pack is charged when either the AC power or the external DC power is connected, regardless of the front STANDBY/ON switch position. The power supply has circuitry to prevent the battery pack from overcharging.

# Installing PXI Modules

**Caution** ***Turn off the mainframe power before installing CompactPCI or PXI modules.***

Install a module into a mainframe slot by first placing the module's card edges into the front module guides (top and bottom), as shown in Figure 2-2. Slide the module to the rear of the mainframe (making sure that the injector/ejector handle is pushed down as shown in Figure 2-3).

When you begin to feel resistance, push up on the injector/ejector handle to inject the card into the frame. Secure the module's front panel to the mainframe using the module's front-panel mounting screws.




| | | | | | |
|---|---|---|---|---|---|
| 1 | PXI-1000B Chassis | 3 | PXI Board | 5 | Injector/Ejector Rail |
| 2 | PXI-8156B System Controller | 4 | Injector/Ejector Handle | | |

**Figure 2-2.** Installing PXI or CompactPCI Modules

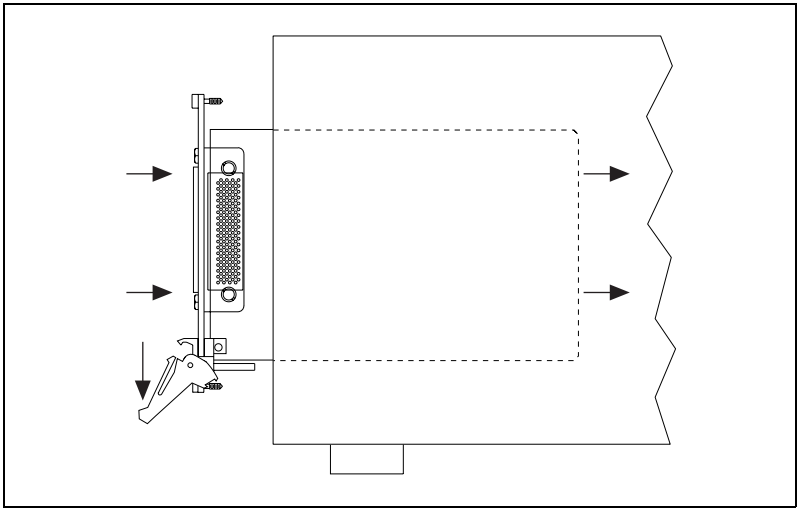


**Figure 2-3.** Injector/Ejector Handle Position during Module Insertion

# Installing Filler Panels

To optimize module cooling performance, install filler panels into unused or empty slots. Secure with the captive mounting screws.

# Using the Chassis Initialization File

To assist system integrators, the PXI specification requires manufacturers of PXI chassis and system modules to document the capabilities of their products. The minimum documentation requirements are contained in `.ini` files, which consist of ASCII text. The system integrator can read the `.ini` file, and configuration utilities and device drivers can also use this file. The PXI-1000B chassis initialization file, `chassis.ini`, is included on the diskette for your PXI-1000B.

# 3

# Maintenance

This chapter describes basic maintenance procedures you can perform on the PXI-1000B mainframe.

## Service Interval

Clean the mainframe fan filters at a maximum interval of six months. Depending upon the amount of use and ambient dust levels in the operating environment, the filters may require more frequent cleaning.

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

## Preparation

The information in this section is designed for use by qualified service personnel. Read the *For Your Safety* section at the beginning of this manual before attempting any procedures in this chapter.

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

## Cleaning

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

**Caution** ***Always power-off the mainframe and disconnect the power cord before cleaning or servicing the mainframe.***

## Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the mainframe. Use a soft-bristle brush for cleaning around components. If you must use a liquid for minor interior cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.

## Exterior Cleaning

Clean the exterior surfaces of the mainframe 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 mainframe.

**Cautions** ***Avoid getting moisture inside the mainframe during exterior cleaning. 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 mainframe.***

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

# Cleaning the Fan Filters

You can easily remove the mainframe cooling filters from the rear of the mainframe by removing the plastic housing attached to each fan.

Clean the fan filters by washing them in a mild soap solution and then vacuuming or blowing air through them. Rinse the filters with water and allow them to dry before reinstalling them on the mainframe.

