

» Kontron User's Guide «

AdvancedMC™



AM4320

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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 properly 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

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/Products/Product_List.html

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, 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.

Storing Boards

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

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. Use caution when servicing electrical components. Use caution when servicing electrical components. The following is an example of each type of advisory.

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.



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 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.



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.

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.



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 destined to be used in end-product equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

CE Certification

The product described in this user's guide was tested in a representative system and is found to be compliant with the CE marking requirements. 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 fulfill 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

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1. Product Description

1.1 Product Overview

The Kontron AM4320 Dual 10GbE module is the ideal AdvancedMC unit for network applications that require multiple ports directly from an AdvancedTCA processor blade, such as the AT8060 Dual 8-Core Xeon ATCA Processor blade.

- Provides expanded bandwidth for ATCA node blades (AT8060) and MicroTCA platforms
- Two 10Gigabit Ethernet on SFP+ ports supported by Intel 82599ES Ethernet controller implementation
- PCI Express GEN 2 x8 interface between AMC edge connector and controller
- Supports remote management via IPMI v2.0 and features a Management Controller that is run-time field reprogrammable without any payload impact.
- Designed to meet NEBS compliance - Reliability, Availability, Serviceability, Maintainability

1.2 What's Included

The shipping box contains the following items

- One Quick Reference Sheet.
- One Documentation & Drivers disk
- One AM4320 board

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"> • AMC.0 R2.0 • AMC.1 R2.0 • PICMG HPM.1 R1.0
OS Compatibility	<ul style="list-style-type: none"> • Red Hat Enterprise Linux Server 5.5 64-bit • Red Hat Enterprise Linux Server 6.0 64-bit • Windriver PNE 4.0
IPMI Features	<ul style="list-style-type: none"> • Management Controller compliant to PICMG 3.0, AMC.0 R2.0 and IPMI v2.0. • Management Controller is run-time field-reprogrammable without payload impact. • Robust fail-safe reprogramming implementation (which includes two firmware images) that can perform an automatic or manual rollback if a problem occurs during critical reprogramming phases. • Remote upgrade capability from any IPMI interface (via IPMB-L). • Management Controller self test which can detect failure in its code integrity and trigger an automatic rollback.
Supervisory	<ul style="list-style-type: none"> • Hardware system monitor through IPMI (voltages, currents, temperature), temperature monitor / alarm; board temperature sensor, power failure.
Mechanical	<ul style="list-style-type: none"> • 181.5 x 75 x 18.96 mm, Single-width mid-size
Power Requirements	<ul style="list-style-type: none"> • Management power is less than 150mA peak at 3.3V • Payload power is 12W
Environmental Temperature*	<ul style="list-style-type: none"> • Operating: 0-55°C/32-131°F • Storage and Transit: -40 to +70°C/-40 to 158°F
Environmental Humidity*	<ul style="list-style-type: none"> • Operating: 15% to 90% @55°C/131°F non-condensing • Storage and Transit: 5% to 95% @ 40°C/104°F non-condensing
Environmental Altitude*	<ul style="list-style-type: none"> • Operating: 4,000 m / 13,123 ft • Storage and Transit: 15,000 m / 49,212 ft
Environmental Shock*	<ul style="list-style-type: none"> • Operating: 30G, half-sine 11ms, each axis • Storage and Transit: Bellcore GR-63-CORE Section 4.3
Environmental Vibration*	<ul style="list-style-type: none"> • Operating: 1.0G, 5-500Hz each axis • Storage and Transit: 2.0G, 5-50Hz; 3.0G, 50-500Hz each axis
Safety / EMC	<ul style="list-style-type: none"> • Meet or exceed: • Safety: UL 60950-1 1st Ed.; 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
Warranty	<ul style="list-style-type: none"> • Two years 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 R2.0
- AMC.1 R2.0

1.5 Hot-Swap Capability

The AM4320 supports Full Hot Swap 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 PCIe Hot Plug)

