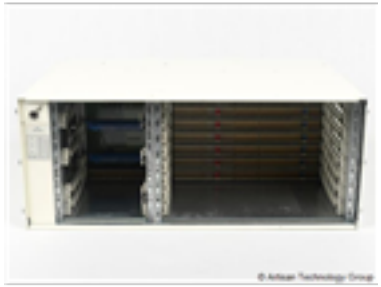
Performance Technologies ZT 5091e

IPnexus 4U General Purpose Packet-Switched Platform



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IPnexus™

ZT 5091*e*

4U General Purpose Packet-Switched Platform

User's and System Integrator's Guide

Revision History

Revision Date	Revision History
5/29/03	Beta Release
6/16/03	Initial Production Release
8/05/03	Corrected Introduction: Ethernet port a is connected from each node to the same fabric. Made corrections to Table 2, “CompactPCI Slot Connections”
9/19/03	Added references to the CPC7301 ISM, RTM4808. Corrected maximum ambient temperature.
12/9/03	Added grounding wire spec.
3/22/04	Changed DC supply wire gauge and AC/DC grounding wire to 12 AWG
3/31/04	Updated compatible component references to reflect newer products.

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Errors and Omissions

Although diligent efforts are made to supply accurate technical information to the user, occasionally errors and omissions occur in manuals of this type. Refer to the Performance Technologies, Inc. web site to obtain manual revisions or current customer information: http://www.pt.com.
Performance Technologies, Inc., reserves its right to change product specifications without notice.

Symbols and Conventions in this Manual

The following symbols appear in this document:

Caution: There is risk of equipment damage. Follow the instructions.

Warning: Hazardous voltages are present. To reduce the risk of electrical shock and danger to personal health, follow the instructions.

Electrostatic Discharge

Caution: Electronic components on printed circuit boards are extremely sensitive to static electricity. Ordinary amounts of static electricity generated by your clothing or work environment can damage the electronic equipment. It is recommended that anti-static ground straps and anti-static mats are used when installing the board in a system to help prevent damage due to electrostatic discharge.

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Tables

Figures

Section

1 Introduction

This section provides an overview of the ZT 5091*e* system. It includes a product definition and summaries of the system's hardware and software features. This section is useful for comparing the features of the ZT 5091*e* to the needs of a specific application.

1.1 User Documentation

The latest product information and manuals are available on the Performance Technologies website at http://www.pt.com. Refer to the following manuals and Technical Data Sheets for more information about the components that may be in your system.

- IPnexus™ ZT 5504*e* System Master Processor Board hardware manual
- IPnexus™ ZT 5524*e* System Master Processor Board hardware manual
- IPnexus™ ZT 4807*e* Rear Panel Transition Board hardware manual
- IPnexus™ ZT 4808 Packet Switched Rear Panel Transition Board hardware manual
- IPnexus™ CPC44xx Ethernet Switching Platform User's and System Integrator's Guide
- IPnexus™ CPC5400 PICMG 2.16® Gb Ethernet Switch Product Specification
- IPnexus™ CPC66xx PICMG 2.16® Gb Ethernet Switch Product Specification
- IPnexus™ CPC7301 Intelligent Shelf Manager hardware manual
- IPnexus™ CPC7301 Intelligent Shelf Manager software manual
- ZT 6304/6314 325W AC/DC Power Supplies with IPMI Management Data Sheet
- Performance Technologies Embedded BIOS software manual
- Performance Technologies Hot Swap Kit for Windows® 2000 software manual

1.2 Product Definition

The ZT 5091*e* is a 4U, rack-mount, 8-slot (seven node slots and one fabric slot) CompactPCI® system for telecom and Internet applications built around the PICMG 2.16 V1.0 Packet Switching Backplane specification. The system features a transversely mounted backplane that accepts 6U cards at the front and rear. The backplane includes a PCI bus and an H.110 bus.

Slot 1, at the top of the enclosure, contains the system's dedicated 2.16 fabric blade slot, allowing communication between slots 2-8 via a fast Ethernet switch such as the IPnexus CPC6600. This topology connects Link Port A from each node to the same fabric. This provides better utilization of Ethernet link ports on the fabric blade and increased bandwidth to node slots in a compact 4U chassis.

Slot 8 provides support for a System Master processor blade such as the IPnexus ZT 5524*e*. Slots 2-7 allow loading of up to six peripheral blades.

One single H.110 TDM telephony bus is supported on slots 2-8 (not supported on slot 8 on Alpha product).

- The Shelf Manager (SM) slot at the lower left of the enclosure provides a location for a PICMG 2.9 compliant System Management/IPMI module such as the IPnexus CPC7301 Intelligent Shelf Manager. The SM is required for the ZT 5091*e* to power up unless BD_SEL# is jumpered to ground on the midplane. See the "BD_SEL# Signals" topic in Section 2 for more information.

The ZT 5091*e* also features support for three 3U, 325W AC or DC power supplies in N+1 redundancy, a replaceable fan tray with two high-efficiency blowers, and optional rear panel I/O.

Your system may differ from the configurations depicted in this manual. Please contact Performance Technologies for available system configurations (see Section 9 for contact information).

1.3 ZT 5091*e* Features

- Low profile 4U height, 19-inch rack-mount enclosure
- 8-slot (total) PICMG 2.16 Compliant CompactPCI backplane accepts 6U blades
- H.110 computer telephony bus (PICMG® 2.5 R1.0)
- Fan-tray mounted blowers provide side-to-rear cooling
- Support for up to three 250W power supplies in N+1 redundancy
- Support for a dedicated 2.16 fabric blade
- Support for a System Master processor blade featuring the Intel® Pentium® processor
- Support for the IPnexus CPC7301 Intelligent Shelf Manager
- Choice of Rear Transition Modules to compliment processor blades

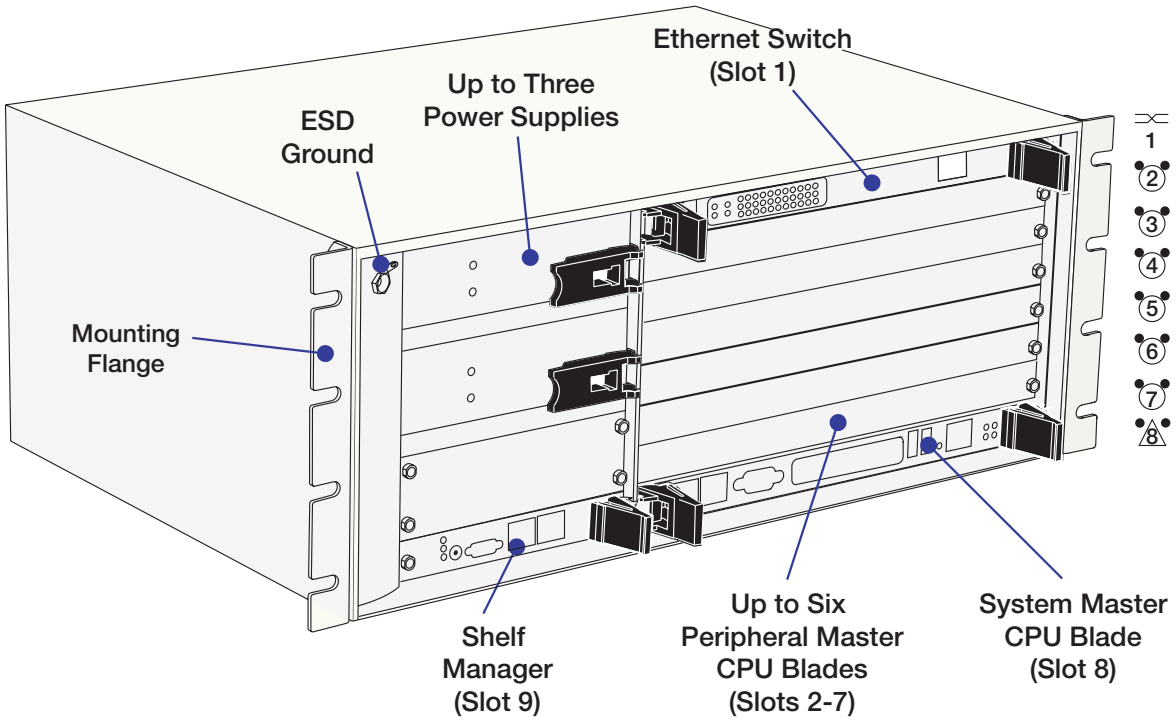

Figure 1. ZT 5091*e* Features (Front)

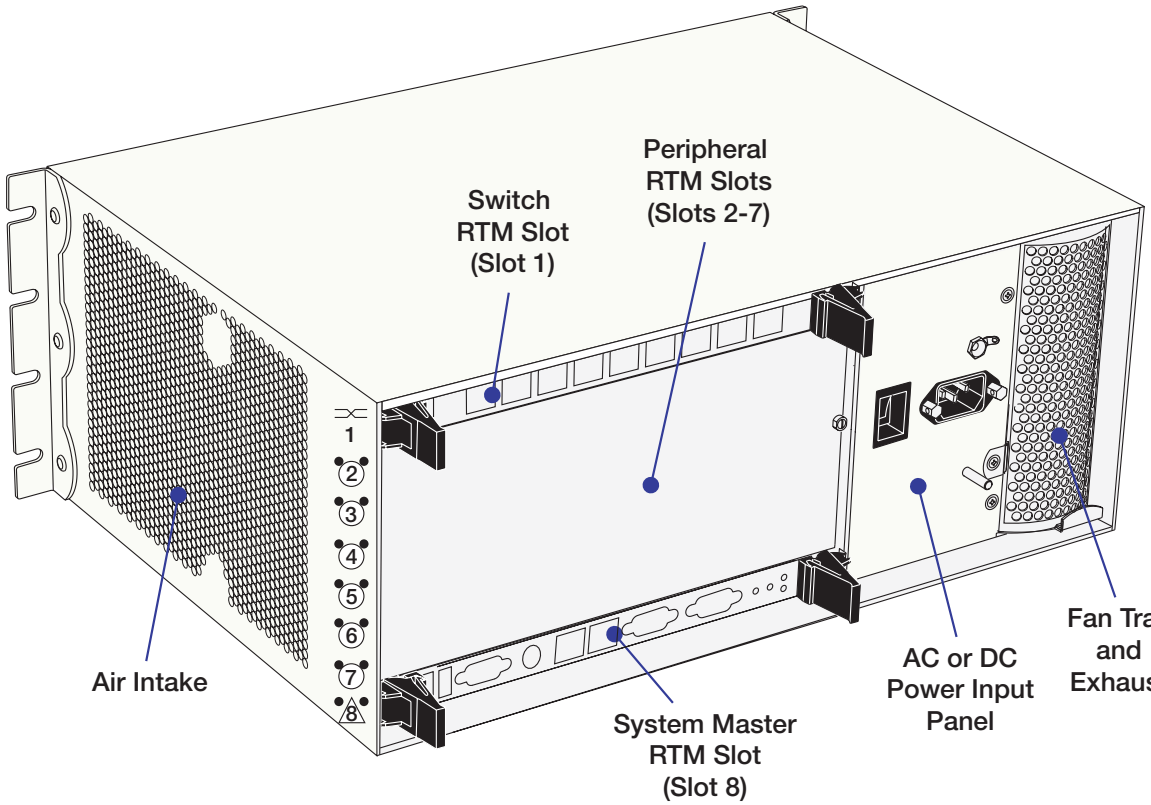

Figure 2. ZT 5091*e* Features (Rear)

1.4 Functional Considerations

The following topics briefly discuss the key functional areas of the ZT 5091*e* platform. Refer to Section 5, "Specifications," for mechanical, electrical, and environmental specifications.

Mechanical Considerations

The ZT 5091*e* is a 19" EIA rack-mount system compliant with the 4U Eurorack height standard. Mounting flanges are included with the system and can be positioned for front- or mid-mounting.

The ZT 5091*e* platform is compatible with front-mounted IEEE 1101.10 compliant blades, rear-mounted IEEE 1101.11 transition modules, and 3U modular power supplies. See the "Mechanical Specifications" topic in Section 5 for system dimensions.

Electrical Considerations

The ZT 5091*e* system is compliant with

- CompactPCI Specification, PICMG 2.0, R3.0
- CompactPCI Hot Swap Specification, PICMG 2.1, R1.0
- CompactPCI Packet Switching Backplane Specification, PICMG 2.16, R1.0
- CompactPCI Computer Telephony Specification, PICMG 2.5, R1.0
- CompactPCI System Management Specification, PICMG 2.9, R1.0
- CompactPCI Power Interface Specification, PICMG 2.11, R1.0

The system is factory configured for either AC or DC power input. The power input panel configuration must match the power supply input voltage (AC or DC). The power input panel incorporates a power standby/on switch, a grounding stud (CHASSIS GROUND), and an ESD grounding jack (ESD GROUND). An additional ESD grounding jack is provided at the front of the system. See the "Electrical Specifications" topic in Section 5 for more information.

The ZT 5091*e* features a universal backplane that can be configured for 3.3V or 5V V(I/O) CompactPCI device support. As shipped from the factory, the backplane is jumpered for 5V operation and the CompactPCI connector mating keys allow only 5V blades to be installed. See the “Setting V(I/O)” topic for details.

Environmental Considerations

The ZT 5091*e* system, as configured by Performance Technologies, is designed to withstand the shock and vibration levels found in most industrial environments (as defined by the NEBS standard). Due to the modular construction of the system, components could be added that change the system’s environmental constraints. Board level components and power supply modules have their own operating temperature ratings. Refer to component-specific product manuals for operational details that may affect system performance. See "Environmental Specifications" in Section 5 for more information.

This product contains materials that may be regulated upon disposal. Please dispose of this product in accordance with local rules and regulations. For disposal or recycling information, please contact your local authorities or the Electronic Industries Alliance: http://www.eia.org.

Section

2 Getting Started

This section describes the steps necessary to install and set up the ZT 5091*e* system. It includes instructions on unpacking, rack mounting, and making power connections.

2.1 Unpacking the System

Check the shipping carton for damage. If the shipping carton and contents are damaged, notify the carrier and Performance Technologies for an insurance settlement. Retain the shipping carton and packing material for inspection by the carrier. Obtain authorization before returning any product to Performance Technologies. Refer to Section 9 for assistance information.

Caution: Performance Technologies has designed special packing material to protect the system during shipping. It is critical that the packing material be saved after unpacking the enclosure. Shipping the unit without the original packing material may void the warranty. Replacement packing material can be purchased from Performance Technologies.

Caution: This system contains board-level components that must be protected from static discharge and physical shock. Wear a wrist strap grounded through one of the system's ESD Ground jacks when handling system components.

2.2 Shipping Contents

The ZT 5091*e* may be ordered with many options. The system is shipped fully assembled and tested and may be accompanied by several accessories. The basic system configuration and most common options and accessories are listed below. Your system may differ from the system illustrated in this manual.

- Basic configuration:
  - 4U 19” rack-mount enclosure with mounting flanges attached
  - 8-Slot (total) PICMG 2.16 V1.0 packet switching backplane (with H.110 bus)
  - AC or DC power input panel
  - Up to three AC input or DC input modular power supplies
  - Fan tray with two blowers
  - Filler Panels: 1 6U x 24HP (6-slot) filler panel and 2 6U x 4HP (1-slot) filler panels
- Board-level options:
  - ZT 5504*e* System Master processor board
  - ZT 5524*e* System Master processor board
  - CPC44xx Ethernet Switch

  - CPC5400 PICMG 2.16 Gb Ethernet Switch
  - CPC66xx PICMG 2.16 Gb Ethernet Switch
  - IPnexus CPC7301 Intelligent Shelf Manager (ISM)
  - ZT 4807*e* Rear Panel I/O board (for System Master processor blade)
  - ZT 4808 Rear Panel I/O board (for System Master processor blade)
- Accessories:
  - AC power cord (with AC-configured system)
  - Safety and compliance literature
  - Optional software support packages and development kits

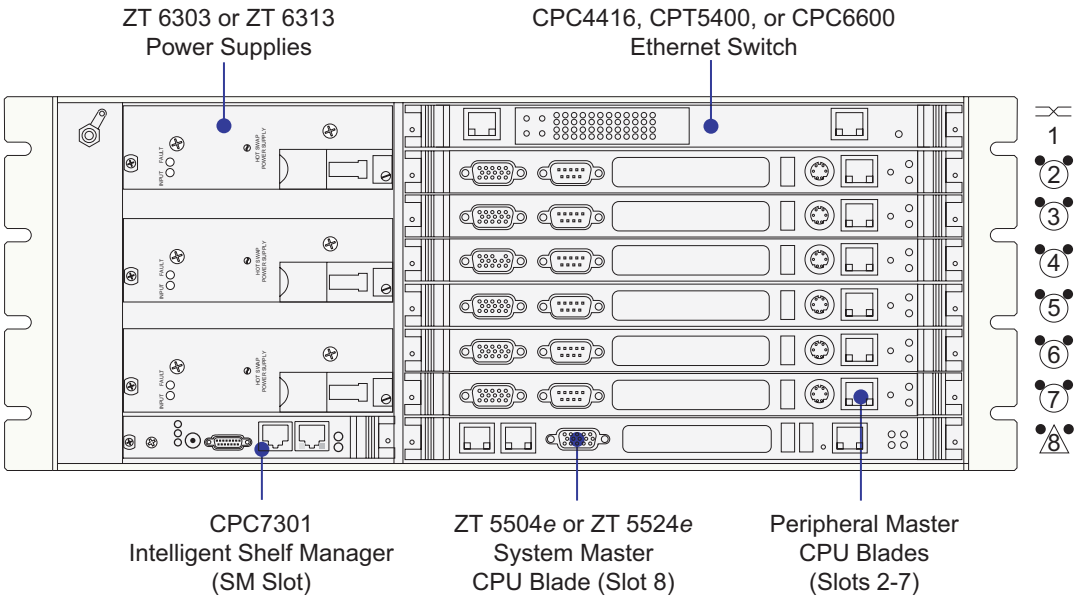

Figure 3. Fully Loaded Example (Front)

