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Sun Netra™ CP3240
Advanced Mezzanine Card 10GbE
Copper User's Guide

for the AMC.2-CU

Sun Microsystems, Inc.
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Preface

The *Sun Netra™ CP3240 Advanced Mezzanine Card 10GbE Copper User's Guide* describes the installation and configuration of the Sun Netra CP3240 AMC.2-CU (AMC.2-CU). This guide also includes information about software, environment specifications, connectors, and certifications.

Before You Read This Document

Obtain and read the following documents:

■ *Sun Netra CP3x40 Switch Safety and Compliance Manual* (820-3505)

■ *Sun Netra CP3x40 Switch Product Notes* (820-3260)

■ *Sun Netra CP3240 Switch Installation Guide* (820-3251)

How This Document Is Organized

Chapter 1 provides unpacking instructions and initial setup information for the AMC. It provides information and procedures needed to install and make the Sun Netra CP3240 AMC.2-CU operational.

Chapter 2 introduces the key features of the AMC. This chapter includes a product definition, a list of product features, and a functional block diagram with a brief description of each block. This chapter can be used to compare the features of the AMC against the needs of a specific application.

Chapter 3 describes the jumper settings on the AMC. This chapter details factory default settings and provides information about tailoring the AMC to the needs of specific applications.

Chapter 4 describes the management software running on the AMC. This section serves as a primer for using the software to manage the AMC.

Appendix A contains the electrical, environmental, and mechanical specifications for the AMC.

Appendix B provides a connector location illustration and connector pin out tables. A detailed description and pin out for each connector is given.

Appendix C presents UL, CE, and FCC agency approval and certification information for the AMC.

Appendix D provides links to web sites with information about many of the devices and technologies used in the AMC.

Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
AaBbCc123	What you type, when contrasted with on-screen computer output	`% `**`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

Note – Characters display differently depending on browser settings. If characters do not display correctly, change the character encoding in your browser to Unicode UTF-8.

Related Documentation

The following table lists the documentation for the AMC and its corresponding switch. The online documentation is available at:

http://docs.sun.com/app/docs/prod/cp3240.copper#hic

http://docs.sun.com/app/docs/prod/cp3240.switch?l=en#hic

Application	Title	Part Number	Format	Location
Latest information	*Sun Netra CP3240 Advanced Mezzanine Card Product Notes*	820-7575-*xx*	PDF	Online
Latest information	*Sun Netra CP3x40 Switch Product Notes*	820-3260-*xx*	PDF	Online
Pointer doc	*SunNetra CP3240 Advanced Mezzanine Card Getting Started Guide*	820-7260-*xx*	Printed	Shipping Kit
Installation (this document)	*Sun Netra CP3240 Advanced Mezzanine Card 10GbE Copper User's Guide*	820-7261-*xx*	PDF	Online
Usage	*Sun Netra CP3240 Switch User's Guide*	820-3252-*xx*	PDF	Online
Reference	*Sun Netra CP3240 Switch Software Reference Manual*	820-3253-*xx*	PDF	Online
Safety	*Sun Netra CP3x40 Switch Safety and Compliance Manual*	820-3505	PDF	Online

The following table lists the documentation that is related to this product. The online documentation is available at:

http://docs.sun.com/app/docs/prod/n900.srvr#hic

Application	Title	Part Number	Format	Location
Latest information	*Netra CT 900 Server Product Notes*	819-1180-*xx*	PDF	Online
Pointer doc	*Netra CT 900 Server Getting Started Guide*	819-1173-*xx*	Printed	Shipping kit
Overview	*Netra CT 900 Server Overview*	819-1174-*xx*	PDF	Online
Installation	*Netra CT 900 Server Installation Guide*	819-1175-*xx*	PDF	Online
Service	*Netra CT 900 Server Service Manual*	819-1176-*xx*	PDF	Online
Administration	*Netra CT 900 Server Administration and Reference Manual*	819-1177-*xx*	PDF	Online

Application	Title	Part Number	Format	Location
Programming	*Netra CT 900 Software Developer's Guide*	819-1178-*xx*	PDF	Online
Safety	*Netra CT 900 Server Safety and Compliance Guide*	819-1179-*xx*	PDF	Online
Setup	*Netra CT 900 Server Hardware Setup Guide*	819-1647-*xx*	PDF	Online
Safety	*Important Safety Information for Sun Hardware Systems*	816-7190-*xx*	Printed	Shipping kit

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http://www.sun.com/hwdocs/feedback

Please include the title and part number of your document with your feedback:

Sun Netra CP3240 Advanced Mezzanine Card 10GbE Copper User's Guide, part number 820-7261-10.

Getting Started

This chapter provides information and procedures needed to install and make the Netra CP3240 AMC 10G-CU operational. This chapter should be read before using the AMC.

In addition to this chapter, refer to the following safety documentation:

- *Sun Netra CP3x40 Switch Safety and Compliance Manual* (820-3505)
- *Important Safety Information for Sun Hardware Systems* (816-7190)

Caution – When the system is plugged in, energy hazards are present on the midplane. Do not reach into the enclosure while the power is on.

Caution – Static electricity can damage electronic components. Wear a wrist strap grounded through one of the system's ESD ground jacks when removing and replacing hot-swappable components.

This chapter contains the following topics:

- Section 1.1, "System Requirements" on page 1-2
- Section 1.2, "Unpacking" on page 1-3
- Section 1.3, "Handling AMCs" on page 1-4
- Section 1.4, "AMC Faceplate" on page 1-5
- Section 1.6, "Removing and Installing AMCs" on page 1-8
- Section 1.5, "AMC LEDs" on page 1-6

1.1 System Requirements

The following sections briefly describe the minimum system requirements and the configurable features. Links are provided to other chapters and appendices containing more detailed information.

1.1.1 Connectivity

The AMC can work in any AdvancedTCA shelf with a single-width, mid-height AMC slot supporting the AMC.2 Type 5 (10GbE on ports 8-11) standard. In addition, a 1000BaseT connection is available that conforms to AMC.2 Type E1(1GbE on port 0).

1.1.2 Electrical and Environmental

See Appendix A for electrical and environmental requirements

Caution – None of the integrated chips junction temperature should exceed 125°C. The AMC requires air flow to meet this requirement. Testing should be done in your shelf to find the quantity of air flow needed. 50 LFM is the recommended minimum quantity of air flow.

1.1.3 Disposal

The AMC might contain materials that require regulation upon disposal. Please dispose of this product in accordance with local rules and regulations. For disposal or recycling information, please contact your local authorities or the Electronic Industries Alliance at `http://www.eiae.org/`.

1.1.4 Connectors

The AMC includes several connectors to interface to application-specific devices. Refer to the Chapter B for complete connector descriptions and pin outs.

1.1.5 Jumper Options

The AMC provides several jumper configuration options for features. Location figures and descriptions are provided in Chapter 3.

1.2 Unpacking

Check the shipping carton for damage. If the shipping carton or contents are damaged, notify the carrier and Sun. Retain the shipping carton and packing material for inspection by the carrier. Obtain authorization before returning any product to Sun. Refer to the *Sun Netra CP3240 AMC Getting Started Guide* (820-7260) for return instructions.

