



# Sun Netra™ CP3240 Advanced Mezzanine Card LED User's Guide

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for the AMC.0-LED

Sun Microsystems, Inc.  
[www.sun.com](http://www.sun.com)

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# Contents

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## **Preface xi**

Before You Read This Document xi

How This Document Is Organized xii

Typographic Conventions xiii

Related Documentation xiv

Third-Party Web Sites xv

Sun Welcomes Your Comments xv

## **1. Getting Started 1-1**

1.1 System Requirements 1-2

1.1.1 Connectivity 1-2

1.1.2 Electrical and Environmental 1-2

1.1.3 Disposal 1-2

1.1.4 Connectors 1-3

1.1.5 Jumper Options 1-3

1.2 Unpacking 1-3

1.3 Handling AMC.0-LEDs 1-4

1.4 AMC.0-LED Faceplate 1-5

1.5 LEDs 1-6

1.6 Removing and Installing AMC.0-LEDs 1-8

1.6.1	Removing an AMC.0-LED	1-8
1.6.2	Removing a Switch and AMC.0-LED	1-11
1.6.3	Installing an AMC.0-LED	1-13
<b>2.</b>	<b>Overview</b>	<b>2-1</b>
2.1	Features	2-2
2.2	Key Components	2-2
2.2.1	Lattice MachXO	2-2
2.2.2	Port LEDs	2-2
2.2.3	Push Button for Base or Fabric LEDs	2-3
2.2.4	Pigeon Point BMR-AVR-AMCm AdvancedMC IPMI Subsystem	2-3
2.3	AMC.0-LED Functional Block	2-4
2.4	AMC.0-LED Port Map	2-5
2.5	Technical Support and Warranty	2-5
<b>3.</b>	<b>Configuring Jumper Settings</b>	<b>3-1</b>
3.1	Jumper Locations and Settings	3-2
<b>4.</b>	<b>Managing the AMC.0-LED</b>	<b>4-1</b>
4.1	IPMI Firmware	4-2
4.2	IPMI Sensors	4-2
<b>A.</b>	<b>Environment Specifications</b>	<b>A-1</b>
A.1	Electrical and Environmental	A-2
A.1.1	Absolute Maximum Ratings	A-2
A.1.2	Normal Operating Ranges	A-2
A.2	Reliability	A-3
A.3	Mechanical	A-3
<b>B.</b>	<b>Connectors</b>	<b>B-1</b>

- B.1 Connector Locations and Assignments B-2
- B.2 Connector Pinouts B-3
  - B.2.1 Goldfingers (GF1) Connectors B-3
- B.3 OEM Connector (J1) B-6
  
- C. Agency Certifications C-1**
  - C.1 CE Certification C-2
  - C.2 NEBS/ETSI C-2
  - C.3 Safety C-2
  - C.4 Emissions Test Regulations C-3
    - C.4.1 EN 55022 Emissions C-3
    - C.4.2 EN 55024 Immunity C-4
  - C.5 Regulatory Information C-5
    - C.5.1 FCC (USA) C-5
    - C.5.2 Industry Canada (Canada) C-5



# Figures

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- FIGURE 1-1 AMC.0-LED Faceplate 1–5
- FIGURE 1-2 Deactivating the AMC.0-LED 1–9
- FIGURE 1-3 Removing the AMC.0-LED 1–10
- FIGURE 1-4 Front Cable Management Bracket in Lower Position 1–11
- FIGURE 1-5 Injector/Ejector on the Netra CP3240 switch (Open Position) 1–12
- FIGURE 1-6 Opening the Injector/Ejector Latches 1–14
- FIGURE 1-7 Inserting the AMC 1–16
- FIGURE 2-1 AMC.0-LED Functional Block Diagram 2–4
- FIGURE 3-1 AMC.0-LED Jumper Locations 3–2
- FIGURE A-1 AMC.0-LED PCB Dimensions A–4
- FIGURE B-1 AMC.0-LED Connector Locations B–2



# Tables

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<a href="#">TABLE 1-1</a>	ATCA Board Status LEDs	1–6
<a href="#">TABLE 1-2</a>	Hot-Swap LED States	1–7
<a href="#">TABLE 2-1</a>	AMC.0-LED Port Map	2–5
<a href="#">TABLE 3-1</a>	AMC.0-LED Configuration Jumper Settings	3–2
<a href="#">TABLE 4-1</a>	State Sensor	4–2
<a href="#">TABLE 4-2</a>	Threshold Sensors	4–2
<a href="#">TABLE A-1</a>	Absolute Maximum Electrical and Temperature Ratings	A–2
<a href="#">TABLE A-2</a>	Normal Operating Electrical and Temperature Ratings	A–2
<a href="#">TABLE A-3</a>	Board Dimensions and Weight	A–3
<a href="#">TABLE B-1</a>	AMC.0-LED Connector Assignments	B–2
<a href="#">TABLE B-2</a>	AMC.0-LED Goldfingers (GF1) Connectors	B–3



# Preface

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The *Sun Netra™ CP3240 Advanced Mezzanine Card LED User's Guide* describes the installation and configuration of the Sun Netra CP3240 AMC.0-LED (AMC.0-LED). This guide also includes information about software, environment specifications, connectors, and certifications.

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## 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)

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# How This Document Is Organized

[Chapter 1](#) provides unpacking instructions and initial setup information for the AMC.0-LED. It provides information and procedures needed to install and make the Sun Netra CP3240 AMC.0-LED operational.

[Chapter 2](#) introduces the key features of the AMC.0-LED. 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.0-LED against the needs of a specific application.

[Chapter 3](#) describes the jumper settings on the AMC.0-LED. This chapter details factory default settings and provides information about tailoring the AMC.0-LED to the needs of specific applications.

[Chapter 4](#) describes the management software running on the AMC.0-LED. This section serves as a primer for using the software to manage the AMC.0-LED.

[Appendix A](#) contains the electrical, environmental, and mechanical specifications for the AMC.0-LED.

[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.0-LED.

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# Typographic Conventions

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

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**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.

