

DAQ

PXI™-1010 Chassis User Manual

*Combination Chassis for PXI, CompactPCI,
and SCXI Modules*

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- **Live Circuits**—Operating personnel and service personnel must not remove protective covers when operating or servicing the PXI-1010. Adjustments and service to internal components must be undertaken *only* 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**—Service this equipment only 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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The *PXI-1010 Chassis User Manual* describes the features of the PXI-1010 chassis and contains information about configuring the chassis, installing the modules, and operating the chassis.

Organization of This Manual

This manual is organized as follows:

- [Chapter 1, *Introduction*](#), describes the PXI-1010, lists what you need to get started, describes the optional equipment, and explains how to unpack the PXI-1010 chassis.
- [Chapter 2, *Installation and Configuration*](#), describes how to prepare and operate your PXI-1010 chassis.
- [Chapter 3, *Maintenance*](#), describes basic maintenance procedures for the PXI-1010 chassis.
- [Appendix A, *Specifications*](#), contains complete specifications for the PXI-1010 chassis.
- [Appendix B, *I/O Connector*](#), describes the P1 and P2 connector pin assignments for the PXI subsystem 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

This font is used for the proper names of filenames.

NI-DAQ

NI-DAQ is used throughout this manual to refer to the NI-DAQ software.

SCXIBus

SCXIBus refers to the backplane in the chassis SCXI subsystem. A signal on the backplane is referred to as the SCXIBus <signal name> line (or signal). The SCXIBus descriptor may be omitted when the meaning is clear.

PXI chassis

PXI chassis or simply *chassis* refers to the PXI-1010.

Slot 0

Slot 0 refers to the power supply and control circuitry in the SCXI subsystem.

National Instruments Documentation

The *PXI-1010 Chassis User Manual* is one piece of the documentation set for your PXI system. You could have any of several types of documents, depending on the hardware and software in your system. Use the documents you have as follows:

- *Getting Started with SCXI*—This is the first manual you should read. It gives an overview of the SCXI system and contains the most commonly needed information for the modules, chassis, and software.
- Your SCXI hardware documentation—Read these next for detailed information about signal connections and module configuration. They also explain in greater detail how the module works and contain application hints.
- Your data acquisition (DAQ) hardware documentation—This documentation has detailed information about the DAQ hardware that plugs into or is connected to your computer. Use these documents for hardware installation and configuration instructions, specification information about your DAQ hardware, and application hints.
- Software documentation—You might have several sets of software documentation, including LabVIEW, LabWindows/CVI, and NI-DAQ. After you have set up your hardware system, use either the application software (LabVIEW or LabWindows/CVI) or the NI-DAQ documentation to help you write your application. If you have a large and complicated system, it is worthwhile to look through the software documentation before you configure your hardware.
- Accessory installation guides or manuals—If you are using accessory products, read the terminal block and cable assembly installation guides or accessory user manuals. They explain how to physically connect the relevant pieces of the system. Consult these guides when you are making your connections.
- *PXI-1010 Chassis User Manual*—Read this manual for maintenance information on the chassis and installation instructions. This manual serves as your SCXI chassis manual.

Related Documentation

The following document contains information you may find useful as you read this manual:

- Your computer technical reference manual

If you are designing your own module, the following National Instruments specification, available by request, describes the physical, electrical, and timing requirements for PXI:

- *PXI Specification*, Revision 1.0

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.

Introduction

Chapter

1

This chapter describes the PXI-1010, lists what you need to get started, describes the optional equipment, and explains how to unpack the PXI-1010 chassis.

About the PXI-1010 Chassis

Thank you for purchasing the National Instruments PXI-1010 chassis. This chassis integrates a high-performance 8-slot PXI subsystem with a 4-slot SCXI subsystem to offer a complete solution for signal conditioning applications. The PXI section of the chassis accepts an embedded controller and a wide variety of peripheral modules (such as multifunction I/O, digital I/O, and instrument modules). The four SCXI slots integrate signal conditioning modules into your PXI system. These modules provide analog and digital input conditioning, isolation, and other functions. The PXI-1010 is ideal for applications where rack-mount space is limited because it combines the computer, plug-in devices, and signal conditioning in a single chassis. You can daisy-chain additional SCXI chassis to the PXI-1010 to build very high channel-count systems.

What You Need to Get Started

To set up and use your PXI-1010 chassis, you will need the following items:

- PXI-1010 chassis
- Power cable (see Table 1-1)
- PXI-1010 Chassis User Manual*

- One of the following software packages and documentation:
 - BridgeVIEW
 - ComponentWorks
 - LabVIEW for Windows
 - LabWindows/CVI for Windows
 - Measure
 - NI-DAQ for PC compatibles
 - VirtualBench
- PXI Chassis Initialization File for PXI-1010, version 1.0 (floppy disk) with `chassis.ini`
- PXI system controller and software
- PXI DAQ module
- SCXI module
- Flathead screwdriver
- Needle-nose pliers

Table 1-1. 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
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 cable, contact 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 in shipment, file a claim with the carrier. Retain the packing material for possible inspection and/or reshipment.

Software Programming Choices

You have several options to choose from when programming your National Instruments DAQ and SCXI hardware. You can use National Instruments application software, NI-DAQ, or register-level programming.

National Instruments Application Software

ComponentWorks contains tools for data acquisition and instrument control built on NI-DAQ driver software. ComponentWorks provides a higher-level programming interface for building virtual instruments through standard OLE controls and DLLs. With ComponentWorks, you can use all of the configuration tools, resource management utilities, and interactive control utilities included with NI-DAQ.

LabVIEW features interactive graphics, a state-of-the-art user interface, and a powerful graphical programming language. The LabVIEW Data Acquisition VI Library, a series of VIs for using LabVIEW with National Instruments DAQ hardware, is included with LabVIEW. The LabVIEW Data Acquisition VI Library is functionally equivalent to NI-DAQ software.

LabWindows/CVI features interactive graphics, state-of-the-art user interface, and uses the ANSI standard C programming language. The LabWindows/CVI Data Acquisition Library, a series of functions for using LabWindows/CVI with National Instruments DAQ hardware, is included with the NI-DAQ software kit. The LabWindows/CVI Data Acquisition Library is functionally equivalent to the NI-DAQ software.

VirtualBench features virtual instruments that combine DAQ products, software, and your computer to create a stand-alone instrument with the added benefit of the processing, display, and storage capabilities of your computer. VirtualBench instruments load and save waveform data to disk in the same forms that can be used in popular spreadsheet programs and word processors.

Using ComponentWorks, LabVIEW, LabWindows/CVI, or VirtualBench software will greatly reduce the development time for your data acquisition and control application.

NI-DAQ Driver Software

The NI-DAQ driver software is included at no charge with all National Instruments DAQ hardware. NI-DAQ has an extensive library of functions that you can call from your application programming environment. These functions include routines for analog input (A/D conversion), buffered data acquisition (high-speed A/D conversion), analog output (D/A conversion), waveform generation, digital I/O, counter/timer operations, SCXI, PXI Trigger Bus (RTSI), self-calibration, messaging, and acquiring data to extended memory.

NI-DAQ also internally addresses many of the complex issues between the computer and the plug-in board, such as programming interrupts and DMA controllers. NI-DAQ maintains a consistent software interface among its different versions so that you can change platforms with minimal modifications to your code. Whether you are using conventional programming languages or National Instruments application software your application uses the NI-DAQ driver software, as illustrated in Figure 1-1.

