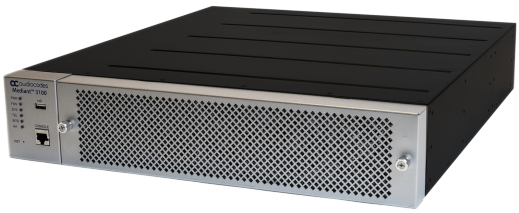
Hardware Installation Manual

AudioCodes Gateway & Session Border Controller Series

Mediant™ 3100

SBC & Media Gateway



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Notice

Date Published: June-25-2024

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.

Security Vulnerabilities

All security vulnerabilities should be reported to vulnerability@audiocodes.com.

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Notes and Warnings

Read and adhere to all warning statements in this document before installing the device.


This device is considered as IPX0 non-water ingress protected and therefore, must be installed only **indoors**.


Ethernet port interface cabling must be shielded and routed only **indoors** (must not exit the building).


For AC powered models, the device must be connected to a grounded AC power outlet.


For AC powered models, use only the AC power cords supplied with the device to connect to the power source**.**


Caution Electrical Shock: Do not open or disassemble this device. The device carries high voltage and contact with internal components may expose you to electrical shock and bodily harm.


The device must be installed and serviced only by qualified service personnel.


Disconnect the device from the mains and Telephone Network Voltage (TNV) before servicing.


The device must be installed only in a restricted access location that is compliant with ETS 300 253 guidelines where equipotential bonding has been implemented.


Installation of this device must be in a weather protected location of maximum ambient temperature of 40°C.

Related Documentation

Document Name
Datasheet
Mediant 3100 Gateway & SBC User's Manual

Document Revision Record

LTRT	Description
89808	Initial document release.
89809	Device replacement.
89810	64 T1/E1s; DC power.
89811	Miscellaneous (drawings and text); caution for lifting into chassis.
89812	DC power connection options (note).
89813	68-Pin D-Sub pinouts.
89814	PSTN Fallback added.
89815	Patch panels for connecting T1/E1 trunks when using 68-Pin D-Sub.

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1 Introduction

This document provides a hardware description of AudioCodes Mediant 3100 Session Border Controller (SBC) and Media Gateway (hereafter referred to as *device*) and provides step-by-step instructions on how to install the device.

The device supports the following interfaces:

- 8 x Gigabit Ethernet (10/100/1000Base-T) LAN ports
- Up to 64 Single T1/E1 interfaces
- 1 x USB port for optional, USB storage services
- Serial console port (RJ-45) for device management
- 1+1 AC or DC power supply

- Hardware configurations may change without notice. Currently available hardware configurations are listed in AudioCodes Price Book. For any enquiries, please contact your AudioCodes sales representative.
- For information on configuring the device, refer to the device's *User's Manual*.

2 Unpacking the Device

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

➢ **To unpack the device:**

1. Open the carton and remove the packing materials.
2. Remove the chassis from the carton.
3. Check that there is no equipment damage.
4. Ensure that in addition to the chassis, the package contains the following items:
   - 2 x front-mounting brackets with six screws for 19-inch rack mounting
   - 1 x grounding lug
   - 1 x serial cable adapter
   - 2 x AC power cables (f ordered with AC power)
5. Check, retain and process any documents.

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

3 Physical Description

This section provides a physical description of the device.

Physical Dimensions and Operating Environment

The device's physical dimensions and operating environment are listed in the following table:

Table 3-1: Physical Dimensions and Operating Environment

Physical Specification	Description
Dimensions	2U high, 19-inch rack wide (H x W x D) 88 x 438 x 490 mm (3.5 x 17.24 x 19 inches)
Weight	11.5 kg (25.3 lbs.) for a fully-populated chassis
Environmental	■ Operational: 0 to 40°C (41 to 104°F) ■ Storage: -25 to 70°C (-13 to 158°F) ■ Humidity: 5 to 90% non-condensing

Front Panel Description

The device's front panel is shown in the following figure and described in the subsequent table.

Figure 3-1: Front Panel

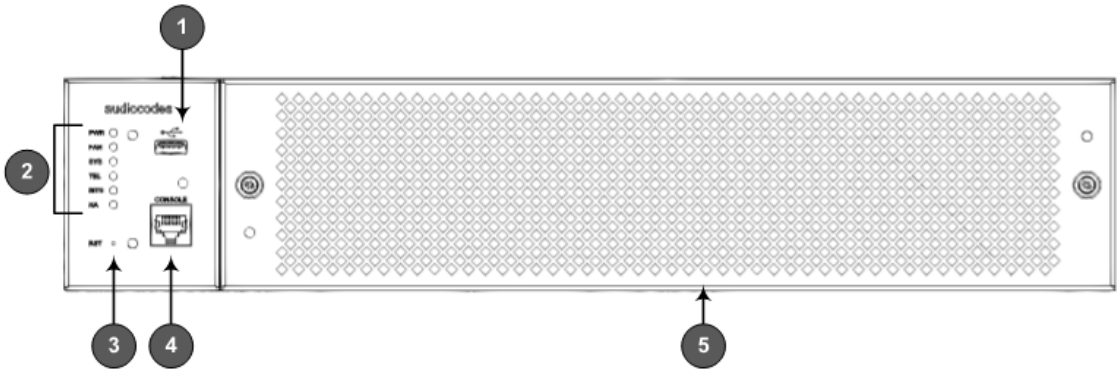


Table 3-2: Front Panel Description

Item #	Label	Description
1		USB 2.0 Type-A port, which can be used for storage capabilities using an external USB hard drive or flash disk (disk on key).

Item #	Label	Description
2	**PWR**, **FAN**, **SYS**, **TEL**, **BITS**, **HA**	Front-panel LEDs. For more information, see LED Descriptions below. **Note:** The **BITS** and **HA** LEDs are currently not used (for future support).
3	**RST**	Reset pinhole button for resetting the device and restoring it to factory defaults: ■ **To reset the device:** Using a paper clip or any other similar pointed object, press and hold down the button for at least 2 seconds (but no more than 10 seconds). ■ **To restore the device to factory defaults:** Using a paper clip or any other similar pointed object, press down the button for at least 15 seconds (but not longer than 25 seconds).
4	**CONSOLE**	RS-232 serial port (RJ-45) for connecting to the device's Command-Line Interface (CLI).
5	-	Fan Tray and Fan Filter cover. For more information, see Fan Tray Description on page 6.

LED Descriptions

This section describes the LEDs on the front panel of the chassis.

PWR LED

The **PWR** LED indicates the power status, as described in the following table.

Table 3-3: PWR LED Description

Color	State	Description
Green	On	The chassis is receiving power and the Power Supply modules are operating normally.
Red	On	One of the Power Supply modules is faulty.
-	Off	The chassis is not receiving any power.

FAN LED

The **FAN** LED indicates the status of the Fan Tray module, as described in the following table.

Table 3-4: FAN LED Description

Color	State	Description
Green	On	The Fan Tray module is operating normally.
Red	On	One or more fans of the Fan Tray module are faulty.
-	Off	The Fan Tray module is not receiving power.

SYS LED

The **SYS** LED indicates the device's (system) operating status, as described in the following table.