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## Related Documentation

The following table lists the documentation for the AMC.0-LED and its corresponding switch. The online documentation is available at:

<http://docs.sun.com/app/docs/prod/cp3240.led#hic>

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

Application	Title	Part Number	Format	Location
Latest information	<i>Sun Netra CP3240 Advanced Mezzanine Card Product Notes</i>	820-7575-xx	PDF	Online
Latest information	<i>Sun Netra CP3x40 Switch Product Notes</i>	820-3260-xx	PDF	Online
Pointer doc	<i>Sun Netra CP3240 Advanced Mezzanine Card LED Getting Started Guide</i>	820-7260-xx	Printed	Shipping Kit
Installation (this document)	<i>Sun Netra CP3240 Advanced Mezzanine Card LED User's Guide</i>	820-7263-xx	PDF	Online
Usage	<i>Sun Netra CP3240 Switch User's Guide</i>	820-3252-xx	PDF	Online
Reference	<i>Sun Netra CP3240 Switch Software Reference Manual</i>	820-3253-xx	PDF	Online
Safety	<i>Sun Netra CP3x40 Switch Safety and Compliance Manual</i>	820-3505-xx	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	<i>Netra CT 900 Server Product Notes</i>	819-1180-xx	PDF	Online
Pointer doc	<i>Netra CT 900 Server Getting Started Guide</i>	819-1173-xx	Printed	Shipping kit
Overview	<i>Netra CT 900 Server Overview</i>	819-1174-xx	PDF	Online
Installation	<i>Netra CT 900 Server Installation Guide</i>	819-1175-xx	PDF	Online
Service	<i>Netra CT 900 Server Service Manual</i>	819-1176-xx	PDF	Online
Administration	<i>Netra CT 900 Server Administration and Reference Manual</i>	819-1177-xx	PDF	Online

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

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

*Sun Netra CP3240 Advanced Mezzanine Card LED User's Guide*, part number 820-7263-10.



# Getting Started

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This chapter provides information and procedures to install and make the Sun Netra CP3240 AMC.0-LED operational. Read this chapter before using the AMC.0-LED.

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 AMC.0-LEDs” on page 1-4](#)
- [Section 1.4, “AMC.0-LED Faceplate” on page 1-5](#)
- [Section 1.5, “LEDs” on page 1-6](#)
- [Section 1.6, “Removing and Installing AMC.0-LEDs” on page 1-8](#)

---

## 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 Sun Netra CP3240 AMC.0-LED is designed to be used with the Netra CP3240 switch. It can be used in any available AMC site on the Netra CP3240 switch.

---

**Note** – The Sun Netra CP3240 AMC.0-LED will not work in any other product.

---

### 1.1.2 Electrical and Environmental

The AMC.0-LED has a 10W power requirement and does not require any air flow for cooling. See [Appendix A](#) for detailed electrical and environmental requirements.

### 1.1.3 Disposal

The AMC.0-LED 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.0-LED includes goldfinger connectors to interface with the host board. Refer to the [Appendix B](#) for complete connector descriptions and pinouts.

## 1.1.5 Jumper Options

The AMC.0-LED provides several jumper configuration options for features. By default all jumpers are off. Jumper locations 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 Advanced Mezzanine Card 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 AMC.0-LEDs



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**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.

---



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**Caution** – Do not flex the AMC.0-LEDs; the surface-mounted components can break if the AMC.0-LED is bent.

---

To minimize the amount of AMC.0-LED flexing, observe the following precautions:

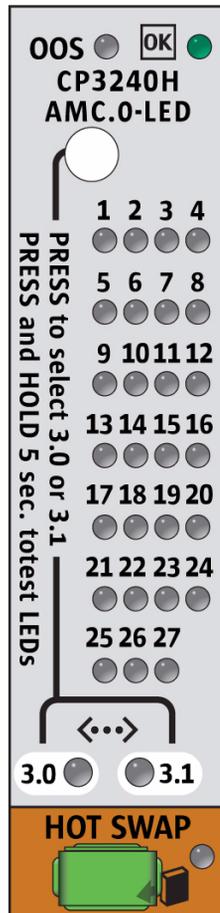
- When removing a AMC.0-LED from an electrostatic discharge bag, keep it vertical until you place the AMC.0-LED on the electrostatic discharge mat.
- Do not place a AMC.0-LED on a hard surface. Use a cushioned antistatic mat. The AMC.0-LED connectors and components have very thin pins that bend easily.
- Be careful of small parts located on the component side of a AMC.0-LED.
- Do not use an oscilloscope probe on the components. The soldered pins are easily damaged or shorted by the probe point.
- Transport a AMC.0-LED in an antistatic bag.

---

## 1.4 AMC.0-LED Faceplate

The following shows the faceplate of the Sun Netra CP3240 AMC.0-LED. This AMC.0-LED must be paired with a Netra CP3240 switch.

FIGURE 1-1 AMC.0-LED Faceplate



## 1.5 LEDs

The tables in this section give status information for the LEDs on the AMC.0-LED. The following table 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.0-LED error, indicating that the board should be removed.
OK	Green	On	This LED is lit when the AMC.0-LED is booted and switching.
A	Amber	Off	Minor Error/User Defined. This LED can be customized using software applications.

Note that the OOS LED will be lit when the board is powered yet 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.

The following table 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 AMC.0-LEDs

This section describes how to remove and install AMC.0-LEDs.

### 1.6.1 Removing an AMC.0-LED

If you want to remove only an AMC.0-LED from a Netra CP3240 switch, use the following instructions.

If you want to remove the switch with the AMC.0-LED installed, see [Section 1.6.2, “Removing a Switch and AMC.0-LED” on page 1-11](#).

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

If you fail to do this before pulling the AMC.0-LED's hotswap latch, the OS might panic.