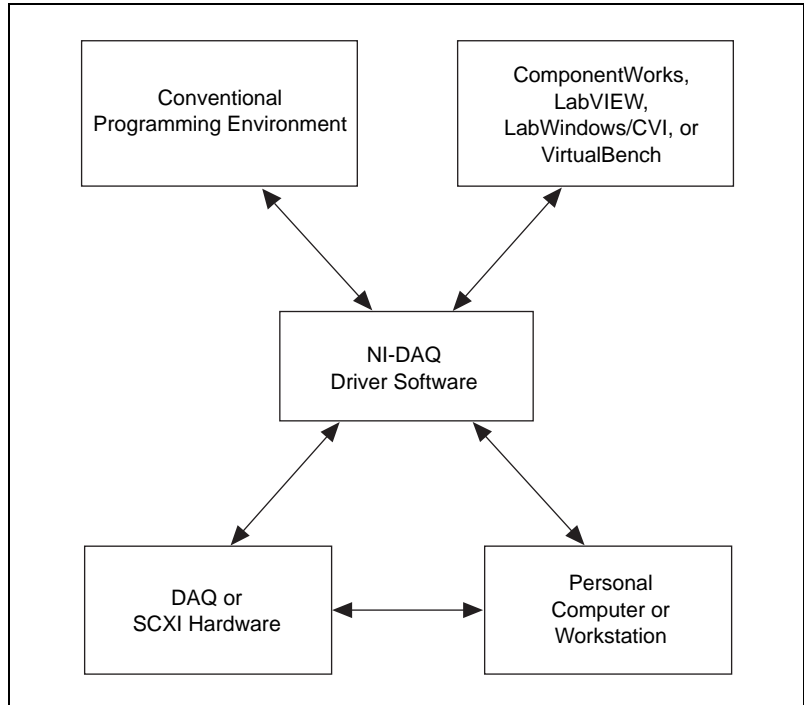


Figure 1-1. The Relationship between the Programming Environment, NI-DAQ, and Your Hardware

Register-Level Programming

The final option for programming any National Instruments DAQ hardware is to write register-level software. Writing register-level programming software can be very time-consuming and inefficient and is not recommended.

Even if you are an experienced register-level programmer, consider using National Instruments application software to program your National Instruments DAQ hardware. Using National Instruments application software is easier than and as flexible as register-level programming and can save weeks of development time.

Optional Equipment

National Instruments offers a variety of products to use with your PXI-1010 chassis, including cables and other accessories, as follows:

- Cables and cable accessories, shielded and ribbon
- Shielded and unshielded 68- and 100-pin screw terminals
- SCXI modules and accessories for isolating, amplifying, exciting, and multiplexing signals for relays and analog output.
- PXI modules and accessories for multifunction I/O and instrumentation.

For more specific information about these products, refer to your National Instruments catalogue or call the office nearest you.

Key Features

The PXI-1010 combines a high-performance 8-slot PXI subsystem with a 4-slot SCXI subsystem. The PXI-1010 has a structural design that is optimized for maximum use in a wide range of applications. The PXI-1010 fully complies with the *PXI Specification, Revision 1.0*, offering advanced timing and synchronization features.

The SCXI subsystem supplies a low-noise environment for signal conditioning, supplying power and control circuitry for the SCXI modules. Use this general-purpose chassis with current and future SCXI modules.

The PXI-1010 has a built-in interconnect between the PXI and SCXI subsystems that allows a DAQ device in the eighth PXI slot to control the SCXI subsystem without additional cables.

Chassis Description

Figure 1-2 shows the front view of the PXI-1010. Table 1-2 describes the front view items.

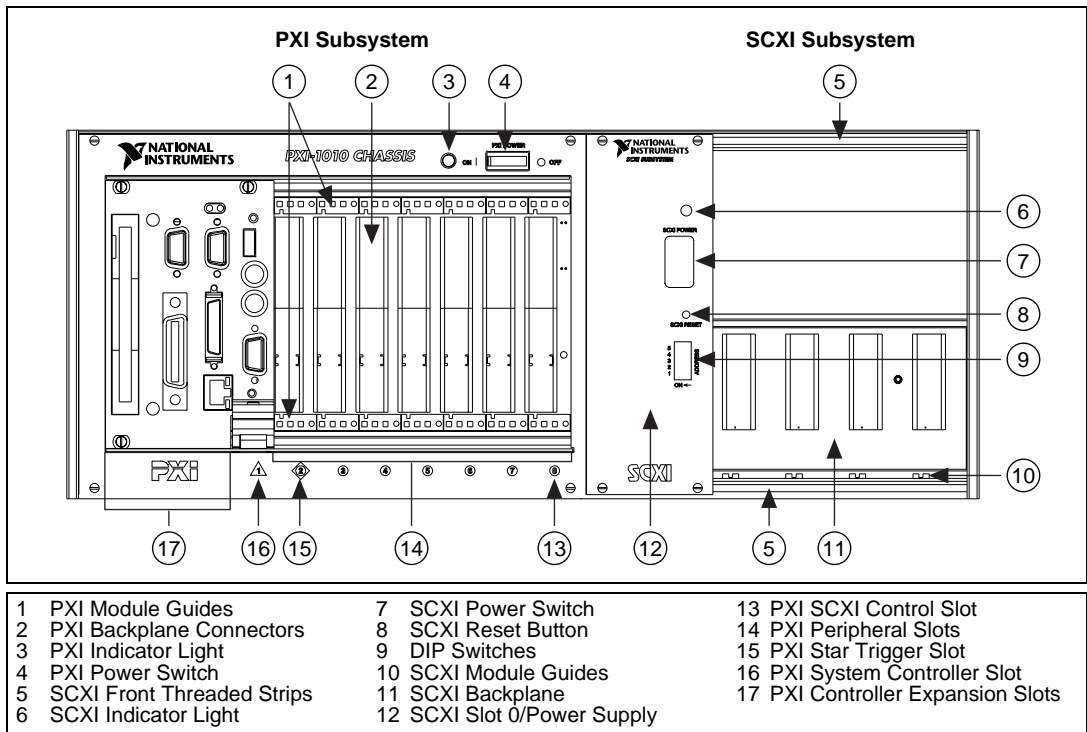


Figure 1-2. Front View of the PXI-1010 Chassis

Table 1-2. PXI-1010 Chassis Front View Items

Item	Description
PXI module guides	Guide PXI modules to mate with PXIbus connectors
PXI backplane connectors	Connects PXI modules to the PXIbus
PXI indicator light	When lit, indicates that the PXI subsystem is powered on
PXI power switch	Turns the PXI subsystem on and off
SCXI front-threaded strips	Secure modules in the SCXI subsystem and attach front panels

Table 1-2. PXI-1010 Chassis Front View Items (Continued)

Item	Description
SCXI indicator light	When lit, indicates that the SCXI subsystem is powered on
SCXI power switch	Turns the SCXI subsystem on and off
SCXI reset button	Reinitializes slot 0 and all SCXI modules to their power-on state when pressed
DIP switches	Determine the SCXI subsystem address
SCXI module guides	Guide modules to mate with the SCXIbus connector
SCXI backplane	Brings power, control lines, and analog bus connections to SCXI modules
SCXI slot 0/power supply	Contains the power supply and control circuitry for the SCXI subsystem
PXI SCXI control slot	Device in this slot can control SCXI subsystem
PXI peripheral slots	Hold PXI peripheral modules
PXI star trigger slot	Holds PXI star trigger controller or any PXI peripheral module
PXI system controller slot	Holds PXI system controller
PXI controller expansion slots	Provide space for large controllers

Figure 1-3 shows the chassis rear view items that are then described in Table 1-3.