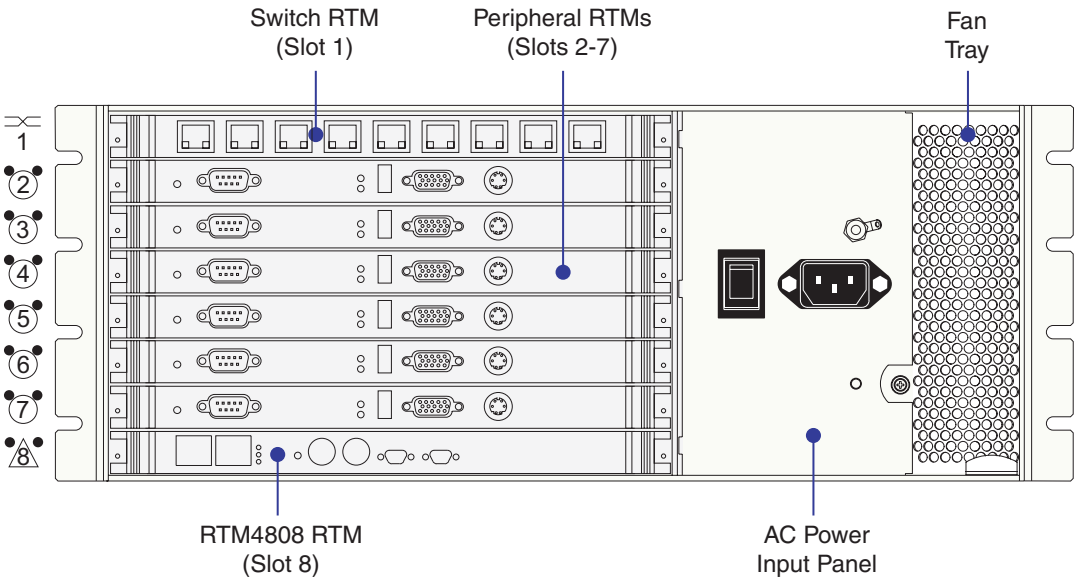

Figure 4. Fully Loaded Example (Rear)

2.3 Installing the System

Before installing and using the ZT 5091*e*, ensure that all cover panels are in place and that all component slots are populated with a component, filled with an air management blade (front), or covered with a blank filler panel (rear). Use CompactPCI industry standard blank filler panels with EMI gaskets for the rear panel. Air management blades and blank filler panels may be purchased from Performance Technologies or equivalent. Refer to the following part numbers.

Warning: Failure to cover open slots could cause overheating of power supplies, blades, or other components, and could damage the system.

- To cover a single rear panel slot, use a filler panel that is 6U x 4HP (horizontal pitch=0.2") (Performance Technologies PN 18299).
- To cover six rear panel slots, use a filler plate that is 6U x 24HP (Performance Technologies PN 20434).
- To fill a front slot, use an air management blade that is 6U X 4HP (Performance Technologies PN 20456).
- To fill a power supply bay, use an air management blade that is 3U X 8HP (Performance Technologies PN 20455).
- To fill an SM slot, use a filler panel that is 3U X 4HP (Performance Technologies PN 18309).

The ZT 5091*e* system fits standard 19" EIA racks. Mounting flanges are attached to the front of the enclosure to facilitate front mounting. The flanges can be repositioned for center-mounting the enclosure.

Warning: This unit is intended for installation in restricted access locations.

Caution: To prevent damage to the components, never use component handles or cables to lift or move the system.

This system is intended for stationary mounting in a rack designed to meet the physical strength requirements of NEBS GR-63-CORE and NEBS GR 1089-CORE. Be sure to mount the system in a way that ensures even weight distribution in the rack. Uneven mechanical loading can result in a hazardous condition. Secure all mounting bolts when installing the enclosure to the frame/rack.

The maximum ambient temperature at which a factory-configured ZT 5091*e* system should operate is 40°C at 5% to 85% relative humidity (see Section 5, “Environmental Specifications” for details). If the system is installed with its ventilation intakes near another system's exhaust or in a closed or multi-unit rack assembly, the operating ambient temperature inside the enclosure may be greater than the room's ambient temperature. Install the system in an environment compatible with this recommended maximum ambient temperature. Due to the modular design of the system, components may be installed that alter the system’s operating requirements. Please refer to product-specific documentation for the maximum recommended ambient temperature for individual components.

Safe operation of the ZT 5091*e* is dependent on the 200 LFM/node slot and 250 LFM/power supply of forced-air cooling provided by the system's cooling fans. Be sure to install the system in an environment that does not compromise this recommended minimum air flow requirement.

The following topics discuss installing the ZT 5091*e* step-by-step.

Rack Mounting the System

1. Disconnect all power sources and external connections/cables prior to installing or removing the system from a rack.
2. Select a position in the rack that does not interfere with other equipment and that provides safe weight distribution.
3. For efficient cooling, the area around the ZT 5091's intake and exhaust vents should be clear of obstructions. The intake should be away from another system's exhaust (refer to the following “Air Flow” illustration).
4. Secure the mounting flanges to the front or middle of the enclosure.
5. Place the enclosure in its intended location and line up the mounting holes on the ZT 5091's flanges with the rack's mounting holes.
6. Bolt the enclosure to the rack (rack hardware is not included).

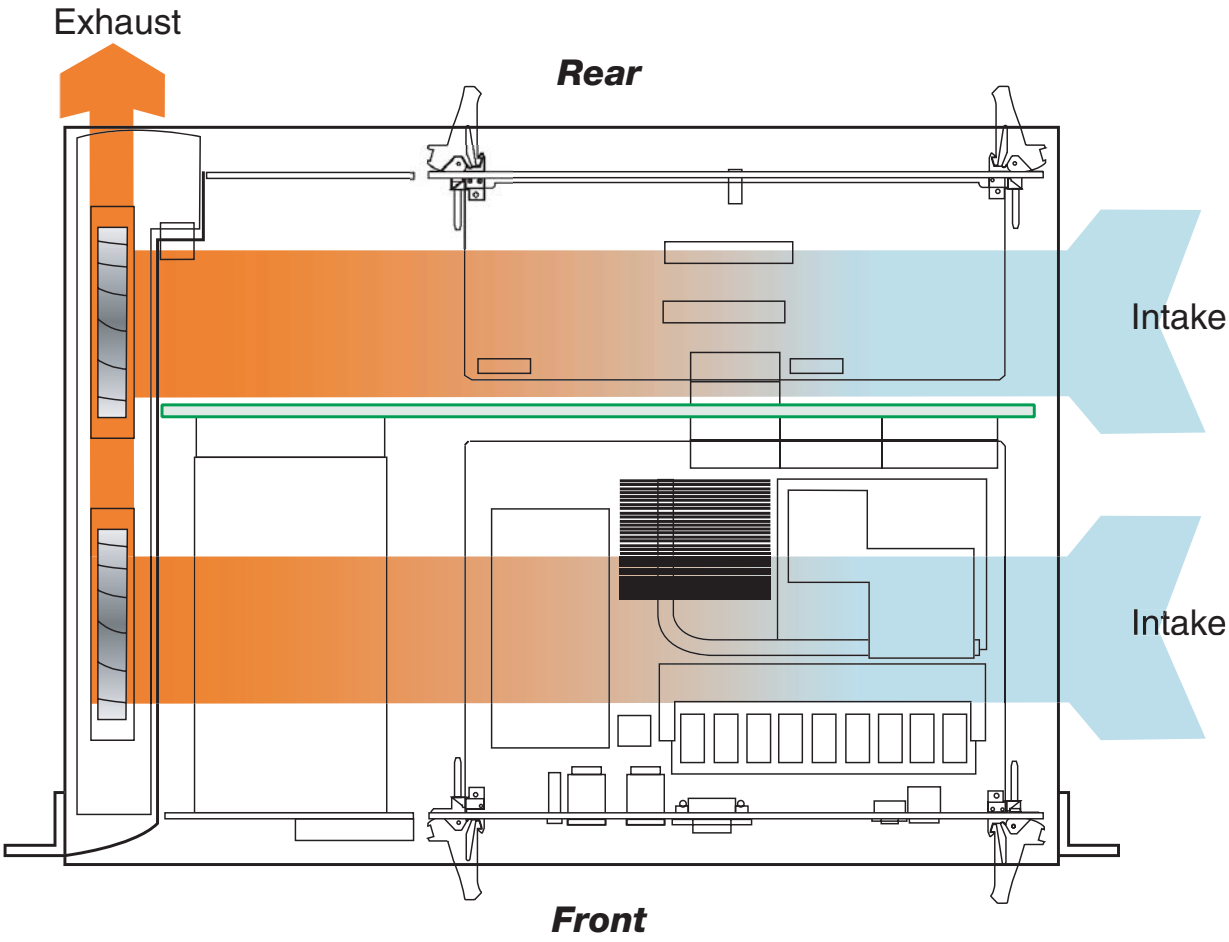

Figure 5. Air Flow (Top View)

Grounding the System

Before making any connections to the system, the enclosure must be properly grounded.

- Attach a grounded strap or cable, with a #10 ring terminal, to the chassis ground post on the ZT 5091's power input panel (refer to the "Power Input Panel (AC System)" or "DC Terminal Block" illustration). Use 12 AWG or heavier grounding wire.
- ESD ground jacks are located at the front and rear of the system. To protect components from static shock when handling system components, wear a wrist strap plugged into the most convenient ESD jack. Refer to the "ZT 5091*e* Features (Front)" Illustration in Section 1 and the "Power Input Panel (AC System)" or "DC Terminal Block" illustration for ESD ground jack locations.

Providing Power

The power input panel at the rear of the enclosure allows AC or DC power to be connected to the system. The power input panel configuration must match the voltage input configuration of the power supplies intended for use with the system. See the "Power Input Panel (AC System)" and "DC Terminal Block" illustrations for connector locations.

The ZT 5091*e* must be connected to a properly rated supply. For permanently connected equipment, a readily accessible disconnect device should be incorporated in the building wiring installation.

This product relies on the building's wiring installation for short-circuit (overcurrent) protection. Ensure that a listed and certified fuse or circuit breaker no larger than 72 VDC, 15 A is used on all DC current-carrying conductors or 230VAC @15A on all AC current-carrying conductors.

Warning: Always use a grounded outlet to supply power to the system. Always use a power cable with a grounded plug, such as the one supplied with the system.

When the system is plugged in, high voltages are present on the backplane. Do not reach into the enclosure.

Connecting AC Power (P1 Option)

1. Ensure that the power standby switch is in the “standby” (⏻) position. See the “Power Input Panel (AC System)” illustration for switch location.
2. Connect the supplied power cord to the AC input receptacle at the back of the enclosure and engage the cable retention device.
3. Plug the power cord into a grounded AC outlet capable of supplying 100 to 230VAC @ 50 to 60Hz @15A.
4. Once power is connected, the power standby switch may be used to turn on the system.

Warning: The power standby switch does not turn off power to the system. The system must be disconnected from the power source.

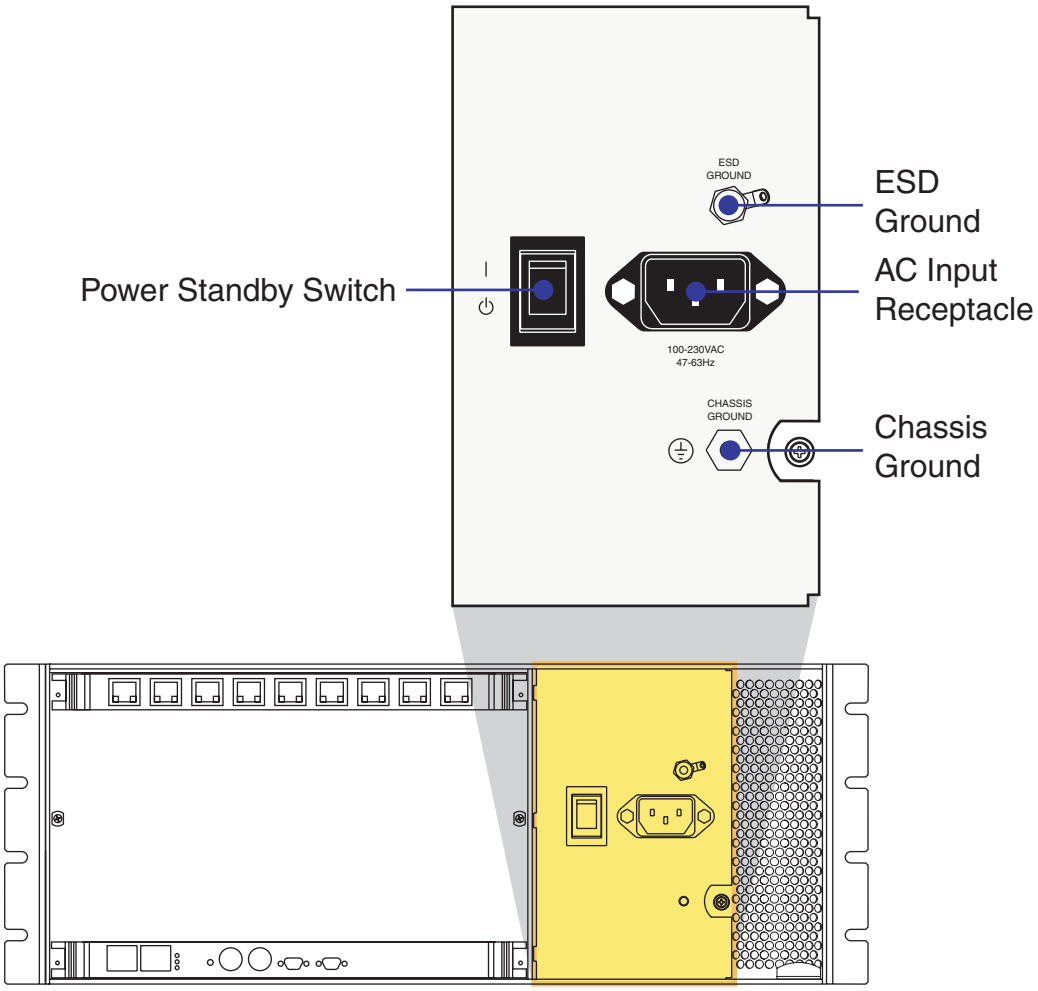

Figure 6. Power Input Panel (AC System)

Connecting DC power (P2 Option)

1. Ensure that the power standby switch is in the “standby” (⏻) position. See the “DC Terminal Block” illustration for switch location.
2. Remove the protective cover from the DC terminal block.
3. The **(A) RTN** and **(B) RTN** terminals should be tied together with a suitable jumper. A jumper comes pre-installed on the terminal block.
4. Connect the DC supply terminals to the terminal block. Connections should be made with 12 AWG wire with #8 ring terminals (use copper conductors only). To provide DC input power redundancy, connect both the (A) and (B) inputs. See the “DC Terminal Block” illustration for terminal assignments.
5. Replace the protective cover on the terminal block.
6. Complete the connection to the DC power source.
7. Once power is connected, the power standby switch may be used to turn on the system.

Warning: The power standby switch does not turn off power to the system. The system must be disconnected from the power source.