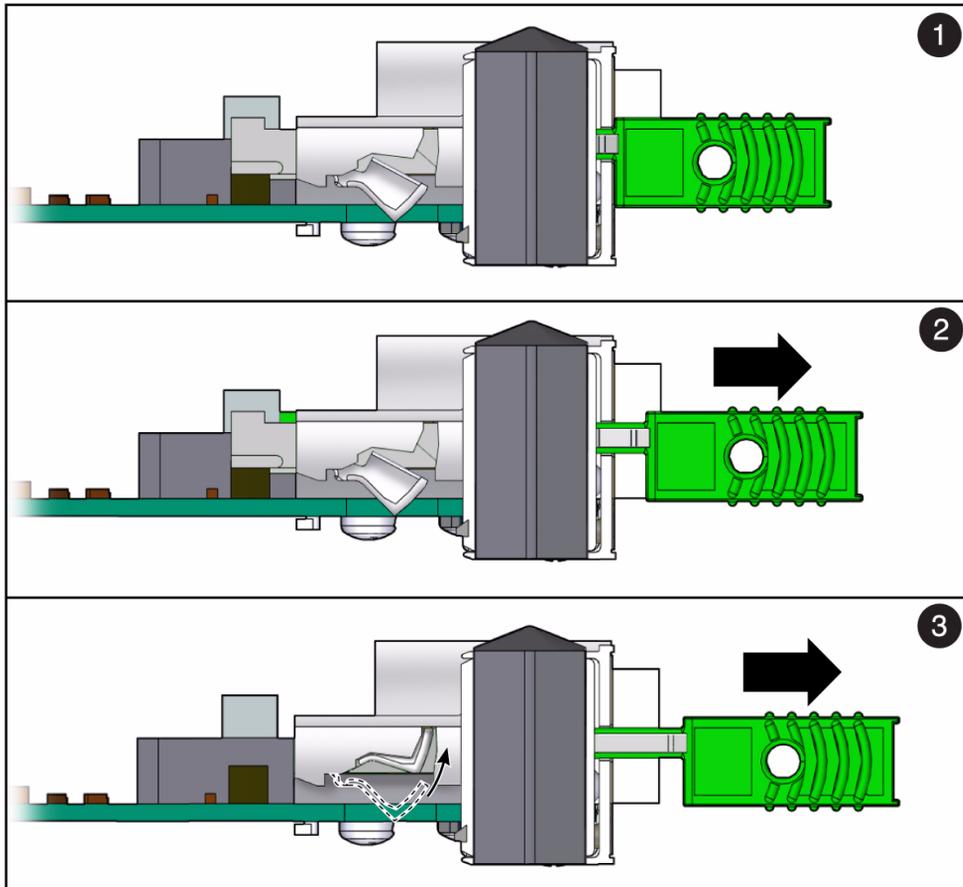
**2. At the front of the Netra CP3240 switch, locate the AMC.0-LED you want to remove.**

**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.0-LED

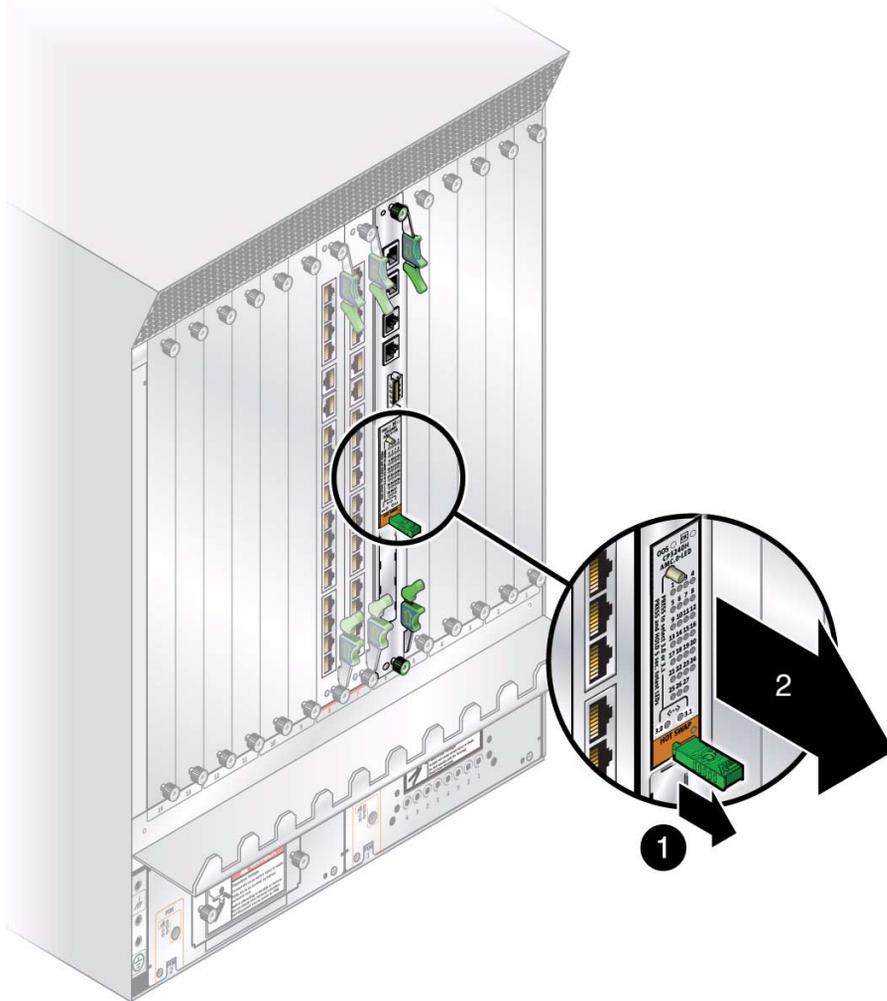


**Figure Legend**

- 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.0-LED as shown in the following figure.

FIGURE 1-3 Removing the AMC.0-LED



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**Caution** – Failure to fill all sites with AMC.0-LEDs or cover with filler panels can negatively impact the cooling of the system.