Table 3-5: SYS LED Description

Color	State	Description
Green	On	The device is operating normally.
Orange	On	The chassis is approaching the high temperature threshold (but not critical).
Red	On	Indicates one of the following: ■ Fatal error has occurred. ■ The chassis is approaching the critical high temperature threshold.
-	Off	The device is booting up.

TEL LED

The **TEL** LED indicates the status of the T1/E1 PSTN interfaces, as described in the following table.

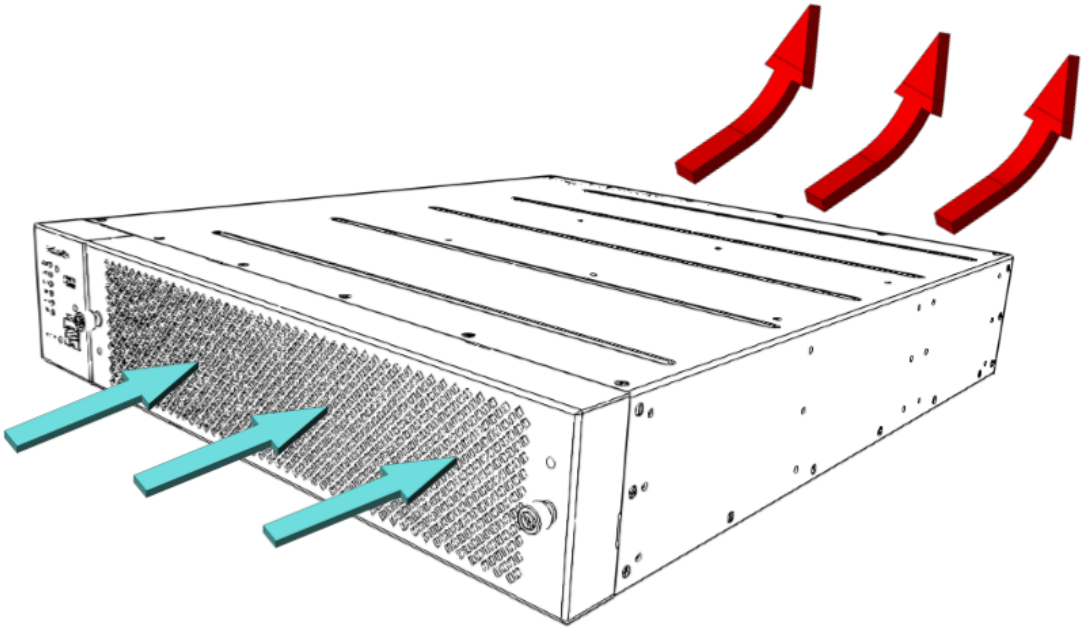
Table 3-6: TEL LED Description

Color	State	Description
Green	On	Normal operation
Orange	On	Temporary out-of-service of one or more T1/E1 interfaces. (A device reset may resolve the issue.)
Red	On	Out-of-service of one or more T1/E1 interfaces.
-	Off	No power.

Fan Tray Description

The frontal Fan Tray unit is a front-to-rear air-forced cooling system with a replaceable air filter. The air is sucked in from the front panel and extracted out the rear panel, as illustrated below:

Figure 3-2: Airflow Direction through Chassis



When installing the chassis, make sure that there is sufficient front and rear clearance for proper airflow into and out of the chassis.

Figure 3-3: Fan Tray Module

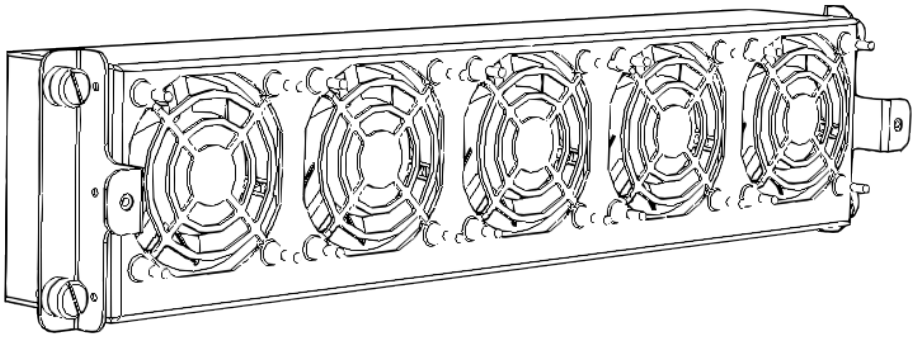


Figure 3-4: Fan Tray Cover

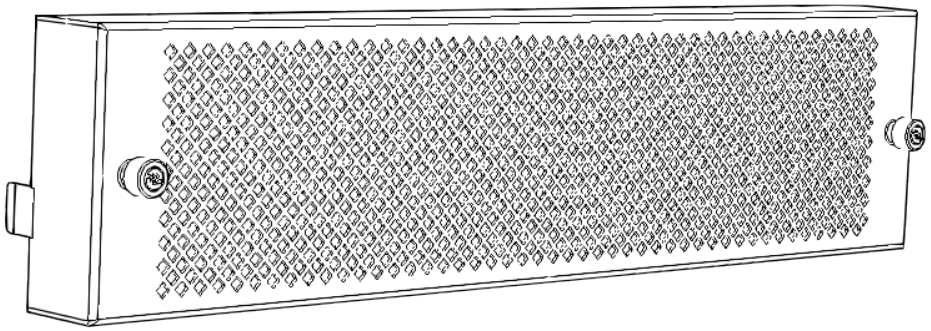
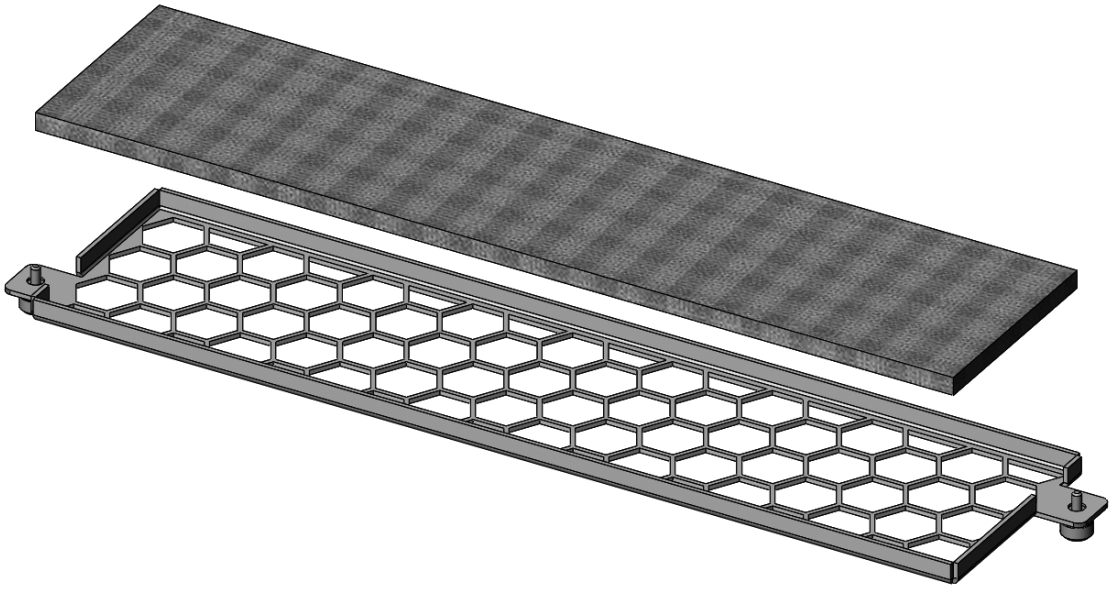


Figure 3-5: Air Filter and Cover (within Fan Tray Cover)



For operating status of the Fan Tray module, check the **FAN** LED on the front panel, as described in FAN LED on page 4.