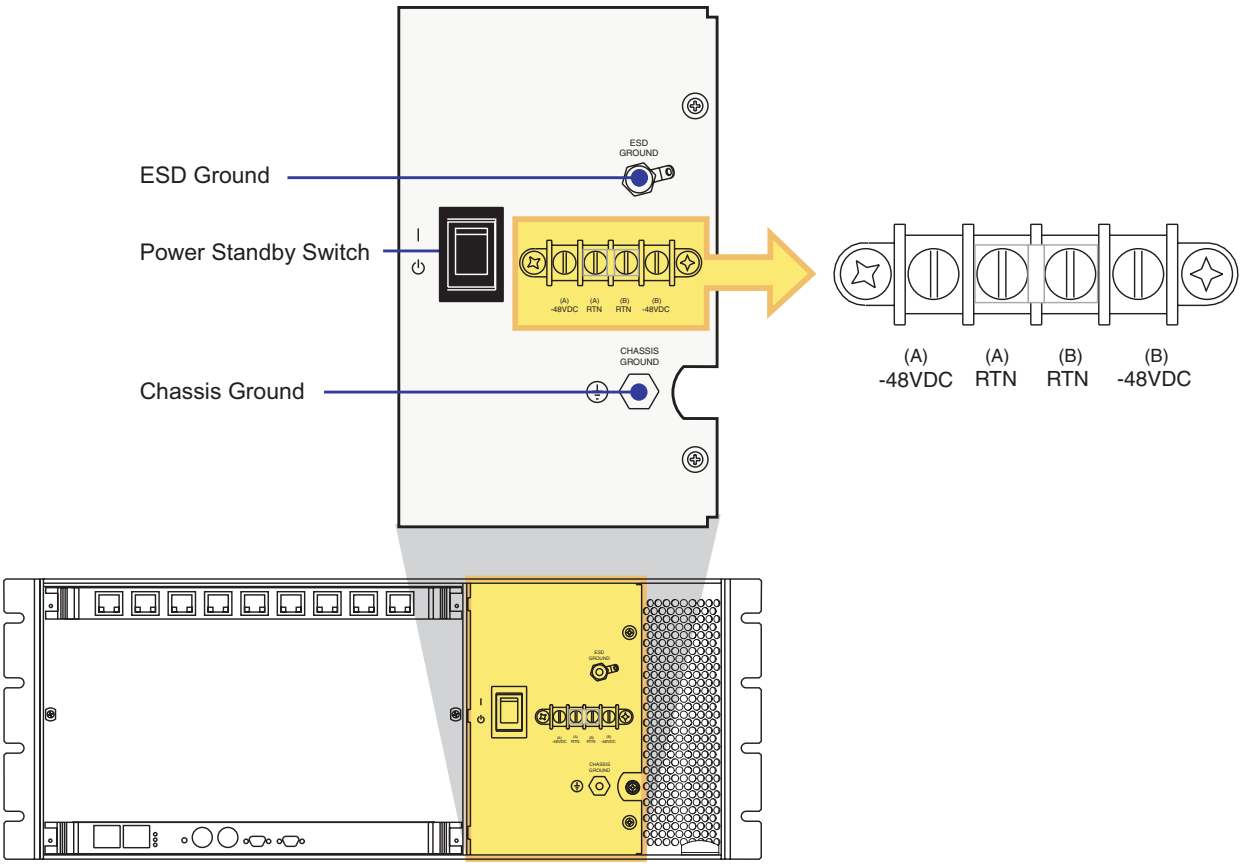

Figure 7. DC Terminal Block

Connecting I/O Devices

The front and rear board-level components in the ZT 5091*e* system offer connections for many different I/O devices such as a monitor, keyboard, mouse, and serial devices. Rear panel connectors are for added cabling flexibility and should not be used to connect extra devices to a given processor blade. Unpredictable behavior may occur if the same front and rear panel connectors are used simultaneously (for example, connecting two keyboards).

Refer to the blade-specific hardware manuals for connectivity options and limitations.

Connecting to a Network

Most IPnexus System Master and Peripheral Master processor blades support two channels of 10/100/1000 Mbps Ethernet. Your system may include both front- and rear-panel Ethernet connectors for channels A and B. Each channel can be independently routed for connection at the front of the system (on the processor blade) or at the rear of the system (on the Rear Transition Module—RTM). Refer to blade-specific hardware manuals for additional Ethernet connectivity information.

IMPORTANT: Connection to a 100BASE-TX hub for 100 Mbps operation requires Category 5 unshielded twisted-pair (UTP) cable. The maximum length from the 100BASE-TX hub to the adapter is 100 meters. Connection to a 10BASE-T hub for 10 Mbps operation requires a Category 3, 4, or 5 UTP cable.

2.4 Setup and Configuration

The following topics present a brief introduction to the setup and configuration of the ZT 5091*e*.

BIOS Configuration

For detailed information about BIOS configuration and diagnostics, see the *Performance Technologies Embedded BIOS* software manual and specific IPnexus processor blade manuals located on the Performance Technologies web site. The processor blade manual specifies the BIOS version.

Operating System Installation

If it is necessary to install an operating system (OS) on the processor blades included with your ZT 5091*e*, refer to specific IPnexus processor blade manuals. For OS-specific information, refer to the documentation provided by the OS vendor or visit the appropriate Internet web site.

Other Setup Considerations

The ZT 5091's backplane has several features that can be used to tailor the system for use in a specific environment. The following topics address BD_SEL# signals, shelf enumeration, slot assignments, and setting V(I/O).

BD_SEL# Signals

The BD_SEL# signal must be asserted (grounded) to blades inserted in slots 1-8 for the blades to power up. A Shelf Manager (SM) operating in slot 9 controls BD_SEL# assertion to slots 1-8. The ZT 5091's backplane provides eight standard, two-post jumper locations (J21-J28) that allow assertion of BD_SEL# to slots 1-8 in the absence of an SM (refer to the "Jumper Locations (Front)" illustration). Systems operating without an SM must have jumpers installed in all eight locations. Systems operating with an SM should have jumpers removed from all eight locations. The factory default configuration does not install jumpers in these locations. See the "Working with the Shelf Manager" topic for more information.

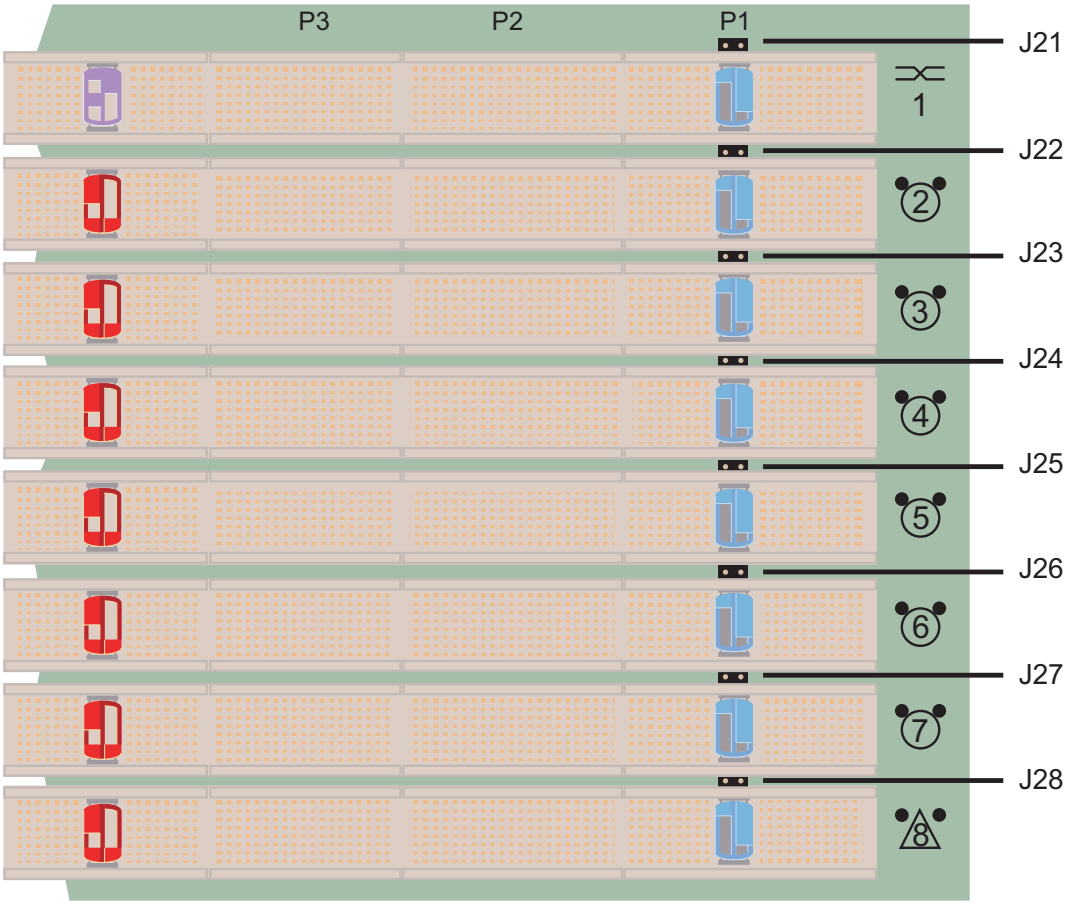

Figure 8. Jumper Locations (Front)

J21-J28 Position		Operation
All In		System with no SM
All Out	Default	System with SM

Shelf Enumeration

Assign a unique address to the ZT 5091*e* for use with other systems by configuring cuttable traces CT1-CT10 and CT13-CT17. See the "Shelf Enumeration" topic in Section 4 for more information.

Slot Assignments

The ZT 5091's backplane supports geographic addressing; each slot is individually addressed to match its slot number. See the “CompactPCI Slot Connectors” table for physical to logical slot relationships.

The backplane is fully hot swap compliant and buses individual clocks from the System Slot (slot 8) to each of the peripheral slots (slots 2-7). Refer to the *CompactPCI Specification, PICMG 2.0, R3.0* for additional information on slot addressing and signal assignment.

Setting V(I/O)

The ZT 5091*e* incorporates a "universal" backplane, allowing V(I/O) to be changed for use with either 5V or 3.3V blades. A jumper bus bar at the rear of the backplane controls V(I/O) provided to the CompactPCI slots. See the “V(I/O) Selection” illustration below. Connect J10 to J11 for +5V operation, or J11 to J12 for +3.3V operation. The factory default setting is for 5V operation (terminals J10 and J11 are jumpered).

CompactPCI blades are designed for use in 5V or 3.3V systems. Blades incorporate a color-coded mechanical key (in the J1 CompactPCI connector) that prevents a 3.3V blade from inserting into a 5V backplane and vice versa. Since the ZT 5091's backplane is configured for use with 5V blades (blue keys), the jumper and the CompactPCI keys must be changed for use with 3.3V blades (yellow keys).

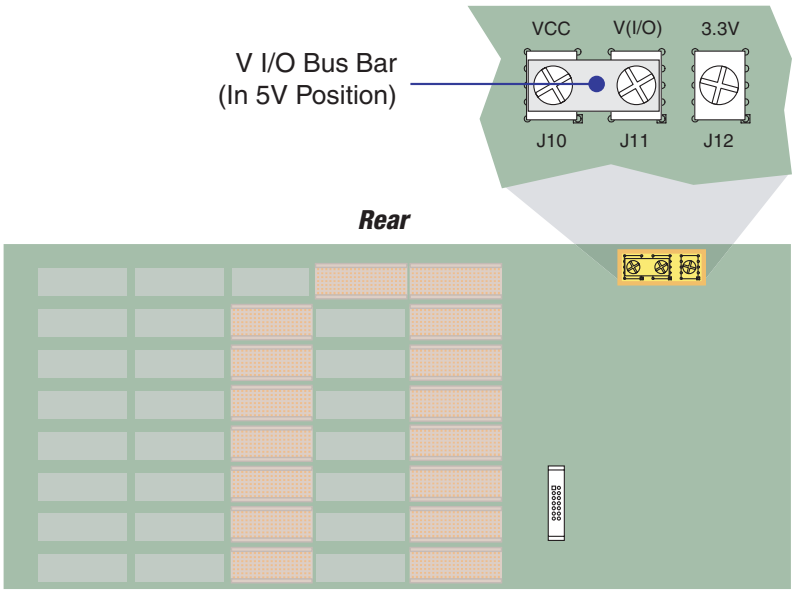

Figure 9. V(I/O) Selection

Setting IPMB Power

A jumper bus bar at the rear of the backplane ties IPMB power to V(I/O). See the “IPMB Power Selection” illustration below. To connect IPMB Power to a remote power supply, remove the bus bar between J16 and J17, and connect the remote voltage to J17 and its ground to J15.

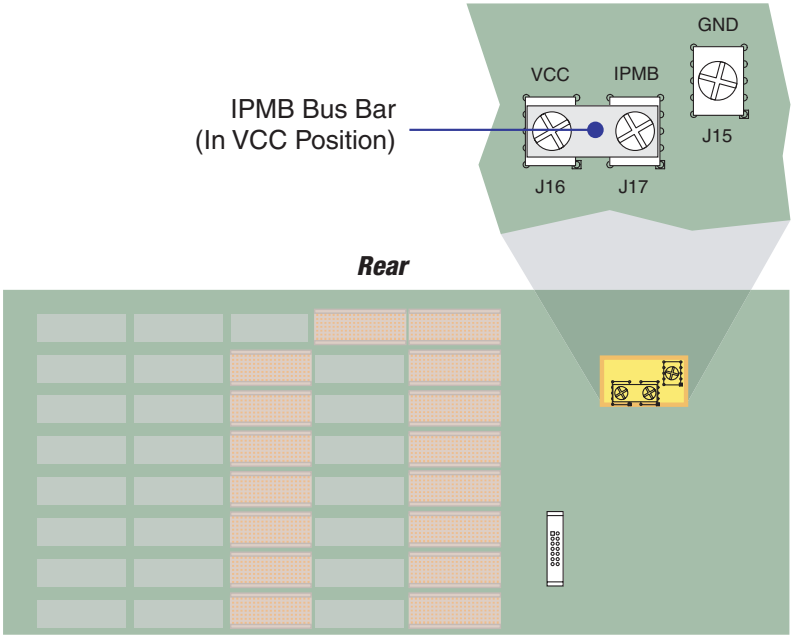

Figure 10. IPMB Power Selection

Section

3 Field Replaceable Units

Field Replaceable Units (FRUs) are modular components that can be quickly and easily serviced without disturbing other components in the system. Some FRUs are hot swappable and can be serviced without turning the system off. The following topics discuss working with the ZT 5091's modular components including the Shelf Manager, board-level components, power supplies, and the fan tray. For details about specific blade products, refer to the appropriate board-level hardware manuals.

Warning: When the system is plugged in, high voltages are present on the backplane. Do not reach into the enclosure.

Warning: Static electricity can damage electronic components. Wear a wrist strap grounded through one of the system's ESD Ground jacks when servicing system components.

3.1 Working with the Shelf Manager

The Shelf Manager (SM) affects power to slots 1-8 in accordance with the PICMG 2.1 specification. PICMG 2.1 defines the power control (BD_SEL# signals) as pulled up on general-purpose blades. This means that the BD_SEL# signals must be asserted (grounded) for the blades to power up. An SM operating in slot 9 controls BD_SEL# assertion to slots 1-8.

Jumpers at locations J21-J27 on the ZT 5091*e* backplane allow assertion of BD_SEL# to slots 1-8 in the absence of a system SM (See the topic BD_SEL# Signals for more information). Check that jumpers are removed from all eight locations if the system is intended for use with an SM. Installed jumpers may cause unpredictable behavior from the shelf management software. The factory default configuration does not install jumpers in these locations.

Installing the SM

The following instructions cover the mechanical aspects of installing a Shelf Manager (SM) in a ZT 5091*e* system.

1. System power does not need to be off to install an SM. The SM must only be inserted in slot 9 (refer to the "ZT 5091*e* Features (Front)" illustration for slot identification.
2. Remove the filler-panel or existing SM (see "Removing the SM" for removal instructions).
3. Prepare the new/replacement SM by opening its injector/ejector handle (refer to the "Injector/Ejector Operation" illustration).
4. Carefully align the edges of the blade with the card guides in the SM slot. It may be helpful to look into the enclosure to verify correct alignment of the rails in the guides.

5. Taking care to keep the blade aligned in the guides, slide the blade in until the injector/ejector mechanism engages the retention bar.
6. Simultaneously push in the blade and rotate the injector/ejector handle to its closed position (rotate inward) to seat the backplane connectors.
7. If system power is on, the SM boots and its Status LED lights green (active SM) or blinks green (standby SM).
8. Screw in the blade retention screw to anchor the blade in the chassis. This screw is located at the opposite end of the faceplate from the ejector handle.
9. Use the SM's Command Line Interface (CLI) to configure the SM. Refer to the *IPnexus CPC7301 Intelligent Shelf Manager* hardware manual for more information.

Removing the SM

The following instructions cover the mechanical aspects of removing a Shelf Manager (SM) from a system.

NOTE: Because the SM controls the power to every slot in the system (via BDSEL#), if the system's SM is removed all the blades in the system lose power. When removing an SM from a powered system, the SM performs a controlled shutdown of itself but not the other blades in the system. Therefore, you should ensure that the entire system is in a "safe" state before removing the SM.

1. System power does not need to be off to remove an SM blade.
2. Unscrew the blade retention screw that fastens the blade to the enclosure. This screw is located at the opposite end of the faceplate from the ejector handle.
3. If system power is off or the SM's blue hot swap LED is on, proceed to step six. If not, the SM needs to be in a "safe" state before it can be removed. Signal the SM that it is about to be removed by partially unlatching its ejector. Do not fully open the ejector as this levers the blade out of the enclosure and breaks its backplane connection before the blade can shut down properly.
4. Wait for the blue hot swap LED to light. This shouldn't take more than a few seconds.
5. Open the ejector handle fully, rotating it outward until the blade disengages from the backplane (refer to the "Injector/Ejector Operation" illustration).
6. Slide the blade evenly out of the enclosure.
7. Install a replacement SM or cover the empty slot with a filler panel to maintain the system's shielding and cooling performance. If no replacement SM is installed, ensure that BD_SEL# jumpers are installed for all populated slots.

3.2 Working with Board-Level Components

The ZT 5091*e* has slots for up to nine board-level components at the front of the enclosure (see the "ZT 5091*e* Features (Front)" illustration). Slots are numbered 1 through 9, with slot 1 being at the top right of the enclosure, slot 8 at the bottom right, and slot 9 at the bottom left. Slots are defined as follows:

Slot 1	Fabric Slot; supports PICMG 2.16-compliant Ethernet switch blades.
Slots 2 - 7	Peripheral Slots; support Peripheral Master processor blades and other peripheral blades.
Slot 8	System Slot; supports a System Master processor blade.
Slot 9	SM Slot; supports a Shelf Manager.

Blades installed at the front of the ZT 5091*e* may be paired with Rear Transition Modules (RTM) accessible from the rear of the system (see the "ZT 5091*e* Features (Rear)" illustration).

Caution: Some third party CompactPCI blades use latches with alignment pins that insert into tapped screw holes in the chassis. Performance Technologies highly recommends removing the alignment pins prior to insertion of these blades into the chassis. Insertion of alignment pins into tapped screw holes can generate metal particles, resulting in product failure. Failures resulting from use of this latch type are not covered under the Performance Technologies warranty.

