PXI Express

PXIe-1078 User Manual

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

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC[1].

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

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

Some hardware may require the use of a metal, shielded enclosure (windowless version) to meet the EMC requirements for special EMC environments such as, for marine use or in heavy industrial areas. Refer to the hardware's user documentation and the DoC[1] for product installation requirements.

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

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

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

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[1] The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

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About This Manual

The *PXIe-1078 User Manual* describes the features of the PXIe-1078 chassis and contains information about configuring the chassis, installing the modules, and operating the chassis.

Note For PXIe-1078 specifications, refer to the *PXIe-1078 Specifications* on `ni.com`.

Related Documentation

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

- IEEE 1101.1-1991, *IEEE Standard for Mechanical Core Specifications for Microcomputers Using IEC 603-2 Connectors*
- IEEE 1101.10, *IEEE Standard for Additional Mechanical Specifications for Microcomputers Using IEEE 1101.1 Equipment Practice*
- *PICMG EXP.0 R1.0 CompactPCI Express Specification*, PCI Industrial Computers Manufacturers Group
- *PCI Express Base Specification*, Revision 2.0, PCI Special Interest Group
- *PXI-5 PXI Express Hardware Specification*, Revision 1.0, PXI Systems Alliance

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Getting Started

This chapter describes the key features of the PXIe-1078 chassis and lists the kit contents and optional equipment you can order from National Instruments.

Unpacking

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

What You Need to Get Started

The PXIe-1078 chassis kit contains the following items:

- PXIe-1078 chassis
- Filler panels
- AC power cable—refer to Table 1-1 for AC power cables
- *PXIe-1078 User Manual*
- Software media with *PXI Platform Services 2.0* or higher
- *Read Me First: Safety and Electromagnetic Compatibility*
- Chassis number labels

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
Universal Euro 230 V	CEE (7), II, IV, VII IEC83
North America 120 V	ANSI C73.20/NEMA 5-15-P/IEC83
United Kingdom 230 V	BS 1363/IEC83

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

Key Features

The PXIe-1078 combines a 9-slot PXI Express backplane with a structural design optimized for maximum usability in a wide range of applications.

The key features of the PXIe-1078 chassis include the following:

- Accepts 3U PXI Express, Compact PCI Express, and hybrid slot-compatible PXI-1/CompactPCI modules
    - 3 PXI Express peripheral slots directly connected as x1 links to the system slot
    - 5 hybrid peripheral slots connected as x1 links to a PCI Express switch, which is connected to the system through a x4 link
    - 32-bit, 33 MHz PCI connected to each hybrid slot
- Accepts 4-slot wide PXI Express embedded controller
- Rugged, compact chassis with universal AC input
- Auto/high temperature-controlled fan speed based on air intake temperature to minimize audible noise
- Rack mountable
- Optional carrying handle for portability

Chassis Description

Figures 1-1 and 1-2 show the key features of the PXIe-1078 chassis front and back panels. Figure 1-1 shows the front view of the PXIe-1078. Figure 1-2 shows the rear view of the PXIe-1078.

Figure 1-1. Front View of the PXIe-1078 Chassis
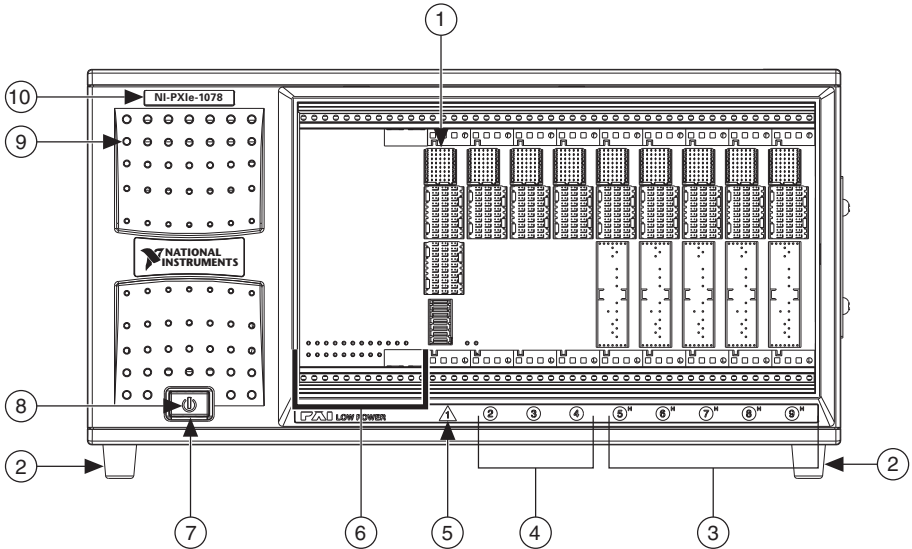
1	Backplane Connectors	6	System Controller Expansion Slots
2	Removable Feet	7	Power Inhibit Switch
3	PXI Express Hybrid Peripheral Slots	8	Power Inhibit Switch LED
4	PXI Express Peripheral Slots	9	Power Supply Airflow Intake Vents
5	PXI Express System Controller Slot	10	Chassis Model Name

Figure 1-2. Rear View of the PXIe-1078 Chassis
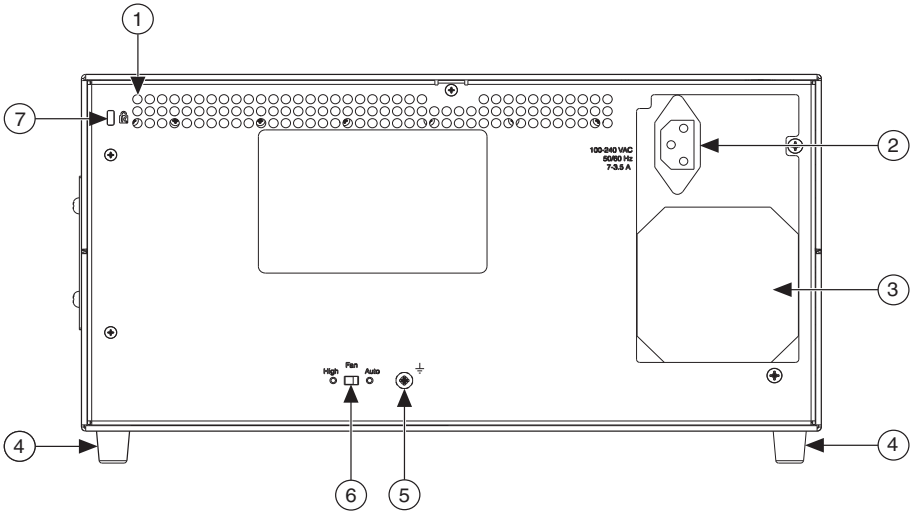
1	Rear Intake Vents	5	Chassis Ground Screw
2	AC Input	6	AUTO/HIGH Fan Speed Selector Switch
3	Power Supply Fan Exhaust	7	Kensington Slot
4	Removable Feet		

