

» Kontron User's Guide «

Advanced TCA®



RTM806X

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Revision History

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Kontron reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology. Changes that affect the operation of the unit will be documented in the next revision of this user's guide.

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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 metallic 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
- 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 find the signal on the board.	
	Jumper Settings: Indicate the jumpers that are related to this section.	
	BIOS Settings: Indicate where you can set this option in the BIOS.	
	Software Usage: Indicates how you can access this feature through software.	
	CAUTION	
	WARNING	
	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, including AMC adapters.

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.

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 A Devices

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference 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 A 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 IECCE 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 2

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1. Product Description

1.1 Product Overview

The RTM806X is a single slot (6HP) AdvancedTCA Rear Transition Module. This RTM provides additional connectivity and storage functionality to the AT8060 CPU front board.

1.2 What's Included

This board is shipped with the following items:

- One RTM806X board
- Two Hard Disk Carriers with their respective HDD, already mounted on the RTM806X board.
- One CD-ROM containing documentations.

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

1.3 Board Specifications

Table 1-1: Board Specifications

Features	Description
Compliance	<ul style="list-style-type: none">• PICMG3.0 R3.0 (see note in section 1.4)• SAS1R10• SFF-8088• IEEE 802.3z (fiber interface)• PICMG HPM.1• USB 2.0
IPMI Features	<ul style="list-style-type: none">• Management Controller compliant to PICMG 3.0, IPMI v2.0 and AMC.0 R2.0.• Management Controller is run time field reprogrammable without payload impact.• Robust fail safe reprogramming implementation (which includes two firmware images) that performs an automatic or manual rollback if a problem occurs during critical reprogramming phase.• Remote upgrade capability (via IPMB).• Management Controller self test which can detect a failure in its code integrity and trigger an automatic rollback.
Supervisory	<ul style="list-style-type: none">• Hardware system monitor(sensors, alarm, events) through IPMI (voltages, temperatures), power failure.
Mechanical	<ul style="list-style-type: none">• 350.93 X 176.8 X 28.95 mm
Power Requirements	<ul style="list-style-type: none">• 10W Typical without hard drive.• 65W Maximum with hard drives.

Features	Description
Environmental Temperature*	Operating: 0-55°C/32-131°F with 3.8 CFM 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, half-sine 11ms, each axis Storage and Transit: 18G, half-sine 11ms, each axis
Environmental Vibration*	Operating: 5-200Hz. 0.2G, each axis Storage and Transit: 5 Hz to 20 Hz @ 1 m2/s3 (0.01 g2 /Hz) (flat) 20 Hz to 200 Hz @ -3 dB/oct (slope down)
Reliability	<ul style="list-style-type: none"> • Whole board protected by an active breaker • USB voltage protected by an active breaker
Safety / EMC	<ul style="list-style-type: none"> • Safety: CE Mark to EN 60950-1:2001. Meets or exceeds UL 60950-1/CSA C22.2 No 60950-1-07. • Designed to meet GR-1089-CORE • EMI/EMC: FCC 47 CFR Part 15, Class A; CE Mark to EN55022/EN55024/EN300386
Warranty	Two years limited warranty

* Designed to meet or exceed

1.4 Compliance

This product conforms to the following specifications:

- USB 2.0 - Universal Serial Bus Version 2.0
- PICMG3.0 R3.0 - Advanced Telecommunication Computing Architecture (see note below)
- PICMG HPM.1
- SAS1R10 - Serial Attached SCSI - 1.0 Revision 10.
- SFF-8088 (T10 Technical Committee and SCSI Trade Association)
- IEEE 802.3z (fiber interface)
- IPMI v2.0
- AMC.0 R2.0



Note:

Board might not be 100% compliant to ATCA PICMG 3.0 Specification REQ 4.94 when a hard drive is present on the RTMHDD. The HDD might connect the Logic Ground and the Shelf Ground. By default the Logic Ground and the Shelf Ground are connected through a removable screw.

**Note:**

In order to fit two 2.5" SAS disks, the RTM806X is exceeding the RTM mechanical envelope defined by ATCA PICMG 3.0 specification, only in HDDs section.

1.5 Hot-Swap Capability

The RTM806X supports Full Hot Swap capability as per PICMG3.0R3.0. 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.

**WARNING**

All the managements infrastructures are present for hot-swap, but the user must take the proper action to protect its data under the OS installed on the Front Board (such as unmount a SAS drive)



1.6 Interfacing with the Environment

1.6.1 RTM (rear transition module)

The RTM806X is a single slot (6HP) AdvancedTCA Rear Transition Module. This module provides additional connectivity for AT8060 CPU front board.