# Resetting the AC Mains Circuit Breaker

If your PXI-1000B is connected to an AC source and encounters an over-current condition, the circuit breaker located on the rear panel will trip to prevent damage to the mainframe. Complete the following steps to reset the circuit breaker:

1. Turn the power switch to the Standby position.
2. Disconnect the AC line cord.
3. Depress the circuit breaker to reset it.
4. Reconnect the AC line cord.
5. Turn the power switch to the On position.

If the circuit breaker trips again, complete the following steps:

1. Turn the front panel power switch to the Standby position.
2. Disconnect the mainframe from the AC mains power source.
3. Remove all modules from the mainframe.
4. Complete the test procedure described in the *Connecting to Power Source and Testing Power up* section in Chapter 2, *Installation, Configuration, and Operation*.
5. If any voltages are outside the acceptable limits, contact National Instruments.
6. If all voltages are within the acceptable limits, verify that your PXI-1000B can meet the power requirements of your CompactPCI or PXI modules. Overloading the chassis can cause the breaker to trip. Refer to Appendix A, *Specifications*.
7. The over-current condition that caused the circuit breaker to trip may be due to a faulty CompactPCI or PXI module. Refer to the documentation that was supplied with the modules for troubleshooting your modules.

# Troubleshooting the PXI-1000B

Refer to Table 3-1 to troubleshoot the PXI-1000B mainframe. The table lists possible causes for power failure and recommends ways to correct the problem.

**Table 3-1.** Troubleshooting

| Possible Cause | What to Do |
|---|---|
| PXI-1000B mainframe is not connected to power source. | Make sure that the PXI-1000B is connected to a live electrical outlet. Try operating another piece of equipment from this outlet. |
| Power switch is not switched on. | Set the power switch to the On position. |
| Remote inhibiting input on the rear panel of the mainframe is active. | Deactivate your system's remote inhibiting control. |
| Circuit breaker is tripped. | Reset the circuit breaker. Refer to the *Resetting the AC Mains Circuit Breaker* section in this chapter. |
| If DC-capable PXI-1000B is powered by an external DC source, inline fuse on DC-power cord may be blown. | Check fuse and replace if necessary. |
| If DC-capable PXI-1000B is powered by optional battery pack, the inline fuse to the battery pack may be blown. | Remove power supply (see *Installing the Battery Pack* in Chapter 2 for procedure). Check inline fuse to battery pack and replace if necessary. |
| If DC-capable PXI-1000B is powered by an optional battery pack only, the battery pack may be discharged. | Connect PXI-1000B to AC or DC power source to charge battery. Notice: The battery is charged whether the power switch is in the On or Standby position. |
| Power supply has failed. | Contact National Instruments. |

# A

# Specifications

This appendix contains complete specifications for the PXI-1000B mainframe.

## Electrical

**Table A-1.** AC Input Specifications for AC-Only Power Supply

| Characteristic | Description |
|---|---|
| Input Voltage Range | 90–264 VAC |
| Input Frequency Range | 47 to 63 Hz |
| Over-Current Protection | 10 A circuit breaker |
| Maximum Steady State Operating Current | 8 A |
| Line Regulation | ± 0.2% over operating line range |
| Efficiency | 70% typical |
| Power Disconnect | The (standby) power switch causes the power module to supply DC power to the CompactPCI/PXI backplane. The rear-panel D-sub connector facilitates remote inhibiting operation. The (standby) switch must be in the On position prior to use of remote inhibit. The power cord provides main power disconnect. |

**Table A-2.** DC Output Specifications for AC-Only Power Supply

| Characteristic | Description | |
|---|---|---|
| Maximum Usable Power | 300 W | |
| DC Current Capacity ($I_{MP}$) | Voltage | $I_{MP}$ (Steady-State Current) |
| | +3.3 V | 35 A |
| | +12 V | 4 A |
| | +5 V | 25 A |
| | –12 V | 1 A |
| Load Regulation | Voltage | Regulator |
| | +3.3 V | < 1.5% |
| | +12 V | < 5% |
| | +5 V | < 1% |
| | –12 V | < 5% |
| Maximum Ripple and Noise | 1% ripple, 1% noise<br>20 MHz bandwidth | |
| Over-Current Protection | All outputs protected from short circuit and overload, automatic recovery | |
| Over-Voltage Protection | 3.3 V, 5 V clamp at 20% to 30% above output voltage<br>+12 V and –12 V clamp at 26 to 29 V referenced across + and – terminals | |
| Power Supply/Fan Unit MTTR | Replacement in under 5 minutes | |