Figure 1-3. Bottom View of the PXIe-1078 Chassis
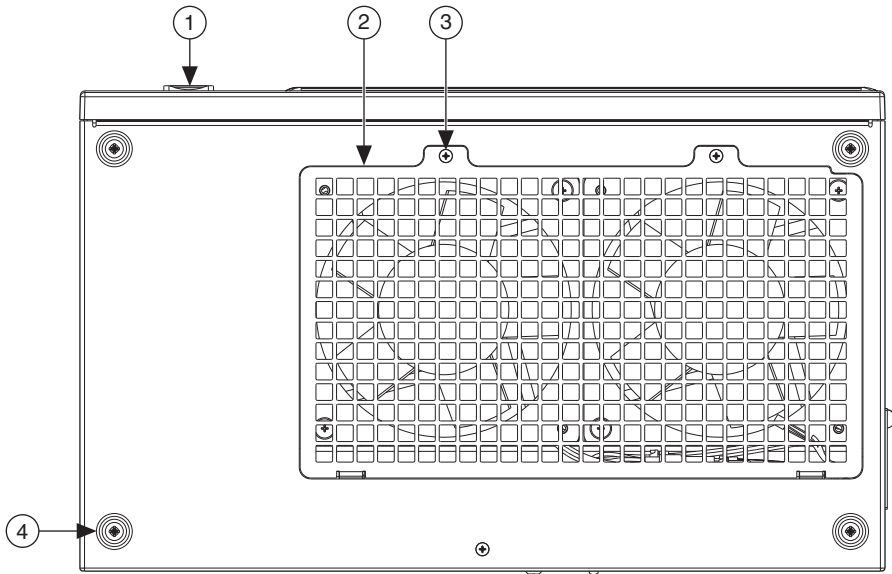
| 1 | Power Switch (On/Standby) | 3 | Fan Intake Cover Screw |
| 2 | Fan Intake Cover | 4 | Removable Foot |

Optional Equipment

Contact National Instruments to order the following options for the PXIe-1078 chassis.

EMC Filler Panels

Optional EMC filler panel kits are available from National Instruments through part number 778700-01.

Rack Mount Kit

A rack mount kit option is available for mounting the PXIe-1078 chassis into a 19 in. instrument cabinet. Refer to the *PXIe-1078 Specifications* on ni.com for more information.

Slot Blockers

Optional slot blocker kits are available from National Instruments for improved thermal performance when all slots are not used.

Handle/Feet Kit

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

PXIe-1078 Chassis Backplane Overview

This section provides an overview of the backplane features for the PXIe-1078 chassis.

Interoperability with CompactPCI

The design of the PXIe-1078 provides you the flexibility to use the following devices in a single PXI Express chassis:

• PXI Express compatible products

• CompactPCI Express compatible 4-Link system controller products

• CompactPCI Express compatible Type-2 peripheral products

• PXI peripheral products

• Standard CompactPCI peripheral products

Refer to Figure 1-4 for an overview of the PXIe-1078 architecture.

Figure 1-4. PXIe-1078 Backplane Architecture
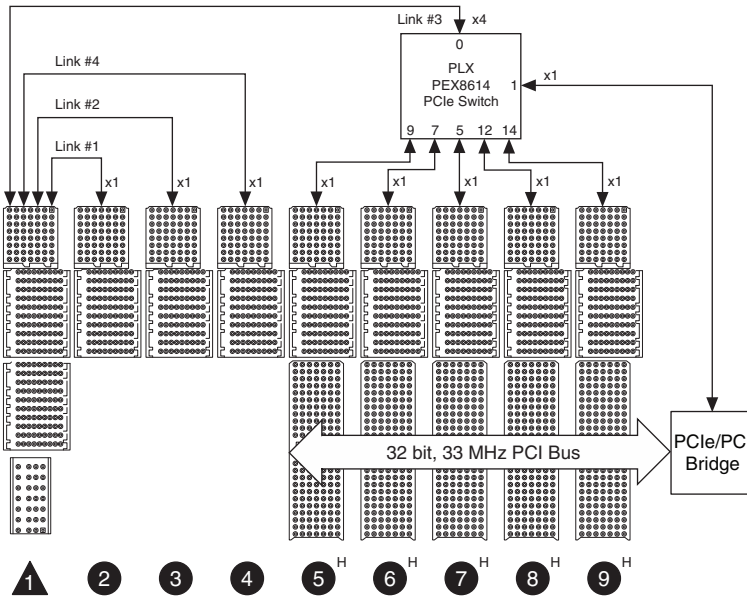
System Controller Slot

The system controller slot is Slot 1 of the chassis and is a 4-Link configuration system slot as defined by the CompactPCI Express and PXI Express specifications. It has three system controller expansion slots for system controller modules that are wider than one slot. These slots allow the system controller to expand to the left to prevent the system controller from using peripheral slots.

The backplane routes three PCI Express (PCIe) links of the system slot to peripheral slots as x1 links. The other link of the system slot is routed as a x4 link to the upstream port of a PCI Express switch that in turn provides x1 PCIe links to the remaining peripheral slots. Refer to Figure 1-4 for PCI Express and PCI connectivity.

By default, the system controller will control the power supply with the PS_ON# signals. A logic low on this line will turn the power supply on.

Note The Inhibit Mode switch on the backplane must be in the **Default** position for the system controller to have control of the power supply. Refer to the *Inhibit Mode Switch* section of Chapter 2, *Installation and Configuration*, for details about the Inhibit Mode switch.