Chapter 2

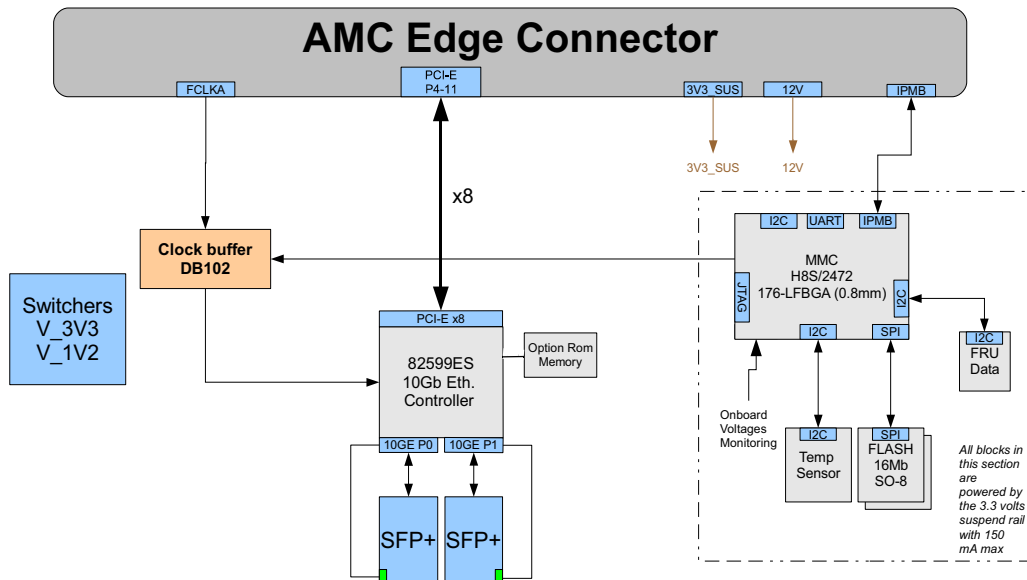
Board Features

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2. Board Features

2.1 Block Diagram

Figure 2-1: AM4320 Block Diagram



2.2 Ethernet Interfaces

2.2.1 Intel 82599ES Ethernet Controller

The AMC interface is implemented with one Intel dual-port 10 Gigabit Ethernet controller. The controller supporting two 10GbE SFP+ modules. See www.intel.com for additional details on this controller.



Signal Path:

The two SFP+ connectors are on the faceplate.

2.3 MMC Boot Block

The MMC runs a firmware from its internal 256KB flash. It is programmed by an additional 8K boot block. It stores the active and previous MMC firmware in a dedicated flash memory. The boot block activates the MMC image and can fall back to the secondary image in case of problems.

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 and 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 and temperature are monitored by the MMC microcontroller device. The MMC will send an event to the Carrier if any of the thresholds are exceeded.

To increase the reliability of the AM4320 management subsystem, an external watchdog supervisor for the MMC is implemented. The MMC must strobe the external watchdog at two-second intervals to indicate 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 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 received. The external watchdog supervisor is not configurable and must not be confused with the IPMI v1.5 watchdog timer commands.

A boot block located on the microcontroller is responsible for managing the MMC's fail safe firmware upgrade process. It can store two Firmware copies located on an external flash memory. If a failure occurs during firmware upgrade, the Boot Block 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/hysteresis and event generation capabilities that specify sensor behavior. Some fields of the sensor SDR are configurable through IPMI v1.5 commands and are set to built-in initial values. Finally one field which is the sensor owner must reflect the module addresses that allow the AMC Carrier to identify the owner of the SDR when it is scanned by the module management controller and merged within the AMC Carrier Device SDR repository.

From an IPMI perspective, the AM4320 management controller is set up as a satellite management controller (SMC). It supports sensor devices, and uses the IPMI static sensor population feature of IPMI v1.5 to merge the hot swapped AMC sensor with the carrier board sensors population. The AMC Carrier is informed of AMC insertion events 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 the next section.

2.4.2 Hardware Sensors

Table 2-1: Hardware Sensors

Sensor Name	Voltage/Signals Monitored	Scanning Enabled under Power State	Health LED (Green to Amber)
IPMI Info-1	Internal IPMC firmware diagnostic	*	N
IPMI Info-2	Internal IPMC firmware diagnostic	*	N
FRU Agent	Board FRU Data agent that verify FRU Data validity	*	N
ModuleHotSwap	AMC HS State	*	N
IPMBL State	Operational state of IPMB-L	*	N
MMC Storage Err	Management sub-system health: non volatile memory error.	*	N
MMC Reboot	IPMC reboot detection	*	N
Ver Change	IPMC firmware upgrade detection	*	N
Temp Board	Board air outlet temperature	*	X
Temp LAN	LAN Temperature	*	X
Temp MMC	MMC Temperature	*	X
Vcc +3.3V SUS	3.3 V management	*	X
Vcc +12V	12 V payload	-	X
Vcc +3.3V	3.3 V	-	X
Vcc +1.2V	1.2V	-	X
V_PUMP	Voltage on board blue LED VPUMP suspend power supply	*	X
Power State	Board State	*	X
Health Error	Board health sensors (aggregation of other sensors)	*	Asserted / De-asserted
Pres SFP1	SFP1 Presence	-	
Pres SFP2	SFP2 Presence		