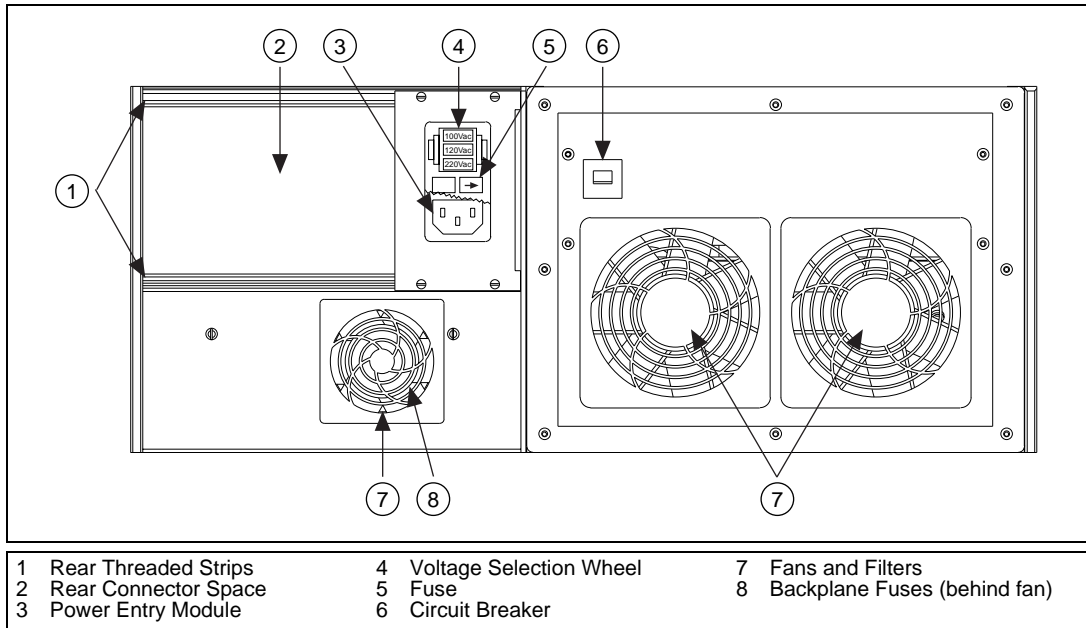


Figure 1-3. Rear View of the PXI-1010 Chassis

Table 1-3. PXI-1010 Chassis Rear View Items

Item	Description
Rear-threaded strips	Secure cable connections, mounting brackets, or filler panels to the chassis
Rear-connector space	For module space, connector mounting brackets, or adapter boards
Power entry module	IEC receptacle for power input, voltage selection wheel, and fuse
Voltage selection wheel	Configures the chassis for the AC line voltage
Fuse	Protects both you and the SCXI subsystem in case of a fault in the SCXI subsystem
Circuit breaker	Protects both you and the PXI subsystem in case of a PXI subsystem fault
Fans and filters	Cool the chassis; prevents dirt from contaminating the chassis circuitry
Backplane fuses	Protect the SCXI subsystem power supply from module shorts

SCXI Subsystem Backplane Overview

You can use the SCXI subsystem in the following ways:

- Install several SCXI modules and a PXI DAQ device in slot 8 of the PXI backplane to control and/or acquire data from all the SCXI modules.
- Install several SCXI modules and cable one of them to a DAQ device that controls and/or acquires data from all of the SCXI modules.
- Install several SCXI modules and an SCXI-1200 module that operates similarly to a DAQ device, except that it communicates with the host computer via a parallel port instead of the computer plug-in bus.
- Install SCXI modules that are each dedicated to conditioning signals for only a single DAQ device (for example, in parallel mode), or that operate independently and only use the SCXI subsystem as a power source and/or container. You can use the chassis this way in addition to or instead of one of the first three methods.

PXI Subsystem Backplane Overview

The following sections describe the PXI subsystem backplane.

Interoperability with CompactPCI

The PXI backplane is interoperable with PXI-compatible products and standard CompactPCI products. This is an important feature, because many PXI-compatible 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 PXI-1010 backplane P1 connector meet the requirements of the CompactPCI specification for both the peripheral and system modules. The PXI-specific signals are located on the P2 connector and are found only on the signals that are reserved or not used in the CompactPCI 64-bit specification. Therefore, all modules that meet the CompactPCI 64-bit specification requirements will function in the PXI-1010.

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 wider than one slot. As defined in the PXI specification, these slots allow the controller to expand to the left so it does not use up peripheral slots.

Peripheral Slots

The PXI-1010 has seven peripheral slots located in slots 2 through 8. You can use PXI modules in peripheral slots to add functionality to the PXI subsystem not already provided by the system controller. Examples of PXI peripheral modules are multifunction I/O, digital I/O, and instrument modules. Some peripheral slots also have special capabilities, such as the Star Trigger slot and the SCXI Control slot which are explained in the following sections.

Star Trigger Slot

The Star Trigger slot is located at slot 2. This slot has a dedicated trigger line between each peripheral slot (see Figure 1-4) and is intended for modules with Star Trigger functionality to 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.

Local Bus

The PXI backplane local bus is a daisy-chained bus that connects each peripheral slot with its adjacent left and right peripheral slots, 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 modules 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 modules to prohibit the use of incompatible devices. This software uses the configuration information specific to each peripheral module to evaluate compatibility. This method is a flexible way to define local bus functionality that is not limited by keying hardware.

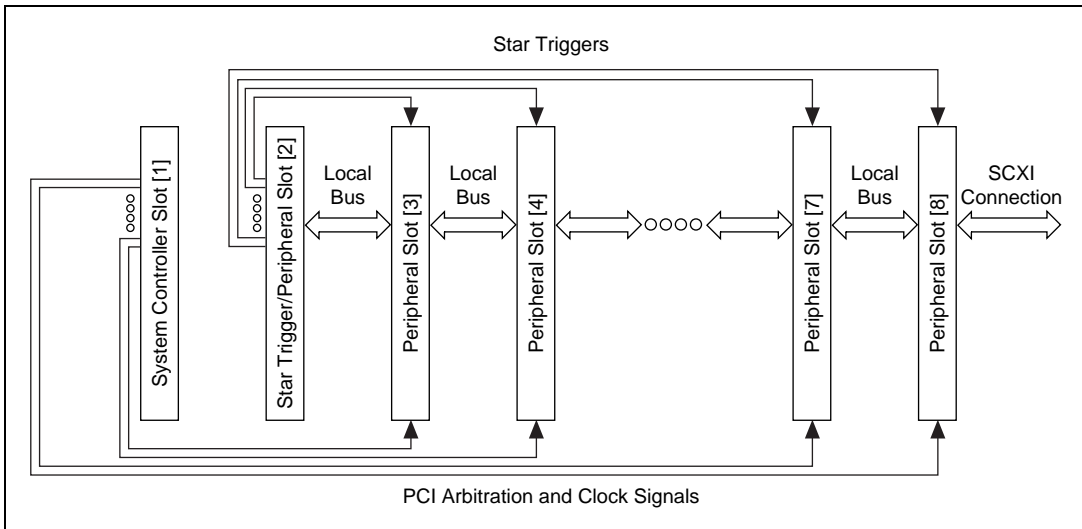


Figure 1-4. PXI Star Trigger and Local Bus Routing

SCXI Connection

Slot 8 of the PXI backplane has connections for a PXI peripheral module to control the SCXI subsystem. These connections use the available local bus right pins (PXI_LBR0:12). The SCXI connection passes communication, timing, and analog signals between the SCXI backplane and the PXI module in slot 8.