Hybrid Peripheral Slots

The chassis provides five hybrid peripheral slots as defined by the *PXI-5 PXI Express Hardware Specification*: slots 5-9. A hybrid peripheral slot can accept the following peripheral modules:

- A PXI Express Peripheral with a x1 PCI Express link through the PCIe switch to the system slot

- A CompactPCI Express Type-2 Peripheral with a x1 PCI Express link through the PCIe switch to the system slot

- A hybrid-compatible PXI Peripheral module that has been modified by replacing the J2 connector with an XJ4 connector installed in the upper eight rows of J2. Refer to the *PXI Express Specification* for details. The PXI Peripheral communicates through the backplane's 32-bit PCI bus.

- A CompactPCI 32-bit peripheral on the backplane's 32-bit PCI bus

The hybrid peripheral slots provide PXI Express functionality (excluding DSTAR and PXI Star) and 32-bit PXI functionality except for PXI Local Bus. The hybrid peripheral slot only connects to PXI Local Bus 6 left and right.

PXI Express Peripheral Slots

There are three PXI Express peripheral slots: slots 2-4. PXI Express peripheral slots can accept the following modules:

- A PXI Express peripheral with a x1 PCI Express link to the system slot
- A CompactPCI Express Type-2 peripheral with a x1 PCI Express link to the system slot

PXI Local Bus

The PXI backplane local bus is a daisy-chained bus that connects each peripheral slot with adjacent peripheral slots to the left and right.

The backplane routes PXI Local Bus 6 between adjacent PXI slots. The left Local Bus 6 from slot 1 is not routed anywhere. The right Local Bus 6 from slot 9 also is not routed anywhere.

Local bus signals may range from high-speed TTL signals to analog signals as high as 42 V.

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

Figure 1-5. PXI Trigger Bus Connectivity Diagram
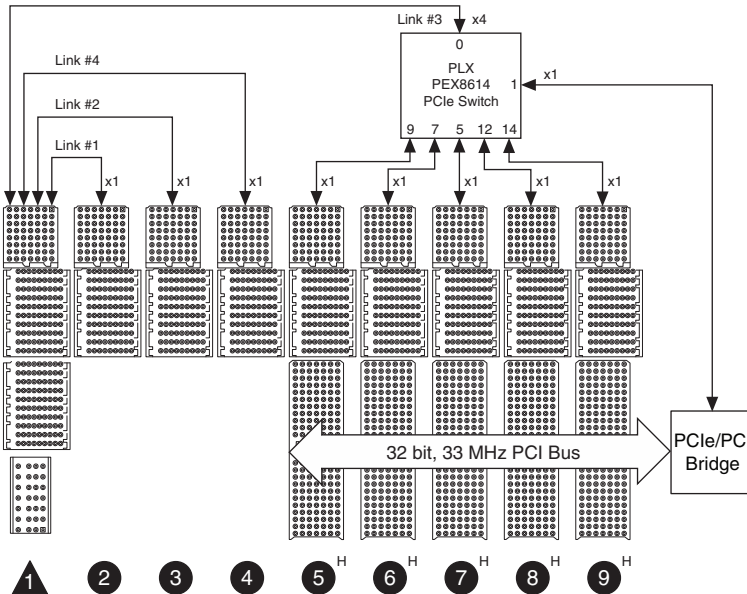
PXI Trigger Bus

All slots share eight trigger lines. You can use these trigger lines in a variety of ways. For example, you can use triggers to synchronize the operation of several different PXI peripheral modules. In other applications, one module 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 PXIe-1078 chassis supplies PXI_CLK10, PXIe_CLK100, and PXIe_SYNC100 to every peripheral slot with an independent driver for each signal.

An independent buffer (having a source impedance matched to the backplane and a skew of less than 500 ps between slots) drives PXI_CLK10 to each peripheral slot. You can use this common reference clock signal to synchronize multiple modules in a measurement or control system.

An independent buffer drives PXIe_CLK100 to each peripheral slot. These clocks are matched in skew to less than 100 ps. The differential pair must be terminated on the peripheral with LVPECL termination for the buffer to drive PXIe_CLK100 so that when there is no peripheral or a peripheral that does not connect to PXIe_CLK100, there is no clock being driven on the pair to that slot.

An independent buffer drives PXIe_SYNC100 to each peripheral slot. The differential pair must be terminated on the peripheral with LVPECL termination for the buffer to drive PXIe_SYNC100 so that when there is no peripheral or a peripheral that does not connect to PXIe_SYNC100, there is no clock being driven on the pair to that slot.

PXI_CLK10, PXIe_CLK100 and PXIe_SYNC100 have the default timing relationship described in Figure 1-6.

Figure 1-6. System Reference Clock Default Behavior

2
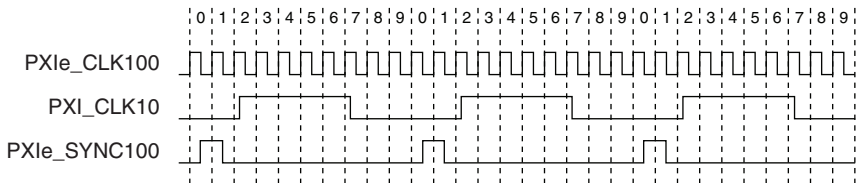
Installation and Configuration

This chapter describes how to prepare and operate the PXIe-1078 chassis.

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

Safety Information

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

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

- **Chassis Grounding**—The chassis requires a connection from the premise wire safety ground to the chassis ground. The earth safety ground must be connected during use of this equipment to minimize shock hazards. Refer to the *Connecting Safety Ground* section for instructions on connecting safety ground.

- **Live Circuits**—Operating personnel and service personnel *must* not remove protective covers when operating or servicing the chassis. Adjustments and service to internal components must be undertaken by qualified service technicians. During service of this product, the mains connector to the premise wiring must be disconnected. Dangerous voltages may be present under certain conditions; use extreme caution.

- **Explosive Atmosphere**—Do *not* operate the chassis in conditions where flammable gases are present. Under such conditions, this equipment is unsafe and may ignite the gases or gas fumes.

- **Part Replacement**—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact National Instruments for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the chassis. Furthermore, damage or fire may occur if replacement parts are unsuitable.

- **Modification**—Do *not* modify any part of the chassis from its original condition. Unsuitable modifications may result in safety hazards.

Chassis Cooling Considerations

The PXIe-1078 chassis is designed to operate on a bench or in an instrument rack. Regardless of the configuration, you must provide the cooling clearances as outlined in the following sections.

