# AM4300 User's Guide

## AdvancedTCA

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kontron

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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

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# 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.

# Preface

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# 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.

You can find the latest release of this User's Guide at:
http://www.kontron.com or at: ftp://ftp.kontron.ca/support/

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, Onboard Features
- Chapter 3, Installing the board
- Appendix A, Connector Pinout
- Appendix B, Getting Help

# 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, Related Jumpers, 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 Paths:**
Indicate the places where you can fin the signal on the board



**Related Jumpers:**
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.



**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.

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

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

## *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.



### *UL Certification*



This product bears the combined UL Recognized Component Mark for Canada and U.S. It indicates investigations to the UL Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment. It is destinated to be used in end-product equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

### *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, re-funding 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.

# 1. Product Description

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# 1.1 Product Overview

AdvancecdMC modules are the key to extending the value of AdvancedTCA platforms designed for multiple applications in the wireless / wireline network infrastructure.

The Kontron AM4300 Quad GbE module is the ideal AdvancedMC unit for network applications that require multiple ports directly from an AdvancedTCA processor blade. Available in full height, single width form factors, the AM4300 features 4 x 10Base-T/100Base-Tx/1000Base-T ports, supports PCI-E x8, x4, x2 and x1 link, and supports remote management via IPMI v1.5.

As a hot-swappable, field replaceable unit (FRU), the AM4300 also follows the same stringent carrier grade RASM feature set, namely - Reliability, Availability, Serviceability, Maintainability. When offered in combination with AdvancedTCA platforms, TEM (Telecom Equipment Manufacturers) clients literally conserve valuable system slots, as the AM4300 maximizes communications I/O for Gigabit Ethernet and Fast Ethernet networks with four independent 10/100/1000 ports from a single slot.

# 1.2 What's Included

This board is shipped with the following items:

1. One Quick Reference Sheet.
2. One CD-ROM containing documentations and drivers.
3. One AM4300 board

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

# 1.3 Board Specifications

| FEATURES | DESCRIPTION | | |
|---|---|---|---|
| **Compliancy** | • AMC.0 R1.0<br>• AMC.1 R1.0<br>• AMC.3 R1.0 | | |
| **OS Compatibility** | • Linux Red Hat Enterprise 4 | | |
| **IPMI Features** | • Management Controller compliant to PICMG 3.0, AMC.0 R1.0 and IPMI v1.5 rev 1.1.<br>• Management Controller is run time field reprogrammable without payload impact.<br>• Robust fail safe reprogramming implementation (which includes two firmware images) that could perform automatic or manual rollback if a problem occurs during critical reprogramming phase.<br>• Remote upgrade capability from all IPMI interfaces (via IPMB).<br>• Management Controller self test which can detect failure under its code integrity and trig an automatic rollback. | | |
| **Supervisory** | • Hardware system monitor through IPMI (voltages, currents, temperature), temperature monitor / alarm; board temperature sensor, power failure. | | |
| **Mechanical** | • 181.5 x 75 x 30.16 mm, Single-width Full-height<br>• Weight: TBD | | |
| **Power Requirements** | • Management power is less than 100mA peak at 3.3V<br>• Payload power is 1A | | |
| **Environmental** | | Operating | Storage and Transit |
| | Temperature* | 0-55°C/32-131°F | -40 to +70°C/-40 to 158°F |
| | Humidity* | 15% to 90% @55°C/131°F non-condensing | 5% to 95% @ 40°C/104°F non-condensing |
| | Altitude* | 4,000 m / 13,123 ft | 15,000 m / 49,212 ft |
| | Shock* | 30G, half-sine 11ms, each axis | Bellcore GR-63-CORE Section 4.3 |
| | Vibration* | 1.0G, 5-500Hz each axis | 0.5G, 5-50Hz;<br>3.0G, 50-500Hz each axis |
| **Reliability** | • MTBF: > 470 000 hours @ 30°C / 86°F (Telcordia SR-332, Issue 1) | | |
| **Safety/EMC** | Meet or exceed:<br>• Safety: UL 60950 3rd Ed.; CSA C22.2 No 60950-00; EN 60950:2000; IEC60950-1<br>• EMI/EMC: FCC 47 CFR Part 15, Class B; CE Mark to EN55022/EN55024 | | |
| **Warranty** | Two year limited warranty | | |