Caution – This board must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the antistatic bag shipped with the product to handle the board. Wear a wrist strap grounded through one of the system's ESD ground jacks when installing or servicing system components.

1.3 Handling AMCs

Caution – The system is sensitive to static electricity. To prevent damage to the assembly, always connect an antistatic wrist strap between you and the system.

Caution – Do not flex the AMCs; the surface-mounted components can break if the AMC is bent.

To minimize the amount of AMC flexing, observe the following precautions:

- When removing a AMC from an electrostatic discharge bag, keep it vertical until you place the AMC on the electrostatic discharge mat.
- Do not place a AMC on a hard surface. Use a cushioned antistatic mat. The AMC connectors and components have very thin pins that bend easily.
- Be careful of small parts located on the component side of a AMC.
- Do not use an oscilloscope probe on the components. The soldered pins are easily damaged or shorted by the probe point.
- Transport a AMC in an antistatic bag.

1.4 AMC Faceplate

The following shows the faceplate of the Netra CP3240 AMC 10G-CU, which is a copper AMC (XCP3240H-AMC10G-CU-Z).

FIGURE 1-1   AMC.2-CU Faceplate
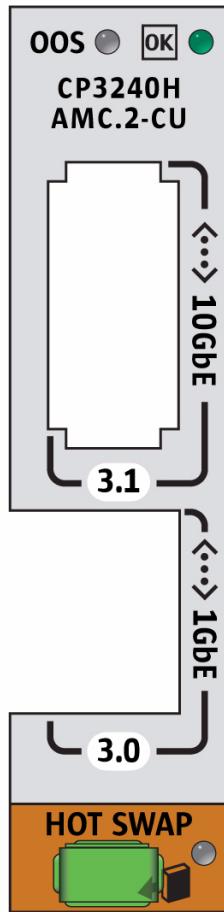
1.4.1 Base 10/100/1000 Ports (RJ-45)

This connector provides outside-the-chassis access to the 10/100/1000BASE-T Ethernet AdvancedTCA Base Interface.

1.4.2 Fabric Connector

This connector provides outside-the-chassis access to the 10GBASE-CX4 Ethernet AdvancedTCA Fabric Interface. The CX4 port is only active on the middle AMC site.

1.5 AMC LEDs

The following tables give status information for all of the LEDs on the AMC.

TABLE 1-1 describes the LEDs defined by ATCA to monitor board status.

TABLE 1-1 ATCA Board Status LEDs

LED	Color	Normal Operation	Description
OOS	Red	Off	Out of service. This LED lights on a critical AMC error, such that the board should be removed.
OK	Green	On	This LED is lit when the AMC is booted and switching
A	Amber	Off	Minor Error/User Defined. This LED can be defined by the user via software applications.

Note that the OOS LED will be lit when the board is powered but not booted. This includes all hot swap states M1 through M3. It will remain on until the IPMI software has received the e-Keying signal from the shelf manager.

TABLE 1-2 shows the different states of the Hot-Swap LED.

TABLE 1-2   Hot-Swap LED States

Order	Visible State	State	Description
1	Solid	M1 FRU Inactive	The Intelligent Platform Management Interface (IPMI) microcontroller is booted, but the payload is not. The bottom latch is not fully closed.
2	Blinking (from solid)	M2 Activation Request	The IPMI microcontroller has requested permission to boot the payload from the shelf management controller.
3	Off	M3-M4 Active	The IPMI microcontroller has received permission to boot the payload, and has done so. This should be the state under normal operation.
4	Blinking (from off)	M5-M6 Deactivation Request	The IPMI microcontroller has requested permission to shut down the payload. Opening the bottom latch activates this state.

Note – A board should be hot-swapped only when the LED is solid blue.

1.6 Removing and Installing AMCs

This section describes how to remove and install AMCs.

1.6.1 Removing an AMC

If you want to remove only an AMC from a Netra CP3240 switch, use the following instructions.

If you want to remove the switch with the AMC installed, see the next section Section 1.6.2, "Removing a Switch and AMC" on page 1-11.

1. **Shut down the payload OS.**

   If you fail to do this before pulling the AMC's hotswap latch, the OS might panic.

2. **At the front of the Netra CP3240 switch, locate the AMC you want to remove.**

3. **Initiate the hot-swap deactivation sequence by pulling the injector/ejector latch out half way (**FIGURE 1-2**).**

   The Hot-Swap LED starts blinking. Wait until the LED is solid blue.

4. **When the hot-swap LED is solid blue, pull the injector/ejector latch out completely (**FIGURE 1-2**).**

FIGURE 1-2   Deactivating the AMC
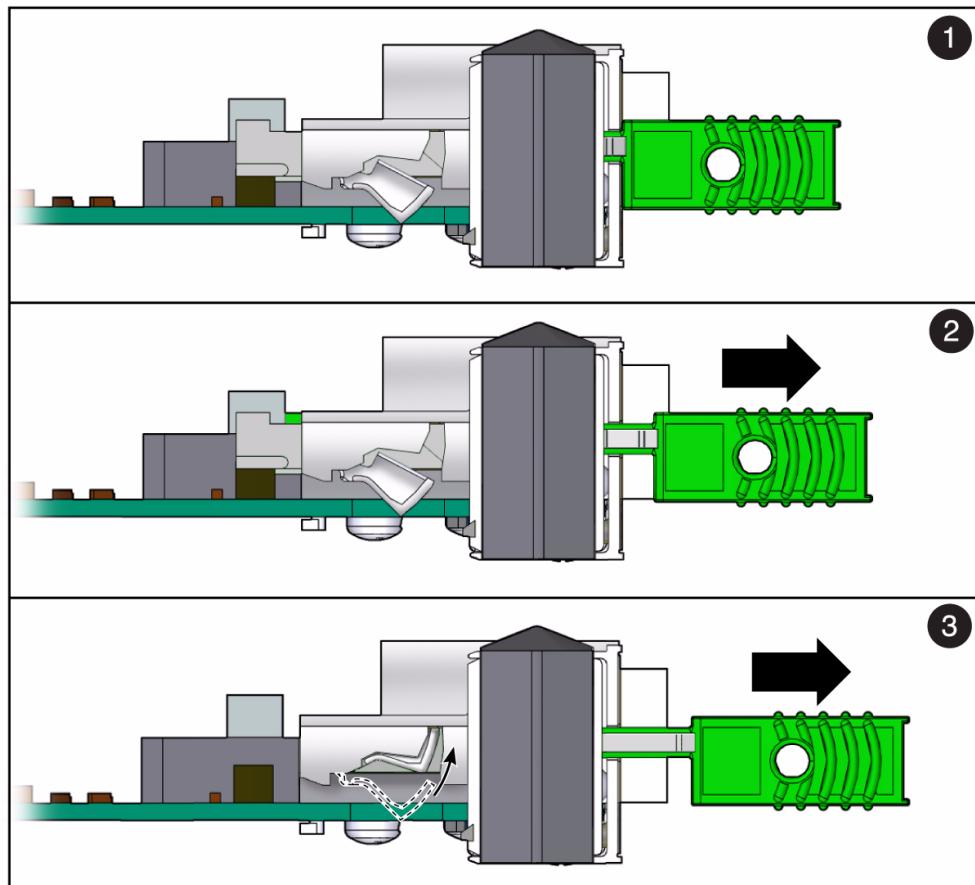
Figure Legend

1   Fully In (IN) When IN, the module communicates to the Shelf Manager that the module is not in the Hotswap state, and the Shelf Manager communicates with the MMC. This position is for normal operation.