1.6.1.1 SAS Feature

- Compliant to SAS 3G (RTM8063), SAS 6G (RTM8066)
- A JBOD unit can be use as additional external storage. This connection is done through a standard mini-SAS cable. SAS signal integrity guaranteed over a two meters cable

1.6.1.2 Serial Port Feature

- One (1) serial port available on the RTM face plate through one (1) RJ-45 connector
- RS-232 signals level at RTM face plate connector.
- Serial port speed capability is: 9.6kbits/s to 115.2kbits/s.

1.6.1.3 FRU Data EEPROM

- FRU Data EEPROM size is 4Kbyte and it includes board identification and serial number.

1.6.1.4 Hot Swap

As a Hot Swappable Intelligent Managed FRU, the RTM806X (FRU2) includes a Management Controller, the AdvancedTCA Hot Swap indicator (Blue LED), and the standard AdvancedTCA handle switch.

Each HDD is an independent FRU that is hot swappable. The HDD hotswap handle is used to raise an event to the OS in order to hotswap the HDD without interrupting the front board operation.

1.6.1.5 *Insertion and Removal of the Managed FRUs*

After insertion, the front board detects and activates the management components of the FRU. When the handle is closed, the power budget and the e-keying negotiations start. Then, the front board's IPMC activates the payload components of the FRU.

Opening the RTM handle switch on the RTM FRU will start the deactivation process, which either deactivates the whole board (front board, RTM and RTMHDD) or only the RTM806X and its RTMHDDS, depending on a configuration policy available through the CMOS configuration menu. See AT8060 User Manual's appropriate BIOS section for details.

The operational state of the FRU is reported through the management subsystem's FRU Hot Swap sensors. The BLUE LED is 100% off when a FRU is operational and unsafe for extraction. An always on(100%) indicates that a FRU can safely be extracted; transitional states are identified through blinking patterns. Additional details on the standard FRU Hot Swap sensor and the BLUE LED usage can be found in the AdvancedTCA specifications.

Chapter 2

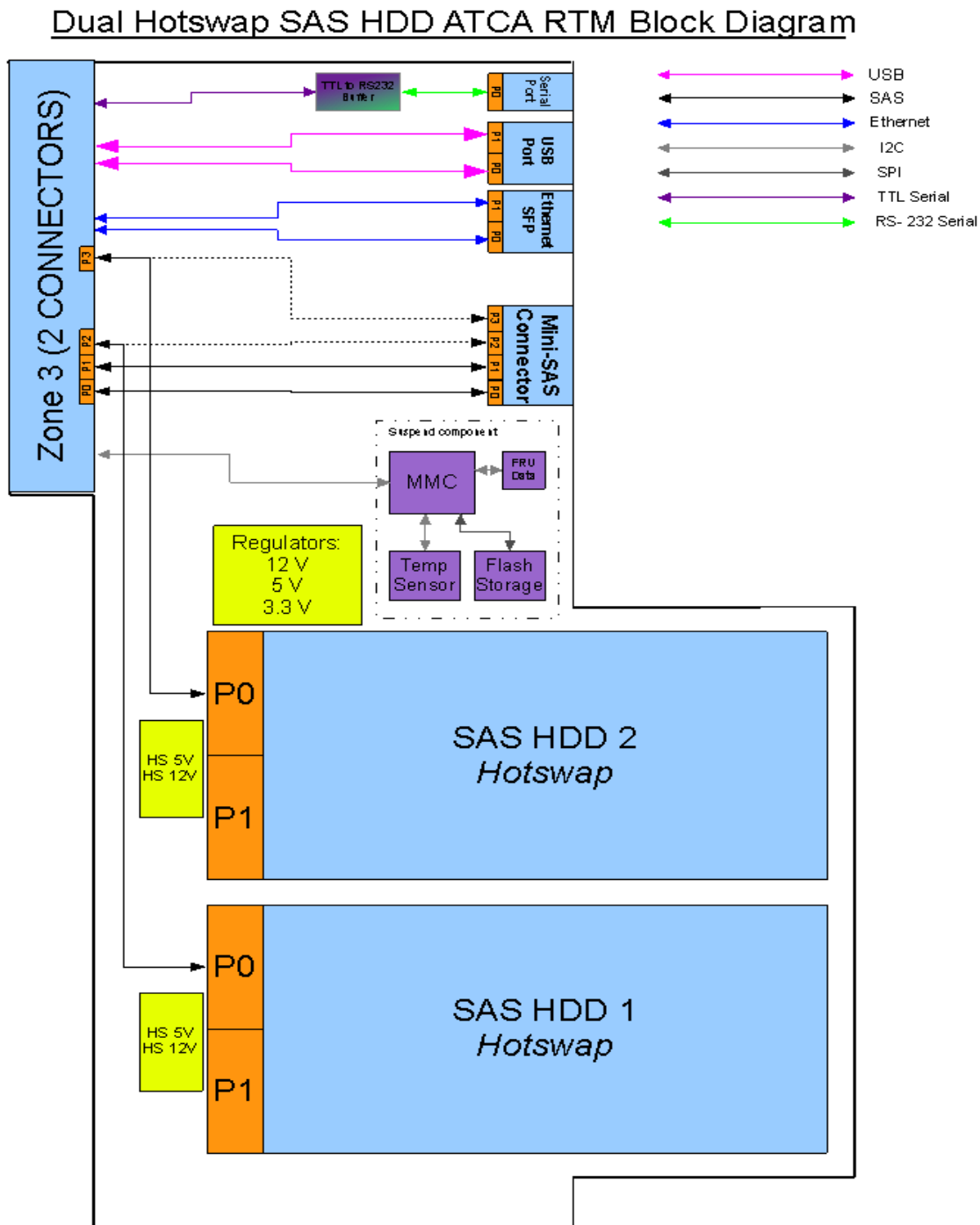
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2. Board Features