---

6. Replace the AMC.0-LED with another AMC.0-LED (FIGURE 1-7) or a filler panel.

---

**Note** – Be sure to follow handling instructions. See [Section 1.3, “Handling AMC.0-LEDs”](#) on page 1-4.

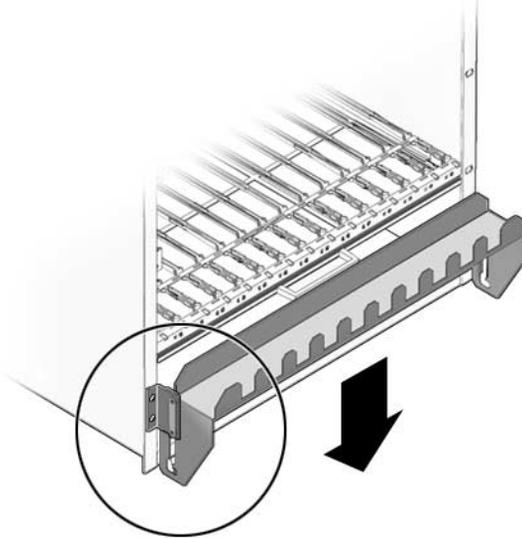
---

## 1.6.2 Removing a Switch and AMC.0-LED

Following are the instructions for removing both a Netra CP3240 switch and an installed AMC.0-LED. For instructions on removing switch and RTM sets, refer to the *Sun Netra CP3240 Switch Installation Guide* (820-3251).

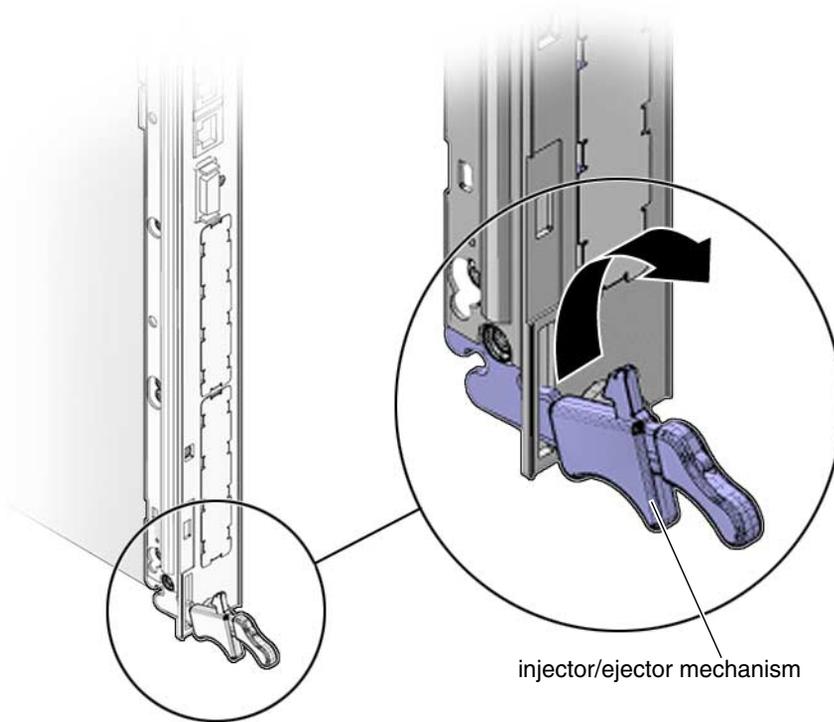
1. Move the front cable management bracket to the lower position ([FIGURE 1-4](#)).

**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.
3. Wait for the Hot-Swap LED to light.

**FIGURE 1-5** Injector/Ejector on the Netra CP3240 switch (Open Position)



4. Disconnect all cables connected to the switch.
5. Loosen the two board retention screws that fasten the board to the enclosure.
6. Open the ejectors fully, rotating the handles outward until the board disengages from the midplane.
7. Slide the board evenly out of the enclosure.



---

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

---

**8. Either replace the switch or install a filler panel:**

- 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 shielding and cooling performance of the enclosure.

---

**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.

---

## 1.6.3 Installing an AMC.0-LED

Following are the instructions for installing an AMC.0-LED. 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.0-LED.**
2. **Remove the filler panel, if necessary.**
3. **Obtain the AMC.0-LED card from the ship kit.**

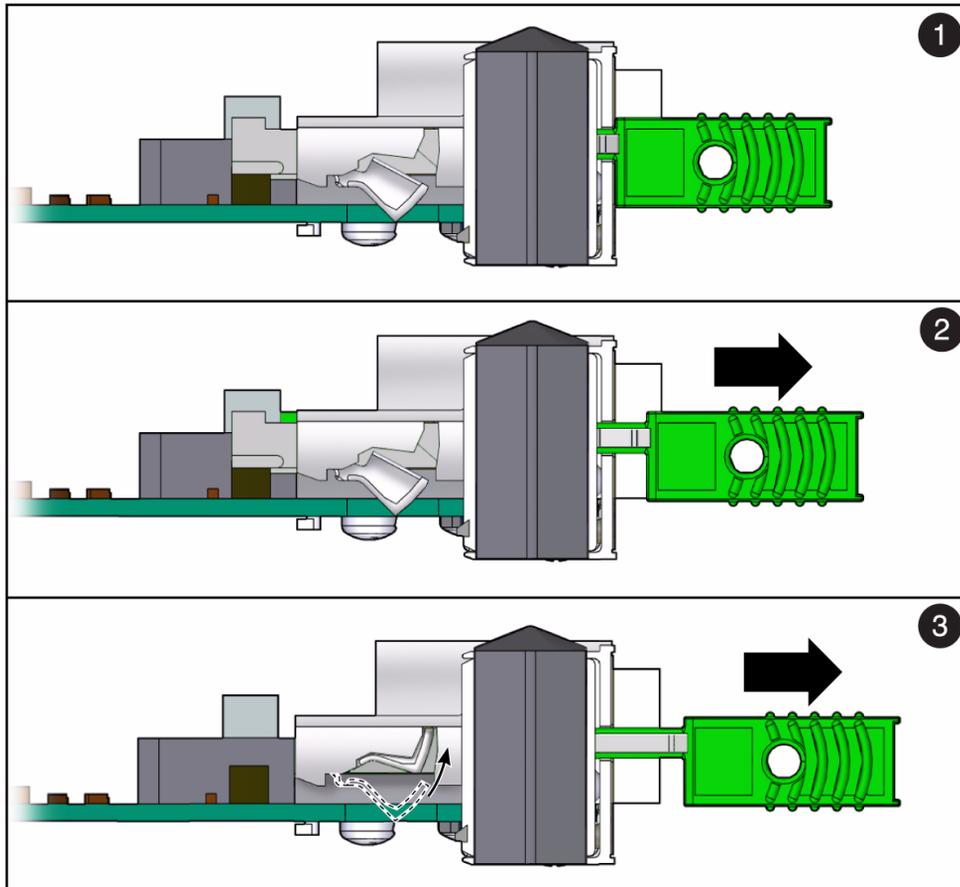
---

**Note** – Follow unpacking and handling instructions in [Section 1.2, “Unpacking”](#) on page 1-3 and [Section 1.3, “Handling AMC.0-LEDs”](#) on page 1-4.