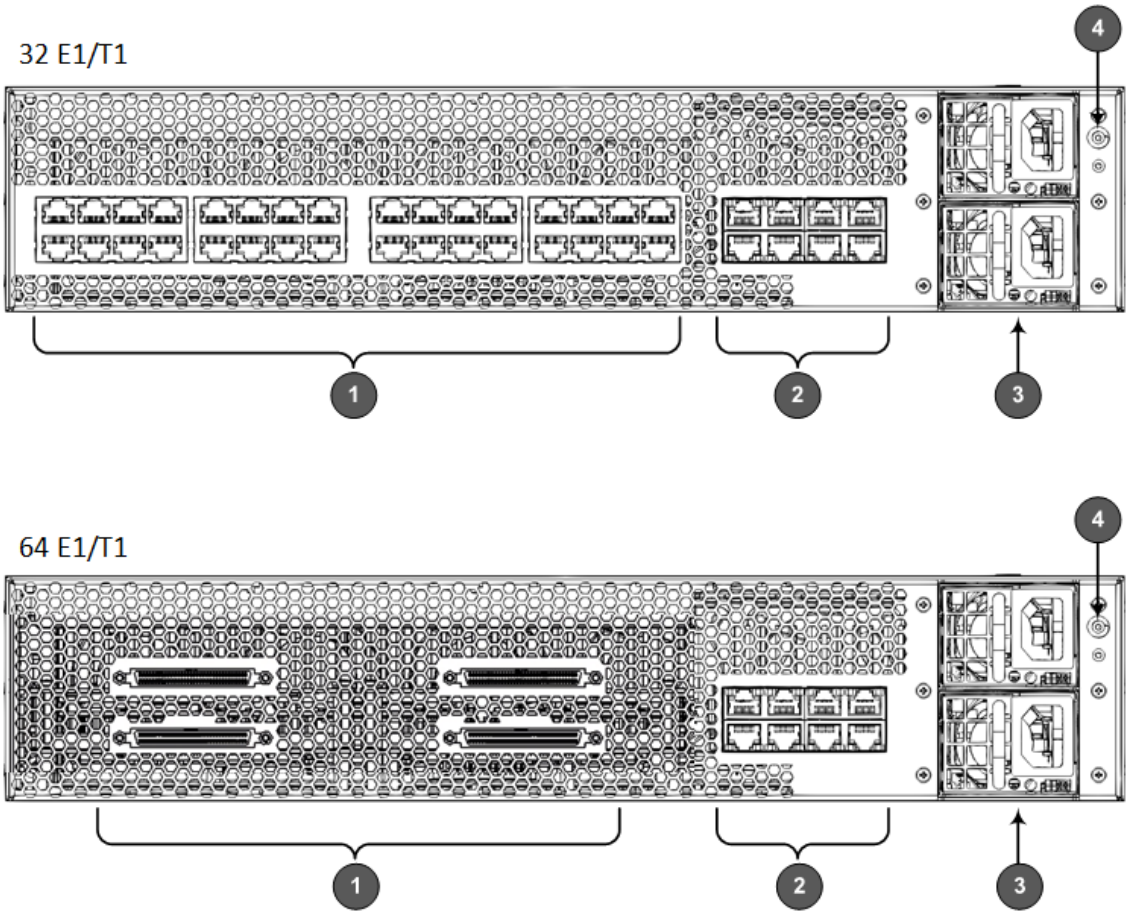
During system operation, the inner ambient temperature is continuously monitored. Upon excessive temperature conditions, an SNMP Temperature Alarm is generated (acBoardTemperatureAlarm). Upon a speed degradation or full stop of any fan, an SNMP Fan Alarm (acFanTrayAlarm) is generated.

The Fan Tray module is hot-swappable, allowing you to replace it even when the device is powered on. The Fan Tray module and air filter are available as field-replaceable units (FRU). For replacing the Fan Tray module, see Replacing the Fan Tray Module. For replacing the air filter, see Replacing the Air Filter. (The Fan Tray cover is not replaceable.)

Rear Panel Description

The device's rear panel is shown in the following figure and described in the subsequent table.

Figure 3-6: Mediant 3100 Rear Panel (example of AC-powered Model)



The figure above is used only as an example. The number of T1/E1 interfaces and type of Power Supply modules (AC or DC) depend on your ordered hardware configuration.

Table 3-7: Rear Panel Description

Item #	Label	Description
1	Up to 32 T1/E1: **S1 1-16 / S2 17-32** Up to 64 T1/E1: **S1 1-16 / S2 17-32 / S3 33-48 / S4 49-64**	T1/E1 PSTN trunk interfaces. The type of ports depends on the ordered configuration: ■ For up to 64 T1/E1: 4 x 68-pin D-Sub ports ■ For up to 32 T1/E1: 32 x RJ-48C ports For connecting the T1/E1 interfaces, see Connecting T1/E1 Trunks using RJ-48C Ports on page 17.
2	**GE 1-8**	Eight 100/1000Base-T (Gigabit) Ethernet ports (RJ-45) for connecting to the IP network. The ports provide LEDs to indicate Ethernet status. For more information, see Ethernet LEDs on page 16. For connecting the Ethernet ports, see Connecting Ethernet Interfaces on page 15.

Item #	Label	Description
3	**PS1 / PS2**	Two Power Supply modules. The device can be ordered with AC or DC power. For more information, see Power Supply Modules below.
4	⏚	Location for attaching a grounding lug to the chassis. For more information, see Grounding and Surge Protection on page 14.

Power Supply Modules

The device can be powered from an AC or a DC power source. The type of power depends on your ordered hardware configuration.

- DC Power Supply Module on the next page
- AC Power Supply Module below

AC Power Supply Module

The device can accept up to two extractable AC Power Supply modules. These power supplies are of load-sharing type connected in 1+1 topology, therefore allowing power redundancy.

The Power Supply modules are hot-swappable. Therefore, a module can be replaced while the system is up and running.

The Power Supply module is available as a spare part. For replacing Power Supply modules, see Replacing Power Supply Modules on page 34.