2.1 Block Diagram

Figure 2-1:Block Diagram



2.2 USB 2.0 Interface

The RTM806X features two USB connectors on the faceplate.

USB features include:

- Capability to daisy chain as many as 127 devices per interface
- Fast bi-directional
- Isochronous/asynchronous interface
- 480 MBPS transfer rate
- Standardization of peripheral interfaces into a single format
- Backward compatible with USB 1.1 devices

USB supports Plug and Play and hot-swapping operations (OS level). These features allow USB devices to be automatically attached, configured and detached, without reboot or running setup.

Table 2-1:USB Connector Pinout

Pin	Signal
1	VCC
2	DATA-
3	DATA+
4	GND



Signal Path:

The USB Ports are available through the RTM face plate (J2).

2.3 SAS

The SAS connections are only offered through the RTM. The controller is located on the front board and sends the four signals from the PCH to the RTM through the RTM connectors. The SAS signals are accessible through:

- Two HDD mounted on RTM806X
- Two external links through the mini-SAS connector

2.4 HD Hot-Swap Option

Kontron offers the possibility to add two Hot-Swap SAS hard drives on the RTM806X. Those hard drives are located on the lower part of the RTM806X. The Hotswap infrastructure includes a Hot-Swap LED, Hot-Swap handle, hard disk presence status and a thermal sensor. All of which are connected to the MMC. They are managed by the IPMC and presented as a regular managed FRU to management subsystem.

2.5 SFP

The RTM806X has two SFP modules connectors available on the RTM face plate. The SFP module signals come from the front board 1000Base-KX interface through the zone 3 connector.

2.6 MMC Boot Block

The MMC runs a firmware from its internal 256KB flash. It is programmed by an additional 8K boot block. It keeps the last two copies of the MMC firmware in a dedicated flash memory. The boot block activates the MMC image and can rollback a firmware update in case of problems.

2.7 Hardware Management Overview

The RTM communicates with the front board using the IPMB-L channel. Kontron's Intelligent RTM address on the IPMB-L is fixed and has a value of 0xA6.

The memory subsystem of the MMC consists of an integrated flash memory to hold the MMC operation code and integrated RAM for data. The field replacement unit (FRU) inventory information is stored in the nonvolatile memory on an EEPROM connected via a local I2C interface to the MMC. It is possible to store up to 4 KBytes within the FRU inventory information. Events are sent over the IPMB-L bus to the front board which then forwards it to the ShMc to ensure that 'post-mortem' logging information is available even if the power of the RTM is disabled.

The onboard DC voltages and temperatures are monitored by the MMC device. The MMC will send an event to the front board if any of the thresholds are exceeded.

