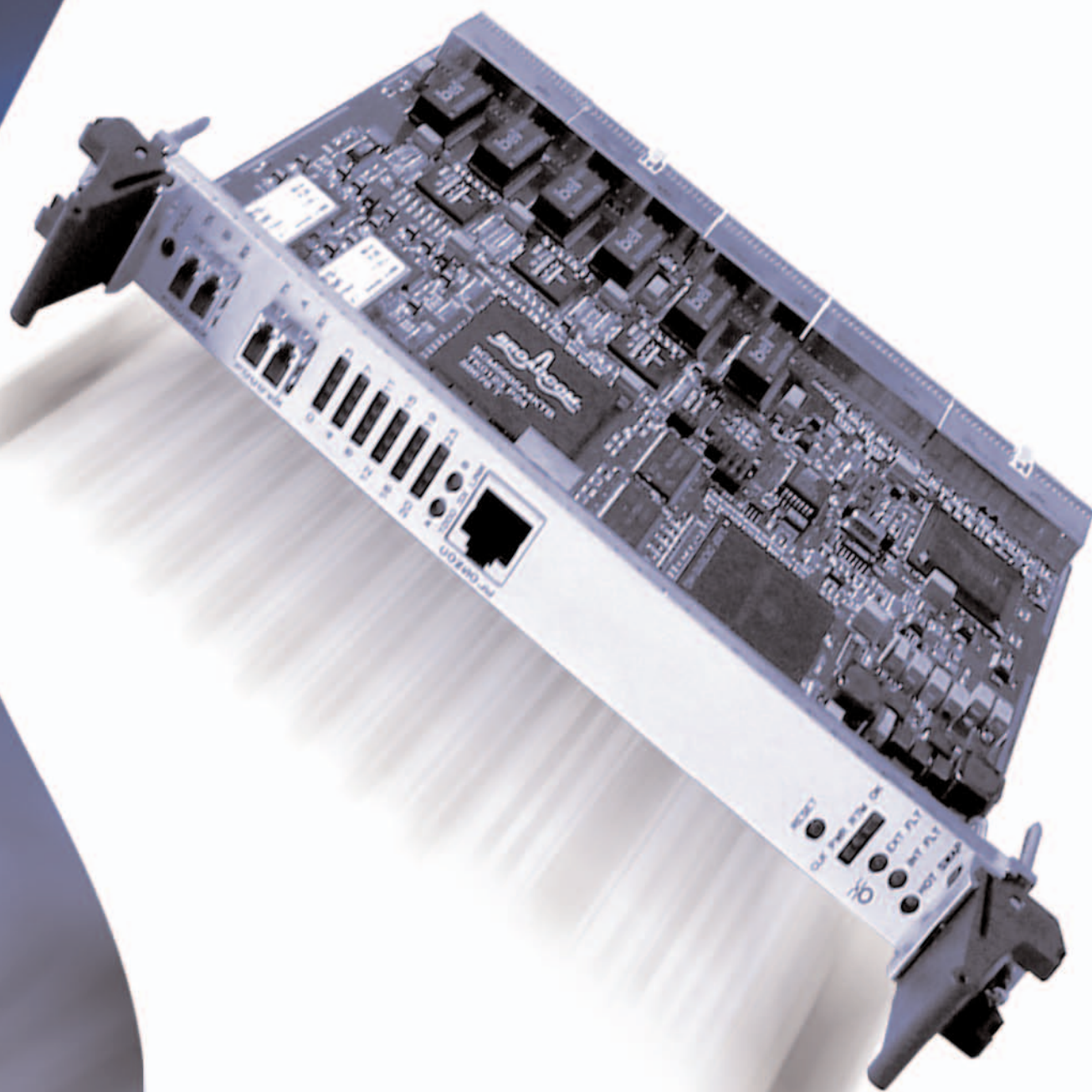


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# *ZX4500P Product Specification*

*10/100/1000  
CompactPCI Packet Switching Backplane Ethernet Switch*

IP MANAGED BY  
**OPENARCHITECT**

DESIGNED FOR  
**NEBS**  
LEVEL 3  
SYSTEMS



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## Main Features

### Powerful, Out-of-Box Embedded Switching

- 6U PICMG 2.16 CPSB Fabric/Node Compliant
- Two Gigabit Ethernet ports
- 24 10/100 Ethernet ports
- Line rate switching of up to 9 Gbps
- 6.6 million packets per second

### Fully-Managed with OpenArchitect Software

- Includes all standard networking protocols
- Routing
- Network services
- IP multicast
- Quality and class of service
- Network management

### Extensible for Value-Added OEM Solutions

- Provides complete Linux environment
- Supports new or custom IP policies
- Uses existing Linux networking applications with little or no modification