Figure 3-7: AC Power Supply Module

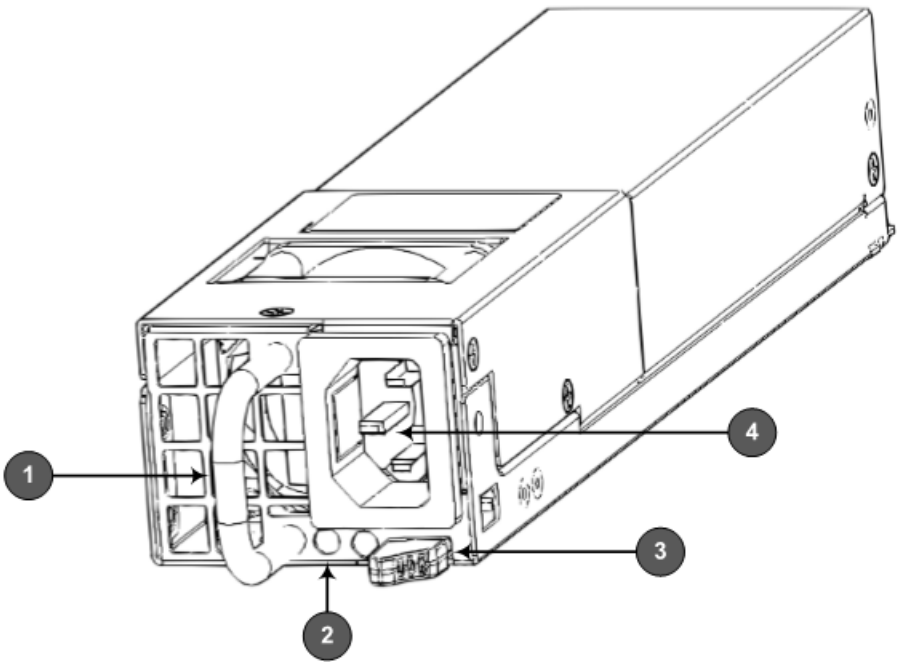


Table 3-8: AC Power Supply Module Description

<table>
<tr><th>Item #</th><th colspan="3">Description</th></tr>
<tr><td>1</td><td colspan="3">Handle for extracting and installing module.</td></tr>
<tr><td>2</td><td colspan="3">LED for indicating power status:</td></tr>
<tr><td></td><td>Color</td><td>State</td><td>Description</td></tr>
<tr><td></td><td>Green</td><td>On</td><td>The AC power output is good.</td></tr>
<tr><td></td><td>Amber</td><td>Flashing</td><td>The Power Supply module is faulty.
Indicates one of the following:
■ An internal power supply malfunction.
■ The power source is disconnected.</td></tr>
<tr><td></td><td>-</td><td>Off</td><td></td></tr>
<tr><td>3</td><td colspan="3">Release latch for releasing and securing module from / to chassis slot.</td></tr>
<tr><td>4</td><td colspan="3">C-14 Power inlet.</td></tr>
</table>

DC Power Supply Module

The device can accept up to two extractable DC Power Supply modules. These power supplies are of load-sharing type connected in 1+1 topology, therefore allowing power redundancy.

The Power Supply modules are hot-swappable and therefore, a faulty module can be replaced while the system is up and running.

The Power Supply module is available as a spare part. For replacing Power Supply modules, see Replacing Power Supply Modules on page 34.

Figure 3-8: DC Power Supply Module

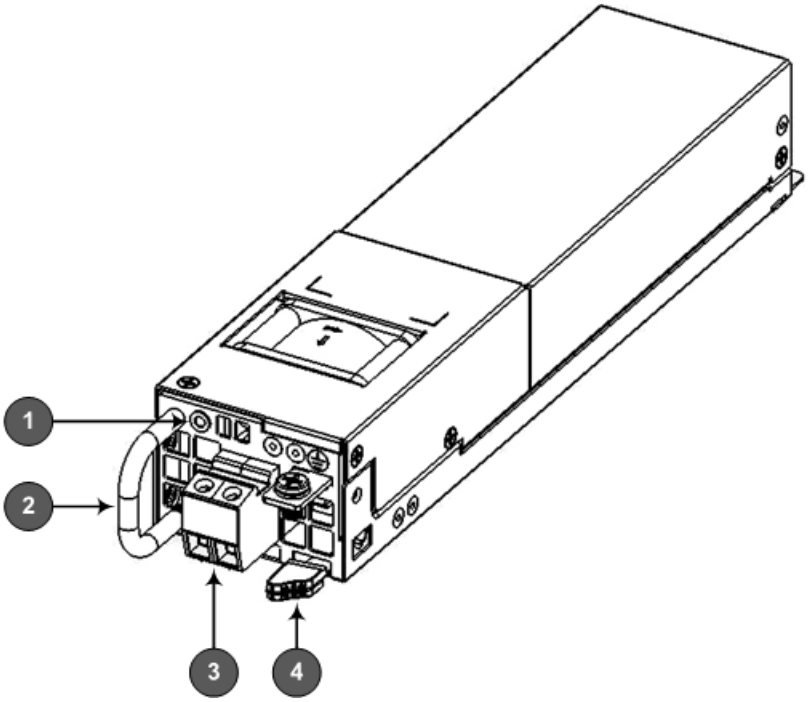


Table 3-9: DC Power Supply Module Description

Item #	Description
1	LED for indicating power status: Color / State / Description Green / On / The DC power output is good. Amber / Flashing / The Power Supply module is faulty. Indicates one of the following: - / Off / ■ An internal power supply malfunction. ■ The power source is disconnected.
2	Handle for extracting and installing module.
3	DC terminal block.
4	Release latch for releasing / securing module from / to chassis slot.

4 19-Inch Rack Mounting

The device is designed to be mounted in a standard 19-inch rack. This is done by placing it on a shelf (not supplied) in a 19-inch rack and then securing it to the rack's posts, using the front-mounting brackets (supplied).

A fully populated chassis weighs up to 11.5 kg (25.3 lbs.). The 19-inch rack cabinet must be able to withstand this weight.

Lifting and placing the chassis in the rack is a two-person job.

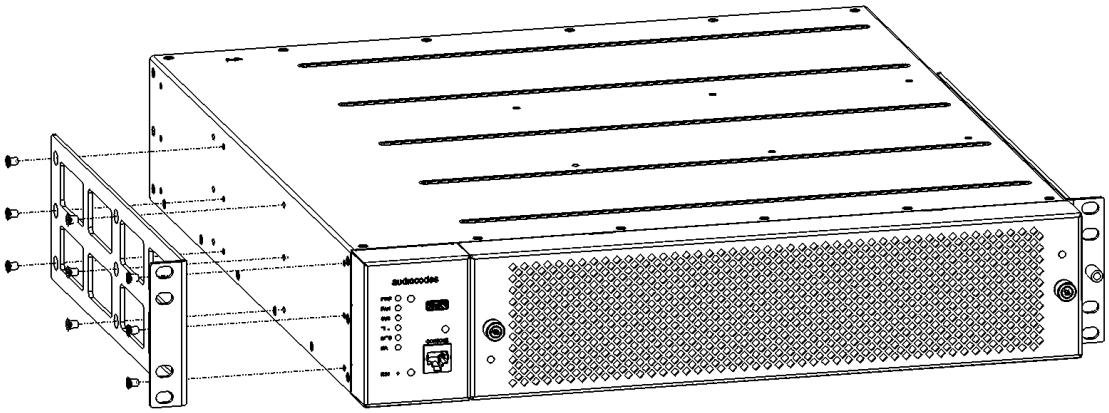
Rack Mount Safety Instructions: When installing the chassis in a rack, adhere the following safety instructions:

- Elevated Operating 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 maximum ambient temperature (Ta) 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.)

