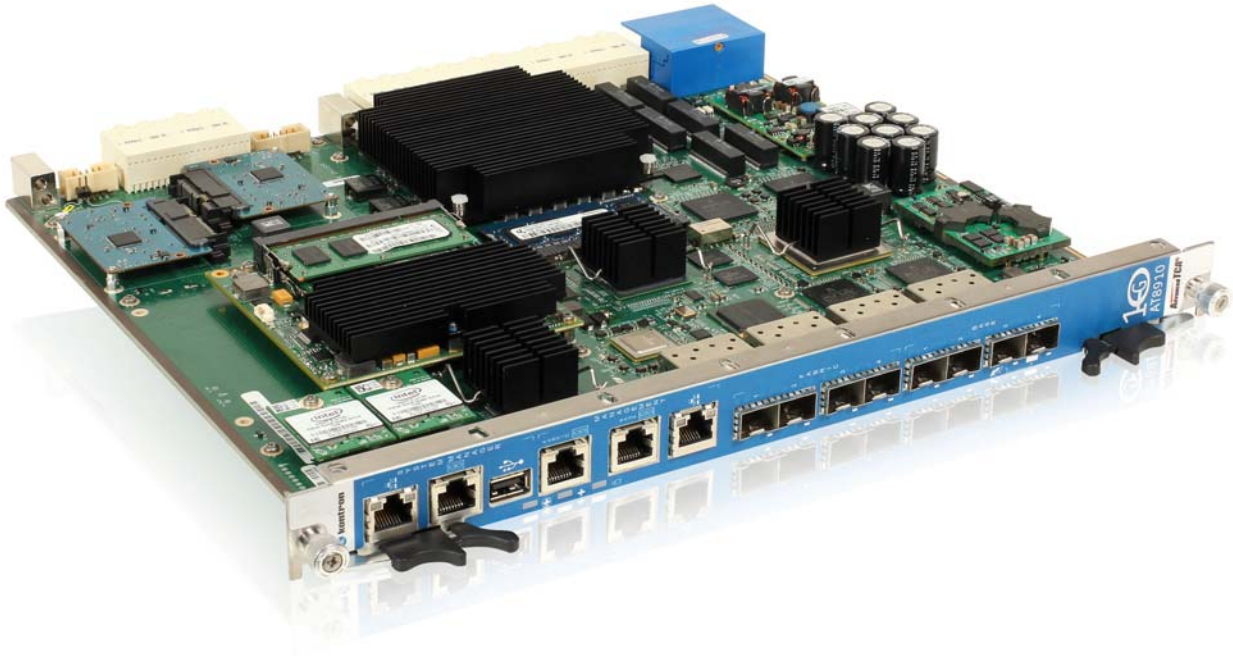
kontron

»Kontron User's Guide«

AdvancedTCA®



AT8910/AT8940

Document Revision 1.5
April 2013

Revision History

Rev. Index	Brief Description of Changes	Date of Issue
1.0	First Release	May 2011
1.1	Second Release	October 2011
1.2	Third Release	April 2012
1.4	Fourth Release	January 2013
1.5	Fifth Release	April 2013

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Safety Instructions

Before You Begin

Before handling the board, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section in the Preface for advisory conventions used in this user's guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics service personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user's guide for precautions and procedures. If you have any questions, please contact Kontron Technical Support

WARNING

High voltages are present inside the chassis when the unit's power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Kontron strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

Take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.
- When you want to remove the protective foil (if present), make sure you are properly grounded and that you touch a metalic part of the board.

CAUTION

Removing the protective foil from the top and bottom cover might create static.
When you remove those protections, make sure you follow the proper ESD procedure.

Preface

How to Use This Guide

This user's guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

For the circuits, descriptions and tables indicated, Kontron assumes no responsibility as far as patents or other rights of third parties are concerned.

The following is a summary of chapter contents:

- Chapter 1, Product Description
- Chapter 2, Board Features
- Chapter 3, Installing the board
- Chapter 4, Hardware Management
- Chapter 5, Software Setup
- Chapter 6, Thermal Considerations
- Appendix A, Connector Pinout
- Appendix B, Software Update
- Appendix C, Getting Help
- Appendix D, Glossary

Customer Comments

If you have any difficulties using this user's guide, discover an error, or just want to provide some feedback, please send a message to: Tech.Writer@ca.kontron.com. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user's guide on our Web site. Thank you.

Advisory Conventions

Seven types of advisories are used throughout the user guides to provide helpful information or to alert you to the potential for hardware damage or personal injury. They are Note, Signal Paths, Jumpers Settings, BIOS Settings, Software Usage, Cautions, and Warnings. The following is an example of each type of advisory. Use caution when servicing electrical components.

Note:
Indicate information that is important for you to know.

Signal Path:
Indicate the places where you can fin the signal on the board.

Jumper Settings:
Indicate the jumpers that are related to this sections.

BIOS Settings:
Indicate where you can set this option in the BIOS.

Software Usage:
Indicates how you can access this feature through software.

CAUTION
Indicate potential damage to hardware and tells you how to avoid the problem.

WARNING
Indicates potential for bodily harm and tells you how to avoid the problem.

ESD Sensitive Device:
This symbol and title inform that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.
Please read also the section "Special Handling and Unpacking Instructions".

CE Conformity:
This symbol indicates that the product described in this manual is in compliance with all applied CE standards. Please refer also to the section "Regulatory Compliance Statements" in this manual.

Disclaimer: We have tried to identify all situations that may pose a warning or a caution condition in this user's guide. However, Kontron does not claim to have covered all situations that might require the use of a Caution or a Warning.

Unpacking

Follow these recommendations while unpacking:

- Remove all items from the box. If any items listed on the purchase order are missing, notify Kontron customer service immediately.
- Inspect the product for damage. If there is damage, notify Kontron customer service immediately.
- Save the box and packing material for possible future shipment.

Powering Up the System

Before any installation or setup, ensure that the board is unplugged from power sources or subsystems.

If you encounter a problem, verify the following items:

- Make sure that all connectors are properly connected.
- Verify your boot devices.
- If the system does not start properly, try booting without any other I/O peripherals attached.

Make sure your system provides the minimum DC voltages required at the board's slot, especially if DC power is carried by cables.

If you are still not able to get your board running, contact our Technical Support for assistance.

Adapter Cables

Because adapter cables come from various manufacturers, pinouts can differ. The direct crimp design offered by Kontron allows the simplest cable assembly. All cables are available from Kontron Sales Department.

Storing Boards

Electronic boards are sensitive devices. Do not handle or store device near strong electrostatic, electromagnetic, magnetic or radioactive fields.

Regulatory Compliance Statements

FCC Compliance Statement for Class B Devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generated, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experience radio/TV technician for help.

WARNING

This is a Class B product. If not installed in a properly shielded enclosure and used in accordance with this User's Guide, this product may cause radio interference in which case users may need to take additional measures at their own expense.

Safety Certification

All Kontron equipment meets or exceeds safety requirements based on the IEC/EN/UL/CSA 60950-1 family of standards entitled, "Safety of information technology equipment." All components are chosen to reduce fire hazards and provide insulation and protection where necessary. Testing and reports when required are performed under the international IECEE CB Scheme. Please consult the "Kontron Safety Conformity Policy Guide" for more information. For Canada and USA input voltage must not exceed -60Vdc for safety compliance.

CE Certification

The product(s) described in this user's guide complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques. Although Kontron offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. Kontron does not offer engineering services for designing cabling systems. In addition, Kontron will not retest or recertify systems or components that have been reconfigured by customers.

Limited Warranty

Kontron grants the original purchaser of Kontron's products a TWO YEAR LIMITED HARDWARE WARRANTY as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of Kontron are valid unless the consumer has the express written consent of Kontron.

Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long- term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than Kontron or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.

Chapter 1

Product Description

1. Product Description

1.1 Product Overview

The AT8910/AT8940 is an ATCA 10/40GbE Fabric Interface Hub designed around the Broadcom BCM56840 architecture. All considerations are being taken to ensure this product can be used as a standard hub offered to the broad telecom and datacenter market.

Architectural features under consideration such as 40GbE interfaces are expected to deliver a high-performance switching and routing up to 14 nodes in a redundant chassis configuration. Some of the highlights are:

- Starting with 320 Gbps non-blocking switching bandwidth upgradable to 640 Gbps upon silicon availability
    - 320 Gbps variant with BCM56842
    - 640 Gbps variant with BCM56846
- Support for 14x 10/40GbE nodes and one redundant hub meeting NEBS and ETSI standard
- Support for separate switch silicon for Base and Fabric interface
- Support for 2x 40GbE Fabric Interface to the RTM
- Support for 10GbE SFP+ Base Interface uplink front panel connectors
- Support for Synchronous Ethernet on RTM

1.2 Board Specifications

Table 1-1: Board Specifications

Features	Description
10G Fabric Interface (AT8910)	• Broadcom StrataXGS®IV Ethernet Switch Architecture • Broadcom BCM56840 high performance Ethernet Multilayer Switch. • BCM56842 320Gbps Switching Capacity. • Support of up 14 Fabric IF to backplane running at 10G XAUI • Support one port 10G HUB interlink to backplane • Support of 4 10G interfaces to RTM. • Support of 4 1G/10G SFP+ front uplinks with Broadcom BCM84754 Quad XFI to SFI transceiver. • SFP+ monitoring via I2C interface • Unit Computer manages Fabric Switch via PCIe Gen1 x1 (2.5Gbps) • SyncE and BroadSync(tm) interface connection to FPGA for future usage.
40G Fabric Interface (AT8940)	• Broadcom StrataXGS®IV Ethernet Switch Architecture • Broadcom BCM56840 high performance Ethernet Multilayer Switch. • BCM56846 640Gbps Switching Capacity. • Support of up 14 Fabric IF to backplane running at 10G XAUI or 40GBase-KR4 • Support one port 10G XAUI or 40GBase-KR4 HUB interlink to backplane • Support of up to 1 40G interface and 4 1G/10G interfaces to RTM. • Support of 4 1G/10G SFP+ front uplinks with Broadcom BCM84754 Quad XFI to SFI transceiver. • SFP+/QSFP monitoring via I2C interface • Unit Computer manages Fabric Switch via PCIe Gen1 x1 (2.5Gbps) • SyncE and BroadSync(tm) interface connection to FPGA for future usage.
Base Interface	• Broadcom StrataXGS®IV Metro Ethernet Access Switch Architecture • Broadcom BCM56334 24-Port GbE Ethernet Multilayer Switch with 4 10GbE Uplinks. • 14 Base Interface ports running at 10/100/1000Base-T/TX/T. • One Hub interlink running at 10/100/1000Base-T/TX/T. • One port configurable either as Hub interlink via Update Channel or IPMC link for IPMI/Serial over LAN. • Hub interlink running at 1000Base-BX • IPMC link forced to 100Base-TX (no autonegotiation) • ShMC A/B connect running at 10/100Base-T/TX • 4 1G/10G SFP+ front uplinks with Broadcom BCM8727 Dual XAUI to SFI transceiver. • 3 RTM uplinks running at 10/100/1000Base-T/TX/T (SGMII) or 1000Base-x (Fiber) • SFP/SFP+ monitoring via I2C interface • Unit Computer manages Base Switch via PCIe Gen1 x1 (2.5Gbps) • One port connected to Unit Computer running at 1000Base-BX • One port connected to System Manager running at 1000Base-BX
Unit Computer and System Memory	• Dual-core Freescale P2020 1000MHz processor • Up to 2GB DDR3 SODIMM (1Gb default) • 2x 128MByte NOR FLASH with dual Image Support • 1GB NAND FLASH • I2C Management IF to RTM clock infrastructure • 1000Base-BX Hub interconnect via backplane Update Channel • RTC Clock support • Interrupt source from RTM external clocking • Synchronization Clock support from RTM via FPGA

Features	Description
IPMI	• Renesas H8S2472 Microcontroller • PICMG 3.0 / IPMI 2.0 compliant • Current and Voltage Sensors • Base Board, RTM hot swap and power control • Base Board, RTM FRU data reading and writing • Firmware Update handling for field upgrades, rollbacks and watchdog functions • Customer specific data fields • Board Temperature monitoring via I2C enabled sensors • ATCA LED support; BLUE LED, Out-of-Service, Healty • 128 kByte FRU data EEPROM • 8 MByte SPI FLASH for Firmware • Ethernet link to Base Interface
RTM Support	• Zone 3 RTM support • IPMB-L to RTM • Management Power, Payload power implementation as AMC slot • I2C Clock Management IF • I2C SFP Diagnostic IF • 3 GbE Base-Interface Uplinks (SGMII/SERDES) • Up to 2 40GbE Fabric-Interface Uplinks each configurable as • 1x 40GbE • 4x 10GbE • 4x 1GbE • FI MIIM Interface • CLK1, CLK2, CLK3 Clock distribution • JTAG TAP and PIP port. • 2x SerialATA from System Manager
Power	• ATCA compliant Power Input System • Total power is below 220 W • Hot Swap • Holdover Circuit with min. hold-up time of 10 ms • Polarity protrection • Under voltage shutdown between -32 V and -36 V • Startup/Recover at -36 V • Voltage range 0 V to 75 V • Transient Protection • 48V voltage and current monitoring • Fuse monitoring • Management power is below 15 W • Autonomous Overheating Power Shutdown • Standard QBrick 48V to 12V DCDC converters • PoL DCDC converters running at 12 VIN