* Designed to meet or exceed

# 1.4 Compliance

This product conforms to the following specifications:

- PICMG3.0R1.0 (Advanced TCA core specification)
- AMC.0 R1.0
- AMC.1 R1.0
- AMC.2 R1.0
- ACPI rev 1.0

# 1.5 Hot-Plug Capability

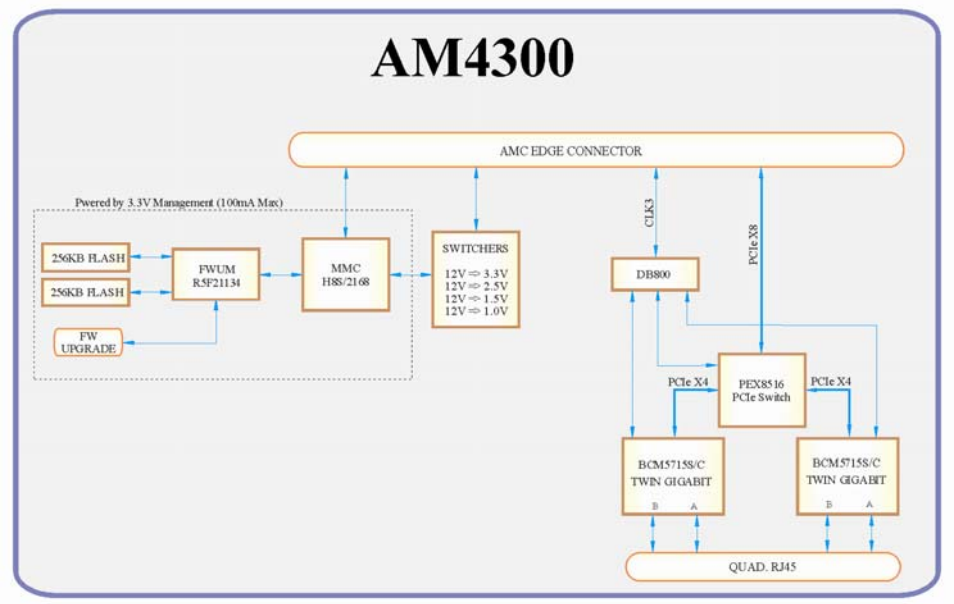
The AM4300 supports **Full Hot Plug** capability as per PICMG3.0R1.0. It can be removed from or installed in the system while it is on (without powering-down the system). Please refer to the PICMG3.0R1.0 specification for additional details. (OS must support drive hot swap)

# 2. Onboard Features

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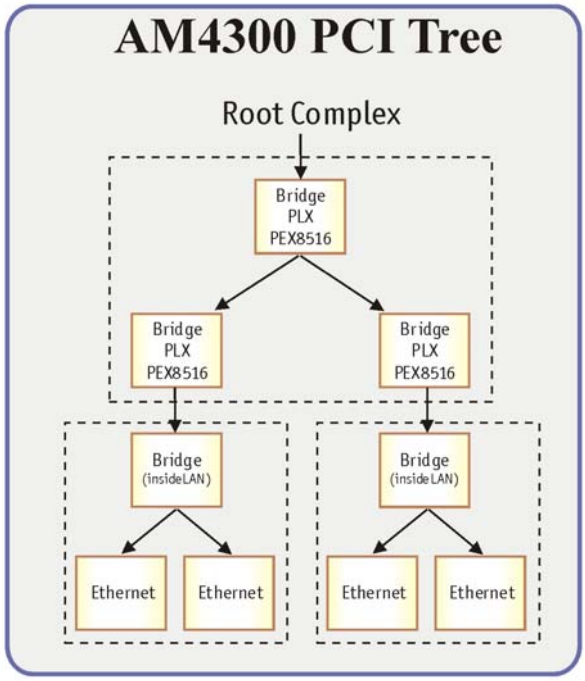

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# 2.1 Block Diagram




## 2.1.1 PCI Tree

This diagram represent how the BIOS will recognize the PCI-Express bridge and the two dual Ethernet controllers.