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

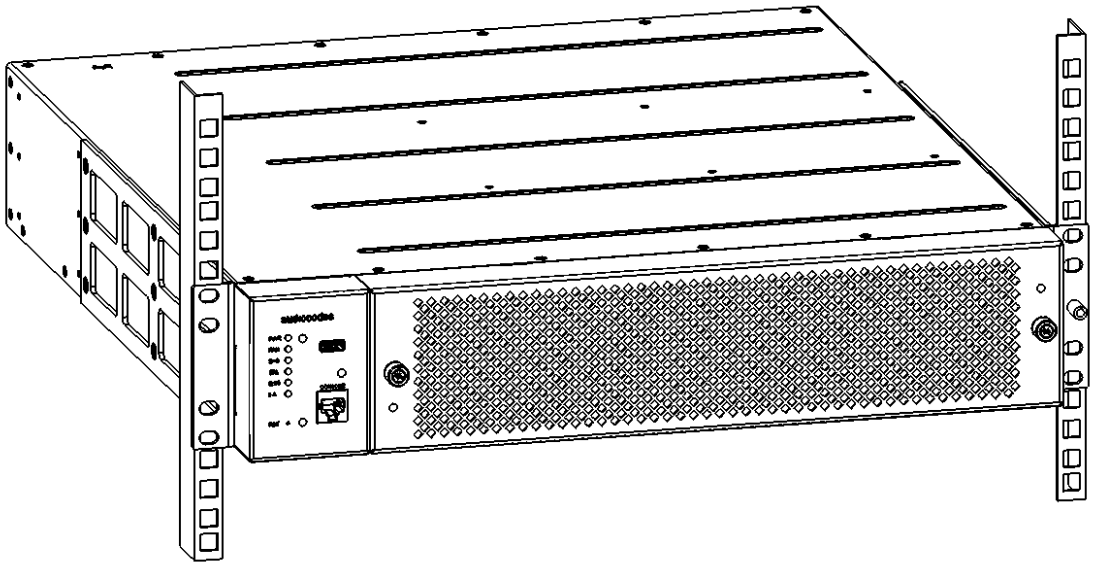
1. In the 19-inch rack, install a shelf (not supplied) on which you will later place the chassis.
2. Attach the two front-mounting brackets (supplied) to both sides of the chassis, as shown in the following figure. Each bracket is secured to the chassis using 9 screws (supplied).

Figure 4-1: Attaching Mounting Brackets to Chassis



3. Place the chassis onto the shelf that you installed in the 19-inch rack (see Step 1).
4. Align the holes of the chassis' mounting brackets with the holes of the rack posts, as shown in the following figure. Secure the mounting brackets to the rack posts, using 19-inch rack bolts (not supplied). Each mounting bracket is secured to the rack using two bolts.

Figure 4-2: Holes of Front-Mounting Brackets Flush and Aligned with Front Rack Posts



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

5 Cabling the Device

This section describes how to cable the device.

Grounding and Surge Protection

The device must be permanently earthed to a stable local earth reference.

Grounding and Power Surge Protection:

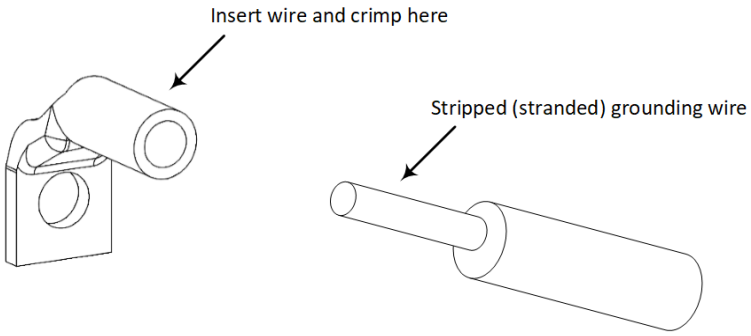
- The device must be installed only in telecommunication sites / centers in compliance with ETS 300-253 requirements "Earthing and Bonding of Telecommunication Equipment in Telecommunication Centers".
- Prior to installation, earth loop impedance test must be performed by a certified electrician to ensure grounding suitability at the power outlet intended to feed the unit. It is essential that the impedance will be kept below 0.5 ohms!
- Proper grounding is crucial to ensure the effectiveness of the lightning protection, connect the device permanently to ground (as described in the procedure below). The device's grounding screw must be connected to the equipotential grounding bus bar located in the Telecommunication rack or installation site, using a wire of 6 mm^2 surface wire. If the device is installed in a rack with other equipment, the rack must be connected to the equipotential grounding bus bar of the Telecommunication room, using a stranded cable with surface area of 25 mm^2. The length of this cable must be as short as possible (no longer than 3 meters).

Protective Earthing:

- The equipment is classified as Class I EN 62368-1 and UL 62368-1 and must be earthed at all times (using an equipment-earthing conductor).
- Finland: "Laite on liltettava suojamaadoituskoskettimilla varustettuun pistorasiaan."
- Norway: "Apparatet rna tilkoples jordet stikkontakt."
- Sweden: "Apparaten skall anslutas till jordat uttag."

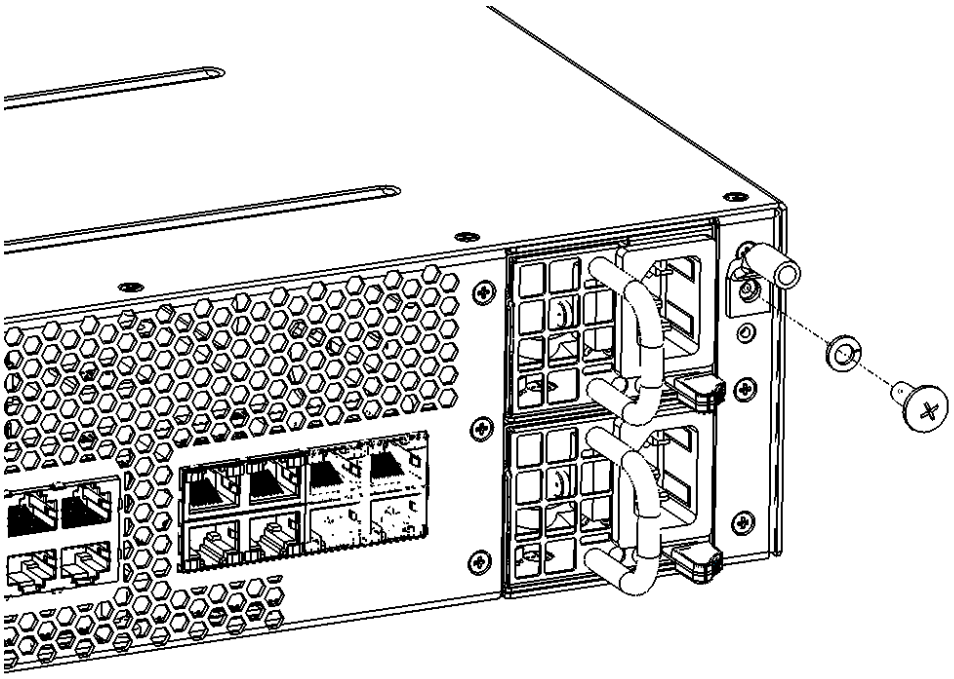
➢ **To connect the chassis to an earth ground:**

1. Prepare an adequate length (approx. 12 mm or 0.5 in.) of stranded grounding wire (8 AWG minimum size) for the ground connection.
2. Insert the stranded end of the grounding wire into the grounding lug (supplied), and then use a crimping tool (not supplied) to secure the wire to the grounding lug.