Trigger Bus

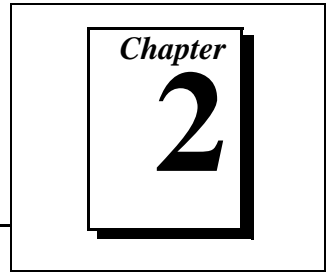
The eight PXI trigger lines are bused to each slot. You can use the trigger lines in a variety of ways. For example, you can use triggers to synchronize the operation of several different PXI peripheral modules. In other applications, one module can control carefully timed sequences of operations performed 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-1010 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-4, *P2 (J2) Connector Pin Assignments for the Star Trigger Slot*, in [Appendix B, I/O Connector](#).) Sourcing an external clock on this pin automatically disables the backplane 10 MHz source.

Installation and Configuration



This chapter describes how to prepare and operate your PXI-1010 chassis.

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

Mounting Information

The PXI-1010 is designed to operate on a bench or in an instrument rack. Determine how you want to use your PXI-1010 and follow the appropriate installation instructions.

Apertures in the rear and along both sides of the chassis facilitate power supply and module cooling. Air enters through filters and fan inlets located in the lower rear of the chassis and exits through the upper sections through the side. Place your PXI-1010 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 chassis have adequate ventilation. Keep other equipment a minimum of 3.0 in. (76.2 mm) away from the air inlets and outlets.

Install your chassis for easy access to the rear panel. This simplifies the air filter replacement.

Rack-mount applications require the optional rack-mount kit available from National Instruments. Refer to the rack-mount kit documentation to install your PXI-1010 in an instrument rack.

Chassis Configuration

Chassis configuration involves selecting an SCXI subsystem address, line voltage, and fuse value, described briefly in the following sections.

SCXI Subsystem Address Selection



Note: *Unless you are using multiple chassis and need to configure one or more SCXI chassis for a different address, you can skip this section. The SCXI subsystem will have the factory-default address of 0.*

You can configure the SCXI subsystem for one of 32 different addresses so that you can connect multiple SCXI chassis to the same control source. The five switches on the front panel of slot 0 determine the chassis address. Switches one through five represent the values 1, 2, 4, 8, and 16 respectively, when set to the *ON* position. When set to the *OFF* position, their value is zero. The chassis address is the sum of the switch values. Figure 2-1 shows examples of both the factory-default setting of the chassis address 0 and the switch setting for chassis address 19.

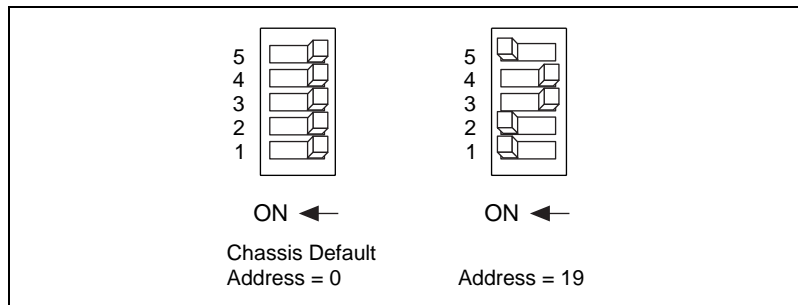


Figure 2-1. Address Setting Examples

Line Voltage-Selection and Fuse Values

The voltage selection wheel and fuse should be correct for operation in your geographical region (the -0x extension of the kit part number corresponds to your geographical region). Check the voltage on the voltage-selection wheel to ensure that you have the correct voltage-selection wheel setting and fuse.

The PXI-1010 chassis can operate with line voltages of 100, 120, 220, and 240 VAC. The voltage selection wheel in the power entry module

determines the voltage for which the chassis is configured. Identify the operating voltage by looking at the number on the power entry module when the selection wheel door is closed. The fuse is a 5 by 20 mm SLO-BLO type, which has a current rating relative to the operating voltage. Table 2-1 shows the proper voltage selection and fuse ratings for different geographical regions.



Caution: *For continued protection against fire, replace fuses only with fuses of the same type and rating.*

Table 2-1. PXI-1010 Voltage Selection and Fuse Ratings by Region

Region	Line Voltage	Fuse Rating
North America	120 VAC	1/2 A
Japan	100 VAC	3/4 A
Europe	240 VAC	1/4 A
Switzerland	220 VAC	1/4 A

Table 2-2 shows the manufacturer part numbers National Instruments uses for these fuses.

Table 2-2. PXI-1010 Fuse Part Numbers

Fuse Rating	Manufacturer	Part Number
1/4 A	Littelfuse	218.250
1/2 A	Littelfuse	239.500
3/4 A	Littelfuse	239.750

To select a line voltage, refer to Figure 1-3, *Rear View of the PXI-1010 Chassis*, as needed and perform the following steps:

1. Turn off the PXI-1010 power.
2. Remove the power cable from the power-entry module.
3. Using a flathead screwdriver, pry the door to the selection wheel open from the top.
4. Remove the selection wheel.
5. Rotate the wheel for the appropriate voltage and reinsert it into the power-entry module.
6. Close the door.

7. Check that the voltage showing on the selection wheel is correct.
8. Reinsert the power cable.

PXI-1010 Chassis Installation



Caution: *Equipment described in this document must be used in an Installation Category II environment per IEC 644. This category requires local level supply mains-connected installation.*

Follow these steps to install the PXI-1010 chassis:

1. If you are *not* using multiple chassis, skip this step and leave the address at its factory-default setting of 0. If you are using multiple chassis, change the SCXI chassis address of the SCXI subsystem by following the instructions in [the SCXI Subsystem Address Selection](#) section earlier in this chapter.
2. Place the PXI chassis on a sturdy, level surface. Leave at least 10 cm (4 in.) of space behind the chassis for adequate air circulation.
3. Turn off the power switches.
4. Check that the voltage selection wheel in the power-entry module is set for your outlet line voltage. Refer to the [Line Voltage-Selection and Fuse Values](#) section earlier in this chapter if necessary.
5. Insert the female end of your power cable into the power-entry module.
6. Insert the male end of your power cable into the wall outlet.
7. Install the SCXI and PXI modules into the chassis (see the appropriate sections later in this chapter).
 - If you are *not* using a DAQ device in slot 8 of the PXI backplane to control the SCXI modules, install the necessary cabling for your modules. Consult your SCXI module documentation for cabling installation instructions.
8. Install any front and rear filler panels (see the appropriate sections later in this chapter).
9. Turn on the chassis power switches.

PXI Module Installation



Caution: Turn off the PXI subsystem power using the power switch shown in Figure 1-2, *Front View of the PXI-1010 Chassis*, before installing CompactPCI or PXI modules.

Follow these steps to install a PXI module into a chassis slot:

1. First place the module edges into the PXI module guides (top and bottom), as shown in Figure 1-2.
2. 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 inject the module into the frame.
4. Secure the module's front panel to the chassis using the module front-panel mounting screws.

