Hardware Installation Manual

AudioCodes Media Gateways & Session Border Controllers

Mediant 3000

Enterprise Session Border Controller (E-SBC) & Media Gateway

audiocodes

Table of Contents

Notice

Information contained in this document is believed to be accurate and reliable at the time of printing. However, due to ongoing product improvements and revisions, AudioCodes cannot guarantee accuracy of printed material after the Date Published nor can it accept responsibility for errors or omissions. Updates to this document can be downloaded from https://www.audiocodes.com/library/technical-documents.

This document is subject to change without notice.

Date Published: December-06-2018

WEEE EU Directive

Pursuant to the WEEE EU Directive, electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

Customer Support

Customer technical support and services are provided by AudioCodes or by an authorized AudioCodes Service Partner. For more information on how to buy technical support for AudioCodes products and for contact information, please visit our website at https://www.audiocodes.com/services-support/maintenance-and-support.

Abbreviations and Terminology

Each abbreviation is spelled out in full when first used. Throughout this manual, unless otherwise specified, the following terms are used:

Term	Meaning
Device	Mediant 3000
Blade	TP-6310 and TP-8410 blades

Related Documentation

Manual Name
SIP Release Notes
Mediant 3000 SIP User's Manual

Notes and Warnings

Caution Electrical Shock

The equipment must be installed or serviced only by qualified service personnel.

Note: The device is an **INDOOR** unit and therefore, must be installed **only** indoors.

Document Revision Record

LTRT	Description
94715	Initial document release (Ver. 7.0).
94716	M3K-ICPU-1 Integrated CPU Blade removed.
94717	Specifications for operating temperature and fiber optic added.
94718	Physical Network Separation update (PhysicalSeparationConfiguration).
94720	Fan Tray module warning statements.
94721	Cabling E1/T1 (orderable cables per span configuration) updated.
94722	AC power cable warning (Japanese).
94723	Updated document with new logos and URLs.
94724	HA and Ethernet loss; redundancy between TP and SA blades.

Documentation Feedback

AudioCodes continually strives to produce high quality documentation. If you have any comments (suggestions or errors) regarding this document, please fill out the Documentation Feedback form on our website at https://online.audiocodes.com/documentation-feedback.

1 Introduction

This document provides a hardware description of the Mediant 3000 (hereafter referred to as *device*) as well as step-by-step instructions on how to cable it.

The telephony interface support on the Mediant 3000 depends on the installed blade:

- Configurations hosting TP-6310 blade:
  - Mediant 3000 hosting a single TP-6310 blade, providing 1+1 SONET/SDH or 3 x T3 PSTN interfaces.
  - Mediant 3000 hosting two TP-6310 blades for 1+1 High Availability (HA), providing 1+1 SONET / SDH or 3 x T3 PSTN interfaces.
  - Depopulated TP-6310 with single DS3 configuration including eight DSPs. This is offered on the following models:
    - M3K1/DC (AC)
    - M3K3/DC (AC)
    - M3K40/ESBC/AC (DC)
    - M3K42/ESBC/AC (DC)
- Configurations hosting TP-8410 blade:
  - Mediant 3000 hosting a single TP-8410 blade, providing 16 E1 / 21 T1 PSTN interfaces.
  - Mediant 3000 hosting a single TP-8410 blade, providing up to 63 E1 / 84 T1 PSTN interfaces.
  - Mediant 3000 hosting two TP-8410 blades for 1+1 HA, providing up to 16 E1 / 21 T1 PSTN interfaces.
  - Mediant 3000 hosting two TP-8410 blades for 1+1 HA, providing up to 63 E1 / 84 T1 PSTN interfaces.

Notes:

- The Mediant 3000 can be deployed either as a standalone IP-to-IP media gateway, a standalone PSTN-IP media gateway, or a combined PSTN-IP/IP-to-IP media gateway. This support depends on the Software Upgrade Key installed on the device.
- For configuring the device, refer to the *User's Manual*.

This page is intentionally left blank.

2 Unpacking the Device

Follow the procedure below for unpacking the received carton in which the device is shipped.

➢ **To unpack the device:**

1. Open the carton and remove the packing materials.
2. Remove the device from the carton.
3. Ensure that the package contains the following items:
   - One or two DC power cables.
   - RS-232 adapter cable (two meters in length).
   - Regulatory Information list.
4. Check that there is no equipment damage.
5. Check, retain and process any documents.

If any items are missing or damaged, please notify your AudioCodes sales representative.

This page is intentionally left blank.

3 Physical Description

This section provides a physical description of the device.

3.1 Hardware Components

The device includes the following components:

- A 19-inch, 2U high rack-mount chassis (see Section 3.2 on page 13).
- TP-6310 blades: regarded as a complete gateway/media server module, supporting all necessary functions for voice, data, and fax streaming over IP networks (see Section 3.3 on page 21). The blade is supplied with a rear input/output (I/O) module referred to as the *Rear Transition Module* (RTM). RTM-6310 provides the port connections to the supported interfaces:
  - Two Gigabit Ethernet
  - PSTN Interfaces:
    - Up to three T3 interfaces, offering scalability by allowing you to start with a single T3 interface and to later add another one or two T3 interfaces as capacity requirements grow
    - 1+1 STM-1/OC-3
- TP-8410 blades: regarded as a complete gateway module, supporting all necessary functions for voice, data, and fax streaming over IP networks (see Section 3.4 on page 26). The RTM-8410 provides the port connections to the supported interfaces:
  - Two Gigabit Ethernet
  - Up to 63 E1 / 84 T1
- Alarm, Status and Synchronization blade (SA/M3K): provides clock synchronization (see Section 3.5 on page 31)
- Cooling system (see Section 3.6 on page 33):
  - Fan Tray module (FM/M3K)
  - Air Filter (AF/3K) located within the Fan Tray module
- System alarm LEDs and ACO button (see Section 3.7 on page 35)
- Power system, available in one of the following power types:
  - Alternating Current (see Section 3.8.1 on page 39):
    - Two AC Power Supply modules (PS/AC/3K) for load sharing
    - Two AC Power Entry modules (PEM/AC/3K)
  - Direct Current (see Section 3.8.2 on page 40):
    - Two DC Power Supply modules (PS/DC/3K) for load sharing
    - Two DC Power Entry modules (PEM/DC/3K)

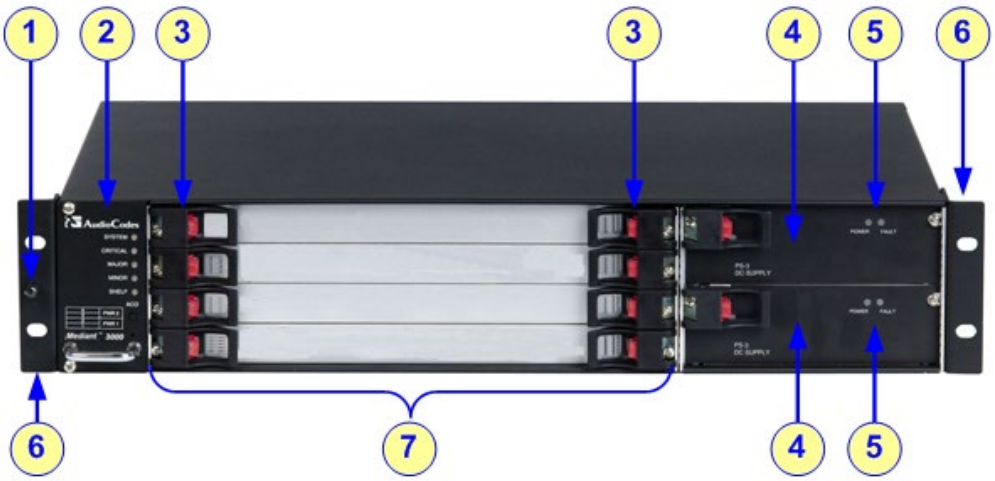
Notes:

- The device operates in either Simplex mode or High Availability (HA) mode. The difference is that HA provides 1+1 redundancy for the voice functionality.
- The blades and modules are supplied pre-installed in the device's chassis. For replacing these components, see Section 6 on page 73.
- For blade chassis slot assignment, see Section 3.2.2 on page 14.

3.1.1 Front Panel Description

The main components of the device's front panel (without blade interfaces) are shown below:

Figure 3-1: Chassis Front Panel



Notes:

- For clarity, the figure above displays the device without communication blades.
- Depending on the ordered configuration (e.g., AC or DC power system), your device may differ from the figure above.

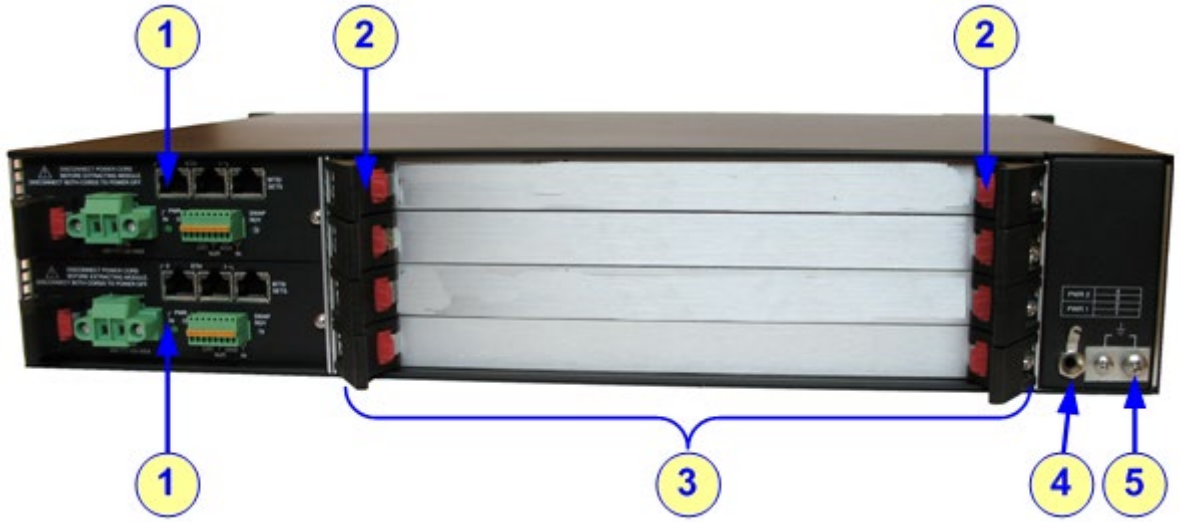
Table 3-1: Front-Panel Description

Item #	Component Description
1	Electrostatic discharge (ESD) terminal.
2	Fan Tray module (housing the Air Filter), providing system alarm LEDs, **ACO** button, and component location diagram indicating numbering of blade slots and Power Supply units.
3	Latches and screws for securing blades to chassis.
4	Power Supply units.
5	Power Supply LEDs.
6	Integral mounting brackets for mounting the chassis in a standard 19-inch Telco rack.
7	Blade slots (currently covered with blank panels) for housing the blades.

3.1.2 Rear Panel Description

The main components of the device's rear panel (without RTMs) are shown below:

Figure 3-2: Chassis Rear Panel



Notes:

- For clarity, the figure above displays the device without communication blades.
- Depending on the ordered configuration (e.g., AC or DC power system), your device may differ from the figure above.

Table 3-2: Rear-Panel Description

Item #	Component Description
1	Two Power Entry Modules (PEM).
2	Latches and screws to secure blades and modules to chassis.
3	Slots (currently covered with blank panels) for housing the RTMs.
4	ESD terminal lug.
5	Earthing terminal (one-hole G-32 lug and 6-8 AWG wire).

3.2 Chassis

The device's modular chassis design allows easy installment and replacement of blades, RTMs, and modules. The chassis provides four front- and rear-panel blade slots and includes an ID Prom component that clearly defines the hardware version. The chassis also includes a DIP switch for configuring the shelf geographical addressing.

3.2.1 Dimensions and Operating Environment

The device's chassis is a compact, rugged 19-inch rack mount unit, 2U high, designed to meet NEBS Level 3 requirements.

Table 3-3: Dimensions and Operating Environment Specifications

Specification	Value
Dimensions	
Width	48.3 cm (19 inches)
Height	2U or 8.9 cm (3.5 inches)
Depth	29.68 cm (11.69 inches)
Weight (fully loaded)	13 kg (29 lb)
Weight (fully loaded in packaging)	16 kg (35.5 lb) approx.
Operating Environment	
Operating Temperature	0 to 40°C (32 to 104°F)
Storage	-40 to 70°C (-40 to 158°F)
Relative Humidity	10 to 90% non-condensing

3.2.2 Blade Cage and Slot Assignment

The device features a four-slot chassis:

- Four front-panel slots for housing the blades
- Four rear-panel slots for housing the RTMs

The blades in the front-panel slots interface through a midplane (located in the middle of the chassis) with the RTMs in the rear-panel slots. The midplane contains slot keys which match the appropriate blade or RTM. This prevents insertion of a blade or RTM in an incorrect slot.

A diagram indicating the number of the slots and Power Supply unit is located on the Fan Tray panel (see Section 3.6 on page 33).

Notes:

- While the slot keys on the midplane are designed to prevent the insertion of a blade in an incorrect location, ensure that you don't force a blade or RTM into a slot; otherwise, you may damage the blade/RTM or midplane.
- All unoccupied slots must be covered with protective blank panels (see Section 6.2 on page 74).

3.2.2.1 Chassis with TP-6310 Blades

The slot assignment for blades and RTMs in the chassis for TP-6310 is described in the table below.

Table 3-4: Slot Assignment for Mediant 3000 with TP-6310

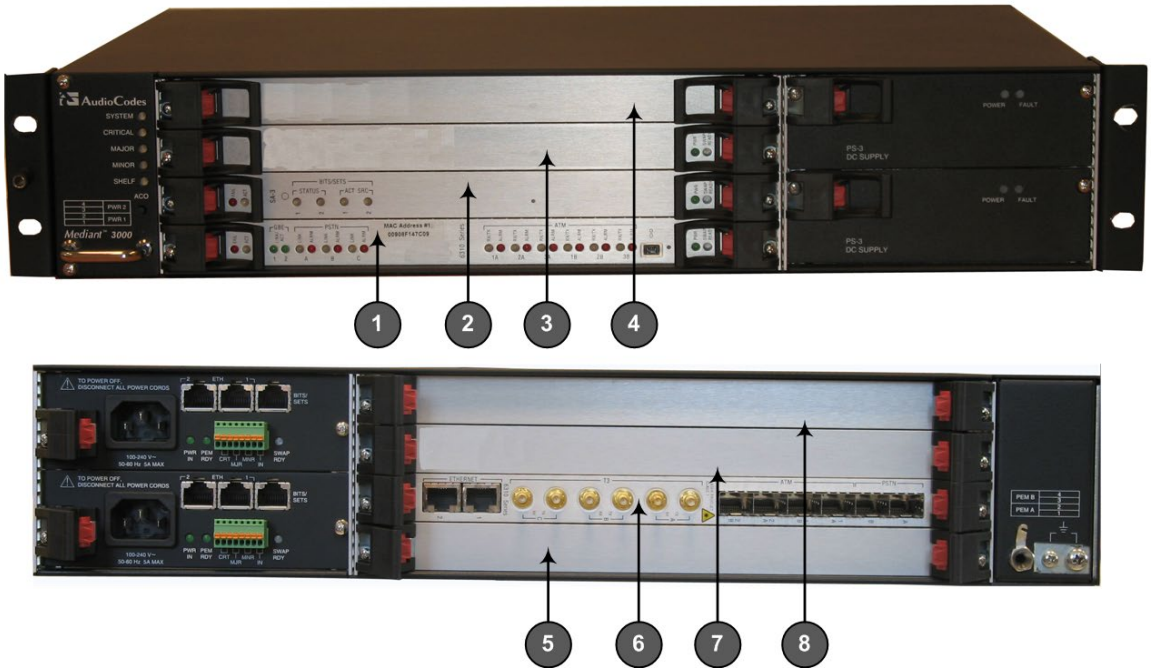
Chassis Panel	Slot #	Simplex Mode	HA Mode
Front	1	TP-6310 blade	Active TP-6310 blade
	2	Alarm, Status and Synchronization (SA/M3K) blade	Active SA/M3K blade **Note:** This blade operates with the TP-6310 blade in Slot #1.
	3	Slot covered by a blank panel	Standby (redundant) TP-6310 blade.
	4	Slot covered by a blank panel	Standby SA/M3K blade **Note:** This blade operates with the TP-6310 blade in Slot #3.
Rear	1	Slot covered by a blank panel	Slot covered by a blank panel
	2	RTM-6310 providing the following interfaces: ▪ GbE ▪ 1+1 STM-1/OC-3 or up to 3 x T3 interfaces	RTM-6310 providing the following interfaces: ▪ GbE ▪ 1+1 STM-1/OC-3 or up to 3 x T3 interfaces
	3	Slot covered by a blank panel	RTM-6310 Redundancy
	4	Slot covered by a blank panel	Slot covered by a blank panel

Note:

- Each TP blade operates with its corresponding SA blade. The TP blade in Slot 1 (front panel) operates with the SA blade in Slot 2 (front panel); the TP blade in Slot 3 (front panel) operates with the SA blade in Slot 4 (front panel). If a failure occurs in either the active TP blade or active SA blade, the device switches over to the redundant TP and SA blades. For example, if the TP blade in Slot 1 is active and a failure occurs in the SA blade in Slot 2, the device switches over to the TP blade in Slot 3 and SA blade in Slot 4.
- In HA mode, if the Ethernet connection is lost (for whatever reason), the device performs a switchover to the redundant blades. For example, if the TP blade in Slot 1 (front panel) is active and the Ethernet connection on the RTM blade in Slot 2 (rear panel) is lost, the device switches over to the redundant blades, i.e., TP blade in Slot 3 (front panel) and RTM blade in Slot 3 (rear panel).