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## 1.0 Overview

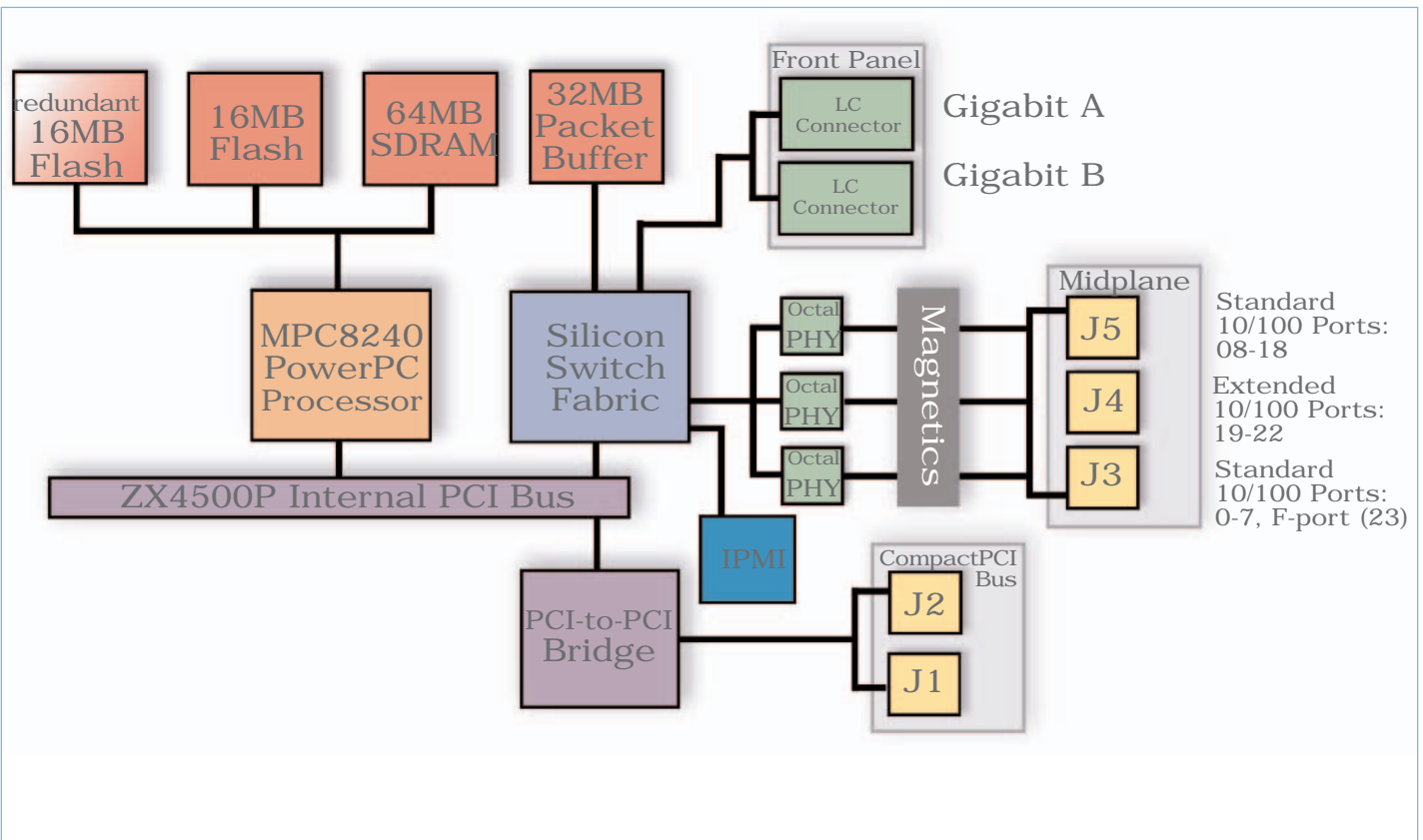
The ZX4500P with OpenArchitect is an extensible managed switch for embedded high-availability Ethernet in CarrierClass™ telecommunications systems using the CompactPCI Packet Switching Backplane (CPSB) chassis. The 6U switch provides Layer 2 switching and Layer 3 IP routing, at line-rate, plus Layer 4-7 packet classification and filtering. The switch's fully integrated OpenArchitect management software environment provides comprehensive IP routine services "out-of-the-box" plus the capability to add new or custom routing, control and management policies. The switch also provides remote manageability with Intelligent Platform Management Interface (IPMI), extensive SNMP protocols, and COPS for Remote Provisioning. The ZX4500P with OpenArchitect combines the performance of a silicon-

based switching fabric with flexibility of software-managed routing policies.

Telecommunication, Datacenter and Enterprise OEMs and integrators use the ZX4500P to create an embedded high-availability Ethernet network within a chassis. The ZX4500P provides all the standard protocols for general routing, network services, IP multicasting, quality and class of service and network management. OEMs and integrators can use the extensibility of the OpenArchitect software to create proprietary value-add services.

This document provides specifications for the ZX4500P hardware. A separate document, the OpenArchitect Product Specification, provides a detailed description of the management software environment.

Diagram 2-1 ZX4500P Hardware Logic Schematic





## 1.1 CompactPCI Packet Switching Backplane

The PICMG 2.16 CompactPCI Packet Switching Backplane (CPSB) specification defines the next generation telco chassis - including an embedded Ethernet environment. CPSB uses switched Ethernet for fast, high availability communications between all boards plugged in the chassis backplane. CPSB technology allows single-chassis integration of subsystems using virtually any operating system or driver. The subsystem boards are treated as objects; the common interface is Internet Protocol (IP). The performance of inter-board communications with embedded Ethernet is superior to the traditional shared PCI bus in a standard CompactPCI chassis. A CPSB chassis supports high-speed switched 10/100/1000 Ethernet connectivity to all system components embedded in chassis fabric and node slots. The dual-star configuration of CPSB enables full redundancy for high availability switching solutions built with the industry's most popular communication protocols and standards.

## 2.0 Product Description

The ZX4500P with OpenArchitect is the combination of a powerful hardware platform and a sophisticated management software environment. The hardware platform - a 6U CompactPCI/CPSB fabric card -- provides a complete 24 10/100 and two Gigabit Ethernet switching subsystem that performs all switching on silicon with line-rate throughput of up to 6.6 million packets-per-second. It also provides a complete microprocessor unit.

OpenArchitect is a sophisticated software suite for switch management. This management software platform implements numerous routing policies "out-of-the-box." OpenArchitect is also an extensible development environment supporting the creation of new value-added policies.