2   Half Way (HW) When in the HW position, the hotswap sequence is initiated. The MMC sends a hotswap event to the Shelf Manager.

3   Out (OUT) When OUT, the latching mechanism is released and the module can be extracted. Wait for the Hot-Swap LED to stop blinking before pulling the latch all the way out.

5. Remove the AMC as shown in the following figure.

FIGURE 1-3 Removing the AMC
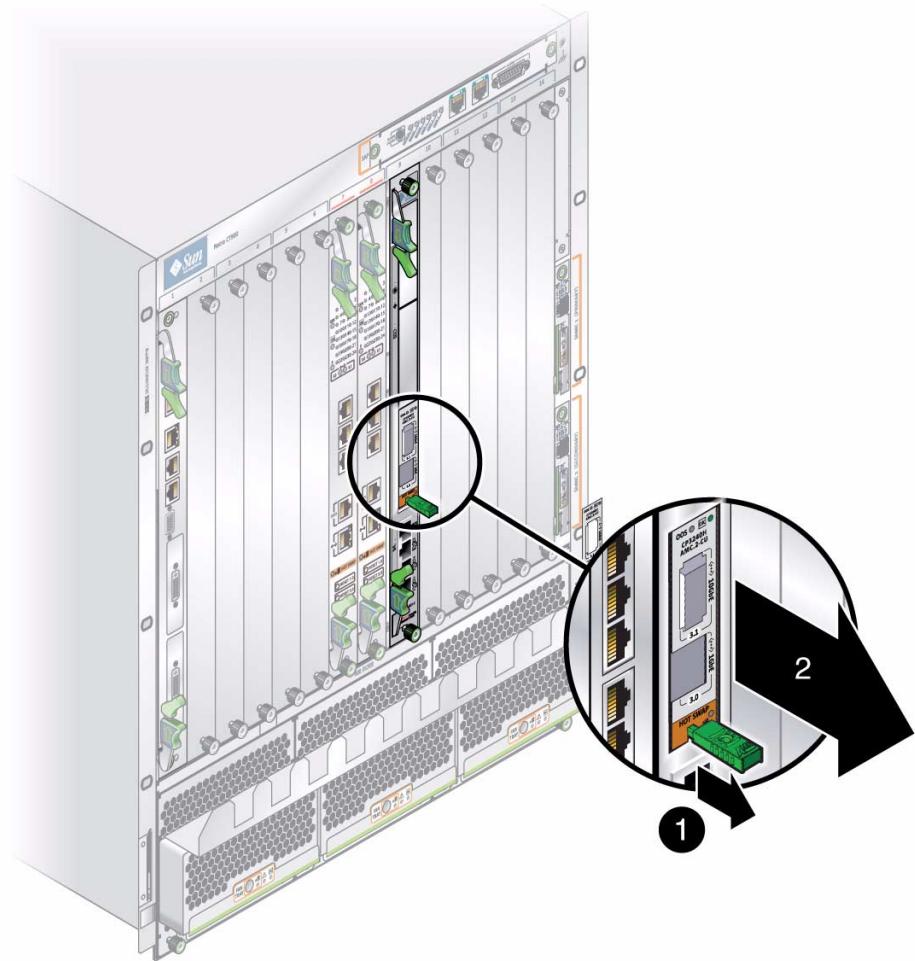
6. Replace the AMC with another AMC (FIGURE 1-7**) or install a filler panel.**

Note – Be sure to follow handling instructions. See Section 1.3, "Handling AMCs" on page 1-4.

Caution – Failure to fill all sites with AMCs or cover with filler panels can negatively impact the cooling of the system.

1.6.2   Removing a Switch and AMC

Following are the instructions for removing both a Netra CP3240 switch and an installed AMC. For instructions on removing switch and RTM sets, refer to the *Sun Netra CP3240 Switch Installation Guide* (820-3251).

1. Move the front cable management bracket to the lower position (FIGURE 1-4**).**

FIGURE 1-4   Front Cable Management Bracket in Lower Position
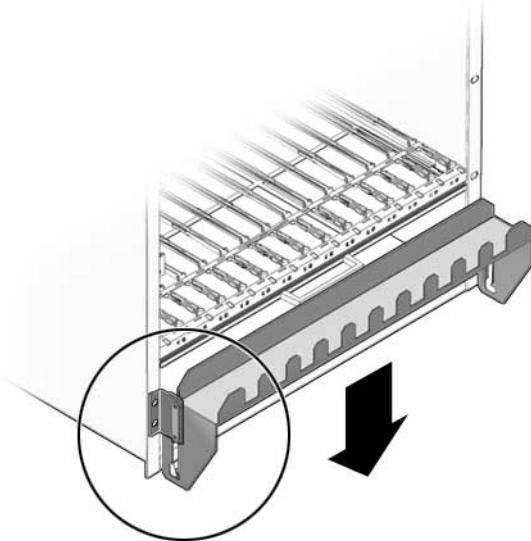
2. Disengage the injector/ejector mechanisms at the top and bottom of the switch to notify software that the board is about to be removed. Wait for the Hot-Swap LED to light.

FIGURE 1-5   Injector/Ejector on the Switch (Open Position)

injector/ejector mechanism
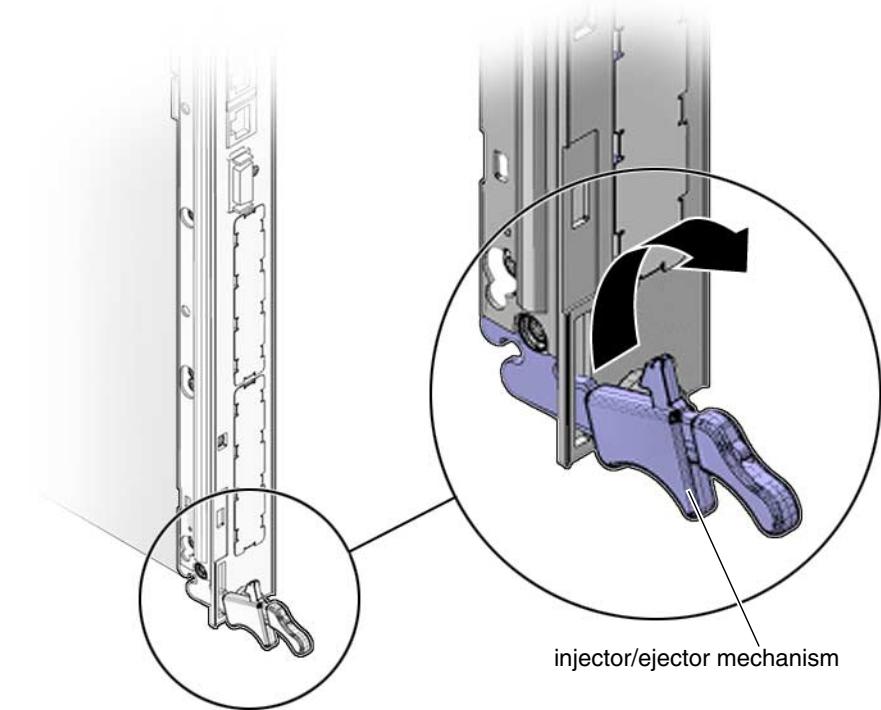
3. Disconnect all cables connected to the switch.