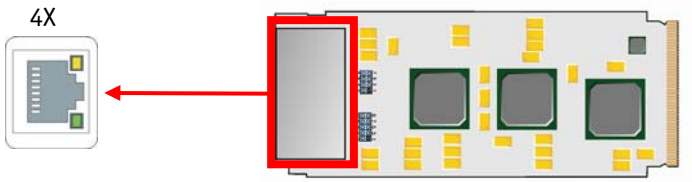
# 2.2 Ethernet Interfaces

## 2.2.1 Broadcom LAN with copper interface

The ATCA AMC interface is implemented with two Broadcom dual-port Gigabit Ethernet controllers. Each controller supports two 10/100/1000 Base-T.

The LAN features high performance with TCP/IP and UDP/IP checksum offloading for IPv4 and IPv6, packet filtering, and jumbo frame up to 16K. See www.broadcom.com for additional details on this controller.

| Pin | Signal 10/100/1000 |
|---|---|
| 1 | DA+ |
| 2 | DA- |
| 3 | DB+ |
| 4 | DC+ |
| 5 | DC-. |
| 6 | DB- |
| 7 | DD+. |
| 8 | DD- |




**Signal Paths:**
The Ethernet RJ45 connectors are on the faceplate.

**BIOS Settings:**

There are no specific BIOS setting.

Make sure that the AMC carrier has it's AMC ROM BIOS enabled if you want to boot from LAN

# 2.3 Redundant MMC Flash & FWUM

The MMC microcontroller runs a firmware from its internal 256KB flash. It is programmed by an other microcontroller named FWUM (FirmWare Update Manager). The FWUM keeps the last two copies of the MMC firmware in dedicated flash memories. The FWUM act as a watchdog to the MMC and can rollback a firmware update in the MMC in case of problems.

The FWUM itself is a microcontroller with internal flash to store MMC firmware image. This microcontroller is also an external watchdog for the MMC. Functions of this micrcontroller are kept to a minimum. The FWUM firmware is field updatable.

**Note:**
The MMC and the FWUM have an internal hardware watchdog.

# 2.4 Hardware Management Overview

The AMC Carrier communicates with the Module Management Controller (MMC) using the IPMB_L channel.
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 microcontroller. It is possible to store up to 4 KBytes within the FRU inventory information. Event generation over IPMB-L bus to reach the AMC Carrier that forward it to the ShMc ensure that 'post-mortem' logging information is available even if the power of the AMC is disabled.

The onboard DC voltages, currents, and temperature are monitored by the MMC microcontroller device. The MMC will send an event to the Carrier AMC if any of the thresholds are exceeded.

To increase the reliability of the AM4300 SBC management subsystem, an external watchdog supervisor only for the MMC is implemented. The MMC must strobes the external watchdog at two-second intervals to ensure continuity of operation of the board's management subsystem. If the MMC ceases to strobe the watchdog supervisor, the watchdog isolates the MMC from the IPMBs and resets the MMC. The watchdog supervisor does not reset the payload power and the restart of the MMC will not affect the payload and will restore the previous Module Hot Swap state. The watchdog timeout expires after six seconds 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 second microcontroller. This microcontroller is responsible to monitor the MMC and to manage MMC fail safe firmware upgrade process. The name of this second microcontroller is the Firmware Upgrade Manager (FWUM). The FWUM can handle two Firmware code that are stored in two external SEPROM memories. If a failure occurs during firmware upgrade, the FWUM will automatically rollback to the redundant MMC firmware image.