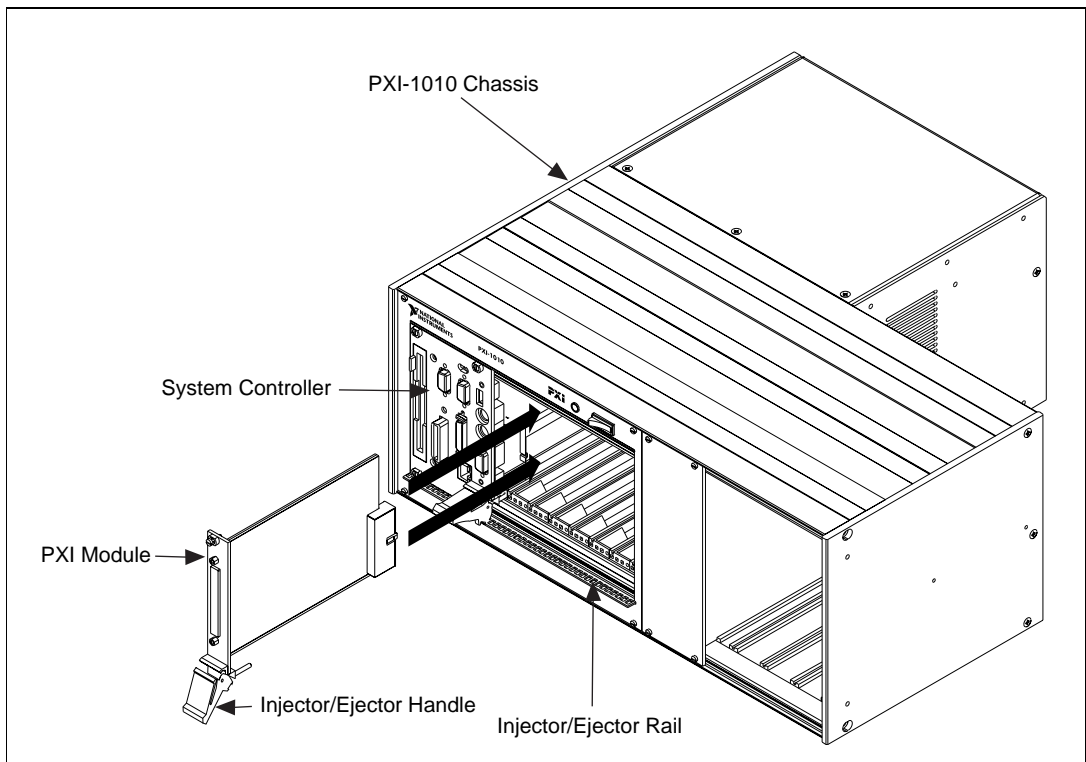


Figure 2-2. Installing PXI or CompactPCI Modules (PXI Module Shown)

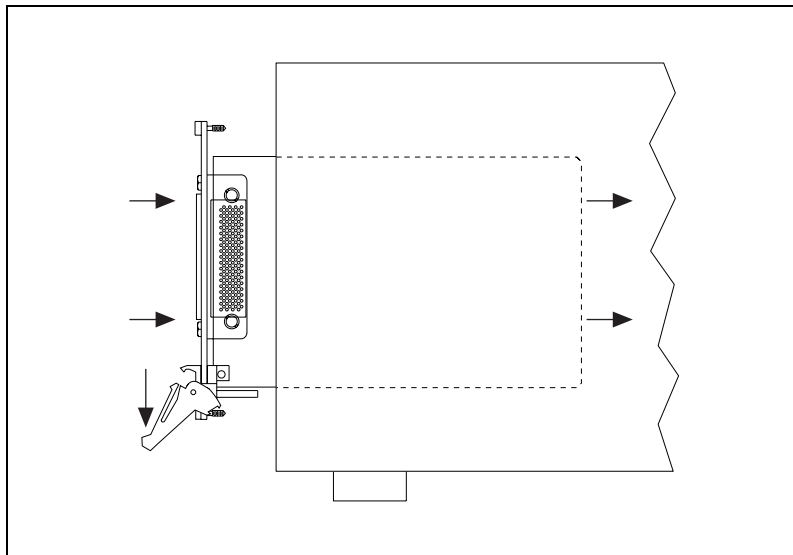


Figure 2-3. Injector/Ejector Handle Position during Module Insertion

PXI Filler Panel Installation

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

SCXI Module Installation

Follow these steps to install SCXI modules:

1. Turn off the SCXI subsystem using the switch shown in Figure 1-2, *Front View of the PXI-1010 Chassis*.
2. Remove the front filler panel of an empty SCXI slot.
3. Insert the module into the module guide rails and slide the module to the back of the chassis. Do *not* force the module into place.
4. Screw the front mounting panel of the module to the top and bottom threaded strips of the SCXI chassis using the thumbscrews on the module front panel.
5. Install any cabling necessary.

The installation is complete.

Refer to your SCXI module documentation for specific instructions pertaining to the module, especially module cabling.

SCXI Filler Panel Installation

The SCXI front and rear filler panel accessories protect the inside of the SCXI subsystem and installed modules by preventing unwanted material from entering the PXI chassis and damaging modules or forming conductive paths that may degrade performance. Install all SCXI modules first, then, in any unused SCXI slots, install filler panels from the edge of the module front panels.

Front Filler Panel Installation

Front filler panels are the height of a full slot. Follow these steps to install SCXI front filler panels:

1. Place the filler panel with the captive screws to the right of the PXI chassis front. Line up the screws with the threaded strip holes.
2. Using a flathead screwdriver, screw the two captive screws into the threaded strip holes.

Rear Filler Panel Installation

Rear filler panels are half the height of front filler panels. To install SCXI rear filler panels:

1. Place the filler panel at the rear of the chassis between the two threaded strips. Align the filler panel so that the serial number faces into the chassis and the screw holes are on the right of the rear panel.
2. Using a flathead screwdriver, screw the two screws through the rear panel into the threaded strip holes.

Using the PXI Chassis Initialization File

To assist system integrators, the PXI specification requires manufacturers of PXI chassis and system modules to document their product capabilities. The minimum documentation requirements are 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-1010 chassis initialization file, `chassis.ini`, is included on the media for your PXI-1010.

Maintenance

Chapter

3

This chapter describes basic maintenance procedures for the PXI-1010 chassis.

Maintenance Procedures

Service Interval

Clean the chassis 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 chassis 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 document 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.*

Cleaning

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



Caution: *Always power-off the chassis and disconnect the power cable before cleaning or servicing the chassis.*

Interior Cleaning

Use a dry, low-velocity stream of air to clean the chassis interior. 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 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.



Caution: *Avoid getting moisture inside the chassis 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 chassis.

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

PXI Subsystem Fan Filter Cleaning

To easily remove the chassis cooling filters from the rear of the chassis, remove the plastic housing attached to each fan.

To clean the fan filters, wash them in a mild soap solution and then vacuum or blow air through them. Rinse the filters with water and allow them to dry before reinstalling them onto the chassis.

SCXI Subsystem Fan Filter Cleaning

The fan on the rear of the SCXI subsystem cools the SCXI subsystem and its modules. To keep the fan effective, the fan filters must be clean. Dust and dirt accumulation reduces airflow, which makes the inside of the chassis hotter, shortening the life of the chassis and modules. Use the following procedure to clean the fan filters:

1. Turn the power off.
2. Remove the power cable from the power-entry module.

3. Place the chassis face down on a flat surface so that the fan is on top. If the chassis is so heavily cabled that you cannot practically place it in this position, leave the chassis as it is but be careful to support the fan during removal and reinstallation to prevent breaking the fan wires.
 - To remove the fan filter, remove the four screws that secure the fan and filter to the rear of the chassis. When removing the last screw, be careful to hold the fan to prevent breaking the fan wires.
4. Clean the fan filter by moving the filter around under a gentle stream of cold tap water until all the dust has been removed. Dry the filter.
5. Replace the fan filter by aligning the fan and filter with the fan holes, making sure that the label side of the fan is face down. Reinstall the four screws and make sure the assembly is secure.