4. Loosen the two board retention screws that fasten the board to the enclosure.

5. Open the ejectors fully, rotating the handles outward until the board disengages from the midplane.

6. Slide the board evenly out of the enclosure.

7. **Determine if you are going to replace the switch.**

   - If you are going to replace the switch, refer to the *Sun Netra CP3240 Switch Installation Guide* (820-3251) for instructions.

   - If you are not going to replace the switch, install a filler panel to maintain the enclosures shielding and cooling performance.

Note – When a switch is removed from the site, and the system is running with only a single remaining switch, you do not have redundancy for that component. Both switches must be installed and running to have redundancy for that component.

Caution – Failure to cover all open sites with filler panels can negatively impact the cooling of the system.

1.6.3   Installing an AMC

Following are the instructions for installing an AMC. For instructions on installing switch and RTM sets, refer to the *Sun Netra CP3240 Switch Installation Guide* (820-3251).

1. **At the front of the Netra CP3240 switch, locate the AMC site where you want to install the AMC.**

2. **Remove the filler panel, if necessary.**

3. **Obtain the AMC card from the ship kit.**

Note – Be sure to follow unpacking and handling instructions. See Section 1.2, "Unpacking" on page 1-3 and Section 1.3, "Handling AMCs" on page 1-4.

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4. **Perform any card-specific hardware procedures, if necessary.**

5. **Prepare the AMC by opening its injector/ejector latches.**

**FIGURE 1-6**   Opening the Injector/Ejector Latches
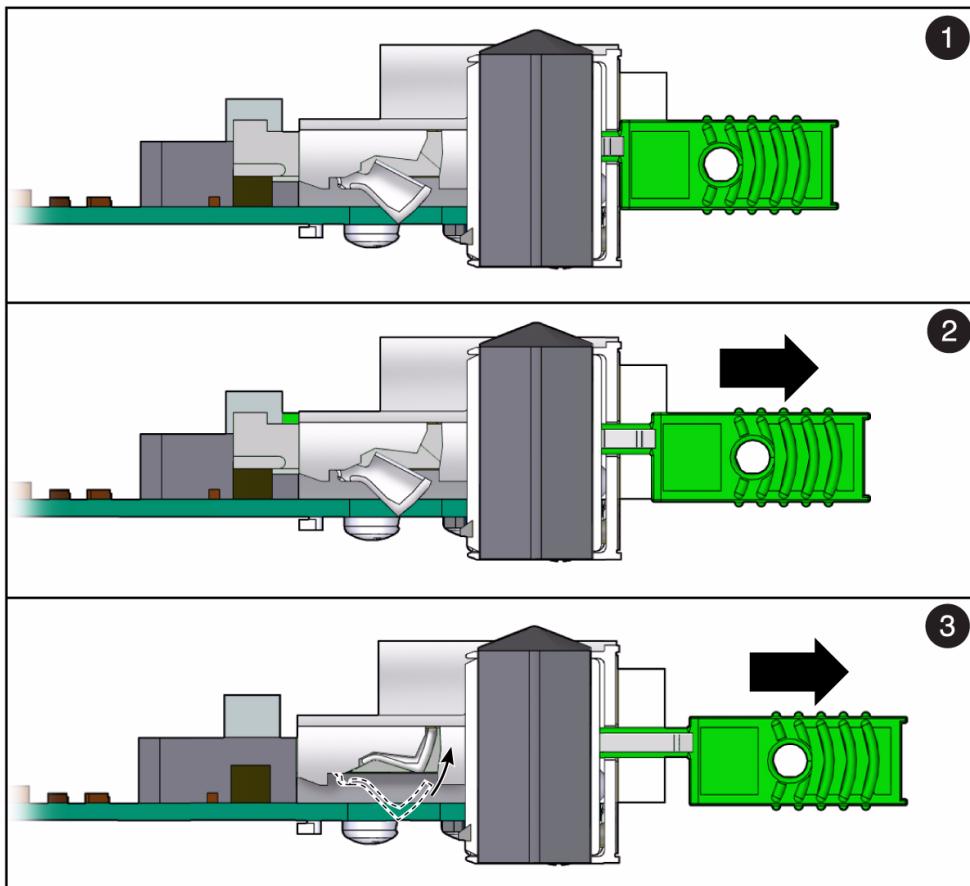
Figure Legend

1	Fully In (IN) When IN, the module communicates to the Shelf Manager that the module is not in the Hotswap state, and the Shelf Manager communicates with the MMC. This position is for normal operation.
2	Half Way (HW) When in the HW position, the hotswap sequence is initiated. The MMC sends a hotswap event to the Shelf Manager.
3	Out (OUT) When OUT, the latching mechanism is released and the module can be extracted. Wait for the Hot-Swap LED to stop blinking before pulling the latch all the way out.

6. Carefully align the edges of the board with the guides in the appropriate site.

It might be helpful to look into the enclosure to verify correct alignment of the rails in the guides.

Caution – Do not force the AMC into the site. If it does not fit properly, check to ensure that you have the correct matching AMC for the switch.

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7. Keeping the board aligned in the guides, slide the board in by pressing on the AMC faceplate until the AMC faceplate is flush with the Netra CP3240 switch faceplate.

FIGURE 1-7   Inserting the AMC
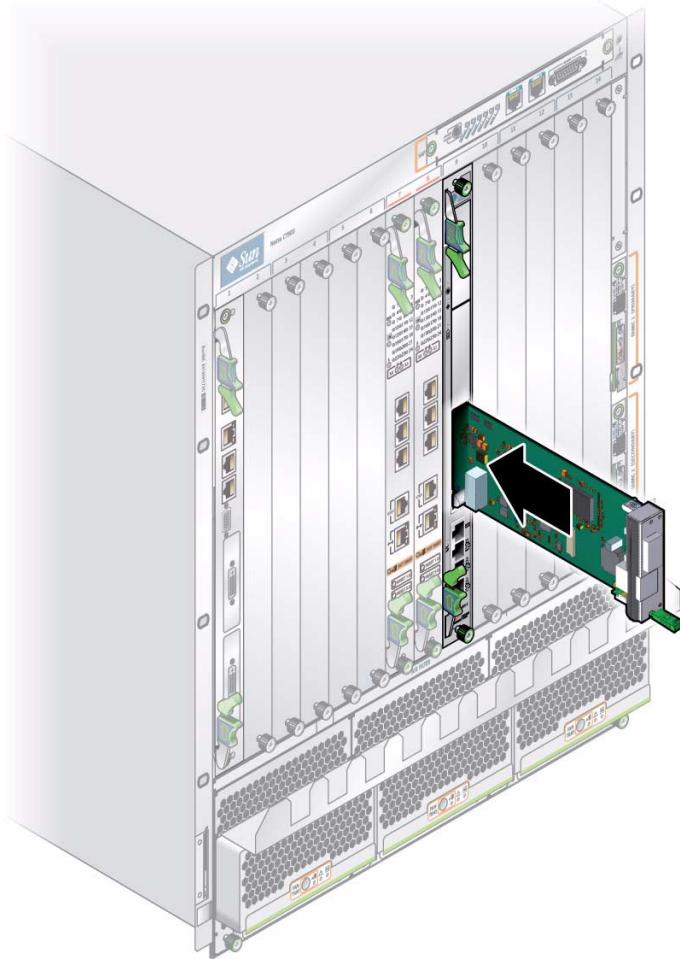
8. Push the ejector latch in fully.