## 2.4.1 Sensor Data Record (SDR)

Every sensor on the baseboard is associated with a Sensor Data Record (SDR). Sensor Data Records contain information about the sensors identification such as sensor type, sensor name, sensor unit. SDR also contain the configuration of a specific sensor such as threshold/hystheresis, event generation capabilities that specifies sensor behaviour. Some field of the sensor SDR are configurable through IPMI v1.5 command and are set to built-in initial value. Finally one field wich is the sensor owner must reflect the module addresses that allow the AMC Carrier to identify the owner of the SDR when it is scaned from the module management controller and merged within the AMC Carrier Device SDR repository.

From IPMI prespective, the AM4300 management controller is set up as a satellite management controller (SMC). It does support sensor devices, and use the IPMI static sensor population feature of IPMI v1.5 to merge the hot swaped AMC sensor with the AT8001 sensors population. The usual way the AMC Carrier is informed about an AMC insertion is through the AMC Module Hot Swap sensor and a radial presence line on the AMC connector. All SDRs can be queried using Device SDR commands to the firmware. Module sensors that have been implemented are listed below.

## 2.4.2 Hardware Sensors

| Sensor Name | Voltage/Signals Monitored | Scanning Enabled under Power State | Health LED (Green to Red) |
|---|---|---|---|
| FRU Agent" | | | |
| ModuleHotSwap" | | | |
| IPMBL State" | | | |
| Board 3.3V" | 3.3V | | |
| Board 3.3VSUS" | 3.3V Suspend | | |
| Board 12.0v" | 12.0 V | | |
| Board VPump" | | | |
| Board 2.5V" | 2.5 V | | |
| Board Vtt1.5V" | | | |
| Board 1.2V" | 1.2V | | |
| Board 1.0V" | 1.0V | | |
| Temp AirInlet" | | | |
| Temp Q13" | | | |
| Temp Q12" | | | |
| Temp Q14" | | | |
| Lan1 Link" | | | |
| Lan2 Link" | | | |
| Lan3 Link" | | | |
| Lan4 Link" | | | |
| Health Error" | | | |
| PexLaneGood 0" | | | |
| PexLaneGood 1" | | | |
| PexLaneGood 2" | | | |
| PexLaneGood 3" | | | |
| PexLaneGood 4" | | | |
| PexLaneGood 5" | | | |
| PexLaneGood 6" | | | |
| PexLaneGood 7" | | | |
| PexLaneGood 8" | | | |
| PexLaneGood 9" | | | |
| PexLaneGood A" | | | |
| PexLaneGood B" | | | |
| PexLaneGood C" | | | |
| PexLaneGood D" | | | |
| PexLaneGood E" | | | |
| PexLaneGood F" | | | |

### *2.4.2.1 IPMB-L Link Sensor*

The AM4300 has an IPMB-L links to communicate with the AMC Carrier and other chassis devices on the chassis IPMB-0 bus. MMC monitors the bus for any link failure and send the bus failure event to the AMC Carrier upon the recovery occurs.

#### *2.4.2.2 Module Hot Swap*

The hot-swap event message conveys the current state of the module, the previous state, and a cause of the state change as can be determined by the MMC. Refer to AMC.0 R1.0 Specifications for further details on the module hot-swap state.

## 2.4.3 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 AM4300 includes data describing the AM4300 board as per AMC.0 R1.0 specification requirements. This information is retrieved by the Carrier AMC, enabling reporting of board-specific information through an standardized mechanism.

Following are the definitions for the multirecord implemented by the firmware as part of Module data.

## 2.4.4 E-Keying

E-Keying has been defined in the AMC.0 R1.0 Specification to prevent module damage, prevent misoperation, and verify bay connection compatibility. The FRU data contains the AMC point-to-point connectivity record as described in Section 3.9.2 of the AMC.0 R1.0 specification.

The Set/Get AMC Port State IPMI commands defined by the AMC.0 specification are used for either granting or rejecting the E-keys.