The following instructions cover the removal and installation of System Master processor blades, Peripheral Master processor blades, and RTMs. There are additional considerations to working with the Shelf Manager. This component is therefore covered in a separate topic.

Caution: Processor blades may contain a socketed lithium battery. This battery is not a field-replaceable unit. There is a danger of explosion if the battery is incorrectly replaced or handled. Do not disassemble or recharge the battery. Do not dispose of the battery in fire. When the battery is replaced, the same type or an equivalent type recommended by the manufacturer must be used. Used batteries must be disposed of according to the manufacturer's instructions. Return the processor blade to the manufacturer for battery service.

Installing a Processor Blade

The following steps cover the mechanical aspects of installing an IPnexus System Master processor blade in the System Slot (slot 8) or a Peripheral Master in a Peripheral Slot (slots 2-7).

1. System power does not need to be off to insert a hot-swappable System Master or Peripheral Master processor blade. The System Master processor blade must only be inserted in slot 8 (refer to the "ZT 5091*e* Features (Front)" illustration for slot identification). Peripheral Master processor blades must only be inserted in peripheral slots 2-7.
2. Prepare the blade by opening the injector/ejector mechanisms (refer to the "Injector/Ejector Operation (Board-Level Components)" illustration below).

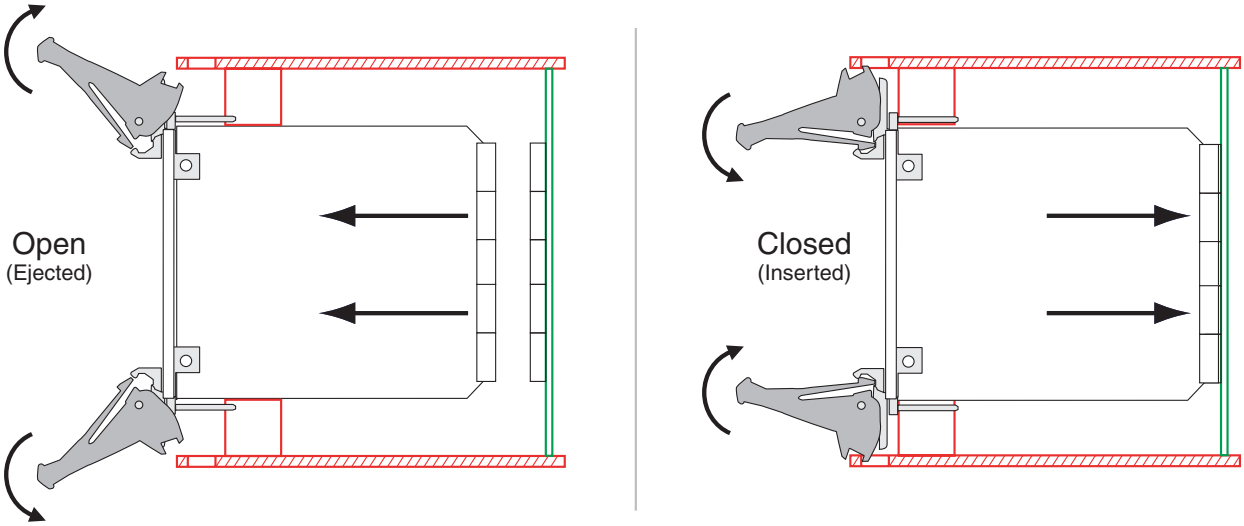

Figure 11. Injector/Ejector Operation (Board-Level Components)

3. Carefully align the edges of the blade with the left and right card guides in the appropriate slot (refer to the "Blade Alignment in the Enclosure Card Guides" illustration). It may be helpful to look into the enclosure to verify correct alignment of the rails in the guides.

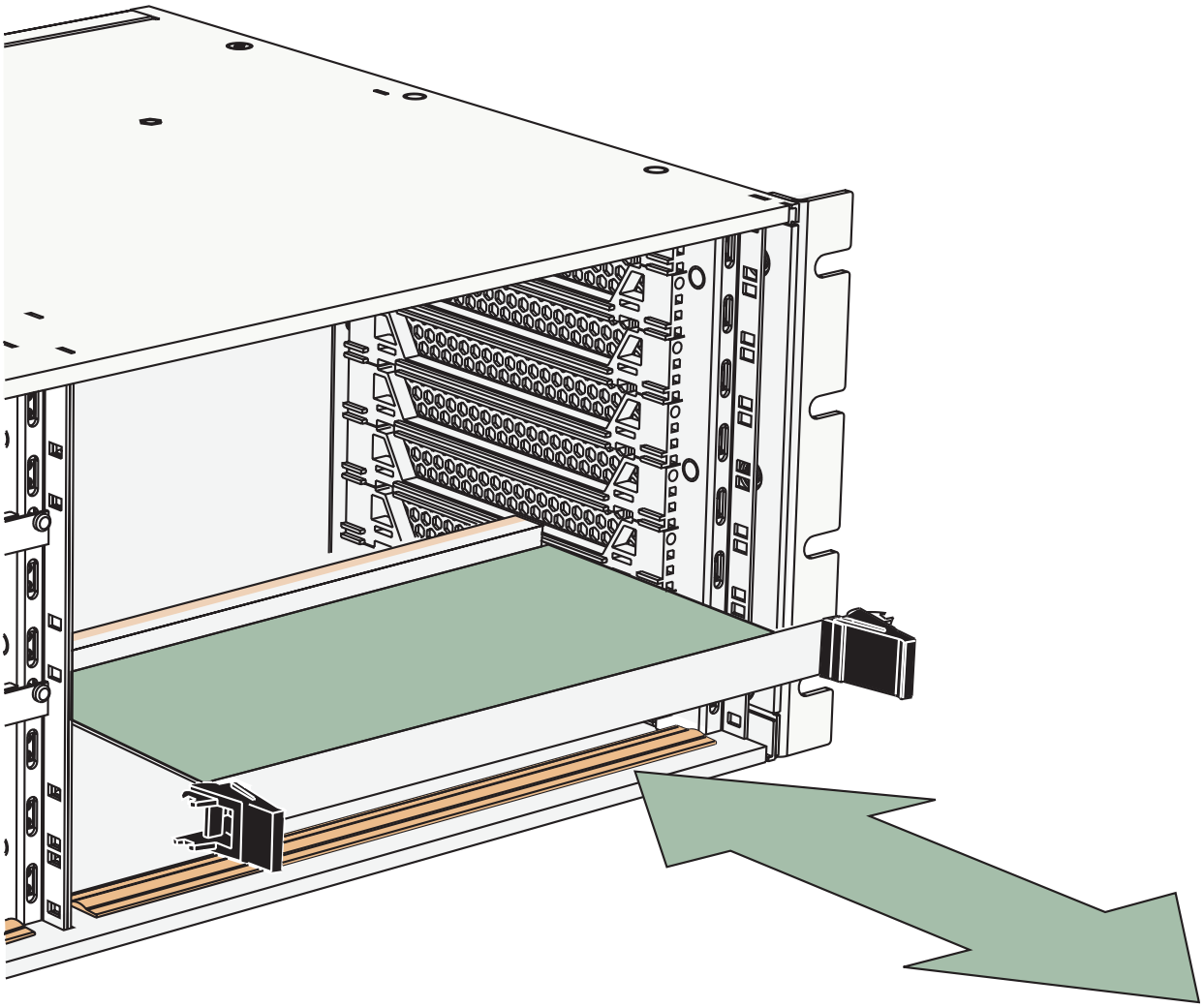

Figure 12. Blade Alignment in the Enclosure Card Guides

4. Taking care to keep the blade aligned in the guides, slide the blade in until the injector/ejector mechanisms engage the retention bars (refer to the "Injector/Ejector Operation" illustration).
5. Simultaneously push in the blade and rotate the injector/ejector mechanisms to their closed positions (rotate inward) to seat the backplane connectors. When the processor blade is in place and system power is on, the status light on the blade turns green, and the blade boots.
6. Make the desired connections at the faceplate and configure the processor blade.

Removing a System Master Processor Blade

The following steps cover the mechanical aspects of removing an IPnexus System Master processor blade from the System Slot (slot 8).

The processor blade may be accompanied by a media expansion blade, such as a CD-ROM drive carrier. In this case, the processor blade and expansion blade must be removed/installed together. Ejector/injector handles on the blades are ganged (connected together) and operate as one.

1. System power does not need to be off to remove a hot-swappable processor blade. The System Master processor blade resides in slot 8.
2. Disconnect connections at the faceplate (Ethernet, VGA, keyboard, etc.).
3. Unscrew any retention screws that fasten the blade to the enclosure. If the processor blade has an attached media expansion blade, unscrew the retention screws that fasten it to the enclosure.
4. Open the ejectors fully, rotating the handles outward until the blade disengages from the backplane (refer to the “Injector/Ejector Operation” illustration).
5. Slide the blade evenly out of the enclosure. If the processor blade has a media expansion blade attached to it, the blades should slide out together.
6. Install a replacement blade or cover the empty slot with a filler panel to maintain the enclosure's shielding and cooling performance.

Removing a Peripheral Master Processor Blade

The following steps cover the mechanical aspects of removing an IPnexus Peripheral Master processor blade from slots 2-7.

1. System power does not need to be off to remove a hot-swappable Peripheral Master processor blade.
2. Disconnect connections at the faceplate (Ethernet, VGA, keyboard, etc.).
3. Unscrew any retention screws that fasten the blade to the enclosure.
4. The blade should be in a "safe" state to be removed or data may be lost. Signal the system that a blade is about to be removed by partially unlatching the ejectors on the blade to be removed. Do not fully open the ejectors, as this levers the blade out of the enclosure and prematurely breaks its backplane connection.
5. Wait for the blue hot swap LED on the blade's faceplate to light; this indicates that blade processes have finished and the blade is safe to extract. If the hot swap LED fails to light after 30 seconds, re-latch the ejectors and unlatch them again. In this case, the blade is safe to extract (though the hot swap LED may not light).
6. Once the hot swap LED lights, open the injector/ejector mechanisms fully, rotating the handles outward until the blade disengages from the backplane (refer to the “Injector/Ejector Operation” illustration).
7. Slide the blade evenly out of the enclosure.
8. Install a replacement blade or cover the empty slot with a filler panel to maintain the enclosure's shielding and cooling performance.

Removing a Rear Transition Module

These instructions cover the mechanical aspects of removing an IPnexus Rear Transition Module (RTM) from a ZT 5091*e* system. RTMs may be installed at the rear of the ZT 5091*e* system in slots 1-8.

1. Shut down system operations and move the standby power switch to the standby (⏻) position.
2. Disconnect connections at the RTM's faceplate.
3. Unscrew the retention screws that fasten the blade to the enclosure.
4. Open the injector/ejector mechanisms, rotating the handles outward until the blade disengages from the backplane (refer to the "Injector/Ejector Operation" illustration).
5. Begin to slide the blade evenly out of the enclosure.
6. Before pulling the blade out entirely, check for internal cabling attached to the RTM that may become snagged or that must be disconnected before the blade can be fully removed.
7. Detach internal cables if necessary.
8. Remove the blade from the enclosure.
9. Install a replacement blade or cover the empty slot with a filler panel to maintain the enclosure's shielding and cooling performance.

Installing a Rear Transition Module

These instructions cover the mechanical aspects of installing an IPnexus Rear Transition Module (RTM). RTMs may be installed at the rear of the ZT 5091*e* system in slots 1-8.

1. Shut down system operations and move the standby power switch to the standby (⏻) position.
2. Choose an appropriate RTM slot. RTMs must be installed in-line behind their companion processor blades. For instance, the System Master is installed in slot 8 so its RTM must be installed at the back of the system in slot 8.
3. Prepare the RTM by opening the injector/ejector mechanisms (refer to the "Injector/Ejector Operation" illustration).
4. Connect any internal system cabling, such as an IDE device, to the appropriate headers on the RTM. Route the cabling so it doesn't snag or kink when the RTM is inserted.
5. Carefully align the edges of the RTM with the left and right card guides in the appropriate slot. It may be helpful to look into the enclosure to verify correct alignment of the rails in the guides.
6. Taking care to keep the RTM aligned in the guides, slide the RTM in until the injector/ejector mechanisms engage the retention bars.
7. Simultaneously push in the RTM and rotate the injector/ejector mechanisms to their closed positions (rotate inward) to seat the backplane connectors.
8. Make the desired connections at the faceplate and configure the RTM.

3.3 Working with Power Supplies

The ZT 5091*e* accommodates up to three 325W AC or DC, CompactPCI, modular power supplies. The power supplies are load sharing, hot swappable, and plug directly into the backplane (see the "Power Supply Orientation" illustration for power supply location).

The number of power supplies needed in any given system depends on the load in that system. It is recommended that three power supplies be used in every ZT 5091*e*.

Warning: The ZT 5091*e* is configured for either AC or DC input. The system's power input configuration (AC or DC) must match the power supply input voltage (AC or DC). **DO NOT INSTALL A DC INPUT POWER SUPPLY IN A ZT 5091*e* CONFIGURED FOR AC INPUT.**

Warning: Power supply maintenance should only be performed by trained personnel. When the system is plugged in, high voltages are present on the backplane. Do not reach into the enclosure.

Installing a Power Supply

1. System power does not need to be off to install a power supply.
2. Select an empty power supply bay.
3. Align the rails on the power supply with the guides in the bay. It may be helpful to look into the enclosure to verify correct alignment of the rails in the guides.
4. Slide the power supply in the guides and press firmly to seat the connector. Refer to the "Injector/Ejector Operation (Power Supplies)" illustration.
5. Tighten the two retention screws on the front panel of the power supply. Refer to the "Power Supply Orientation" illustration for the location of power supply retention screws.

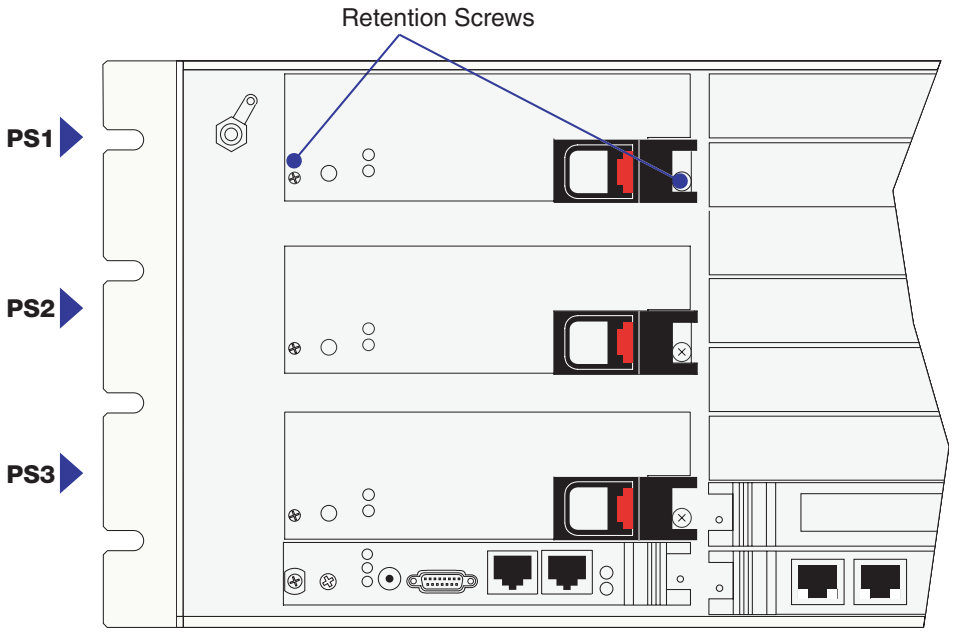

Figure 13. Power Supply Orientation

Power Supply

1. System power does not need to be off to remove a power supply.
2. Unscrew the two retention screws on the front of the power supply you wish to remove. Refer to the "Power Supply Orientation" illustration for the location of power supply retention screws.
3. Push down the spring-loaded latch on the ejector and rotate the ejector away from the power supply's faceplate. This levers the power supply away from the backplane. Refer to the "Injector/Ejector Operation (Power Supplies)" illustration.
4. Pull the power supply away from its backplane connection and slide it out of the enclosure.
5. Install a replacement power supply or cover the empty slot with a filler panel to maintain the enclosure's shielding and cooling performance.