**Table A-3.** AC Input Specifications for DC-Capable Power Supply

| Characteristic | Description |
|---|---|
| Input Voltage Range | 85–265 VAC |
| Input Frequency Range | 45 to 65 Hz |
| Over-Current Protection | 5 A circuit breaker |

**Table A-3.** AC Input Specifications for DC-Capable Power Supply (Continued)

| Characteristic | Description |
|---|---|
| Operating Current (RMS Steady State) | 3.0 A |
| Line Regulation | ± 0.2% over operating line range |
| Efficiency | 85% typical |
| Power Disconnect | The (standby) power switch causes the power module to supply DC power to the CompactPCI/PXI backplane. The rear-panel D-sub connector facilitates remote inhibiting operation. The (standby) switch must be in the On position prior to use of remote inhibit. The power cord provides main power disconnect. |

**Table A-4.** DC Input Specifications for DC-Capable Power Supply

| Characteristic | Description |
|---|---|
| Input Voltage Range | 10–32 V |
| DC to DC Isolation | 500 VAC |
| Over-Current Protection | Inline fuse must be installed into DC input cable |
| Efficiency | 82% typical |
| Power Disconnect | The front (standby) power switch causes the power module to supply DC power to the CompactPCI/PXI backplane. The rear-panel D-sub connector facilitates remote inhibiting operation. The front (standby) switch must be in the On position prior to use of remote inhibit. The power cord provides main power disconnect. |

**Table A-5.** DC Output Specifications for DC-Capable Power Supply

| Characteristic | Description |
|---|---|
| Maximum Usable Power | 160 W |
| DC Current Capacity ($I_{MP}$) | Voltage — $I_{MP}$ (Steady-State Current)<br>+3.3 V — 10 A<br>+12 V — 4 A<br>+5 V — 20 A - (3.3 V power)<br>–12 V — 0.4 A |
| Load Regulation | Voltage — Regulator<br>+3.3 V — < 2%<br>+12 V — < 2%<br>+5 V — < 2%<br>–12 V — < 5% |
| Maximum Ripple and Noise | 1% ripple, 1% noise<br>20 MHz bandwidth |
| Over-Current Protection | All outputs have over-current protection. Restart by ON/STANDBY switch. |
| Over-Voltage Protection | 20% to 35% above output voltage causes supply shutdown. Restart by ON/STANDBY switch. |
| Power Supply/Fan Unit MTTR | Replacement in under 5 minutes |

# Cooling

**Table A-6.** Cooling Specifications

| Characteristic | Description |
|---|---|
| Per Slot Cooling Capacity | Slot cooling capacity in worst-case slot is 20 W with fan speed set to HI |
| Module Cooling System | Forced air circulation (positive pressurization) via two 60 cfm fans with HI/LO speed selector |
| Slot Airflow Direction | P1 to P2, bottom of module to top of module |
| Module Cooling Intake | Bottom rear of mainframe |
| Module Cooling Exhaust | Along both sides of mainframe |
| Power Supply Cooling System | Forced air circulation via integrated fan |
| Power Supply Cooling Intake | Rear of mainframe |
| Power Supply Cooling Exhaust | Along both sides of mainframe rear and upper rear panel |
| Module Cooling Fan MTBF | 40,000+ hr |
| Power Supply/Fan Unit | Replacement in under 5 minutes |

# Safety

**Table A-7.** Safety Specifications

| Characteristic | Description |
|---|---|
| Safety Characteristics | UL 3111-1, IEC 1010-1, CSA 22.2 No. 1010.1<br>Installation Category II<br>Pollution Degree 2<br>Safety Class 1 |

# Environmental

**Table A-8.** Environmental Specifications

| Characteristic | Description |
|---|---|
| Operating Temperature | 0° to 50° C |
| Storage Temperature | –20° to 70° C |
| Operating Relative Humidity | Maximum 80% for temperatures up to 31° C, decreasing linearly to 50% at 40° C |
| Functional Shock (Operating) | MIL-T-28800E CLASS 3, Half-Sine Shock Pulse, 11 ms duration, 30 g peak |
| Operating Location | Indoor use |
| Random Vibration (Operational)* | 5 to 500 Hz, 0.31 $g_{RMS}$ |
| Random Vibration (Non-Operational)* | 10 to 500 Hz, 2.46 $g_{RMS}$ |
| EMC Emissions | FCC Class A compliant and EN 55011 Group 1 Class A Compliant |
| EMC Immunity | Refer to DOC supplied with chassis for compliance to relevant directives. |
| Altitude | 2 km (1.24 mi) |

* Random vibration profiles were developed in accordance with MIL-T-28800E CLASS 3 and MIL-STD-810E Method 514 Test levels exceed those recommended in MIL-STD-810E for Category 1 (Basic Transportation), Figures 514.4-1 through 514.4-3.