## Providing Adequate Clearance

⚠ **Caution**   Failure to provide adequate clearances may result in thermal related failures in the chassis or modules.

Apertures in the top, bottom, front, rear, and along the sides of the chassis facilitate power supply and module cooling, as shown in Figure 2-2. Air for module cooling enters through a fan intake in the bottom of the chassis. It then exits through the upper sections at the right side and top, as shown in Figure 2-1. Air for cooling the power supply enters the front and left side of the chassis and exits through the rear of the chassis, as shown in Figure 2-2.

Place the chassis on a bench top or in an instrument rack so that the fans (air intakes) and the air outlet apertures along the right side, the top, and the back of the chassis have adequate ventilation. Provide at least 44.5 mm (1.75 in.) clearance above, behind, and on the sides of the unit for adequate venting, as shown in Figure 2-3. High-power applications may require additional clearance.

Figure 2-1. PXIe-1078 Module Cooling Airflow Side View
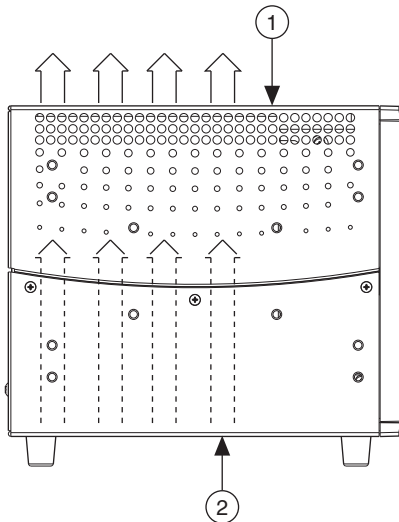
| 1 | Air Outlets | 2 | Air Intake |

Figure 2-2. PXIe-1078 Vents
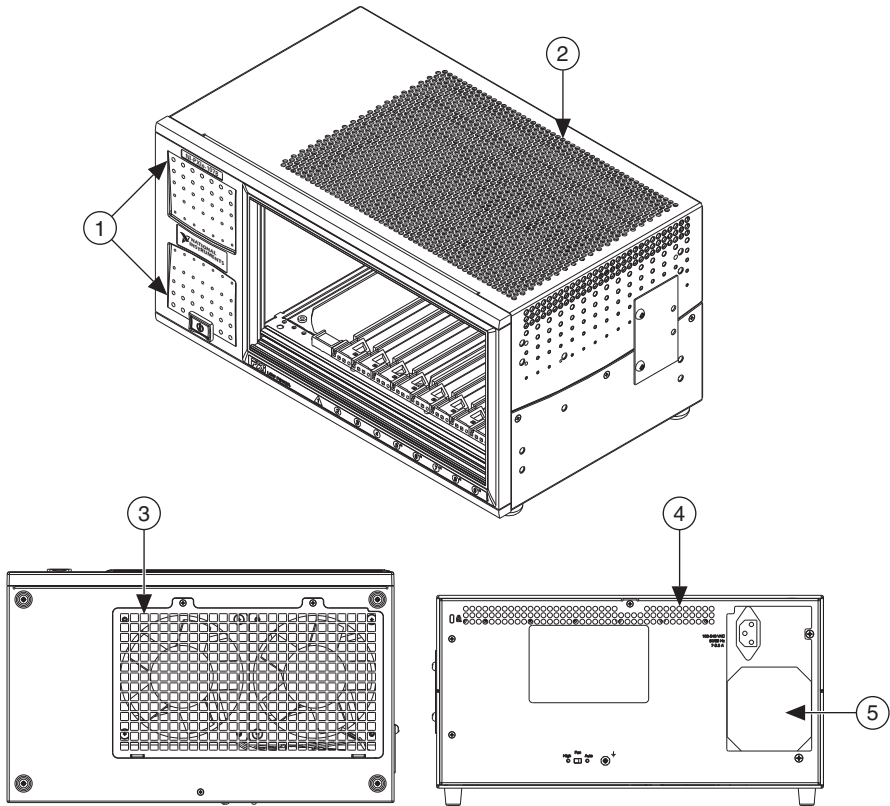
1	Power Supply Cooling Intake Vent	4	Backplane Cooling Exhaust Vent
2	Module Cooling Exhaust Vent	5	Power Supply Cooling Exhaust Vent
3	Module Cooling Intake Vent		

Figure 2-3. PXIe-1078 Cooling Clearances
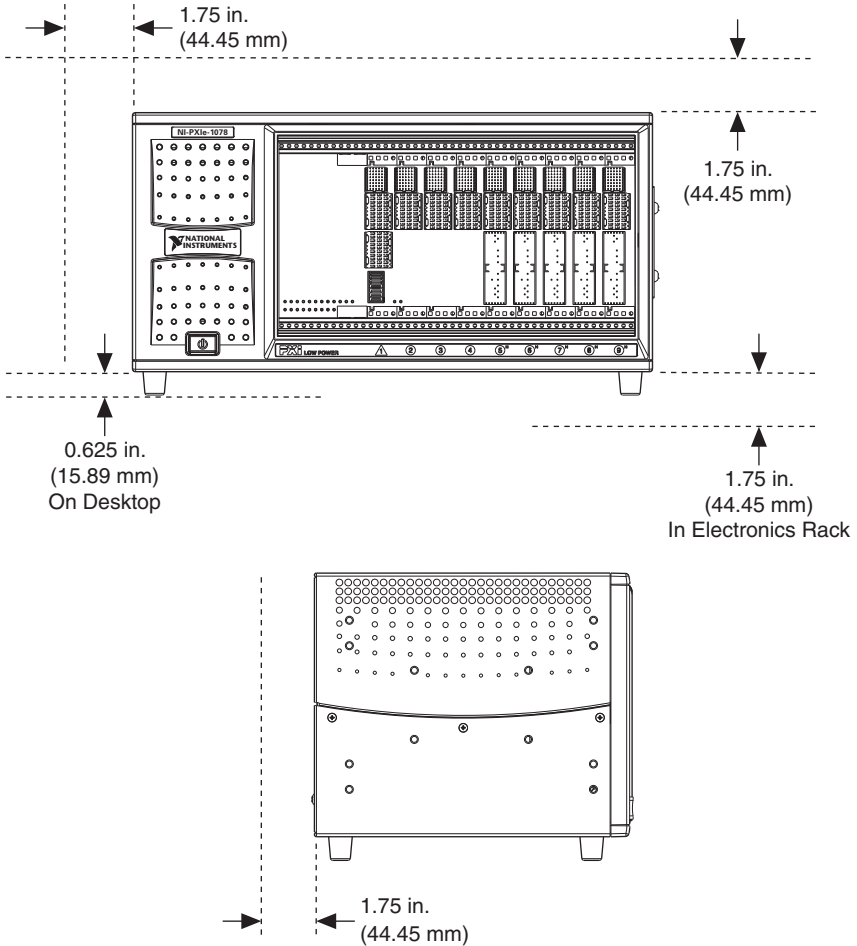
Chassis Ambient Temperature Definition