A chassis slot assignment example for Mediant 3000 Simplex with TP-6310 is shown in the figure below:

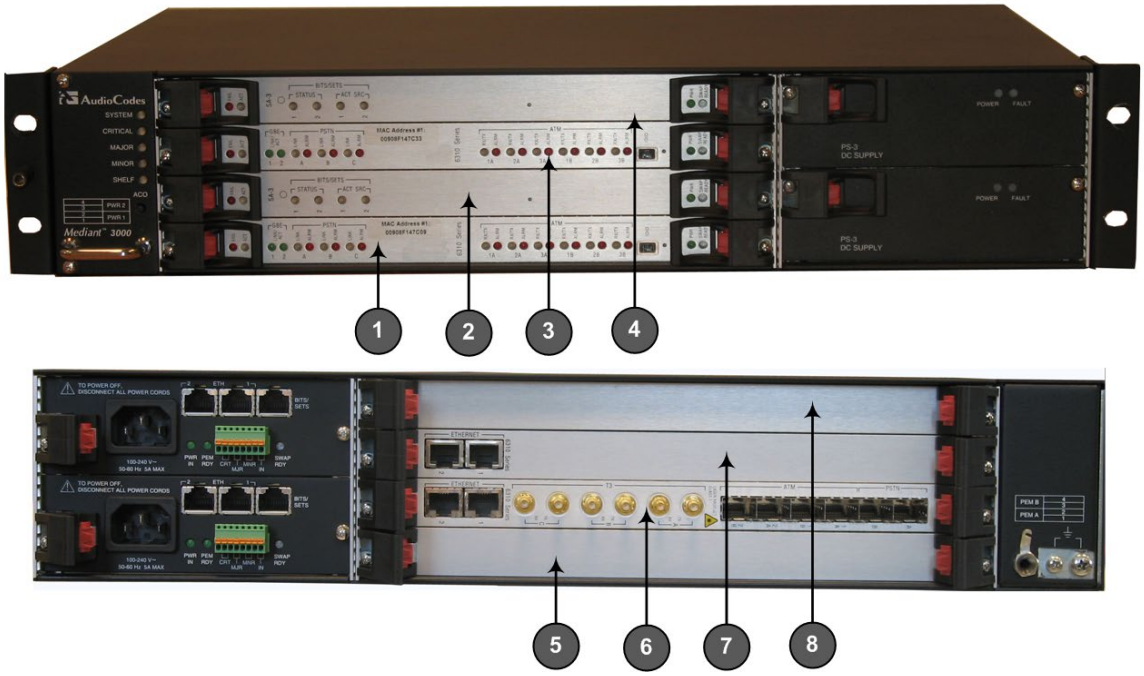
Figure 3-3: Slot Assignment for Mediant 3000 Simplex with TP-6310 Blade



Item #	Description
1	**Front panel Slot #1 -** TP-6310 blade
2	**Front panel Slot #2 -** SA/M3K blade
3	**Front panel Slot #3 -** Slot covered with a blank panel
4	**Front panel Slot #4 -** Slot covered with a blank panel
5, 8	Blank panels covering unoccupied slots
6	**Rear panel Slot #2 -** RTM-6310 providing STM-1/OC-3 or T3 interfaces and dual Gigabit Ethernet (GbE) interfaces
7	**Rear panel Slot #3 -** Slot covered with a blank panel

A chassis slot assignment example for Mediant 3000 HA with TP-6310 is shown in the figure below:

Figure 3-4: Slot Assignment for Mediant 3000 HA with TP-6310 Blades



Item #	Description
1	Front panel Slot #1 - Active TP-6310 blade
2	Front panel Slot #2 - Active SA/M3K blade
3	Front panel Slot #3 - Standby (redundant) TP-6310 blade
4	Front panel Slot #4 - Standby (redundant) SA/M3K blade
5, 8	Blank panels covering unoccupied slots
6	Rear panel Slot #2 - RTM-6310 providing STM-1/OC-3 or T3 interfaces, and dual GbE interfaces
7	Rear panel Slot #3 - RTM-6310 Redundant, providing dual GbE interfaces

3.2.2.2 Chassis with TP-8410 Blades

The slot assignment for blades and RTMs in the chassis for TP-8410 is described in the table below.

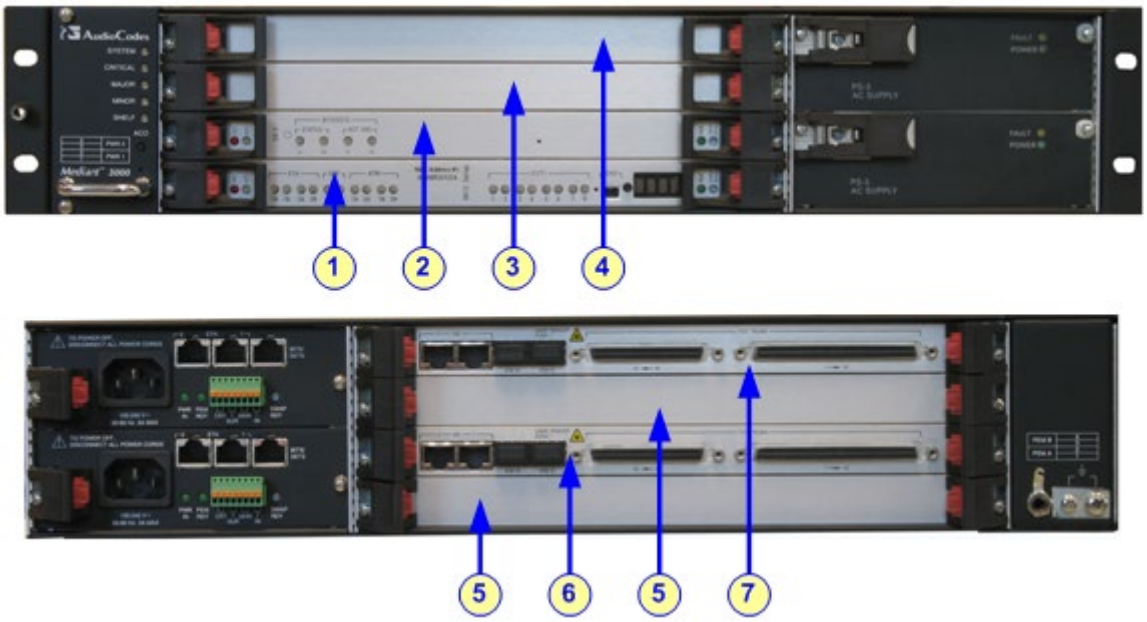
Table 3-5: Slot Assignment for Mediant 3000 with TP-8410

Chassis Panel	Slot #	Simplex Mode	HA Mode
Front	1	TP-8410 blade	Active TP-8410 blade
	2	SA/M3K blade	Active SA/M3K blade **Note:** This blade operates with the TP-8410 blade in Slot #1.
	3	Slot covered by a blank panel	Standby (redundant) TP-8410 blade
	4	Slot covered by a blank panel	Standby SA/M3K blade **Note:** This blade operates with the TP-8410 blade in Slot #3.
Rear	1	Slot covered by a blank panel	Slot covered by a blank panel
	2	RTM-8410 type providing one of the following interfaces: ▪ **16 Spans:** single SCSI connector for 16 E1/T1 spans and two RJ-45 connectors for GbE interfaces ▪ **42 Spans:** two SCSI connectors for 1-42 E1/T1 spans and two RJ-45 connectors for GbE interfaces ▪ **84 Spans:** two SCSI connectors for 1-42 E1/T1 spans and two RJ-45 connectors for GbE interface (same as for 42 spans) **Note:** Trunks 43-84 are connected to the RTM-8410 in Slot #4.	RTM-8410 type providing one of the following interfaces: ▪ **16 Spans:** single SCSI connector for 16 E1/T1 spans and two RJ-45 connectors for GbE interfaces ▪ **42 Spans:** two SCSI connectors for 1-42 E1/T1 spans and two RJ-45 connectors for GbE interfaces ▪ **84 Spans:** two SCSI connectors for 1-42 E1/T1 spans and two RJ-45 connectors for GbE interface (same as for 42 spans) **Note:** Trunks 43-84 are connected to the RTM-8410 in Slot #4.
	3	Slot covered by a blank panel	Slot covered by a blank panel
	4	RTM-8410 type providing one of the following interfaces: ▪ **16 Spans:** slot covered by a blank panel ▪ **42 Spans:** Two SCSI connectors and two RJ-45 connectors for GbE interfaces **Note:** The SCSI ports are not used. ▪ **84 Spans:** Two SCSI connectors for E1/T1 spans and two RJ-45 connectors for GbE interfaces	RTM-8410 type providing one of the following interfaces: ▪ **16 Spans:** RTM-8410 providing only two RJ-45 connectors for GbE interfaces ▪ **42 Spans:** two SCSI connectors and two RJ-45 connectors for GbE interfaces **Note:** The SCSI ports are not used. ▪ **84 Spans:** Two SCSI connectors for E1/T1 spans and two RJ-45 connectors for GbE interfaces

Note: Each TP blade operates with its corresponding SA blade. The TP blade in Slot 1 (front panel) operates with the SA blade in Slot 2 (front panel); the TP blade in Slot 3 (front panel) operates with the SA blade in Slot 4 (front panel). If a failure occurs in either the active TP blade or active SA blade, the device switches over to the redundant TP and SA blades. For example, if the TP blade in Slot 1 is active and a failure occurs in the SA blade in Slot 2, the device switches over to the TP blade in Slot 3 and SA blade in Slot 4.

A chassis slot assignment example for Mediant 3000 Simplex with TP-8410 is shown in the figure below:

Figure 3-5: Slot Assignment for Mediant 3000 Simplex with TP-8410 Blade



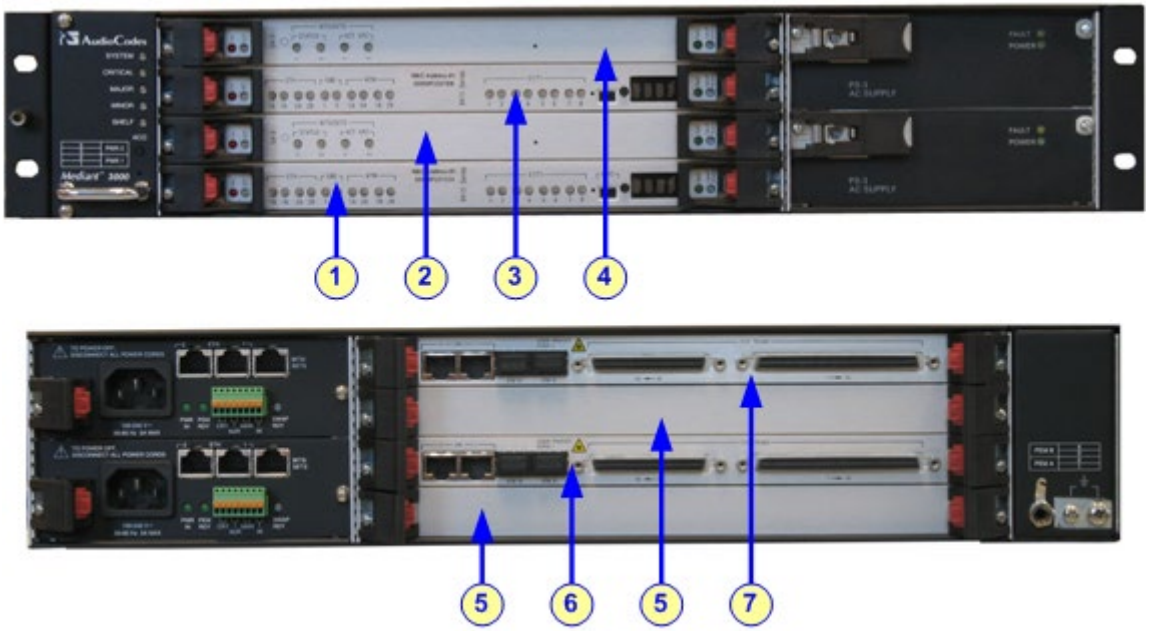
Legend:

1. **Front-panel Slot #1:** TP-8410 blade
2. **Front-panel Slot #2:** SA/M3K blade
3. **Front-panel Slot #3:** slot covered with a blank panel
4. **Front-panel Slot #4:** slot covered with a blank panel
5. Blank panels covering unoccupied slots
6. **Rear-panel Slot #2:** RTM-8410 providing PSTN E1/T1 (Trunks 1 to 42, or 1 to 16) and dual Gigabit Ethernet interfaces
7. **Rear-panel Slot #4:** RTM-8410 providing PSTN E1/T1 (Trunks 43 to 84) interfaces and Gigabit Ethernet interfaces

Note: For 16-Span (Simplex) configuration, Slot #4 is covered by a blank panel.

A chassis slot assignment example for Mediant 3000 HA with TP-8410 is shown in the figure below:

Figure 3-6: Slot Assignment for Mediant 3000 HA with TP-8410 Blades



Legend:

1. **Front-panel Slot #1:** active TP-8410 blade
2. **Front-panel Slot #2:** active SA/M3K blade
3. **Front-panel Slot #3:** standby (redundant) TP-8410 blade
4. **Front-panel Slot #4:** standby (redundant) Alarm and Status blade
5. Blank panels covering unoccupied slots
6. **Rear-panel Slot #2:** RTM-8410 providing PSTN E1/T1 (Trunks 1 to 42, or 1 to 16) and dual Gigabit Ethernet interfaces
7. **Rear-panel Slot #4:** RTM-8410 providing PSTN E1/T1 (Trunks 43 to 84) interfaces and Gigabit Ethernet interfaces

3.3 TP-6310 Blade

The TP-6310 blade is a member of AudioCodes series of TrunkPack voice-over-packet (VoP) communication platform. The blade is a high-density, hot-swappable, resource blade (form factor 6U PICMG 2.16) with a capacity of up to 2,016 DS0 channels. The blade is considered a complete gateway / media server module, supporting all necessary functions for voice, data, and fax streaming over IP networks. The blade is housed in the chassis front panel and has its own MAC address and IP address.

The blade operates together with the RTM-6310 housed in the rear panel, which provides the port connections for the following interfaces:

- One of the following PSTN interfaces:
  - 1+1 STM-1/OC-3
  - Up to three T3 (single, two, or three T3 interfaces)
- IP (Gigabit Ethernet)

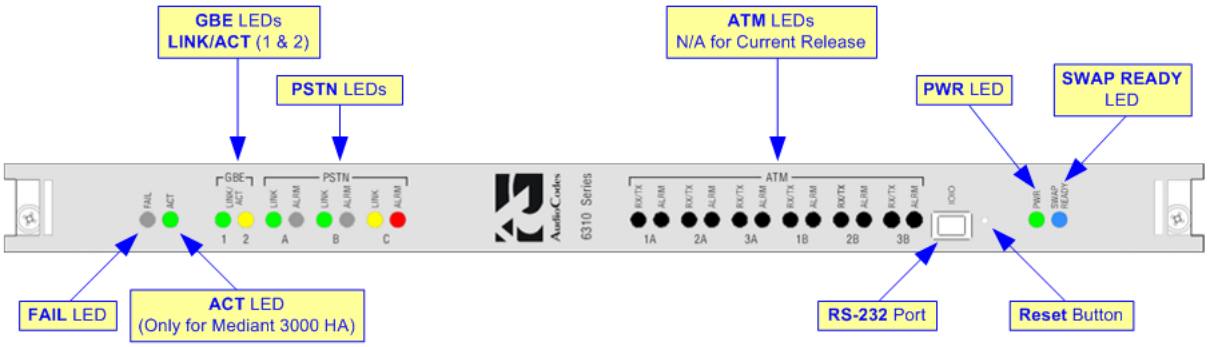
For more information on the RTM-6310, see Section 3.3.2 on page 24.

The TP-6310 blade provides automatic protection switching (APS) capability (1+1) for STM-1/OC-3 PSTN interfaces. In HA mode (i.e., two blades housed in the chassis), the blade is designed for protection capabilities provided by the redundant RTM (RTM-6310 Redundant) housed in the rear panel (see Section 3.3.3 on page 25).

The blade provides LEDs for indicating various operating status (see Section 3.3.1 on page 21), a Reset pinhole-button, and an RS-232 interface port (labeled **1010**). This port provides RS-232 interface with a computer's serial port (COM), using a DB-9 adapter cable. The RS-232 port can be used to access the Command-Line Interface (CLI) and receive error/notification messages.

The TP-6310 blade components are shown in the figure below:

Figure 3-7: TP-6310 Blade



Notes:

- The Reset pinhole button is reserved for future use.
- The RS-232 port can be disabled for security, using the *DisableRS232* ini file parameter (refer to the *User's Manual*).
- PSTN APS is partially compliant to GR-253 only.
- The TP-6310 blade supports STM-1/OC-3 or T3 PSTN interface. The supported interface is determined using the *PSTNTransmissionType* parameter.

3.3.1 TP-6310 LEDs Description

The TP-6310 blade provides LEDs on its front panel, which indicates various operational status of the blade.

Note: The **ATM** LEDs are reserved for future use.

3.3.1.1 Blade Operating Status LEDs

The LEDs providing operational status of the TP-6310 is described in the table below.

Table 3-6: Blade Operational Status LEDs Description

Label	Color	Status	Description
FAIL	**Red**	On	Blade failure (fatal error).
	-	Off	Normal operation.
ACT	**Green**	On	Active blade. **Note:** Applicable only to the HA mode.
	Yellow	Blinking	Redundant blade in standby mode. **Note:** Applicable only to the HA mode.
	-	Off	Standalone blade (i.e., in Simplex mode).
PWR	**Green**	On	Blade is receiving power.
	-	Off	No power is received by the blade.
SWAP READY	**Blue**	On	The blade can now be fully removed or inserted.
	-	Off	The blade has been inserted successfully.

3.3.1.2 Gigabit Ethernet LEDs

The Gigabit Ethernet LEDs are described in the table below.

Table 3-7: Gigabit Ethernet (GBE) LEDs Description

Label	Color	Status	Description
LINK/ACT 1 and LINK/ACT 2	**Green**	On	Ethernet link is established.
		Blinking	Data is transmitted or received.
	Yellow	On	Protection (redundant) link is established.
	-	Off	No Ethernet link.

3.3.1.3 PSTN LEDs

The PSTN LEDs are described in the table below.

Table 3-8: PSTN (STM-1/OC-3 or T3 Interface) LEDs Description

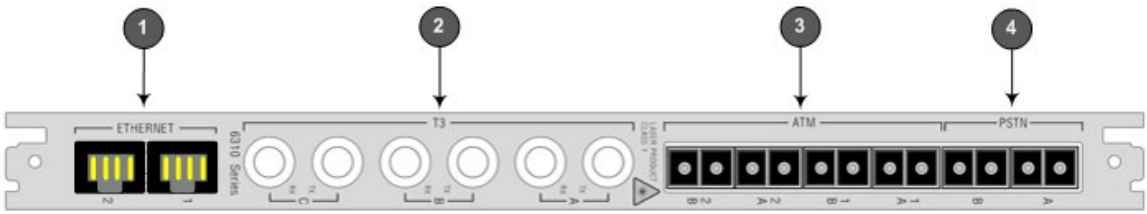
<table>
<tr><th>Interface</th><th colspan="2">Label</th><th>Color</th><th>Status</th><th colspan="3">Description</th></tr>
<tr><td rowspan="11">STM-1/OC-3</td><td rowspan="11">A & B</td><td rowspan="3">LINK</td><td>Green</td><td>On</td><td colspan="3">Working (active) link is established.</td></tr>
<tr><td>Yellow</td><td>On</td><td colspan="3">Protection (standby) link is established.</td></tr>
<tr><td>-</td><td>Off</td><td colspan="3">No link.</td></tr>
<tr><td rowspan="8">ALRM</td><td rowspan="6">Red</td><td rowspan="6">On</td><td colspan="3">Indicates one of the following alarms:</td></tr>
<tr><td>Status</td><td>SDH</td><td>SONET</td></tr>
<tr><td>Loss of Signal</td><td>LOS</td><td>LOS</td></tr>
<tr><td>Loss of Frame</td><td>RS-LOF (RS = Regenerator Section)</td><td>LOF</td></tr>
<tr><td>Alarm Indication Signal</td><td>MS-AIS (MS = Multiplex Section)</td><td>AIS-L (L = Line)</td></tr>
<tr><td>Remote Defect Indication</td><td>MS-RDI (MS = Multiplex Section)</td><td>RDI-L (L = Line)</td></tr>
<tr><td>-</td><td>Off</td><td colspan="3">Normal operation (no alarms).</td></tr>
<tr><td rowspan="5">T3</td><td rowspan="5">A, B, & C</td><td rowspan="3">LINK</td><td>Green</td><td>On</td><td colspan="3">T3 is synchronized.</td></tr>
<tr><td>Yellow</td><td>On</td><td colspan="3">RAI (Remote Alarm Indication) -- 'Yellow Alarm'.</td></tr>
<tr><td>-</td><td>Off</td><td colspan="3">No link.</td></tr>
<tr><td rowspan="2">ALRM</td><td rowspan="2">Red</td><td rowspan="2">On</td><td colspan="3">Traffic loss due to one of the following signals:
▪ LOS (Loss of Signal)
▪ LFA (Loss of Frame Alignment)
▪ AIS (Alarm Indication Signal) - 'Blue Alarm'</td></tr>
<tr><td>-</td><td>Off</td><td colspan="3">No Near End Alarms.</td></tr>
</table>

Note: The **PSTN C** LEDs are applicable only to T3 interface.