### 2.1 Hardware

The ZX4500P is a 6U CompactPCI/CPSB fabric board, designed for any fabric/node slot of a CPSB system chassis compliant with the PCI Industrial Computer Manufacturers Group (PICMG) 2.16 standard. The sin-

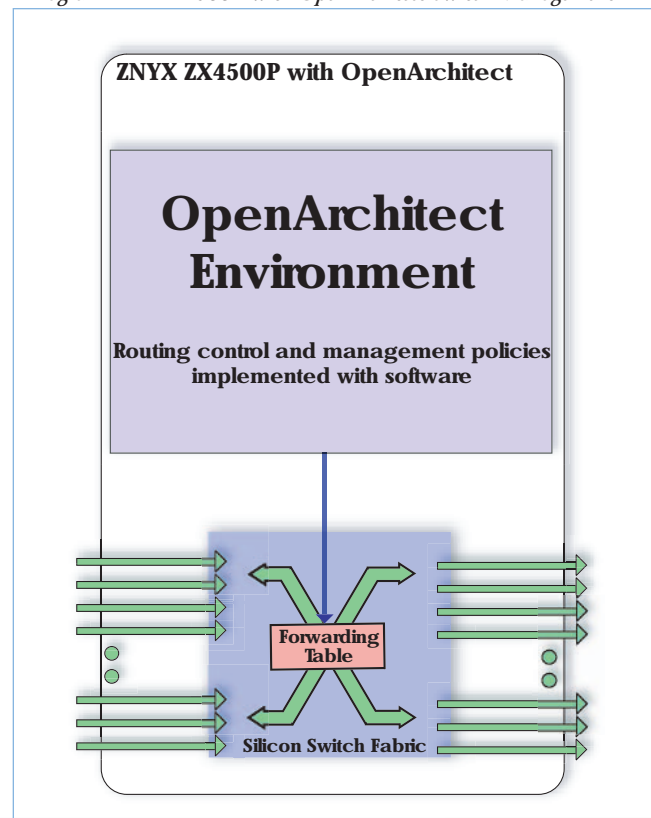
gle-board assembly includes the switch fabric, buffer memory, Ethernet PHY devices, LC-style Gigabit Ethernet transceivers, MPC8240 embedded processor with RAM and Flash ROM, PCI-PCI Bridge, DC-DC power supplies and HotSwap circuitry. The bracket assembly provides visibility for all user-accessed LEDs, and provides required gasket seals for RFI emission/immunity requirements.

One of several Rear Transition Boards (RTBs; see sections 5.5, 11.2) is required for pulling unused Ethernet ports, to the rear panel.

### 2.1.1 CPSB Chassis Options (Standard and Extended Mode)

The ZX4500P with OpenArchitect works in both standard and extended mode CPSB chassis. Standard mode includes two switch fabric slots and up to 19 application node slots. Extended mode CPSB, an extension of the PICMG 2.16 standard, increases I/O capabilities to 23 node slots.

Diagram 2-2 ZX4500P with OpenArchitect Switch Management



### **2.1.2 CPSB Slot Options**

The ZX4500P with OpenArchitect works in all CPSB slots, including the two switch fabric slots and all node slots.

When used in the fabric slots, the ZX4500P routes inter-board communication across the CPSB backplane for up to 23 expansion boards. The 24th Ethernet port is used by the ZX4500P to broadcast switch health to the redundant switch for high availability operations.

When used in a node slot, the ZX4500P provides additional external Ethernet to the CPSB chassis. Up to 22 external Ethernet ports can be added per ZX4500P, with the remaining two ports available for communication across the CPSB backplane.

Note: H.110 backplanes are incompatible with the ZX4500P

### **2.1.3 Hardware Features at a Glance**

- 6U PICMG 2.16 CompactPCI Packet Switching Backplane
- Two Gigabit Ethernet ports (LC Connector)
- 24 10/100 Ethernet ports for backplane or external use
- 6.6 million packets-per-second throughput
- IPMI (Intelligent Platform Management Interface)
- 8K L2 Ethernet switch table
- 2K L3 IP switch table
- 127-entry L2-7 packet switch table
- Layer 2-7 packet classification
- 32MB packet buffer memory
- OpenArchitect open-systems protocol and management
- PowerPC 603e RISC 200MHz with 64MB SDRAM
- 32MB FlashROM
- 512KB Boot FlashROM
- PCI-PCI bridge to host
- Full PICMG 2.1 HotSwap compliant (Blue HotSwap LED)
- CORE-2914 LED
- INT Fault LED
- EXT Fault LED
- CLK LED
- Link/Status LED per channel

- Power OK LED
- RTB-present LED

### **2.2 Software**

The OpenArchitect management software component - Linux, IP protocol stack, control applications and the OA Engine -- runs on the embedded microprocessor. OpenArchitect provides support for extensive routing policies (RIP, OSPF, BGP, etc.), link management protocols such as Spanning tree, traffic management protocols (VLAN, QoS, etc.) and high availability functionality (VRRP, fast fail-over, etc.). OpenArchitect enables rapid porting of other UNIX/Linux-based protocols, including open source RFCs. It also enables the development of application-specific routing programs.

The OA Engine is the bridge between the software environment and high performance switch fabric. The engine transparently moves routing policies established by software to the switch fabric's forwarding table. This bridge enables line rate packet switching, executed on a silicon switch fabric chip, that is managed by open source routing protocols -- a quick time-to-market, feature-rich protocol set.