The chassis fan control system uses intake air temperature as the input for controlling fan speeds when in Auto Fan Speed mode. Because of this, the chassis ambient temperature is defined as the temperature that exists just outside of the fan intake vent on the bottom of the chassis. Note that this temperature may be higher than ambient room temperature depending on the surrounding equipment and/or blockages present. You must ensure that this ambient temperature does not exceed the rated ambient temperature as stated in the *PXIe-1078 Specifications* on ni.com.

Setting Fan Speed

The AUTO/HIGH fan-speed selector switch is on the rear panel of the PXIe-1078. Refer to Figure 1-2, *Rear View of the PXIe-1078 Chassis*, to locate the fan-speed selector switch. Select HIGH for maximum cooling performance (recommended) or AUTO for quieter operation. When set to AUTO, the chassis intake air temperature determines the fan speed.

Installing Filler Panels

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

Installing Slot Blockers

You can improve the chassis cooling performance by installing optional slot blockers. Refer to ni.com for more details.

Rack Mounting

Rack mount applications require the optional rack mount kits available from National Instruments. Refer to the instructions supplied with the rack mount kits to install your PXIe-1078 chassis in an instrument rack. Refer to the *PXIe-1078 Specifications* on ni.com.

Note You may want to remove the feet from the PXIe-1078 chassis when rack mounting. To do so, remove the screws holding the feet in place.

Connecting Safety Ground

⚠ **Caution**   The PXIe-1078 chassis is designed with a three-position inlet that connects the cord set ground line to the chassis ground. To minimize shock hazard, make sure the electrical power outlet you use to power the chassis has an appropriate earth safety ground.

Connecting to Power Source

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

To completely remove power, you *must* disconnect the AC power cable.

Attach input power through the rear AC inlet using the appropriate AC power cable supplied. Refer to Figure 1-2, *Rear View of the PXIe-1078 Chassis*, to locate the AC inlet.

Installing a PXI Express System Controller

This section contains general installation instructions for installing a PXI Express system controller in a PXIe-1078 chassis. Refer to your PXI Express system controller user manual for specific instructions and warnings. To install a system controller, complete the following steps:

1. Inspect the slot 1 pins on the chassis backplane for any bending or damage prior to installation.

2. Connect the AC power source to the PXI Express chassis before installing the system controller. The AC power cord grounds the chassis and protects it from electrical damage while you install the system controller.

3. Install the system controller into the system controller slot (slot 1, indicated by the red card guides) by first placing the system controller PCB into the front of the card guides (top and bottom). Slide the system controller to the rear of the chassis, making sure that the injector/ejector handle is pushed down as shown in Figure 2-4.

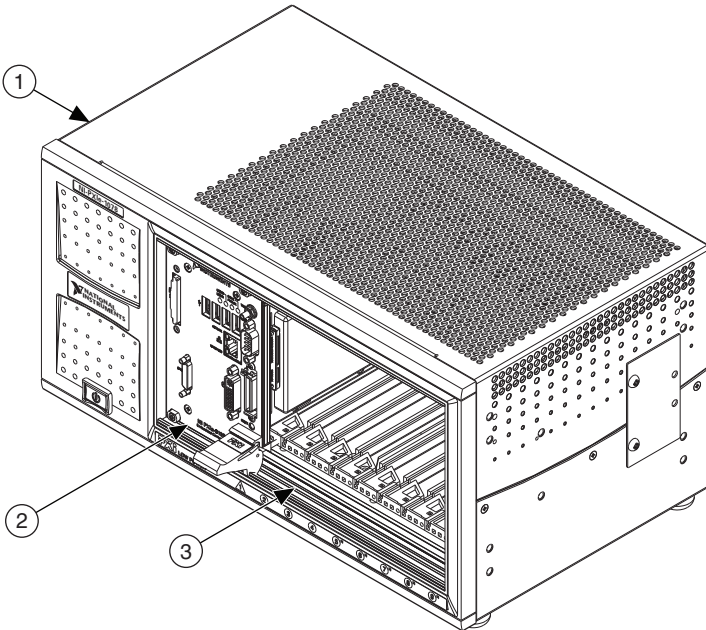**Figure 2-4.** Installing a PXI Express System Controller
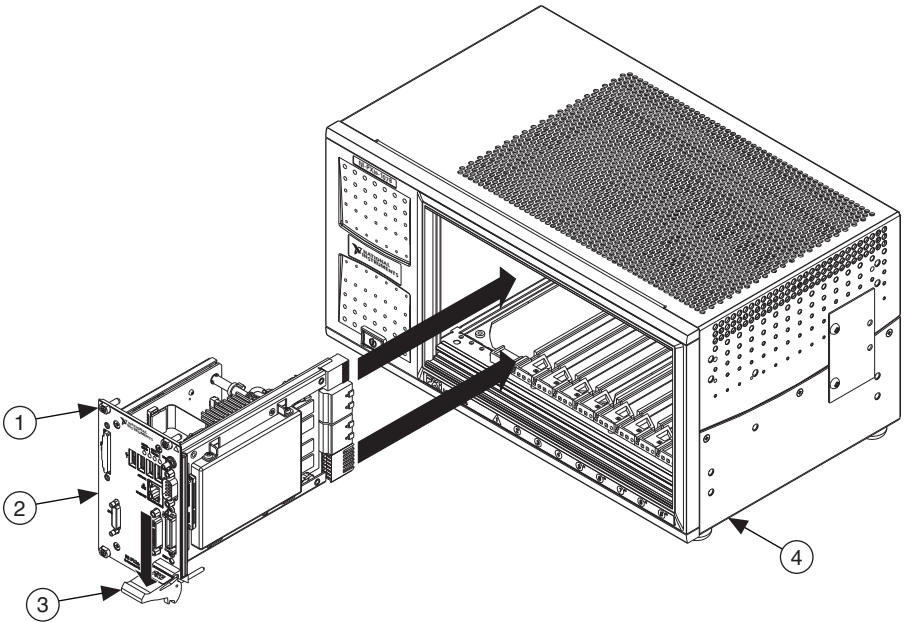
| 1 | System Controller Front Panel Mounting Screws (4x) | 3 | Injector/Ejector Handle |
| 2 | NI PXI Express System Controller | 4 | PXIe-1078 Chassis |