3.3.2 RTM-6310 Rear Transition Module

The RTM-6310 (housed in the rear panel) operates with the TP-6310 blade (housed in the front panel). These two blades connect through the chassis midplane. RTM-6310 provides the I/O interface connections to the IP (Gigabit Ethernet) and PSTN (i.e., STM-1/OC-3 or T3) networks.

Figure 3-8: RTM-6310 Ports



Item #	Label	Description
1	**ETHERNET**	Dual Gigabit Ethernet ports for 1+1 Redundancy (RJ-45 or optical SFP)
2	**T3**	PSTN T3 - three pairs of T3 SMB TX/RX connectors
3	**ATM**	N/A for current release.
4	**PSTN**	PSTN STM-1/OC-3 interfaces - two pairs of SFP TX/RX receptacles for redundancy

Note: The device's T3 support is available in 1, 2, or 3 T3 interfaces configuration.

The table below describes the RTM-6310 port interfaces.

Table 3-9: RTM-6310 Ports Description

Interface	Port	Label		Description
STM-1/OC-3 PSTN	SFP	**PSTN**	**A**, **B**	Two pairs of small form-factor pluggable (SFP) Tx/Rx receptacles for STM-1/OC-3 interface. The dual STM-1/OC-3 interface provides 1+1 redundancy (**A** and **B** make a redundant pair - APS for PSTN interfaces). An SFP cage is provided with an SFP 155-Mbps optical module for attaching an optical fiber with an LC-type optical connector.
T3 PSTN	SMB	**T3**	**A**, **B**, **C**	Up to three pairs (Tx/Rx) of SMB RF connectors, supporting up to three T3 PSTN interfaces.
GbE	RJ-45	**ETHERNET**	**1**, **2**	Two 10/100/1000Base-TX RJ-45 ports for GbE LAN interfaces (1+1 redundancy). The connection to the LAN is typically through Category 5 (Cat 5 twisted-pair copper cabling) LAN cables.

Interface	Port	Label		Description
				Notes: ▪ Instead of RJ-45 ports, 1000Base-SX 1.25 Gbps multi-mode optical SFP transceiver using 850 nm wavelength can be provided (customer ordered). In such a setup, the connection to the LAN is through fiber optic cables. ▪ For full capacity and functionality, the device must be connected with a 1-Gbps link.

Notes:

- RTM-6310 provides T3 and STM-1/OC-3 interfaces. However, only one interface type can be supported per deployment (software configurable, using the *PSTNTransmissionType* ini file parameter).
- Unused SFP transceiver modules must be covered with dust / EMI plugs (see Section 6.7 on page 83).
- Un-assembled SFP cages must be covered with protective dust plugs (see Section 6.7 on page 83).
- ATM interface is reserved for future use.

3.3.3 RTM-6310 Redundancy Rear Transition Module

The RTM-6310 Redundant RTM is used for the HA mode. RTM-6310 Redundant is housed in Slot #3 in the rear panel. It provides the Ethernet interface to the redundant TP-6310 blade housed in Slot #3 in the front panel, upon failure of the TP-6310 blade in Slot #1.

Upon TP-6310 failure, the standby TP-6310 blade switches the I/O interfaces of RTM-6310 from the failed TP-6310 blade to the standby TP-6310 blade. RTM-6310 Redundant re-routes all calls from the failed blade to the currently active blade (previously redundant), by relaying the interface between RTM-6310 and the newly active blade.

RTM-6310 Redundant also supports GbE link redundancy, by providing two Ethernet ports. These ports are available (customer ordered) as either 10/100/1000Base-TX RJ-45 or optical SFP GbE connectors.

Figure 3-9: RTM-6310 Redundant Rear Transition Module

Notes:

- RTM-6310 Redundancy is applicable only to HA mode.
- RTM-6310 Redundant provides only GbE interfaces (no PSTN interfaces).

3.4 TP-8410 Blade

The TP-8410 blade is a member of AudioCodes series of TrunkPack VoP communication platform. The blade is a high-density, hot-swappable, resource blade providing up to 63 E1 / 84 T1 PSTN interfaces, with a capacity of up to 2,016 DS0 channels. The blade is considered a complete gateway / media server module, supporting all necessary functions for voice, data, and fax streaming over IP and wireless networks. The blade is housed in the chassis front panel and has its own MAC address and IP address.

The TP-8410 blade operates together with RTM-8410 housed in the rear panel, which provides the port connections for the following interfaces:

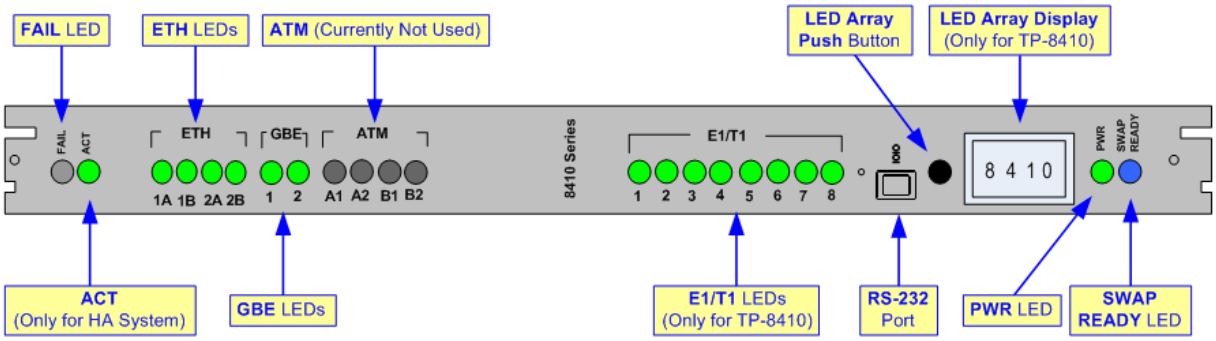
- E1/T1 PSTN
- GbE

For more information on the RTM-8410, see Section 3.4.2 on page 30.

The TP-8410 blade provides redundancy protection (HA) functionality when two blades are installed, in which the standby blade takes over from the active blade upon failure. The TP-8410 blade also provides an RS-232 interface port, status LEDs, and a LED Array display.

The TP-8410 blade components are shown in the figure below:

Figure 3-10: TP-8410 Blade



Note: The RS-232 port can be disabled for security, using the *ini* file parameter *DisableRS232*.

3.4.1 TP-8410 LEDs Description

The TP-8410 blade provides LEDs on its front panel, which indicates various operational status of the blade.

3.4.1.1 Blade Operating Status LEDs

The LEDs providing operational status of the TP-8410 is described in the table below.

Table 3-10: Blade Operating Status LEDs Description

Label	Color	Status	Description
FAIL	**Red**	On	Blade failure (fatal error).
	-	Off	Normal operation.
ACT	**Green**	On	Active blade. **Note:** Applicable only to the HA mode.
	Yellow	Blinking	Redundant blade in standby mode. **Note:** Applicable only to the HA mode.
	-	Off	Standalone blade (i.e., for Simplex configuration).
PWR	**Green**	On	Blade is receiving power.
	-	Off	No power is received by the blade.
SWAP READY	**Blue**	On	The blade can now be fully removed or inserted.
	-	Off	The blade has been inserted successfully.

3.4.1.2 Ethernet LEDs

The Ethernet LEDs are described in the table below.

Table 3-11: Ethernet LEDs Description

Label	Color	Status	Description
ETH (1A, 1B, 2A, 2B)	**Green**	On	10/100BaseT Ethernet link is established. For the status of the Ethernet ports on the PEM module, see Section 3.8 on page 35. ▪ **A** LEDs: status of the Ethernet ports located on the lower PEM module. ▪ **B** LEDs: status of the Ethernet ports located on the upper PEM module. ▪ **1A** and **1B**: status of the Control network interface. ▪ **2A** and **2B**: status of the OAMP network interface.
		Blinking	Data is being transmitted or received.
	-	Off	No Ethernet link.
GBE (1, 2)	**Green**	On	Gigabit Ethernet link is established. This LED indicates Media network traffic. For the status of the Ethernet ports on RTM-8410, see Section 3.4.2 on page 30.
		Blinking	Data is being transmitted or received.
	-	Off	No Gigabit Ethernet link.

3.4.1.3 PSTN (E1/T1) LEDs

The PSTN LEDs are described in the table below.

Table 3-12: PSTN E1/T1/J1 LEDs Description

Label	Color	Status	Description
E1 / T1 (1 - 8)	**Green**	On	E1/T1 is synchronized.
	Red	On	Traffic loss due to one of the following signals: ▪ LOS (Loss of Signal) ▪ LFA (Loss of Frame Alignment) ▪ AIS (Alarm Indication Signal) - 'Blue Alarm' ▪ RAI (Remote Alarm Indication) - 'Yellow Alarm'
	-	Off	No link.

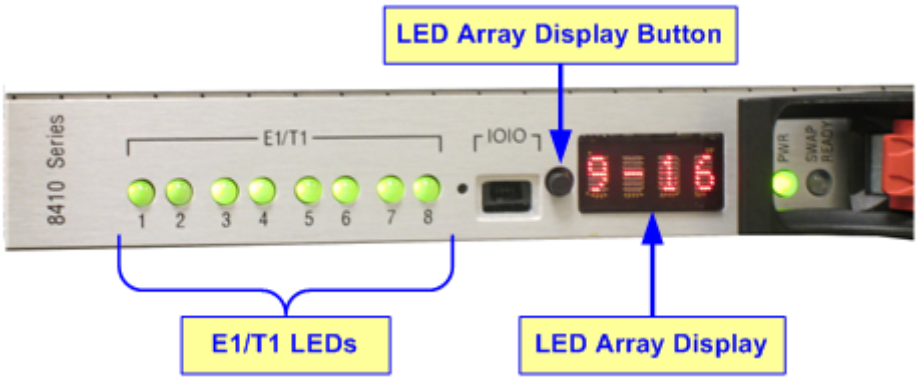
Note: The **E1/T1** LEDs display only eight E1/T1 trunks at a time. The trunk numbers for which the LEDs are currently relevant are displayed in the LED Array Display. To view the next consecutive group of eight trunks and for a description of the LED Array Display, see Section 3.4.1.4 on page 28.

3.4.1.4 LED Array Display for PSTN LEDs

The TP-8410 blade provides a LED Array display indicates the trunk numbers for which the **E1/T1** LEDs (described in the previous section) are currently relevant. The status of the E1/T1

trunks is indicated by the eight **E1/T1** LEDs in groups of eight trunks. Each time you press the **LED Array Display** button (located to the left of the LED display) the status of the next eight consecutive trunks is indicated by the **E1/T1** LEDs. In other words, the first group of trunks depicted by the LEDs is 1-8, then trunks 9-16 at the next press of the button, then trunks 17-24 at the next press of the button, and so on, up to trunk 84. The number of trunks depends on the blade configuration and Software Upgrade Key. For example, in the figure below, the eight lit **E1/T1** LEDs represent trunks 9 through 16, as displayed in the LED Array display.

Figure 3-11: LED Array Display on TP-8410 Blade



The LED Array display also shows the blade's MAC address. To view the MAC address, press the **LED Array Display** button until the last group of trunks is displayed, and then press again to display the MAC address. When the MAC address is displayed, the **E1/T1** LEDs turn off. Pressing the button again displays the first group of eight trunks.

3.4.2 RTM-8410 Rear Transition Module

The RTM-8410 (housed in the rear panel) operates with TP-8410 blade (housed in the front panel). These two blades connect through the chassis midplane. RTM-8410 provides and routes DS1 (E1/T1) PSTN interfaces to the TP-8410 blade. RTM-8410 also provides two Gigabit Ethernet interfaces (RJ-45 ports or fiber optic SPF modules) for connection to the LAN (IP network), using Cat 5 or fiber optic cables, respectively.

The type and quantity of RTM-8410 required depends on the number of supported E1/T1 interfaces, as listed in the table below:

Table 3-13: Type and Quantity of RTM-8410 per E1/T1 Span Configuration

E1/T1 Span Configuration	RTM-8410 Type and Quantity
Fixed 16 E1 / 21 T1	One RTM-8410 providing a single SCSI connector (see Section 3.4.2.1 on page 30).
Scalable from 16 E1 / T1 to 32 E1 / 42 T1	Two RTM-8410s, each providing two SCSI connectors, but only one RTM is cabled (see Section 3.4.2.2 on page 30).
Scalable from 32 E1 / 42 T1 to 63 E1 / 84 T1	Two RTM-8410s, each providing two SCSI connectors for 42 E1 / T1 spans (see Section 3.4.2.2 on page 30).
Fixed 63 E1 / 84 T1	Two RTM-8410s, each providing two SCSI connectors for 42 E1 / T1 spans (see Section 3.4.2.2 on page 30).

Note: For blade slot assignment in the chassis, see Section 3.2.2 on page 14.

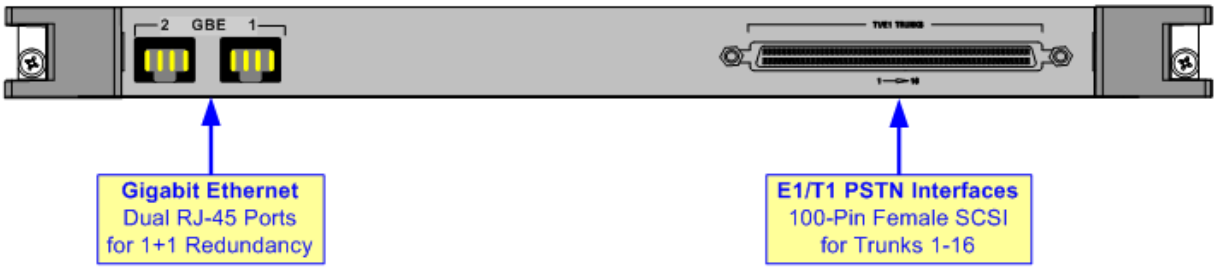
3.4.2.1 RTM-8410 for 16-Span Configuration

The RTM-8410 for fixed 16 E1 / 21 T1 span configuration includes the following port interfaces:

- A 100-pin female SCSI connector for E1/T1 trunks 1-16
- Two RJ-45 GbE ports (for 1+1 Ethernet redundancy)

This RTM is housed in Slot #2 on the rear panel.

Figure 3-12: RTM-8410 for 16 Spans (Single SCSI Port)



For HA mode, an RTM-8410 that provides only GbE ports is housed in Slot #4, as shown below. For Simplex mode, Slot #4 is covered by a blank panel.

Figure 3-13: RTM-8410 Redundant for 16 Spans in Slot #4 (for Mediant 3000 HA Only)

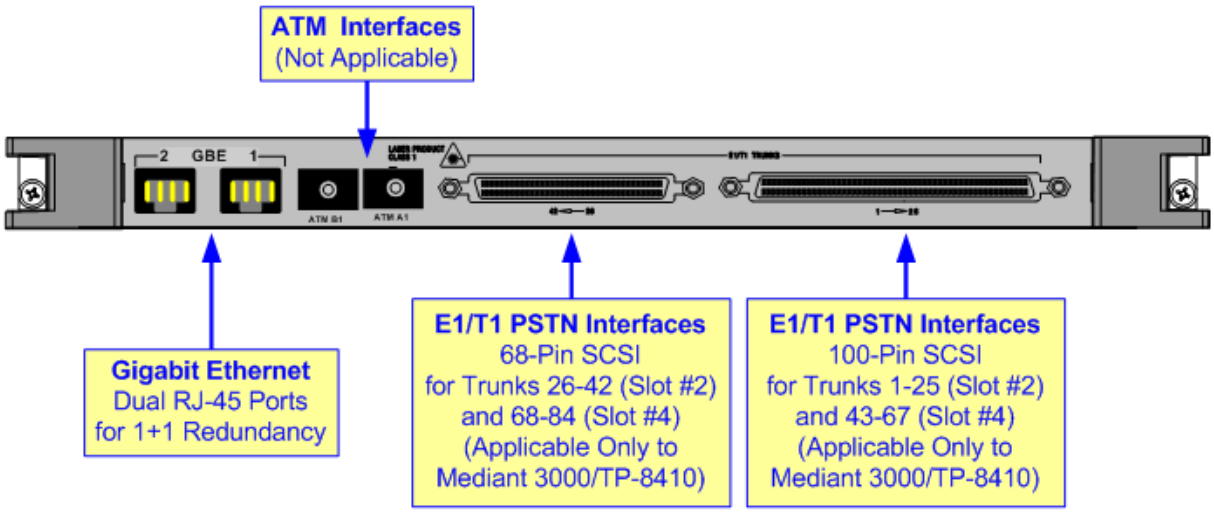
3.4.2.2 RTM-8410 for Scalable Span Configuration

For fixed 63 E1 / 84 T1 span configuration and for scalable span configurations from 16 E1/T1 to 32 E1 / 42 T1, and 32 E1 / 42 T1 to 63 E1 / 84 T1, two identical RTM-8410s are used - one housed in Slot #2, the other in Slot #4.

These two RTM-8410s provide the following interfaces:

- A 100-pin female SCSI connector, supporting the following trunks (depending on the chassis slot in which the RTM-8410 is housed):
  - RTM-8410 in Slot 2: E1/T1 trunks 1-25
  - RTM-8410 in Slot 4: E1/T1 trunks 43-67
- A 68-pin female SCSI connector, supporting the following trunks (depending on the chassis slot in which the RTM-8410 is housed):
  - RTM-8410 in Slot 2: E1/T1 trunks 26-42
  - RTM-8410 in Slot 4: E1/T1 trunks 68-84
- Two RJ-45 GbE ports (for 1+1 Ethernet redundancy) ports per RTM-8410.

Figure 3-14: Two RTM-8410s for 84 Spans (Two SCSI Ports) in Slots #2 and #4



Note: ATM interfaces (i.e., SFP ports labeled **ATM A1** and **ATM B1**) are reserved for future use.

3.5 Alarm, Status and Synchronization Blade

The Alarm, Status and Synchronization (SA/M3K) blade is a 6U blade, which is housed in Slot #2 on the front panel. This blade performs the following functions:

- Monitors all midplane voltages (3.3V, 5V, +12V, -12V).
- Monitors proper operation of all power supplies.
- Monitors and controls chassis temperature by changing the fans' speed according to the chassis' temperature.
- Controls the state of alarm closures.
- Controls the front-panel chassis LEDs.
- Detects the state of the front chassis push-button.
- Detects the availability of the power at the inlet leads.
- Provides the clock synchronization for the I/O blades
- Interfaces with the Building Integrated Timing Source (BITS) / SETS

The blade interconnects with all chassis elements. Alarms detected are transmitted through the midplane to the various LED indicators on the chassis and blades, as well as to the Alarm Terminal Closures on the PEM module.