---

4. **Perform any card-specific hardware procedures, if necessary.**
5. **Prepare the AMC.0-LED 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.



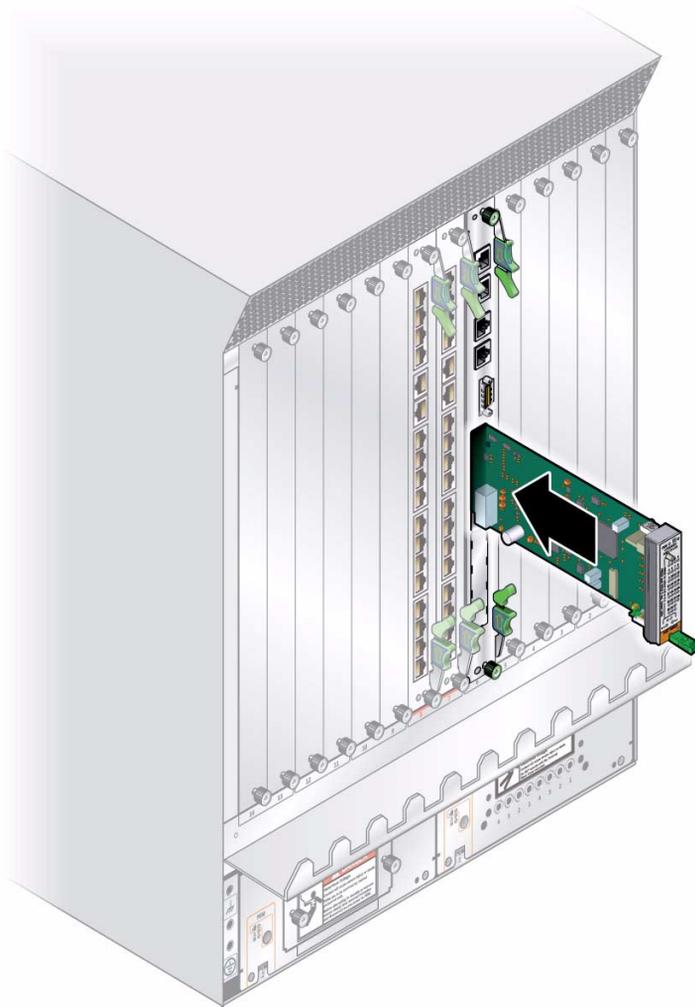
---

**Caution** – Do not force the AMC.0-LED into the site. If it does not fit properly, check to ensure that you have the correct matching AMC.0-LED for the switch.

---

7. Keeping the board aligned in the guides, slide the board in by pressing on the AMC.0-LED faceplate until the AMC.0-LED faceplate is flush with the Netra CP3240 switch faceplate.

**FIGURE 1-7** Inserting the AMC



**8. Push the ejector latch in fully.**

If the system power is on and the AMC.0-LED is installed properly, the AMC.0-LED 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 AMC.0-LEDs or cover with filler panels can negatively impact the cooling of the system.

---



# Overview

---

This chapter introduces the key features of the AMC.0-LED. This chapter includes a product definition, a list of product features, and functional block diagrams with brief descriptions.

This chapter contains the following topics:

- [Section 2.1, “Features” on page 2-2](#)
- [Section 2.2, “Key Components” on page 2-2](#)
- [Section 2.3, “AMC.0-LED Functional Block” on page 2-4](#)
- [Section 2.4, “AMC.0-LED Port Map” on page 2-5](#)
- [Section 2.5, “Technical Support and Warranty” on page 2-5](#)

---

## 2.1 Features

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

The AMC.0-LED is an AMC board designed to provide the port status of Netra CP3240 switch ports via LEDs.

The following briefly outlines the features of the AMC.0-LED:

- 27 numbered bicolor LEDs, each representing a port
- 2 LEDs representing the current set of ports displayed (Base or Fabric)
- A momentary push button to change between displaying Base and Fabric ports
- Hot-swap ability and IPMI management
- FPGA for configurable LED output
- Support for HPM.1 compliant firmware upgrades

---

## 2.2 Key Components

The following sections describe key components of the Sun Netra CP3240 AMC.0-LED.

### 2.2.1 Lattice MachXO

A Lattice MachXO is used to perform the serial-to-parallel conversion of the port status data.

### 2.2.2 Port LEDs

Each port has one LED. The LEDs are bicolor and represent the speed, activity, and link status of the ports. For descriptions of LED ports, see [Section 2.4, "AMC.0-LED Port Map" on page 2-5](#).