4. When you begin to feel resistance, push up on the injector/ejector handle to seat the system controller fully into the chassis frame. Secure the system controller front panel to the chassis using the system controller front-panel mounting screws.

5. Connect the keyboard, mouse, and monitor to the appropriate connectors. Connect devices to ports as required by your system configuration.

6. Power on the chassis. Verify that the system controller boots. If the system controller does not boot, refer to your system controller user manual.

Figure 2-5 shows a PXI Express system controller installed in the system controller slot of a PXIe-1078 chassis. You can place CompactPCI, CompactPCI Express, PXI, or PXI Express modules in other slots depending on the slot type.

Figure 2-5. NI PXI Express System Controller Installed in a PXIe-1078 Chassis

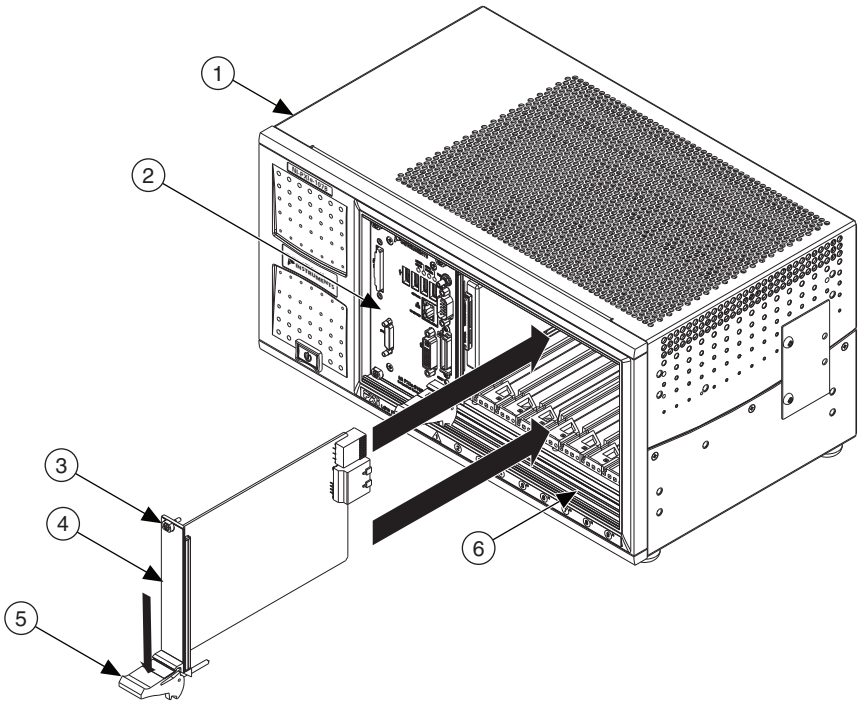| 1 | PXIe-1078 Chassis | 2 | NI PXI Express System Controller | 3 | Injector/Ejector Rail |

Installing Peripheral Modules

⚠ **Caution** The PXIe-1078 chassis accepts a variety of peripheral module types in different slots. To prevent damage to the chassis, ensure that the peripheral module is being installed into a slot designed to accept it. Refer to Chapter 1, *Getting Started*, for a description of the various slot types.

This section contains general installation instructions for installing a peripheral module in a PXIe-1078 chassis. Refer to your peripheral module user manual for specific instructions and warnings. To install a module, complete the following steps:

1. Inspect the slot pins on the chassis backplane for any bending or damage prior to installation.

2. Connect the AC power source to the PXI Express chassis before installing the module. The AC power cord grounds the chassis and protects it from electrical damage while you install the module.

3. Ensure that the chassis is powered off.

4. Install a module into a chassis slot by first placing the module card PCB into the front of the card guides (top and bottom), as shown in Figure 2-6. Slide the module to the rear of the chassis, making sure that the injector/ejector handle is pushed down as shown in Figure 2-6.

5. When you begin to feel resistance, push up on the injector/ejector handle to fully seat the module into the chassis frame. Secure the module front panel to the chassis using the module front-panel mounting screws.

Figure 2-6. Installing PXI, PXI Express, or CompactPCI Peripheral Modules

|			
1	PXIe-1078 Chassis	4	PXI Express Peripheral Module
2	NI PXI Express System Controller	5	Injector/Ejector Handle
3	Peripheral Module Front Panel Mounting Screws (2x)	6	Injector/Ejector Rail

Power Inhibit Switch LED Indicator

The chassis power inhibit switch has an integrated LED. This LED indicates one of two conditions:

*   If the inhibit switch LED is steady green (not flashing), the chassis is powered on and operating normally.
*   If the inhibit switch LED is red, the system fans have failed.

Inhibit Mode Switch

On the PXIe-1078 backplane is a four-position DIP switch (SW1). Switch 1 of SW1 controls the chassis inhibit mode. (Refer to Figure 2-7.) In its default position (OFF), the PXI Express controller controls the power supply on/off state based on the power switch on the chassis front panel.