Features	Description
System Manager	• Support for basic and micro COM Express ETX Modules with Type 1 connector, according COMExpress 0 R1.0 • Management connection to System Manager via RS232 front RJ45. • Basic and Micro ETX use SuperIO LPC to UART Bridge • UART switched through FPGA • Management connection to System Manager using front 10/100/1000Base-T RJ45 management port. • Front panel USB port • Support of ETX modules up to 30W • Additional Ethernet Connection to Base IF and redundant HUB via Dual Ethernet Controller Intel 82580DB • 1000Base-BX to Base Switch • 1000Base-BX to Update Channel • Support for JEDEC SerialATA MO-297 SSD, Port 0 and Port 2 • Support for RTM SATA applications, Port 1 and Port 3 • Support of up to 2 eUSB Flash Modules
Power Requirements	120 W* -38V @ -72V with 12GB of memory, no RTM. Maximum of 225W * The power consumption will vary depending on your product configuration (RTM & extra memory)
Environmental Temperature*	Operating: 0-55°C/32-131°F with 30CFM airflow Storage and Transit: -40 to +70°C/-40 to 158°F
Environmental Humidity*	Operating: 15% to 90% @55°C/131°F non-condensing Storage and Transit: 5% to 95% @ 40°C/104°F non-condensing
Environmental Altitude*	Operating: 4,000 m / 13,123 ft Storage and Transit: 15,000 m / 49,212 ft
Environmental Shock*	Operating: 3G each axis Storage and Transit: 18G each axis
Environmental Vibration*	Operating: 5-200Hz. 0.2G, each axis Storage and Transit: 5Hz to 20Hz @ 1 m2/s3 (0.01g2 /Hz) (flat) 20Hz to 200Hz @ -3dB/oct (slope down)
Reliability	• Whole board protected by active breaker • USB voltage protected by an active breakers
Safety / EMC	Meet or exceed: • Safety: UL 60950-1; CSA C22.2 No 60950-1-03; EN 60950-1:2001; IEC60950-1 • EMI/EMC: FCC 47 CFR Part 15, Class B; CE Mark to EN55022/EN55024/EN300386
Warranty	Two years limited warranty

1.3 What's Included

This board is shipped with the following items:

- One AT8910/AT8940 board
- One RJ45-DB9 serial adaptor (1015-9404)
- Cables that have been ordered

If any item is missing or damaged, contact the supplier.

1.4 Compliance

This product conforms to the following specifications:

- PICMG® 3.0 R3.0 Advance TCA™ base specification
- PICMG® 3.1 R2.0 Advance TCA™ Ethernet specification (Draft)
- PICMG 1.0 R1.0 COM Express
- Serial ATA Revision 2.6
- IEEE standard 1149.1, 2001 Edition (JTAG). Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Std 1149.6-2003, IEEE Standard for Boundary-Scan Testing of Advanced Digital Networks,IEEE, 2003 (AC-JTAG).
- JEDEC JESD79-3
- JEDEC 4.20.18
- MSA SFF 8431
- IEEE 802.3 2008
- IPMI 2.0

1.5 Hot-Plug Capability

The AT8940 supports Full Hot Swap capability as per PICMG3.0R3.0 for the board itself. It can be removed from or installed in the system while it is on (without powering-down the system). Please refer to the PICMG3.0R3.0 specification for additional details about Hot Swap.

The AT8940 supports also the RTM Hotplug.

1.6 Interfacing with the Environment

1.6.1 RTM (rear transition module)

The RTM is a single slot (6HP) AdvancedTCA Rear Transition Module. This module provides additional connectivity for AT8940 CPU front blade.

1.6.1.1 Standard Compliance

- PICMG® 3.0 R3.0 Advance TCA™ base specification
- PICMG® 3.1 R2.0 Advance TCA™ Ethernet specification

1.6.1.2 Hot Swap

The RTM supports hot swapping by using the switch connected to the face plate lower ejector. This switch indicates the coming hot swap action. The insertion of the RTM to a slot is always done over a non powered connector. During the extraction procedure, the management power is disabled only when the RTM is removed. This procedure meets the AdvancedTCA AMC behavior.

1.6.1.2.1 Inserting the RTM into the slot

The presence of the RTM is indicated by one signal. The front blade IPMC recognizes the RTM insertion when the signal is low. After recognizing the RTM, the IPMC turns the blue LED ON and enables the management power to the RTM. Once the IPMB-L link is working, the IPMC accesses the MMC to retrieve FRU data. After knowing the type of RTM inserted, the IPMC negotiates with the shelf manager in order to activate the +12V payload power. After RTM local voltages have been ramped up, the RTM's MMC enables the RTM Link.

After this the front board IPMC informs the shelf manager there is a functional RTM blade present.

1.6.1.2.2 Removing the RTM from the slot

The RTM_EJECT signal goes HIGH by opening the RTM lower ejector handle. This indicates to the front blade IPMC that a hot swap action is going to take place. The IPMC then negotiates the removal with the System manager and if it is granted, it proceeds with the removal process.

The IPMC proceeds to the deactivation by disabling ekey governed links, the IPMC then disables the RTM Link and turns OFF the payload +12V power. When it is safe to remove the RTM blade from the slot, the IPMC turns the Blue / Hot Swap LED ON. Front Blade IPMC turns OFF the management power only when there is no RTM detected. (RTM removed from the slot)

1.6.2 System Manager

- Support for basic and micro COM Express Modules with Type 1 connector, according COMExpress 0 R1.0
- Management connection to System Manager via RS232 front RJ45.
- Basic use SuperIO LPC to UART Bridge
- UART switched through FPGA
- Management connection to System Manager using front 10/100/1000Base-T RJ45 management port.
- Front panel USB port
- Support of COMExpress modules up to 30W
- Additional Ethernet Connection to Base IF and redundant HUB via Dual Ethernet Controller Intel 82580DB
- 1000Base-BX to Base Switch
- 1000Base-BX to Update Channel
- Support for JEDEC SerialATA MO-297 SSD, Port 0 and Port 2
- Support for RTM SATA applications, Port 1 and Port 3
- Support of up to 2 eUSB Flash Modules

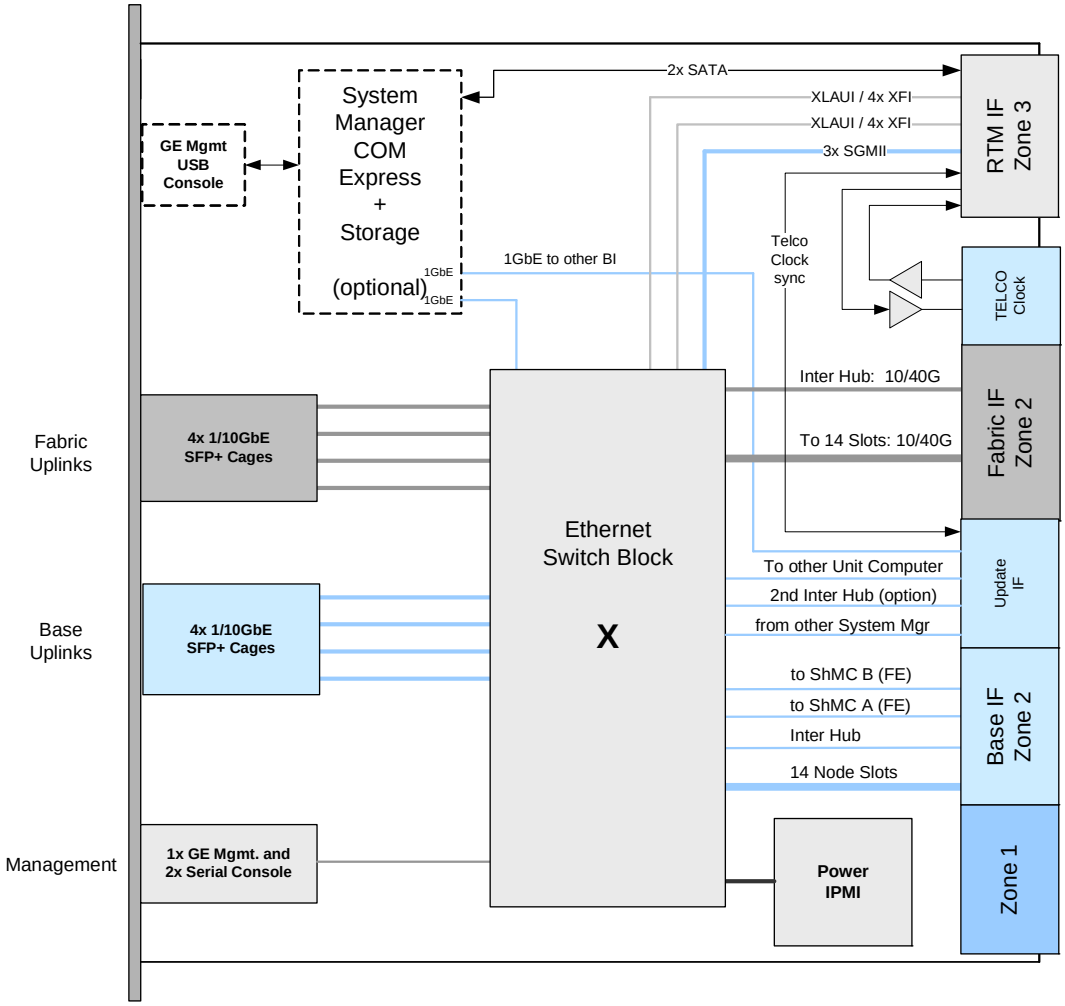
Chapter 2

Board Features

2. Board Features

2.1 Block Diagram

Figure 2-1:Block Diagram



The Ethernet Switch Block consists of the Fabric Interface Switch, the Base Interface Switch and the Unit Computer managing both.

2.2 Unit Computer

- Dual-core Freescale P2020 1000MHz processor, each core controls one Ethernet switch
- 1GB DDR3 SODIMM
- 2x 128MByte NOR FLASH with dual Image Support
- 1GB NAND FLASH
- 1000Base-BX Hub interconnect to redundant partner via backplane Update Channel
- RTC Clock support
- Synchronization Clock support from RTM via FPGA

2.3 Base Interface

- Broadcom StrataXGS®IV Metro Ethernet Access Switch Architecture
- Broadcom BCM56334 24-Port GbE Ethernet Multilayer Switch with 4 10GbE Uplinks.
- 14 Base Interface ports running at 10/100/1000Base-T/TX/T.
- One Hub interlink running at 10/100/1000Base-T/TX/T.
- One port configurable either as Hub interlink via Update Channel or IPMC link for IPMI/Serial over LAN.
- Hub interlink running at 1000Base-KX
- IPMC link forced to 100Base-TX (no autonegotiation)
- ShMC A/B connect running at 10/100Base-T/TX
- 4 1G/10G SFP+ front uplinks with Broadcom BCM8727 Dual XAUI to SFI transceiver.
- 3 RTM uplinks running at 10/100/1000Base-T/TX/T (SGMII) or 1000Base-x (Fiber)
- SFP/SFP+ monitoring via I2C interface
- Unit Computer manages Base Switch via PCIe Gen1 x1 (2.5Gbps)
- One port connected to Unit Computer running at 1000Base-KX
- One port connected to System Manager running at 1000Base-KX

2.3.1 Base Switch

The Broadcom BCM56334 24-Port Multilayer Switch with four 10 GbE Uplinks builds the core of the Base Interface.

Table 2-1:Base Switch Port Mapping

Base CLI Port	Operation Mode	Speed	Connected to
0/1	SerDes/XAUI	1 G / 10 G	BI SFP+ 1
0/2	SerDes/XAUI	1 G / 10 G	BI SFP+ 2
0/3	SerDes/XAUI	1 G / 10 G	BI SFP+ 3
0/4	SerDes/XAUI	1 G / 10 G	BI SFP+ 4
0/5	SGMII/SerDes	1000Base-xX (fiber)10/100/1000Base-T/-TX/-T	RTM SFP BI1
0/6	SGMII/SerDes	1000Base-xX (fiber)10/100/1000Base-T/-TX/-T	RTM SFP BI2
0/7	SGMII/SerDes	1000Base-xX (fiber)10/100/1000Base-T/-TX/-T	Not connected on RTM
0/8	SerDes	1000Base-KX	P2020 eTSEC 2
0/9	SGMII/SerDes	10/100Base-T/-TX / 1000Base-KX	IPMI/Update Channel
0/10	SGMII	10/100Base-T/-TX	ShMC A
0/11	SGMII	10/100Base-T/-TX	ShMC B
0/12	SGMII	10/100/1000Base-T/-TX/-T	BI 2
0/13	SGMII	10/100/1000Base-T/-TX/-T	BI 3
0/14	SGMII	10/100/1000Base-T/-TX/-T	BI 4
0/15	SGMII	10/100/1000Base-T/-TX/-T	BI 5
0/16	SGMII	10/100/1000Base-T/-TX/-T	BI 6
0/17	SGMII	10/100/1000Base-T/-TX/-T	BI 7
0/18	SGMII	10/100/1000Base-T/-TX/-T	BI 8
0/19	SGMII	10/100/1000Base-T/-TX/-T	BI 9
0/20	SGMII	10/100/1000Base-T/-TX/-T	BI 10
0/21	SGMII	10/100/1000Base-T/-TX/-T	BI 11
0/22	SGMII	10/100/1000Base-T/-TX/-T	BI 12
0/23	SGMII	10/100/1000Base-T/-TX/-T	BI 13
0/24	SGMII	10/100/1000Base-T/-TX/-T	BI 14
0/25	SGMII	10/100/1000Base-T/-TX/-T	BI 15
0/26	SGMII	10/100/1000Base-T/-TX/-T	BI 16
0/27	SerDes	1000Base-KX	System Manager Port 1
0/28	SerDes	1000Base-KX	Redundant System ManagerPort 2

2.4 Fabric Interface

- Broadcom StrataXGS®IV high performance Ethernet Switch Architecture
    - BCM56846 640Gbps Switching Capacity.