Resetting the AC Main Circuit Breaker

If your PXI subsystem encounters an over-current condition, the circuit breaker located on the rear panel will trip to prevent chassis damage. Refer to Figure 1-2, *Front View of the PXI-1010 Chassis*, and Figure 1-3, *Rear View of the PXI-1010 Chassis*, as you use the following procedures:

1. Turn off the PXI power switch.
2. Depress the circuit breaker to reset it.
3. Turn on the PXI power switch.

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

1. Turn off the PXI power switch.
2. Remove all modules from the chassis.
3. Depress the circuit breaker to reset it.
4. Turn on the power switch and verify that the circuit breaker does not trip.
5. Verify that your PXI-1010 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](#), for power requirements.

6. The over-current condition that caused the circuit breaker to trip may be due to a faulty CompactPCI or PXI module. Refer to your module documentation to troubleshoot your modules.

SCXI Subsystem Fuse Replacement

Power Entry Module Fuse Replacement



Caution: *Disconnect all power before removing cover.*

Refer to Figure 1-3, *Rear View of the PXI-1010 Chassis*, as you use the following procedure to replace the power-entry module fuse:

1. Turn off the power.
2. Remove the power cable from the power-entry module.
3. Using a flathead screwdriver, pry the door to the voltage selection wheel open from the top.
4. Pull out the fuse drawer.
5. Remove the fuse.
6. Install the new fuse in the drawer.
7. Reinsert the fuse drawer in the right side slot with the arrow pointing to the right.
8. Close the door.
9. Reinsert the power cable.

SCXI Subsystem Backplane Fuse Replacement and Check

In addition to the power entry module fuse, the analog supply lines on the backplane are fused at 1.5 A. The fuse manufacturer is Littelfuse, part number 251 01.5.

If you are going to make your own modules, fuse your module at 250 mA to avoid blowing the backplane fuses. Fusing your module also better protects your module because a failure can result in a large amount of current drawn, but not enough to blow the backplane fuses.

The backplane fuses are located behind the SCXI subsystem fan.

Use the following procedure to check or replace fuses:

1. Remove the appropriate fan and filter from the rear of the chassis, following the instructions in the *SCXI Subsystem Fan Filter Cleaning* section in this chapter. Make sure to switch the power off and remove the power cable.
2. The fuse marked with a copper + on the backplane is for the positive analog supply, and the fuse marked with a copper – is for the negative analog supply. To check whether a fuse is blown, connect an ohmmeter across the leads. If the reading is not 0 Ω , replace the fuse.
3. Use a pair of needle-nose pliers to carefully extract the fuse.
4. Take a new fuse and bend its leads so the component is 1.27 cm (0.5 in.) long (the dimension between the fuse sockets), and clip the leads to a length of 0.635 cm (0.25 in.).
5. Using the needle-nose pliers, insert the fuse into the socket holes.
6. Repeat, if necessary, for the other fuse.
7. Check the fan filter and, if it is dirty, clean it as described in the *SCXI Subsystem Fan Filter Cleaning* section in this chapter.
8. Reinstall the fan and filter.

Troubleshooting the PXI-1010

Refer to Table 3-1 to troubleshoot the PXI-1010 chassis. The table lists possible causes for power failure and recommends ways to correct the problem.

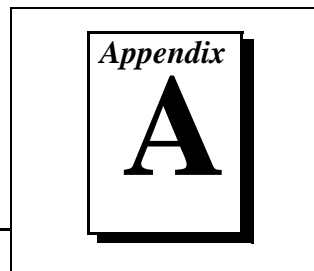
Table 3-1. Troubleshooting Power Failure

Possible Cause	What to Do
PXI-1010 chassis is not connected to power source.	Make sure that the PXI-1010 is connected to a live electrical outlet. Try operating another piece of equipment from this outlet.
Power switch is not switched on.	Set the PXI power switch to the <i>On</i> position.

Table 3-1. Troubleshooting Power Failure (Continued)

Possible Cause	What to Do
Circuit breaker is tripped.	Reset the circuit breaker. Refer to the <i>Resetting the AC Main Circuit Breaker</i> section in this chapter.
Power supply has failed.	Contact National Instruments.

Specifications



This appendix contains complete specifications for the PXI-1010 chassis.

PXI Subsystem Electrical Characteristics

AC Input

- Input voltage range100, 120, 220, or
240 VAC \pm 10%
- Input frequency range47 to 63 Hz
- Over-current protection.....10 A circuit breaker and fuse
- Operating current8 A
- Efficiency80% typ

PXI Subsystem DC Output

- Max usable power300 W
- DC current capacity

Voltage	I_{MP} (Steady-state current)
+3.3 V	40 A
+5 V	20 A
+12 V	4 A
-12 V	1 A

Load regulation	1% for 10% to 100% load changes, all outputs 10% min. load required on V1 (+3.3 V) for max. load regulation on outputs V2 (+5 V), V3 (+12 V), and V4 (-12 V).
Line regulation	±0.5% over operating line range, all outputs
Max ripple and noise	1% ripple, 1% noise, or 100 mV, whichever is greater 20 MHz bandwidth
Transient response.....	Output max excursion of ±5% for 25% load step. Recovery less than 500 µs.
Over-current protection	All outputs protected from short circuit and overload, automatic recovery
Over-voltage protection.....	3.3 V clamps at 20 to 30% above output voltage 5 V, +12 V, and -12 V clamps at 10 to 20% above output voltage
Power supply unit meantime between failure (MTBF).....	90,000+ h

SCXI Subsystem Electrical Characteristics

DC Output

V+ output	
Tolerance limits include peaks	+18.5 to +25 V
Ripple (peak-to-peak)	1.5 V
Max load	680 mA

V– output

Tolerance limits include peaks –18.5 to –25 V
 Ripple (peak-to-peak) 1.5 V
 Max load..... 680 mA

+5 V output

Tolerance limits include peaks +4.75 to +5.25 V
 Ripple (peak-to-peak) 50 mV
 Max load..... 200 mA

Maximum loads are the supply current for the entire chassis. Scaling the maximum power gives the allotted current per slot, as follows:

V+ output 170 mA
 V– output 170 mA
 +5 V output 50 mA

PXI Subsystem Cooling

Per slot cooling capacity Slot cooling capacity in worst-case slot is 20 W

Module cooling system Forced air circulation (positive pressurization) via two fans

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

Module cooling intake Bottom rear of chassis

Module cooling exhaust Top sides of chassis

Power supply cooling system Forced air circulation via integrated fan

Power supply cooling intake Rear of chassis

Power supply cooling exhaust Sides of chassis

Module cooling fan (MTBF) 30,000 h

Safety

Safety characteristics.....	UL 3111-1, IEC 1010-1, CSA; 22.2 No. 1010.1; Installation category II; Pollution degree 2; Safety class 1
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Environmental

Operating temperature.....	0° to 50° C
Storage temperature	-55° to 125° C
Operating relative humidity.....	5% to 90% (noncondensing)
Functional shock (operating).....	MIL-T-28800E CLASS 3, Half-Sine Shock Pulse, 11 ms duration, 30 g peak
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

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

Mechanical

Overall dimensions	Refer to Figure A-1 through Figure A-3 for the physical dimensions of the PXI-1010 chassis
Weight	4.5 kg (10 lb)