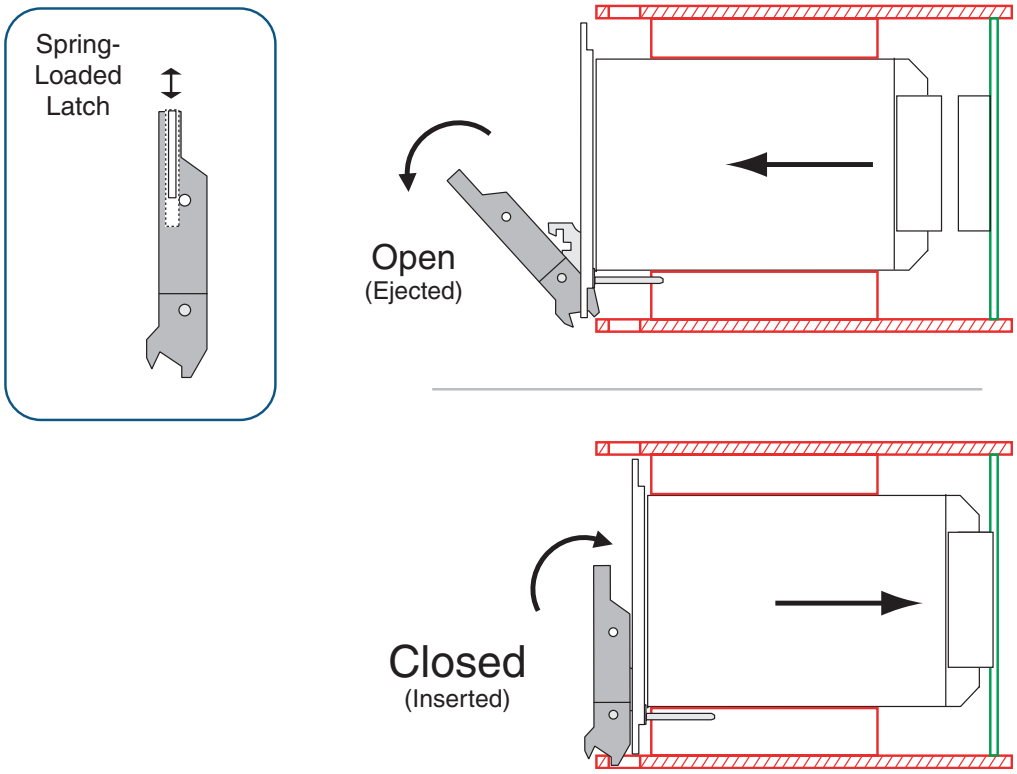

Figure 14. Injector/Ejector Operation (Power Supplies)

3.4 Working with the Fan Tray

Two blowers housed in a removable fan tray occupy the right side of the enclosure (when viewed from the rear). The fan tray is secured by a captive screw and plugs into a blind mate receptacle in the enclosure (see the "Fan Tray Installation/Removal" illustration).

Caution: System cooling should not be absent for more than three minutes on an operating ZT 5091*e* system.

Removing the Fan Tray

1. A #1 Phillips screwdriver is required to remove the fan tray.
2. System power does not need to be turned off to remove the fan tray.
3. Loosen (turn counterclockwise) the captive retention screw on the fan tray grille until it releases the tray from the enclosure.
4. The grille and fan tray are one assembly. Use the handle at the bottom of the grille to pull the fan assembly out of the enclosure.
5. Perform the necessary maintenance or obtain a new fan tray.

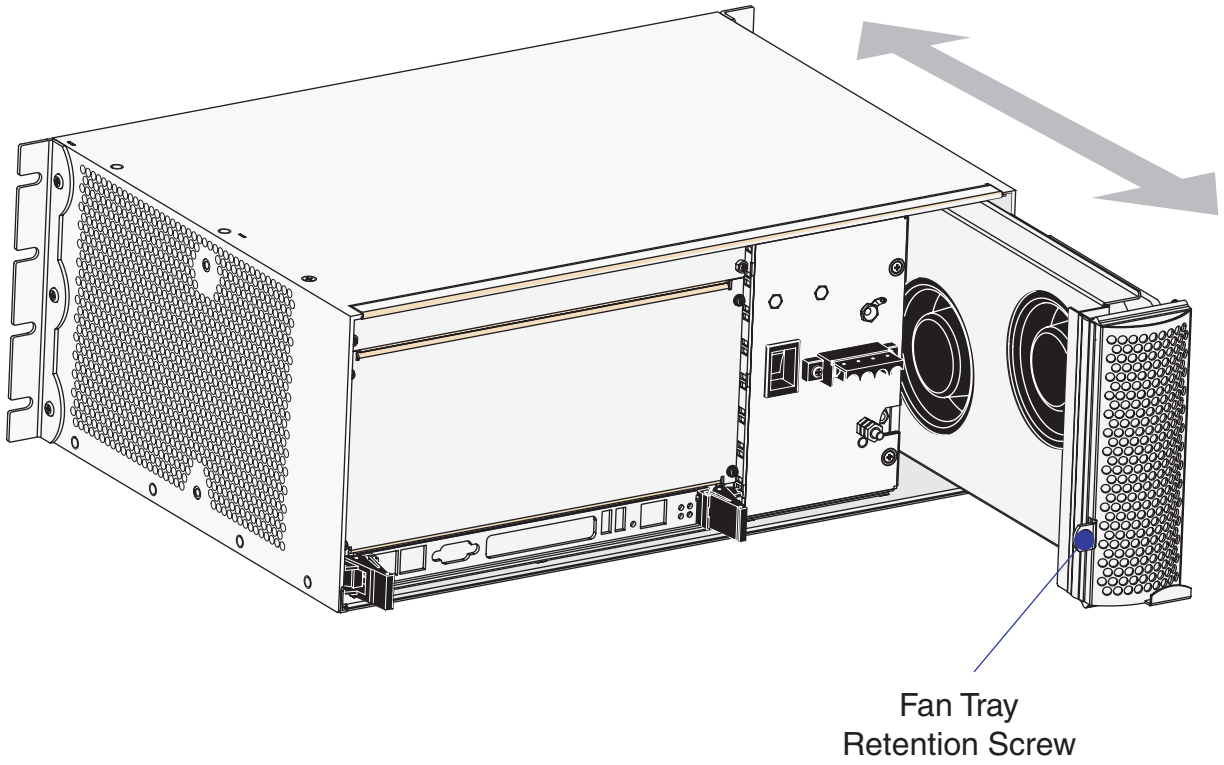

Figure 15. Fan Tray Installation/Removal

Installing the Fan Tray

1. A #1 Phillips screwdriver is required to install the fan tray.
2. System power does not need to be turned off to install a fan tray.
3. The fan tray slides into the fan bay at the right rear of the enclosure. The fan tray should be oriented with the handle at the bottom.
4. Slide the fan tray into the enclosure.
5. Turn (clockwise) the captive screw to start the threads. When the threads engage properly, lightly tighten the screw.

Section

4 Backplane Connectors

This section includes location illustrations, descriptions, and pinouts for the connectors on the ZT 5091*e* backplane.

The ZT 5091*e* includes a hot swap-compatible, 8-slot, CompactPCI backplane. The backplane is configured with a packet switched bus, a CompactPCI bus, and a H.110 TDM bus. Refer to the "Backplane Connector Locations (Front)" and "Backplane Connector Locations (Rear)" illustrations for connector locations.

Table 1. Connector Assignments

Connector	Function
P1-P5, Slot 1	PSB Fabric Interface (front)
P1-P5, Slot 8	System Master Processor Blade Interface (front)
P1-P5, Slots 2-7	Peripheral Blade Interfaces (front)
P1-P3, Slot 9	Chassis Management Interface (front)
J1, J2, and J3	Modular Power Supply Connectors (front)
J4, J5, and J6	Power Taps (Rear)
J9	Power Supply Logic On/Off (rear)
J10, J11, and J12	V(I/O) Selection (rear)
J13	IDE/Floppy Drive Power Connector (rear)
J14	Fan Connector (rear)
J15, J16, J17	IPMB Power Plane (rear)
J21-J28	BD_SEL# Signals (front)
J22	Reserved (front)
U1-U8	Temperature Sensors (front)
U9	System ID and Information (Rear)
CT1-CT5	H.110 Bus Shelf Enumeration (rear)
CT13-CT17	2.16 Fabric Slot Shelf Enumeration (rear)

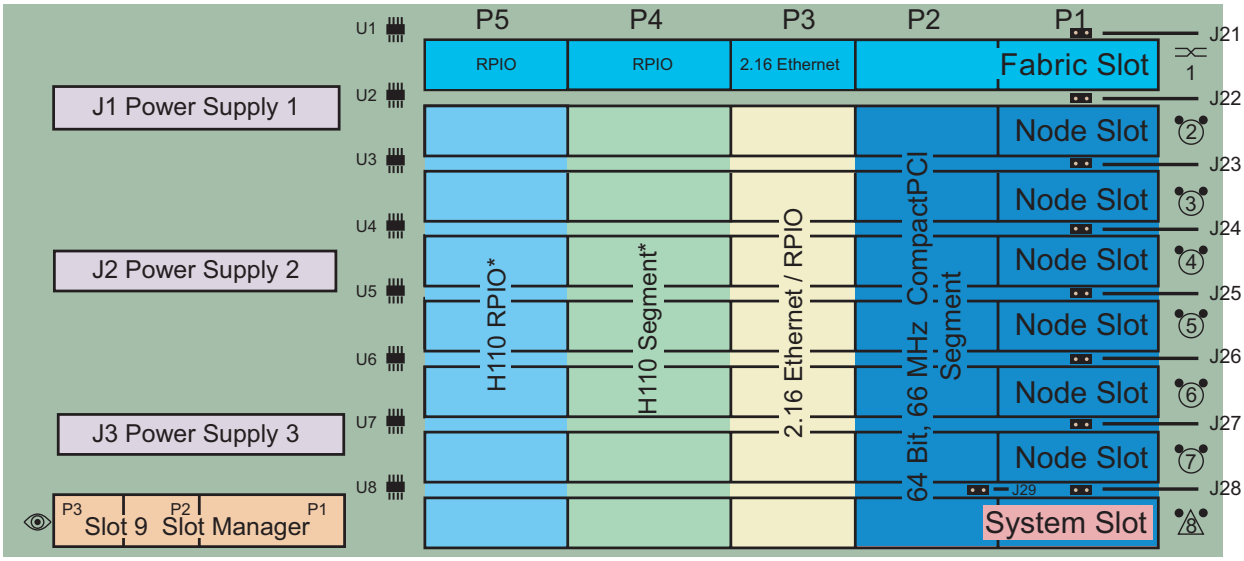

Figure 16. Backplane Connector Locations (Front)

*H.110 does not extend to slot 8 on alpha-release product.

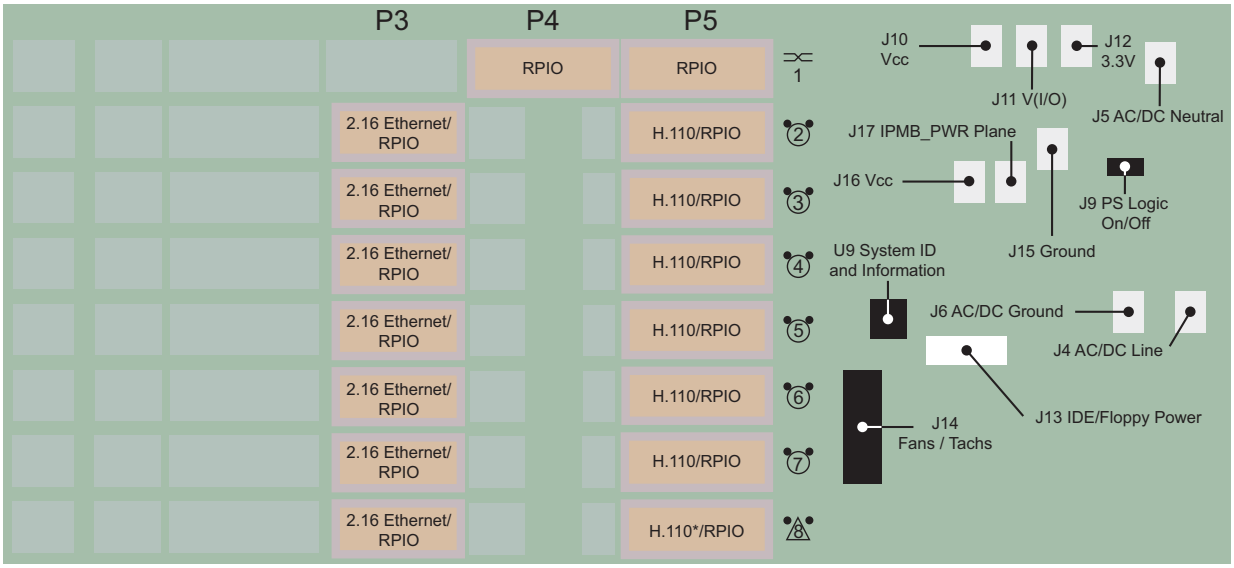

Figure 17. Backplane Connector Locations (Rear)

*H.110 does not extend to slot 8 on alpha-release product.

Table 2. CompactPCI Slot Connectors

Physical Slot	Logical Slot	Backplane Silkscreen	P1 Loading	P2 Loading	P3 Loading	P4 Loading	P5 Loading
Slot 1	8-A, Fabric	1APx	32-Bit	64-Bit	Fabric	RPIO	Fabric
Slot 2	7-A	2APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 3	6-A	3APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 4	5-A	4APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 5	4-A	5APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 6	3-A	6APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 7	2-A	7APx	32-Bit	64-Bit	Node	H.110	H.110/RPIO
Slot 8	1-A, System	8APx	32-Bit	64-Bit	Node	H.110*	H.110/RPIO*
Slot 9	—	9APx	SM	SM	SM	No	No

NOTES:

32-Bit =	32-bit CompactPCI connector loaded
64-Bit =	64-bit CompactPCI connector loaded
Fabric =	PICMG 2.16 PSB Fabric Slot connector
Node =	Rows 15-18 provide links to fabric slot/rows 14 and 19 provide isolation/all others are available for RPIO
H.110 =	ECTF H.110-compliant connector loaded
RPIO =	Signals passed through to rear panel connector for access via Rear Transition Module
SM =	Shelf Manager
No =	No connector loaded

* Not connected to the H.110 bus on alpha-release product

4.1 Fabric Slot CompactPCI Connectors (Slot 1)

On the front side of the backplane, slot 1 is reserved as the Fabric Slot. Slot 1 is compatible only with PICMG 2.16-compliant Ethernet switch blades. CompactPCI connectors are loaded in the P1-P5 locations at slot 1. See the "Backplane Connector Locations (Front)" illustration above for location information.

P1 at slot 1 has a brilliant blue key to indicate 5V operation. P1 is a 25-row CompactPCI connector. See the "P1 (at Slots 1-8) CompactPCI 2.16 Backplane Connector Pinout" table for pin definitions. Pins used for Slot 1 are marked with a dagger (†) in the table. Refer to the *CompactPCI Hot Swap Specification, PICMG 2.1, R1.0* for more information.

P2 is an un-keyed, 22-row CompactPCI connector. Refer to the "P2 (at Slots 1-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Pins not used for Slot 1 are marked with a double dagger (‡) in the table. Refer to the *CompactPCI Specification, PICMG 2.0, R3.0* for more information.

P3 at slot 1 is an un-keyed, 19-row Standard Fabric Blade CompactPCI connector. At slot 1, P3 provides links to Node blades in slots 2-8. Refer to the "P3 (at Slot 1) CompactPCI 2.16 Fabric Slot Backplane Connector Pinout" table for pin definitions. Refer to the PICMG *CompactPCI Packet Switching Backplane Specification, PICMG 2.16, R1.0* for more information.

P4 has a blue/lilac key to indicate Standard Fabric Board operation. P4 is a 22-row CompactPCI connector that is not bused. The connector's "Z" and "F" columns are grounded and all other pins are available for customer-defined I/O.

P5 is an un-keyed, 22-row CompactPCI connector that is not bused. The connector's "Z" and "F" columns are grounded and all other pins are available for customer-defined I/O.