To increase the reliability of the RTM806X management subsystem, an external watchdog supervisor is implemented for the MMC. The MMC must strobe the external watchdog at 500 μ sec. intervals to ensure continuity of operation of the board's management subsystem. If the MMC ceases to strobe the watchdog supervisor, the watchdog resets the MMC. The watchdog timeout expires after one second if strobes are not generated. The external watchdog supervisor is not configurable and must not be confused with the IPMI v1.5 watchdog timer commands. This external watchdog of the MMC is implemented in a separate chip.

2.7.1 Sensor Data Record (SDR)

Every sensor on the RTM is associated with a Sensor Data Record (SDR). Sensor Data Records contain information about the sensors identification such as sensor's type, sensor name, sensor unit. SDRs also

contain the configuration of a specific sensor such as threshold/hysteresis, event generation capabilities that specify sensor behaviour. Some fields of the sensor SDR are configurable through IPMI v1.5 command and are set with built-in initial value. Finally, the field 'sensor owner' must reflect the module's address which allows a system management software to identify the owner of the SDR when it is scanned from the front board IPMC and merged within the IPMC Device SDR repository.

From an IPMI perspective, the RTM806X management controller is set up as a satellite management controller (SMC). It does support sensor devices, and uses the IPMI static sensor population feature of IPMI v1.5 to merge the hotswap RTM sensor with the front board's sensor population. The SHMC is informed about an RTM insertion through the RTM Module Hot Swap sensor and a radial presence line on the RTM connector. All SDRs can be queried using Device SDR commands to the firmware. Module sensors that have been implemented are listed below.

2.7.2 Hardware Sensors

Table 2-2:IPMI Hardware Sensors

IPMI sensor ID	Sensor Name	Description (Sensor Type, Event trigger)	Scanning Enabled under Power State	Health LED (Green to Amber)
0	IPMI Info-1	Internal Management Controller firmware diagnostic	*	N
1	IPMI Info-2	Internal Management Controller firmware diagnostic	*	N
2	FRU Agent	FRU Information Agent - FRU0 Data Error Detection	*	N
3	Module HS	Hot Swap state	*	N
4	IPMBL State	IPMB-L branch from FRU0 fault detection sensor	*	N
5	MMC Stor Err	Management sub-system health: non volatile memory error	*	N
6	MMC Reboot	IPMC reboot detection	*	N
7	Ver Change	Firmware Change Detection	*	N
8	Temp MMC	Module Management Controller Temperature (Degrees)	*	X
9	Temp SAS HD	Hard disk zone temperature	*	X
10	Temp Air In	Air Inlet Temperature (Degrees)	*	X
11	Temp Air Out	Air Outlet Temperature (Degrees)	*	X
12	Vcc +3.3VSUS	Voltage on board 3.3V suspend (management) power supply	*	X
13	Vpump	Voltage on board blue LED VPUMP suspend power supply	*	X
14	Vcc +12V In	Voltage on board 12V payload power supply	-	X
15	Vcc +5V	Voltage on board 5V backend power supply	-	X
16	Vcc +3.3V	Voltage on board 3.3V backend power supply	-	X
17	Vcc +12V HD	Voltage on board 12V payload disk power supply	-	X
18	SFP1 Status	SFP1 Presence/Fault status	-	X
19	SFP2 Status	SFP2 Presence/Fault status	-	X
20	USB1 OC	USB1 Over Current Status	-	X
21	USB2 OC	USB2 Over Current Status	-	X
22	Disk1 Bay	Removable Disk 1 Bay Slot/Connector Status	*	N
23	Disk2 Bay	Removable Disk 2 Bay Slot/Connector Status	*	N
24	Power State	Board Power State	*	N

IPMI sensor ID	Sensor Name	Description (Sensor Type, Event trigger)	Scanning Enabled under Power State	Health LED (Green to Amber)
25	Power Good	Actual RTM power good status	-	X
26	Pwr Good HD1	Actual HD1 power good status	-	X
27	Pwr Good HD2	Actual HD1 power good status	-	X
28	Health Error	General health status	*	N

X Exceed critical threshold / Error Assertion

* Power On/Off

- Power On

N No change

2.7.2.1 IPMB-L Link Sensor

The RTM806X has an IPMB-L link to communicate with the processor board and other devices in the chassis chassis IPMB-0 bus. MMC monitors the bus for any link failure and sends the bus failure event to the front board upon the recovery occurs.

2.7.3 Field Replaceable Unit (FRU) Information

The FRU Information provides inventory data about the boards where the FRU Information Device is located. The part number or version number can be read through software.