Figure 2-7. Switch 1 of SW1
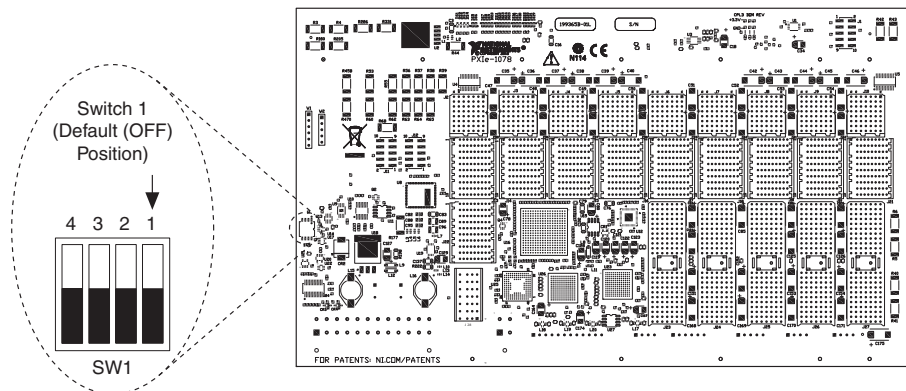
When switch 1 of SW1 is on, the backplane controls the power supply on/off state. This allows you to circumvent the controller and turn the chassis on or off manually. When switch 1 of SW1 is on, the power supply turns on when the you press the front panel power switch. When the power supply is on, holding down the front panel power switch for about one second turns the power supply off.

⚠️ **Cautions**   Be careful to avoid damaging the backplane when accessing this switch.

Suddenly removing power from an operating controller may result in loss of data and incorrect behavior on subsequent boots.

PXI Express System Configuration with MAX

The PXI Platform Services software included with your chassis automatically identifies your PXI Express system components to generate a `pxiesys.ini` file. You can configure your entire PXI system and identify PXI-1 chassis through Measurement & Automation Explorer (MAX), included with your system controller. MAX creates the `pxiesys.ini` and `pxisys.ini` file, which define your PXI system parameters. MAX also provides an interface to route and reserve triggers so dynamic routing, through drivers such as DAQmx, avoids double-driving and potentially damaging trigger lines. For more information about routing and reserving PXI triggers, refer to KnowledgeBase 3TJDOND8 at `ni.com/support`.

The configuration steps for single or multiple-chassis systems are the same.

Figure 2-8. Multichassis Configuration in MAX
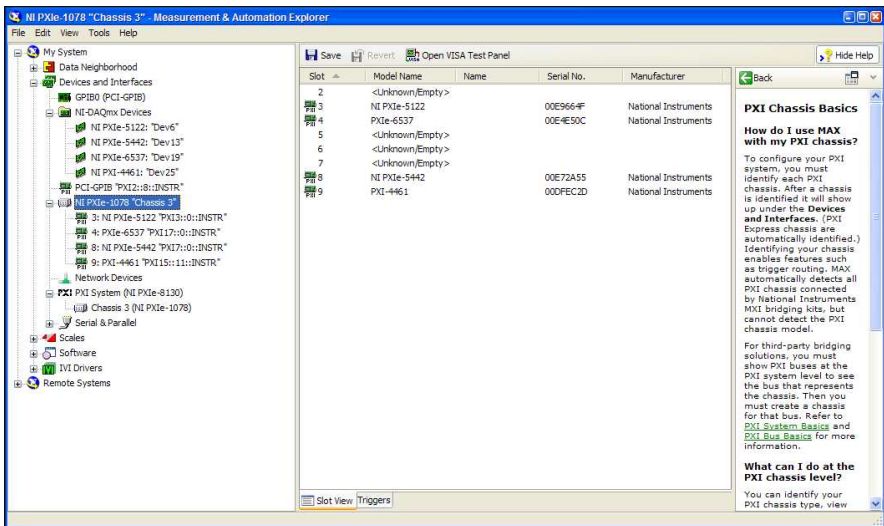
PXI-1 System Configuration

1. Launch MAX.

2. In the **Configuration** tree, click the **Devices and Interfaces** branch to expand it.

3. If the PXI system controller has not yet been configured, it is labeled **PXI System (Unidentified)**. Right-click this entry to display the pop-up menu, then select the appropriate system controller model from the **Identify As** submenu.

4. Click the PXI system controller. The chassis (or multiple chassis in a multichassis configuration) is listed below it. Identify each chassis by right-clicking its entry, then selecting the appropriate chassis model through the **Identify As** submenu. Further expanding the **PXI System** branch shows all devices in the system that can be recognized

by NI-VISA. When your system controller and all your chassis are identified, the required `pxisys.ini` file is complete.

The PXI specification allows for many combinations of PXI chassis and system modules. To assist system integrators, the manufacturers of PXI chassis and system modules must document the capabilities of their products. PXI Express devices must provide a driver and `.ini` file for identification. These files are provided as part of the PXI Platform Services software included with your system controller. The minimum documentation requirements for PXI-1 are contained in `.ini` files, which consist of ASCII text. System integrators, configuration utilities, and device drivers can use these `.ini` files.

The capability documentation for a PXI-1 chassis is contained in a `chassis.ini` file provided by the chassis manufacturer. The information in this file is combined with information about the system controller to create a single PXI-1 system initialization file called `pxisys.ini` (PXI System Initialization). The NI system controller uses MAX to generate the `pxisys.ini` file from the `chassis.ini` file.

Device drivers and other utility software read the `pxiesys.ini` and `pxisys.ini` file to obtain system information. For detailed information about initialization files, refer to the PXI specification at `www.pxisa.org`.

Using System Configuration and Initialization Files

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

The capability documentation for the PXIe-1078 chassis is contained in the `chassis.ini` file on the software media that comes with the chassis. The information in this file is combined with information about the system controller to create a single system initialization file called `pxisys.ini` (PXI System Initialization). The system controller manufacturer either provides a `pxisys.ini` file for the particular chassis model that contains the system controller or provides a utility that can read an arbitrary `chassis.ini` file and generate the corresponding `pxisys.ini` file. System controllers from NI provide the `pxisys.ini` file for the PXIe-1078 chassis, so you should not need to use the `chassis.ini` file. Refer to the documentation provided with the system controller or to `ni.com/support` for more information on `pxisys.ini` and `chassis.ini` files.

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

3

Maintenance

This chapter describes basic maintenance procedures you can perform on the PXIe-1078 chassis.

⚠ **Caution** Disconnect the power cable prior to servicing a PXIe-1078 chassis.

Service Interval

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

Preparation

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

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

Cleaning

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

⚠️ **Caution** *Always* disconnect the AC power cable before cleaning or servicing the chassis.

Interior Cleaning

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

Exterior Cleaning

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.

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

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

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

A

Pinouts

This appendix describes the connector pinouts for the NI PXIe-1078 chassis backplane.