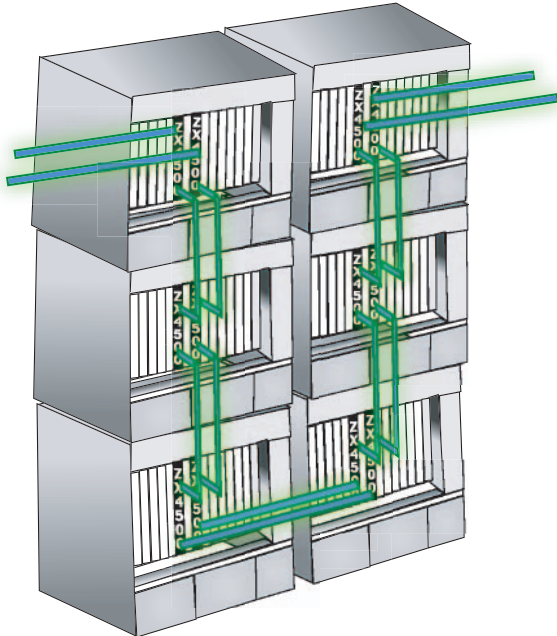
#### **2.2.1 Intelligent Platform Management Interface**

The ZX4500P with OpenArchitect supports the new PICMG 2.9 standard that is based on the Intelligent Platform Management Interface (IPMI) manageability standard, which defines message-based interfaces for monitoring the physical health characteristics of devices. The switch will provide operational status information to an IPMI management application. End customers benefit with advanced notice of potential problems.

### 3.0 Applications

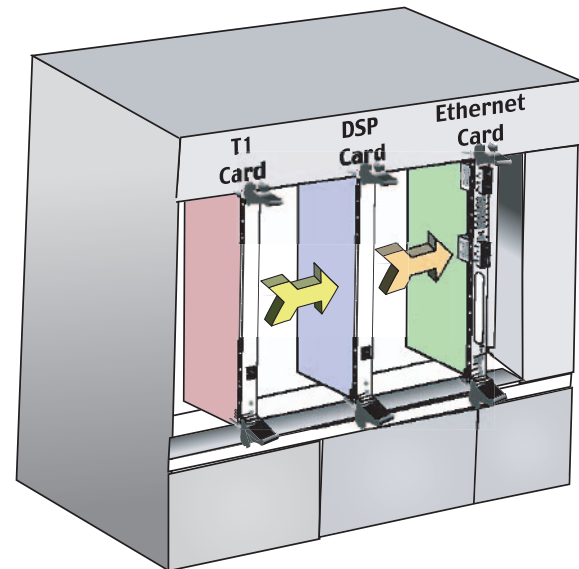
#### 3.1 Central office

New central office telco systems often use Ethernet for connectivity. The high-density ZX4500P switching subsystem integrates with OAM&P infrastructure. Multiple ZX4500Ps can create fault-tolerant solutions. The switch can interconnect chassis and racks, and also provides a gigabit "uplink" to the Internet.



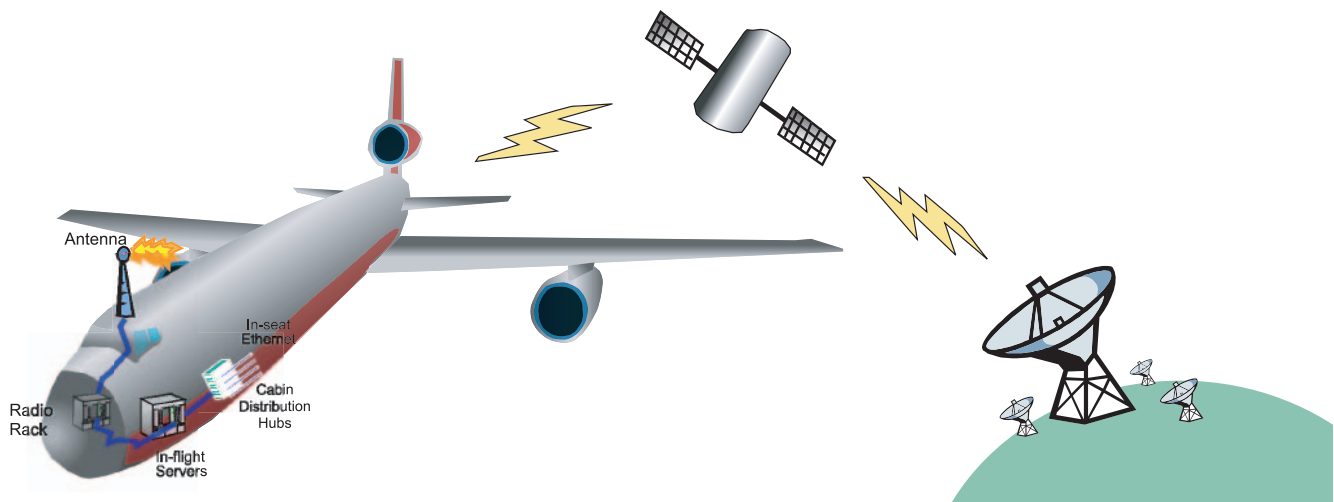
#### 3.2 Voice-over-IP Gateway

OEMs can build a VoIP gateway by concentrating an array of DSP resources through a ZX4500P switch. The ZX4500P multiplexes Ethernet ports on the DSP resource cards. Multiple ZX4500Ps can create redundancy for a fault-tolerant VoIP gateway.



#### 3.3 Airborne Networks

Airborne Internet is another use of the ZX4500P's high density and high availability switching. The switch connects on-board radio devices using Ethernet. Another LAN in the plane's cabin also uses the ZX4500P's intelligent switching services to access on-board servers and the satellite uplink.



## 4.0 Model Numbers (SKUs)

Customers may order the ZX4500P with OpenArchitect and appropriate Rear Transition Board with the following SKUs: (see 5.5 Rear Transition Modules for descriptions)

Table 4.1 - SKU Ordering Information

SKU	Description
ZX4500P	10/100/1000 CPSB Fabric/Node Ethernet Switch w/ 2 1000 Mbps Fiber
ZXRTB04	4 Port, Single Wide, Rear Transition Module-4 RJ-45 connectors
ZXRTB05	5 Port, Single Wide, Rear Transition Module-5 RJ-45 connectors
ZXRTB24	24 Port, Double Wide, Rear Transition Module-24 RJ-45 connectors

One Rear Transition Board is required for each ZX4500P switch requiring external Fast Ethernet connectivity.