FRU information in the RTM806X includes data describing the RTM806X board similar to AMC.0 R2.0 specification requirements. This information is retrieved by the RTM, enabling reporting of board-specific information through a standardized mechanism.

Table 2-3:Board Information Area

Board Information Area	
Field Description	Value (hex)
Format Version	0x01
Board Area Length	*Calculated
Language code	0x00
Manufacturing Date / Time	*Based on mfg. date
Board Manufacturer type/length	*Calculated
Board Manufacturer	"Kontron"
Board Product Name type/length	*Calculated
Board Product Name	"RTM806X"
Board Serial Number type/length	*Calculated
Board Serial Number	Manufacturer S/N
Board Part Number type/length	*Calculated
Board Customer Part Number	"T5707###_R"
FRU File ID type/length	*Calculated

Board Information Area	
FRU File ID	"FRU5707-YY"
No more fields	0xC1
Padding	0x00
Board Area Checksum	*Calculated

Table 2-4:Product Information Area

Product Information Area	
Field Description	Value (hex)
Format Version	0x01
Product Area Length	*Calculated
Language Code	0x00
Manufacturer Name type/length	*Calculated
Manufacturer Name	"Kontron"
Product Name type/length	*Calculated
Product Name	"RTM806X"
Product Part/Model Number type/length	*Calculated
Product Part/Model Number	"T5707_XX"*
Product Version type/length	*Calculated
Product Version	"XX" *
Product Serial Number type/length	*Calculated
Product Serial Number	Manufacturer S/N
Asset Tag type/length	0xC0
Asset Tag	
FRU File ID type/length	*Calculated
FRU File ID bytes	"FRU5707-YY" **
No more fields	0xC1
Padding	0x00
Product Info Area Checksum	*Calculated

Table 2-5:Type 16 Module Current Requirements Records

Type 16 – Module Current Requirements Record	
Record Type ID	C0h
Record format version	02h
Manufacturer ID	00315Ah (PICMG Record ID)
PICMG Record ID	16h (Module Power Descriptor table)
Record Format Version	00h
Current Draw	04h (0.4 Amps at 12 V -> 4.8 Watts)

2.7.4 MMC Firmware Code

MMC firmware code is organized into boot code and operational code, both of which are stored in a flash module. Upon an MMC reset, the MMC executes the boot code and performs the following:

- 1-Self test to verify the status of its hardware and memory.
- 2-Performs a checksum of the operational code.
- 3-Set operational state that tells the boot block that the firmware is operating correctly.

Upon successful verification of the operational code checksum, the firmware will jump to the operational code.

2.7.5 MMC Firmware Upgrade Procedure

The upgrade procedure is compliant to PICMG HPM.1. MMC Firmware upgrades can be done by using IPMITOOL from [sourceforge](#) from the front board or remotely on the chassis. It has been designed to upgrade through any IPMI interface without payload impact.

2.7.6 Hot-Swap Process

The RTM806X has the ability to be hot-swapped in and out of the front board. The onboard MMC manages the RTM's power-up and power-down transitions. The list below illustrates this process for power down request.

- 1-Ejector latch is opened. HOT_SWAP_PB# assertion. MMC firmware detects the assertion of this signal.
- 2-MMC sends "Module Handle Open" event message to the front board. The corresponding M state of the front board moves from M4-> M5.
- 3-The front board moves from M5 -> M6 if the SHMC grants the request. The front board IPMC sends the FRU control requesting quiesced state to the RTM.
- 4-The firmware deasserts payload power and sends "Module Quiesced" event message to the front board where it transitions from M6 to M1 state.



Note:

Depending on your BIOS configuration, a hot-swap process might turn off the front board. Please refer to the BIOS section "**Managed FRU Deactivate Policies**" of the AT8060.

2.7.6.1 Hot-Swap LED

The RTM806X and both RTM HDD support a blue Hot Swap LED mounted on the front panel. This LED indicates when it is safe to remove the RTM from the front board or the hard disk from the RTM. The on-board MMC drives this LED to indicate the hot-swap state. The following states are possible:

Table 2-6: Hot-Swap LED Description

LED state	Description
OFF	M4 state; normal state when board is in operation.
ON	M1 state; ready for hot swap.
Short blink	M5 state; deactivation request
Long blink	M2 state; activation request.