Table 3. P1 (at Slots 1- 8) CompactPCI 2.16 Backplane Connector Pinout

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) *(L)*	AD[0]	ACK64#	GND
23	GND	3.3V	AD[4]	AD[3]	5V *(L)*	AD[2]	GND
22	GND	AD[7]	GND	3.3V *(L)*	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 *(L)*	AD[13]	GND
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND
17	GND	3.3V	IPMB_SCL †	IPMB_SDA †	GND *(L)*	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3V	FRAME#	IRDY#	BD_SEL# *(S)* †	TRDY#	GND
14	KEY AREA						
13							
12							
11	GND	AD[18]	AD[17]	AD[16]	GND *(L)*	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL *(S)*	AD[23]	GND *(L)*	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 *(L)*	AD[27]	GND
6	GND	REQ#	PCI_PRESENT#	3.3V *(L)*	CLK †	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	PCI_RST# †	GND *(L)*	GNT#	GND
4	GND	IPMB_PWR †	HEALTHY# †	V(I/O) *(L)*	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5V *(L)*	INTD#	GND
2	GND	TCK*	5V	TMS*	TDO*	TDI*	GND
1	GND	5V	-12V	TRST#	+12V	5V	GND

NOTES:

A color-coded (for V I/O) key plug occupies the KEY AREA—Brilliant Blue for 5V, Cadmium Yellow for 3.3V

Designates a low true signal

* Designates signals NOT bused

† *Designates signals used in Fabric Slot 1*

Pins are medium (Level 2) length except as follows:

(S) designates a short (Level 1) pin length

(L) designates a long (Level 3) pin length

Columns Z and F contain long (Level 3) pins

Table 4. P2 (at Slots 1- 8) CompactPCI Backplane Connector Pinout

Pin#	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6 † ‡	GND	RSV † ‡	RSV † ‡	RSV † ‡	GND
20	GND	CLK5 † ‡	GND † ‡	RSV † ‡	GND	RSV † ‡	GND
19	GND	GND † ‡	GND	RSV † ‡	RSV † ‡	RSV † ‡	GND
18	GND	BRSVP2A18 ‡	BRSVP2B18 ‡	BRSVP2C18 ‡	GND	BRSVP2E18 ‡	GND
17	GND	BRSVP2A17 ‡	GND	PRST# † ‡	REQ6# † ‡	GNT6# † ‡	GND
16	GND	BRSVP2A16 ‡	BRSVP2B16 ‡	DEG# † ‡	GND	BRSVP2E16 ‡	GND
15	GND	BRSVP2A15 ‡	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]# † ‡	64EN# ‡	V(I/O)	C/BE[4]# † ‡	PAR64 † ‡	GND
4	GND	V(I/O)	BRSVP2B4 ‡	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

NOTES:

Designates a low true signal

† Designates NOT connected on peripheral slots

‡ *Designates NOT connected on fabric slot*

Table 5. P3 (at Slot 1) CompactPCI 2.16 Fabric Slot Backplane Connector Pinout

Pin #	Z	A	B	C	D	E	F
19	GND	SGA4	SGA3	SGA2	SGA1	SGA0	GND
18	GND	LPf_DA+ †	LPf_DA- †	GND	LPf_DC+ †	LPf_DC- †	GND
17	GND	LPf_DB+ †	LPf_DB- †	GND	LPf_DD+ †	LPf_DD- †	GND
16	GND	LP8_DA+	LP8_DA-	GND	LP8_DC+	LP8_DC-	GND
15	GND	LP8_DB+	LP8_DB-	GND	LP8_DD+	LP8_DD-	GND
14	GND	LP7_DA+	LP7_DA-	GND	LP7_DC+	LP7_DC-	GND
13	GND	LP7_DB+	LP7_DB-	GND	LP7_DD+	LP7_DD-	GND
12	GND	LP6_DA+	LP6_DA-	GND	LP6_DC+	LP6_DC-	GND
11	GND	LP6_DB+	LP6_DB-	GND	LP6_DD+	LP6_DD-	GND
10	GND	LP5_DA+	LP5_DA-	GND	LP5_DC+	LP5_DC-	GND
9	GND	LP5_DB+	LP5_DB-	GND	LP5_DD+	LP5_DD-	GND
8	GND	LP4_DA+	LP4_DA-	GND	LP4_DC+	LP4_DC-	GND
7	GND	LP4_DB+	LP4_DB-	GND	LP4_DD+	LP4_DD-	GND
6	GND	LP3_DA+	LP3_DA-	GND	LP3_DC+	LP3_DC-	GND
5	GND	LP3_DB+	LP3_DB-	GND	LP3_DD+	LP3_DD-	GND
4	GND	LP2_DA+	LP2_DA-	GND	LP2_DC+	LP2_DC-	GND
3	GND	LP2_DB+	LP2_DB-	GND	LP2_DD+	LP2_DD-	GND
2	GND	LP1_DA+	LP1_DA-	GND	LP1_DC+ †	LP1_DC- †	GND
1	GND	LP1_DB+	LP1_DB-	GND	LP1_DD+ †	LP1_DD- †	GND

NOTES:

† Not connected on fabric slot

P4 (at Slot 1) CompactPCI 2.16 Standard Fabric Slot Backplane Connector Pinout

Pin #	Z	A	B	C	D	E	F
25	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
24	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
23	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
22	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
21	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
20	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
19	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
18	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
17	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
16	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
15	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
14	GND	KEY AREA					GND
13	GND						GND
12	GND						GND
11	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
10	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
9	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
8	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
7	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
6	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
5	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
4	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
3	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
2	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND
1	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND

NOTES:

Fabric Slot key colors: Lilac Blue = Standard Fabric, Ochre Yellow = Extended Fabric

Table 6. P5 (at Slot 1) CompactPCI 2.16 Fabric Slot Backplane Connector Pinout

Pin #	Z	A	B	C	D	E	F
22	GND	LP19_DA+	LP19_DA-	GND	LP19_DC+	LP19_DC-	GND
21	GND	LP19_DB+	LP19_DB-	GND	LP19_DD+	LP19_DD-	GND
20	GND	LP18_DA+	LP18_DA-	GND	LP18_DC+	LP18_DC-	GND
19	GND	LP18_DB+	LP18_DB-	GND	LP18_DD+	LP18_DD-	GND
18	GND	LP17_DA+	LP17_DA-	GND	LP17_DC+	LP17_DC-	GND
17	GND	LP17_DB+	LP17_DB-	GND	LP17_DD+	LP17_DD-	GND
16	GND	LP16_DA+	LP16_DA-	GND	LP16_DC+	LP16_DC-	GND
15	GND	LP16_DB+	LP16_DB-	GND	LP16_DD+	LP16_DD-	GND
14	GND	LP15_DA+	LP15_DA-	GND	LP15_DC+	LP15_DC-	GND
13	GND	LP15_DB+	LP15_DB-	GND	LP15_DD+	LP15_DD-	GND
12	GND	LP14_DA+	LP14_DA-	GND	LP14_DC+	LP14_DC-	GND
11	GND	LP14_DB+	LP14_DB-	GND	LP14_DD+	LP14_DD-	GND
10	GND	LP13_DA+	LP13_DA-	GND	LP13_DC+	LP13_DC-	GND
9	GND	LP13_DB+	LP13_DB-	GND	LP13_DD+	LP13_DD-	GND
8	GND	LP12_DA+	LP12_DA-	GND	LP12_DC+	LP12_DC-	GND
7	GND	LP12_DB+	LP12_DB-	GND	LP12_DD+	LP12_DD-	GND
6	GND	LP11_DA+	LP11_DA-	GND	LP11_DC+	LP11_DC-	GND
5	GND	LP11_DB+	LP11_DB-	GND	LP11_DD+	LP11_DD-	GND
4	GND	LP10_DA+	LP10_DA-	GND	LP10_DC+	LP10_DC-	GND
3	GND	LP10_DB+	LP10_DB-	GND	LP10_DD+	LP10_DD-	GND
2	GND	LP9_DA+	LP9_DA-	GND	LP9_DC+	LP9_DC-	GND
1	GND	LP9_DB+	LP9_DB-	GND	LP9_DD+	LP9_DD-	GND

4.2 System Slot CompactPCI Connectors (Slot 8)

On the front side of the backplane, slot 8 is reserved as the System Slot. CompactPCI connectors are loaded in the P1-P5 locations at slot 8. See the "Backplane Connector Locations (Front)" illustration above for location information.

P1 at slot 8 has a brilliant blue key to indicate 5V operation. P1 is a 25-row connector providing 32-bit CompactPCI busing between the system processor and the P1 connectors loaded at peripheral slots 2-7. Refer to the "P1 (at Slots 1-8) CompactPCI 2.16 Backplane Connector Pinout" table for pin definitions. Refer to the *CompactPCI Hot Swap Specification, PICMG 2.1, R1.0* for more information.

P2 at slot 8 is an un-keyed, 22-row connector providing 64-bit CompactPCI busing between the system processor and the P2 connectors loaded at peripheral slots 2-7. Refer to the "P2 (at Slot 8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the PICMG *CompactPCI Specification, PICMG 2.0, R3.0* for more information.

P3 is an un-keyed, 19-row, CompactPCI node blade Ethernet connector. At slot 8, P3 provides links to P3 at fabric slot 1. P3 at slot 8 also provides pins for through-backplane user-definable I/O. Refer to the "P3 (at Slots 2-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the PICMG *CompactPCI Packet Switching Backplane Specification, PICMG 2.16, R1.0* for more information.

P4 at slot 8 is a Strawberry Red keyed, 25-row CompactPCI connector providing telephony signal busing among slots 2-8. Refer to the "P4 (at Slots 2-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the *CompactPCI Computer Telephony Specification, PICMG 2.5, R1.0* for more information.

P5 is an un-keyed, 22-row CompactPCI connector with staged pins for hot swap. The pins are specified for H.110 RPIO or through-backplane user-definable I/O. The backplane surrounding the P5 connectors is devoid of power planes, ground planes, and other signal routing on the inner and surface layers. See the "P5 (at Slots 2-8) H.110 Backplane Connector Pin Staging" table for pin staging information. Refer to the *CompactPCI Computer Telephony Specification, PICMG 2.5, R1.0* for more information.

NOTE: P4 and P5 at slot 8 are not connected to the H.110 bus in alpha-release product

Table 7. P2 (at Slot 8) CompactPCI Backplane Connector Pinout

Pin#	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV †	RSV †	RSV †	GND
20	GND	CLK5	GND	RSV †	GND	RSV †	GND
19	GND	GND	GND	SMB_SDA †	SMB_SCL †	SMB_ALERT# †	GND
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND
17	GND	BRSVP2A17	GND	PRST# †	REQ6# †	GNT6# †	GND
16	GND	BRSVP2A16	BRSVP2B16	DEG# †	GND	BRSVP2E16	GND
15	GND	BRSVP2A15	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]#	64EN#	V(I/O)	C/BE[4]#	PAR64	GND
4	GND	V(I/O)	BRSVP2B4	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

NOTES:

Designates a low true signal

†Not connected on system slot

Table 8. P3 (at Slots 2-8) CompactPCI Backplane Connector Pinout

Pin #	Z	A	B	C	D	E	F
19	GND	ISO*	ISO*	ISO*	ISO*	ISO*	GND
18	GND	LPa_DA+	LPa_DA-	GND	LPa_DC+	LPa_DC-	GND
17	GND	LPa_DB+	LPa_DB-	GND	LPa_DD+	LPa_DD-	GND
16	GND	LPb_DA+ †	LPb_DA- †	GND	LPb_DC+ †	LPb_DC- †	GND
15	GND	LPb_DB+ †	LPb_DB- †	GND	LPb_DD+ †	LPb_DD- †	GND
14	GND	ISO* †	ISO* †	ISO* †	ISO* †	ISO* †	GND
13	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
12	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
11	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
10	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
9	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
8	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
7	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
6	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
5	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
4	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
3	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
2	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND
1	GND	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	BP(I/O) †	GND

NOTES:

* Used for Isolation

† *Not connected in system slot*

ISO row 19 (row 19, pins A-E) may be at logic ground or may be at earth ground. A removable bypass capacitor to ground selects this option, as defined in the 2.16 specification. Refer to the "Logic Ground Isolation Capacitors" topic. ISO row 14 (row 14, pins A-E) cannot be tied to earth ground.

4.3 Peripheral Slot CompactPCI Connectors (Slots 2-7)

On the front side of the backplane, slots 2-7 are reserved for peripheral blades. CompactPCI connectors are loaded in the P1-P5 locations at slots 2-7. See the "Backplane Connector Locations (Front)" illustration for location information.

P1 has a Brilliant Blue key indicating 5V operation. P1 is a 25-row CompactPCI connector. At slots 2-7, P1 buses between 32-bit peripheral blades and P1 at the system slot (slot 8). See the "P1 (at Slots 1-8) CompactPCI 2.16 Backplane Connector Pinout" table for pin definitions. Refer to the *CompactPCI Hot Swap Specification, PICMG 2.1, R1.0* for more information.

P2 is an un-keyed, 22-row CompactPCI connector. At slots 2-7, P2 buses between 64-bit peripheral cards and P2 at the system slot (slot 8). Refer to the "P2 (at Slots 1-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the *CompactPCI Specification, PICMG 2.0, R3.0* for more information.

P3 is an un-keyed, 19-row, CompactPCI node blade Ethernet connector. At slots 2-7, P3 provides links to P3 at fabric slot 1. P3 at slots 2-7 also provides pins for through-backplane user-definable I/O. Refer to the "P3 (at Slots 2-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the PICMG *CompactPCI Packet Switching Backplane Specification, PICMG 2.16, R1.0* for more information.

P4 at slots 2-7 is a Strawberry Red keyed, 25-row CompactPCI connector providing telephony signal busing among peripheral slots 2-8. Refer to the "P4 (at Slots 2-8) CompactPCI Backplane Connector Pinout" table for pin definitions. Refer to the *CompactPCI Computer Telephony Specification, PICMG 2.5, R1.0* for more information.

P5 is an un-keyed, 22-row CompactPCI connector with staged pins for hot swap. The pins are specified for H.110 RPIO or through-backplane user-definable I/O. The backplane surrounding the P5 connectors is devoid of power planes, ground planes, and other signal routing on the inner and surface layers. See the "P5 (at Slots 2-8) H.110 Backplane Connector Pin Staging" table for pin staging information. Refer to the *CompactPCI Computer Telephony Specification, PICMG 2.5, R1.0* for more information.

Table 9. P4 (at Slots 2-8) CompactPCI Backplane Connector Pinout

Pin#	Z	A	B	C	D	E	F
25	NP	SGA4	SGA3	SGA2	SGA1	SGA0	FGND
24	NP	GA4	GA3	GA2	GA1	GA0	FGND
23	NP	+12V	/CT_Reset	/CT_EN *(S)*	-12V	CT_MC	FGND
22	NP	PFS0#	RSV	RSV	RSV	RSV	FGND
21	NP	-SELVbat *(L)*	PFS1#	RSV	RSV	-SELVbatRtn *(L)*	FGND
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	VRG	NP	NP	NP	VRGRtn	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	-Vbat *(L)*	NP	NP	NP	-VbatRtn *(L)*	NP
14	KEY AREA						
13							
12							
11	NP	CT_D29	CT_D30	CT_D31	V(I/O) *(L)*	/CT_FRAME_A	GND
10	NP	CT_D27	+3.3V	CT_D28	+5V *(L)*	/CT_FRAME_B	GND
9	NP	CT_D24	CT_D25	CT_D26	GND *(L)*	/FR_COMP	GND
8	NP	CT_D21	CT_D22	CT_D23	+5V *(L)*	CT_C8_A	GND
7	NP	CT_D19	+5V	CT_D20	GND *(L)*	CT_C8_B	GND
6	NP	CT_D16	CT_D17	CT_D18	GND *(L)*	CT_NETREF_1	GND
5	NP	CT_D13	CT_D14	CT_D15	+3.3V *(L)*	CT_NETREF_2	GND
4	NP	CT_D11	+5V	CT_D12	+3.3V *(L)*	SCLK	GND
3	NP	CT_D8	CT_D9	CT_D10	GND *(L)*	SCLKx2	GND
2	NP	CT_D4	CT_D5	CT_D6	CT_D7	GND *(L)*	GND
1	NP	CT_D0	+3.3V	CT_D1	CT_D2	CT_D3	GND

NOTES:

NP designates no pin

Designates a low true signal

Pins are medium (Level 2) length except as follows:

(S) designates a short (Level 1) pin length

(L) designates a long (Level 3) pin length

Column F contains long (Level 3) pins

Table 10. P5 (at Slots 2-8) H.110 Backplane Connector Pin Staging

Pin#	Z	A	B	C	D	E	F
22	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
21	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
20	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
19	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
18	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
17	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
16	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
15	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
14	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
13	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
12	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
11	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
10	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
9	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
8	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
7	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
6	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
5	NH	*(S)*	*(S)*	*(S)*	*(S)*	*(S)*	GND *(L)*
4	NH	*(M)*	*(M)*	*(M)*	*(M)*	*(M)*	GND *(L)*
3	NH	*(M)*	*(M)*	*(M)*	*(M)*	*(M)*	GND *(L)*
2	NH	*(M)*	*(M)*	*(M)*	*(M)*	*(M)*	GND *(L)*
1	NH	*(M)*	*(M)*	*(M)*	*(M)*	*(M)*	GND *(L)*

NOTES:

Rows “A” through “E” pins 1-22 are open for user definition

NH designates no hole in backplane

(S) designates a short (Level 1) pin length

(M) designates a medium (Level 2) pin length

(L) designates a long (Level 3) pin length

4.4 Shelf Manager CompactPCI Connectors (Slot 9)

On the front side of the backplane, slot 9 is reserved for the Shelf Manager. P1, P2, and P3 connectors are loaded at slot 9 and are routed to assorted pins across the backplane. See the following P1, P2, and P3 pinout tables for pin definitions. See the "Backplane Connector Locations (Front)" illustration for location information.