## 5.0 Electrical

### 5.1 Universal I/O

The ZX4500P is a universal CompactPCI board. It accepts 3.3V or 5V PCI I/O signals for normal and HotSwap operations. The J1 Backplane connector ships unkeyed by default; it loads with a safety key ensuring use only in the correct slot.

### 5.2 Power Requirements

Table 5.1 - ZX4500P Power Consumption

Total Power Consumption	Voltage	Current	Power
21.22W (max.)	3.3V	2.7 A	10 W
	5V	2.34 A	15 W

### 5.3 Port Connections

The ZX4500P switches Fast Ethernet data from ports 0-18 and port 23 (f-port) through connectors J3/P3 and J5/P5 to the CompactPCI Packet Switching Backplane. The Fast Ethernet ports that are not used (ports 19-22) on the CPSB backplane may be pulled through the J4/P4 connector and routed to RJ-45 connectors mounted on a "ZX" Rear Transition Board to interface with Category 5 cabling. Two 1000BaseSX Fiber Gigabit Ethernet LC type connectors (ports 24 and 25) provide a front panel interface on the ZX4500P to standard 62.5/125 micron multimode fiber cabling.

Table 5.2 - ZX4500P Port Assignments

Port Assignments	Speed	Connector	Connection	Media
0-7,23	10/100 Mbps	J3	Midplane/Rear Panel	copper
08-18	10/100 Mbps	J5	Midplane/Rear Panel	copper
24-25	1000 Mbps	LC	Front Panel	fiber

### 5.4 Hardware Reset Button

The hardware-reset button is located on the ZX4500P front faceplate, flush mounted, as to avoid accidental resets. When depressed, the ZX4500P initiates a lamp test by activating all LEDs. When the reset button is released, the CPU, switch fabric and all other circuitry reboots. The switch then automatically configures to the last saved state. Configuration files are saved to the onboard FLASH ROM using the 'zsync' utility in OpenArchitect.

### 5.5 Rear Transition Modules

The ZXRTB series of Rear Transition Boards (RTBs) pulls Ethernet signals from the CPSB backplane for presentation to external cable ports on the rear panel. All RTBs use only passive components such as connectors and LEDs. This design improves reliability of the ZX4500P and permits HotSwap without recabling.

RJ3, RJ4 and RJ5 connectors on a RTB include guider pins to ensure proper pin alignment in the backplane interface.

**ZXRTB04** - One-slot wide RTB pulls 4 signals of switched Ethernet through the RP3/RJ3 connector to 4 RJ-45 connectors on the back of the chassis. (Extended ports 19-22)

**ZXRTB05** - One-slot wide RTB pulls 5 signals of switched Fast Ethernet through the RP3/RJ3 and RP5/RJ5 connectors to 5 RJ-45 connectors on the back of the chassis. (Extended ports 19-23)

**ZXRTB24** - Two-slot wide RTB pulls 24 signals of switched Fast Ethernet through the RP4/RJ4 connectors to 24 RJ-45 connectors on the back of the chassis. If used in a node slot of a CPSB chassis, the ZXRTB24 pulls 22 signals of switched Fast Ethernet through to the rear panel, while two ports are used to communicate with the switches in the fabric slots.



## **6.0 Mechanical**

The ZX4500P meets the requirements stated in the PICMG 2.1 CompactPCI specification as well as the PICMG 2.16 CompactPCI Packet Switching Backplane (CPSB) specification.

### **6.1 Form Factor**

The ZX4500P is a standard 6U CompactPCI board; it measures 233.35mm by 160mm. ZXRTB04s and ZXRTB05s are one-slot 6U size; all measure 233.35mm by 80mm. The 24-port ZXRTB24 is a two-slot wide RTB that contains 24 ganged RJ-45 connectors.

### **6.2 CompactPCI Connectors**

Standard 2mm CompactPCI connectors interface the ZX4500P to the CompactPCI/CPSB backplane. Type AB connectors populate the J1 and J4 to ensure proper pin alignment between the ZX4500P and the backplane.

### **6.3 Front Panel**

The ZX4500P front panel conforms to IEEE Specification 1101.10. Two Fiber LC connectors provide front panel links for Gigabit Ethernet. A management console port can be accessed via a front panel RJ-45 connector. Link/Activity and diagnostic LEDs provide front panel visual monitoring of switch activity. A hardware-reset button is flush mounted, as to avoid accidental resets.

### **6.4 Console Port**

One method for interfacing with the switch software is the RJ-45 console port mounted on the front panel of the ZX4500P. An RJ45-to-serial cable adapter is supplied by ZNYX Networks to interface the ZX4500P with another device running any industry standard telnet application.

## **7.0 Switched Ethernet Ports**

The ZX4500P provides a non-blocking switch fabric by integrating 24 copper 10/100Mbps Fast Ethernet ports and two fiber 1000Mbps Gigabit Ethernet ports. The ZX4500P sustains full line-rate Layer 2 switching and Layer 3 IP routing at full duplex. Maximum switching capacity is 6.6 million packets-per-second.

The ZX4500P switch silicon also supports Layers 4-7 filtering. The OpenArchitect environment implements custom applications in those layers.