## 2.2.3 Push Button for Base or Fabric LEDs

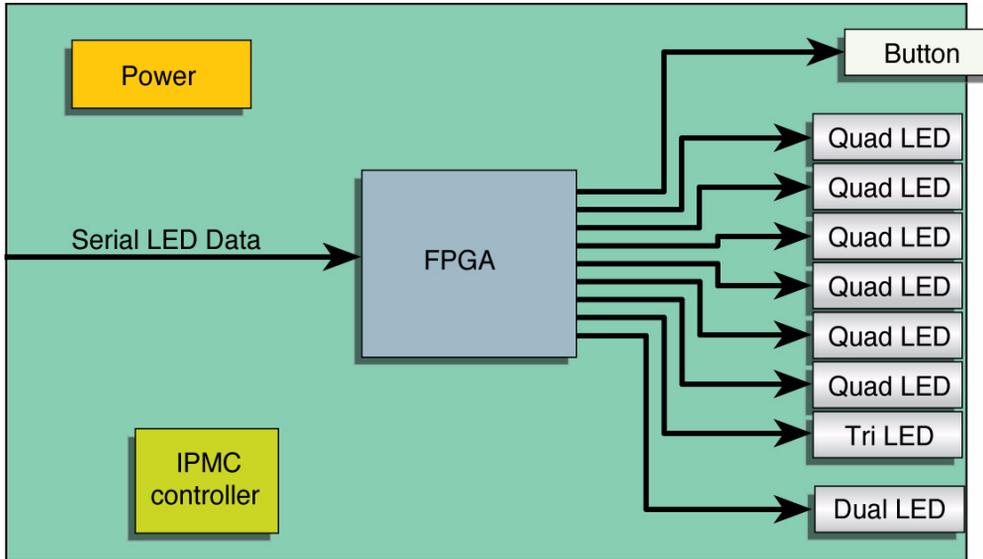
Only either the Base or Fabric port LEDs are shown at one time. The Base and Fabric LEDs indicate which set of ports is currently being displayed. The push button can be pressed to switch between the Base or Fabric set of ports.

## 2.2.4 Pigeon Point BMR-AVR-AMCm AdvancedMC IPMI Subsystem

The AMC.0-LED uses the near industry standard Pigeon Point Systems BMR-AVR-AMCm for dedicated IPMI management. It controls all interaction between the AMC.0-LED and the ATCA carrier or uTCA management controller. It fully supports the AMC.0 R2.0 specifications. The BMR-AVR-AMCm provides all required management for the AMC.0-LED modules in addition to the voltage monitoring, temperature monitoring, e-Keying, and other services it provides for the AMC.0-LED. Pigeon Point Systems is the leading provider of IPMI firmware for PICMG, and its firmware has been thoroughly tested to be fully compliant with the specification.

## 2.3 AMC.0-LED Functional Block

FIGURE 2-1 AMC.0-LED Functional Block Diagram



---

## 2.4 AMC.0-LED Port Map

The following table provides port mapping for the AMC.0-LED.

**TABLE 2-1** AMC.0-LED Port Map

Port	Connected	Port	Connected
0	FPGA	13	FPGA
1	Not Connected	14	Not Connected
2	Not Connected	15	Not Connected
3	Not Connected	17	Not Connected
4	Not Connected	18	Not Connected
5	Not Connected	19	Not Connected
6	Not Connected	20	FPGA
7	Not Connected	TCLK1	Not Connected
8	Not Connected	TCLK2	Not Connected
9	Not Connected	TCLK3	Not Connected
10	Not Connected	TCLK4	Not Connected
11	Not Connected	FCLK	Not Connected
12	FPGA		

---

## 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.0-LED 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.0-LED 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

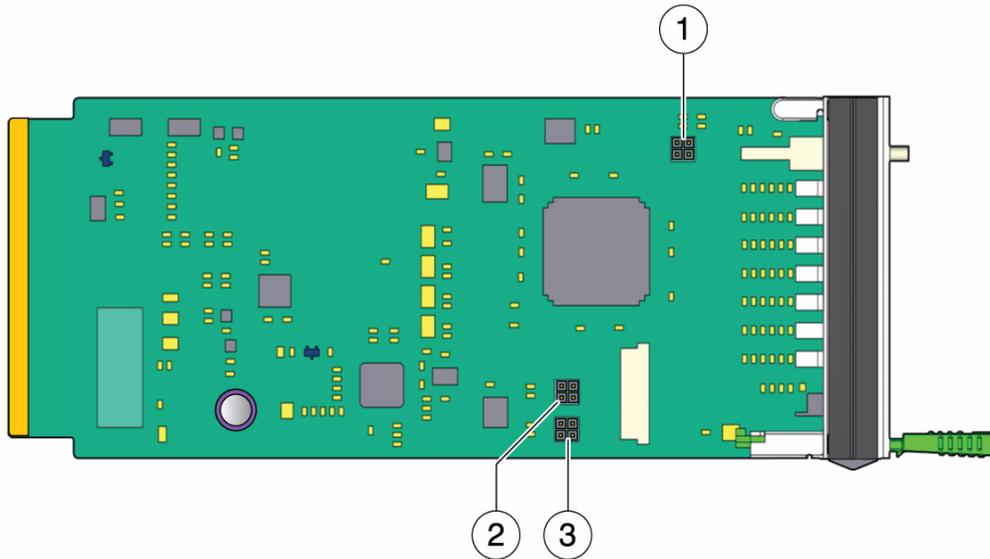
---

This chapter describes jumper settings for configuring the AMC.0-LED. Other configuration options are software controlled. Software configuration options are described in [Chapter 4](#).

## 3.1 Jumper Locations and Settings

The following figure shows the locations of the jumpers. The following table defines the settings.

**FIGURE 3-1** AMC.0-LED Jumper Locations



**TABLE 3-1** AMC.0-LED Configuration Jumper Settings

	<b>Jumper</b>	<b>Default</b>	<b>Purpose</b>
<b>1</b>	P1	Off	Connects bracket ground to digital ground, when set to On
<b>2</b>	P2	Reserved	Reserved
<b>3</b>	P3	Reserved	Reserved

# Managing the AMC.0-LED

---

This chapter describes the AMC.0-LED management software. The Sun Netra CP3240 AMC.0-LED includes full IPMI support.

This chapter contains the following topics:

- [Section 4.1, “IPMI Firmware” on page 4-2](#)
- [Section 4.2, “IPMI Sensors” on page 4-2](#)

---

## 4.1 IPMI Firmware

The IPMI firmware is a customized version of Pigeon Point Systems' BMR-AVR-AMCm software. It provides all the standard AMC.0 R2.0 management features.

For instructions on upgrading the firmware, refer to *Sun Netra CP3240 AMC Product Notes* (820-7575).

---

## 4.2 IPMI Sensors

The following sensors are accessible through the IPMI.