If system power is on and AMC is installed properly, the AMC board Hot-Swap LED lights up. The Hot-Swap LED blinks for several seconds, then goes off.

If the Hot-Swap LED does not go off after several seconds, push firmly on the injector/ejector handles to ensure that they are pushed in all the way.

Caution – Failure to fill all sites with AMCs or cover with filler panels can negatively impact the cooling of the system.

Overview

This chapter introduces the key features of the AMC. This chapter includes a product definition, a list of product features, and functional block diagrams with brief descriptions. This chapter can be used to compare the features of the AMC against the needs of a specific application.

This chapter contains the following topics:

2.1　Features

Part of Sun's ATCA platform, the Sun Netra CP3240 AMC.2-CU complies with PICMG 3.0 AdvancedTCA Specification R2.0 ECN002 and AMC.0 R2.0.

The AMC.2-CU is a mid-size AMC (AdvancedMC) Form Factor board with 10-Gigabit Ethernet connectivity for use in a wide variety of next generation and wireless networking equipment. Designed for high performance and reliability, the AMC.2-CU is ideal for telecom equipment manufacturers (TEMs) to add 10G Ethernet ports to networking equipment that use the AdvancedTCA (ATCA) platform specification, as well as OEMs that are designing to the MicroTCA specification for high-performance embedded systems.

The AMC.2-CU is a hot-swappable AMC board designed for use in ATCA switches. This AMC brings one Base port and one Fabric port to the front of the ATCA chassis. The Fabric port is accessible via a CX4 connector on the faceplate, and the Base port is accessible through a standard RJ-45 jack on the faceplate. The AMC.2-CU follows the single-width, mid-height AMC form factor. The AMC.2-CU can be installed in a B2 (middle) AMC site; it cannot be installed in sites B1 and B3.

The following briefly outlines the features of the AMC.2-CU:

- Advanced Mezzanine Card (Single-Width, Mid-Height); PICMG AMC.0 R2.0 compliant
- Hot swappable
- 10Gb Ethernet PICMG AMC.2 Type 5
- 1Gb Ethernet PICMG AMC.2 Type E1
- 10GBase-CX4 connected to the fat pipe region, AMC ports 8-11
- 1000Base-T connected to the common options region, AMC port 0
- Support for HPM.1 compliant firmware upgrades

2.2 Key Components

The following sections describe key components of the Sun Netra CP3240 AMC.2-CU.

2.2.1 Broadcom BCM5461S 1000Base-T Ethernet PHY

This Broadcom PHY provides the physical interfacing for the 1000Base-T Ethernet Base port. This is a low power device that provides features such as jumbo frames support, auto-MDIX, and cable testing.

2.2.2 Module Management Controller (MMC)

The ATmega128, a member of the AVR family of microcontrollers by Atmel, serves as the MMC for the AMC.2-CU. The MMC is the first system component to be brought up and must negotiate with the carrier board over IPMB before the card payload is enabled. The MMC monitors board voltages and temperature, controls the hot-swap and failures status LEDs, and stores FRU information. For more information about the MMC and management functions, see Chapter 4.

2.3 Functional Diagram

FIGURE 2-1   AMC.2-CU Functional Block Diagram
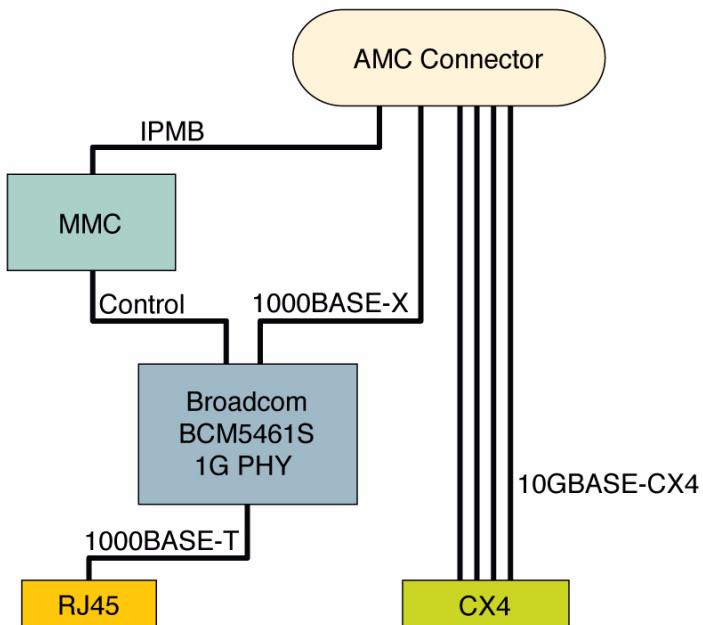
2.4 AMC Sites

For 10GbE operation, the Sun Netra CP3240 AMC.2-CU must be used in site B2, the second AMC site from the top when vertical, of the corresponding Netra CP3240 switch. For 1GbE operation, the Sun Netra CP3240 AMC.2-CU can be used in any of the three AMC sites.

2.5 Technical Support and Warranty

Should you have any technical questions or support issues that are not addressed in the Sun Netra CP3240 AMC.2-CU documentation set or on the web site, contact your local Sun Services representative. This hardware carries a one-year return-to-depot warranty.

For customers in the US or Canada, call 1-800-USA-4SUN (1-800-872-4786).

For customers in the rest of the world, find the World Wide Solution Center nearest you by visiting our web site:

http://www.sun.com/service/contacting/solution.html

When you call Sun Services, indicate if the Sun Netra CP3240 AMC.2-CU was purchased separately and is not associated with a system. Have the proper AMC identification information ready. Be prepared to give the representative the AMC part number, serial number, and date code.

Configuring Jumper Settings

This chapter describes jumper settings for configuring the AMC. Other configuration options are software controlled. Software configuration options are described in Chapter 4.

3.1 Jumper Locations and Settings

FIGURE 3-1 shows the locations of the jumper settings. The following table defines the settings.