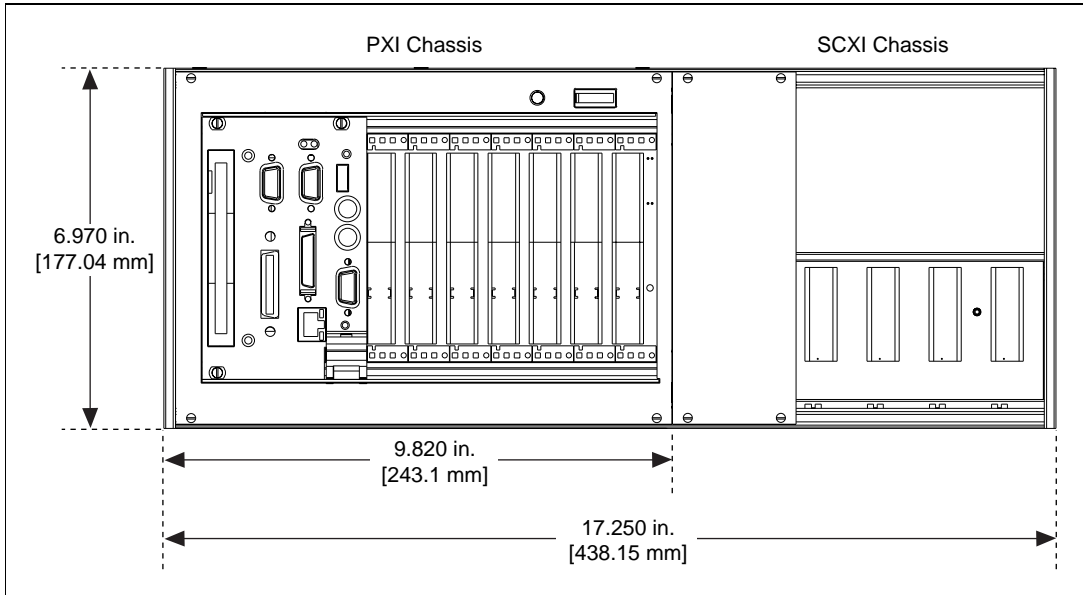


Figure A-1. PXI-1010 Dimensions (Front View Shown)

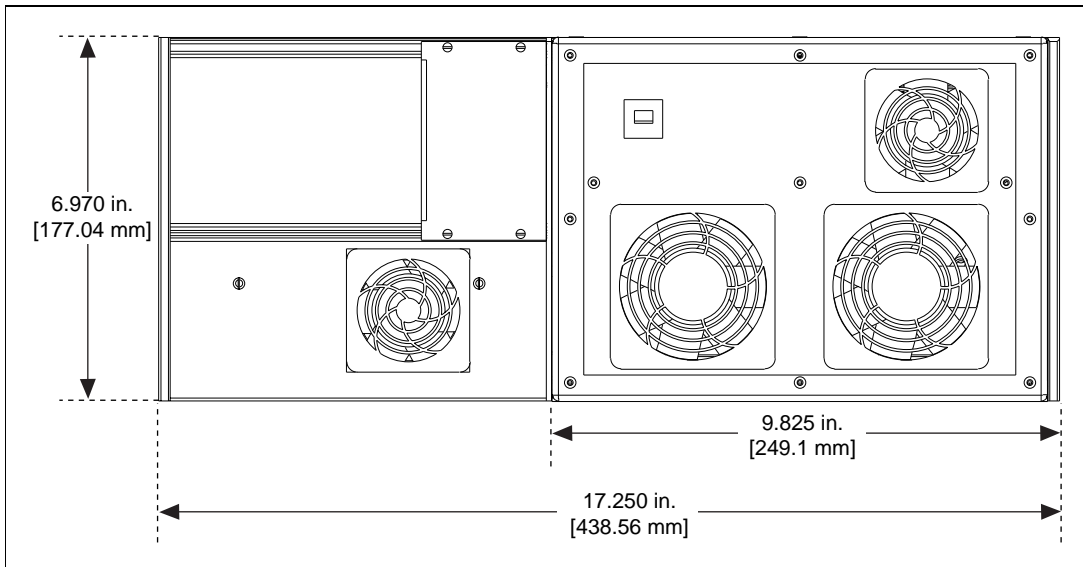


Figure A-2. PXI-1010 Dimensions (Rear View Shown)

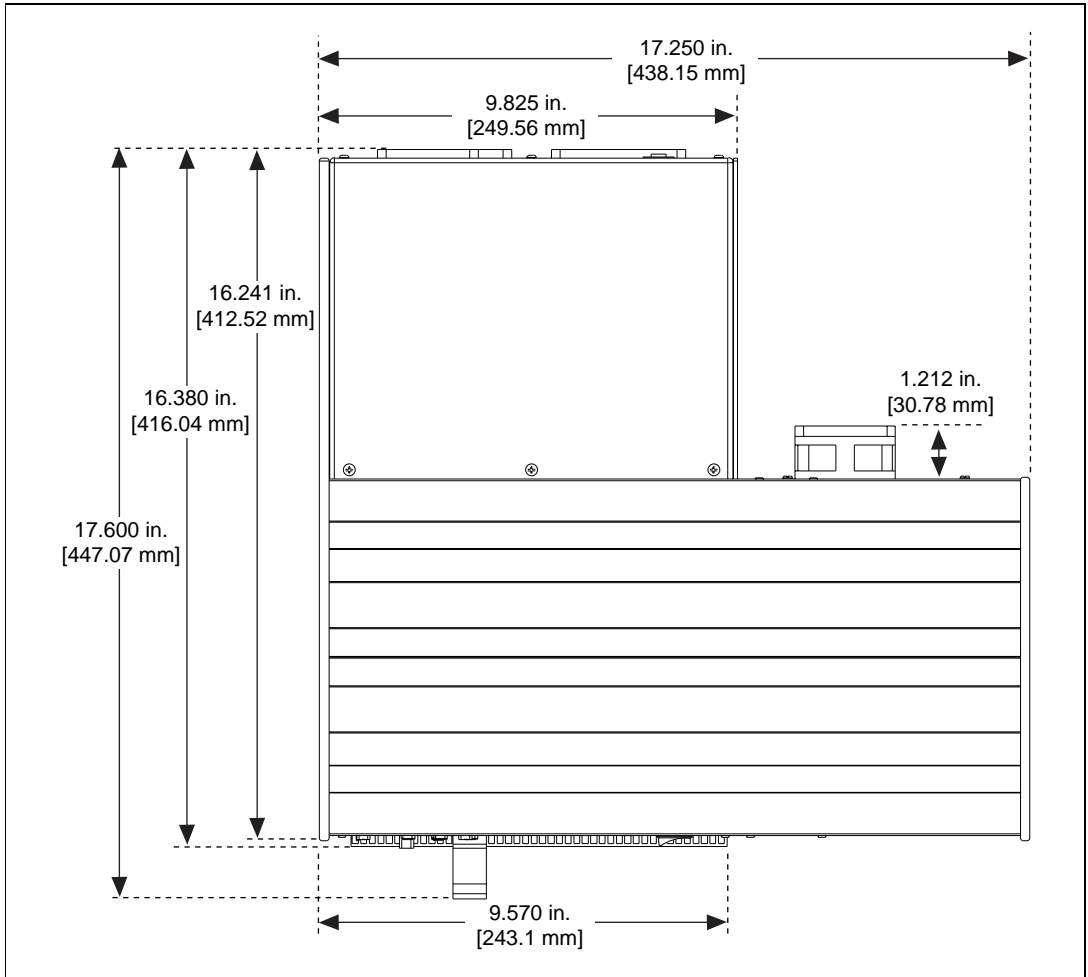


Figure A-3. PXI-1010 Dimensions (Top View Shown)

I/O Connector

The logo for Appendix B, featuring the word "Appendix" in a serif font above a large, bold, black letter "B". The entire logo is enclosed in a double-line rectangular border.

This appendix describes the P1 and P2 connector pin assignments for the PXI subsystem backplane.

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

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

Table B-3 shows the P1 (J1) connector pin assignments for the Star Trigger slot.

Table B-4 shows the P2 (J2) connector pin assignments for the Star Trigger slot.