# Backplane

**Table A-9.** Backplane Specifications

| Characteristic | Description |
|---|---|
| Size | 3U-sized; one system slot (with three system expansion slots) and seven peripheral slots.<br>Compliant with IEEE 1101.10 mechanical packaging.<br>PXI Specification Revision 1.0 compliant.<br>Accepts both PXI and CompactPCI (PICMG 2.0 R2.1) 3U modules. |
| Backplane Bare-Board Material | UL 94 V-0 recognized<br>(File No. E 116551) |
| Backplane Connectors | Conform to IEC 917 and IEC 1076-4-101, and are UL 94 V-0 rated |

# Mechanical

**Table A-10.** Mechanical Specifications

| Characteristic | Description |
|---|---|
| Overall Dimensions<br>Standard Mainframe<br><br>Height<br>Width<br>Depth | <br><br>17.78 cm (7.00 in.)<br>27.02 cm (10.64 in.)<br>37.85 cm (14.90 in.)<br>**Notes:**<br>1.80 cm (.71 in.) added to height when feet are installed.<br>When tilted with front feet extended on table top, height is increased approximately 5.29 cm (2.083 in.) in front and 1.48 cm (.583 in.) in rear. |
| Weight | 8.6 kg (19 lb.) |
| Maximum Module Weight | 1.8 kg (4 lb.) |
| Materials | Sheet Aluminum (5052-H32) and Cold Rolled Steel |
| Finish<br>Unpainted Aluminum<br>Cold Rolled Steel<br>Paint | <br>Conductive Clear Iridite<br>Clear Chromate Zinc Plating<br>Polyurethane Enamel |

Figure A-1 shows the PXI-1000B dimensions. The holes shown are for the installation of the optional rack-mount kit. You can install this kit on the front or rear of the chassis, depending on which end of the chassis you wish to face toward the front of the instrument cabinet. Note that the front and rear chassis mounting holes (size M4) are symmetrical.