FIGURE 3-1   AMC.2-CU Jumper Locations
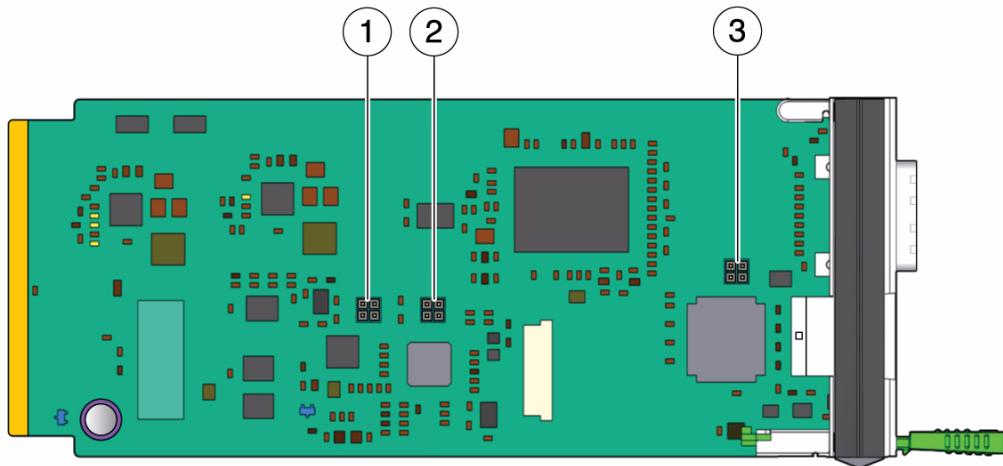
TABLE 3-1   AMC Jumper Settings

	Jumper	Default	Purpose
1	P1	Reserved	Reserved
2	P2	Reserved	Reserved
3	P3	Off	Connects bracket ground to digital ground, when jumper is On.

Managing the AMC

This chapter describes the AMC management software.

The Netra CP3240 AMC 10G-CU includes an IPMI-based MMC (Module Management Controller) that meets all requirements set out in the PICMG AMC.0 specification. The MMC allows detection of the module by the carrier board and manages communication between the AMC 10G-CU and management controllers on the carrier board and system level. Board voltages, temperature, and hot-swap handle status are all monitored by the MMC as well.

This chapter contains the following topics:

4.1　Monitoring and Control Functions

The MMC is responsible for communicating module status information to the carrier board, but it also carries out some control at the module level. The 10GbE local PHY is held in reset until the AMC Carrier IPMI uses e-Keying to turn on the interface (to ensure the interface is compatible). The MMC has the ability to reset the PHY via IPMI `FRU Control` command.

4.2　IPMB

The IPMB is an I2C interface routed through the AMC connector to the host carrier board and backplane. The IPMB allows the AMC 10G-CU MMC to be discovered by and communicate with the carrier board and system level management. It is always active.

4.3　FRU Information

Board information such as serial number, date of manufacture, OEM name, part number, and so on is retrievable from the FRU EEPROM integrated into the MMC. FRU information stored on board the AMC 10G-CU complies with the AMC.0 specification.

4.4 Sensors

The AMC 10G-CU module management is connected to sensors monitoring key board voltages and temperatures. Data records from the following sensors are accessible using IPMI commands:

- Hot-swap sensor
- +3.3V STBY (management power)
- +12V (from carrier board)
- DS75 Temp (board temperature)
- AD7417 Temp (board temperature)*
- +1.2V Onboard Voltage (Generated from Payload)
- +2.5V Onboard Voltage (Generated from Payload)
- +3.3V Onboard Voltage (Generated from Payload)
- BMC Watchdog

* All AMC modules are required to have at least two temperature sensors.

TABLE 4-1 Threshold Sensors

Sensor	Name	Type	Description	Units	Lower Thresholds Minor	Critical	Non-recoverable	Upper Thresholds Minor	Critical	Non-recoverable
0	Hotswap	Hot-swap	Hot-swap	M states	N/A	N/A	N/A	N/A	N/A	N/A
1	+3.3V STBY	Voltage	IPMI management control	Volts	3.15	3.03	2.90	3.46	3.56	3.70
2	+12V	Voltage	Main power input	Volts	11.20	10.90	10.00	13.00	13.60	13.80
3	DS75 Temp	Temp	Ambient temp sensor	Celsius	N/A	N/A	N/A	60	70	80
4	AD7417 Temp	Temp	Ambient temp sensor	Celsius	N/A	N/A	N/A	60	70	80

TABLE 4-1   Threshold Sensors *(Continued)*

Sensor	Name	Type	Description	Units	Lower Thresholds Minor	Critical	Non-recoverable	Upper Thresholds Minor	Critical	Non-recoverable
5	+1.2V	Voltage	Onboard voltage regulator	Volts	1.14	1.09	1.00	1.28	1.33	1.40
6	+2.5V	Voltage	Onboard voltage regulator	Volts	2.40	2.28	2.20	2.60	2.70	2.80
7	+3.3V	Voltage	Onboard voltage regulator	Volts	3.14	3.05	2.92	3.47	3.56	3.71

4.5   Firmware and Software Upgrades

For up-to-date instructions on upgrading the firmware and software, refer to the following documentation:

■ *Sun Netra CP3240 Advanced Mezzanine Card Product Notes* (820-7575)

■ README files within the download package

Environment Specifications

This appendix describes the electrical, environmental, and mechanical specifications. It includes connector descriptions and pin outs, as well as illustrations of the board dimensions and connector locations.

This appendix contains the following topics:

A.1 Electrical and Environmental

The following sections provide tables and illustrations showing the electrical and environmental specifications.

A.1.1 Absolute Maximum Ratings

The following values are stress ratings only. Do not operate at these maximums. See Section A.1.2, "Normal Operating Ranges" on page A-2 for normal operating conditions.

TABLE A-1 Absolute Maximum Electrical and Temperature Ratings

Payload voltage, +12V	0 VDC to +13.2VDC
Management voltage, +3.3V	0 VDC to +5.5VDC
Storage temperature:	-40˚ to +85˚ Celsius
Noncondensing relative humidity:	<95% at 40˚ Celsius

A.1.2 Normal Operating Ranges

TABLE A-2 Normal Operating Electrical and Temperature Ratings

Description	Range
Nominal operating voltage	+10.8 to +13.2VDC Payload Power +2.97 to + 3.63VDC Management Power
Operating temperatures: • 60m below sea level up to 1800m above sea level*	-5˚ to +55˚ Celsius
• from 1800m up to 4000m above sea level**	-5˚ to +40˚ Celsius
Operating humidity	<85% at 40˚ Celsius
Idle power consumption (without links)	1.44W
Maximum power consumption	2.88W

*The MTBF will be significantly reduced if operated above 45˚ C for more than 96 consecutive hours.

**The MTBF will be significantly reduced if operated above 30˚ C for more than 96 consecutive hours.

A.2 Reliability

Reliability prediction was done using Issue 1, Method I, Case 3 of the Telcordia Industrial Reliability program. The prediction assumed 25°C operating temperature with 100% duty cycle, in a ground benign, controlled environment.

- MTBF: 1,622,712 hours
- 2 year limited warranty

A.3 Mechanical

This section includes the mechanical specifications for dimensions and weight. The AMC.2-CU meets the PICMG 3.0 AdvancedTCA Specification R2.0 ECN002 and AMC.0 R2.0 for all mechanical parameters.

A.3.1 Board Dimensions and Weight

The AMC.2-CU conforms to the PICMG AMC.0 single-width, full-height AMC form factor for all mechanical parameters. Mechanical dimensions are shown in the illustration and are outlined in the following table.