3. Attach the grounding lug to the chassis, as shown in the following figure, making sure that the spring washer is located between the screw head and the lug.

Figure 5-1: Attaching Grounding Lug to Chassis



4. Connect the other end of the grounding wire to the building's protective earth. This should be in accordance with the regulations enforced in the country in which the device is being installed.

Connecting Ethernet Interfaces

The device provides eight 100/1000Base-T Gigabit Ethernet ports (RJ-45) for connecting to the IP network (e.g., LAN). The ports support half- and full-duplex modes, auto-negotiation, and straight or crossover cable detection. The ports can operate as a pair (Ethernet Group) to provide 1+1 port redundancy, where one port serves as the active port while the other as standby. When the active port fails, the device switches to the standby port.

The cabling specifications and procedure for connecting the device to the LAN is as follows:

- Cable: Straight-through, Category (Cat) 5, 5e or 6 cable
- Connector: Standard RJ-45

- Connector Pinouts:

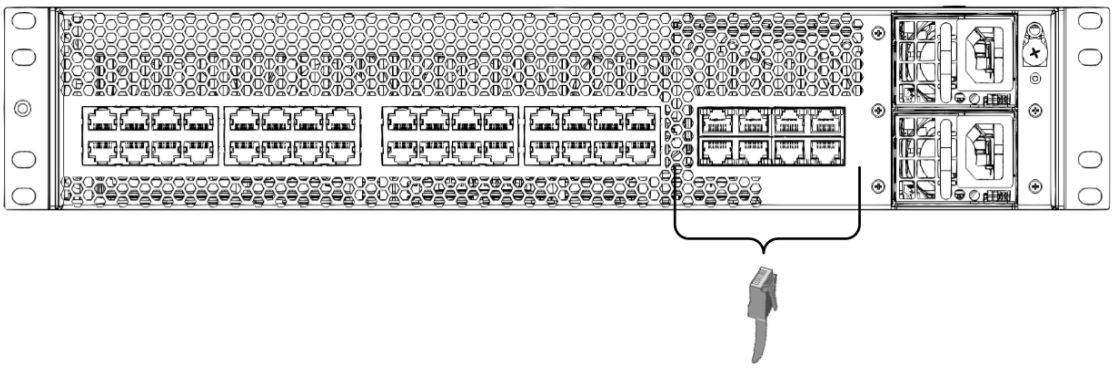
Table 5-1: RJ-45 Connector Pinouts

Pin	Name	Description
1	BI_DA+	Bi-directional pair A+
2	BI_DA-	Bi-directional pair A-
3	BI_DB+	Bi-directional pair B+
4	BI_DC+	Bi-directional pair C+
5	BI_DC-	Bi-directional pair C-
6	BI_DB-	Bi-directional pair B-
7	BI_DD+	Bi-directional pair D+
8	BI_DD-	Bi-directional pair D-

➢ **To connect the Ethernet interfaces:**

1. Connect the RJ-45 Ethernet cable to one of the Ethernet ports (labeled **GE 1-8**) on the chassis' rear panel, as shown in the following figure:

Figure 5-2: Connecting the Ethernet Ports



2. Connect the other end of the cable to your network.
3. For 1+1 Ethernet port redundancy, repeat steps 1 through 2 for the standby port. Make sure that you connect each port to a different network (but in the same subnet).

Ethernet LEDs

Each Ethernet port on the rear panel provides a LED (located on its left) which indicates network connectivity status, as described in the following table.

Table 5-2: Ethernet LEDs Description

Color	State	Description
Green	On	Ethernet link established.
	Flashing	Data is being received or transmitted.
-	Off	No Ethernet link.

Connecting T1/E1 Trunks

Depending on your ordered hardware configuration, the T1/E1 trunks are connected using one of the following port types:

- RJ-48 ports (see Connecting T1/E1 Trunks using RJ-48C Ports below)
- 68-Pin D-Sub ports (see Connecting T1/E1 Trunks using 68-Pin D-Sub Ports on the next page)

Connecting T1/E1 Trunks using RJ-48C Ports

This section is relevant only if you have ordered support for up to 32 T1/E1 interfaces.

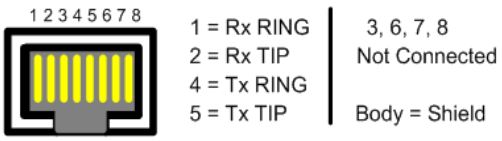
The device provides 32 RJ-48C ports for connecting up to 32 T1/E1 trunks.

- T1/E1 port cabling must be routed only **indoors** and must not exit the building.
- To comply with EMC rules and regulations, use shielded twisted pair (STP) cables for E1 interfaces.

Cable specifications:

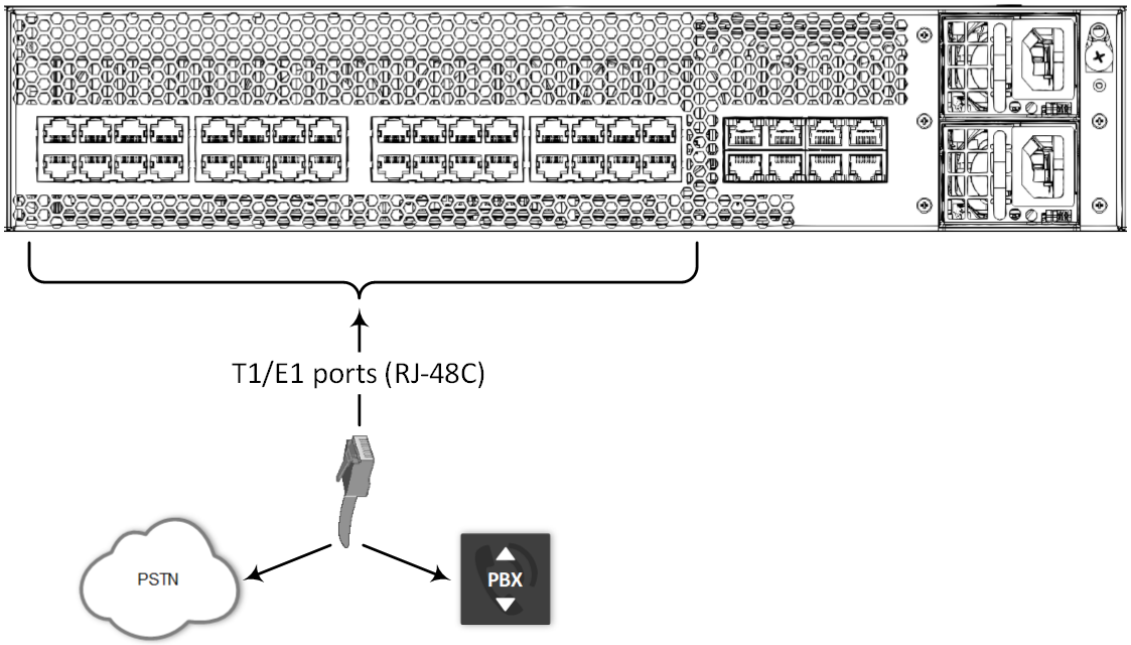
- **Cable:** STP cable of 26 AWG min.
- **Connector Type:** RJ-48C
- **Connector Pinouts:**

Figure 5-3: RJ-48C Connector Pinouts for T1/E1 Interface



➢ **To connect T1/E1 port interface to PBX/PSTN:**

1. Connect one end of the trunk cable to an RJ-48C port located on the rear panel.
2. Connect the other end of the trunk cable to your PBX/PSTN switch.