### **7.1 10/100Mbit Switched Ethernet Ports**

The ZX4500P provides 24 10Base-T/100Base-TX dual-speed, switched Ethernet ports. The switch's meshed fabric of Media Access Controllers (MAC) supports 10 and 100Mbps at half and full duplex. Each MAC conforms to the IEEE 802.3 (CSMA/CD) MAC interface. The IEEE 802.3x flow control specification applies when the number of packets exceeds the port limit.

The PHYs present a standard four-wire auto MDI-X signal, which can interface with either the CPSB mid-plane for enabling communication between the node devices and/or a ZXRTB for external Ethernet transmission through RJ-45 connectors.

### **7.2 1000Mbit Switched Ethernet Ports**

The ZX4500P provides two 1000Base-SX fiber switched Ethernet ports. The switch's meshed fabric of Media Access Controllers (MACs) supports 1000Mbps at full duplex. Each MAC conforms to the IEEE 802.3 (CSMA/CD) MAC interface. The IEEE 802.3x flow control specification applies when the number of packets exceeds the port limit.

## **8.0 Onboard PCI bus**

The ZX4500P uses an onboard Local PCI bus that complies with the PICMG 2.1 specification. The bus provides a 64-bit, 33MHz-wide communication link between the silicon switch fabric, PowerPC processor and PCI-to-PCI bridge. The PCI-to-PCI bridge on the ZX4500P supports communication across the host chassis PCI bus.

### **8.1 PCI-to-PCI Bridge**

The ZX4500P has technical means to communicate with other devices across the PCI bus via an onboard PCI-to-PCI bridge. Currently, ZNYX Networks does not implement this capability. Activation requires loading a device driver on the host system, which allows the bridge to respond as a PCI target to other bus masters



collocated on the host PCI bus.

A typical custom application using the PCI-to-PCI bridge option is integrating the ZX4500P with an existing host management system. Another is providing ZX4500P-based conversion of system traffic on non-Ethernet devices in the chassis, which effectively integrates those devices with the IP world.

ZNYX Networks Professional Services can assist OEMs and system integrators with implementing communication across the CompactPCI bus. Contact a ZNYX Networks sales representative for a service agreement.

### **9.0 MPC8240 PowerPC Processor**

The ZX4500P uses an embedded Motorola MPC8240 PowerPC Processor. The MPC8240 provides high performance with low power consumption. Multiple networking applications within the OpenArchitect environment run on the MPC8240. Other Linux applications also may run on the MPC8240; all receive direct access to the switch fabric and memory banks via the onboard PCI bus. The MPC8240 uses Motorola's 603e core architecture, which is standard across Motorola's PowerPC line. This feature eases porting Linux applications written for other PowerPC microprocessors.

### **10.0 Internal Memory**

The ZX4500P locally stores switch configurations, applications and scripts with different memory technologies. The ZX4500P may optionally store, retrieve and replicate files from a remote server. A Linux-based file structure and user interface supports local storage and management of files in ZX4500P internal memory. See the OpenArchitect Specification Sheet and OpenArchitect ZX4500P User's Guide for details.

#### **10.1 Boot PROM**

The ZX4500P uses a 512KB Boot PROM. The embedded OpenArchitect zmonitor (zmon) utility is a boot loader. It includes the device boot string plus extra space for editing the startup script. During the boot process, zmon reads the device boot string to locate and validate correct application images loaded from the Application Flash ROMs.

#### **10.2 Flash Storage**

A proactive memory architecture in the ZX4500P provides fault-free operation with no file corruption. The architecture includes two 32MB Application Flash ROMs. Flash1 serves as the primary working image. Flash2 stores a replica of Flash1, which provides an alternate boot mechanism if Flash1 is corrupted, or to restore the ZX4500P to its factory-shipped configuration.

Each 16MB ROM contains the OpenArchitect operating system and previously loaded Linux applications, stored in a compress format. You may flash-upgrade the ROM in three ways:

- In-band over any Ethernet port (the preferred method)
- Over the CompactPCI bus (software not provided by ZNYX Networks)
- Out-of-band via a serial connection

#### **10.3 Application SDRAM**

Compressed images on Flash1 and Flash2 load into the 64MB of application SDRAM after decompression. See the OpenArchitect Specification Sheet for current available/used disk space when adding other Linux applications.

#### **10.4 Packet Buffer**

The ZX4500P switching silicon provides optimum performance with 512KB of on-chip memory for packet buffering. During periods of extreme network traffic, the switch fabric uses an additional 32MB of dedicated external SDRAM to decrease the number of dropped packets.

### **11.0 High Availability Features**

CompactPCI provides technical means for High Availability on ZX4500P-based switching solutions -- a benefit unavailable from standard rack-mounted alternatives. See the OpenArchitect Software Specification for an extensible set of High Availability features.

**11.1 Hot Swap Circuitry**

The ZX4500P provides a fully-compliant PICMG 2.1 HotSwap circuit. This ensures no electrical operation side effects when inserting or extracting the ZX4500P into/from a PICMG 2.1-compliant system. The system includes electrostatic discharge equalization strips, and early power-ups coupled to pre-charge all signal pins on insertion.

All required signals, such as ENUM# and BDSE-LECT# are supported for software control. This includes the Blue HotSwap LED required by the specification.

**11.2 Rear Transition Boards**

The ZXRTB Family of Rear Transition Boards is used to bring the Ethernet signals to the rear panel of the chassis for external cabling. RTBs provide a near-zero failure rate by using only passive components. Customers may leave cabling untouched in the event that a ZX4500P needs replacement. This cuts out the chance of error caused by removing and replacing Ethernet cabling and provides a lower Mean Time To Repair.