  - BCM56842 320Gbps Switching Capacity.
- Support of up 14 Fabric IF to backplane running at 1000Base-X, 10GBASE-KX4, 10GBase-KR or 40GBase-KR4
- Support one port 40GBase-KR4 HUB interlink to backplane
- Support of 2 40G interfaces to RTM.
- Support of 4 1G/10G SFP+ front uplinks with Broadcom BCM84754 Quad XFI to SFI transceiver.
- SFP+/QSFP monitoring via I2C interface
- Unit Computer manages Fabric Switch via PCIe Gen1 x1 (2.5Gbps)

2.4.1 Fabric Switch

2.4.1.1 10G Option (BCM56842 320 Gbps)

The Broadcom BCM56842 320 Gbps Ethernet Multilayer Switch with 18 integrated Warp Cores builds the core of the 10G Fabric Interface. The Warp Cores are set in the required transfer mode; XFI, XAUI or 10GBASE-KR.

The 18 Warp Core cores are separated into four groups:

- Group 0: Warpcore[4:0] with 84 Gbps bandwidth
- Group 1: Warpcore[8:5] with 80 Gbps bandwidth
- Group 2: Warpcore[13:9] with 80 Gbps bandwidth
- Group 3: Warpcore[17:14] with 80 Gbps bandwidth

An additional 4 Gbps is allowed in Group 0 if WarpCore 0 is configured as 4x 1 GbE

The configuration of the Fabric Switch needs to limit the maximum bandwidth within the WarpCore Group. The port mapping is defined in a way the maximum bandwidth could be reached in different chassis and applications.

Table 2-2:Fabric Switch Port Assignment

CLI Port	Type	Speed
0/1	SFP+	1/10GbE
0/2	SFP+	1/10GbE
0/3	SFP+	1/10GbE
0/4	SFP+	1/10GbE
0/5	1- Hub	1/10GbE
0/6	2- Node-Board	1/10GbE
0/7	3- Node-Board	1/10GbE
0/8	4- Node-Board	1/10GbE

CLI Port	Type	Speed
0/9	5- Node-Board	1/10GbE
0/10	6- Node-Board	1/10GbE
0/11	7- Node-Board	1/10GbE
0/12	8- Node-Board	1/10GbE
0/13	9- Node-Board	1/10GbE
0/14	10- Node-Board	1/10GbE
0/15	11- Node-Board	1/10GbE
0/16	12- Node-Board	1/10GbE
0/17	13- Node-Board	1/10GbE
0/18	14- Node-Board	1/10GbE
0/19	15- Node-Board	1/10GbE
0/20	RTM SFP+ FI2.1	10GbE
0/21	RTM SFP+ FI2.2	10GbE
0/22	RTM SFP+ FI2.3	10GbE
0/23	RTM SFP+ FI2.4	10GbE

Table 2-3:Fabric Switch Port Mapping AT8910

BCM56842 Warp-Core Group	BCM56842 WarpCore	Lane	SerDes	Operation Mode	Speed	Connected to
0	0	0	1	4x XFI	4x 1GbE or 4x 10GbE	Front uplinks
		1	2			
		2	3			
		3	4			
	1	0	5	-/-	0 (Bandwidth limitation)	RTM QSFP+ FI1
		1	6			
		2	7			
		3	8			
	2	0	9	XAUI	10 GbE	FC# 15
		1	10			
		2	11			
		3	12			
	3	0	13	XAUI	10 GbE	FC# 13
		1	14			
		2	15			
		3	16			
	4	0	17	XAUI	10 GbE	FC# 6
		1	18			
		2	19			
		3	20			

BCM56842 Warp-Core Group	BCM56842 WarpCore	Lane	SerDes	Operation Mode	Speed	Connected to
1	5	0	21	XAUI	10 GbE	FC# 5
		1	22			
		2	23			
		3	24			
	6	0	25	XAUI	10 GbE	FC# 4
		1	26			
		2	27			
		3	28			
	7	0	29	XAUI	10 GbE	FC# 2
		1	30			
		2	31			
		3	32			
	8	0	33	XAUI	10 GbE	FC# 3
		1	34			
		2	35			
		3	36			
2	9	0	37	XAUI	10 GbE	FC# 1
		1	38			
		2	39			
		3	40			
	10	0	41	XAUI	10 GbE	FC# 14
		1	42			
		2	43			
		3	44			
	11	0	45	XAUI	10 GbE	FC# 12
		1	46			
		2	47			
		3	48			
	12	0	49	XAUI	10 GbE	FC# 7
		1	50			
		2	51			
		3	52			
	13	0	53	XFI/SFI/KR	1/10 GbE	RTM SFP+ FI2.1
		1	54	XFI/SFI/KR	1/10 GbE	RTM SFP+ FI2.2
		2	55	XFI/SFI/KR	1/10 GbE	RTM SFP+ FI2.3
		3	56	XFI/SFI/KR	1/10 GbE	RTM SFP+ FI2.4

BCM56842 Warp-Core Group	BCM56842 WarpCore	Lane	SerDes	Operation Mode	Speed	Connected to
3	14	0	57	XAUI	10 GbE	FC# 8
		1	58			
		2	59			
		3	60			
	15	0	61	XAUI	10 GbE	FC# 9
		1	62			
		2	63			
		3	64			
	16	0	65	XAUI	10 GbE	FC# 11
		1	66			
		2	67			
		3	68			
	17	0	69	XAUI	10 GbE	FC# 10
		1	70			
		2	71			
		3	72			

2.4.1.2 40G Option (BCM56846 640 Gbps)

The Broadcom BCM56846 640 Gbps Ethernet Multilayer Switch with 18 integrated Warp Cores builds the core of the 10G Fabric Interface. The Warp Cores are set in the required transfer mode; 40 GbE, 10 GbE, XFI, XAUI, 10GBASE-KR, 40GBASE-KR4 or XLAUI.

The 18 Warp Core cores are separated into four groups:

- Group 0: Warpcore[4:0] with 164 Gbps bandwidth
- Group 1: Warpcore[8:5] with 160 Gbps bandwidth
- Group 2: Warpcore[13:9] with 160 Gbps bandwidth
- Group 3: Warpcore[17:14] with 160 Gbps bandwidth

An additional 4 Gbps is allowed in Group 0 if WarpCore 0 is configured as 4x 1 GbE

The configuration of the Fabric Switch needs to limit the maximum bandwidth within the WarpCore Group. The port mapping is defined in a way the maximum bandwidth could be reached in different chassis and applications.

Table 2-4:Fabric Switch Port Mapping AT8940

BCM56846 WarpCore Group	BCM56846 WarpCore	Lane	SerDes	Operation Mode	Speed	Connected to
0	0	0	1	XFI	4x 1GbE or 4x 10GbE	Front uplinks
		1	2			
		2	3			
		3	4			
	1	0	5	KR4	40GbE	RTM QSFP+ FI1
		1	6			
		2	7			
		3	8			
	2	0	9	XAUI/KR4	10/40 GbE	FC# 15
		1	10			
		2	11			
		3	12			
	3	0	13	XAUI/KR4	10/40 GbE	FC# 13
		1	14			
		2	15			
		3	16			
	4	0	17	XAUI/KR4	10/40 GbE	FC# 6
		1	18			
		2	19			
		3	20			
1	5	0	21	XAUI/KR4	10/40 GbE	FC# 5
		1	22			
		2	23			
		3	24			
	6	0	25	XAUI/KR4	10/40 GbE	FC# 4
		1	26			
		2	27			
		3	28			
	7	0	29	XAUI/KR4	10/40 GbE	FC# 2
		1	30			
		2	31			
		3	32			
	8	0	33	XAUI/KR4	10/40 GbE	FC# 3
		1	34			
		2	35			
		3	36			

BCM56846 WarpCore Group	BCM56846 WarpCore	Lane	SerDes	Operation Mode	Speed	Connected to
2	9	0	37	XAUI/KR4	10/40 GbE	FC# 1
		1	38			
		2	39			
		3	40			
	10	0	41	XAUI/KR4	10/40 GbE	FC# 14
		1	42			
		2	43			
		3	44			
	11	0	45	XAUI/KR4	10/40 GbE	FC# 12
		1	46			
		2	47			
		3	48			
	12	0	49	XAUI/KR4	10/40 GbE	FC# 7
		1	50			
		2	51			
		3	52			
	13	0	53	XFI/SFI/KR	1/10 GbE	RTM QSFP+ FI2.0 or SFP+ FI2.1
		1	54	XFI/SFI/KR	1/10 GbE	RTM QSFP+ FI2.1 or SFP+ FI2.2
		2	55	XFI/SFI/KR	1/10 GbE	RTM QSFP+ FI2.2 or SFP+ FI2.3
		3	56	XFI/SFI/KR	1/10 GbE	RTM QSFP+ FI2.3 or SFP+ FI2.4
3	14	0	57	XAUI/KR4	10/40 GbE	FC# 8
		1	58			
		2	59			
		3	60			
	15	0	61	XAUI/KR4	10/40 GbE	FC# 9
		1	62			
		2	63			
		3	64			
	16	0	65	XAUI/KR4	10/40 GbE	FC# 11
		1	66			
		2	67			
		3	68			
	17	0	69	XAUI/KR4	10/40 GbE	FC# 10
		1	70			
		2	71			
		3	72			

Note:
The table shows possible operating modes for each port. The actually available modes depend on the port mapping configuration which is still under development for the AT8940.

2.5 System Manager

Basic or micro COM Express ETX Modules with Type 1 connector, according COMExpress 0 R1.0 could operate as a System Manager on the AT8910.

- Management connection to System Manager via RS232 front RJ45.
- Basic and Micro ETX use SuperIO LPC to UART Bridge
- UART switched through FPGA
- Management connection to System Manager using front 10/100/1000Base-T RJ45 management port.
- Front panel USB port
- Support of COMExpress modules up to 30W
- Additional Ethernet Connection to Base IF and redundant HUB via Dual Ethernet Controller Intel 82580DB
- 1000Base-KX to Base Switch
- 1000Base-KX to Update Channel
- Support for JEDEC SerialATA MO-297 SSD, Port 0 and Port 2
- Support for RTM SATA applications, Port 1 and Port 3
- Support of up to 2 eUSB Flash Modules

2.5.1 SM Management Port

The SM Management 10/100/1000Base-T Ethernet Port is located on the AT8940 faceplate.

Table 2-5:SM Management Port LED

LED	Function/Displays
L1	Link/Activity: Green LED • Off link down • On link up but no activity • Blinking link up and activity
L2	Speed: Green/Amber LED • Off 10Base-T • On (amber) 100Base-Tx • On (Green) 1000Base-T

2.5.2 Dual Gigabit Ethernet Controller

The Intel 82580 Dual Gigabit Ethernet Controller connects to the 4 lane PCIe Interface of the Type 1 connector. The 82580 supports PCI Express Gen 1 (2.5 Gbps) or Gen 2 (5.0 Gbps).

Ethernet Port 0 operates in SerDes 1000Base-KX mode and connects to the AT8940 Base Interface.

Ethernet Port 1 operates in SerDes 1000Base-KX mode and connects to redundant ATCA hub blade Base Interface via the Update Channel of Zone 2.

The System FPGA holds the 82580 in device off state when no COMExpress module is present.

The System FPGA holds the 82580 in reset until the COMExpress module release the peripheral devices.

2.5.3 USB Front Connector

The USB front interface is a Type A receptacle according USB 2.0. It connects to the COM Express ETX Module USB channel 2.

The USB Front Interface is filtered, overcurrent and fuse protected.

Signal Path:
USB Front Connector is located on J8.

2.5.4 USB SSD Connectors

The USB SSD Flash Disk are USB 2.0 SSD type storage module builds up with NAND flash memory.

- Solid State Drive (SSD)
- Single Port USB 2.0 interface
- Capacity: 2 GB
- Vendor: INTEL
- Package: Low Profile

Signal Path:
USB SSD Sockets are located on J2 and J6.

2.5.5 SATA SSD Connectors

The AT8910 supports two SATA SSD sockets according JEDEC MO-297 Slim Lite SSD Assembly.

The supply voltage are 12.0 V, 5 V and 3.3 V.

Signal Path:
SATA SSD Sockets are located on J3 and J12.