Connecting T1/E1 Trunks using 68-Pin D-Sub Ports

- This section is applicable only if you have ordered the device with support for up to 64 T1/E1 interfaces.
- Use **only** AudioCodes DB-68 to RJ-48 cable adapter for connecting the T1/E1 trunks. You need to order and purchase this cable separately from AudioCodes. The cable kit includes 4 sets of DB-68 to RJ-48 cable adapters, where each cable provides 16 RJ-48 male connectors. The kit also includes 4 patch panels (1U rack) with 16 ports each, which you can optionally use.

  The cable kit's ordering part number depends on the cable type:
  - ✓ Straight-through: **M3100-PATCH-PL-KIT-S**
  - ✓ Crossover: **M3100-PATCH-PL-KIT-C**

The device provides four DB-68 female ports on its rear panel for connecting T1/E1 trunks. Each DB-68 port provides connectivity to up to 16 T1/E1 trunks. Thus, the device can support up to 64 T1/E1 trunks.

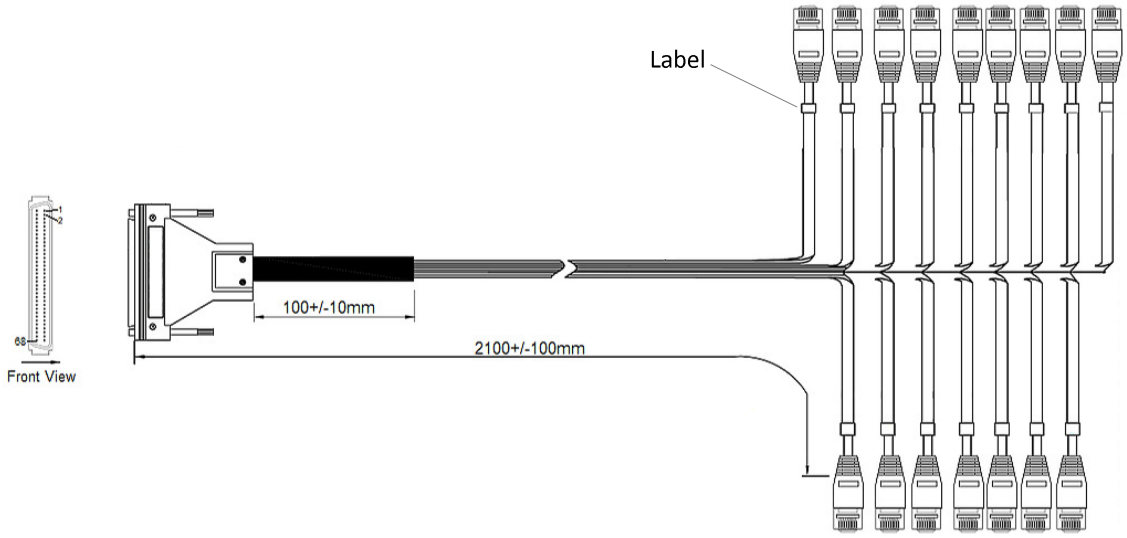
The label on each DB-68 port indicates the slot number ("S") and trunk range:

- **S1: 1-16** - Slot 1, trunks 1 to 16
- **S2: 17-32** - Slot 2, trunks 17 to 32
- **S3: 33-48** - Slot 3, trunks 33 to 48
- **S4: 49-64** - Slot 4, trunks 49 to 64

The DB-68-to-RJ-48 cable adapter for connecting the trunks must be ordered separately from AudioCodes (see note above):

- **Cable:** 26 AWG (100 to 120 Ohm)
- **Connector Type:** 68-pin D-sub male, 16 RJ-48 male:

Figure 5-4: DB-68-to-RJ-48 Cable Adapter (Ordered from AudioCodes)



Connector Pinouts:

- **Straight-through cable:**

Figure 5-5: Connector Pinouts for DB-68 to RJ-48 Straight-Through Cable Adapter (Ordered from AudioCodes)

68-Pin D-Sub Connector		RJ45 Connector Shielded			68-Pin D-Sub Connector		RJ45 Connector Shielded		Label
Pin	Name (Host)	Pin	Name (Host)		Pin	Name (Host)	Pin	Name (Host)	(S1/S2/S3/S4)
1	RX-8	1	RX, Ring, -		35	TX-8	4	TX, Ring, -	8/24/40/56
2	RX+8	2	RX, Tip, +		36	TX+8	5	TX, Tip, +	
3	RX-7	1	RX, Ring, -		37	TX-7	4	TX, Ring, -	7/23/39/55
4	RX+7	2	RX, Tip, +		38	TX+7	5	TX, Tip, +	
5	RX-6	1	RX, Ring, -		39	TX-6	4	TX, Ring, -	6/22/38/54
6	RX+6	2	RX, Tip, +		40	TX+6	5	TX, Tip, +	
7	RX-5	1	RX, Ring, -		41	TX-5	4	TX, Ring, -	5/21/37/53
8	RX+5	2	RX, Tip, +		42	TX+5	5	TX, Tip, +	
9	RX-4	1	RX, Ring, -		43	TX-4	4	TX, Ring, -	4/20/36/52
10	RX+4	2	RX, Tip, +		44	TX+4	5	TX, Tip, +	
11	RX-3	1	RX, Ring, -		45	TX-3	4	TX, Ring, -	3/19/35/51
12	RX+3	2	RX, Tip, +		46	TX+3	5	TX, Tip, +	
13	RX-2	1	RX, Ring, -		47	TX-2	4	TX, Ring, -	2/18/34/50
14	RX+2	2	RX, Tip, +		48	TX+2	5	TX, Tip, +	
15	RX-1	1	RX, Ring, -		49	TX-1	4	TX, Ring, -	1/17/33/49
16	RX+1	2	RX, Tip, +		50	TX+1	5	TX, Tip, +	
17	NC	NC	NC		51	NC	NC	NC	
18	NC	NC	NC		52	NC	NC	NC	
19	RX-16	1	RX, Ring, -		53	TX-16	4	TX, Ring, -	16/32/48/64
20	RX+16	2	RX, Tip, +		54	TX+16	5	TX, Tip, +	
21	RX-15	1	RX, Ring, -		55	TX-15	4	TX, Ring, -	15/31/47/63
22	RX+15	2	RX, Tip, +		56	TX+15	5	TX, Tip, +	
23	RX-14	1	RX, Ring, -		57	TX-14	4	TX, Ring, -	14/30/46/62
24	RX+14	2	RX, Tip, +		58	TX+14	5	TX, Tip, +	
25	RX-13	1	RX, Ring, -		59	TX-13	4	TX, Ring, -	13/29/45/61
26	RX+13	2	RX, Tip, +		60	TX+13	5	TX, Tip, +	
27	RX-12	1	RX, Ring, -		61	TX-12	4	TX, Ring, -	12/28/44/60
28	RX+12	2	RX, Tip, +		62	TX+12	5	TX, Tip, +	
29	RX-11	1	RX, Ring, -		63	TX-11	4	TX, Ring, -	11/27/43/59
30	RX+11	2	RX, Tip, +		64	TX+11	5	TX, Tip, +	
31	RX-10	1	RX, Ring, -		65	TX-10	4	TX, Ring, -	10/26/42/58
32	RX+10	2	RX, Tip, +		66	TX+10	5	TX, Tip, +	
33	RX-9	1	RX, Ring, -		67	TX-9	4	TX, Ring, -	9/25/41/57
34	RX+9	2	RX, Tip, +		68	TX+9	5	TX, Tip, +	