**11.3 Power Source**

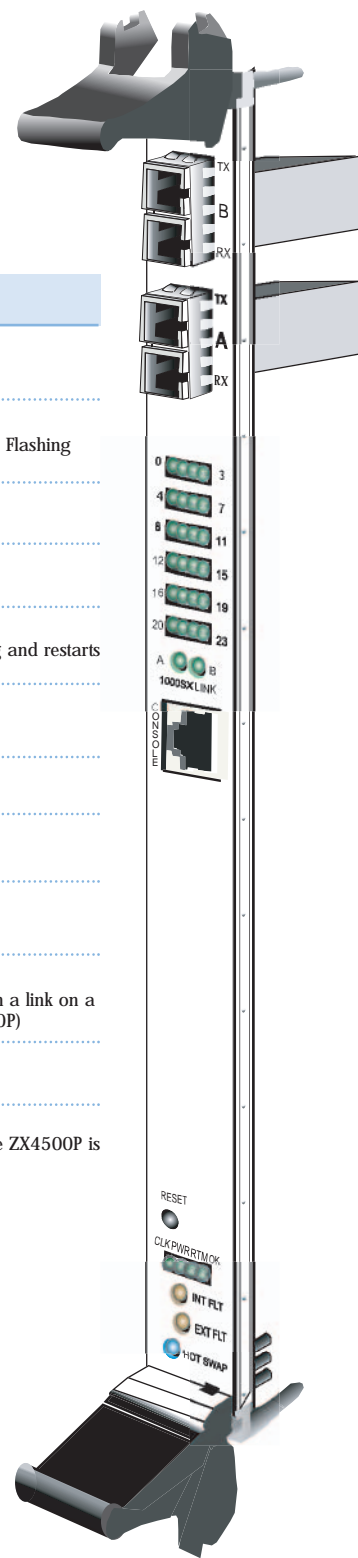
Most CompactPCI/CPSB chassis include a redundant power supply, providing the ZX4500P with uninterrupted power if the primary power supply fails. Redundancy depends on the chassis manufacturer and specifications.

**11.4 F-port**

The ZX4500P supports the f-port option (port 23) in the PICMG 2.16 specification for linking redundant fabric switches in a CPSB chassis. In the event of a switch failure, this option provides means for an automatic, transparent failover between fabric slots.

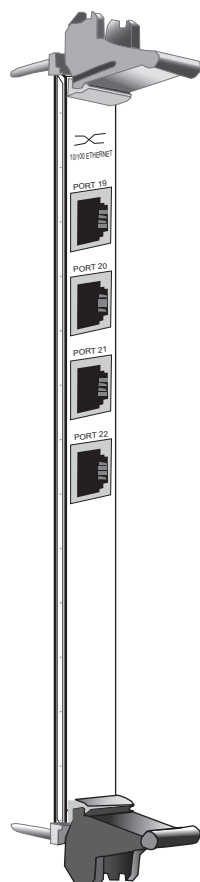
### 12.0 ZX4500P (Blade) LEDs

LED	Color	Power up Display	Function
PULL	Red	ON during the power up and turns OFF when complete	ON indicates the switch software is ready for extraction
0-23 link/activity	Green	OFF during power up	ON indicates the corresponding Ethernet channel is successfully linked. Flashing indicates activity on the channel
A	Green	OFF during power up	ON indicates the gigabit channel is successfully linked
B	Green	OFF during power up	ON indicates the gigabit channel is successfully linked
RESET	Black		Pressing RESET runs a lamp test to ensure all switch LEDs are operating and restarts the ZX4500P
CLK	Green	ON during power up	OFF after power up.
PWR	Green	ON during power up	ON indicates the power source is active
RTM	Green	ON during power up	ON indicates continuity with the Rear Transition Module
OK	Green	OFF during power up and ON after initialization is complete	ON indicates the initialization has completed successfully
EXT FLT	Orange	ON during power up	ON indicates a failure external to the switch. (e.g., inability to establish a link on a configured port or another connectivity problem external to the ZX4500P)
INT FLT	Orange	ON during power up	ON indicates a failure of the internal tests
HotSwap	Blue	OFF during power up	After the extraction levers are released (pulled apart), ON indicates the ZX4500P is ready to be removed

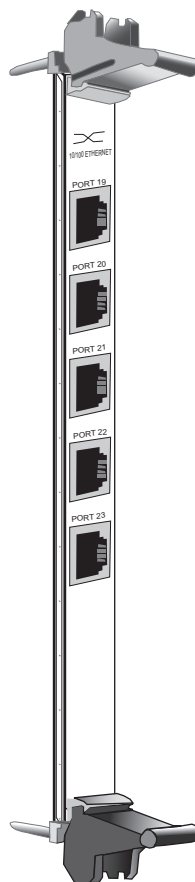




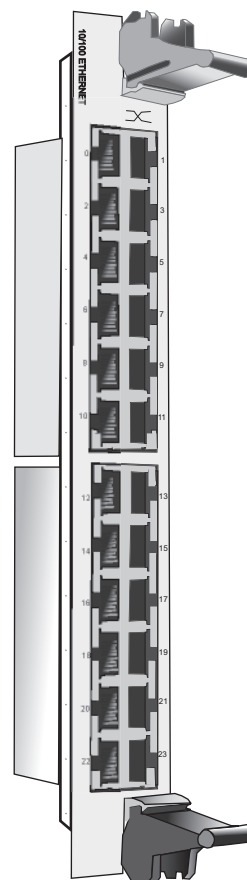
## 13.0 RTB Configurations



ZXRTB04



ZXRTB05



ZXRTB24

BACKPLANE SLOT	RTB	PORT DISTRIBUTION
Standard Fabric slot	No ZXRTB	up to 19 node slots on the CPSB Backplane; no external Fast Ethernet
	ZXRTB04	up to 19 node slots on the CPSB Backplane; 4 ports of external Ethernet via rear panel RTB
	ZXRTB05	up to 19 node slots on the CPSB Backplane; 5 ports of external Ethernet via rear panel RTB (no Fport)
Extended Fabric slot	No ZXRTB	all 24 ports are used on the CPSB backplane; no external Fast Ethernet
Node slot	ZXRTB24	2 ports are used on the CPSB backplane for communication to the fabric slot; 22 ports of external Ethernet

## **14.0 Reliability, Safety, EMC/EMI and Environmental**

The ZX4500P conforms to the following standards.