2.6 LEDs Significations

2.6.1 Hot Swap LED (Blue)

Solid On	(100 % on):	FRU Inactive
Long Blink	(90 % on):	FRU Activation Request
Solid Off	(0 % on):	FRU Activation In Progress / FRU Active
Short Blink	(10 % on):	FRU Deactivation Request / FRU Deactivation In Progress

2.6.2 Out Of Service (Red/Amber)

Solid On:	MMC in reset
Fast Blink (~50 % on):	MMC upgrade/rollback in progress
Application Defined:	May be controlled by application using PICMG API

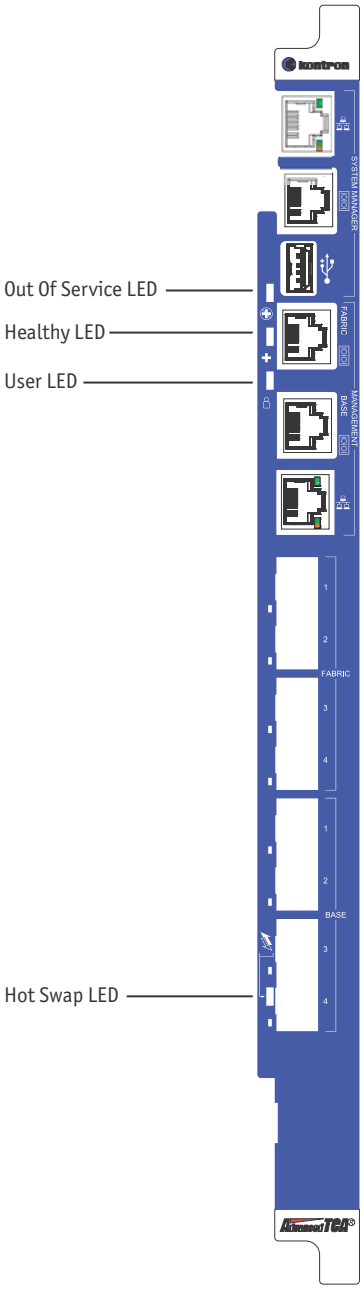
2.6.3 Healthy LED (Amber/Green)

Off:	Payload power down
Green:	Health Ok
Amber:	Health Error (Critical)
Application Defined:	May be controlled by application using PICMG API

2.6.4 SFP+ LED (Green)

Green On:	Link 10Gbit
Green Blink:	Activity 10Gbit
Amber On:	Link 1Gbit
Amber Blink:	Activity 1Gbit

Figure 2-2: Faceplate LEDs



Chapter 3

Installing the Board

3. Installing the Board

3.1 Setting Jumpers

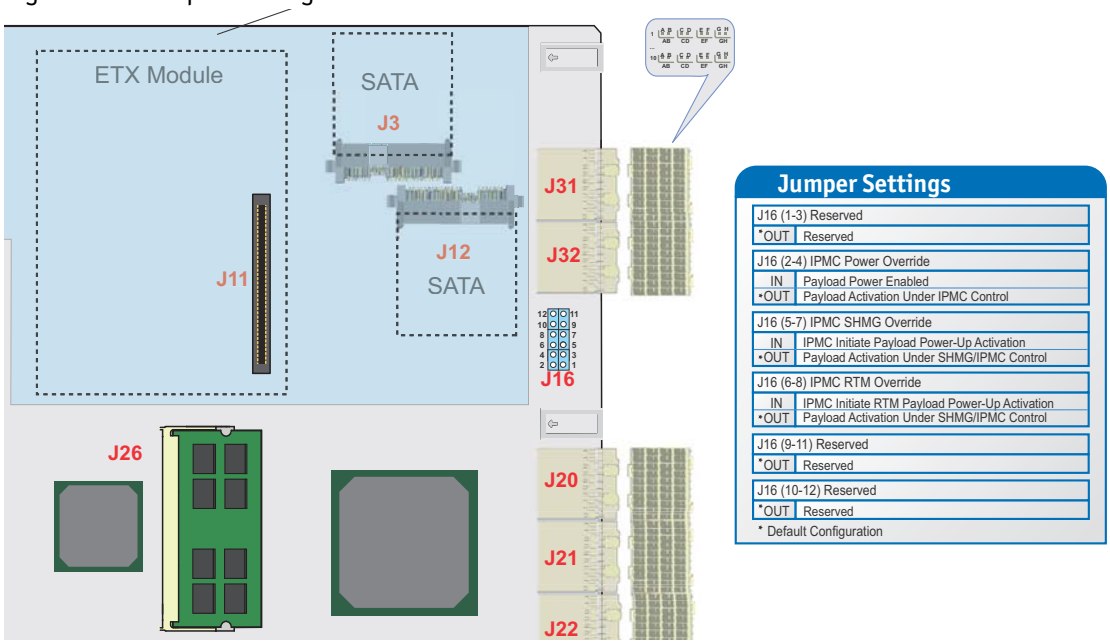
3.1.1 Jumper Description

Table 3-1: Jumper Description

Name	Description	Jumper
Reserved	Reserved	JP16 (1-3)
IPMC Power Override	When On, Payload Power is enabled	JP16 (2-4)
IPMC SHMG Override	When On, IPMC Initiates Payload Power-Up Activation	JP16 (5-7)
IPMC RTM Override	When ON, IPMC Initiates RTM Payload Power-Up Activation	JP16 (6-8)
Reserved	Reserved	JP16 (9-11)
Reserved	Reserved	JP16 (10-12)

3.1.2 Setting Jumper & Locations

Figure 3-1: Jumper Settings and Locations



Note:
More details about the jumper settings can be found on the Quick Reference Sheet.

3.2 COM Express and Memory

The COM Express and the memory module are preinstalled and should not be removed or exchanged by the user.

WARNING

Removing memory and/or Com Express modules may leave the board inoperable or my even damage the board.

3.3 Board Hot Swap and Installation

Because of the high-density pinout of the hard-metric connector, some precautions must be taken when connecting or disconnecting a board to/from a backplane:

1 Rail guides must be installed on the enclosure to slide the board to the backplane.

2 Do not force the board if there is mechanical resistance while inserting the board.

3 Screw the frontplate to the enclosure to firmly attach the board to its enclosure.

4 Use ejector handles to disconnect and extract the board from its enclosure.

WARNING

Always use a grounding wrist wrap before installing or removing the board from a chassis.

3.3.1 Installing the Board in the Chassis

To install a board in a chassis:

1 Remove the filler panel of the slot or see "Removing the Board" below.

2 Ensure the board is configured properly.

3 Carefully align the PCB edges in the bottom and top card guide.

4 Insert the board in the system until it makes contact with the backplane connectors.

5 Using both ejector handles, engage the board in the backplane connectors until both ejectors are locked.

6 Fasten screws at the top and bottom of the faceplate.

3.3.2 Removing the Board

If you would like to remove a card from your chassis please follow carefully these steps:

1 Unscrew the top and the bottom screw of the front panel.

2 Unlock the lower handle latch, depending on the software step; this may initiate a clean shutdown of the operating system.

3 Wait until the blue LED is fully ON, this mean that the hot swap sequence is ready for board removal.

4 Use both ejectors to disengage the board from the backplane.

5 Pull the board out of the chassis.

3.3.3 Installing the RTM

To install the RTM:

1 Remove the filler panel of the slot.

2 Ensure the board is configured properly.

3 Carefully align the PCB edges in the bottom and top card guide.

4 Insert the board in the system until it makes contact with the CPU board.

5 Using both ejector handles, engage the board in the front board connectors until both ejectors are locked.

6 Fasten screws at the top and bottom of the faceplate.

3.3.4 Removing the RTM

To remove the RTM:

1 Unscrew the top and the bottom screw of the faceplate.

2 Unlock the lower handle latch.

3 Wait until the blue LED is fully ON, this mean that the hot swap sequence is ready for board removal.

4 Use both ejectors to disengage the board from the front board.

5 Pull the board out of the chassis.

Chapter 4

Hardware Management

4. Hardware Management

4.1 Hardware Management Overview

The purpose of the hardware management system is to monitor, control, insure proper operation and provide hot swap support of ATCA Boards. The hardware management system watches over the basic health of the system, reports anomalies, and takes corrective action when needed. The hardware management system can retrieve inventory information and sensor readings as well as receive event reports and failure notifications from boards and other Intelligent FRUs. The hardware management system can also perform basic recovery operations such as power cycle or reset of managed entities.

4.2 Hardware Management Functionality

The Front Blade Unit supports an “intelligent” hardware management system, based on the Intelligent Platform Management Interface Specification. The hardware management system of the Front Blade Unit provides the ability to manage the power and interconnect needs of intelligent devices, to monitor events, and to log events to a central repository.

4.2.1 IPMC specific features

4.2.1.1 IPMC - ShMC interface

The principal management-oriented link within a Shelf is a two-way redundant implementation of the Intelligent Platform Management Bus (IPMB). IPMB is based on the inter-integrated circuit (I2C) bus and is part of the IPMI architecture. In AdvancedTCA Shelves, the main IPMB is called IPMB-0. Each entity attached to IPMB-0 does so through an IPM Controller, the distributed management controller of the IPMI architecture. Shelf Managers attach to IPMB-0 through a variant IPM Controller called the Shelf Management Controller (ShMC). AdvancedTCA IPM Controllers, besides supporting dual redundant IPMBs, also have responsibility for detecting and recovering from IPMB faults.

The reliability of the AdvancedTCA IPMB-0 is increased by using two IPMBs, with the two IPMBs referenced as IPMB-A and IPMB-B. The aggregation of the two IPMBs is IPMB-0. The IPM Controllers aggregate the information received on both IPMBs. An IPM Controller that has a message ready for transmit uses the IPMBs in a round robin fashion. An IPM Controller tries to alternate the transmission of messages between IPMB-A and IPMB-B.

If an IPM Controller is unable to transmit on the desired IPMB then it tries to send the message on the alternate IPMB. By using this approach, an IPMB can become unavailable and then available without the IPM Controller needing to take specific action.

4.2.1.2 IPMC - System Manager Interface

The Section 24 of [IPMI 2.0] describes how IPMI messages can be sent to and from the IPMC encapsulated in RMCP (Remote Management Control Protocol) packets datagrams. This capability is also referred to as "IPMI over LAN" (IOL). IPMI also defines the associated LAN-specific configuration interfaces for setting things such as IP addresses other options, as well as commands for discovering IPMI-based systems. The Distributed Management Task Force (DMTF) specifies the RMCP format. This LAN communication path make the Front Blade Unit reachable to the System Manager for any management action (IPMC firmware upgrade, query of all FRU Data, CPU reset etc.) without the need to go through the ShMC.

4.2.1.3 IPMC - System Event Log

The Kontron IPMC implementation includes a Local System Event Log device as specified in the Section 31 of [IPMI 2.0]. The local System Event Log is a nonvolatile repository for the front board and all managed FRU events (RTM). The local SEL provides space for more than 5000 entries. However, even if blade events are logged into the local SEL, the IPMI platform event messages are still generated by the IPMC's Event Generator and sent to the centralized SEL hosted by the Shelf Manager through the IPMB-0 communication path - [PICMG 3.0] chapter 3.5; [IPMI 2.0] Section 29. Local SEL is useful for maintenance purposes and provides access to the events when the FRU is extracted from the Shelf.

4.3 IPMC

4.3.1 Supported commands

The table below lists the IPMI commands supported by the IPMC. This table is identical as the one provided by AMC.0 and PICMG 3.0. The last column states the Kontron support for the specific command.

Table 4-1:IPM Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
IPM Device "Global" Commands				M	M	
Get Device ID	20.1	App	01h	M	M	Yes
Cold Reset	20.2	App	02h	O	O	Yes
Warm Reset	20.3	App	03h	O	O	No
Get Self Test Results	20.4	App	04h	M	M	Yes
Manufacturing Test On	20.5	App	05h	O	O	Yes
Set ACPI Power State	20.6	App	06h	O	O	No
Get ACPI Power State	20.7	App	07h	O	O	No
Get Device GUID	20.8	App	08h	O	O	No
Broadcast "Get Device ID"	20.9	App	01h	O/M	M	Yes

Table 4-2:Watchdog Timer Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
BMC Watchdog Timer Commands				M	M	
Reset Watchdog Timer	27.5	App	22h	M	M	Yes
Set Watchdog Timer	27.6	App	24h	M	M	Yes
Get Watchdog Timer	27.7	App	25h	M	M	Yes

Table 4-3:Device Messaging Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
BMC Device and Messaging Commands[5]				M	O	
Set BMC Global Enables	22.1	App	2Eh	M	O/M	Yes
Get BMC Global Enables	22.2	App	2Fh	M	O/M	Yes
Clear Message Flags	22.3	App	30h	M	O/M	Yes
Get Message Flags	224	App	31h	M	O/M	Yes
Enable Message Channel Receive	22.5	App	32h	O	O	Yes
Get Message	22.6	App	33h	M	O/M	Yes
Send Message	22.7	App	34h	M	M	Yes
Read Event Message Buffer	22.8	App	35h	O	O	Yes
Get BT Interface Capabilities	22.10	App	36h	M	O/M	No
Get System GUID	22.14	App	37h	O	O	No
Get Channel Authentication Capabilities	22.13	App	38h	O	O	No
Get Session Challenge	22.15	App	39h	O	O	Yes
Activate Session	22.17	App	3Ah	O	O	Yes
Set Session Privilege Level	22.18	App	3Bh	O	O	Yes
Close Session	22.19	App	3Ch	O	O	Yes
Get Session Info	22.20	App	3Dh	O	O	Yes
Get AuthCode	22.21	App	3Fh	O	O	No
Set Channel Access	22.22	App	40h	O	O	Yes
Get Channel Access	22.23	App	41h	O	O	Yes
Get Channel Info	22.24	App	42h	O	O	Yes
Set User Access	22.26	App	43h	O	O	Yes
Get User Access	22.27	App	44h	O	O	Yes
Set User Name	22.28	App	45h	O	O	Yes

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Get User Name	22.29	App	46h	O	O	Yes
Set User Password	22.30	App	47h	O	O	Yes
Activate Payload	24.1	App	48h			No
Deactivate Payload	24.2	App	49h			No
Get Payload Activation Status	24.4	App	4Ah			No
Get Payload Instance Info	24.5	App	4Bh			No
Set User Payload Access	24.6	App	4Ch			No
Get User Payload Access	24.7	App	4Dh			No
Get Channel Payload Support	24.8	App	4Eh			No
Get Channel Payload Version	24.9	App	4Fh			No
Get Channel OEM Payload Info	24.10	App	50h			No
Master Write-Read	22.11	App	52h			No
Get Channel Cipher Suites	22.15	App	54h			Yes
Suspend/Resume Payload Encryption	24.3	App	55h			Yes
Set Channel Security Keys	22.25	App	56h			No
Get System Interface Capabilities	22.9	App	57h			Yes