Table 11. P1 (at Slot 9) CompactPCI Backplane Connector

Pin #	Z	A	B	C	D	E	F
22	GND	PDEG0#	PDEG2#	GND	PDEG4#	PDEG6#	GND
21	GND	PDEG1#	PDEG3#	IPMB_PWR	PDEG5#	PDEG7#	GND
20	GND	PFAIL0#	PFAIL2#	GND	PFAIL4#	PFAIL6#	GND
19	GND	PFAIL1#	PFAIL3#	IPMB_PWR	PFAIL5#	PFAIL7#	GND
18	GND	PINH0#	PINH2#	GND	PINH4#	PINH6#	GND
17	GND	PINH1#	PINH3#	IPMB_PWR	PINH5#	PINH7#	GND
16	GND	PS_SCL0	PS_SDA0	GND	PRESI#	GA0	GND
15	GND	PS_SCL1	PS_SDA1	RES	FANP0#	FANP2#	GND
14	GND	FT_SCL	FT_SDA	GND	FANP1#	FANP3#	GND
13	GND	CS_SCL	CS_SDA	RES	FANPWM0	FANPWM2	GND
12	GND	CF_SCL0	CF_SDA0	GND	FANPWM1	FANPWM3	GND
11	GND	CF_SCL1	CF_SDA1	RES	FANTK0	FANTK8	GND
10	GND	PI_SCL	PI_SDA	GND	FANTK1	FANTK9	GND
9	GND	AC_SCL	AC_SDA	RES	FANTK2	FANTK10	GND
8	GND	STx	SRx	SRI	FANTK3	FANTK11	GND
7	GND	SCTS	SRTS	SCD	FANTK4	FANTK12	GND
6	GND	SDSR	SDTR	RES	FANTK5	FANTK13	GND
5	GND	RPMAC#	RPMIC#	RES	FANTK6	FANTK14	GND
4	GND	RPCR#	RPMAR#	RPMIR#	FANTK7	FANTK15	GND
3	GND	BP_5V	BP_N12V	BP_12V	BP_3.3V	VIO	GND
2	GND	SwTx+	SwTx-	GND	RpTx+	RpTx-	GND
1	GND	SwRx+	SwRx-	GND	RpRx+	RpRx-	GND

NOTE: # Designates a low true signal

Table 12. P2 (at Slot 9) Connector Pinout

Pin #	Z	A	B	C	D	E	F
11	GND	N_SCL0	N_SDA0	N_SCL9	N_SDA9	N_SCL17	GND
10	GND	N_SCL1	N_SDA1	N_SCL10	N_SDA10	N_SDA17	GND
9	GND	N_SCL2	N_SDA2	N_SCL11	N_SDA11	N_SCL18	GND
8	GND	N_SCL3	N_SDA3	N_SCL12	N_SDA12	N_SDA18	GND
7	GND	N_SCL4	N_SDA4	N_SCL13	N_SDA13	N_SCL19	GND
6	GND	N_SCL5	N_SDA5	N_SCL14	N_SDA14	N_SDA19	GND
5	GND	N_SCL6	N_SDA6	N_SCL15	N_SDA15	N_SCL20	GND
4	GND	N_SCL7	N_SDA7	N_SCL16	N_SDA16	N_SDA20	GND
3	GND	N_SCL8	N_SDA8	GND *(L)*	NGO	HLY#	GND
2	GND	R_SCL	IPMB_PWR	RES	IPMB_PWR *(L)*	HLYI#	GND
1	GND	GND *(L)*	R_SDA	BD_SEL# *(S)*	NGOI	GND *(L)*	GND

NOTES:

Designates a low true signal

Pins are medium (Level 2) length except as follows:

(S) designates a short (Level 1) pin length

(L) designates a long (Level 3) pin length

Table 13. P3 (at Slot 9) Connector Pinout

Pin #	Z	A	B	C	D	E	F
11	GND	N_HLY0#	N_BDS0#	N_HLY9# †	N_BDS9# †	N_HLY17# †	GND
10	GND	N_HLY1#	N_BDS1#	N_HLY10# †	N_BDS10# †	N_BDS17# †	GND
9	GND	N_HLY2#	N_BDS2#	N_HLY11# †	N_BDS11# †	N_HLY18# †	GND
8	GND	N_HLY3#	N_BDS3#	N_HLY12# †	N_BDS12# †	N_BDS18# †	GND
7	GND	N_HLY4#	N_BDS4#	N_HLY13# †	N_BDS13# †	N_HLY19# †	GND
6	GND	N_HLY5#	N_BDS5#	N_HLY14# †	N_BDS14# †	N_BDS19# †	GND
5	GND	N_HLY6#	N_BDS6#	N_HLY15# †	N_BDS15# †	N_HLY20# †	GND
4	GND	N_HLY7#	N_BDS7#	N_HLY16# †	N_BDS16# †	N_BDS20# †	GND
3	GND	N_HLY8# †	N_BDS8# †	IPMB_PWR	PIMP0# †	ACCMP# †	GND
2	GND	PIMH0 †	GND	RES †	GND	RES †	GND
1	GND	IPMB_PWR	PIMH1 †	PRES# †	PIMP1# †	IPMB_PWR	GND

NOTES:

Designates a low true signal

† Not connected

4.5 J1, J2, and J3 Power Supply Connectors

J1, J2, and J3 are 47-pin modular power supply connectors. Up to three AC or DC input, 325W power supplies can be plugged into the front side of the ZT 5091's backplane. See the following "J1, J2, and J3 Power Supply Connector Pinout" table for pin definitions. See the "Backplane Connector Locations (Front)" illustration for location information.

Warning: The ZT 5091*e* is configured for either AC or DC input. The system's power input configuration (AC or DC) must match the power supply input voltage (AC or DC). **DO NOT INSTALL A DC INPUT POWER SUPPLY IN A ZT 5091*e* CONFIGURED FOR AC INPUT.**

Table 14. J1, J2, and J3 Power Supply Connector Pinout

Pin#	Staging	Name	Function
1-4	M	V1	V1 Output (VCC, +5V)
5-12	M	RTN	V1 and V2 Return (GND)
13-18	M	V2	V2 Output (+3.3V)
19	M	RTN	V3 Return (GND)
20	M	V3	V3 Output (+12V)
21	M	V4	V4 Output (-12V)
22	M	RTN	Signal Return (GND)
23	M	RSV †	Reserved
24	M	RTN	V4 Return (GND)
25	M	GA0	Geographic Address Bit 0
26	M	RSV †	Reserved
27	S	EN#	Enable (Grounded)
28	M	GA1	Geographic Address Bit 1
29	M	V1ADJ †	V1 Adjust
30	M	V1 SENSE	V1 Remote Sense 5V
31	M	GA2	Geographic Address Bit 2
32	M	V2ADJ †	V2 Adjust
33	M	V2 SENSE	V2 Remote Sense 3.3V
34	M	S RTN	Sense Return
35	M	V1 SHARE	V1 Current Share
36	M	V3 SENSE	V3 Remote Sense +12V
37	M	IPMB_SCL	Reserved for System Management Bus
38	M	DEG#	Degrade Signal
39	M	INH#	Inhibit (to Logic Power Switch)
40	M	IPMB_SDA	Reserved for System Management Bus
41	M	V2 SHARE	V2 Current Share
42	M	FAL#	Fail Signal
43	M	IPMB_PWR	Reserved for System Management Bus
44	M	V3 SHARE	V3 Current Share
45	L	CGND	Chassis Ground (safety ground)
46	M	ACN/+DC IN	AC Input – Neutral; +DC Input
47	M	ACL/-DC IN	AC Input – Line; -DC Input

Notes:

L designates a "long length" pin; M designates a "medium length" pin; S designates a "short length" pin

† Not connected

4.6 J4, J5, and J6 Power Taps

These three screw-down terminals, located on the rear of the backplane, allow connection of external power to the system power supplies. They supply line-level AC to the system power supplies if the external power source is AC, and line-level DC if the external power source is DC.

See the following "J4, J5, and J6 Power Taps" table for pin definitions. See the "Backplane Connector Locations (Rear)" illustration for location information.

Table 15. J4, J5, and J6 Power Taps

Connector	Function
J4	AC Line/ -48VDC
J5	AC Neutral/ -48V RTN DC
J6	Earth Ground

4.7 J9 Power Supply Logic On/Off

This 2-pin connector, located on the rear of the backplane, can “logically” turn the power supplies on and off by applying a ground through a group of three diodes, each connected to the INH# signal of a power supply.

See the "Backplane Connector Locations (Rear)" illustration for location information.

4.8 J10, J11, and J12 V(I/O) Selection

The ZT 5091*e* can be configured for use with 5V or 3.3V CompactPCI cards. On the rear of the backplane, connections to these three screw-down terminals determine V(I/O) for the CompactPCI connectors. See the "Backplane Connector Locations (Rear)" illustration for location information.

- For 5V operation (default setting), connect terminals J10 and J11 with the jumper/bus bar; do not connect J12.
- For 3.3 V operation, connect terminals J11 and J12 with the jumper/bus bar; do not connect J10.

See the "Setting V(I/O)" topic for additional location and setup information.

Be aware that CompactPCI connectors may be keyed for use in either 5V or 3.3V systems. A 3.3V blade (with a yellow key) will not insert into a 5V backplane (with a blue key). Since the ZT 5091’s backplane is configured for use with 5V blades, the jumper *and* the CompactPCI keys must be changed for 3.3V use.

4.9 J13 IDE/Floppy Drive Power Connector

The ZT 5091*e* system includes a power connector for an external IDE device, such as a CD-ROM drive, or a floppy drive. The device's power cable is connected to J13 at the rear of the backplane. See the "J13 IDE/Floppy Drive Power Connector Pinout" table for pin definitions. See the "Backplane Connector Locations (Rear)" illustration for location information.

Table 16. J13 IDE/Floppy Drive Power Connector Pinout

Pin#	Name
1	+12V
2	GND
3	GND
4	Vcc

4.10 J14 Fan Connector

The ZT 5091*e* system features an integrated fan tray. The fans (blowers) are cabled to connector J14 at the rear of the backplane. See the "J14 Fan Connector Pinout" table for pin definitions. See the "Backplane Connector Locations (Rear)" illustration for location information.

Table 17. J14 Fan Connector Pinout

Pin#	Name	Pin#	Name
1	FANTK0	2	FT_SCL
3	FANTK1	4	FT_SDA
5	FANTK2	6	FANPWMO
7	12V	8	12V
9	12V	10	FANPO
11	GND	12	GND
13	IPMB_PWR	14	GND

4.11 J15-J17 IPMB Power Plane

The ZT 5091*e* is configured to provide IPMB power for the SM. On the rear of the backplane, three screw-down terminals allow the IPMB power plane to be strapped to VCC. Set for 5V IPMB operation (default setting) as follows:

Connect terminals J16 and J17 with the jumper/bus bar ***or*** remove the jumper/bus bar from terminals J16 and J17 and connect a remote IPMB power source to J17 and ground to J15.

See the "Backplane Connector Locations (Rear)" illustration for location information.

4.12 J21-J28 (BD_SEL# Signals)

Eight standard, two-post jumper locations (J21-J28) allow assertion of BD_SEL# to slots 1-8 in the absence of an SM. Systems operating without an SM must have jumpers installed in all eight locations. See the “Backplane Connector Locations (Front)" illustration for location information.

Systems operating with an SM should have jumpers removed from all eight locations. The factory default configuration does not install jumpers in these locations. See the “BD_SEL# Signals” topic in Section 2 for more information.

4.13 J29 (Reserved)

This standard two-post jumper is reserved for future use by Performance Technologies.

4.14 U1-U8 Two-Wire Thermometers

Two-wire thermometers (DS75S) are loaded at U1-U8 on the front side of the ZT 5091’s backplane. Temperature data is used by the SM to monitor system performance. See the “Thermal” topic in Section 7 for more information on the DS75S. The following “U1-U8 Two-Wire Thermometer Locations” table lists the thermometers and their signals. See the "Backplane Connector Locations (Front)" illustration for location information.

Table 18. U1-U8 Two-Wire Thermometer Locations

Slot Number	Device	Signal
1	U1	SENSOR 0
2	U2	SENSOR 1
3	U3	SENSOR 2
4	U4	SENSOR3
5	U5	SENSOR 4
6	U6	SENSOR 5
7	U7	SENSOR 6
8	U8	SENSOR 7

4.15 U9 System ID and Information

U9 is a socket on the rear of the midplane containing an EEPROM with the ZT 5091's system ID, serial #, and manufacturing date.

See the "Backplane Connector Locations (Rear)" illustration for location information.

4.16 Logic Ground Isolation Capacitors

Logic ground can be isolated or connected to earth ground. Install capacitors C277-C285 on the rear of the backplane to isolate logic ground. Remove C277-C285 and install 0603-style zero ohm resistors to tie logic ground to earth ground. See the "Logic Ground Isolation Capacitor Locations" figure. The factory default configuration installs C277-C285.

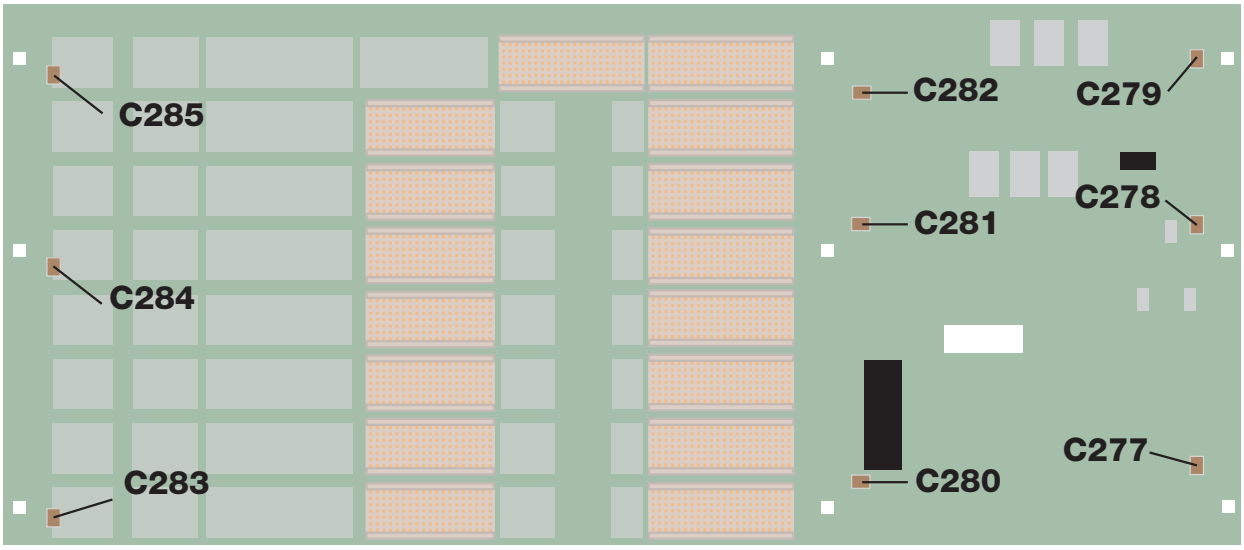

Figure 18. Logic Ground Isolation Capacitor Locations (Rear)

4.17 Cuttable Traces

CT1-CT5 (H.110 Bus Shelf Enumeration)

The H.110 bus is provided with a set of cuttable traces (CT1-CT5) that allow it to be set with a unique shelf enumeration address (self geographic address). 0 Ω resistors are pre-installed as indicated in the “CT1-CT5 (H.110 Bus Shelf Enumeration)” table, resulting in an address of 001.

The "Cuttable Trace Locations (Rear)" illustration shows the location of the cuttable traces.

Table 19. CT1-CT5 (H.110 Bus Shelf Enumeration)

CT	Address	Default
1	SGA0	Out
2	SGA1	In
3	SGA2	In
4	SGA3	In
5	SGA4	In

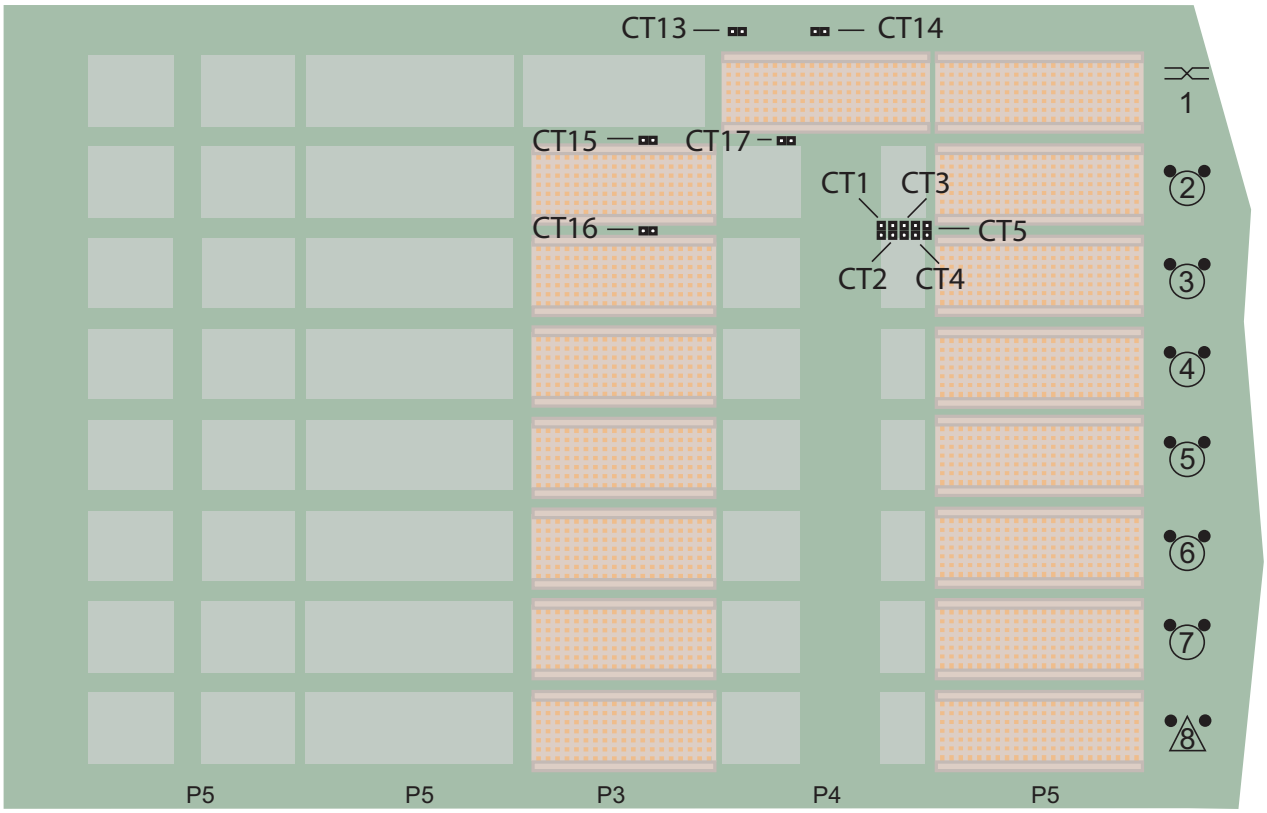

Figure 19. Cuttable Trace Locations (Rear)

CT13-CT17 (Fabric Slot Shelf Enumeration)

Cuttable traces CT13-CT17 allow the ZT 5091*e* 2.16 fabric slot to be assigned a unique shelf enumeration address for use with other 2.16-compliant systems. 0 Ω resistors are pre-installed as indicated in the “CT13-CT17 (Fabric Slot Shelf Enumeration)” table, resulting in an address of 001.