The SA/M3K blade provides LEDs on its front panel, as displayed below and described in the subsequent table:

Figure 3-15: Alarm, Status and Synchronization Blade (SA/M3K)

Table 3-14: SA/M3K Blade LEDs Description

Label	Color	Status	Description
FAIL	**Red**	On	Blade failure (fatal error).
	-	Off	Normal operation.
ACT	**Green**	On	Active blade initialization sequence completed successfully. **Note:** This is applicable only to HA mode.
	Yellow	On	Standby blade initialization sequence terminated successfully. **Note:** This is applicable only to HA mode.
		Blinking	Blade initialization sequence terminated successfully.
	-	Off	Standalone blade.
BITS/SETS STATUS (**1** & **2**)	Green	On	Framer locked on BITS clock. **Note:** Each LED (**1** or **2**) depicts the BITS source connected either to the upper or lower PEM module on the device's rear panel. Therefore, only one of the LEDs is applicable (they change only if the BITS source is changed).
	Red	On	Timing source failure or BITs is not in use.
	-	Off	This BITS clock reference is not used.
BITS/SETS ACT SRC (1 & 2)	**Green**	On	Active clock source. **Note:** Each LED (**1** or **2**) depicts the BITS source connected either to the upper or lower PEM module on the device's rear panel. Therefore, only one of the LEDs is applicable (they change only if the BITS source is changed).
	Red	On	Timing source failure.
	-	Off	This is not an active source.
PWR	**Green**	On	Blade receiving power.
	-	Off	No power received by blade.
SWAP READY	**Blue**	On	Blade can be fully inserted or removed (after being partially inserted or removed).
	-	Off	Blade is successfully inserted (not ready to be removed).

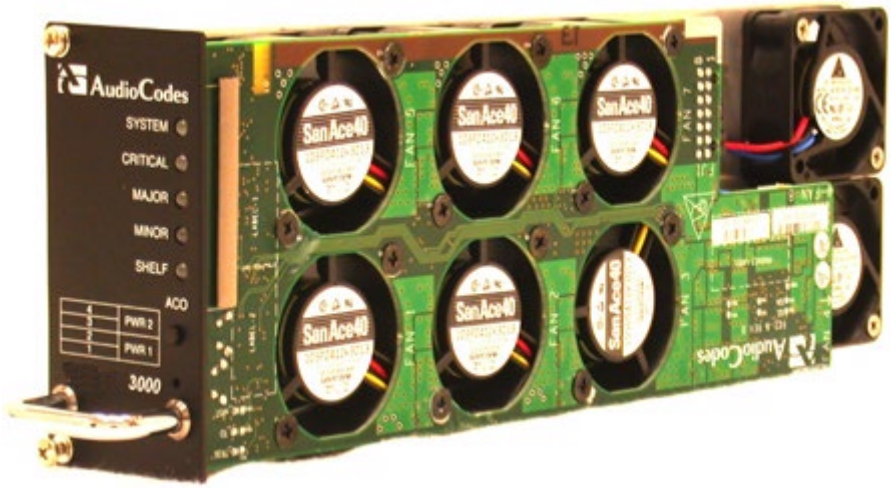
3.6 Chassis Cooling System

The device's components are cooled by the Fan Tray module (FM/M3K), located on the extreme left of the chassis front panel. The Fan Tray module is hot swappable and provides a handle for quick and easy removal and insertion.

The module is composed of eight fans and a removable Air Filter (AF/3K). The fans are divided into two independent functional segments to prevent a single point of failure, providing necessary air flow for each blade in the card cage even if one of the fans or one segment stops operating. The Fan Tray module sucks air into the chassis using the eight fans, through a perforated grill located on the chassis' left panel. The incoming air passes through the Air Filter, whose honeycombed design prevents radio frequency interferences. The cool air passes over the entire set of blades, cooling each one. The air then exits the chassis through perforated vents on the chassis' right panel.

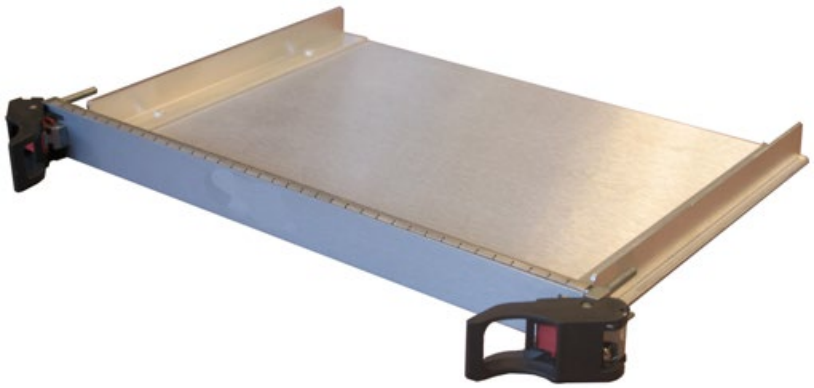
The Fan Tray module also provides severity alarm LEDs and an Alarm Cut-Off (**ACO**) button on its front panel (for more information, see Section 3.7 on page 21).

Figure 3-16: Fan Tray Module



Blank panels are used to cover all unoccupied slots on the chassis front and rear panels. These panels are constructed to assist optimal air flow within the chassis. When implementing the TP-8410 blade in a Simplex mode, Air Baffle panels are also used (see figure below) to assist in cooling the system. The Air Baffles maintain internal airflow pressure and ensure the correct operating temperature in the front cage of the chassis. These panels are installed in slots #3 and #4 in the chassis' front panel.

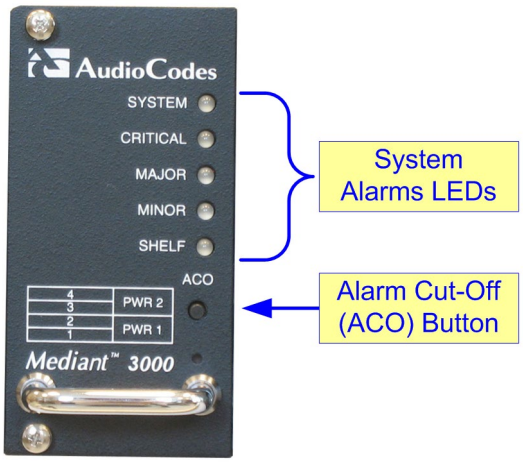
Figure 3-17: Air Baffle Panel for Unoccupied Front-Panel Slots



3.7 Alarm LEDs and ACO Button

The front panel of the Fan Tray module provides fault detection severity alarm LEDs and an Alarm Cut-Off (**ACO**) button, as shown in the figure below:

Figure 3-18: Fan Tray Module with Alarm LEDs and ACO Button



The **ACO** button is used to mute the external Telco alarm relay devices attached to the Power Entry Module (see Section 3.7 on page 35). When the **ACO** button is pressed, all alarm relays are returned to normal position, de-activating the alarm relay devices. The chassis LEDs and other device alarm signals are not affected.

The fault detection alarm LEDs (described in the table below) are connected to the Alarm, Status and Synchronization blade.

Table 3-15: Fan Tray Module Alarm LEDs Description

LED	Color	Status	Description
SYSTEM	**Green**	On	Normal operation.
	Red	On	System failure.
CRITICAL	**Green**	On	No Critical alarms.
	Red	On	(Default when the device is powered on.) Detection of a fault(s) categorized as “Critical” (i.e., Critical alarm). When this LED is on, the **MAJOR** and **MINOR** LEDs are also lit.
MAJOR	**Green**	On	No Major alarms.
	Orange	On	(Default when the device is powered on.) Detection of a fault(s) categorized as “Major” (i.e., Major alarm). When this LED is on, the **MINOR** LED is also lit.
MINOR	**Green**	On	No Minor alarms.
	Orange	On	(Default when the device is powered on.) Detection of a fault(s) categorized as "Minor" (i.e., Minor alarm).
SHELF	**Green**	On	Initialization completed successfully (i.e., normal functioning of the chassis hardware).
	Red	On	(Default when the device is powered on.) Undergoing initialization (or failure of the chassis hardware).

3.8 Power Supply

The device can be powered from one of the following power sources (depending on customer order):

- AC power source (see Section 3.8.1 on page 37)
- DC power source (see Section 3.8.2 on page 40)

The power supply units provide the following features:

- Load-sharing to provide necessary voltages and fail-safe operation - active current load sharing on positive outputs (V1, V2)
- Integral LED status indicators
- Hot-pluggable connector, with staged pin lengths
- Hot swappable
- Optimized thermal management
- Control and monitoring features

Note: If you want to change the device's power system (i.e., AC to DC, or DC to AC), you need to change the chassis. For more information, contact your AudioCodes representative.

3.8.1 AC Power System

The AC power system is powered from two AC redundant feeds (providing 1+1 power redundancy) and consists of the following hardware components:

- Power Entry Module (PEM/AC/3K) – see Section 3.8.1.1 on page 38
- Power Supply Module (PS/AC/3K) – see Section 3.8.1.2 on page 39

The table below lists the device's AC power specifications.

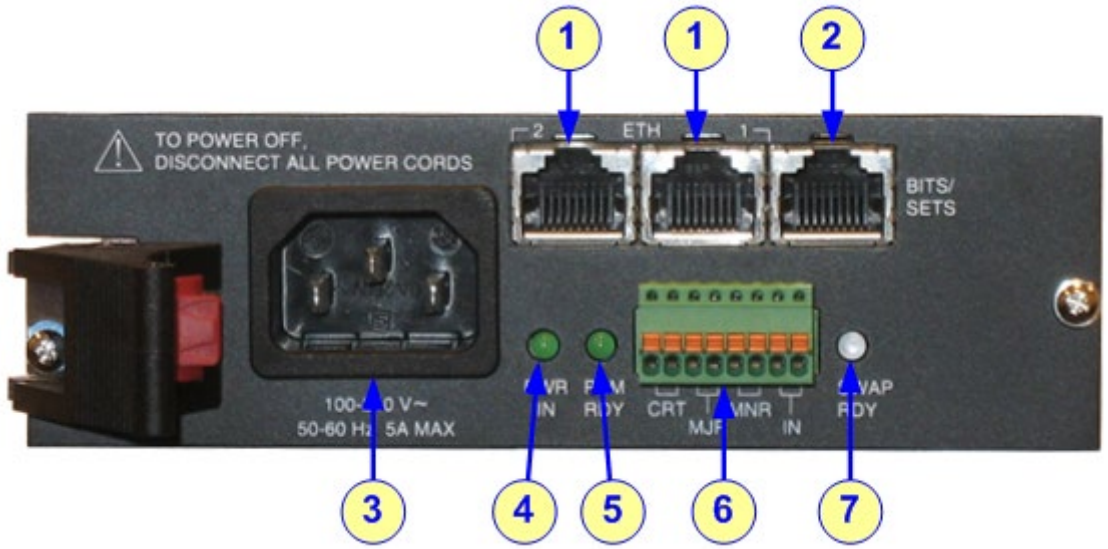
Table 3-16: AC Power Supply Specifications

Parameter	Value
Power Requirements	Universal 100-240 VAC input at a nominal 50/60 Hz line frequency, and power factor correction
Power Consumption	Depends on installed blade and configuration: ▪ TP-6310 OC-3/STM-1 Simplex: ✓ 2.1A @ 110VAC, 235W ✓ 1A @ 230VAC, 235W ▪ TP-6310 OC-3/STM-1 HA: ✓ 3.4A @ 110VAC, 373W ✓ 1.6A @ 230VAC, 373W ▪ TP-8410 Simplex 24 E1/T1: ✓ 1.5A @ 110VAC, 162W ✓ 0.7A @ 230VAC, 162W ▪ TP-8410 HA 24 E1/T1: ✓ 2.1A @ 110VAC, 230W ✓ 1A @ 230VAC, 230W ▪ TP-8410 Simplex 63 E1/84 T1: ✓ 2.1A @ 110VAC, 230W ✓ 1A @ 230VAC, 230W ▪ TP-8410 HA 63 E1/84 T1: ✓ 3.3A @ 110VAC, 336W ✓ 1.6A @ 230VAC, 336W
Connection Provisions	PEM module with 3-prong AC inlet

3.8.1.1 AC Power Entry Modules

The device's chassis is supplied with two PEM/AC/3K Power Entry Modules (PEM) modules (housed in its rear panel), for connecting the device's chassis to AC power sources. The dual PEMs allow connection to two independent AC power sources, providing electrical input (power) redundancy in the event of an AC power source failure. The device uses complete power entry separation between the two existing AC power supplies in the system.

Figure 3-19: AC Power Entry (PEM/AC/3K) Module



The table below describes the PEM module's connectors and LEDs.

Table 3-17: AC Power Entry (PEM/AC/3K) Module Description

Item #	Label	Description
1	**ETH**	▪ **PEM with TP-6310 blades:** N/A (GbE interface is provided by the Ethernet ports on RTM-6310). ▪ **PEM with TP-8410 blades:** Two 10/100BaseT Ethernet interfaces (RJ-45 ports) for connection to OAMP and Control (optional) networks (i.e., Physical Network Separation feature). Their operating status is provided by the **ETH** LEDs on the TP-8410 blade (see Section 3.4.1 on page 26).
2	**BITS/SETS**	Standard E1/T1 RJ-48 connector for synchronization and timing source.
3	**100-240V~ 50/60 Hz 5A MAX**	3-Prong IEC 60320 type AC power inlet.
4	**PWR IN**	Power LED (green color) - incoming primary AC power detected.
5	**PEM RDY**	Backplane power is received (secondary PEM power is normal and active). The LED lights up green.

Item #	Label	Description
6	**CRT**, **MJR**, **MNR**, **IN**	Alarm Terminal Block Closures: Contains four groups of terminals for connecting external Telco alarm devices according to Critical, Major, and Minor severities. Devices can be controlled using Common, Normally Open method. The IN connector is for Shelf (User-Defined) connections, which are to be implemented in a future version.
7	**SWAP RDY**	N/A.

3.8.1.2 AC Power Supply Modules

The PS/AC/3K Power Supply module is an advanced-design, multi-output switching power supply, providing AC primary input power configurations. The Power Supply modules are located on the front panel and connect to the PEM modules (located on the rear panel) through the chassis' backplane. The unit has a handle for easy removal and re-insertion, under power (hot-swap capable).

Figure 3-20: AC Power Supply (PS/AC/3K) Module

Power for the device is typically supplied from redundant AC power feeds, whose input voltage ranges from 100-240 VAC. The Power Supply modules function in an output current, load-sharing configuration to provide necessary voltages and fail-safe operation to the blades in the chassis.

Table 3-18: AC Power Supply (PS/AC/3K) Module Technical Specifications

Function	Specification
Output	
Output Power	300 watts maximum, continuous
Outputs (V1-V4)	+3.3 V at 40 A; +5 V at 40 A; +12 V at 5.5 A; -12 V at 1.5A
Controls and Signaling	TTL
General Characteristics	
Efficiency	75% at full load
Dimensions	4 x 12.7 x 28 cm (1.6 x 5 x 11 inch) for a 6.8 watt/inch3 power density output

Function	Specification
Safety Standards	EN 60950-1, UL 6050-1
AC Input	
PEM/AC	Power Entry Module for AC
Input	100 to 240 V AC 50/60 Hz, 8A Max

The Power Supply module provides LEDs on its front panel, as described in the table below.

Table 3-19: AC Power Supply (PS/AC/3K) Module LEDs Description

LED	Color	Status	Description
FAULT	**Yellow**	On	Power supply failure.
	--	Off	Normal operation.
POWER	**Green**	On	Power is supplied to the blade.
	--	Off	No power is supplied to the blade.

3.8.2 DC Power System

The DC power system is powered by two DC redundant feeds (providing 1+1 power redundancy) and consists of the following hardware components:

- Power Entry Module (PEM/DC/3K) – see Section 3.8.2.1 on page 41
- Power Supply Module (PS/DC/3K) – see Section 3.8.2.2 on page 42

Warnings:

- Use two separate DC power sources for power redundancy to avoid total power failure in case one of the DC power sources fails.
- When using DC power as the primary input, ensure that the output is SELV, as defined by the safety standard requirements CAN/CSA-C22.2 No. 60950-1UL 60950-1, and EN 60950-1.

The table below lists the device's DC power specifications.

Table 3-20: DC Power Supply Specifications

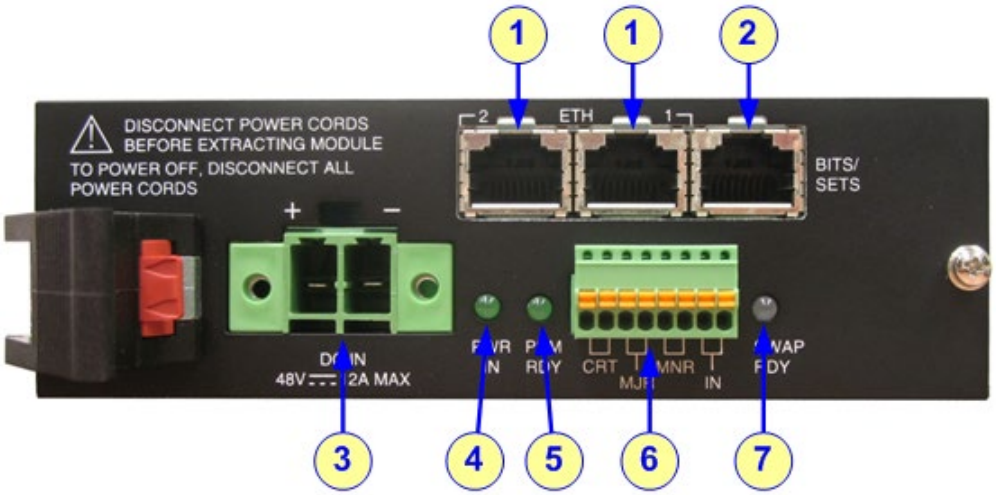
Parameter	Value
Power Requirements	-40.5 to -60 VDC
Power Consumption	▪ **Mediant 3000 with TP-6310:** ✓ **OC-3/STM-1 Simplex: 4.5A @ 48 VDC, 216W** ✓ **O**C-3/STM-1 HA: 7.1A @ 48 VDC, 343W ▪ **Mediant 3000 with TP-8410:** ✓ 16E1/21T1 Simplex: 3.1A @ 48 VDC, 150W ✓ 16E1/21T1 HA: 4.4A @ 48 VDC, 211W ✓ 63E1/84T1 Simplex: 4.4A @ 48 VDC, 211W ✓ 63E1/84T1 HA: 7A @ 48 VDC, 336W
Connection Provisions	PEMs with input block terminals

3.8.2.1 DC Power Entry Module

The device's chassis is supplied with two PEM/DC/3K DC Power Entry Modules (PEM) modules (housed in its rear panel), for connecting the device's chassis to the DC power sources. The dual PEMs allow connection to two independent DC power sources, providing electrical input (power) redundancy (High Availability) in the event of a failure in one of the DC power sources. The device uses complete power entry separation between the two existing DC power supplies in the system.

Each PEM is connected to its corresponding Power Supply module (see Section 3.8.2.2 on page 42) located on the front panel. In other words, the upper PEM connects to the upper Power Supply module; the lower PEM connects to the lower Power Supply module. Therefore, when a fault is detected on a PEM module, its corresponding Power Supply module becomes inactive. In normal operation, both PEMs should be cabled to a power supply. When both PEMs are powered, both Power Supply modules provide power simultaneously to the device.

Figure 3-21: DC Power Entry (PEM/DC/3K) Module



The table below describes the PEM module's connectors and LEDs.

Table 3-21: DC Power Entry (PEM/DC/3K) Module Description

Item #	Label	Description
1	**ETH**	▪ **PEM with 6310 blades:** N/A (GbE interface is provided by the Ethernet ports on RTM-6310). ▪ **PEM with 8410 blades:** Two 10/100BaseT Ethernet interfaces (RJ-45 ports) for connection to OAMP and Control (optional) networks for the Physical Network Separation feature. For more information, see Section 5.3.2 on page 60. Their operating status is provided by the **ETH** LEDs on the 8410 blade (see Section 3.4.1 on page 26).
2	**BITS/SETS**	Standard E1/T1 RJ-48 connector for synchronization and timing source.
3	**DC IN**	-48 VDC power inlet.
4	**PWR IN**	Power LED (green color) - incoming primary voltage (-48 VDC) detected.
5	**PEM RDY**	Backplane power is alive (secondary PEM power is normal and active). The LED lights up green.