When the RTM latch is disengaged from the faceplate, the hot swap switch embedded in the PCB will assert a "HOT_SWAP_PB#" signal to the MMC, and the MMC will send "Module Handle Open" event message to the front board which moves from the M4 state to the M5 state. At the M5 state, the front board will ask the SHMC (or Shelf Manager) for permission to move the RTM to the M6 state. Then the IPMC of the front board, through IPMB-L, will set the RTM/HDD Hot Swap LED to indicate this state with a short blink. Once permission is received from the SHMC or higher-level software, the front board will move to the M6 state.

The SHMC or higher level software can reject the request to move to the M6 state. If this occurs, the RTM/HDD will return the Hot Swap LED to a solid off condition, indicating that the RTM has returned to M4 state.

If the RTM/HDD reaches the M6 state through an extraction request through the RTM/HDD handle latch, the MMC communicates to the front board that the module must discontinue operation in preparation for removal. The Hot Swap LED continues to flash during this preparation time, just like it does at the M5 state. When main RTM/HDD payload power is successfully removed from the RTM/HDD slot, the Hot Swap LED remains lit, indicating it is safe to remove the RTM from the chassis or the hard disk from the RTM.

Refer to the AT8060 manual for information on "Managed FRU Deactivation Policies" affecting the FRU deactivation process.

2.8 Face Plate Indicators

Only LED1 and LED2 can be overridden with standard PICMG LED APIs.

2.8.1 Hot Swap LED (LED0)

The Blue / Hot Swap LED indicates the hot swap status of the RTM. The LED is ON when it is safe to remove the RTM from the slot. During normal operation, this LED is OFF.

2.8.2 Out Of Service (LED1)

The AdvancedTCA LED1 is red or amber and indicates an Out-of-Service (OOS) condition. During normal operation, the OOS LED is OFF. This LED is ON during firmware upgrade and is user configurable if needed by a customer application.

2.8.3 Healthy LED (LED2)

The AdvancedTCA LED2 is green or amber and indicates a healthy condition. The healthy LED indicates if the blade is powered up and all voltages and temperatures are within specifications. During normal operation, this LED is ON (green). This LED is also ON (amber) when one of the RTM806X voltage or temperature fails.

2.8.4 RTM HDD 1 and 2 Hot Swap LED

The Blue / Hot Swap LED indicates the hot swap status of the RTMDISK. The LED is ON when it is safe to remove the RTMDISK from the RTM. During normal operation, this LED is OFF.

Chapter 3

Board Features

- 3.1 RTM Hot Swap and Installation 17
- 3.2 RTM HDD Hot Swap and Installation 18

3. Hot Swap and Installation

3.1 RTM 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 RTM to/from an AT8060:

- 1- Rail guides must be installed on the enclosure to slide the RTM to the AT8060.
- 2- Do not force the RTM if there is mechanical resistance while inserting it.
- 3- Screw the faceplate to the enclosure to firmly attach the RTM to its enclosure.
- 4- Use extractor handles to disconnect and extract the RTM from its enclosure.



WARNING

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



3.1.1 Installing the RTM in the chassis

To install the RTM:

- 1- Remove the filler panel of the slot.
- 2- Ensure the RTM is configured properly.
- 3- Carefully align the PCB edges at the bottom and top card guide.
- 4- Insert the RTM in the system until it makes contact with the CPU board.
- 5- Using the ejector handles, engage the RTM in the CPU board connectors until the ejectors are locked.
- 6- Fasten screws at the top and bottom of the faceplate.

3.1.2 Removing the RTM from the chassis

To remove the RTM:

- 1- Unscrew the top and the bottom screw of the faceplate.
- 2- Unlock the upper handle latch.
- 3- Wait until the blue LED is fully ON, this mean that the hot swap sequence is ready for RTM removal.
- 4- Use the ejector to disengage the RTM from the CPU board.
- 5- Pull the RTM out of the chassis.

3.2 RTM HDD Hot Swap and Installation

3.2.1 Installing the Hot Swap RTMHDD

To install the RTMHDD:

- 1- Make sure the RTM is secured in place, i.e. both thumbscrews are screwed into the chassis.
- 2- Carefully engage the RTMHDD into the guide. Push it until it fully mates with its connector. Secure the hard disk handle to the locking position.
- 3- The HDD blue LED will start to blink to indicate that the hotswap process is started. It will turn off at the end of the sequence.