## 2.4.5 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- Communicates with the Firmware Upgrade Manager (FWUM) in order to inform the MMC watchdog that the actual MMC firmware is suitable for execution.

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

## 2.4.6 MMC Firmware Upgrade Procedure

It is important to use compatible, MMC, FWUM versions. Since all these software and hardware solution are exchanging information, they must be in synch. Please always follow Kontron documentation for all your upgrade.
The recommended upgrade sequence must be:, FWUM, MMC,.

MMC Firmware upgrades can be done by using IPMITOOL from the AMC Carrier or remotely on the chassis. It has been desigh to upgrade through any IPMI interface without payload impact

## 2.4.7 FWUM Firmware Upgrade Procedure

It is important to use compatible, MMC, FWUM versions. Since all these software and hardware solution are exchanging information, they must be in synch. Please always follow Kontron documentation for all your upgrade.

The recommended upgrade sequence must be: FWUM, MMC,.

FWUM Firmware upgrade is done using IPMIFWU utility. This is a Linux utility developed by Kontron that use the serial port of any computer to exchange with the FirmWare Upgrade Manager (FWUM) in order to upgrade to FWUM or the MMC firmware. Then this tool doesn't need the KCS driver to run over the Carrier AMC (it doesn't use the IPMI interfaces) but requires a serial cable hook on the AMC module.

Type the following to perform MMC firmware upgrade
ipmifwu –p –f <FWUM_firmware_filename> -m -p /dev/ttyS0 -S<enter>

Please note that during FWUM firmware upgrade the MMC is held in reset.

### *2.4.7.1 Hot-Swap Process*

The AM4300 AMC has the ability to be hot-swapped in and out of a AMC Carrier. The onboard MMC manages the AMC'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 AMC Carrier. The corresponding M state of AMC Carrier moves from M4-> M5.
3- AMC Carrier moves from M5 -> M6 if the SHMC grants the request and then send the FRU Control requesting quiesced state to the AMC.
4- The firmware deasserts payload power and sends "Module Quiesced" event message to the AMC Carrier where it transitions from M6 to M1 state.

### *2.4.7.2 Hot-Swap LED*

The AM4300 supports a blue Hot Swap LED mounted on the front panel. This LED indicates when it is safe to remove the AMC from the AMC Carrier. The on-board MMC drives this LED to indicate the hot-swap state. The following states are possible:

| LED state | Description |
|---|---|
| OFF | AMC is in M4 state, normal state when board is in operation. |
| ON | Ready for hot swap. |
| Short blink | M5 state deactivation request |
| Long blink | M2 state Activation Request. |

When the AMC 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 AMC Carrier wich move from the M4 state to the M5 state. At the M5 state, the AMC Carrier will ask the SHMC (or Shelf Manager) for permission to move the AMC to the M6 state. Then the Carrier AMC will set the AMC Hot Swap LED to indicate this state with a short blink. Once

permission is received from the SHMC or higher-level software, the AMC carrier 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 AMC Carrier will returns the Hot Swap LED to a solid off condition, indicating that the AMC has returned to M4 state.

If the AMC Carrier reaches the M6 state, either through an extraction request through the AMC handle latch, the MMC communicates to the AMC Carrier 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 AMC payload power is successfully removed from the AMC Bay, the Hot Swap LED remains lit, indicating it is safe to remove the AMC from the AMC Carrier.

| LED Status | Meaning |
|---|---|
| Off | Normal status |
| Blinking Blue | Preparing for removal/insertion: Long blink indicates activation is in progress, short blink when deactivation is in progress. |
| Solid Blue | Ready for hot swap |

# 2.5 Debugging Features

## 2.5.1 IPMI controlled LED

The green Management LED represents the MMC heart beat when it blink slowly
The blinking red Management LED represents MMC communication over IPMB-L when pulsing

# 3. Installing the board

## *Contents*


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3.2 Board Hot Swap and Installation..... 3-1

# 3.1 Onboard Interconnectivity

## 3.1.1 Onboard Connectors and Headers

| Description | Connector | Comments |
|---|---|---|
| AMC Connector | J1 | AMC Connector |
| Manufacturing Connector | J3 | Reserved |
| Ethernet Connectors | J4 | 4 Ethernets connectors populated only with the SerDes Option |

# 3.2 Board Hot Swap and Installation

Some precautions must be taken when connecting or disconnecting a board to:

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. Use extractors handle 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.