The "Cuttable Trace Locations (Rear)" illustration shows the location of the cuttable traces.

Table 20. CT13-CT17 (Fabric Slot Shelf Enumeration)

CT	Address	Default
13	SGA0	Out
14	SGA1	In
15	SGA2	In
16	SGA3	In
17	SGA4	In

Section

5 Specifications

This section describes the electrical, environmental, and mechanical specifications of the ZT 5091's enclosure and backplane.

5.1 Electrical Specifications

The ZT 5091's configuration options allow either an AC or DC power input panel.

AC input voltage: 100-240 VAC continuous, 50-60 Hz, 2.5-5.7A

DC input voltage: -36 to -60 VDC, 8-15A

Fan voltage: 12 VDC

Warning: The ZT 5091*e* is configured for either AC or DC input. The system's power input configuration (AC or DC) must match the power supply input voltage (AC or DC). **DO NOT INSTALL A DC INPUT POWER SUPPLY IN A ZT 5091*e* CONFIGURED FOR AC INPUT.**

The following telecom voltages are bused through P4 connectors on slots 2-7 (see the *CompactPCI Computer Telephony Specification, PICMG 2.5, Version 1.0* for more information):

- **-Vbat** – telecom power source
- **-VbatRtn** – telecom power source return
- **-SELVbat** – short loop battery
- **-SELVbatRtn** – short loop battery return
- **VRG** – bused ringing voltage source
- **VRGRtn** – bused ringing voltage return

The ZT 5091*e* incorporates a universal backplane and can be jumpered to provide either 5V or 3.3V to the CompactPCI slots. See the "Setting V(I/O)" topic in Section 2 for information on changing V(I/O).

IPMB Power can be tied to V(I/O) or to a remote power supply. See the "Setting IPMB Power" topic in Section 2 for information on connecting IPMB Power to a remote power supply.

5.2 Environmental Specifications

The ZT 5091*e* platform (enclosure, fan tray, and backplane) is designed for harsh environments. The platform features sturdy steel and aluminum construction with a corrosion resistant finish.

- Min. Operating Temperature: 10° C
- Max. Operating Temperature: two power supplies, 400W total = 40° C
  three power supplies (n+1), 400W total = 25° C
  three power supplies (n+1), 280W total = 40° C
- Storage Temperature: -40° C to 70° C
- Non-Condensing Relative Humidity: 5% to 90%
- Cooling: 200LFM/slot
- Fan MTBF: 50,000 hrs (at 65º C)
- Operating Shock: 10 G per ASTM 0775
- Non-Operating Vibration: 5 to 300 Hz at 1.03 Gs
- Operating Vibration: 16 to 200 Hz at 0.25 G

Due to the modular construction of the system, components could be added that change the system's environmental constraints. Board-level components and power supply modules have their own operating temperature ratings. Refer to component-specific product manuals for operational details that may affect system performance.

5.3 Mechanical Specifications

The ZT 5091*e* is a 4U, 8-slot platform designed to fit standard 19" EIA racks. The system's mounting flanges may be positioned for front- or mid-mounting. The ZT 5091*e* accommodates IEEE 1101.10-compliant CompactPCI blades and IEEE1101.11-compliant RTMs. The RTMs allow I/O connection to the rear of the enclosure using 80 mm deep, plug-in cards.

Chassis Dimensions

Height: 6.94" (176 mm)

Width: 19.00" (483 mm), 17.20" (437 mm) excluding mounting flanges

Depth: 12.20" (310 mm)

Weight: 22 lbs. (10 kg) including chassis, backplane, and fan tray

Card slots are located on 0.8" (20.32 mm) centers.

See the "Chassis Dimensions" figure below for mounting dimensions.

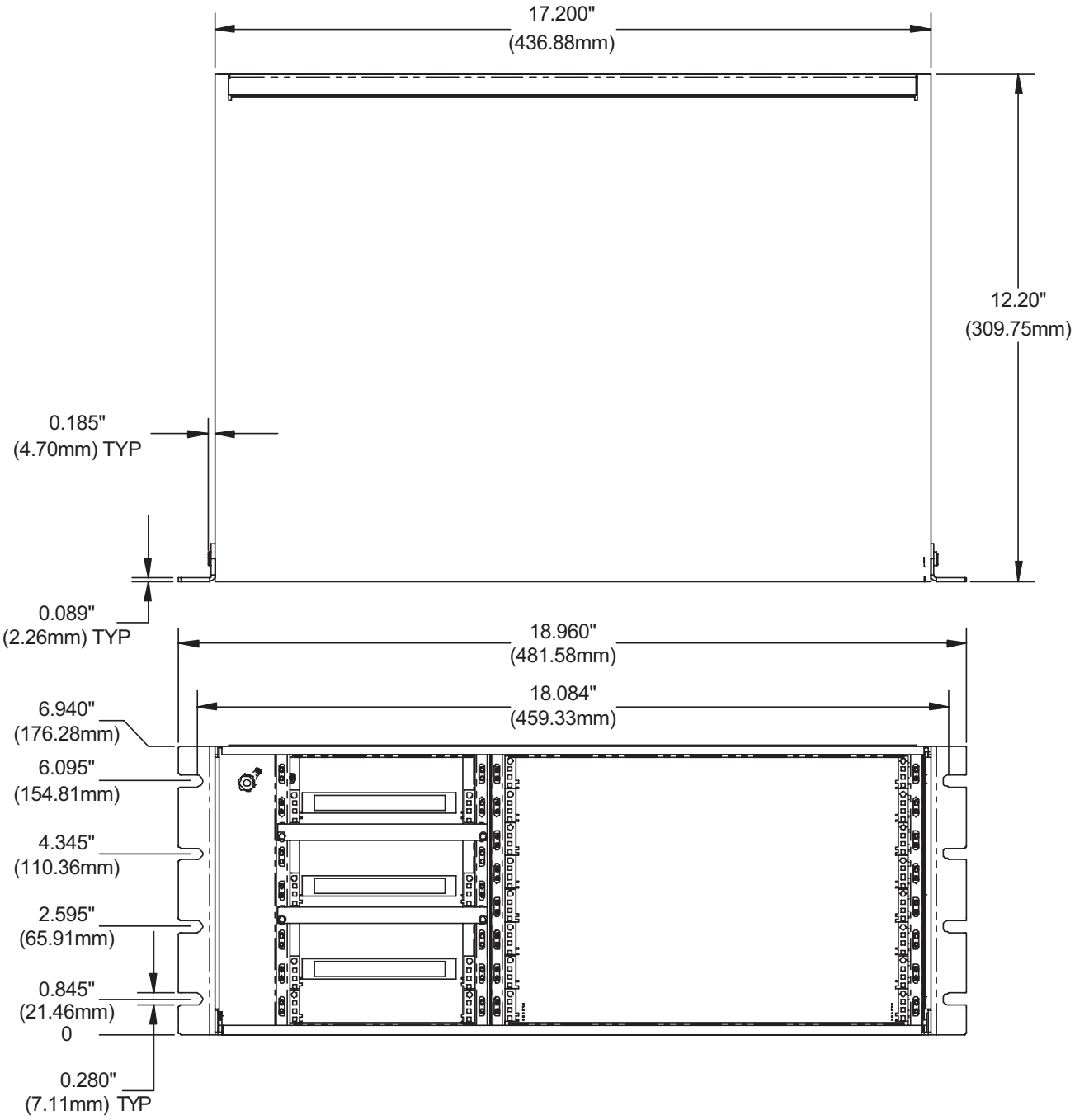

Figure 20. Chassis Dimensions

Backplane Connectors and Devices

See Section 4, “Backplane Connectors” for connector locations drawings, descriptions, and pinout tables.

Section
6

Power Supplies and Hot Swap Circuitry

Performance Technologies' hot swap products are essentially electrically isolated from the backplane when installed or removed. This prevents transients from corrupting backplane communication when a product is installed or removed while the system is operating.

When blades are powering up, this circuit monitors the power supply voltages available. Until the proper voltages are present, the blade will not power up. This creates a concern when using power supplies that require a minimum load to start up.

6.1 The Power Supply Perspective

Power supplies typically have two minimum load requirements for the primary output to operate properly:

- The minimum start-up load requirement (typically 100-200mA).
- The minimum regulation load requirement. This requirement must be met to guarantee that the power supply's auxiliary outputs regulate properly when fully loaded, even if the primary output is not fully loaded. This is typically specified as 10% of the maximum output capability of the primary output.

In a pure hot swap system, the power supply essentially sees no load even after the input power to the system is applied because the hot swap circuitry remains disabled until the voltage levels reach the appropriate value. The power supply never generates the proper voltage until it sees a load. They both wait for each other and the system never powers up.

When configuring a pure hot swap system, minimum start up loads for the power supply must be considered. This can be accomplished in a number of ways. The most direct solution is to include a simple power resistor in the system to provide the start up load necessary for the supply.

6.2 Performance Technologies Power Supplies

The power supplies that Performance Technologies currently provides have a minimum start up load and a minimum guaranteed regulation load:

- Start up load: +5 V @ 100 mA
- Regulation: +5 V @ 2.5 A

These requirements should be met for EACH SUPPLY in the system. In a hot swap system with three power supplies, a *minimum* load of 300 mA on the +5V output must be present to guarantee that the power supplies start up properly.

Section 7

Data Sheet Reference

This section provides links to data sheets, standards, and specifications for the technology designed into the blades in your system.

7.1 CompactPCI

Current CompactPCI Specifications can be purchased from PICMG (PCI Industrial Computers Manufacturers Group) for a nominal fee. Short form specifications in Adobe Acrobat format (PDF) are also available on PICMG's website at:

http://www.picmg.org/

7.2 Thermal

Refer to the Dallas Semiconductor *DS75 2-Wire Thermal Watchdog* data sheet for more information about the DS75 device. The data sheet is in Adobe Acrobat format (PDF) and is available online at:

http://www.maxim-ic.com/index.cfm

7.3 User Documentation

The latest product information and manuals are available on the Performance Technologies website at http://www.pt.com. Refer to the following manuals and Technical Product Specifications for more information about the components that may be in your system.

- ZT 5504*e* System Master Processor Board hardware manual
- ZT 5524*e* System Master Processor Board hardware manual
- ZT 4807*e* Rear Panel Transition Board hardware manual
- ZT 4808 Packet Switched Rear Panel Transition Board hardware manual
- CPC44xx Ethernet Switching Platform User's and System Integrator's Guide
- CPC5400 PICMG 2.16® Gb Ethernet Switch Product Specification
- CPC66xx PICMG 2.16® Gb Ethernet Switch Product Specification
- IPnexus™ CPC7301 Intelligent Shelf Manager hardware manual
- IPnexus™ CPC7301 Intelligent Shelf Manager software manual
- Performance Technologies Embedded BIOS software manual
- Performance Technologies Hot Swap Kit for Windows® 2000 software manual

Section

8 Agency Approvals

Performance Technologies' platforms have been demonstrated to show compliance with mandatory U.S. and international electromagnetic compatibility standards with all chassis slots either filled with compliant devices or covered by blank filler panels. In order to maintain this compliance, it is **mandatory** that all unused slots be filled with blank filler panels or compliant devices.

Use CompactPCI industry standard blank filler panels with EMI gaskets. Blank filler panels may be purchased from Performance Technologies (refer to "Installing the System" in Section 2 for part numbers).

8.1 CE Certification

The ZT 5091*e* meets intent of Directive 89/336/EEC for Electromagnetic Compatibility and Low-Voltage Directive 73/23/EEC for Product Safety. The ZT 5091*e* has been designed for NEBS/ETSI compliance.

8.2 Safety

UL/cUL 60950	Safety for Information Technology Equipment (UL File # E179737)
EN/IEC 60950	Safety for Information Technology Equipment
CB Report Scheme	CB certificate and Report

8.3 Emissions Test Regulations

FCC Part 15, Subpart B

EN 55022

CISPR 22

Bellcore GR-1089

EN 50081-1 Emissions

GR-1089-CORE	Sections 2 and 3
EN 55022	Class A Radiated
EN 55022	Power Line Conducted Emissions

EN 61000-3-2	Power Line Harmonic Emissions
EN 61000-3-3	Power line Fluctuation and Flicker

EN 55024 Immunity

GR-1089-CORE	Sections 2 and 3
EN 61000 4-2	Electro-Static Discharge (ESD)
EN 61000 4-3	Radiated Susceptibility
EN 61000 4-4	Electrical Fast Transient Burst
EN 61000 4-5	Power Line Surge
EN 61000 4-6	Frequency Magnetic Fields
EN 61000 4-11	Voltage dips, Variations, and Short Interruptions

8.4 Regulatory Information

FCC (USA)

This product has been designed to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Caution: If you make any modification to the equipment not expressly approved by Performance Technologies, you could void your authority to operate the equipment.

Industry Canada (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

8.5 Product Safety Information

Review the following precautions to avoid injury and prevent damage to this product, or any products to which it is connected. To avoid potential hazards, use the product only as specified.

Read all safety information provided in the component product user manuals and understand the precautions associated with safety symbols, written warnings, and cautions before accessing parts or locations within the unit. Save this document for future reference.

Caution: To Avoid Electric Overload: To avoid electrical hazards (heat shock and/or fire hazard), do not make connections to terminals outside the range specified for that terminal. See the product user manual for correct connections.

Caution: To Avoid the Risk of Electric Shock: When supplying power to the system, always make connections to a grounded main. Always use a power cable with a grounded plug (third grounding pin). Do not operate in wet, damp, or condensing conditions.

Caution: System Airflow Requirements: Platform components such as Single Board Computers, Ethernet Switches, etc., are designed to operate with external airflow. Components can be destroyed if they are operated without external airflow. External airflow is normally provided by chassis fans when components are installed in compatible chassis. Filler panels must be installed over unused chassis slots so that airflow requirements are met. Please refer to the product data sheet for airflow requirements if you are installing components in custom chassis.

Caution: Microprocessor Heatsinks May Become Hot During Normal Operation: To avoid burns, do not allow anything to touch processor heatsinks.

Caution: Do Not Operate Without Covers: To avoid electric shock or fire hazard, do not operate this product with any removed enclosure covers or panels.

Caution: To Avoid the Risk of Electric Shock: Do not operate in wet, damp, or condensing conditions.

Caution: Do Not Operate in an Explosive Atmosphere: To avoid injury, fire hazard, or explosion, do not operate this product in an explosive atmosphere.

Caution: If Your System Has Multiple Power Supply Sources: Disconnect all external power connections before servicing.

Warning: Power Supplies Must Be Replaced by Qualified Service Personnel Only.

Caution: Lithium Batteries Are Not Field-Replaceable Units: There is a danger of explosion if a battery is incorrectly replaced or handled. Do not disassemble or recharge the battery. Do not dispose of the battery in fire. When the battery is replaced, the same type or an

equivalent type recommended by the manufacturer must be used. Used batteries must be disposed of according to the manufacturer's instructions. Return the unit to Performance Technologies for battery service.

AC and/or DC Power Safety Warning (AC and/or DC Powered Units)

The AC and/or DC power cord is your unit's main AC and/or DC disconnecting device, and must be easily accessible at all times. Auxiliary AC and/or DC On/Off switches and/or circuit breaker switches are for power control functions only (NOT THE MAIN DISCONNECT).

For your safety, use only a power cord with a grounded plug. The enclosure is also provided with a separate earth ground connection/stud. The earth ground connection should be installed prior to the application of power or peripheral connections and should never be disconnected while power or peripheral connections exist.

To reduce the possibility of electric shock from a telephone or Ethernet system, plug your enclosure into the power source before making these connects. Disconnect these connections before unplugging your enclosure from the power source.

Warning: Verify Power Cord and Outlet Compatibility. Check to ensure you are using the appropriate power cords for your power outlet configurations. Visit the following website for additional information: http://kropla.com/electric2.htm.

Rack Mount Enclosure Safety

Your enclosure may be intended for stationary rack mounting. Mount in a rack designed to meet the physical strength requirements of NEBS GR-63-CORE and NEBS GR 487. Your system may have multiple power sources. Disconnect all power sources and external connections/cables prior to installing or removing your system from a rack frame.

Prior to mounting, Performance Technologies recommends you remove all hot-swappable equipment for optimum weight reduction. Be sure to mount your system in a way that ensures even loading of the rack. Uneven mechanical loading of weight can result in a hazardous condition. Secure all mounting bolts when installing the enclosure to the frame/rack.

Caution: Avoid Electric Overload. To avoid electric shock or fire hazard, only connect your system to an input voltage source as specified in the product user manual.

Section

9 In Case of Difficulty

If you encounter difficulty in using this Performance Technologies product, you can contact our support personnel in several ways. Please have the product model and serial number handy before contacting Product Support.

Internet

www.pt.com

Email

support@pt.com

Describe your problem in detail. Please include your return email address and telephone number.

FAX

(805) 541-5088

Mark your FAX “Attention: Product Support.” Describe your problem in detail. Please include your return FAX number and telephone number.

Telephone

(805) 541-0488

Request Product Support: Our offices are open between 8:00 am and 5:00 pm Pacific Time, Monday through Friday.

If you are located outside North America, we encourage you to contact the local Performance Technologies distributor or agent for support. Many of our distributors or agents maintain technical support staffs.

Performance Technologies
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San Luis Obispo, CA 93401 USA