3.2.2 Removing the Hot Swap RTMHDD

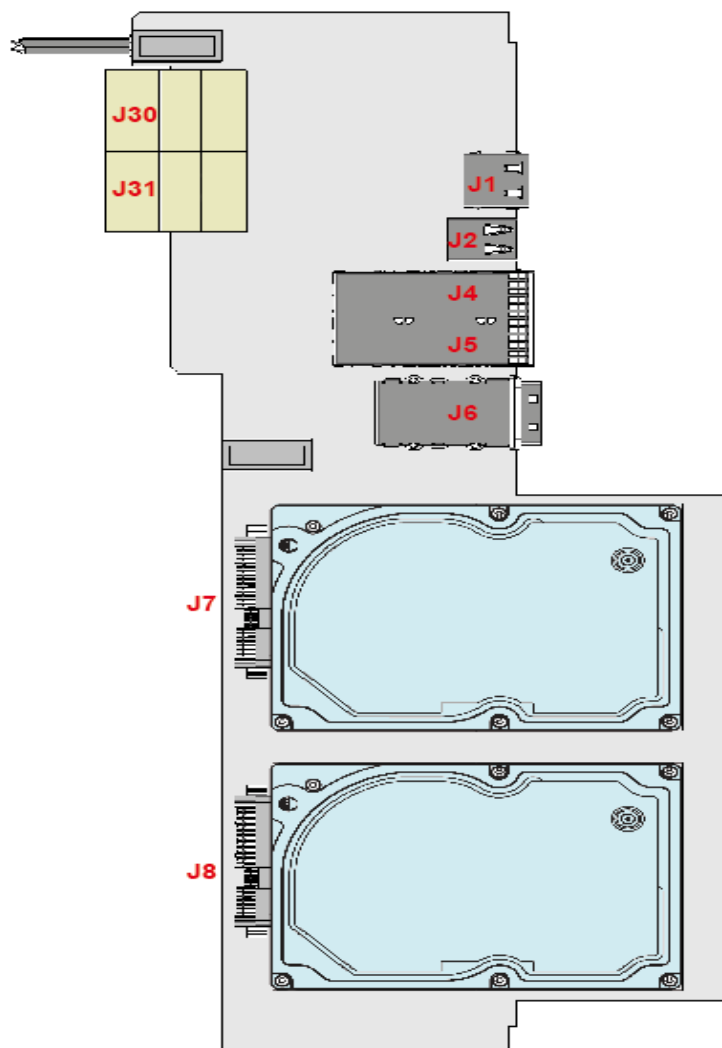
To remove the RTMHDD:

- 1- Make sure the RTM is secured in place, i.e. both thumbscrews are screwed into the chassis.
- 2- Pull out the handle to unlock the RTMHDD
- 3- Wait for the blue LED to turn solid on (100% on).
- 4- Pull out the RTMHDD using the handle.

A. Connector Pinouts

A.1 Connectors and Headers Summary

Connector	Description
J1	SERIAL PORT Connector
J2	DUAL USB Connector
J4-J5	SFP+ Connectors
J6	MINI-SAS Connector
J7	SAS HDD 1
J8	SAS HDD 2
J30	RTM Connector
J31	RTM Connector



A.2 AdvancedTCA I/O RTM Connector (J30)

Pin	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
1	V_12V_1	V_12V_5	V_12V_2	V_3V2_SUS	FPGA_IO_3	RTM_PRSENT#
2	V_12V_3	V_12V_6	V_12V_4	NC_D2	IPMC_SCL	IPMC_SDA
3	SP_TX	SP_RX	JTAG_TD1	JTAG_TD0	JTAG_TMS	JTAG_TCK
4	USB1_D+	USB1_D-	INT_0	INT_1	RTML_TX	RTML_RX
5	SP_RTS#	SP_CTS#	MD2#	SRSVD_D5	CLK_PE+	CLK_PE-
6	SATA_TX+	SATA_TX-	SATA_RX+	SATA_RX-	SFP1_SCL	SFP1_SDA
7	SAS_0_TX+	SAS_0_TX-	SAS_0_RX+	SAS_0_RX-	SAS_1_TX-	SAS_1_TX+
8	GBE_TX1+	GBE_TX1-	GBE_RX1+	GBE_RX1-	GBE_TX2+	GBE_TX2-
9	PE6_TX-	PE6_TX+	PE7_RX-	PE7_RX+	PE5_TX+	PE5_TX-
10	PE4_TX-	PE4_TX+	PE5_RX+	PE5_RX-	PE7_TX+	PE7_TX-