## 3.2.1 Installing an AMC

To install an AMC:

1. Remove the AMC filler panel.
2. Carefully engage the AMC into the card guide. Push the AMC until it fully mate with it's connector. Secure the AMC handle to the locking position.
3. In normal condition, the blue LED shall turn ON as soon as the AMC is fully inserted. It will turn OFF at the end of the hot swap sequence.

## 3.2.2 Removing an AMC

To remove an AMC:

a. Open the AMC handle.
b. The blue LED will start blinking; wait until it is solid blue.
c. Extract the AMC by pulling it out with the handle.



**Note:**
Ensure that your OS is Hot Plug compliant before removing your AMC.

# Appendix

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# A. Connector Pinouts

## A.1 CONNECTORS AND HEADERS SUMMARY

| Connector | Description |
|---|---|
| J1 | AMC |
| J4 | Ethernet Connctors |

# A.2 AMC (J1)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|
| B1 | GND | B43 | GND | B86 | GND | B129 | TxD15-(N.C.) |
| B2 | 12V | B44 | RxD4+ | B87 | TxD8- | B130 | TxD15+(N.C.) |
| B3 | PS1# | B45 | RxD4- | B88 | TxD8+ | B131 | GND |
| B4 | MP_3V3 | B46 | GND | B89 | GND | B132 | RxD15-(N.C.) |
| B5 | GA0 | B47 | TxD4+ | B90 | RxD8- | B133 | RxD15+(N.C.) |
| B6 | RSV | B48 | TxD4- | B91 | RxD8+ | B134 | GND |
| B7 | GND | B49 | GND | B92 | GND | B135 | TxD16-(N.C.) |
| B8 | RSV | B50 | RxD5+ | B93 | TxD9- | B136 | TxD16+(N.C.) |
| B9 | 12V | B51 | RxD5- | B94 | TxD9+ | B137 | GND |
| B10 | GND | B52 | GND | B95 | GND | B138 | RxD16-(N.C.) |
| B11 | RxD0+ * | B53 | TxD5+ | B96 | RxD9- | B139 | RxD16+(N.C.) |
| B12 | RxD0- * | B54 | TxD5- | B97 | RxD9+ | B140 | GND |
| B13 | GND | B55 | GND | B98 | GND | B141 | TxD17- * |
| B14 | TxD0+ * | B56 | IPMI_CLK | B99 | TxD10- | B142 | TxD17+ * |
| B15 | TxD0- * | B57 | 12V | B100 | TxD10+ | B143 | GND |
| B16 | GND | B58 | GND | B101 | GND | B144 | RxD17- * |
| B17 | GA1 | B59 | RxD6+ | B102 | RxD10- | B145 | RxD17+ * |
| B18 | 12V | B60 | RxD6- | B103 | RxD10+ | B146 | GND |
| B19 | GND | B61 | GND | B104 | GND | B147 | TxD18- * |
| B20 | RxD1+ * | B62 | TxD6+ | B105 | TxD11- | B148 | TxD18+ * |
| B21 | RxD1- * | B63 | TxD6- | B106 | TxD11+ | B149 | GND |
| B22 | GND | B64 | GND | B107 | GND | B150 | RxD18- * |
| B23 | TxD1+ * | B65 | RxD7+ | B108 | RxD11- | B151 | RxD18+ * |
| B24 | TxD1- * | B66 | RxD7- | B109 | RxD11+ | B152 | GND |
| B25 | GND | B67 | GND | B110 | GND | B153 | TxD19- * |
| B26 | GA2 | B68 | TxD7+ | B111 | TxD12-( N.C.) | B154 | TxD19+ * |
| B27 | 12V | B69 | TxD7- | B112 | TxD12+( N.C.) | B155 | GND |
| B28 | GND | B70 | GND | B113 | GND | B156 | RxD19- * |
| B29 | RxD2+( N.C.) | B71 | IPMI_DATA | B114 | RxD12-( N.C.) | B157 | RxD19+ * |
| B30 | RxD2-( N.C.) | B72 | 12V | B115 | RxD12+( N.C.) | B158 | GND |
| B31 | GND | B73 | GND | B116 | GND | B159 | TxD20- * |
| B32 | TxD2+( N.C.) | B74 | CLKA+( N.C.) | B117 | TxD13-(N.C.) | B160 | TxD20+ * |
| B33 | TxD2-( N.C.) | B75 | CLKA-( N.C.) | B118 | TxD13+(N.C.) | B161 | GND |
| B34 | GND | B76 | GND | B119 | GND | B162 | RxD20- * |
| B35 | RxD3+( N.C.) | B77 | CLKB+( N.C.) | B120 | RxD13-(N.C.) | B163 | RxD20+ * |
| B36 | RxD3-( N.C.) | B78 | CLKB-( N.C.) | B121 | RxD13+(N.C.) | B164 | GND |
| B37 | GND | B79 | GND | B122 | GND | B165 | TCLK |
| B38 | TxD3+( N.C.) | B80 | REFCLK+ | B123 | TxD14-(N.C.) | B166 | TMS |
| B39 | TxD3-( N.C.) | B81 | REFCLK- | B124 | TxD14+(N.C.) | B167 | TRST# |
| B40 | GND | B82 | GND | B125 | GND | B168 | TDO |
| B41 | ENABLE# | B83 | PS0# | B126 | RxD14-(N.C.) | B169 | TDI |
| B42 | 12V | B84 | 12V | B127 | RxD14+(N.C.) | B170 | GND |
| | | B85 | GND | B128 | GND | | |