**TABLE 4-1** State Sensor

Sensor	Name	Type	Description	Discrete States Returned
0	FRU 0 HOT_SWAP	State	Hot swap discrete state	M state, per ATCA and AMC specification

**TABLE 4-2** Threshold Sensors

Sensor	Name	Type	Description	Units	Lower Thresholds			Upper Thresholds		
					Minor	Major	Critical	Minor	Major	Critical
0	Hot-swap	Hot-swap	Hot-swap	M states	N/A	N/A	N/A	N/A	N/A	N/A
1	+3.3V STBY	Thresh	IPMI Mgmt Power	Volts	3.1652	3.034	2.9192	3.46	3.608	3.805
2	+12V	Thresh	Main power input	Volts	11.44	11.0	10.01	12.705	13.145	13.75

**TABLE 4-2** Threshold Sensors

Sensor	Name	Type	Description	Units	Lower Thresholds			Upper Thresholds		
					Minor	Major	Critical	Minor	Major	Critical
3	+3.3V	Thresh	Onboard Voltage Reg.	Volts	3.1652	3.034	2.9192	3.4604	3.608	3.805
4	DS75 Temp (1)	Thresh	Ambient temp. sensor	oC	N/A	N/A	N/A	60	70	80
5	DS75 Temp (2)	Thresh	Ambient temp. sensor	oC	N/A	N/A	N/A	60	70	80



# Environment Specifications

---

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

This appendix contains the following topics:

- [Section A.1, “Electrical and Environmental” on page A-2](#)
- [Section A.2, “Reliability” on page A-3](#)
- [Section A.3, “Mechanical” on page A-3](#)

---

# 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

Description	Range
Supply voltage, 12V	0 VDC to +13.2 VDC
Management voltage, +3.3V	0 VDC to +5.5 VDC
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 +13.2 VDC payload power +2.97 to + 3.63 VDC 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
Maximum power consumption	1.5W

\*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: 1,698,171 hours
- 2-year limited warranty

---

## A.3 Mechanical

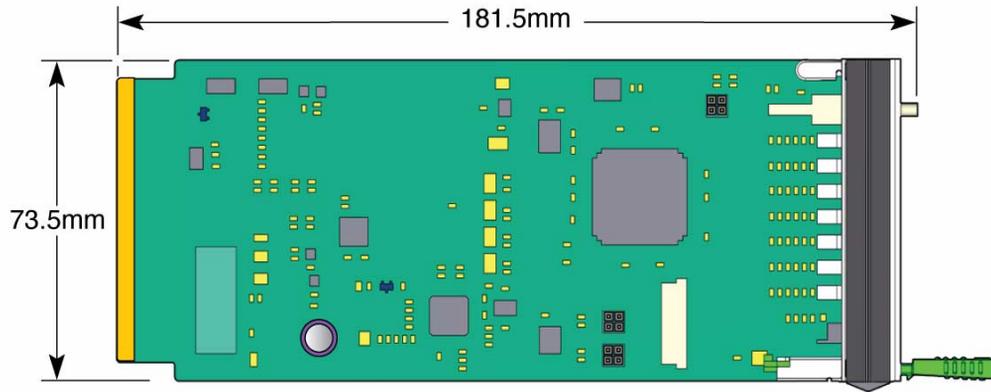
This section includes the mechanical specifications for dimensions and weight. The AMC.0-LED meets the PICMG 3.0 AdvancedTCA Specification R2.0 ECN002 and AMC.0 R2.0 for all mechanical parameters.

The AMC.0-LED 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	0.0567kg (0.125lbs)

**FIGURE A-1** AMC.0-LED PCB Dimensions



# 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 pinout for each connector is given.

This appendix contains the following topics:

- [Section B.1, “Connector Locations and Assignments” on page B-2](#)
- [Section B.2, “Connector Pinouts” on page B-3](#)
- [Section B.3, “OEM Connector \(J1\)” on page B-6](#)

# B.1 Connector Locations and Assignments

FIGURE B-1 AMC.0-LED Connector Locations

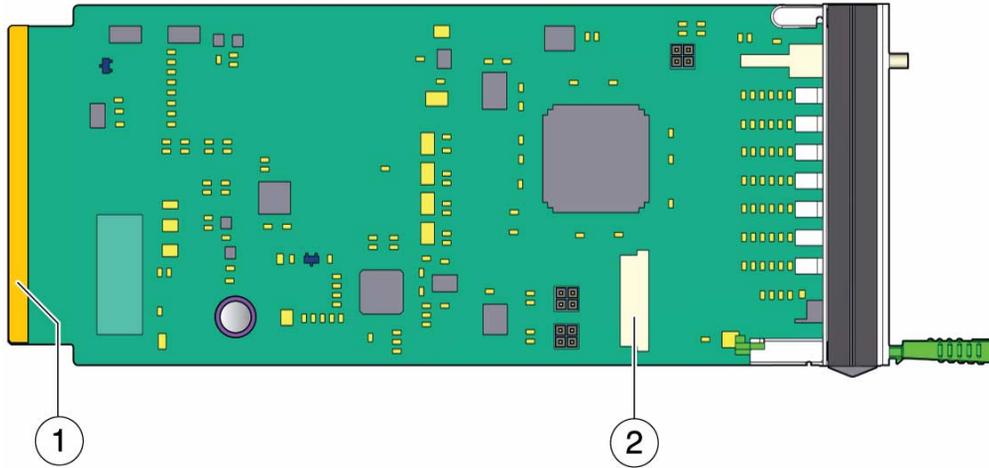


TABLE B-1 AMC.0-LED Connector Assignments

	Connector	Function
1	GF1	AMC.0-LED Connector/Goldfingers
2	J1	OEM Connector

---

## B.2 Connector Pinouts

This section lists the pinouts of the connectors on the AMC.0-LED.

### B.2.1 Goldfingers (GF1) Connectors

The AMC.0-LED interfaces with the carrier board through the AMC connector. Connector usage for the AMC.0-LED is in the following table.