- X Exceed critical threshold
- * Power On/Off
- Power On
- N No change

2.4.2.1 IPMB-L Link Sensor

The AM4320 has an IPMB-L links to communicate with the AMC Carrier and other devices on the IPMB-0 bus. The MMC monitors the bus for any link failure and sends a bus failure event to the AMC Carrier when 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 determined by the MMC. Refer to AMC.0 R2.0 Specifications for further details on module hot-swap states.

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 AM4320 includes data describing the AM4320 board as per the AMC.0 R2.0 specification. This information is retrieved by the Carrier, enabling reporting of board-specific information through a 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 R2.0 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 R2.0 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 Boot Block 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 Firmware Upgrade Procedure

The board's designed to support upgrade via HPM commands. Always follow Kontron documentation for all your upgrade. The instructions are provided with any new software upgrade package.

Upgrades have been designed to be performed without payload impact.

2.4.7 Hot-Swap Process

The AM4320 AMC has the ability to be hot-swapped in and out of an AMC Carrier/Chassis. The onboard MMC manages the AMC's power-up and power-down transitions. The list below illustrates this process for a 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 moves from M4-> M5.
- 3 AMC moves from M5 -> M6 if the ShMC grants the request and then sends the FRU Control requesting quiesced state to the AMC.
- 4 The firmware deasserts payload power and sends "Module Quiesced" event message to the AMC where it transitions from M6 to M1 state.

2.5 LEDs Signification

2.5.1 Hot Swap (Blue)

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

2.5.2 Out of service (Red/Amber) [default : red]

Solid On:	IPMC in reset
Fast Blink (~ 50 % on):	IPMC upgrade/rollback in progress
Short Blink (10 % on):	FRU Power Denied
Application Defined:	May be controlled by application using PICMG API

2.5.3 Health Led (Amber/Green) [default : green]

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

2.5.4 SFP+ Led [Green]

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

Chapter 3

Installing the Board

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3. Installing the Board

3.1 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 AMC handle to deactivate and extract the board from its enclosure.



WARNING

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



3.1.1 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 mates with its connector. Secure the AMC handle in the locking position.
- 3 In normal condition, the blue LED shall turn ON as soon as the AMC is fully inserted. When the handle is closed it will blink and finally turn OFF at the end of the hot swap sequence.

3.1.2 Removing an AMC

To remove an AMC:

- 1 Open the AMC handle.
- 2 The blue LED will start blinking; wait until it is solid blue.
- 3 Extract the AMC by pulling it out with the handle.



Note:

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

A. Connector Pinouts

A.1 AMC (J1)

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

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
B37	GND	B79	GND	B122	GND	B165	TCLK
B38	RxD3+ (N.C.)	B80	REFCLK+	B123	RxD14- (N.C.)	B166	TMS
B39	RxD3- (N.C.)	B81	REFCLK-	B124	RxD14+ (N.C.)	B167	TRST#
B40	GND	B82	GND	B125	GND	B168	TDO
B41	ENABLE#	B83	PS0#	B126	TxD14- (N.C.)	B169	TDI
B42	12V	B84	12V	B127	TxD14+ (N.C.)	B170	GND
		B85	GND	B128	GND		

A.2 SFP+ Connectors

Pin Number	Signal	Pin Number	Signal
1	VeeT	11	VeeR
2	Tx Fault	12	RD-
3	Tx Disable	13	RD+
4	SDA	14	VeeR
5	SCL	15	VccR
6	MODABS	16	VccT
7	Rate Select 0	17	VeeT
8	LOS	18	TD+
9	Rate Select 1	19	TD-
10	VeeR	20	VeeT

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:

North America

Tel.: (450) 437-5682

Fax: (450) 437-8053

EMEA

Tel.: +49 (0) 8341 803 333

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

Kontron Canada, Inc.

4555, Ambroise-Lafortune

Boisbriand, Québec

J7H 0A4 Canada

EMEA

Kontron Modular Computers GmbH

Sudetenstrasse 7

87600 Kaufbeuren

Germany

B.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, full shipping/billing address, your phone number, along with the information of the defective unit: our Invoice #, your Purchase Order #, and the Serial Number.

B.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