Pin	ROW G	ROW H	ROW AB	ROW CD	ROW EF	ROW GH
1	FPGA_IO_1	RTM_EN#	GND	GND	GND	GND
2	USB0_D+	USB0_D-	GND	GND	GND	GND
3	JTAG_TRST	FPGA_IO_2	GND	GND	GND	GND
4	RTML_CLK	PROG	GND	GND	GND	GND
5	RSVD_G5	JTAG_SEL	GND	GND	GND	GND
6	SFPO_SCL	SFPO_SDA	GND	GND	GND	GND
7	SAS_1_RX+	SAS_1_RX-	GND	GND	GND	GND
8	GBE_RX2+	GBE_RX2-	GND	GND	GND	GND
9	PE6_RX-	PE6_RX+	GND	GND	GND	GND
10	PE4_RX-	PE4_RX+	GND	GND	GND	GND

A.3 Serial Port(J1)

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

A.4 SFP+ Channel (J4 & J5)

Pin	Signal	Pin	Signal
1	VeeT	11	VeeR
2	TX_Fault	12	RD-
3	TX_Disable	13	RD+
4	SDA	14	VeeR
5	SCL	15	VccR
6	MOD-ABS	16	VccT
7	Rate Select 0	17	VeeT
8	RX_LOS	18	TD+
9	Rate Select 1	19	TD-
10	VeeR	20	VeeT

A.5 Dual USB Port (J7)

Pin	Signal
1	VCC
2	DATA-
3	DATA+
4	GND

A.6 Hot Swap Hard Disk Module(J7 & J8)

Pin	Signal	Pin	Signal
S1	GND	P1	3.3V_SUS_HD
S2	PortA_TX+	P2	3.3V
S3	PortA_TX-	P3	3.3V_PRE
S4	GND	P4	SMB_SCL
S5	PortA_RX-	P5	HD_PRESENT#
S6	PortA_RX+	P6	GND
S7	GND	P7	5V_PRE
S8	GND	P8	5V
S9	PortB_TX+	P9	5V
S10	PortB_TX-	P10	V_PUMP_R
S11	GND	P11	SMB_SDA
S12	PortB_RX-	P12	GND
S13	PortB_RX+	P13	12V_PRE
S14	GND	P14	12V
		P15	12V

B. Software Update

B.1 MMC Firmware Update Procedure

To update the software of your board, it is recommended to use the update CD, please contact you local technical support department for the proper procedure to follow.

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
AdvancedMC	(Same as AMC). Advanced Mezzanine Card.
AMC	(Same as AdvancedMC). Advanced Mezzanine Card.
AMC.0	Advanced Mezzanine Card Base Specification.
AMC.1	PCI Express and Advanced Switching on AdvancedMC. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
AMC.2	Ethernet Advanced Mezzanine Card Specification. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
AMC.3	Advanced Mezzanine Card Specification for Storage. A subsidiary specification to the Advanced Mezzanine Card Base Specification (AMC.0).
ATCA	Advanced Telecommunications Computing Architecture
BIOS	Basic Input/Output System
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.
CPU	Central Processing Unit. This sometimes refers to a whole blade, not just a processor component.
CTS	Clear To Send
DTR	Data Terminal Ready
EMI	ElectroMagnetic Interference
FCC	Federal Communications Commission
FRU	Field Replaceable Unit. Any entity that can be replaced by a user in the field. Not all FRUs are hot swappable.
GND	GrouND
HDD	Hard Disc Drive
HPM	PICMG Hardware Platform Management specification family
HPM.1	Hardware Platform Management IPM Controller Firmware Upgrade Specification
I2C	Inter Integrated Circuit bus
ID	IDentification
IEEE	Institute of Electrical and Electronics Engineers
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
IPMIFWU	Intelligent Platform Management Interface FirmWare Update
LED	Light-Emitting Diode
MMC	Module Management Controller. MMCs are linked to the IPMC.
NC	Not Connected
OOS	Out Of Service

Acronyms	Descriptions
OS	Operating System
PICMG	PCI Industrial Computer Manufacturers Group
PICMG®	PCI Industrial Computer Manufacturers Group
POST	Power-On Self-Test
RAM	Random Access Memory
RS-232	(Same as RS232). Recommended Standard 232.
RS232	(Same as RS-232). Recommended Standard 232.
RTM	Rear Transition Module
RTS	Request To Send
SAS	Serial Attached SCSI
SFP	Small Form-factor Pluggable
ShMC	Shelf Management Controller
TX	Transmit
TXD	Transmit
USB	Universal Serial Bus
VCC	Power supply