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

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



Note: *PXI signals are shown in boldface.*

Table B-1. P1 (J1) Connector Pin Assignments 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 Pin Assignments 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 Pin Assignments 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 Pin Assignments 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_BRSA15	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

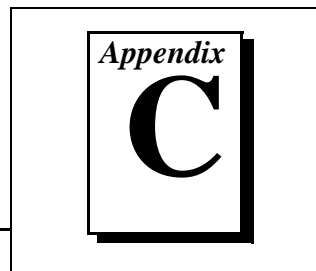
Table B-5. P1 (J1) Connector Pin Assignments for the Peripheral Slot

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 Pin Assignments 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

Customer Communication



For your convenience, this appendix contains forms to help you gather the information necessary to help us solve your technical problems and a form you can use to comment on the product documentation. When you contact us, we need the information on the Technical Support Form and the configuration form, if your manual contains one, about your system configuration to answer your questions as quickly as possible.

National Instruments has technical assistance through electronic, fax, and telephone systems to quickly provide the information you need. Our electronic services include a bulletin board service, an FTP site, a fax-on-demand system, and e-mail support. If you have a hardware or software problem, first try the electronic support systems. If the information available on these systems does not answer your questions, we offer fax and telephone support through our technical support centers, which are staffed by applications engineers.

Electronic Services

Bulletin Board Support

National Instruments has BBS and FTP sites dedicated for 24-hour support with a collection of files and documents to answer most common customer questions. From these sites, you can also download the latest instrument drivers, updates, and example programs. For recorded instructions on how to use the bulletin board and FTP services and for BBS automated information, call 512 795 6990. You can access these services at:

United States: 512 794 5422

Up to 14,400 baud, 8 data bits, 1 stop bit, no parity

United Kingdom: 01635 551422

Up to 9,600 baud, 8 data bits, 1 stop bit, no parity

France: 01 48 65 15 59

Up to 9,600 baud, 8 data bits, 1 stop bit, no parity

FTP Support

To access our FTP site, log on to our Internet host, `ftp.natinst.com`, as anonymous and use your Internet address, such as `joesmith@anywhere.com`, as your password. The support files and documents are located in the `/support` directories.

Fax-on-Demand Support

Fax-on-Demand is a 24-hour information retrieval system containing a library of documents on a wide range of technical information. You can access Fax-on-Demand from a touch-tone telephone at 512 418 1111.

E-Mail Support (Currently USA Only)

You can submit technical support questions to the applications engineering team through e-mail at the Internet address listed below. Remember to include your name, address, and phone number so we can contact you with solutions and suggestions.

support@natinst.com

Telephone and Fax Support

National Instruments has branch offices all over the world. Use the list below to find the technical support number for your country. If there is no National Instruments office in your country, contact the source from which you purchased your software to obtain support.

Country	Telephone	Fax
Australia	03 9879 5166	03 9879 6277
Austria	0662 45 79 90 0	0662 45 79 90 19
Belgium	02 757 00 20	02 757 03 11
Brazil	011 288 3336	011 288 8528
Canada (Ontario)	905 785 0085	905 785 0086
Canada (Quebec)	514 694 8521	514 694 4399
Denmark	45 76 26 00	45 76 26 02
Finland	09 725 725 11	09 725 725 55
France	01 48 14 24 24	01 48 14 24 14
Germany	089 741 31 30	089 714 60 35
Hong Kong	2645 3186	2686 8505
Israel	03 6120092	03 6120095
Italy	02 413091	02 41309215
Japan	03 5472 2970	03 5472 2977
Korea	02 596 7456	02 596 7455
Mexico	5 520 2635	5 520 3282
Netherlands	0348 433466	0348 430673
Norway	32 84 84 00	32 84 86 00
Singapore	2265886	2265887
Spain	91 640 0085	91 640 0533
Sweden	08 730 49 70	08 730 43 70
Switzerland	056 200 51 51	056 200 51 55
Taiwan	02 377 1200	02 737 4644
United Kingdom	01635 523545	01635 523154
United States	512 795 8248	512 794 5678

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-1010 Hardware Configuration Form

Record the settings and revisions of your hardware and software on the line to the right of each item. Also fill out the hardware and software configuration forms for all modules in the chassis, all relevant DAQ boards, and all other chassis in the application. By completing these forms accurately, our applications engineers will be able to answer your questions more efficiently.

National Instruments Products

Complete part number _____

Serial number _____

Chassis revision _____

SCXI subsystem address _____

Line voltage _____

Rack-mount or bench-top configuration _____

Filler panels installed in empty slots _____

SCXI Subsystem Configuration			
Slot	Module	DAQ Device Cabled to Module	Cable Assembly
1			
2			
3			
4			

Other Products

List and describe all devices installed in your PXI subsystem.

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

Documentation Comment Form

National Instruments encourages you to comment on the documentation supplied with our products. This information helps us provide quality products to meet your needs.

Title: *PXI™-1010 Chassis User Manual*

Edition Date: March 1998

Part Number: 321840A-01

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

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

Thank you for your help.

Name _____

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Prefix	Meaning	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
\geq	Equal or greater than
\leq	Equal or less than
%	Percent

A

A	Amperes
AC	Alternating current
ANSI	American National Standards Institute

asynchronous timing 1) Hardware—a property of an event that is not synchronized to a reference clock 2) Software—a property of a function that begins an operation and returns before the operation is complete

AWG American Wire Gauge

B

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

bandwidth The range of frequencies present in a signal, or the range of frequencies to which a measuring device can respond

bus The group of connectors that interconnect individual circuitry in a computer. Typically, a bus is the expansion vehicle to which I/O or other devices are connected. Examples of PC buses are the ISA and PCI buses.

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
GND	Ground signal
GPIO	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	
h	Hour
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
I/O	Input/output

L

lb	Pounds
local bus	A group of signals that connect two peripheral slots

M

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

N

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

O

overcurrent condition	When the lead on a power supply draws more current than what the power supply is rated for
-----------------------	--

P

PXI	PCI eXtensions for Instrumentation
PXI_CLK10	The pin that provides the PXI 10 MHz system clock signal to a peripheral slot
PXI_CLK_10_IN	The pin that a star trigger module uses to supply the PXI 10 MHz system clock signal
PXI backplane	The board in the PXI subsystem that connects the PXI modules
PXI peripheral module	A PXI module that plugs into a PXI peripheral slot
PXI module	A PXI module that plugs into a PXI slot
PXI peripheral slot	Holds PXI peripheral modules

PXI subsystem	The PXI-1010 chassis section that uses PXI modules
PXI 10 MHz system clock signal	A 10 MHz clock reference provided by the PXI backplane to all peripheral modules
R	
RH	Relative humidity
RMS	Root mean square—A method used to measure electrical output in volts and watts
S	
s	Seconds
SCXI	SCXI stands for Signal Conditioning eXtensions for Instrumentation and is a National Instruments product line designed to perform front-end signal conditioning for National Instruments plug-in DAQ devices
SCXI subsystem	The PXI-1010 chassis section that uses SCXI modules
slot	The slot in the chassis where a module is inserted
Slot 0	The power and control circuitry for the SCXI subsystem
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
synchronous timing	1) Hardware—a property of an event that is synchronized to a reference clock 2) Software—a property of a function that begins an operation and returns only when the operation is complete
system integrator	The party who connects pieces of hardware and software to create a complete system for the end user
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

T

trigger Any event that causes or starts some form of data capture

TTL Transistor-transistor logic

U

UL Underwriter's Laboratories

V

V Volts

V_{PP} Peak to peak voltage

VAC Volts alternating current

voltage selection wheel Configures the chassis for the AC line voltage

W

W Watts

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