Item #	Label	Description
6	**CRT**, **MJR**, **MNR**, **IN**	Alarm Terminal Block Closures: Contains four groups of terminals for connecting external Telco alarm devices according to Critical, Major, and Minor severities. Devices can be controlled using Common, Normally Open method. The IN connector is for Shelf (User-Defined) connections, which are to be implemented in a future version.
7	**SWAP RDY**	N/A.

3.8.2.2 DC Power Supply Modules

The PS/DC/3K Power Supply module is an advanced-design, multi-output switching power supply, providing DC primary input power configurations. The Power Supply modules are located on the front panel and connect to the PEM modules (located on the rear panel), through the chassis' backplane.

Figure 3-22: DC Power Supply (PS/DC/3K) Module

Power for the device is typically supplied from redundant DC power feeds, whose input voltage ranges from -40 to -60 VDC nominal -48 to -60 VDC mains, and reverse-polarity protected. The Power Supply modules function in an output current, load-sharing configuration to provide necessary voltages and fail-safe operation to the blades in the chassis.

The unit has a handle for easy removal and re-insertion, under power (hot-swap capable).

Table 3-22: DC Power Supply (PS/DC/3K) Module Specifications

Function	Specification
Output	
Output Power	300 watts maximum, continuous
Outputs (V1-V4)	+3.3 V at 40 A; +5 V at 40 A; +12 V at 5.5 A; -12 V at 1.5A
Controls & Signaling	TTL
General Characteristics	
Efficiency	75% at full load
Safety Standards	EN 60950-1, UL 6050-1
Dimensions	4 x 12.7 x 28 cm (1.6 x 5 x 11 inch), for a 6.8 watt/inch3 power density output
DC Input	
PEM/DC	Power Entry Module for DC

Function	Specification
Input	-40.5 to -72 VDC

The Power Supply module provides LEDs on its front panel, as described in the table below.

Table 3-23: DC Power Supply (PS/DC/3K) Module LEDs Description

LED	Color	Status	Description
POWER	**Green**	On	Power is supplied to the blade.
	--	Off	No power is supplied to the blade.
FAULT	**Red**	On	Power supply failure.
	--	Off	Normal operation.

This page is intentionally left blank.

4 Rack-Mounting the Device

The device is a 19-inch, 2U-high rack mount chassis that can be mounted in a standard 19-inch rack. Mounting is done by attaching the device directly to the rack's frame using the chassis' integral mounting brackets (flanges). These flanges are located on the left and right sides of the chassis. Each flange provides two holes (44.5 mm between screw-hole centers) for attachment to the rack.

Rack Mount Safety Instructions

When installing the chassis in a rack, ensure you implement the following safety instructions:

- **Elevated Operating Ambient Temperature:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the device's maximum ambient operating temperature (Tma) of 40°C (104°F).
- **Reduced Air Flow:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation on the equipment is not compromised.
- **Mechanical Loading:** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing:** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips.)

Notes:

- At least **two** people are required to mount the device in the 19-inch rack.
- Optional rear and mid-attachment is also supported. The mounting brackets for these attachments are **not** provided by AudioCodes and must be purchased from a third-party vendor of your choosing.

➢ **To install the device in a 19-inch rack:**

1. With two people, lift the chassis into the rack from the front of the rack.
2. Hold the chassis for support while the second person positions the chassis so that the front mounting brackets are flush against the front rack posts and that the holes of the brackets align with the holes on the posts.

Note: Make sure that the left and right front-mounting brackets are attached at the same level in the rack posts so that the chassis is supported in a horizontal position.

3. Hold the chassis in position while the second person secures the two front mounting brackets to the front posts, using 19-inch rack bolts (not supplied) to the rack posts.

Figure 4-1: Chassis Mounted in 19-inch Rack

5 Cabling the Device

This section describes how to cable the device:

- Connecting to earth (ground) the chassis – see Section 5.1 on page 47
- Connecting the PSTN interfaces:
  - For chassis with TP-6310 / RTM-6310:
    - Connecting to STM-1/OC-3 interfaces – see Section 5.2.1 on page 49
    - Connecting to T3 interfaces – see Section 5.2.2 on page 51
  - For chassis with TP-8410 / RTM-8410:
    - Connecting to E1/T1 PSTN interfaces – see Section 0 on page 54
- Connecting to Gigabit Ethernet (GbE) interfaces:
  - For chassis with TP-6310 / RTM-6310:
    - Connecting to GbE interfaces - see Section 5.2.3 on page 52
  - For chassis with TP-8410 / RTM-8410:
    - Connecting Ethernet interfaces to OAMP and Control IP networks – see Section 5.3.2 on page 59
    - Connecting to GbE interfaces – see Section 5.3.3 on page 61
- Connecting BITS trunk sources for clock synchronization – see Section 5.4 on page 63
- Connecting to an external Telco alarm equipment – see Section 5.5 on page 65
- Connecting RS-232 interface for serial communication with a computer – see Section 5.6 on page 67
- Connecting to power – see Section 5.7 on page 67

5.1 Grounding the Chassis

The procedure below describes how to ground the chassis.

Earthing

Before connecting the chassis to the earth, read the following:

Safety Earth

Intrinsically, the chassis must be safety-earthed using an equipment-earthing conductor. Do not depend on locknut-bushings and double-locknuts for bonding. Use the earthing hardware provided with the chassis.

Earthing Electrode

The chassis must be earthed to a stable local earth reference. The chassis earth terminal should be connected through a separate earth wire (6-8 AWG recommended) to the rack's earthing. The earth connection's resistance must not be greater than 0.1 Ohm. Verify that the rack's earthing is properly performed.

For Finland: "Laite on liltettava suojamaadoituskoskettimilla varustettuun pistorasiaan."

For Norway: "Apparatet rna tilkoples jordet stikkontakt."

For Sweden: "Apparaten skall anslutas till jordat uttag."

➢ **To ground the chassis:**

- Permanently connect the chassis to a suitable earth with the earthing screw on the rear connector panel using a one-hole G-32 lug and a 6-8 AWG wire.

5.2 Cabling RTM-6310 Interfaces

This section describes how to connect the interfaces provided on RTM-6310:

- PSTN interfaces (depending on software configuration):
  - Connecting to STM-1/OC-3 interfaces – see Section 5.2.1 on page 49
  - Connecting to T3 interfaces – see Section 5.2.2 on page 51
- Connecting the Gigabit Ethernet interfaces to the IP network or LAN – see Section 5.2.3 on page 52

Note: This section is applicable only to devices with TP-6310 / RTM-6310.

5.2.1 Connecting to STM-1/OC-3 PSTN Interfaces

RTM-6310 provides two pairs of 155-Mbps optical small form-factor pluggable (SFP) transceiver modules using 1310 nm wavelength. The SFP pairs provide 1+1 redundancy scheme for STM-1/OC-3 PSTN interfaces.

To interface with the SFP modules, you need to provide (i.e., not supplied) the following items:

- **Cable:** twin, single-mode fiber optic cable
- **Connector:** LC-type plug

The table below lists the specifications of the single-mode fiber interface:

Table 5-1: Single-Mode Fiber for STM-1/OC-3 PSTN Specifications

Specification	Description
Input Sensitivity	-32 dBm typical; -28 dBm maximum
Output Power	-15 dBm minimum; -8 dBm maximum

Caution Laser

Some blades contain a Class 1 LED/Laser emitting device, as defined by 21CFR 1040 and IEC825.

Do NOT stare directly into the beam or into fiber optic terminations as this can damage your eyesight.

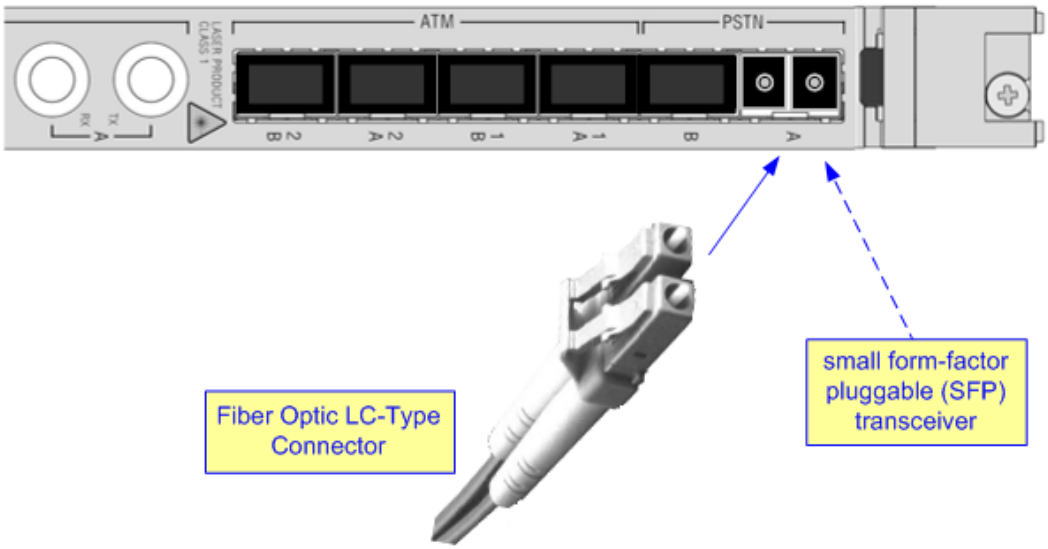
Care in Handling Fiber Optic Cabling:

1. When handling fiber optic cables, be sure to implement the following:
   - √ Excessive bending of the Fiber Optic Cable can cause distortion and signal losses.
   - √ Ensure the minimum bending radius recommended by the Fiber Optic Cable supplier.
   - √ Maximum Fiber Optic cable length for multimode fiber is 550 m.
2. Incoming optic cabling from the network infrastructure can originate from the top of the rack or from another shelf within the rack. Preserve the minimum-bending ratio indicated by the cable manufacturer.
3. To ensure full high-availability capabilities, the configuration of the interface to the IP backbone must include certain redundant features from which two separate fiber optic cables are entering the device.

➢ To connect the STM-1/OC-3 PSTN interface:

1. Remove the protective dust plug from the device's SFP transceiver module.
2. Connect a twin, single-mode fiber optic cable with LC-type plugs to the STM-1/OC-3 PSTN SFP transceivers (labeled **PSTN** - **A**).
3. For redundancy, connect a twin, single-mode fiber optic cable with LC-type plugs to the second pair of STM-1/OC-3 SFP transceivers (labeled **PSTN** - **B**).

Figure 5-1: Connecting the PSTN Fiber Optic Interface



Note: To ensure full 1+1 redundancy protection, two pairs of fiber optic cables must be connected to corresponding PSTN connectors on RTM-6310 (i.e., PSTN ports **A** and **B**).

5.2.2 Connecting to T3 PSTN Interfaces

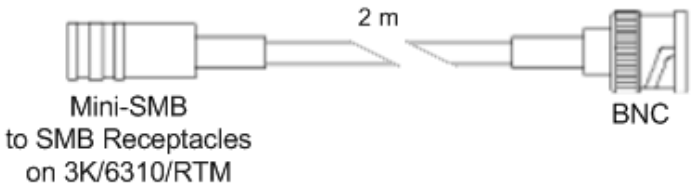
RTM-6310 provides three pairs of Molex mini-SMB receptacles for providing up to three T3 PSTN interfaces. Each mini-SMB pair provides a female connector for receiving and a female connector for transmitting. These SMB jacks must be connected to coaxial cables (not supplied).

To interface with the SMB receptacles, you need to provide (i.e., not supplied) the following items:

- **Cable:** RG-179/U coaxial cable (see figure below)
- **Connector:** 75-Ohm (44.736 Mbps) male mini-SMB terminated on a coaxial cable (see figure below)

The required cable is a Mini SMB-to-BNC cable adaptor (not supplied). Two cable adaptors are required per T3 interface (i.e., per SMB receptacle pair). The figure below displays this cable adaptor.

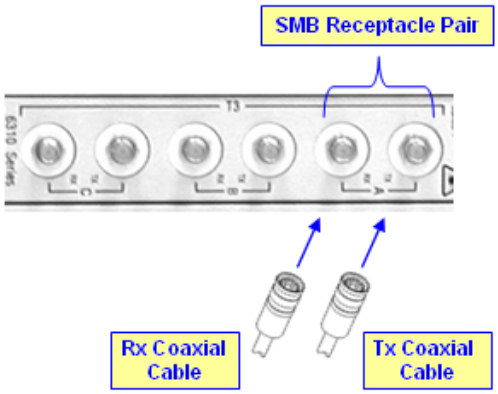
Figure 5-2: Mini SMB-to-BNC Adaptor Cable (Not Supplied)



➢ **To connect the T3 PSTN interface:**

- On RTM-6310, connect twin SMB T3 RG-179/U coaxial cables to the required SMB receptacles (labeled **T3 - A**, **T3 - B**, and **T3 - C**). For each T3 connection, ensure that you connect the transmit SMB connector to the SMB receptacle labeled **TX** and the receive SMB connector to the SMB receptacle labeled **RX**.

Figure 5-3: Connecting the SMB Connector Pair for T3 Interface



5.2.3 Connecting GbE Interfaces to IP Network

The RTM-6310 (and RTM-6310 Redundant for HA mode) provide two GbE interface ports (labeled **ETHERNET 1** and **2**) with full-duplex mode and auto-negotiation. These two ports provide 1+1 Ethernet redundancy.

The Ethernet ports can be provided in one of the following types (customer ordered):

- 10/100/1000Base-TX RJ-45 connector interface (CAT-5 twisted-pair copper cabling)
- 1000Base-SX 1.25 Gbps multi-mode optical small form-factor pluggable (SFP) transceiver, using 850 nm wavelength (hot-swappable)

➢ **To connect the Gigabit Ethernet interfaces:**

- Connect the LAN cable (wired according to the pinouts described in the table below) to one of RTM-6310 GbE ports, using one of the following cable setups (depending on customer order):
  - **SPF transceivers:** Multi-mode fiber optic cables with dual LC plugs.
  - **RJ-45 connectors:** Category 5 LAN cables with RJ-45 plugs (see the figure below):

Figure 5-4: RJ-45 Ethernet Network Port and Connector

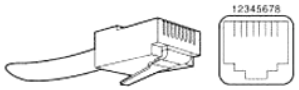
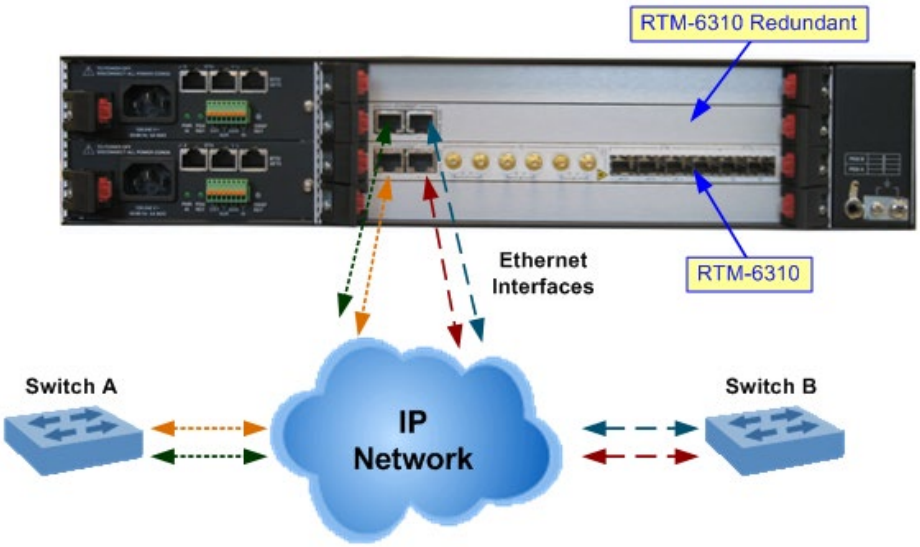


Table 5-2: RJ-45 Connector Pinouts for Gigabit Ethernet Interface

Pin	FE Signal	GE Signal
1	TX DATA+1	Tx A+
2	TX DATA-	Tx A-
3	RX DATA+2	Rx B+
4	N/C	Tx C+
5	N/C	Tx C-
6	RX DATA-	Rx B-
7	N/C	Rx D+
8	N/C	Rx D-

To provide full Ethernet redundancy for HA mode, it is recommended to connect all four Ethernet interfaces (two on RTM-6310 and two on RTM-6310 Redundant) to the external IP network. In addition, to provide Ethernet switch redundancy, the two Ethernet ports on each RTM must be connected to different switches, as illustrated in the figure below:

Figure 5-5: Connecting for LAN Redundancy (for HA Mode Only)



5.3 Cabling RTM-8410 Interfaces

This section describes how to connect the interfaces provided on RTM-8410:

- Connecting to E1/T1 PSTN interfaces – see below section
- Connecting Ethernet interfaces to OAMP and Control IP networks – see Section 5.3.2 on page 59
- Connecting to GbE interfaces – see Section 5.3.3 on page 61

Note: This section is applicable only to devices housing TP-8410 / RTM-8410.

5.3.1 Connecting to E1/T1 PSTN Interfaces

The RTM-8410 blade provides SCSI connectors for interfacing with the E1/T1 trunks.

You can use your own cable connectors or you can purchase orderable cable adapters from AudioCodes. If you use your own cable connectors, make sure that they adhere to the following:

- **Cable:** 26 AWG (100 to 120 Ohm) cable
- **Connector:**

Table 5-3: Recommended Cable Terminations for 68- and 100-Pin SCSI Connectors

Part	Description	No. of Pins	Part #	Supplier
Male Connector	1.27 mm Cable Plug	68	R-ZI-013068	All Best Electronics Co Ltd.
		100	R-ZI-013100	
Cable Hood or Shroud	0.050 Series Backshell	68	R-ZC-013068-S3	
		100	R-ZC-013100-S	

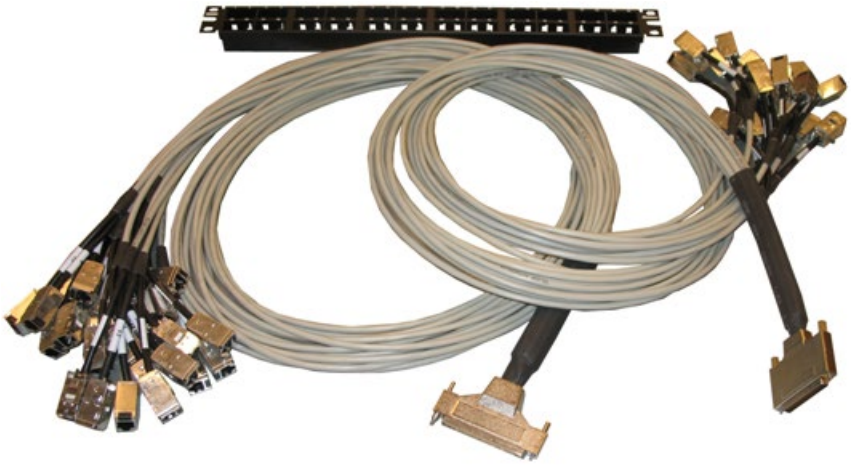
Alternatively, you can order the following 2-meter cable adapters with patch panels (SCSI connector to patch panel) from AudioCodes:

- **Up to 16 Spans:** SCSI connector (100 pin) to 16 x RJ-48 cable adapter with a 19-inch rack mount patch panel (CPN: SCSI-16xE1/T1-CABLE).
- **Up to 21 Spans:** SCSI connector (100 pin) to 24 x RJ-48 cable adapter with a 19-inch rack mount patch panel (CPN: SCSI-24xT1-CABLE).