### **14.1 Reliability**

The ZX4500P reliability rating (measured in Mean Time Before Failure and Failure In Time) is listed below.

**MTBF (Mean Time Between Failure)**

4500P Calculated MTBF > 170,000 hours

=

4500P Calculated MTBF > 19.41 years

**FIT (Failure In Time)**

ZX4500P Calculated FIT > 5,529 hours

### **14.2 Safety**

The ZX4500P conforms to the following safety specifications:

UL 60950, 3<sup>rd</sup> Edition

CAN/CSA C22.2 No. 60950-00

IEC 60950, 3<sup>rd</sup> Edition (1999)

EN45001

### **14.3 EMC/EMI**

The ZX4500P conforms to the following EMC/EMI specifications:

FCC Part 15, EN55022 & EN55024

(EN6100-4-2, EN61000-4-3, ENV50204,

EN61000-4-4, EN61000-4-6),

CISPR 22, VCCI, AS/NZS 3548, Class A

### **14.4 Environmental**

The ZX4500P has been tested to function normally under the following environmental conditions:

Operating Temperature: -5° c to +75° c

Humidity: maximum of 90% non-condensing

### 15.0 Software Compatibility

OpenArchitect branded switches feature the ability to run Linux networking applications on top of the switch Operating System. OpenArchitect is a ready-to-develop software environment for rapid porting of other UNIX/Linux-based protocols, including open source RFCs. It also enables the development of application-specific protocol configuration scripts. This extensibility and access to the open source networking software provides integrators with a low-cost, rapid development environment for creating new value-added services. Additional Add-On software packages from ZNYX Networks are available to extend the value of the OpenArchitect switch line.

### 15.1 ZNYX Networks Software



## OpenArchitect Switch Management

#### Overview

OpenArchitect is an extensible open software platform for the routing, control and management of embedded Ethernet switches. The platform includes the Linux operating system, IP protocol stack, control applications and the OA Engine. OpenArchitect powers IP packet transport in embedded switches such as line-rate CompactPCI Packet Switching Backplane blades from ZNYX Networks, or in proprietary form factors.

#### Routing IP for a New Breed of Embedded Applications

By using OpenArchitect, systems manufacturers, component suppliers and application integrators can quickly and economically build powerful, high-value telecommunications solutions based on the Internet Protocol – including high availability systems. Examples include airborne Internet services, application servers, call server platforms, central office switching components, firewalls, terabit routers, voice-media gateways, voice-over-IP gateways, and wireless base stations.



## OpenArchitect HA Suite

#### Software Platform Adds High Availability And 100% Service Continuity to Embedded Ethernet Solutions

ZNYX Networks is now shipping the first embedded Ethernet software platform that provides five nines High Availability and the more demanding Service Continuity functionality for today's and tomorrow's next generation networks. OpenArchitect/HA Suite delivers Service Continuity by creating a virtual interface for each redundant (primary and backup) Ethernet service. Each interface has a single virtual IP address that is persistent across any failover. This "IP Transparent failover" creates an environment where Ethernet hardware problems are invisible. Uninterrupted, applications continue to talk to clients using the same virtual IP address before and after a failure.

#### OpenArchitect/HA Suite in an Embedded Environment

OpenArchitect/HA Suite also is the only product to provide software at each end of every embedded Ethernet link – each switch-to-node link and the switch-to-switch link – within the CPCI chassis. This complete solution, with total control of the sending and receiving Ethernet components, delivers unparalleled HA and Service Continuity functionality: **ADD-ON**



## OpenArchitect VSLB

#### Virtual Server Load Balancing

OpenArchitect Virtual Server Load Balancing is an OA software application that uses the advanced capabilities of the OpenArchitect series of switches to perform load balancing for any array of servers. All servers may be accessed from the Internet via one virtual IP address, with traffic load distributed to the servers using one of several available algorithms. Data traffic is handled via switch silicon, so system throughput is limited only by the media speed. **ADD-ON**



### 15.2 Third Party Software

An advantage of using OpenArchitect is that there are multiple vendors for linux applications and protocol stacks. There are several commercially available packages that will run unmodified within the OpenArchitect environment.

#### Protocol Stack Vendors



**nexthop** Technologies

##### GateD™ Routing Software -

NextHop develops and markets network routing software solutions, partnering with customers and the industry to empower innovation in networking.

NextHop GateD™ carrier-class software suite has the most complete set of routing protocols in the industry...including OSPF, IS-IS, BGP, Multicast and IPv6. The GateD code base is more reliable, more tested, more widely used, and more scalable than any other vendor-neutral solution.

[www.nexthoptechnologies.com](http://www.nexthoptechnologies.com)



##### ZebOS™ Advanced Routing Suite

The ZebOS™ Advanced Routing Suite delivers scalable, modular, high-performance routing software that supports IPv4 and IPv6 versions of OSPF, BGP, and RIP routing protocols and MPLS, BGP-VPN, RSVP-TE, and CR-LDP switching and signaling protocols.

IP Infusion's portable source code enables equipment manufacturers to easily integrate routing and switching capabilities into their wireless and wireline platforms and to support a broad range of applications, including: mobile, storage area networking, bandwidth & traffic mgmt, provider edge, VPN, VoIP, and security solutions.

[www.ipinfusion.com](http://www.ipinfusion.com)