**TABLE B-2** AMC.0-LED Goldfingers (GF1) Connectors

	<b>Top Side</b>		<b>Bottom Side</b>
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	B_LED_CLK_AMC20
9	+12V	162	B_LED_DATA_AMC20
10	GND	161	GND
11	SERDES_TX+	160	F_LED_CLK_AMC20
12	SERDES_TX-	159	F_LED_DATA_AMC20
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

**TABLE B-2** AMC.0-LED Goldfingers (GF1) Connectors (*Continued*)

<b>Top Side</b>		<b>Bottom Side</b>	
22	GND	149	GND
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	B_LED_CLK_AMC13
51	NC	120	B_LED_DATA_AMC13

**TABLE B-2** AMC.0-LED Goldfingers (GF1) Connectors *(Continued)*

<b>Top Side</b>		<b>Bottom Side</b>	
52	GND	119	GND
53	NC	118	F_LED_CLK_AMC13
54	NC	117	F_LED_DATA_AMC13
55	GND	116	GND
56	IPMB SCL	115	B_LED_CLK_AMC12
57	+12V	114	B_LED_DATA_AMC12
58	GND	113	GND
59	NC	112	F_LED_CLK_AMC12
60	NC	111	F_LED_DATA_AMC12
61	GND	110	GND
62	NC	109	NC
63	NC	108	NC
64	GND	107	GND
65	NC	106	NC
66	NC	105	NC
67	GND	104	GND
68	NC	103	NC
69	NC	102	NC
70	GND	101	GND
71	IPMB SDA	100	NC
72	+12V	99	NC
73	GND	98	GND
74	NC	97	NC
75	NC	96	NC
76	GND	95	GND
77	NC	94	NC
78	NC	93	NC
79	GND	92	GND
80	NC	91	NC
81	NC	90	NC

**TABLE B-2** AMC.0-LED Goldfingers (GF1) Connectors *(Continued)*

<b>Top Side</b>		<b>Bottom Side</b>	
82	GND	89	GND
83	PS0#	88	NC
84	+12V	87	NC
85	GND	86	GND

---

## B.3 OEM Connector (J1)

This connection 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.0-LED.

This appendix contains the following topics:

- [Section C.1, “CE Certification” on page C-2](#)
- [Section C.2, “NEBS/ETSI” on page C-2](#)
- [Section C.3, “Safety” on page C-2](#)
- [Section C.4, “Emissions Test Regulations” on page C-3](#)
- [Section C.5, “Regulatory Information” on page C-5](#)

---

## C.1 CE Certification

The Sun Netra CP3240 AMC.0-LED 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.0-LED 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, 1<sup>ST</sup> 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 3<sup>rd</sup> 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 Section 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



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**Caution** – If you make any modification to the AMC.0-LED not expressly approved by Sun, you could void your warranty and/or regulatory authority to operate the component.

---

The AMC.0-LED was tested with Finisar FCLF-8521-3 copper SFP transceivers. As with all unshielded copper cabling, use of a large number of these in close proximity may have an additive effect on the overall level of the system emissions. Use of more than six might be problematic. Certification is dependent on testing of the final configuration. Use of optical SFP and XFP transceivers is unlimited.

### 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.0-LED 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.

# Index

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## A

A (amber) LED, 1-6  
absolute maximum ratings, A-2  
alignment, 1-15  
amber LED, 1-6  
AMC-LED flexing, preventing, 1-4  
antistatic bag, 1-3

## B

Base or Fabric port LEDs, 2-3  
BMR-AVR-AMCm AdvancedMC IPMI  
subsystem, 2-3

## C

cable management bracket, lowering, 1-11  
Canadian Interference Causing Equipment  
Regulations, C-5  
certifications, C-1  
comments, about this book, xv  
components, key, 2-2  
connectivity, 1-2  
connector/goldfingers, B-2  
connectors, B-1, B-3

## D

deactivation, 1-8  
dimensions and weight, A-3  
disposal, 1-2  
documentation URL, xiv  
documentation, related, xiv

## E

e-Keying, 2-3  
electrical and environmental specifications, A-2  
electromagnetic compatibility, C-2  
Electronic Industries Alliance, 1-2  
emissions, C-3  
energy hazards, 1-1

## F

faceplate, 1-5  
FCC, C-5  
features, 2-2  
filler panels, 1-10  
functional block, 2-4

## G

GF1, B-2, B-3  
goldfinger connectors, 1-3  
green LED, 1-6

## H

handling cards, cautions, 1-4  
Hot-Swap LED, 1-7

## I

injector/ejector latches, 1-11, 1-14  
installing an AMC-LED, 1-13  
IPMI firmware, 4-2  
IPMI sensors, 4-2

## **J**

J1, B-6  
jumpers, 3-2

## **K**

key components, 2-2

## **L**

Lattice MachXO, 2-2  
LED, hot-swap, 1-7  
LEDs, 1-6  
LEDs, port, 2-3  
LEDs, switches, 1-6

## **M**

management voltage, A-2  
maximum power consumption, A-2  
mechanical specifications, A-3

## **N**

NEBS/ETSI, C-2  
nominal operating voltage, A-2  
noncondensing relative humidity, A-2  
normal operating ranges, A-2

## **O**

OEM connector, B-2, B-6  
OK LED, 1-6  
OOS LED, 1-6  
operating humidity, A-2  
operating temperatures, A-2

## **P**

physical shock, 1-3  
port LEDs, 2-2  
port mapping, 2-5

## **R**

red LED, 1-6  
regulatory, C-5  
reliability, A-3  
removing an AMC-LED, 1-8  
removing both a Netra CP3240 switch and an installed AMC-LED, 1-11

## **S**

safety certifications, C-2  
screws, retention, 1-12  
sensors, 4-2  
standards agencies, C-1  
static electricity, 1-1  
storage temperature, A-2  
Sun Services, 2-5  
supply voltage, A-2  
support, 2-5  
switches, LEDs, 1-6  
switching between the Base or Fabric set of ports, 2-3  
system requirements, 1-2

## **T**

temperature monitoring, 2-3

## **U**

unpacking, 1-3  
upgrading the firmware and software, 4-2

## **V**

voltage monitoring, 2-3

## **W**

warranty, 2-5