Figure 5-6: 100-Pin SCSI Patch Cable Adapter for up to 21 Spans (AudioCodes Orderable Item)

- **Up to 42 or 84 Spans:** SCSI connectors (100 pin and 68 pin) to 42 x RJ-48 cable adapter with a 19-inch rack mount patch panel (CPN: SCSI-42xE1/T1-CABLE).

Figure 5-7: 68- and 100-Pin SCSI Patch Cable Adapter - 42 or 84 Spans (AudioCodes Orderable Item)



For more than 42 spans, you need to order 2 x 42-Spans (i.e., 2 x SCSI-42xE1/T1-CABLE).

The following table lists the number of RTM-8410 blades, SCSI connectors as well as AudioCodes orderable cables per required E1/T1 span configuration:

Table 5-4: RTM-8410 Blade and SCSI Connectors per E1/T1 Span Configuration

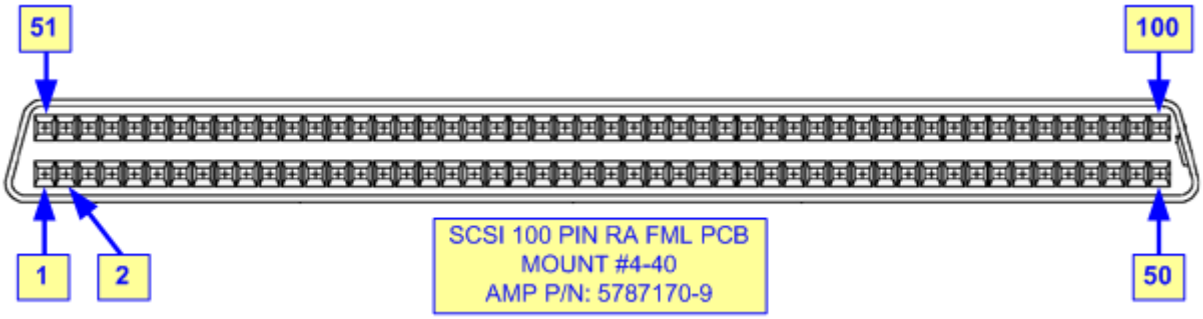
Required Spans	Connected to RTM-8410 in Slot	SCSI Connector on RTM-8410	Trunks	Orderable Cable Adapter
Up to 16	Slot 2	100-Pin	1-16	1 x SCSI-16xE1/T1-CABLE
		68-Pin (Available Only for Scalable Platforms)	-	-
	Slot 4 (Available Only for Scalable Platforms)	100-Pin	-	-
		68-Pin	-	
Up to 21	Slot 2	100-Pin	1-21	1 x SCSI-24xT1-CABLE
		68-Pin (Available Only for Scalable Platforms)	-	-
	Slot 4 (Available Only for Scalable Platforms)	100-Pin	-	-
		68-Pin	-	
Up to 42	Slot 2	100-Pin	1-25	1 x SCSI-42xE1/T1-CABLE
		68-Pin	26-42	
	Slot 4 (Available Only for Scalable Platforms)	100-Pin	-	-
		68-Pin	-	
Up to 84	Slot 2	100-Pin	1-25	1 x SCSI-42xE1/T1-CABLE
		68-Pin	26-42	
	Slot 4	100-Pin	43-67	1 x SCSI-42xE1/T1-CABLE
		68-Pin	68-84	

Note: For scalable platforms, the device is installed with two RTM-8410s, where the RTM-8410 blade in Slot #4 supports trunk 43 and above (up to trunk 84).

5.3.1.1 100-Pin SCSI Connector Specifications

The 100-pin female SCSI connector on the RTM-8410 is shown in the figure below.

Figure 5-8: 100-Pin SCSI Female Connector on RTM-8410 Blade



This connector must mate with a male connector that is wired according to the connector pinouts in the subsequent table.

Table 5-5: E1/T1 Connections 1 to 25 on the 100-Pin SCSI Connector Pinouts

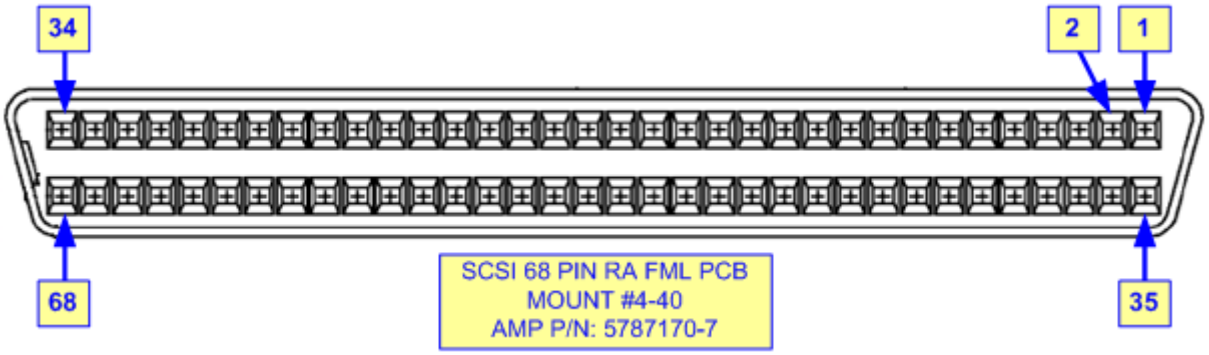
E1/T1 Number (1 to 25) RTM-8410 in Slot #2	E1/T1 Number (43 to 67) RTM-8410 in Slot #4	Tx Pins (Tip / Ring)	Rx Pins (Tip / Ring)
1	43	2 / 1	52 / 51
2	44	4 / 3	54 / 53
3	45	6 / 5	56 / 55
4	46	8 / 7	58 / 57
5	47	10 / 9	60 / 59
6	48	12 / 11	62 / 61
7	49	14 / 13	64 / 63
8	50	16 / 15	66 / 65
9	51	18 / 17	68 / 67
10	52	20 / 19	70 / 69
11	53	22 / 21	72 / 71
12	54	24 / 23	74 / 73
13	55	26 / 25	76 / 75
14	56	28 / 27	78 / 77
15	57	30 / 29	80 / 79
16	58	32 / 31	82 / 81
17	59	34 / 33	84 / 83
18	60	36 / 35	86 / 85
19	61	38 / 37	88 / 87
20	62	40 / 39	90 / 89
21	63	42 / 41	92 / 91

E1/T1 Number (1 to 25) RTM-8410 in Slot #2	E1/T1 Number (43 to 67) RTM-8410 in Slot #4	Tx Pins (Tip / Ring)	Rx Pins (Tip / Ring)
22	64	44 / 43	94 / 93
23	65	46 / 45	96 / 95
24	66	48 / 47	98 / 97
25	67	50 / 49	100 / 99

5.3.1.2 68-Pin SCSI Connector Specifications

The 68-pin female SCSI connector on the RTM-8410 is shown in the figure below.

Figure 5-9: 68-Pin SCSI Female Connector on RTM-8410 Blade



This connector must mate with a male connector that is wired according to the connector pinouts in the subsequent table.

Table 5-6: E1/T1 Connections 26 to 42 on the 68-pin SCSI Connector Pinouts

E1/T1 Number (26 to 42) RTM-8410 in Slot #2	E1/T1 Number (68 to 84) RTM-8410 in Slot #4	Tx Pins (Tip / Ring)	Rx Pins (Tip / Ring)
26	68	2 / 1	36 / 35
27	69	4 / 3	38 / 37
28	70	6 / 5	40 / 39
29	71	8 / 7	42 / 41
30	72	10 / 9	44 / 43
31	73	12 / 11	46 / 45
32	74	14 / 13	48 / 47
33	75	16 / 15	50 / 49
34	76	18 / 17	52 / 51
35	77	20 / 19	54 / 53
36	78	22 / 21	56 / 55
37	79	24 / 23	58 / 57
38	80	26 / 25	60 / 59

E1/T1 Number (26 to 42) RTM-8410 in Slot #2	E1/T1 Number (68 to 84) RTM-8410 in Slot #4	Tx Pins (Tip / Ring)	Rx Pins (Tip / Ring)
39	81	28 / 27	62 / 61
40	82	30 / 29	64 / 63
41	83	32 / 31	66 / 65
42	84	34 / 33	68 / 67

5.3.1.3 Cabling Procedure

The procedure below describes how to cable the E1/T1 trunks

➢ **To connect the E1/T1 trunk interfaces:**

1. Prepare a SCSI cable of suitable length to connect between RTM-8410 housed in Slot #2 and the PBX/PSTN switch. The connector at the RTM-8410 end of the cable should be wired as shown in the tables below (one cable for the 100-pin connector and a second cable for the 68-pin connector).
2. **For 42- and 84-spans configurations:**
   a. Attach the trunk cable with a 100-pin male SCSI connector to the 100-pin female SCSI connector labeled **T1/E1 Trunks 1 to 25**.
   b. Attach the trunk cable with a 68-pin male SCSI connector to the 68-pin female SCSI connector labeled **T1/E1 Trunks 26 to 42**.
   c. For trunks 43 to 84, repeat steps 2.a and 2.b for the RTM-8410 housed in Slot #4.
3. **For 16-spans configuration:** attach the trunk cable with a 100-pin male SCSI connector to the 100-pin female SCSI connector labeled **T1/E1 Trunks 1 to 16**.
4. Connect the other end of the trunk cables to the PBX/PSTN switch.

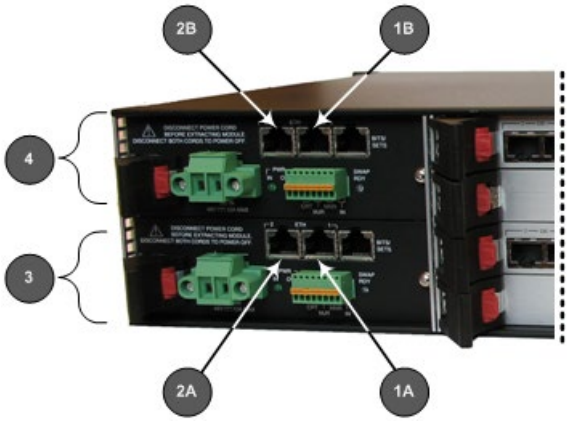
Note: For RTM-8410 in Slot #4, ignore the trunk numbers printed on the two SCSI connectors.

5.3.2 Connecting Ethernet Interfaces to OAMP and Control IP Networks

For devices using the TP-8410 blades, you can cable the device to physically separate the media, control, and OAMP traffic interfaces. Depending on configuration, the port allocation is as follows:

- **Dedicated Port per Application Type:**
  - **Media:** Gigabit Ethernet port on RTM-8410 (see Section 5.3.3 on page 61 for cabling instructions).
  - **Control:** 10/100BaseT Ethernet ports labeled **1A** (bottom Power Entry Modules/PEM module) and **1B** (top PEM module)
  - **OAMP:** 10/100BaseT Ethernet ports labeled **2A** (bottom PEM module) and **2B** (top PEM module)
- **Dedicated Port for OAMP and Dedicated Port for Media and Control:**
  - **Media and Control:** Gigabit Ethernet port on RTM-8410.
  - **OAMP:** 10/100BaseT Ethernet ports labeled 2A (bottom PEM module) and 2B (top PEM module)

Figure 5-10: Connecting PEM Ethernet Ports to Control and OAMP Networks



Legend	Description
1A	Ethernet Port 1A
1B	Ethernet Port 1B
2A	Ethernet Port 2A
2B	Ethernet Port 2B
3	Bottom (A) PEM #1 Module
4	Top (B) PEM #2 Module

The dual ports per network interface type provide 1+1 redundancy. These ports connect directly to the active TP-8410 blade in the front panel.

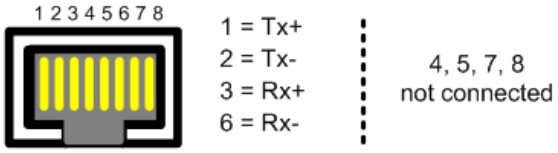
The operating status of these ports is provided by the **ETH** LEDs on the TP-8410 blade (see Section 3.4.1.2 on page 28).

Notes:

- The Physical Network Separation feature is enabled by the *EnableNetworkPhysicalSeparation* parameter. The port allocation for Physical Network Separation is configured by the PhysicalSeparationConfiguration parameter. For more information, refer to the *User's Manual*.
- When Physical Network Separation is disabled, all traffic types (i.e., Media, Control, and OAMP) are directed through the GbE port on the RTM-8410.

The RJ-45 connectors for the Control and OAMP interfaces are wired according to the figure below:

Figure 5-11: RJ-45 Connector Pinouts for OAMP and Control Interfaces



➢ **To connect the OAMP and Control network interfaces:**

1. For each network type, connect a standard CAT-5 network cable to the required Ethernet RJ-45 port (as described above) on one of the PEM modules.
2. Connect the other end of the CAT-5 network cable to your IP network.
3. For Ethernet redundancy, repeat steps 1 through 2 for the corresponding Ethernet port on the second PEM module.

5.3.3 Connecting GbE Interfaces to IP Network

The RTM-8410 provides two GbE interface ports, supporting 1+1 Ethernet redundancy with full-duplex mode and auto-negotiation. These ports are used for interfacing with the IP network (LAN). The status of these ports is indicated by the **GBE** LEDs on the TP-8410 blade (see Section 3.4.1.2 on page 28).

The Ethernet ports can be provided (customer ordered) as one of the following types:

- 10/100/1000Base-TX RJ-45 connector interface (CAT-5 twisted-pair copper cabling)
- 1000Base-SX multi-mode optical small form-factor pluggable (SFP) transceiver, using 850 nm wavelength

The table below lists the specifications of the single-mode fiber interface:

Table 5-7: Multi-Mode Fiber for GbE Specifications

Specification	Description
Input Sensitivity	-29 dBm typical; -17 dBm maximum
Output Power	-9.5 dBm minimum; -2 dBm maximum

Notes:

- In HA mode, both RTM-8410s must be separately cabled to the IP network (using the GbE interface ports). When in Simplex mode and using two RTM-8410s (i.e., for 84 E1/T1), only the RTM-8410 in Slot #2 must be cabled to the IP network.
- Two RTM-8410s are used for 42 and 84 spans in Simplex and HA modes. Therefore, in HA mode and to provide full Ethernet redundancy, it is recommended to connect all four Ethernet ports to the external IP network. In addition, to provide Ethernet switch redundancy, the two Ethernet ports on each RTM-8410 must be connected to different switches.
- When Physical Network Separation is disabled, the RTM-8410 GbE port is used for all traffic (i.e., Media, Control, and OAMP). When the device is configured for Physical Network Separation, the RTM-8410s GbE port is used only for interfacing with the Media network and optionally, the Control network (depending on configuration). The connection to the OAMP network and optionally the Control network (depending on configuration) is done on the PEM modules (see Section 5.3.2 on page 60). The Physical Network Separation feature is enabled by the *EnableNetworkPhysicalSeparation* parameter. The port allocation for Physical Network Separation is configured by the PhysicalSeparationConfiguration parameter. For more information, refer to the *User's Manual*.

➢ **To connect the GbE interfaces:**

- Connect the LAN cable to each of the RTM-8410's GbE ports, using CAT-5 LAN cables with RJ-45 connectors (see the figure below) or multi-mode fiber optic cables with dual LC plugs.

Figure 5-12: RJ-45 Port and Connector for GbE

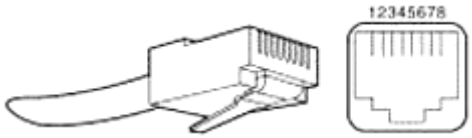


Table 5-8: RJ-45 Connector Pinouts for GbE

Pin	FE Signal	GE Signal
1	TX DATA+1	Tx A+
2	TX DATA-	Tx A-
3	RX DATA+2	Rx B+
4	N/C	Tx C+
5	N/C	Tx C-
6	RX DATA-	Rx B-
7	N/C	Rx D+
8	N/C	Rx D-

5.4 Connecting to BITS Trunk for Clock Synchronization

When the device is configured for the Building Integrated Timing Source (BITS) synchronization mode, you need to follow the procedure described in this section for appropriate cabling.

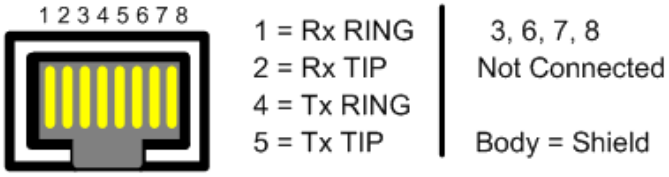
Note: For a detailed explanation on configuring the BITS clock synchronization, see the *User's Manual*.

In HA mode, both active and redundant TP-6310 or TP-8410 blades are synchronized by two BITS source interfaces (i.e., input trunks). The BITS trunks flow through the two SA/M3K blades in the front panel (see Section 3.5 on page 31), each with a designated timing module, which is located on the PEM modules. Two SA/M3K blades are required to ensure seamless clock operation in case of failure in one of the SA/M3K blade's timing-modules (i.e., clock redundancy). When one of the BITS reference clock sources fails, the device automatically switches to the secondary source as a reference clock for the whole system.

In Simplex mode, if the primary BITS clock source fails (and clock fallback is enabled), the device uses the secondary BITS clock source. However, during the transition between the failed clock and the secondary clock, the device remains in hold-over mode until the secondary clock is acquired.

The RJ-48c connector pinouts are shown in the figure below:

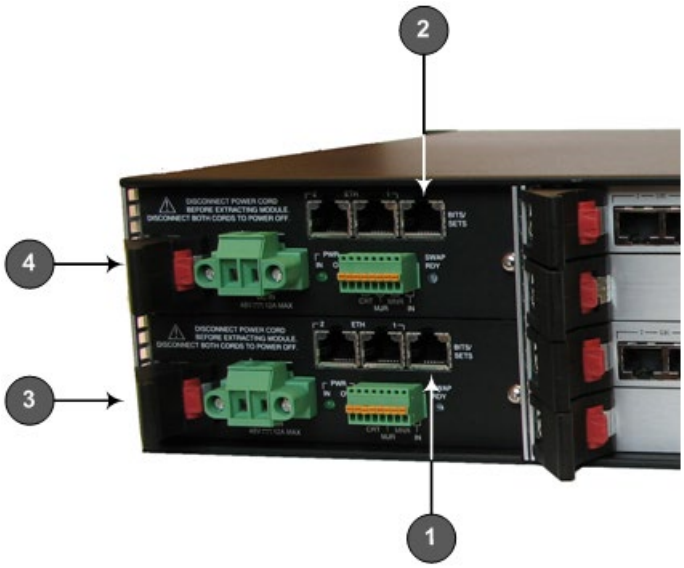
Figure 5-13: RJ-48c Connector Pinouts for E1/T1



➢ **To cable the PEM modules for BITS synchronization mode:**

1. Connect the Trunk from BITS source A to the RJ-48 port (labeled **BITS/SETS**), located on the lower PEM module (A).
2. Connect the Trunk from BITS source B to the RJ-48 port (labeled **BITS/SETS**), located on the upper PEM module (B).