TABLE A-3 Board Dimensions and Weight

Item	Dimensions or Weight
PCB	181.5mm x 73.5mm x 1.6mm
Board	AMC.0 R2.0 single-width, full-height form factor
Weight	181.4g (0.4lb)
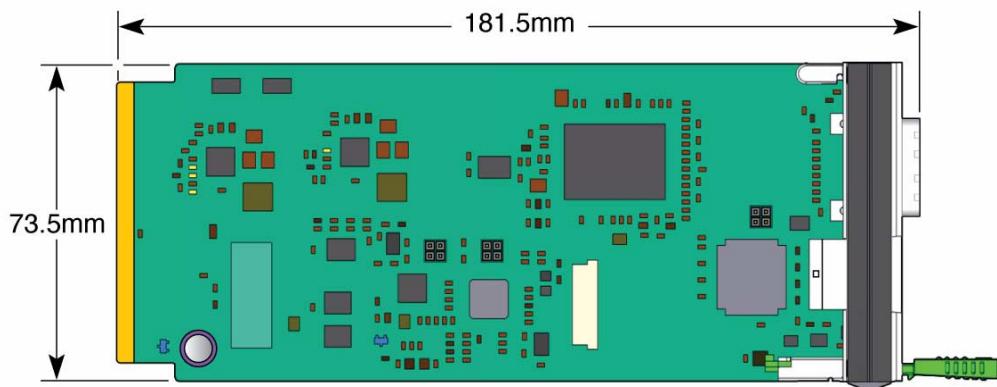
Connectors

This appendix describes the connectors you can use to interface with the host board and application-specific devices. A brief description of each connector is given, and a detailed description and pin out for each connector is given.

This appendix contains the following topics:

B.1   Connector Locations and Assignments

FIGURE B-1   AMC.2-CU Connector Locations
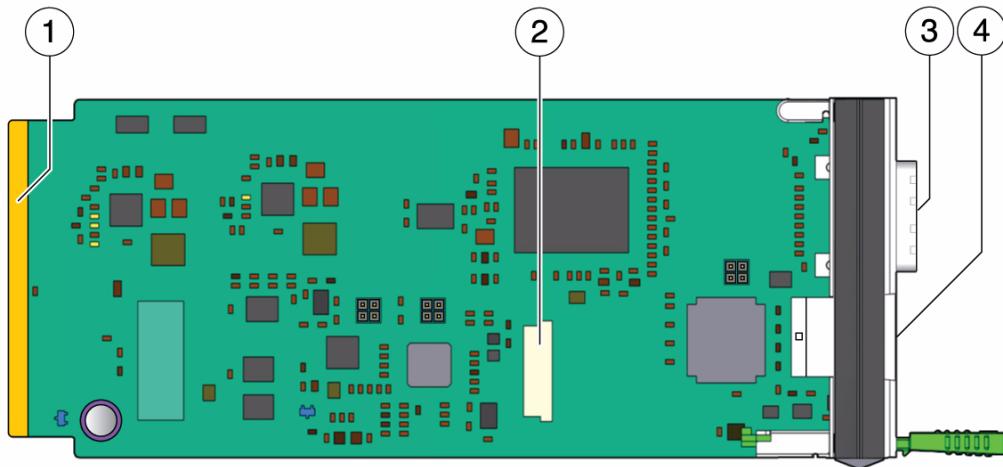
TABLE B-1   Connector Assignments

	Connector	Function
1	GF1	AMC Connector/Goldfingers
2	J1	OEM Connector
3	J3	CX4 Connector
4	J2	RJ45 Connector

B.2 Connector Pinouts

B.2.1 AMC Connector/Goldfingers (GF1)

The AMC.2-CU interfaces with the carrier board through the AMC connector. Connector usage for the AMC.2-CU is in the following table.

TABLE B-2 AMC Connector/Goldfingers (GF1)

Top Side		Bottom Side	
1	GND	170	GND
2	+12V	169	NC
3	PS1#	168	NC
4	+3.3V_STBY	167	NC
5	GA(0)	166	NC
6	NC	165	NC
7	GND	164	GND
8	NC	163	NC
9	+12V	162	NC
10	GND	161	GND
11	SERDES_TX+	160	NC
12	SERDES_TX-	159	NC
13	GND	158	GND
14	SERDES_RX+	157	NC
15	SERDES_RX-	156	NC
16	GND	155	GND
17	GA(1)	154	NC
18	+12V	153	NC
19	GND	152	GND
20	NC	151	NC
21	NC	150	NC
22	GND	149	GND

TABLE B-2   AMC Connector/Goldfingers (GF1) *(Continued)*

	Top Side		Bottom Side
23	NC	148	NC
24	NC	147	NC
25	GND	146	GND
26	GA(2)	145	NC
27	+12V	144	NC
28	GND	143	GND
29	NC	142	NC
30	NC	141	NC
31	GND	140	GND
32	NC	139	NC
33	NC	138	NC
34	GND	137	GND
35	NC	136	NC
36	NC	135	NC
37	GND	134	GND
38	NC	133	NC
39	NC	132	NC
40	GND	131	GND
41	AMC_ENABLE#	130	NC
42	+12V	129	NC
43	GND	128	GND
44	NC	127	NC
45	NC	126	NC
46	GND	125	GND
47	NC	124	NC
48	NC	123	NC
49	GND	122	GND
50	NC	121	NC
51	NC	120	NC
52	GND	119	GND

TABLE B-2   AMC Connector/Goldfingers (GF1) *(Continued)*

Top Side		Bottom Side	
53	NC	118	NC
54	NC	117	NC
55	GND	116	GND
56	IPMB SCL	115	NC
57	+12V	114	NC
58	GND	113	GND
59	NC	112	NC
60	NC	111	NC
61	GND	110	GND
62	NC	109	XAUI_D_TX+
63	NC	108	XAUI_D_TX-
64	GND	107	GND
65	NC	106	XAUI_D_RX+
66	NC	105	XAUI_D_RX-
67	GND	104	GND
68	NC	103	XAUI_C_TX+
69	NC	102	XAUI_C_TX-
70	GND	101	GND
71	IPMB SDA	100	XAUI_C_RX+
72	+12V	99	XAUI_C_RX-
73	GND	98	GND
74	NC	97	XAUI_B_TX+
75	NC	96	XAUI_B_TX-
76	GND	95	GND
77	NC	94	XAUI_B_RX+
78	NC	93	XAUI_B_RX-
79	GND	92	GND
80	NC	91	XAUI_A_TX+
81	NC	90	XAUI_A_TX-
82	GND	89	GND

TABLE B-2   AMC Connector/Goldfingers (GF1) *(Continued)*

	Top Side		Bottom Side
83	PS0#	88	XAUI_A_RX+
84	+12V	87	XAUI_A_RX-
85	GND	86	GND

B.2.2   CX4 Connector (J3)

This connector carries the 10GBase-CX4 Ethernet signals outside the chassis.