Table 4-4:Chassis Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Chassis Device Commands				O	O	
Get Chassis Capabilities	28.1	Chassis	00h	M	O	No
Get Chassis Status	28.2	Chassis	01h	O/M	O	Yes
Chassis Control	28.3	Chassis	02h	O/M	O	Yes
Chassis Reset	28.4	Chassis	03h	O	O	No
Chassis Identify	28.5	Chassis	04h	O	O	No
Set Chassis Capabilities	28.7	Chassis	05h	O	O	No
Set Power Restore Policy	28.8	Chassis	06h	O	O	No
Get System Restart Cause	28.11	Chassis	07h	O	O	No
Set System Boot Options	28.12	Chassis	08h			No
Get System Boot Options	28.13	Chassis	09h			No
Get POH Counter	22.12	Chassis	0Fh	O	O	No

Table 4-5:Event Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Event Commands				M	M	
Set Event Receiver	29.1	S/E	01h	M	M	Yes
Get Event Receiver	29.2	S/E	02h	M	M	Yes
Platform Event	29.3	S/E	03h	M	M	Yes

Table 4-6:PEF and Alerting Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
PEF and Alerting Commands				O	O	
Get PEF Capabilities	30.1	S/E	10h	M	M	No
Arm PEF Postpone Timer	30.2	S/E	11h	M	M	No
Set PEF Configuration Parameters	30.3	S/E	12h	M	M	No
Get PEF Configuration Parameters	30.4	S/E	13h	M	M	No
Set Last Processed Event ID	30.5	S/E	14h	M	M	No
Get Last Processed Event ID	30.6	S/E	15h	M	M	No
Alert Immediate	30.7	S/E	16h	O	O	No
PET Acknowledge	30.8	S/E	17h	O	O	No

Table 4-7:Sensor Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Sensor Device Commands				O	M	
Get Device SDR Info	35.2	S/E	20h	O	M	Yes
Get Device SDR	35.3	S/E	21h	O	M	Yes
Reserve Device SDR Repository	35.4	S/E	22h	O	M	Yes
Get Sensor Reading Factors	35.5	S/E	23h	O	M	No
Set Sensor Hysteresis	35.6	S/E	24h	O	O	Yes
Get Sensor Hysteresis	35.7	S/E	25h	O	O	Yes
Set Sensor Threshold	35.8	S/E	26h	O	O	Yes
Get Sensor Threshold	35.9	S/E	27h	O	O	Yes

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Set Sensor Event Enable	35.10	S/E	28h	O	O	Yes
Get Sensor Event Enable	35.11	S/E	29h	O	O	Yes
Re-arm Sensor Events	35.12	S/E	2Ah	O	O	No
Get Sensor Event Status	35.13	S/E	2Bh	O	O	No
Get Sensor Reading	35.14	S/E	2Dh	M	M	Yes
Set Sensor Type	35.15	S/E	2Eh	O	O	No
Get Sensor Type	35.16	S/E	2Fh	O	O	No

Table 4-8:FRU Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
FRU Device Commands				M	M	
Get FRU Inventory Area Info	34.1	Storage	10h	M	M	Yes
Read FRU Data	34.2	Storage	11h	M	M	Yes
Write FRU Data	34.3	Storage	12h	M	M	Yes

Table 4-9:SDR Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
SDR Device Commands				M	O	
Get SDR Repository Info	33.9	Storage	20h	M	M	No
Get SDR Repository Allocation Info	33.10	Storage	21h	O	O	No
Reserve SDR Repository	33.11	Storage	22h	M	M	No
Get SDR	33.12	Storage	23h	M	M	No
Add SDR	33.13	Storage	24h	M	O/M	No
Partial Add SDR	33.14	Storage	25h	M	O/M	No
Delete SDR	33.15	Storage	26h	O	O	No
Clear SDR Repository	33.16	Storage	27h	M	O/M	No
Get SDR Repository Time	33.17	Storage	28h	O/M	O/M	No
Set SDR Repository Time	33.18	Storage	29h	O/M	O/M	No
Enter SDR Repository Update Mode	33.19	Storage	2Ah	O	O	No
Exit SDR Repository Update Mode	33.20	Storage	2Bh	M	M	No
Run Initialization Agent	33.21	Storage	2Ch	O	O	No

Table 4-10:SEL Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
SEL Device Commands				M	O	
Get SEL Info	31.2	Storage	40h	M	M	Yes
Get SEL Allocation Info	31.3	Storage	41h	O	O	Yes
Reserve SEL	31.4	Storage	42h	O	O	Yes
Get SEL Entry	31.5	Storage	43h	M	M	Yes
Add SEL Entry	31.6	Storage	44h	M	M	Yes
Partial Add SEL Entry	31.7	Storage	45h	M	M	No
Delete SEL Entry	31.8	Storage	46h	O	O	Yes
Clear SEL	31.9	Storage	47h	M	M	Yes
Get SEL Time	31.10	Storage	48h	M	M	Yes
Set SEL Time	31.11	Storage	49h	M	M	Yes
Get Auxiliary Log Status	31.12	Storage	5Ah	O	O	No
Set Auxiliary Log Status	31.13	Storage	5Bh	O	O	No

Table 4-11:LAN Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
LAN Device Commands				O	O	
Set LAN Configuration Parameters	23.1	Transport	01h	O/M	O/M	Yes
Get LAN Configuration Parameters	23.2	Transport	02h	O/M	O/M	Yes
Suspend BMC ARPs	23.3	Transport	03h	O/M	O/M	Yes
Get IP/UDP/RMCP Statistics	23.4	Transport	04h	O	O	Yes

Table 4-12:Serial/Modem Device Supported Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Serial/Modem Device Commands				O	O	
Set Serial/Modem Configuration	25.1	Transport	10h	O/M	O/M	No
Get Serial/Modem Configuration	25.2	Transport	11h	O/M	O/M	No
Set Serial/Modem Mux	25.3	Transport	12h	O	O	No
Get TAP Response Codes	25.4	Transport	13h	O	O	No
Set PPP UDP Proxy Transmit Data	25.5	Transport	14h	O	O	No

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Get PPP UDP Proxy Transmit Data	25.6	Transport	15h	O	O	No
Send PPP UDP Proxy Packet	25.7	Transport	16h	O	O	No
Get PPP UDP Proxy Receive Data	25.8	Transport	17h	O	O	No
Serial/Modem Connection Active	25.9	Transport	18h	O/M	O/M	No
Callback	25.10	Transport	19h	O	O	No
Set User Callback Options	25.11	Transport	1Ah	O	O	No
Get User Callback Options	25.12	Transport	1Bh	O	O	No

Table 4-13:SOL Commands

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
SOL Commands				O	O	
SOL Activating	26.1	Transport		20h		Yes
Set SOL Configuration Params	26.2	Transport		21h		Yes
Get SOL Configuration Params	26.3	Transport		22h		Yes

Table 4-14:PICMG 3.0 Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
AdvancedTCA®	PICMG® 3.0 Table				M	
Get PICMG Properties	3-11	PICMG	00h		M	Yes
Get Address Info	3-10	PICMG	01h		M	Yes
Get Shelf Address Info	3-16	PICMG	02h		O	Yes
Set Shelf Address Info	3-17	PICMG	03h		O	No
FRU Control	3-27	PICMG	04h		M	Yes
Get FRU LED Properties	3-29	PICMG	05h		M	Yes
Get LED Color Capabilities	3-30	PICMG	06h		M	Yes
Set FRU LED State	3-31	PICMG	07h		M	Yes
Get FRU LED State	3-32	PICMG	08h		M	Yes
Set IPMB State	3-70	PICMG	09h		M	Yes
Set FRU Activation Policy	3-20	PICMG	0Ah		M	Yes
Get FRU Activation Policy	3-21	PICMG	0Bh		M	Yes

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
Set FRU Activation	3-19	PICMG	0Ch		M	Yes
Get Device Locator Record ID	3-39	PICMG	0Dh		M	Yes
Set Port State	3-59	PICMG	0Eh		O/M	Yes
Get Port State	3-60	PICMG	0Fh		O/M	Yes
Compute Power Properties	3-82	PICMG	10h		M	Yes
Set Power Level	3-84	PICMG	11h		M	Yes
Get Power Level	3-83	PICMG	12h		M	Yes
Renegotiate Power	3-91	PICMG	13h		O	No
Get Fan Speed Properties	3-86	PICMG	14h		M if controls Shelf fans	No
Set Fan Level	3-88	PICMG	15h		O/M	No
Get Fan Level	3-87	PICMG	16h		O/M	No
Bused Resource	3-62	PICMG	17h		O/M	No
Get IPMB Link Info	3-68	PICMG	18h		O/M	Yes
Get Shelf Manager IPMB Address	3-38	PICMG	1Bh		M	No
Set Fan Policy	3-89	PICMG	1Ch		M	No
Get Fan Policy	3-90	PICMG	1Dh		M	No
FRU Control Capabilities	3-29	PICMG	1Eh		M	Yes
FRU Inventory Device Lock Control	3-42	PICMG	1Fh		M	No
FRU Inventory Device Write	3-43	PICMG	20h		M	No
Get Shelf Manager IP Addresses	3-36	PICMG	21h		M	No
Get Shelf Power Allocation	3-85	PICMG	22h		M	No
Get Telco Alarm Capability	3-93	PICMG	29h		O/M	No
Set Telco Alarm State	3-94	PICMG	2Ah		O/M	No
Get Telco Alarm State	3-95	PICMG	2Bh		O/M	No
Get Telco Alarm Location	3-95	PICMG	39h		O/M	No
Set FRU Extracted	3-25	PICMG	3Ah		M	No

Table 4-15:AMC.0 Carrier Commands for IPMC

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
AMC	AMC.0 Table					
Set AMC Port State	Table 3-27	PICMG	19h		O/M	No
Get AMC Port State	Table 3-28	PICMG	1Ah		O/M	No
Set Clock State	Table 3-44	PICMG	1Ch		O/M	No
Get Clock State	Table 3-45	PICMG	1Dh		O/M	No

Table 4-16:HPM Commands

	IPMI Spec. section	NetFn	CMD	IPMI BMC req.	Carrier IPMC req.	Kontron support on IPMC
HPM						
Get Target Upgrade Capabilities						Yes
Get Component Properties						Yes
Abort Firmware Upgrade						Yes
Initiate Upgrade Action						Yes
Upload Firmware Block						Yes
Finish Firmware Upload						Yes
Get Upgrade Status						Yes
Activate Firmware						Yes
Query Self-Test Results						Yes
Query Rollback Status						Yes
Initiate Manual Rollback						Yes

4.3.2 OEM Commands

Table 4-17:List of supported OEM Commands

Command Name	Standard	NetFN	LUN	Code	Supported
OemApSetControlState	OEM	3Eh	0	20h	YES
OemApGetControlState	OEM	3Eh	0	21h	YES
OemApSetFirmwareCurrentTime	OEM	3Eh	3	01h	
OemApRefreshExternUpdatedSensor	OEM	3Eh	3	02h	
OemApGetFirmwareSysUpTime	OEM	3Eh	3	03h	YES
OemApGetFirmwareCurrentTime	OEM	3Eh	3	04h	
OemApSetNvParam	OEM	3Eh	3	05h	
OemApSetFanLevel	OEM	3Eh	3	06h	
OemApGetFanLevel	OEM	3Eh	3	07h	
OemApDebug	OEM	3Eh	3	08h	

Command Name	Standard	NetFN	LUN	Code	Supported
OemApFormatStorage	OEM	3Eh	3	09h	YES
OemApSetSdrLocatorString	OEM	3Eh	3	0Ah	YES
OemApSetSerialNumber	OEM	3Eh	3	0Bh	
OemApGetSerialNumber	OEM	3Eh	3	0Ch	
OemApSetManufacturingDate	OEM	3Eh	3	0Dh	
OemApGetManufacturingDate	OEM	3Eh	3	0Eh	
OemApSetNvData	OEM	3Eh	3	0Fh	YES
OemApGetNvData	OEM	3Eh	3	10h	YES
OemApSetDeviceGuid	OEM	3Eh	3	11h	
OemApGetNvData	OEM	3Eh	3	12h	YES
OemApGetNvSensConfig	OEM	3Eh	3	13h	YES
OemApLoadNvDefaults	OEM	3Eh	3	14h	
OemApFpgaWriteRead	OEM	3Eh	3	62h	YES
OemApGetReleaseInfo	OEM	30h	3	01h	YES
OemApWriteSMI	OEM	30h	3	97h	YES
OemApReadSMI	OEM	30h	3	98h	YES

4.3.2.1 OemApSetControlState

Table 4-18:Command OemApSetControlState

	Byte	Data Field
Request Data	1	Control ID
	2	Control State
Response Data	1	Completion Code

Table 4-19:Control States

Control ID	Control State
0 - Flash Select	0 - Select Flash Image 0 (valid for next boot) 1 - Select Flash Image 1 (valid for next boot)
1 - Guest OS reset	0 - Request GUEST0 reset 1 - Request GUEST1 reset
2 - ETX module control	0 - Press Reset Button (100ms) 1 - Press Power Button (500ms) 2 - Press Power Button (4500ms)
3 - Ethernet Clock Source Select	0 - Local Oscillator Clock is enabled 1 - Base Interface Sync_E_Clock is enabled
4 - SOL source selection	Select Serial interface for SOL 1 - ETX module (default) 2 - Guest#0 3 - Guest#1

4.3.2.2 OemApGetControlState

Table 4-20:Command OemApGetControlState

	Byte	Data Field
Request Data	1	Control ID
Response Data	1	Completion Code
	2	Control State