Figure 5-14: Connecting BITS Trunk Sources on PEM



Legend	Description
1	Connects trunk from BITS Source A
2	Connects trunk from BITS Source B
3	Lower PEM #1 (A)
4	Upper PEM #2 (B)

5.5 Connecting to Telco Alarm Interface

The Alarm Terminal Block closure on the PEM module contains four groups of terminals for connecting external Telco alarm devices according to Critical, Major, and Minor severity levels. Devices can be controlled using the Common (COM) and Normally Open (NO) method. The IN connector is for user-defined connections (currently not supported).

The PEM module provides three dry contact relays for connecting to Telco alarm equipment. Each alarm output is a dry relay contact. Each contact can withstand up to a maximum of 30 VDC when open and carries up to a maximum of 2 A DC when closed.

Warning: If you are **not** using this external alarm functionality, you must remove the Alarm Terminal Block connector from the PEM module (and store it for future use).

➢ **To cable the PEM alarm terminal block closures:**

1. Connect the PEM module's alarm terminal block closures to an external Telco alarm device, using 20-AWG copper wires.
2. Connect the closures of the PEM using the normal logic method in which the equipment has NO and COM terminals (see the table and figure below).

Figure 5-15: Spring-Cage Alarm Terminal Block Pins

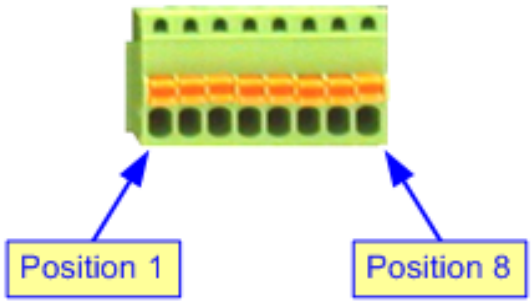
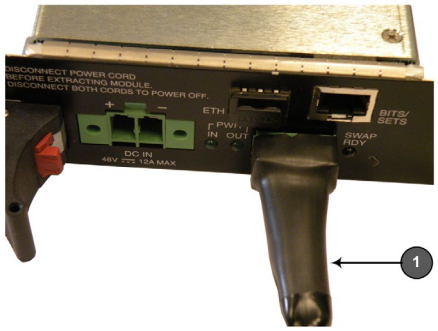


Table 5-9: Alarm Terminal Block Pinouts

Pin	Pin	Description
1 - Common	2 – Normally Open (N.O)	“CRT” (Critical Alarm)
3 - Common	4 – N.O.	“MJR” (Major Alarm)
5 - Common	6 – N.O.	“MNR” (Minor Alarm)
7 – Alarm In	8 – GND	“IN” (User Alarm In)

3. Once you have connected the wires, you must use heat-shrink tubing on the connector and wires on the PEM, in compliance with the IEC61000-4-2 (8KV Air and 4KV Contact) standard (as shown in the figure below).

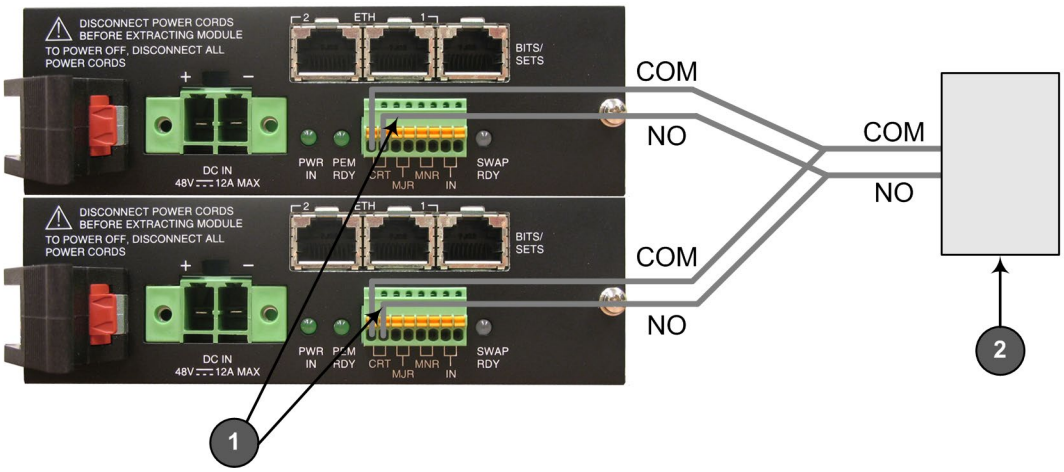
Figure 5-16: Heat Shrink Tubing on PEM Alarm Wires and Connector



Item #	Description
1	Heat Shrink Tubing on Alarm Wires and Connector

It is recommended to provide a dual-redundant solution by wiring the two PEMs' alarm terminal blocks to the alarm device, as shown in the figure below:

Figure 5-17: Normal Logic Alarm Connection (Redundancy Scheme)

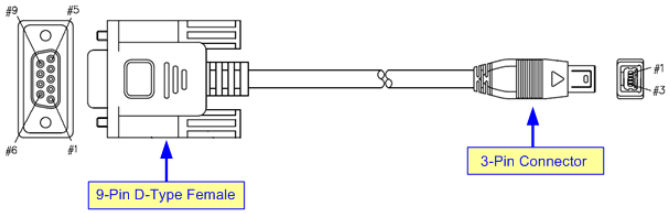


Legend	Description
1	Alarm Terminal Blocks (Critical Alarm)
2	External Telco Alarm Equipment

5.6 Connecting to Computer for Serial Communication

For RS-232 serial communication, a crossover RS-232 cable adapter (of approximately two meters) is supplied. This cable adapter provides a 3-pin connector for connecting to the RS-232 port located on the front panel of the TP-6310 or TP-8410 blade (depending on hardware configuration) and a DB-9 connector (at the other end of the cable) for the COM1 or COM2 RS-232 communication port on your computer.

Figure 5-18: RS-232 Cable Adapter (Supplied)



➢ **To connect the device to a computer for serial communication:**

1. Plug the RS-232 cable adapter's 3-pin connector into the RS-232 port (labeled **1010**) located on the blade's front panel.
2. Connect the DB-9 female connector (at the other end of the RS-232 cable adapter) to the COM1 or COM2 port on the computer.

Note: The RS-232 port is not intended for permanent connection.

5.7 Connecting Power

The device can be connected to one of the following power sources (depending on ordered hardware platform):

- AC power source – see Section 5.7.1 on page 37
- DC power source – see Section 5.7.2 on page 40

Warning: Do not combine AC and DC power configurations on the same chassis (i.e., ensure that both the installed PEM modules support the same power configuration).

Earthing

Before connecting the device to the power supply, ensure that you have earthed (grounded) the chassis, as described in Section 5.1 on page 47.

After powering-up the device, the **PWR** and **FAIL** LEDs on the TP-6310 or TP-8410 blade (depending on ordered hardware platform) are lit, and then after a few seconds, the **FAIL** LED turns off. During this time, the blade loads the relevant software files (e.g., configuration and auxiliary files) and undergoes self-testing (**PSTN** LEDs turn on and then off) for about a minute. After this stage, the **GBE** and **PSTN** LEDs are lit green, indicating a successful connection to the LAN and PSTN interfaces. Any malfunction changes the **FAIL** LEDs to red. For more information on LEDs, see Section 3.3.1.1 on page 22 for TP-6310 or Section 3.4.1 on page 27 for TP-8410.

5.7.1 Connecting to AC Power Supply

The device is supplied with two PEM modules. Each PEM module is equipped with an AC power inlet (IEC 60320 type).

Warning: Use only the AC power cord supplied with the device.

ご注意

本製品に添付の電源ケーブルは、Mediant 3000 に専用設計されているため、汎用性がありません. 本電源ケーブルを他の機器に使用されないよう、ご注意ください.

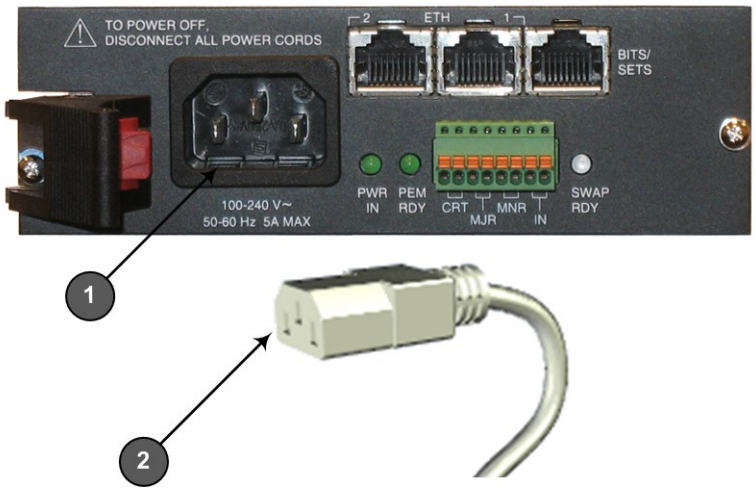
Notes:

- For power redundancy, connect each PEM module to a different AC supply circuit.
- For power redundancy, ensure that the two AC power sources have the same ground potential.
- To power down the device, disconnect **both** AC power cords from the PEM modules.

➢ **To connect the device to an AC power supply:**

1. Plug the AC power cord (not supplied) into the AC power inlet located on the PEM module.
2. Plug the other end of the power cord to an AC electrical outlet.
3. For power redundancy, repeat steps 1 through 2 for the second PEM.

Figure 5-19: Connecting AC Power Cord



Item #	Description
1	AC power inlet
2	IEC 60320 Type AC power plug outlet

5.7.2 Connecting to DC Power Supply

The device is supplied with two PEM modules. Each PEM module is equipped with a DC power inlet (Phoenix Contact type MSTB2.5/2-STF, 5.08 mm). The DC input is floating with a maximum input current of 5.25 A.

Depending on customer requirements, the power cabling is available in one of the following configurations:

- **DC terminal block with a screw connection type:** the device is provided with a pre-installed terminal block in the chassis (DC inlet). This terminal block must be used with 14-AWG wires for connecting to the DC mains.
- **DC terminal block with a crimp connection type:** the device is supplied with a 48-VDC power feed cable crimped to this terminal block. The connector types that constitute this connection is as follows:
  - Phoenix contact type crimp terminal female 14-16 AWG (P/N: STG-MTN 1,5-2,5)
  - Phoenix female terminal block shroud 7.62 mm 2 pole cable mounting (P/N: PCC4/2-ST-7,62)

Electrical Caution

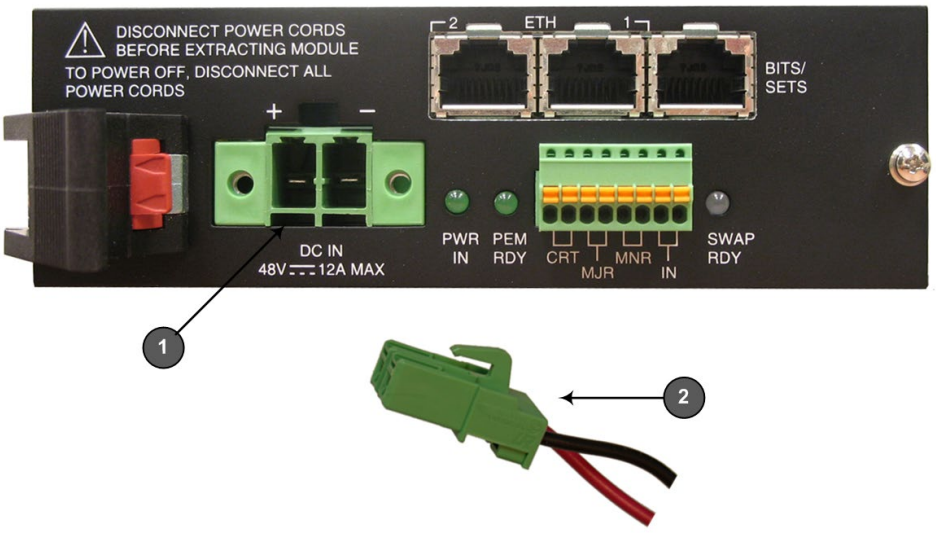
Before crimping the power wires to the terminal blocks, ensure that the power wires are not connected to the DC mains.

➢ **To connect power using a DC terminal block crimp connector:**

1. Remove the terminal block screw from the chassis power socket (labeled **DC IN**), by unscrewing the two screws located on the front of the terminal block.
2. Connect the two insulated wires to the correct DC power outlet. Ensure that the connections to the DC power outlet maintain the correct polarity (positive and negative).
3. Insert the supplied DC power feed cable crimped to the terminal block into the DC inlet (labeled **DC IN**). Ensure that the hook on the terminal block snaps into the groove above the DC inlet.

When power is received, the **PWR IN** LED is lit (green).

Figure 5-20: Power Feed Cable Terminated with Crimp-Connection Type DC Terminal Block



Item #	Description
1	PEM power socket (with removed screw-type terminal block)
2	DC crimp-type terminal block

Notes:

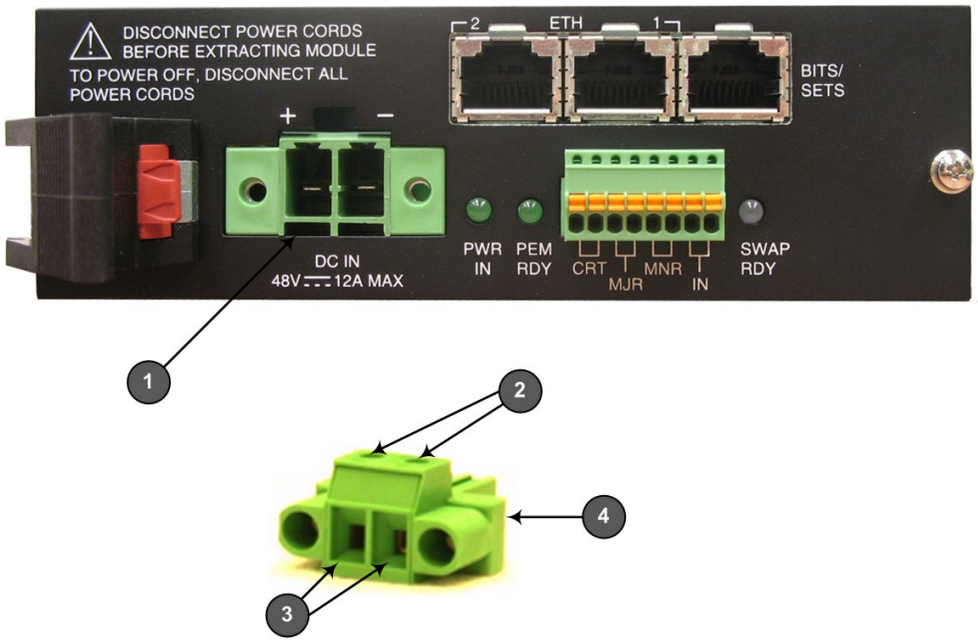
- To ensure power redundancy, connect both PEM modules to the power source.
- To power down the device, disconnect both DC power sources.

➢ **To connect power using a DC terminal block screw connector:**

1. Remove the terminal block screw from the chassis power socket (labeled **DC IN**), by unscrewing the two screws located on the front of the terminal block.
2. Ensure that the power feed cables that you want to use are not connected to your DC power outlet.
3. Create a DC power feed cable by inserting two 48 VDC insulated wires (up to 10 AWG) into the terminal block screw. Secure the wires by fastening the two screws, each one located directly above each wire. Ensure the correct polarity (positive + and negative -), as indicated under the **DC IN** label.
4. Connect the two insulated wires to the correct DC power outlet. Ensure that the connections to the DC power outlet maintain the correct polarity.
5. Re-insert the terminal block screw connector into the DC inlet located on the chassis. Secure the terminal block by tightening the two screws located on the front of the terminal block.

When power is received, the **PWR IN** LED is lit (green).

Figure 5-21: DC Power Connector with and without Screw-type Terminal Block Connector



Item #	Description
1	PEM power socket (without removed terminal block)
2	Terminal-block screws for clamping wires to terminal
3	Screw terminal plug for DC power wires
4	DC Screw-type terminal block removed from PEM power socket

6 Hardware Maintenance and Repair

This section describes the following hardware maintenance and repair operations:

- Electrostatic discharge protection – see Section 6.1 on page 73
- Replacing blades and RTMs – see Section 6.2 on page 74
- Replacing the Power Supply modules – see Section 6.3 on page 77
- Replacing the Power Entry modules – see Section 6.4 on page 79
- Replacing the Fan Tray module – see Section 6.5 on page 80
- Replacing the Air Filter – see Section 6.6 on page 81
- Replacing 155-Mbps Optical SFP Transceiver Modules – see Section 6.7 on page 83

Before performing any maintenance procedures, read the following warning bulletin:

Electrical Component Sensitivity

Electronic components on printed circuit boards are extremely sensitive to static electricity. Normal amounts of static electricity generated by clothing can damage electronic equipment. To reduce the risk of damage due to electrostatic discharge when installing or servicing electronic equipment, it is recommended that anti-static earthing straps and mats be used. For ESD protection procedure, see Section 6.1 on page 73.

6.1 Ensuring ESD Protection before Maintenance Procedures

The procedure below describes how to protect the device from electrostatic discharge (ESD). This must be done before removing or installing chassis modules.

Note: Place all removed components in an anti-static bag.

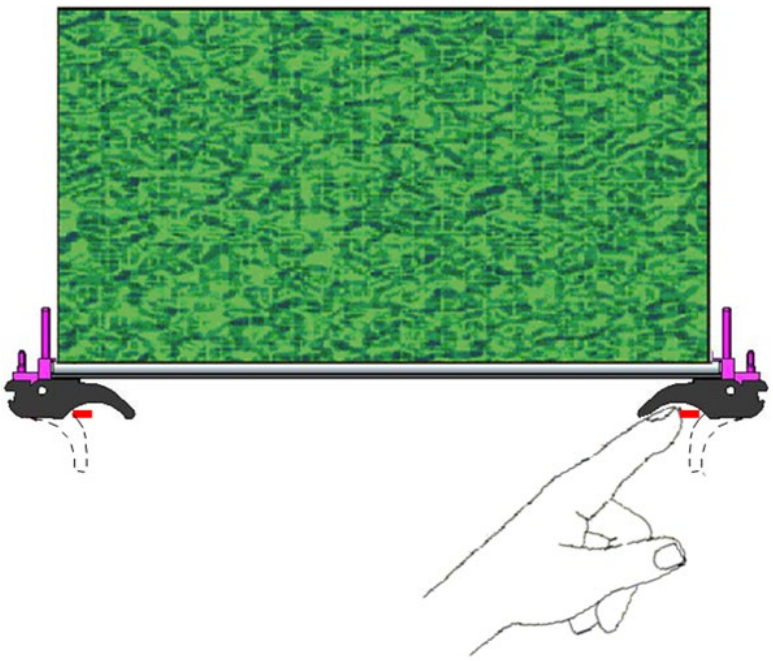
➢ **To protect the device from ESD:**

1. Locate the two ESD connectors on the chassis. One is located on the right rack-mounting flange; the other is located on the rear panel of the Fan Tray module.
2. Attach yourself to an ESD wrist strap and then connect the other end to one of the ESD connectors (mentioned in Step 1), using a banana plug or an alligator clip.

6.2 Replacing Blades and RTMs

This section describes how to replace the blades and RTMs in the chassis. The blades and RTMs provide ejector / injector latches on either side (see the figure below) to secure them to the chassis cage slots.

Figure 6-1: Ejector/Injector Latches on Blade/RTM



Note: It is imperative to cover unoccupied slots with blank panels (see the figure below) in the chassis' front and rear slot cages to maintain internal airflow pressure.