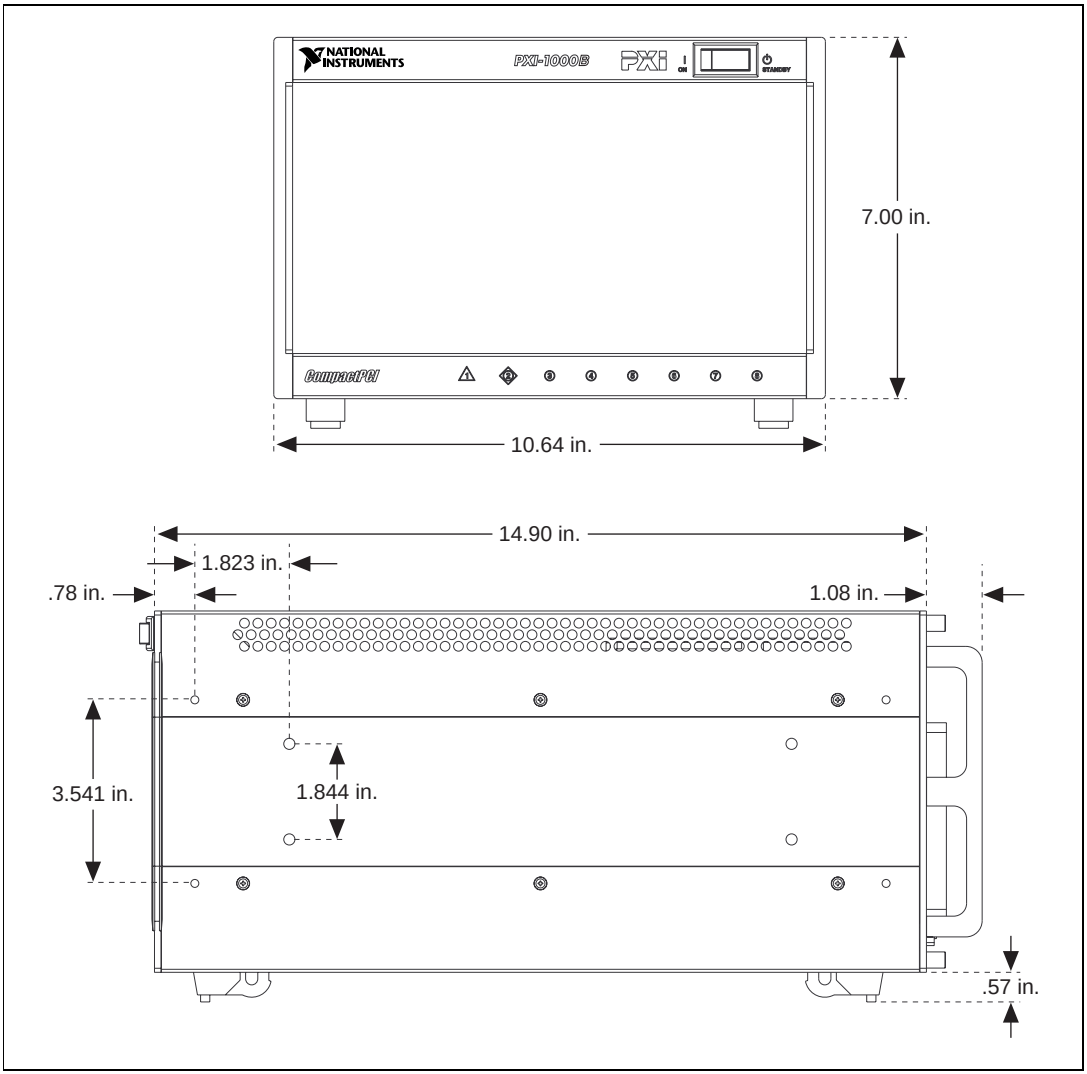



**Figure A-1.** PXI-1000B Dimensions

# B

# Pinouts

This appendix describes the P1 and P2 connector pinouts for the PXI-1000B 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 boldface.***

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 25 | GND | 5V | REQ64# | ENUM# | 3.3V | 5V | GND |
| 24 | GND | AD[1] | 5V | V(I/O) | AD[0] | ACK64# | GND |
| 23 | GND | 3.3V | AD[4] | AD[3] | 5V | AD[2] | GND |
| 22 | GND | AD[7] | GND | 3.3V | AD[6] | AD[5] | GND |
| 21 | GND | 3.3V | AD[9] | AD[8] | M66EN | C/BE[0]# | GND |
| 20 | GND | AD[12] | GND | V(I/O) | AD[11] | AD[10] | GND |
| 19 | GND | 3.3V | AD[15] | AD[14] | GND | AD[13] | GND |
| 18 | GND | SERR# | GND | 3.3V | PAR | C/BE[1]# | GND |
| 17 | GND | 3.3V | SDONE | SBO# | GND | PERR# | GND |
| 16 | GND | DEVSEL# | GND | V(I/O) | STOP# | LOCK# | GND |
| 15 | GND | 3.3V | 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 | 3.3V | 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 | 3.3V | 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# | 5V | INTD# | GND |
| 2 | GND | TCK | 5V | TMS | TDO | TDI | GND |
| 1 | GND | 5V | –12V | TRST# | +12V | 5V | GND |

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 22 | GND | **PXI_RSVA22** | **PXI_RSVB22** | **PXI_RSVC22** | **PXI_RSVD22** | **PXI_RSVE22** | GND |
| 21 | GND | RSV | GND | RSV | RSV | RSV | GND |
| 20 | GND | RSV | RSV | RSV | GND | RSV | GND |
| 19 | GND | RSV | GND | RSV | RSV | RSV | 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 | AD[35] | AD[34] | AD[33] | GND | AD[32] | GND |
| 13 | GND | AD[38] | GND | V(I/O) | AD[37] | AD[36] | GND |
| 12 | GND | AD[42] | AD[41] | AD[40] | GND | AD[39] | GND |
| 11 | GND | AD[45] | GND | V(I/O) | AD[44] | AD[43] | GND |
| 10 | GND | AD[49] | AD[48] | AD[47] | GND | AD[46] | GND |
| 9 | GND | AD[52] | GND | V(I/O) | AD[51] | AD[50] | GND |
| 8 | GND | AD[56] | AD[55] | AD[54] | GND | AD[53] | GND |
| 7 | GND | AD[59] | GND | V(I/O) | AD[58] | AD[57] | GND |
| 6 | GND | AD[63] | AD[62] | AD[61] | GND | AD[60] | GND |
| 5 | GND | C/BE[5]# | GND | V(I/O) | C/BE[4]# | PAR64 | GND |
| 4 | GND | V(I/O) | **PXI_BRSVB4** | C/BE[7]# | GND | C/BE[6]# | 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 |