Table 4-21:Control States

Control ID	Control State
0 - Flash Select	0 - Select Flash Image 0 (valid for next boot) 1 - Select Flash Image 1 (valid for next boot)
1 - Guest OS reset	NA
2 - ETX module controll	NA
3 - Ethernet Clock Source Select	0 = Local Oscillator Clock is enabled 1 = Base Interface Sync_E_Clock is enabled
4 - SOL source selection	Selected Serial interface for SOL 1 - ETX module (default) 2 - Guest#0 3 - Guest#1

4.3.2.3 OemApGetFirmwareSysUpTime

Table 4-22:Command OemApGetFirmwareSysUpTime

Byte	Data Field	
Request Data	1	
	2	
	3	
	4	
Response Data	1	Completion Code
	2..5	System Up-Time in seconds

4.3.2.4 OemApFormatStorage

Table 4-23:Command OemApFormatStorage

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	
Response Data	1	Completion Code

4.3.2.5 OemApSetSdrLocatorString

Table 4-24:Command OemApSetSdrLocatorString

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	
	5..7	Manufacturer ID
	8..9	Product ID
	10..25	Device ID String
Response Data	1	Completion Code

4.3.2.6 OemApSetNvData

Table 4-25:Command OemApSetNvData

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	
	5	NV Data Param ID
	6..N	Raw data
Response Data	1	Completion Code

Table 4-26:List of Board specific NVTABLE

Table ID	Byte Offset	Default Value	Description
80h	0	0	Boot image selection
81h	0..2: IANA ID 1 3..4: Product ID 1 5..7: IANA ID 2 8..9: Product ID 2 10..12 IANA ID 3 13..14: Product ID 3 15..17 IANA ID 4 18..19: Product ID 4	00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h 00h	Compatible RTM table
82h	0	0	Ethernet clock source selection
83h	0	1	SOL interface source selection

Table ID	Byte Offset	Default Value	Description
84h	0 1	0h 0h	ETX module configuration Byte0: [0] 0b = module not is present 1b = module is present [1..7] reserved Byte1: ETX Module power draw in Watt

85h	0..15	07h 67h
		FFh FFh
		FFh FFh
		FFh FFh
		FFh FFh
		FFh FFh
		FFh FFh
		FFh FFh
			Thermal Trip Configuration for n sensors
			Byte 0+(n*2):
			Number #n
			FFh=UNDEF
			Byte 1+(n*2):
			Threshold #n
			FFh=UNDEF

4.3.2.7 OemApGetNvData

Table 4-27:Command OemApGetNvData

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	
	5	NV Data Param ID
Response Data	1	Completion Code
	2..N	Raw data

4.3.2.8 OemApSetNvSensConfig

Table 4-28:Command OemApSetNvSensConfig

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	
	5	Sensor Config Entry Number: 0..17
	6	Sensor Number
	7..8	Assertion Mask
	9..10	De-assertion Mask

	Byte	Data Field
	11	UNR Threshold
	12	UCR Threshold
	13	UNC Threshold
	14	LNR Threshold
	15	LCR Threshold
	16	UNC Threshold
	17	Positive Hysteresis
	18	Negative Hysteresis
Response Data	1	Completion Code

4.3.2.9 OemApGetNvSensConfig

Table 4-29:Command OemApGetNvSensConfig

Byte	Data Field	
Request Data	1	
	2	
	3	
	4	
	5	Sensor Config Entry Number: 0..17
Response Data	1	Completion Code
	2	Sensor Number
	3..4	Assertion Mask
	5..6	De-assertion Mask
	7	UNR Threshold
	8	UCR Threshold
	9	UNC Threshold
	10	LNR Threshold
	11	LCR Threshold
	12	UNC Threshold
	13	Positive Hysteresis
	14	Negative Hysteresis

4.3.2.10 OemApFpgaWriteRead

Table 4-30:Command OemApFpfaWriteRead

	Byte	Data Field
Request Data	1	
	2	
	3	
	4	

	Byte	Data Field
	5	Register offset
	6	Read data count N
	7	Write data
	8	Write data mask
Response Data	1	Completion Code
	2..N	Read data

4.3.2.11 OemApGetReleaseInfo

Table 4-31:Command OemApReadSMI

Byte	Data Field	
Request Data	1	
	2	
	3	
	4	
Response Data	1	Completion Code
	2..6	Release TAG
	7..12	Sub-release TAG
	13..20	Release Date

4.3.2.12 OemApWriteSMI

Table 4-32:Command OemApWriteSMI

	Byte	Data Field
Request Data	1	Register Address
	2	Data[0] LSB
	3	Data[1] MSB
Response Data	1	Completion Code

4.3.2.13 OemApReadSMI

Table 4-33:Command OemApReadSMI

	Byte	Data Field
Request Data	1	Register Address
Response Data	1	Completion Code
	2	Data[0] LSB
	3	Data[1] MSB

4.3.3 Sensor Data Records

Information that describes the IPMC capabilities is provided through two mechanisms: capabilities commands and Sensor Data Records (SDRs). Capabilities commands are commands within the IPMI command set that return fields providing information on other commands and functions the controller can handle.

Sensor Data Records are data records containing information about the type and number of sensors in the platform, sensor threshold support, event generation capabilities, and information on what types of readings the sensor provides. The primary purpose of Sensor Data Records is to describe the sensor configuration of the hardware management subsystem to system software.

The IPMC are required to maintain Device Sensor Data Records for the sensors and objects they manage. Access methods for the Device SDR entries are described in the [IPMI 2.0] specification, Section 35, "Sensor Device Commands."

After a FRU is inserted, the System Manager, using the Shelf Manager, may gather the various SDRs from the FRU's IPM Controller to learn the various objects and how to use them. The System Manager uses the "Sensor Device Commands" to gather this information. Thus, commands, such as "Get Device SDR Info" and "Get Device SDR," which are optional in the IPMI specification, are mandatory in AdvancedTCA systems.

Most of the current Shelf Manager implementation gathers the individual Device Sensor Data Records of each FRU into a centralized SDR Repository. This SDR Repository may exist in either the Shelf Manager or System Manager. If the Shelf Manager implements the SDR Repository on-board, it shall also respond to "SDR Repository" commands.

This duplication of SDR repository commands creates sometime some confusion among AdvancedTCA users. This is mandatory for IPMC to support the Sensor Device Commands for IPMC built-in SDR as described in the [IPMI 2.0] specification, Section 35, "Sensor Device Commands." For the ShMC, the same set of commands for the centralized SDR Repository must be supported but they are described in the [IPMI 2.0] specification, Section 33, "SDR Repository Commands."

4.3.3.1 IPMC Sensors

Table 4-34: IPMC Sensors

ID	Sensor Name	Sensor Class	Description (Sensor Type, Event Trigger)
0	AT8910	NA (Management Controller Locator Record)	NA
1	FRU0 Hot Swap	F0h (PICMG Hot Swap)	Event Type: 6Fh (Sensor-specific discrete)
2	FRU1 Hot Swap	F0h (PICMG Hot Swap)	Event Type: 6Fh (Sensor-specific discrete)
3	FRU0 Reconfig	12h (System Event)	Event Type: 6Fh (Sensor-specific discrete)
4	Temp Inlet	01h (Temperature)	Event Type: 01h (Threshold)
5	Temp Outlet-1	01h (Temperature)	Event Type: 01h (Threshold)
6	Temp Outlet-2	01h (Temperature)	Event Type: 01h (Threshold)
7	Temp ADT7461	01h (Temperature)	Event Type: 01h (Threshold)
8	Temp BCM5684X	01h (Temperature)	Event Type: 01h (Threshold)
9	Temp BCM54680-1	01h (Temperature)	Event Type: 01h (Threshold)

ID	Sensor Name	Sensor Class	Description (Sensor Type, Event Trigger)
10	Temp BCM54680-2	01h (Temperature)	Event Type: 01h (Threshold)
11	Temp INTEL82580	01h (Temperature)	Event Type: 01h (Threshold)
12	Temp Diode A4	01h (Temperature)	Event Type: 01h (Threshold)
13	Temp DIMM	01h (Temperature)	Event Type: 01h (Threshold)
14	Vcc +1.2V SUS	02h (Voltage)	Event Type: 01h (Threshold)
15	Vcc +2.5V SUS	02h (Voltage)	Event Type: 01h (Threshold)
16	Vcc +3.3V SUS	02h (Voltage)	Event Type: 01h (Threshold)
17	Vcc +5V SUS	02h (Voltage)	Event Type: 01h (Threshold)
18	Vcc +12V	02h (Voltage)	Event Type: 01h (Threshold)
19	Vcc +0.75Vref	02h (Voltage)	Event Type: 01h (Threshold)
20	Vcc +0.75Vtt	02h (Voltage)	Event Type: 01h (Threshold)
21	Vcc +1.0V	02h (Voltage)	Event Type: 01h (Threshold)
22	Vcc +1.025V A	02h (Voltage)	Event Type: 01h (Threshold)
23	Vcc +1.025V D	02h (Voltage)	Event Type: 01h (Threshold)
24	Vcc +1.05V	02h (Voltage)	Event Type: 01h (Threshold)
25	Vcc +1.2V	02h (Voltage)	Event Type: 01h (Threshold)
26	Vcc +1.5V	02h (Voltage)	Event Type: 01h (Threshold)
27	Vcc +1.8V	02h (Voltage)	Event Type: 01h (Threshold)
28	Vcc +2.5V	02h (Voltage)	Event Type: 01h (Threshold)
29	Vcc +3.3V	02h (Voltage)	Event Type: 01h (Threshold)
30	Vcc +5V	02h (Voltage)	Event Type: 01h (Threshold)
31	Icc 12v	03h (Current)	Event Type: 01h (Threshold)
32	RTM Power	03h (Current)	Event Type: 01h (Threshold)
33	-48V Feed A Fail	08h (Power Supply)	Event Type: 6Fh (Sensor-specific discrete)
34	-48V Feed B Fail	08h (Power Supply)	Event Type: 6Fh (Sensor-specific discrete)
35	-48V Fuse Fail		A fuse failure only can be detected when both power feeds are present and valid.
36	Power State	D1h (OEM Power State)	Event Type: 6Fh (Sensor-specific discrete)
37	Board Reset	CFh (OEM Reset)	Event Type: 03h (digital discrete)
38	POST Value	C6h (OEM Post)	Event Type: 6Fh (Sensor-specific discrete)
39	POST Error	C6h (OEM Post)	Event Type: 6Fh (Sensor-specific discrete)
40	Boot Error	1Eh (OEM Boot Error)	Event Type: 6Fh (Sensor-specific discrete)
41	Diag Status	C9h (OEM Diagnostic Status)	Event Type: 6Fh (Sensor-specific discrete)
42	Fwupg Status	CAh (OEM Firmware Update)	Event Type: 6Fh (Sensor-specific discrete)
43	IPMI Watchdog	23h (IPMI Watchdog 2)	Event Type: 6Fh (Sensor-specific discrete)
44	FW Ver Change	2Bh (Version Change)	Event Type: 6Fh (Sensor-specific discrete)
45	Health Error	24h (Platform Alert)	Event Type: 03h (digital discrete)
46	IPMB0 Link State	F1h (PICMG Physical IPMB-0)	Event Type: 6Fh (Sensor-specific discrete)
47	FRU0 IPMBL State	C3h (OEM IPMB-L Link State)	Event Type: 6Fh (Sensor-specific discrete)
48	FRU1 IPMBL State	C3h (OEM IPMB-L Link State)	Event Type: 6Fh (Sensor-specific discrete)
49	FRU Over Icc	CBh (OEM FRU Over Current)	Event Type: 6Fh (Sensor-specific discrete)
50	FRU Sensor Error	CCh (OEM FRU Sensor Discovery)	Event Type: 03h (digital discrete)

ID	Sensor Name	Sensor Class	Description (Sensor Type, Event Trigger)
51	FRU Pwr Denied	CDh (OEM FRU Power Denied)	Event Type: 03h (digital discrete)
52	FRU MngtPwr Fail	D2h (OEM FRU Management Power)	Event Type: 03h (digital discrete)
53	FRU0 Agent	C5h (OEM FRU Info Agent)	Event Type: 0Ah (generic discrete)
54	FRU1 Agent	C5h (OEM FRU Info Agent)	Event Type: 0Ah (generic discrete)
55	EventRcv ComLost	1Bh (Cable Disconnect)	Event Type: 03h (digital discrete)
56	IPMC Reboot	24h (Platform Alert)	Event Type: 6Fh (Sensor-specific discrete)
57	IPMC FwUp	C7h (OEM IPMC Firmware Upgrade)	Event Type: 6Fh (Sensor-specific discrete)
58	IPMC Storage Err	28h (Management Subsystem Health)	Event Type: 6Fh (Sensor-specific discrete)
59	IPMC SEL State	10h (Event Logging Disable)	Event Type: 6Fh (Sensor-specific discrete)
60	Jumper Status	D3h (OEM Jumper)	Event Type: 6Fh (Sensor-specific discrete)
61	IPMI Info-1	C0h (OEM Firmware Info)	Event Type: 70h (OEM)
62	IPMI Info-2	C0h (OEM Firmware Info)	Event Type: 70h (OEM)

4.3.3.2 Health Sensor Aggregation

The following table shows the sensors involved in the health sensor aggregation. The Health Sensor is an aggregation of all analog sensors and is asserted when at least one of the listed sensors report an asserted offset for critical or non-recoverable state.