* Serdes option only

# A.3 ETHERNET 10/100/1000 (J4A, J4B, J4C, J4D)

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | DA+ | 5 | DC- |
| 2 | DA- | 6 | DB- |
| 3 | DB+ | 7 | DD+ |
| 4 | DC+ | 8 | DD- |

# B. 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 |
| 616 Curé Boivin | Sudetenstrasse 7 |
| Boisbriand, Québec | 87600 Kaufbeuren |
| J7G 2A7 Canada | Germany |

## RETURNING DEFECTIVE MERCHANDISE

Before returning any merchandise please do one of the following if your product malfunctions:

- **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.

- **Fax**

1. Make a copy of the request form on the following page.
2. Fill it out.
3. Fax it to us at: North America (450) 437-0304, EMEA +49 (0) 8341 803 339

- **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.

**WHEN RETURNING A UNIT**

- In the box, you have to include the name and telephone number of a person whom we can contact for further explanations if necessary when returning goods. **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 |
| 616 Curé Boivin | Sudetenstrasse 7 |
| Boisbriand, Québec | 87600 Kaufbeuren |
| J7G 2A7 Canada | Germany |



**Return to Manufacturer Authorization Request**

| | | | |
|---|---|---|---|
| Contact Name: | _____ | | |
| Company Name: | _____ | | |
| Street Address: | _____ | | |
| City: | _____ | Province/State: | _____ |
| Country: | _____ | Postal/Zip Code: | _____ |
| Phone Number: | _____ | Extension: | _____ |
| Fax Number: | _____ | E-Mail: | _____ |

| Serial Number | Failure or Problem Description | P.O. # (if not under warranty) |
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**Fax this form to Kontron's Technical Support department**
**in North America at (450) 437-0304**
**in EMEA at +49 (0) 8341 803 339**