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 25 | GND | 5V | REQ64# | ENUM# | 3.3V | 5V | GND |
| 24 | GND | AD[1] | 5V | V(I/O) | AD[0] | ACK64# | GND |
| 23 | GND | 3.3V | AD[4] | AD[3] | 5V | AD[2] | GND |
| 22 | GND | AD[7] | GND | 3.3V | AD[6] | AD[5] | GND |
| 21 | GND | 3.3V | AD[9] | AD[8] | M66EN | C/BE[0]# | GND |
| 20 | GND | AD[12] | GND | V(I/O) | AD[11] | AD[10] | GND |
| 19 | GND | 3.3V | AD[15] | AD[14] | GND | AD[13] | GND |
| 18 | GND | SERR# | GND | 3.3V | PAR | C/BE[1]# | GND |
| 17 | GND | 3.3V | SDONE | SBO# | GND | PERR# | GND |
| 16 | GND | DEVSEL# | GND | V(I/O) | STOP# | LOCK# | GND |
| 15 | GND | 3.3V | 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 | 3.3V | 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 | 3.3V | 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# | 5V | INTD# | GND |
| 2 | GND | TCK | 5V | TMS | TDO | TDI | GND |
| 1 | GND | 5V | –12V | TRST# | +12V | 5V | GND |

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 22 | GND | **PXI_RSVA22** | **PXI_RSVB22** | **PXI_RSVC22** | **PXI_RSVD22** | **PXI_RSVE22** | GND |
| 21 | GND | **PXI_LBR0** | GND | **PXI_LBR1** | **PXI_LBR2** | **PXI_LBR3** | GND |
| 20 | GND | **PXI_LBR4** | **PXI_LBR5** | **PXI_STAR0** | GND | **PXI_STAR1** | GND |
| 19 | GND | **PXI_STAR2** | GND | **PXI_STAR3** | **PXI_STAR4** | **PXI_STAR5** | GND |
| 18 | GND | **PXI_TRIG3** | **PXI_TRIG4** | **PXI_TRIG5** | GND | **PXI_TRIG6** | GND |
| 17 | GND | **PXI_TRIG2** | GND | PRST# | **PXI_CLK10_IN** | **PXI_CLK10** | GND |
| 16 | GND | **PXI_TRIG1** | **PXI_TRIG0** | DEG# | GND | **PXI_TRIG7** | GND |
| 15 | GND | **PXI_BRSVA15** | GND | FAL# | **PXI_STAR6** | **PXI_LBR6** | GND |
| 14 | GND | AD[35] | AD[34] | AD[33] | GND | AD[32] | GND |
| 13 | GND | AD[38] | GND | V(I/O) | AD[37] | AD[36] | GND |
| 12 | GND | AD[42] | AD[41] | AD[40] | GND | AD[39] | GND |
| 11 | GND | AD[45] | GND | V(I/O) | AD[44] | AD[43] | GND |
| 10 | GND | AD[49] | AD[48] | AD[47] | GND | AD[46] | GND |
| 9 | GND | AD[52] | GND | V(I/O) | AD[51] | AD[50] | GND |
| 8 | GND | AD[56] | AD[55] | AD[54] | GND | AD[53] | GND |
| 7 | GND | AD[59] | GND | V(I/O) | AD[58] | AD[57] | GND |
| 6 | GND | AD[63] | AD[62] | AD[61] | GND | AD[60] | GND |
| 5 | GND | C/BE[5]# | GND | V(I/O) | C/BE[4]# | PAR64 | GND |
| 4 | GND | V(I/O) | **PXI_BRSVB4** | C/BE[7]# | GND | C/BE[6]# | GND |
| 3 | GND | **PXI_LBR7** | GND | **PXI_LBR8** | **PXI_LBR9** | **PXI_LBR10** | GND |
| 2 | GND | **PXI_LBR11** | **PXI_LBR12** | SYSEN# | **PXI_STAR7** | **PXI_STAR8** | GND |
| 1 | GND | **PXI_STAR9** | GND | **PXI_STAR10** | **PXI_STAR11** | **PXI_STAR12** | GND |