Table 4-35: Health Sensor Aggregation Table

Sensor ID string
Temp Inlet
Temp Outlet-1
Temp Outlet-2
Temp ADT7461
Temp BCM5684X
Temp BCM54680-1
Temp BCM54680-2
Temp INTEL82580
Temp Diode A4
Vcc +1.2V SUS
Vcc +2.5V SUS
Vcc +3.3V SUS
Vcc +5V SUS
Vcc +12V
Vcc +0.75Vref
Vcc +0.75Vtt
Vcc +1.0V
Vcc +1.025V A
Vcc +1.025V D
Vcc +1.05V

Sensor ID string
Vcc +1.2V
Vcc +1.5V
Vcc +1.8V
Vcc +2.5V
Vcc +3.3V
Vcc +5V

Chapter 5

Software Setup

5. Software Setup

5.1 Installed Firmware

There is a command that shows the currently used SW and the corresponding SW versions of the board

```
(BASE Ethernet) #show boardinfo version

...

Firmware information          (Release       Version       Date          )
  ALTERA-FPGA                : GA-2.02       38            20120330221218
  BCM84754-FIRMWARE          : GA-2.02       2.02          20120330221218
--More-- or (q)uit
  BCM8727C-FIRMWARE          : GA-2.02       2.02          20120330221218
  CONFIGFLASH                : BETA-2.01     2.01          20120120143620
  DIAG                       : RC-2.02       2.02          20120329174753
  FRUDATA                    : GA-2.02       2.02          20120330221218
  IPMI                       : RC-2.02       2.02          20120329152505
  OS                         : RC-2.02       2.02          20120329152505
  ROOTFS                     : RC-2.02       2.02          20120329152505
  UBOOT                      : RC-2.02       2.02          20120329152505
```

Note:
CONFIGFLASH is initialized once during manufacturing time. This partition is persistent across system updates. It shows always the version used to initialize the flash partition during manufacturing time.

5.2 Updating Firmware

The firmware - including bootloader - image is updated using the CLI of the base Ethernet switch.

The system update package (ie: t5310-system-BETA-1.02.tar; this example will be used in the following commands) contains an image of bootloader, Hyperviser and Linux kernel, root filesystems for both guest OSs and config partition as well as a MD5 checksum file for consistency check.

Note:
Please make sure, the name of the update package used does not exceed 32 characters (ASCII).

Note:
Please also note, updating the active image is not allowed

Note:
If you have created custom script files (.SCR) that are saved in the Switch, make sure to copy them on the backup flash bank (run this command in Fastpath before the update: copy active backup), this will copy the scripts from the currently active bank to the backup flash bank. Alternatively, back them up on an external server (Section 8.7.14 of CLI manual) for re-download after the update.

When performing a firmware update, the software package is loaded from a remote TFTP server. A software update of the AT8910/AT8940 Switch is done by performing the following steps:

1 Prepare network access of the board

2 Log in to the privileged exec mode of the base Ethernet CLI of the board

3 Copy system image into the backup partition of the flash memory.

```
(BASE Ethernet) #copy tftp://192.168.50.154/t5310-system-BETA-1.02.tar backup
(BASE Ethernet) #
```

4 Copy diagnostic image into the backup partition of the flash memory.

```
(BASE Ethernet) #copy tftp://192.168.50.154/t5310-diag-GA-2.02.pkg backup
```

5 Check availability of current active image using the command 'show bootvar'

```
(BASE Ethernet) #show bootvar

Image Descriptions

 active : BETA-1.01        (20110406181923)
 backup : BETA-1.02        (20110427161545)


 Images currently available on Flash

----------------------------------------------------------------------
 unit      active      backup     current-active        next-active
----------------------------------------------------------------------
    1     1.1.0.0     1.2.0.0            1.1.0.0            1.1.0.0

(BASE Ethernet) #
```

6 Set the updated backup partition as active for subsequent boots

```
(BASE Ethernet) #boot system backup
Activating image backup ..

(BASE Ethernet)
```

This command will automatically also replace active and backup images with each other.

7 Restart the system

```
(BASE Ethernet) #reload hard

Are you sure you would like to reset the system? (y/n) y


System will now restart!

...

User:admin
Password:
(BASE Ethernet) >enable
Password:

(BASE Ethernet)
```

The image will be copied including the configuration settings currently stored for active image

8 In case of problems with booting the system, last working image (now the backup image) will automatically be copied and used for next time boot. This procedure restores previous system behavior.

9 It is recommended to copy active image to backup image to have a fully redundant system

```
(BASE Ethernet) #copy active backup
Copying active image to backup image

(BASE Ethernet) #
```

The image will be copied including the configuration settings currently stored for active image

5.3 Updating IPMI

Updating the IPMI firmware is done with the "copy" command. In case that the update procedure fails or the update image is corrupted, the PM will be able to restart by means of its rollback functionality.

The IPMI firmware package file is provided in tar format and is stored in the data/update directory of the release directory tree.

```
(BASE Ethernet) #copy tftp://192.168.50.5/t5310-ipmi-BETA-1.02.tar ipmi

Mode..................................... TFTP
Set Server IP.............................. 192.168.50.5
Path..................................... ./
Filename................................. t5310-ipmi-BETA-1.02.tar
Data Type................................ FW Update
Destination Filename..................... ipmi

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
TFTP Firmware transfer starting...


Firmware update successful...
```

5.4 Updating the 10G PHY Firmware

Updating the 10G PHY firmware is done with the "copy" command.

There are two PHYs that can be updated, one for base and one for extension Fabric

- t5310-phy-BETA-1.02.tar (for base PHY BCM8727)
- t5310-phyfabric-BETA-1.02.tar (for fabric PHY BCM8727)

The update packages for both10G PHYs are provided as tar-files and are stored in the data/update path of the release directory tree.

```
(BASE Ethernet) #copy tftp://192.168.50.5/t5310-phy-BETA-1.02.tar phy-base


Mode..................................... TFTP
Set Server IP.............................. 192.168.50.5
Path..................................... ./
Filename................................. t5310-phy-BETA-1.02.tar
Data Type................................ FW Update
Destination Filename..................... phy-base

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y


Firmware update successful...


(BASE Ethernet) #copy tftp://192.168.50.5/t5310-phyfabric-BETA-1.02.tar phy-fabric

Mode..................................... TFTP
Set Server IP.............................. 192.168.50.5
Path..................................... ./
Filename................................. t5310-phyfabric-BETA-1.02.tar
Data Type................................ FW Update
Destination Filename..................... phy-fabric

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y


Firmware update successful...
```

5.5 Updating the FRU Data

Updating the FRU data is done with the "copy" command.

The update package for the FRU comes as a tar-file and is stored in the data/update path of the release directory tree.

There are separate FRU data update packages for AT8910 and AT8940:

- t5310-fru-variant-0-BETA-1.02.tar (for AT8910)
- t5310-fru-variant-1-BETA-1.02.tar (for AT8940)

Note: please make sure, the name of the update package doesn `t extent 32 ASCIIs.

```
(BASE Ethernet) #copy tftp://192.168.50.5/t5310-fru-var-0-BETA-1.02.tar fru-data

Mode..................................... TFTP
Set Server IP.............................. 192.168.50.5
Path..................................... ./
Filename................................. t5310-fru-var-0-BETA-1.02.tar
Data Type................................ FW Update
Destination Filename..................... fru-data

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
```

```
TFTP Firmware transfer starting...

Firmware update successful...

(BASE Ethernet) #
```

5.6 Updating the PLD

Updating the FPGA data is done with the "copy" command.

The update package for the FPGA will be delivered as a tar-file and is stored in the data/update path of the release directory tree.

```
(BASE Ethernet) #copy tftp://192.168.50.5/t5310-fpga-BETA-1.02.tar pld


Mode..................................... TFTP
Set Server IP............................ 192.168.50.5
Path..................................... ./
Filename................................. t5310-fpga-BETA-1.02.tar
Data Type................................ FW Update
Destination Filename..................... pld

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
TFTP Firmware transfer starting...


Firmware update successful...


(BASE Ethernet) #
```

5.7 Using diagnostics

Diagnostics-software is stored in a separate tar-file which is provided with each release and must be loaded separately, e.g.

```
(BASE Ethernet) #copy tftp://192.168.50.5/test-diag.tar backup

Mode..................................... TFTP
Set Server IP............................ 192.168.50.5
Path..................................... ./
Filename................................. tes-diag.tar
Data Type................................ Code
Destination Filename..................... backup

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y
TFTP Code transfer starting...
Write image to flash starting...


File transfer operation completed successfully.

(BASE Ethernet) #
```

Chapter 6

Thermal Considerations

6. Thermal Considerations

The following chapter provide system integrators with the necessary information to satisfy thermal and airflow requirements when using the AT8940.

6.1 Thermal Monitoring

To ensure optimal operation and long-term reliability of the AT8940, all on-board components must remain within the maximum temperature specifications. Operating the AT8940 above the maximum operating limits will result in application performance degradation (e.g. the processor might throttles if it overheats) or may even damage the board. To ensure functionality at the maximum temperature, the blade supports several temperature monitoring and control features.

6.1.1 Heat Sinks

Multiple key components of the AT8940 are equipped with a specifically designed heat sink to ensure the best possible product for operational stability and long-term reliability. The physical size, shape, and construction of the heat sinks ensure the lowest possible thermal resistance. Moreover, the heat sinks were specifically designed to use forced airflow as found in ATCA systems.

6.1.2 Temperature Sensors

The AT8940 is equipped with 10 temperature sensors that are accessible via IPMI. Sensors are precisely positioned near critical components to accurately measure the on-board parts temperature. Temperature monitoring must be exercised to ensure highest possible level of system thermal management. An external system manager constitutes one of the best solution for thermal management, being able to report sensor status to end-user or manage events filters for example.

All sensors available on the AT8940, its RTM can carry are listed into the Sensor Data Repository with their thresholds as defined by the PICMG 3.0 specification. The following extract (from the PICMG 3.0 Base Specification) details naming convention for thresholds as well as the meaning of each threshold level.

IPMI non-critical / PICMG 3.0 minor / telco minor:

Temperature is getting closer to operating limit; it is not really a "problem" yet. It's only a warning.

IPMI critical / PICMG 3.0 major / telco major:

Temperature is at or over normal operating limit, but not in destructive zone. Unit still operating but MTBF might be affected.

IPMI non-recoverable / PICMG 3.0 critical/ telco critical:

Temperature has reached a destructive level. Device might be damaged.

Most ATCA chassis react to temperature events in the following manner: When a minor threshold is reached, the shelf manager will incrementally increase airflow (fan speed) to bring the temperature below the crossed threshold. When a major threshold is reached, the shelf manager will increase the fans to maximum speed. When a critical threshold is reached, the shelf manager will shutdown the blade to prevent damage. The shelf alarm panel, when available, can inform the operator with LEDs when an alarm (minor, major, critical) is raised. Refer to your chassis documentation to adapt and optimize your temperature monitoring application to chassis capabilities. See also System Airflow section for more information.

Below is the list of temperature sensors with their respective thresholds.

Table 6-1:Temperature Sensors Thresholds

Sensor ID	Lower Thresholds			Upper Thresholds		
	Minor	**Major**	**Critical**	**Minor**	**Major**	**Critical**
Temp BCM5684X	N/A	N/A	N/A	+90°C	+95°C	+100°C
Temp Inlet	N/A	N/A	N/A	+60°C	+65°C	+70°C
Temp Outlet-2	N/A	N/A	N/A	+80°C	+85°C	+90°C
Temp Diode A4	N/A	N/A	N/A	+80°C	+85°C	+90°C
Temp Outlet-1	N/A	N/A	N/A	+80°C	+85°C	+90°C
Temp BCM54680-2	N/A	N/A	N/A	+115°C	+125°C	+135°C
Temp BCM54680-1	N/A	N/A	N/A	+115°C	+125°C	+135°C
Temp Intel82580	N/A	N/A	N/A	+115°C	+125°C	+135°C
Temp ADT7461	N/A	N/A	N/A	+115°C	+125°C	+135°C
Temp DIMM						

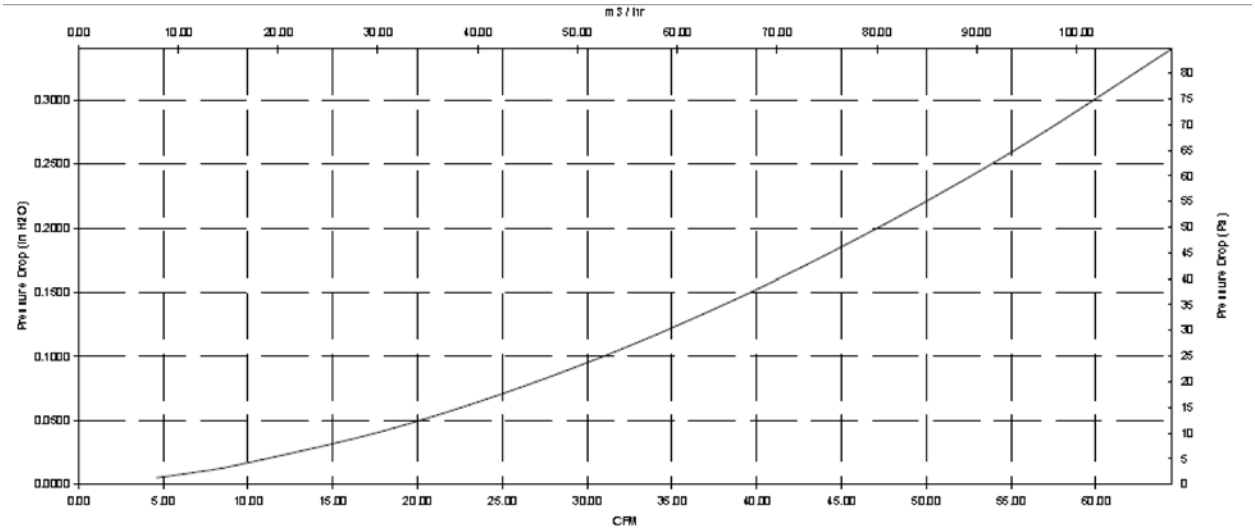
6.1.3 System Airflow

The airflow impedance (pressure) curve gives multiple information and tips about thermal operational range of the system carrying the AT8940. Once volumetric airflow capability of your chassis is known, the pressure curve can help determine the ambient (room) temperature setpoint that should be used for optimal operation. If you are using various models of ATCA blades into the same chassis, it is possible to find the best thermal fit. Having the volumetric airflow value for each chassis slot, it is then possible to decide the layout using the pressure curves.