TABLE B-3   CX4 Connector (J3)

G1	GND	S9	XAUI_D_RX-
S1	XAUI_A_TX+	S10	XAUI_D_RX+
S2	XAUI_A_TX-	G6	GND
G2	GND	S11	XAUI_C_RX-
S3	XAUI_B_TX+	S12	XAUI_C_RX+
S4	XAUI_B_TX-	G7	GND
G3	GND	S13	XAUI_B_RX-
S5	XAUI_C_TX+	S14	XAUI_B_RX+
S6	XAUI_C_TX-	G8	GND
G4	GND	S15	XAUI_A_RX-
S7	XAUI_D_TX+	S16	XAUI_A_RX+
S8	XAUI_D_TX-	G9	GND
G5	GND		

B.3 RJ-45 Connector (J2)

This connector carries the 10/100/1000Base-T Ethernet signals outside the chassis.

TABLE B-4   RJ-45 Connector (J2)

1	FRONT_A+	5	FRONT_C-
2	FRONT_A-	6	FRONT_B-
3	FRONT_B+	7	FRONT_D+
4	FRONT_C+	8	FRONT_D-

B.4 OEM Connector (J1)

This connector is for OEM use and should not be used for normal operations.

Agency Certifications

This appendix lists standards agencies and the certifications related to the AMC.

This appendix contains the following topics:

C.1 CE Certification

The Sun Netra CP3240 AMC.2-CU meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility [EN55024:1998, EN55022:1998] and Low-Voltage Directive 73/23/EEC for Product Safety [EN60950:2000]. A certificate of incorporation is available upon request. The final system configuration must be reconsidered as a whole per these directives.

C.2 NEBS/ETSI

The Sun Netra CP3240 AMC.2-CU has been designed to meet or exceed:

- Telcordia specification FR-2063 Issue 2 Dec 2002 "Network Building Requirements"
  - Telcordia GR-63, Issue 3, March 2006, Network Equipment-Building System (NEBS) Requirements—Physical Protection
  - Telcordia GR-1089, Issue 4, June 2006, Electromagnetic Compatibility And Electrical Safety Generic Criteria For Network Telecommunication Equipment
- ETSI EN 300 019-2-1 V2.1.2 (2000-09), -2-2 V2.1.1 (1999-09), -2-3 V2.2.2 (2003-04), Environmental conditions and environmental tests for telecommunication equipment; Part 2
- ETSI EN 300 119-5, V1.2.2 (2004-12), Part 4: Engineering requirements for subracks in miscellaneous racks and cabinets
- ETSI EN 300 132-2, September 1996, Equipment Engineering Power Supply Interface At The Input To Telecommunications Equipment; Part 2: Operated by direct current (DC)
- ETSI EN 300 753, October 1997, Acoustic Noise Emitted By Telecommunications Equipment

Certification is dependent on your configuration.

C.3   Safety

- UL/cUL 60950--1:2003 Safety for Information Technology Equipment (UL File #E130569)
- EN/IEC 60950-1:2001, 1ST ED CB/CCA –scheme, Safety for Information Technology Equipment (TUV CB certificate and report)

The following group and/or national deviations were considered:

- CENELEC Common Modifications, Annex ZA
- AU (Australia and New Zealand)
- CH (Switzerland)
- DE (Germany)
- DK (Denmark)
- ES (Spain)
- FI (Finland)
- GB (United Kingdom)
- IE (Ireland)
- KR (Korea)
- NO (Norway)
- SE (Sweden)
- China (deviations to IEC 60950 3rd Ed. considered):
  - Telcordia GR-63-CORE Network Equipment-Building System (NEBS) Requirements Issue 3 Mar 2006—Physical Protection (Designed to meet section 4)
  - Telcordia GR-1089-CORE Safety for Network Telecommunication Equipment Issue 4 Jun 2006 (meets Section 7)

C.4 Emissions Test Regulations

- FCC Part 15, Subpart B Class A Commercial Equipment
- Industry Canada ICES-003 Class A Commercial Equipment
- CISPR 22/EN 55022:1998 Class A Radiated, Power line Conducted
- Telcordia GR-1089-CORE EMC For Network Telecommunication Equipment Issue 4 Jun 2006 (Designed to meet Sections 2 and 3)

C.4.1 EN 55022 Emissions

- Telcordia GR-1089-CORE EMC For Network Telecommunication Equipment Issue 4 Jun 2006 (designed to meet 3.2)
- EN55022:1998 Limits and Methods of Measurement of Radio Interference +A1:2000+A2:2003 Characteristics of Information Technology Equipment
- IEC CISPR22:2003 Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
- IEC CISPR 16-1:1999 Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus
- IEC CISPR 16-2:1999 Specification for radio disturbance and immunity measuring apparatus and methods - Part 2: Methods of measurement of disturbances and immunity
- AS/NZS CISPR 22:2004 Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment

C.4.2 EN 55024 Immunity

- Telcordia GR-1089-CORE EMC For Network Telecommunication Equipment Issue 4 Jun 2006 (Sections 2.1 (ESD), designed to meet 2.2 (EFT), 3.3)
- EN 55024:1998 Information Technology Equipment – Immunity +A1:2001+A2:2003 characteristics limits and methods of measurements
- EN 300-386:2002 Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; EMC requirements
- IEC 61000-4-2:2001 EMC - Part 4: Testing and measurement techniques - Section 4.2 Electrostatic discharge immunity test - Basic EMC Publication. (+/- 8KV contact and +/-15KV air discharge)

- IEC 61000-4-3:2003 EMC - Part 4. Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test

- IEC 61000-4-4:2004 EMC - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test - Basic EMC Publication

- IEC 61000-4-5:2001 EMC - Part 4: Testing and measurement techniques - Section 5: Surge immunity test

- IEC 61000-4-6:1996 EMC - Part 4: Testing and measurement techniques - Section 6: +A1:2001 Immunity to conducted disturbances induced by radio frequency fields

C.5   Regulatory Information

Caution – If you make any modification to the AMC not expressly approved by Sun, you could void your warranty and/or regulatory authority to operate the component.

C.5.1   FCC (USA)

This product 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 when the equipment is operated in a commercial environment.

This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

This AMC complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

C.5.2　Industry Canada (Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes:

1. Ce dispositif peut ne pas causer l'interférence nocive.

2. Ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

Datasheet Reference

This appendix provides links to datasheets, standards, and specifications for the technology designed into the AMC.

IEEE 802.3-2002 CDMA/CD (Ethernet) and Other IEEE 802.3/802.1 Documents

This document defines Ethernet and several of the protocols used in Ethernet. Any 802 document can be obtained for free six months after it has been published, or, for a fee, a document can be obtained right after it is published.

http://standards.ieee.org/getieee802/

PICMG 3.0 AdvancedTCA

AdvancedTCA specifications can be purchased from the PCI Industrial Computer Manufacturers Group (PICMG) for a nominal fee. A short form AdvancedTCA specification is also available on PICMG's Website.

http://www.picmg.org.

PICMG AMC.0 Advanced Mezzanine Card Specification

This PICMG specification describes the AMC form factor and module and carrier requirements.

PICMG AMC.1 PCI Express and Advanced Switching

This subsidiary specification covers the implementation of PCI Express links between AMC modules and carriers.

Broadcom Datasheets

A non-disclosure agreement (NDA) with Broadcom is required to view their datasheets. Contact Broadcom for more information.

http://www.broadcom.com/

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