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 25 | GND | 5V | REQ64# | ENUM# | 3.3V | 5V | GND |
| 24 | GND | AD[1] | 5V | V(I/O) | AD[0] | ACK64# | GND |
| 23 | GND | 3.3V | AD[4] | AD[3] | 5V | AD[2] | GND |
| 22 | GND | AD[7] | GND | 3.3V | AD[6] | AD[5] | GND |
| 21 | GND | 3.3V | AD[9] | AD[8] | M66EN | C/BE[0]# | GND |
| 20 | GND | AD[12] | GND | V(I/O) | AD[11] | AD[10] | GND |
| 19 | GND | 3.3V | AD[15] | AD[14] | GND | AD[13] | GND |
| 18 | GND | SERR# | GND | 3.3V | PAR | C/BE[1]# | GND |
| 17 | GND | 3.3V | SDONE | SBO# | GND | PERR# | GND |
| 16 | GND | DEVSEL# | GND | V(I/O) | STOP# | LOCK# | GND |
| 15 | GND | 3.3V | 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 | 3.3V | 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 | 3.3V | 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# | 5V | INTD# | GND |
| 2 | GND | TCK | 5V | TMS | TDO | TDI | GND |
| 1 | GND | 5V | –12V | TRST# | +12V | 5V | GND |

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

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 22 | GND | **PXI_RSVA22** | **PXI_RSVB22** | **PXI_RSVC22** | **PXI_RSVD22** | **PXI_RSVE22** | GND |
| 21 | GND | **PXI_LBR0** | GND | **PXI_LBR1** | **PXI_LBR2** | **PXI_LBR3** | GND |
| 20 | GND | **PXI_LBR4** | **PXI_LBR5** | **PXI_LBL0** | GND | **PXI_LBL1** | GND |
| 19 | GND | **PXI_LBL2** | GND | **PXI_LBL3** | **PXI_LBL4** | **PXI_LBL5** | GND |
| 18 | GND | **PXI_TRIG3** | **PXI_TRIG4** | **PXI_TRIG5** | GND | **PXI_TRIG6** | GND |
| 17 | GND | **PXI_TRIG2** | GND | PRST# | **PXI_STAR** | **PXI_CLK10** | GND |
| 16 | GND | **PXI_TRIG1** | **PXI_TRIG0** | DEG# | GND | **PXI_TRIG7** | GND |
| 15 | GND | **PXI_BRSVA15** | GND | FAL# | **PXI_LBL6** | **PXI_LBR6** | GND |
| 14 | GND | AD[35] | AD[34] | AD[33] | GND | AD[32] | GND |
| 13 | GND | AD[38] | GND | V(I/O) | AD[37] | AD[36] | GND |
| 12 | GND | AD[42] | AD[41] | AD[40] | GND | AD[39] | GND |
| 11 | GND | AD[45] | GND | V(I/O) | AD[44] | AD[43] | GND |
| 10 | GND | AD[49] | AD[48] | AD[47] | GND | AD[46] | GND |
| 9 | GND | AD[52] | GND | V(I/O) | AD[51] | AD[50] | GND |
| 8 | GND | AD[56] | AD[55] | AD[54] | GND | AD[53] | GND |
| 7 | GND | AD[59] | GND | V(I/O) | AD[58] | AD[57] | GND |
| 6 | GND | AD[63] | AD[62] | AD[61] | GND | AD[60] | GND |
| 5 | GND | C/BE[5]# | GND | V(I/O) | C/BE[4]# | PAR64 | GND |
| 4 | GND | V(I/O) | **PXI_BRSVB4** | C/BE[7]# | GND | C/BE[6]# | GND |
| 3 | GND | **PXI_LBR7** | GND | **PXI_LBR8** | **PXI_LBR9** | **PXI_LBR10** | GND |
| 2 | GND | **PXI_LBR11** | **PXI_LBR12** | SYSEN# | **PXI_LBL7** | **PXI_LBL8** | GND |
| 1 | GND | **PXI_LBL9** | GND | **PXI_LBL10** | **PXI_LBL11** | **PXI_LBL12** | GND |

# C

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# Technical Support Form

Photocopy this form and update it each time you make changes to your software or hardware, and use the completed copy of this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

If you are using any National Instruments hardware or software products related to this problem, include the configuration forms from their user manuals. Include additional pages if necessary.