Table 6-2:Pressure curve AT8940

Test Poin	Airflow (CFM)	Pressure drop (in H20)	Airflow (m^3/h)	Pressure Drop (Pa)
1	5	0.005	8.5	1.3
2	10	0.017	17.0	4.3
3	15	0.032	25.5	8.1
4	20	0.050	34.0	12.6
5	25	0.071	42.5	17.8
6	30	0.095	51.0	23.7
7	35	0.122	59.5	30.5
8	40	0.152	68.0	37.9
9	45	0.185	76.5	46.1
10	50	0.221	85.0	55.0
11	55	0.260	93.4	64.6
12	60	0.302	101.9	75.0

Figure 6-1:Pressure Drop Curve



A. Connector Pinouts

A.1 Connectors and Headers Summary

Connector	Description
J1	SM Management Port RJ45
J2, J6	USB SSD Connectors
J3, J12	SATA Connectors
J5	SM Serial Interface RJ45
J8	SM USB Connector
J9	Unit Computer Fabric Console Port
J11	ETXModule
J13	Unit Computer Base Console Port
J18	Unit Computer Ethernet Management Port
J20-J24	Zone 2 Connectors
J26	SP-UDIMM Connector
J31-J32	RTM Connectors
P10	Zone 3 Power Connector
X1	Fabric 1/2 SFP+
X2	Fabric 3/4 SFP+
X3	Base 1/2 SPF+
X4	Base 3/4 SFP+

A.2 Management Port(J1 & J18)

Signal	Pin		Pin	Signal
TRD0+	1		5	TRD2-
TRD0-	2		6	TRD1-
TRD1+	3		7	TRD3+
TRD2+	4		8	TRD3-

A.3 RJ45 Serial Port (J5, J9 & J13)

Signal	Pin		Pin	Signal
RTS	1		5	GND
DTR	2		6	RX#
TX#	3		7	DSR
GND	4		8	CTS

A.4 USB SSD Connectors (J2 & J6)

Signal	Pin		Pin	Signal
VCC	1		6	N.C.
N.C.	2		7	GND
USB_DATA-	3		8	N.C.
N.C.	4		9	N.C. (Key)
USB_DATA+	5		10	N.C.

A.5 SFP+ Connectors (X1, X2, X3 & X4)

Signal	Pin		Pin	Signal
VeeT	1		11	VeeR
TX_Fault	2		12	RD-
TX_Disable	3		13	RD+
SDA	4		14	VeeR
SCL	5		15	VccR
MOD-ABS	6		16	VccT
Rate_ Select_0	7		17	VeeT
RX_LOS	8		18	TD+
Rate_Select_1	9		19	TD-
VeeR	10		20	VeeT

A.6 SATA SSD Connectors (J3 & J12)

Signal	Pin		Pin	Signal
GND	S1		P1	V_3V3
ETX_SATA_TX+	S2		P2	V_3V3
ETX_SATA_TX-	S3		P3	V_3V3
GND	S4		P4	GND
ETX_SATA_RX-	S5		P5	GND
ETX_SATA_RX+	S6		P6	GND
GND	S7		P7	V_5V
GND	S8		P8	V_5V
N.C.	S9		P9	V_5V
N.C.	S10		P10	GND
GND	S11		P11	N.C.
N.C.	S12		P12	GND
N.C.	S13		P13	V_12V
GND	S14		P14	V_12V
			P15	V_12V

B. Software Update

To update the board software, it is recommended to use the Kontron update CD. A version of this CD can be found on the CD/DVD provided with your board or on the Kontron Canada's FTP site. Updating your board with this Update CD will have a payload impact on your board. To update your board from the update CD follow the instructions provided in the AT8940 - Update CD User guide provided with the CD image file.

The latest versions of the Update CD is available from the Kontron Canada's FTP site(ftp.kontron.ca/support/maint.html).

C. Getting Help

If, at any time, you encounter difficulties with your application or with any of our products, or if you simply need guidance on system setups and capabilities, contact our Technical Support at:

North America	EMEA
Tel.: (450) 437-5682	Tel.: +49 (0) 8341 803 333
Fax: (450) 437-8053	Fax: +49 (0) 8341 803 339

If you have any questions about Kontron, our products, or services, visit our Web site at: www.kontron.com

You also can contact us by E-mail at:

North America: support@ca.kontron.com

EMEA: support-kom@kontron.com

Or at the following address:

North America	EMEA
Kontron Canada, Inc.	Kontron Modular Computers GmbH
4555, Ambroise-Lafortune	Sudetenstrasse 7
Boisbriand, Québec	87600 Kaufbeuren
J7H 0A4 Canada	Germany

C.1 Returning Defective Merchandise

Before returning any merchandise please do one of the following:

- Call

  1 Call our Technical Support department in North America at (450) 437-5682 and in EMEA at +49 (0) 8341 803 333. Make sure you have the following on hand: our Invoice #, your Purchase Order #, and the Serial Number of the defective unit.

  2 Provide the serial number found on the back of the unit and explain the nature of your problem to a service technician.

  3 The technician will instruct you on the return procedure if the problem cannot be solved over the telephone.

  4 Make sure you receive an RMA # from our Technical Support before returning any merchandise.

- E-mail

  1 Send us an e-mail at: RMA@ca.kontron.com in North America and at: orderprocessing@kontron-modular.com in EMEA. In the e-mail, you must include your name, your company name, your address, your city, your postal/zip code, your phone number, and your e-mail. You must also include the serial number of the defective product and a description of the problem.

C.2 When Returning a Unit

- In the box, you must include the name and telephone number of a contact person, in case further explanations are required. Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.
- Ensure that the unit is properly packed. Pack it in a rigid cardboard box.
- Clearly write or mark the RMA number on the outside of the package you are returning.
- Ship prepaid. We take care of insuring incoming units.

North America	EMEA
Kontron Canada, Inc.	Kontron Modular Computers GmbH
4555, Ambroise-Lafortune	Sudetenstrasse 7
Boisbriand, Québec	87600 Kaufbeuren
J7H 0A4 Canada	Germany

D. Glossary

Acronyms	Descriptions
ACPI	Advanced Configuration & Power Interface
ANSI	American National Standards Institute
API	Application Programming Interface
APIC	Advanced Programmable Interrupt Controller
ASCII	American Standard Code for Information Interchange. ASCII codes represent text in computers, communications equipment, and other devices that work with text.
ATA	Advanced Technology Attachment
ATAPI	Advanced Technology Attachment Packet Interface
ATCA	Advanced Telecommunications Computing Architecture
BBS	BIOS Boot Specification
BI	Base Interface. Backplane connectivity defined by the ATCA.
BIOS	Basic Input/Output System
BMC	Base Management Controller
CD	Compact Disk
CDROM	(Same as CD-ROM). Compact Disk Read-Only Memory.
CD-ROM	(Same as CDROM). Compact Disk Read-Only Memory.
CFM	Cubic Foot per Minute
CLI	Command-Line Interface
CLK1	AdvancedTCA bused resource Synch clock group 1
CLK1A	AdvancedTCA bused resource Synch clock group 1, bus A
CLK1B	AdvancedTCA bused resource Synch clock group 1, bus A
CLK2	AdvancedTCA bused resource Synch clock group 2
CLK2A	AdvancedTCA bused resource Synch clock group 2, bus A
CLK2B	AdvancedTCA bused resource Synch clock group 2, bus B
CLK3	AdvancedTCA bused resource Synch clock group 3
CLK3A	AdvancedTCA bused resource Synch clock group 3 , bus A
CLK3B	AdvancedTCA bused resource Synch clock group 3 , bus B
CMOS	Complementary Metal Oxide Semiconductor. Also refers to the small amount of battery (or capacitor) powered CMOS memory to hold the date, time, and system setup parameters.
CPLD	Complex Programmable Logic Device
CP-TA	Communications Platforms Trade Association
CPU	Central Processing Unit. This sometimes refers to a whole blade, not just a processor component.
CTS	Clear To Send
DDR3	DDR3 SDRAM or Double-Data-Rate three (3) Synchronous Dynamic Random Access Memory.
DHCP	Dynamic Host Configuration Protocol
DIMM	Dual In-line Memory Module
DMA	Direct Memory Access
DMI	Desktop Management Interface
DTC	Data Transfer Controller
DTR	Data Terminal Ready

Acronyms	Descriptions
DTS	Digital Thermal Sensor in IA32 processors.
DVD	Digital Video Disk
ECC	Error Checking and Correction
EMI	ElectroMagnetic Interference
ETH	Same as Ethernet.
FC	Fibre Channel
FCC	Federal Communications Commission
FI	Fabric Interface. Backplane connectivity defined by the ATCA.
FIFO	First In First Out
FPGA	Field-Programmable Gate Array
FRU	Field Replaceable Unit. Any entity that can be replaced by a user in the field. Not all FRUs are hot swappable.
FWH	FirmWare Hub. Boot flash connected to the LPC bus containing BIOS FW.
Gb	Gigabit
GB	(Same as GByte) GigaByte.
GByte	(Same as GB) GigaByte.
GbE	Gigabit Ethernet
GHz	GigaHertz
GND	GrouND
HDD	Hard Disc Drive
HPM	PICMG Hardware Platform Management specification family
HPM.1	Hardware Platform Management IPM Controller Firmware Upgrade Specification
HW	HardWare
I2C	Inter Integrated Circuit bus
ICH	I/O Controller Hub
ICT	In-Circuit Test
ID	IDentification
IEEE	Institute of Electrical and Electronics Engineers
IMVP-6	Intel Mobile Voltage Positioning. The Intel Mobile Voltage Positioning specification for the Intel® Core™ Duo Processor. It is a DC-DC converter module that supplies the required voltage and current to a single processor.
IO	(Same as I/O). Input Output
IOH	I/O Hub
IOL	IPMI-Over-LAN
IP	Internet Protocol
IPM	Intelligent Platform Management
IPMB	Intelligent Platform Management Bus
IPMB-0	Intelligent Platform Management Bus Channel 0, the logical aggregation of IPMB-A and IPMB-B.
IPMB-A	Intelligent Platform Management Bus A
IPMB-B	Intelligent Platform Management Bus B
IPMB-L	Intelligent Platform Management Bus Local
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface

Acronyms	Descriptions
IPMIFWU	Intelligent Platform Management Interface FirmWare Update
IPv6	Internet Protocol version 6
IRQ	Interrupt ReQuest
JTAG	Joint Test Action Group
KHz	KiloHertz
LAN	Local Area Network
LED	Light-Emitting Diode
LFM	Low Frequency Mode. The lowest operating speed for the processor.
LPC	Low Pin Count port
MAC	Media Access Controller address of a computer networking device.
MB	MegaByte
MCH	Memory Controller Hub
MHz	MegaHertz
MMC	Module Management Controller. MMCs are linked to the IPMC.
NC	Not Connected
OOS	Out Of Service
OS	Operating System
PHY	PHYsical layer. Generic electronics term referring to a special electronic integrated circuit or functional block of a circuit that takes care of encoding and decoding between a pure digital domain (on-off) and a modulation in the analog domain.
PICMG	PCI Industrial Computer Manufacturers Group
PICMG®	PCI Industrial Computer Manufacturers Group
POST	Power-On Self-Test
RAID	Redundant Array of Independent Disks / Redundant Array of Inexpensive Disks.
RAM	Random Access Memory
RHEL	Red Hat Enterprise Linux
RoHS	Restriction of the Use of Certain Hazardous Substances
RS-232	(Same as RS232). Recommended Standard 232.
RS232	(Same as RS-232). Recommended Standard 232.
RTC	Real Time Clock
RTM	Rear Transition Module
RTM-Link	Rear Transition Module Link. Kontron 3-wire protocol.
RTS	Request To Send
SAS	Serial Attached SCSI
SATA	Serial ATA
SEL	System Event Log
SFP	Small Form-factor Pluggable
ShMC	Shelf Management Controller
SMB	(Same as SMBus/SMBUS). System Management Bus.
SMBIOS	System Management BIOS
SMBUS	(Same as SMB/SMBus). System Management Bus.
SMBus	(Same as SMB/SMBUS). System Management Bus.

Acronyms	Descriptions
SOL	Serial Over LAN
SPI	Serial Peripheral Interface
SpeedStep	(Same as EIST). Enhanced Intel SpeedStep Technology.
SSE2	Streaming SIMD Extension 2. SIMD is "Single Instruction, Multiple Data".
SSE3	Streaming SIMD Extension 3. SIMD is "Single Instruction, Multiple Data".
SSH	Secure SHell. A network protocol that allows data to be exchanged over a secure channel between two computers.
TCLKA	Telecom CLocK A. AMC Clock Interface.
TCLKB	Telecom CLocK B. AMC Clock Interface.
TCLKC	Telecom CLocK C. AMC Clock Interface.
TCLKD	Telecom CLocK D. AMC Clock Interface.
TX	Transmit
TXD	Transmit
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus
VCC	Power supply
VLAN	Virtual Local Area Network
XAUI	X (meaning ten) Attachement Unit Interface. A standard for connecting 10 Gigabit Ethernet (10GbE) ports.