Figure 6-2: Blank Panel for Unoccupied Slots

6.2.1 Replacing Blades for Mediant 3000 Simplex

The procedure below describes how to replace a blade for Mediant 3000 Simplex.

Note: Do not use excessive force when inserting the blade into the chassis cage.

➢ **To replace a blade for Mediant 3000 Simplex:**

1. Perform a software-based "graceful" lock on the device so that no new calls are accepted and current calls are terminated only after a user-defined interval. This can be done using the Web interface, as described in the *User's Manual*.
2. Power down the device.
3. Physically remove the blade:
   a. Using a Philips screwdriver, unfasten the screws located at both ends of the blade that secure the blade to the chassis.
   b. Press the blade's red ejector buttons on each of the two black ejector/injector latches to release the blade from the slot.
   c. Simultaneously rotate the ejector/injector latches outward to disengage the blade from the slot.
   d. Pull on the two ejector/injector latches and gently slide the blade out of the slot.
4. Physically insert the new blade:
   a. Choose the appropriate slot in the chassis.
   b. Ensure that the blade's red ejector buttons on each of the two black ejector/injector latches are pressed-in (i.e., black ejector/injector latches in the open, pulled out position).
   c. Hold the blade horizontally and insert it into the slot, aligning its edges with the groves inside the slot.
   d. Ease the blade all the way into the slot, using your thumbs until the ejector/injector latches touch the chassis and the blade is flush with the chassis slot.
   e. Lock the blade into place by pressing the two black ejector/injector latches on both ends inward, toward the middle, until you hear a click.
   f. Using a Philips screwdriver, fasten the screws located at both ends of the blade to secure it to the chassis and to ensure that it has an earth connection to the chassis.
5. Power on the device.
6. Perform a software-based unlock of the device. This can be done using the Web interface, as described in the *User's Manual*.
7. Load the backup *ini* files and other configuration files to the device (refer to the *User's Manual*).

6.2.2 Replacing Blades for Mediant 3000 HA

The procedure below describes how to replace a failed blade as well as an active, operational blade for Mediant 3000 HA. Replacing an active blade is not common, but may be required for future hardware upgrades.

Notes:

- Do not use excessive force when inserting the blade into the chassis cage.
- For replacing a failed blade, there is no need to perform a switchover to the standby blade. In the event of a failed blade, the device automatically switches over to the standby blade (making it the active blade). However, if you want to replace an active blade (for whatever reason), you need to manually perform a switchover, as described in this section.
- Replace the failed blade as soon as possible to restore the HA mode.

➢ **To replace a blade in Mediant 3000 HA:**

1. If you want to replace an active blade, do a manual switchover from the active to standby blade as described in the *User's Manual*; otherwise, skip to Step 2:
2. Physically remove the failed blade from the chassis:
   a. Using a Philips screwdriver, unfasten the screws located at both ends of the blade that secure the blade to the chassis.
   b. Press the blade's red ejector buttons on each of the two black ejector/injector latches to release the blade from the slot.
   c. Simultaneously rotate the ejector/injector latches outward in the horizontal plane to disengage the blade from the slot.
   d. Pull the two ejector/injector latches and gently slide the blade out of the slot.
3. Before you insert the new blade, verify that the software version installed on the new blade is the same (or later) as the version currently installed on the active blade. For example, if the version of the active blade is 6.4, the version of the new blade must be 6.4 or later.
4. Start the BootP Server utility and add a client with the new blade's MAC address and define a private IP address for the new blade (must be in the same subnet as the standby blade). For more information, refer to the *User's Manual*.
5. Insert the new blade into the chassis:
   a. Choose the appropriate slot in the chassis.
   b. Ensure that the blade's red ejector buttons on each of the two black ejector/injector latches are pressed in (i.e., black ejector/injector latches in the open, pulled out position).
   c. Hold the blade horizontally and insert it into the slot, aligning its edges with the groves inside the slot.
   d. Ease the blade all the way into the slot, using your thumbs until the ejector/injector latches touch the chassis and the blade is flush with the chassis slot.

e. Lock the blade into place by pressing the two black ejector/injector latches on both ends inward, toward the middle, until you hear a click.
f. Using a Philips screwdriver, fasten the screws located at both ends of the blade to secure it to the chassis and to ensure that it has an earth connection to the chassis.

6. Verify that the new blade receives the private IP address from the BootP server. If no BootP request has been sent within 10 seconds, remove the new blade and re-insert it again. After the new blade receives its private IP address, the currently active blade updates the new blade with the relevant software version and configuration settings.

6.2.3 Replacing RTMs

The procedure below describes how to replace an RTM.

➢ **To replace an RTM:**

1. Gracefully lock the device (refer to the *User's Manual*).
2. Power down the device.
3. Remove the RTM from the chassis slot:
   a. Disconnect all cables.
   b. Using a Philips screwdriver, unfasten the screws located at both ends of the RTM that secure it to the chassis.
   c. Press the RTM's red ejector buttons on each of the two black ejector/injector latches to release the RTM from the slot.
   d. Simultaneously rotate the ejector/injector latches outward to disengage the RTM from the slot.
   e. Pull on the two ejector/injector latches and gently slide the RTM out of the slot.
4. Insert the new RTM into the chassis slot:
   a. Choose the appropriate slot in the chassis.
   b. Ensure that the RTM's red ejector buttons on each of the two black ejector/injector latches are pressed-in (i.e., black ejector/injector latches in the open, pulled out position).
   c. Hold the RTM horizontally and insert it into the slot, aligning its edges with the groves inside the slot.
   d. Ease the RTM all the way into the slot, using your thumbs until the ejector/injector latches touch the chassis and the RTM is flush with the chassis slot.
   e. Lock the RTM into place by pressing the two black ejector/injector latches on both ends inward, toward the middle, until you hear a click.
   f. Using a Philips screwdriver, fasten the screws located at both ends of the RTM to secure it to the chassis and to ensure that it has an earth connection to the chassis.
5. Attach the cables to the RTM.
6. Power on the device.
7. Unlock the device (refer to the *User's Manual*).

6.3 Replacing the Power Supply Module

The procedure below describes how to replace the Power Supply module.

➢ **To replace a faulty Power Supply module:**

1. Remove the faulty Power Supply module:
   a. Using a Philips screwdriver, unfasten the two screws located on the module.
   b. Press the red ejector buttons on the module's black ejector/injector latches.
   c. Pull on the ejector/injector latches and then gently ease the module out of the slot.
2. Insert the replacement Power Supply module:
   a. With the black ejector/injector latches in the open (pulled out) position, align the module's edges with the groves inside the slot.
   b. Gently ease the module (using your thumbs to push the module) into the slot until the module is flush with the chassis.
   c. Press the module's black ejector/injector latches inward, toward the middle until you hear a click.
   d. Secure the module to the chassis by fastening the two screws (using a Philips screwdriver) located on the module.

6.4 Replacing the Power Entry Module

The procedure below describes how to replace the Power Entry module.

Warning: The PEM modules are not hot-swappable. Before extracting a PEM module, ensure that the power cables of both PEM modules are disconnected from the mains (i.e., the device is powered down).

➢ **To replace a faulty PEM module:**

1. Remove the faulty PEM module:
   a. Power off the power mains to the module.
   b. Disconnect the power cable and all other cables from the module.
   c. Using a Philips screwdriver, unfasten the two screws on the module's front panel.
   d. Press the red ejector buttons on the black ejector/injector latches.
   e. Pull on the ejector/injector latches and ease out the module from the slot.
2. Insert the replacement PEM module:
   a. With the black ejector/injector latches in the open (pulled out) position, align the module's edges with the groves inside the slot.
   b. Gently ease the module all the way into the slot (using your thumbs) until the module is flush with the chassis.
   c. Press the black ejector/injector latches inward, toward the middle until you hear a click.
   d. Using a Philips screwdriver, fasten the two screws on the module's front panel.
   e. Except for the power cables, re-connect all the cables.
   f. Reconnect the power cables.
   g. Re-instate the power from the mains.

6.5 Replacing the Fan Tray Module

The procedure below describes how to replace the Fan Tray module.

Warnings:

- The chassis **cannot** operate without a Fan Tray module for **more than 30 seconds**; otherwise, irreversible damage may be caused to the chassis components due to overheating.
- The Fan Tray module replacement procedure (extraction of the faulty module and then insertion of the replacement module) must be done within 30 seconds. To ensure that the procedure is performed within this time, it is recommended that you have the replacement Fan Tray module ready for insertion before removing the faulty Fan Tray module.
- When removing the Fan Tray module while the power is on (or after the chassis has recently been powered off), the fan blades may still be rotating at high speed. Therefore, to avoid bodily harm, make sure that you don't touch the fan blades.

➢ **To replace a faulty Fan Tray module:**

1. Remove the faulty Fan Tray module:
   a. Using a Philips screwdriver, unfasten the two screws on the top left-hand corner and the bottom left-hand corner of the front panel of the Fan Tray module.
   b. Using the built-in handle, pull the Fan Tray module out of the chassis.
2. Insert the replacement Fan Tray module:
   a. Insert the Fan Tray module into the chassis slot until the front panel is flush with the chassis' front panel.
   b. Verify that the Fan Tray module is functioning correctly by checking that the software has not reported any fan failure. You can also check the Fan Tray module itself, by removing the Fan Tray module and verifying that all the fans are spinning, and then re-inserting the Fan Tray module.
   c. Using a Philips screwdriver, fasten the screws on both the upper and lower ends of the Fan Tray module.

6.6 Replacing the Air Filter

The hot-swappable Fan Tray module contains eight fans and an air filter. The NEBS compliant air filter must be replaced every 90 days. The air filter must also be checked weekly to ensure that it is not filled with dust, in which case it must be replaced as soon as possible.

Warning: The chassis **cannot** operate without a Fan Tray module for mo**re than 30 seconds**; otherwise, irreversible damage may be caused to the chassis components due to overheating. Therefore, the replacement procedure (extraction of the air filter and the Fan Tray module and then the insertion of the replacement air filter and the Fan Tray module) must be done within 30 seconds. To ensure that the procedure is performed within this time, it is recommended to have the replacement air filter ready for insertion before removing the air filter and the Fan Tray module. If, for any reason, there is a delay in inserting the replacement air filter, re-insert the Fan Tray module without the air filter until an air filter is ready.

➢ **To replace the air filter:**

1. Remove the air filter:
   a. Remove the Fan Tray module from the chassis (see Section 6.5 on page 80).
   b. Hold the inside of the steel frame of the air filter and pull it out of the chassis slot. It should slide out relatively easily; if it doesn't, use slightly more force.
   c. Re-insert the Fan Tray module (see Section 6.5 on page 80).

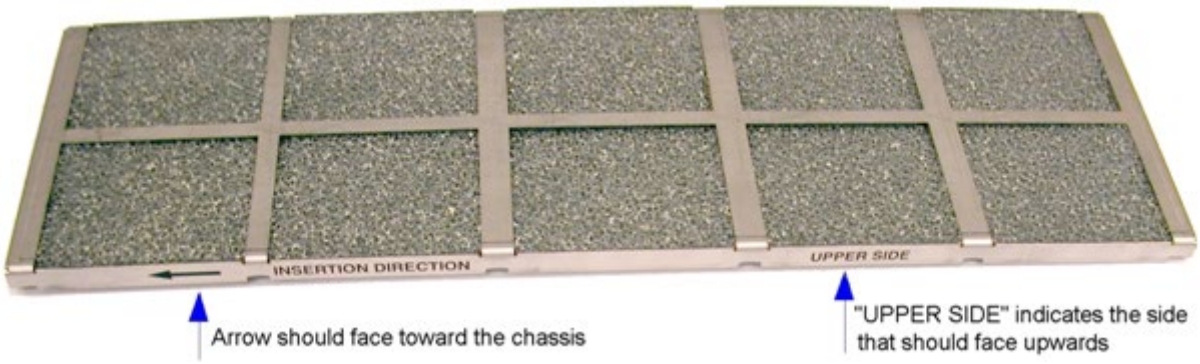
   The figure below shows the air filter partially removed from the chassis:

Figure 6-3: Removing the Air Filter

Item #	Description
1	Directional Arrow
2	Air Filter
3	Fan Tray Module

2. Insert the replaced air filter:
   a. Remove the Fan Tray module from the chassis, which you inserted in Step 1.c, above.
   b. With the **UPPER SIDE** label visible and the **INSERTION DIRECTION** arrow pointing toward where the Fan Tray module is typically housed (see figure below for the arrow locations), slide the air filter into its slot until it can go no further.

Figure 6-4: Air Filter



   c. Re-insert the Fan Tray module into the chassis.

6.7 Replacing Optical SFP Transceiver Modules

RTM-6310 provides Small Form-Factor Pluggable (SFP) cages for accepting replaceable 155-Mbps SFP optical transceiver modules (single-mode) for STM-1/OC-3 PSTN interfaces. These SFP modules are hot-swappable (i.e. they can be plugged in or pulled out while the power is on).

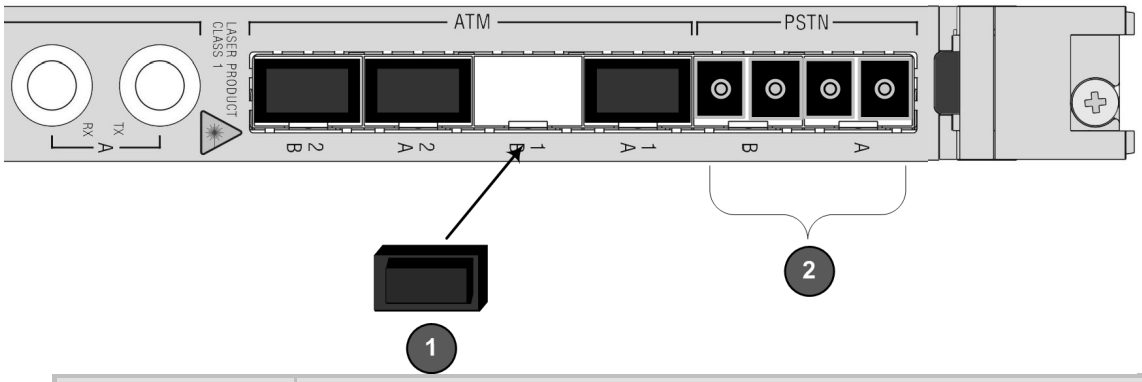
Caution Laser

Laser radiation may be emitted from the aperture of the SFP transceiver modules when no cables are connected. Therefore, avoid exposure to laser radiation by ensuring that you insert dust / EMI plugs into SFP transceiver modules to which no cables are connected. Do not stare into open SFP cages (i.e. plugs yet to be inserted).

Notes:

- This section is applicable only to RTM-6310.
- To prevent contamination of the internal components and to optimize electromagnetic interference (EMI) performance, it is recommended that a protective dust plug be inserted into SFP cage assemblies when no transceiver module is present (see the figure below).
- Use an ESD wrist strap or similar grounding device when handling SFP transceivers or when coming into contact with modules.

Figure 6-5: Inserting Protective Dust Cover into SFP Cage

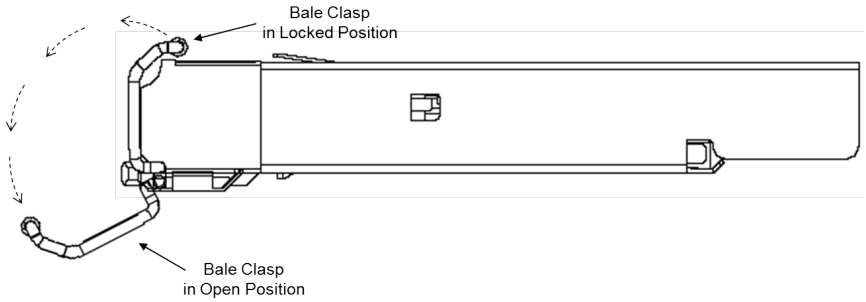


Item #	Description
1	Protective dust cover for empty SFP cage assembly
2	SFP transceiver modules

➢ **To replace an SFP module:**

1. Disconnect the fiber optic cable, if connected to the SFP transceiver module.
2. Unlock the SFP transceiver module, by pivoting the wire latch (bale clasp) so that it moves away and down from the module, as shown in the figure below:

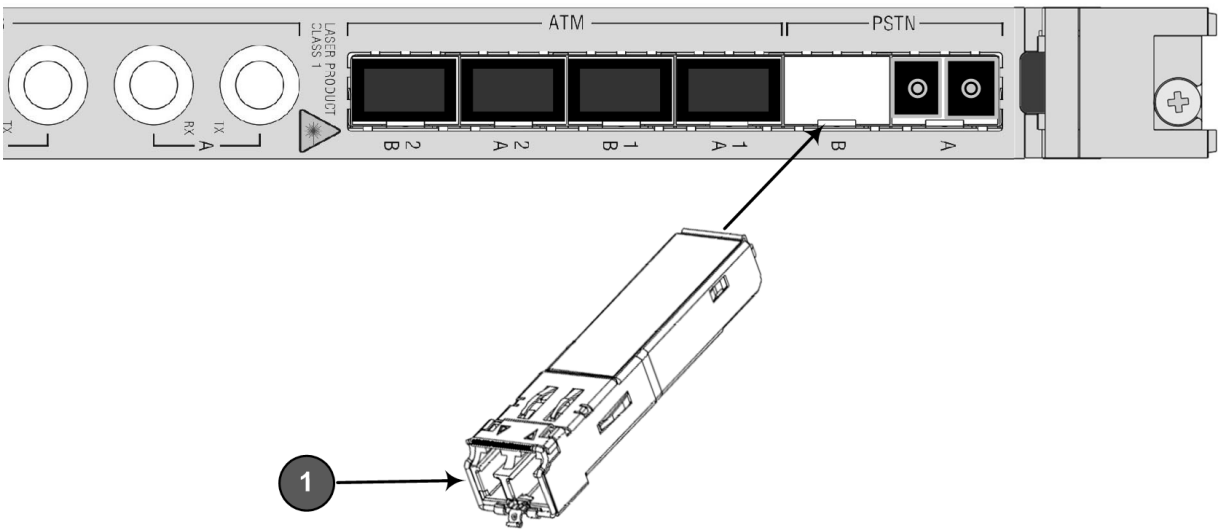
Figure 6-6: Unlocking the SFP Module



Note: The SFP modules contain a locking mechanism that ensures that it can't be inadvertently pulled out of the socket. However, the unlocking mechanism depends on the SFP module type.

3. Slide the module gently out of the RTM's transceiver socket, and then immediately insert a dust plug into the transceiver socket.
4. Insert a repaired or new SFP transceiver module into the RTM's transceiver socket:
   a. Remove the dust plug from the transceiver socket.
   b. Ensure that the SFP module's wire latch is in lock position, as shown in the figure below:

Figure 6-7: Inserting SFP Module into the SFP Cage



Item #	Description
1	SFP bale clasp in closed position

   c. Slide the SFP module into the transceiver socket until the module mates with the socket connector.
   d. Reconnect the fiber optic cable.

This page is intentionally left blank.

International Headquarters
1 Hayarden Street,
Airport City
Lod 7019900, Israel
Tel: +972-3-976-4000
Fax: +972-3-976-4040

AudioCodes Inc.
200 Cottontail Lane,
Suite A101E,
Tel: +1-732-469-0880
Fax: +1-732-469-2298

Contact us: https://www.audiocodes.com/corporate/offices-worldwide
Website: https://www.audiocodes.com/

Document #: LTRT-94724