Name _____

Company _____

Address _____

_____

Fax ( ___ ) _____Phone ( ___ ) _____

Computer brand_____ Model _____Processor_____

Operating system (include version number) _____

Clock speed _____MHz RAM _____MB Display adapter _____

Mouse ___yes ___no Other adapters installed_____

Hard disk capacity _____MB Brand_____

Instruments used _____

_____

National Instruments hardware product model _____ Revision _____

Configuration _____

National Instruments software product _____ Version _____

Configuration _____

The problem is: _____

_____

_____

_____

_____

List any error messages: _____

_____

_____

The following steps reproduce the problem: _____

_____

_____

_____

_____

# PXI-1000B Hardware Configuration Form

Record the settings and revisions of your hardware and software on the line to the right of each item. Complete a new copy of this form each time you revise your software or hardware configuration, and use this form as a reference for your current configuration. Completing this form accurately before contacting National Instruments for technical support helps our applications engineers answer your questions more efficiently.

## National Instruments Products

Complete Part Number _____

Serial Number _____

Line Voltage _____

Fan Speed _____

Safety Ground Connected? _____

Rack-Mount or Bench Top Configuration? _____

Using Remote Power Monitoring _____

Filler Panels Installed in Empty Slots? _____

## Other Products

List and describe all devices installed in your mainframe.

| Slot | Manufacturer, Description, and Function |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

# Documentation Comment Form

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**Title:** *PXI™-1000B User Manual*

**Edition Date:** February 1999

**Part Number:** 321710C-01

Please comment on the completeness, clarity, and organization of the manual.

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If you find errors in the manual, please record the page numbers and describe the errors.

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# Glossary

| Prefix | Meanings | Value |
|---|---|---|
| n- | nano- | $10^{-9}$ |
| µ- | micro- | $10^{-6}$ |
| m- | milli- | $10^{-3}$ |
| c- | centi- | $10^{-2}$ |
| k- | kilo- | $10^{3}$ |
| M- | mega- | $10^{6}$ |

## Symbols

| | |
|---|---|
| ° | Degrees |
| ≥ | Equal or greater than |
| ≤ | Equal or less than |
| % | Percent |

## A

| | |
|---|---|
| A | Amperes |
| AC | Alternating current |
| Ah | Ampere hours |
| ANSI | American National Standards Institute |
| AWG | American Wire Gauge |

## 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 | Cooperative Fuel Research |
| 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 |

## E

| | |
|---|---|
| ECL | Emitter-coupled logic |
| EIA | Electronic Industries Association |
| EMC | Electromagnetic Compatibility |

## F

| | |
|---|---|
| FCC | Federal Communications Commission |

## G

| | |
|---|---|
| g | 1) grams 2) A measure of acceleration 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

| | |
|---|---|
| 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 |
| in. | Inches |

## L

| | |
|---|---|
| lb | Pounds |

## M

| | |
|---|---|
| m | Meters |
| MTBF | Mean time between failure |
| MTTR | Mean time to repair |

## N

| | |
|---|---|
| NEMA | National Electrical Manufacturers Association |

## P

| | |
|---|---|
| PXI | PCI eXtensions for Instrumentation |

## R

| | |
|---|---|
| RH | Relative humidity |
| RMS | Root mean square. A method used to measure electrical output in volts and watts |

## S

| | |
|---|---|
| s | Seconds |
| ST | Star Trigger |
| 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 controller | A module configured for installation in Slot 0 of a VXIbus mainframe. This device is unique in the VXIbus system in that it performs the VMEbus 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 VXIbus backplane, or both. |

## U

| | |
|---|---|
| UL | Underwriter's Laboratories |

## V

| | |
|---|---|
| V | Volts |
| VAC | Volts alternating current |
| $V_{PP}$ | Peak to peak voltage |

## W

| | |
|---|---|
| W | Watts |

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