Table A-1 shows the XP1 connector pinout for the System Controller slot.

Table A-2 shows the XP2 Connector Pinout for the System Controller slot.

Table A-3 shows the XP3 Connector Pinout for the System Controller slot.

Table A-4 shows the XP4 Connector Pinout for the System Controller slot.

Table A-5 shows the P1 connector pinout for the Hybrid peripheral slots.

Table A-6 shows the XP3 Connector Pinout for the PXI Express and Hybrid peripheral slots.

Table A-7 shows the XP4 Connector Pinout for the PXI Express and Hybrid peripheral slots.

For more detailed information, refer to the *PXI-5 PXI Express Hardware Specification*, Revision 2.0. Contact the PXI Systems Alliance for a copy of the specification.

System Controller Slot Pinouts

Table A-1. XP1 Connector Pinout for the System Controller Slot

Pins	Signals
A	GND
B	3.3 V
C	5 V
D	GND
E	12 V
F	12 V
G	GND

Table A-2. XP2 Connector Pinout for the System Controller Slot

Pin	A	B	ab	C	D	cd	E	F	ef
1	3PETp1	3PETn1	GND	3PERp1	3PERn1	GND	3PETp2	3PETn2	GND
2	3PETp3	3PETn3	GND	3PERp3	3PERn3	GND	3PERp2	3PERn2	GND
3	4PETp0	4PETn0	GND	4PERp0	4PERn0	GND	4PETp1	4PETn1	GND
4	4PETp2	4PETn2	GND	4PERp2	4PERn2	GND	4PERp1	4PERn1	GND
5	4PETp3	4PETn3	GND	4PERp3	4PERn3	GND	RSV	RSV	GND
6	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND
7	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND
8	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND
9	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND
10	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND

Table A-3. XP3 Connector Pinout for the System Controller Slot

Pin	A	B	ab	C	D	cd	E	F	ef
1	RSV	RSV	GND	RSV	RSV	GND	RSV	RSV	GND
2	RSV	RSV	GND	PWR_OK	PS_ON#	GND	LINKCAP	PWRBTN#	GND
3	SMBDAT	SMBCLK	GND	4RefClk+	4RefClk-	GND	2RefClk+	2RefClk-	GND
4	RSV	PERST#	GND	3RefClk+	3RefClk-	GND	1RefClk+	1RefClk-	GND
5	1PETp0	1PETn0	GND	1PERp0	1PERn0	GND	1PETp1	1PETn1	GND
6	1PETp2	1PETn2	GND	1PERp2	1PERn2	GND	1PERp1	1PERn1	GND
7	1PETp3	1PETn3	GND	1PERp3	1PERn3	GND	2PETp0	2PETn0	GND
8	2PETp1	2PETn1	GND	2PERp1	2PERn1	GND	2PERp0	2PERn0	GND
9	2PETp2	2PETn2	GND	2PERp2	2PERn2	GND	2PETp3	2PETn3	GND
10	3PETp0	3PETn0	GND	3PERp0	3PERn0	GND	2PERp3	2PERn3	GND

Table A-4. XP4 Connector Pinout for the System Controller Slot

Pin	Z	A	B	C	D	E	F
1	GND	GA4	GA3	GA2	GA1	GA0	GND
2	GND	5Vaux	GND	SYSEN#	WAKE#	ALERT#	GND
3	GND	RSV	RSV	RSV	RSV	RSV	GND
4	GND	RSV	RSV	RSV	RSV	RSV	GND
5	GND	PXI_TRIG3	PXI_TRIG4	PXI_TRIG5	GND	PXI_TRIG6	GND
6	GND	PXI_TRIG2	GND	RSV	PXI_STAR	PXI_CLK10	GND
7	GND	PXI_TRIG1	PXI_TRIG0	RSV	GND	PXI_TRIG7	GND
8	GND	RSV	GND	RSV	RSV	PXI_LBR6	GND

Hybrid Slot Pinouts

Table A-5. P1 Connector Pinout for the Hybrid Slot

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

Table A-6. XP3 Connector Pinout for the PXI Express/Hybrid Slot

Pin	A	B	ab	C	D	cd	E	F	ef
1	PXIe_CLK100+	PXIe_CLK100-	GND	PXIe_SYNC100+	PXIe_SYNC100-	GND	PXIe_DSTARC+	PXIe_DSTARC-	GND
2	PRSNT#	PWREN#	GND	PXIe_DSTARB+	PXIe_DSTARB-	GND	PXIe_DSTARA+	PXIe_DSTARA-	GND
3	SMBDAT	SMBCLK	GND	RSV	RSV	GND	RSV	RSV	GND
4	MPWRGD*	PERST#	GND	RSV	RSV	GND	1RefClk+	1RefClk-	GND
5	1PETp0	1PETn0	GND	1PERp0	1PERn0	GND	1PETp1	1PETn1	GND
6	1PETp2	1PETn2	GND	1PERp2	1PERn2	GND	1PERp1	1PERn1	GND
7	1PETp3	1PETn3	GND	1PERp3	1PERn3	GND	1PETp4	1PETn4	GND
8	1PETp5	1PETn5	GND	1PERp5	1PERn5	GND	1PERp4	1PERn4	GND
9	1PETp6	1PETn6	GND	1PERp6	1PERn6	GND	1PETp7	1PETn7	GND
10	RSV	RSV	GND	RSV	RSV	GND	1PERp7	1PERn7	GND

Table A-7. XP4 Connector Pinout for the PXI Express/Hybrid Slot

Pin	Z	A	B	C	D	E	F
1	GND	GA4	GA3	GA2	GA1	GA0	GND
2	GND	5 Vaux	GND	SYSEN#	WAKE#	ALERT#	GND
3	GND	12 V	12 V	GND	GND	GND	GND
4	GND	GND	GND	3.3 V	3.3 V	3.3 V	GND
5	GND	PXI_TRIG3	PXI_TRIG4	PXI_TRIG5	GND	PXI_TRIG6	GND
6	GND	PXI_TRIG2	GND	ATNLED	PXI_STAR	PXI_CLK10	GND
7	GND	PXI_TRIG1	PXI_TRIG0	ATNSW#	GND	PXI_TRIG7	GND
8	GND	RSV	GND	RSV	PXI_LBL6	PXI_LBR6	GND

B

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