- **Crossover cable:**

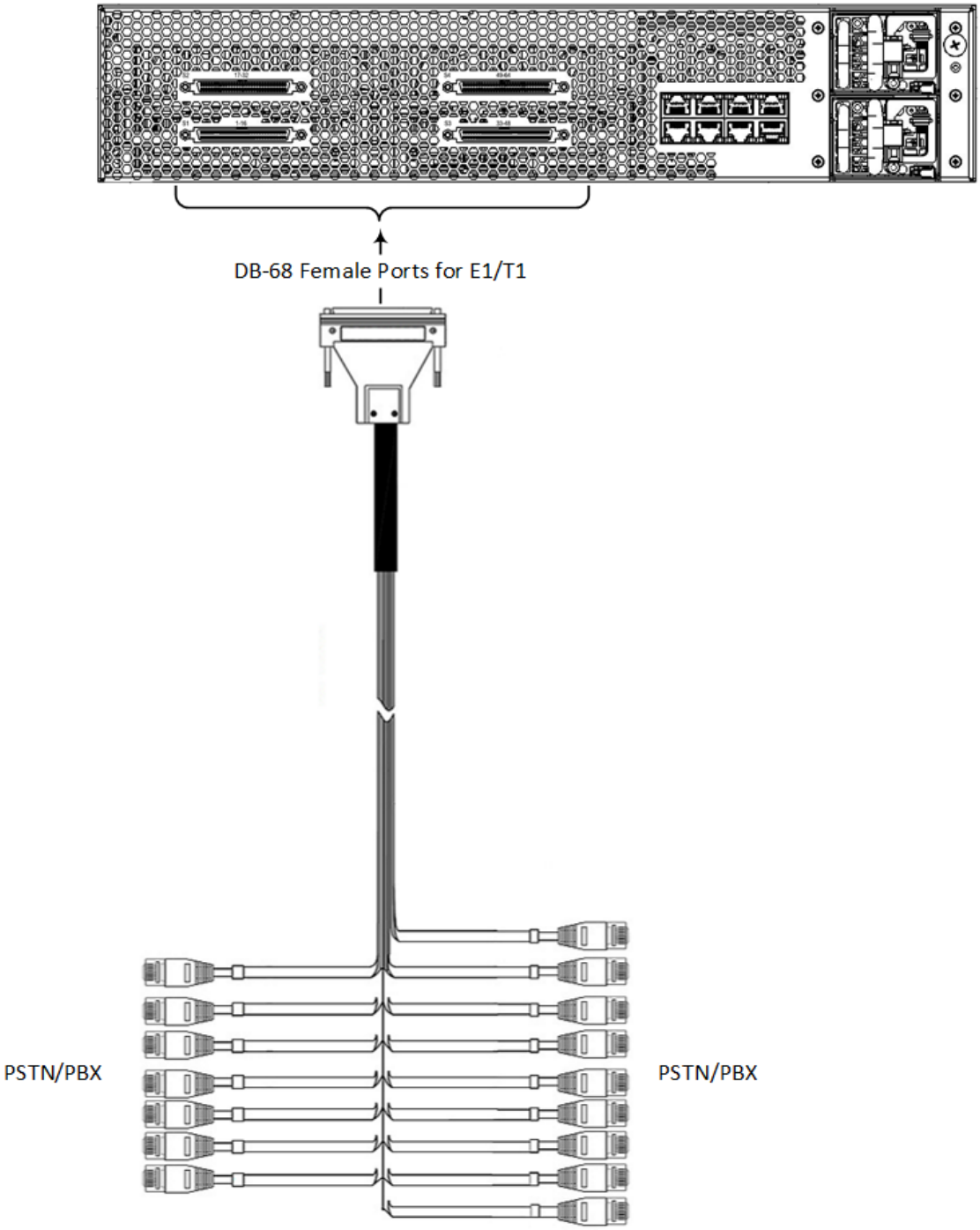
Figure 5-6: Connector Pinouts for DB-68 to RJ-48 Crossover Cable Adapter (Ordered from AudioCodes)

68-Pin D-Sub Connector		RJ45 Connector Shielded			68-Pin D-Sub Connector		RJ45 Connector Shielded		Label
Pin	Name (Host)	Pin	Name (Host)		Pin	Name (Host)	Pin	Name (Host)	(S1/S2/S3/S4)
1	RX-8	4	RX, Ring, -		35	TX-8	1	TX, Ring, -	8/24/40/56
2	RX+8	5	RX, Tip, +		36	TX+8	2	TX, Tip, +	
3	RX-7	4	RX, Ring, -		37	TX-7	1	TX, Ring, -	7/23/39/55
4	RX+7	5	RX, Tip, +		38	TX+7	2	TX, Tip, +	
5	RX-6	4	RX, Ring, -		39	TX-6	1	TX, Ring, -	6/22/38/54
6	RX+6	5	RX, Tip, +		40	TX+6	2	TX, Tip, +	
7	RX-5	4	RX, Ring, -		41	TX-5	1	TX, Ring, -	5/21/37/53
8	RX+5	5	RX, Tip, +		42	TX+5	2	TX, Tip, +	
9	RX-4	4	RX, Ring, -		43	TX-4	1	TX, Ring, -	4/20/36/52
10	RX+4	5	RX, Tip, +		44	TX+4	2	TX, Tip, +	
11	RX-3	4	RX, Ring, -		45	TX-3	1	TX, Ring, -	3/19/35/51
12	RX+3	5	RX, Tip, +		46	TX+3	2	TX, Tip, +	
13	RX-2	4	RX, Ring, -		47	TX-2	1	TX, Ring, -	2/18/34/50
14	RX+2	5	RX, Tip, +		48	TX+2	2	TX, Tip, +	
15	RX-1	4	RX, Ring, -		49	TX-1	1	TX, Ring, -	1/17/33/49
16	RX+1	5	RX, Tip, +		50	TX+1	2	TX, Tip, +	
17	NC	NC	NC		51	NC	NC	NC	
18	NC	NC	NC		52	NC	NC	NC	
19	RX-16	4	RX, Ring, -		53	TX-16	1	TX, Ring, -	16/32/48/64
20	RX+16	5	RX, Tip, +		54	TX+16	2	TX, Tip, +	
21	RX-15	4	RX, Ring, -		55	TX-15	1	TX, Ring, -	15/31/47/63
22	RX+15	5	RX, Tip, +		56	TX+15	2	TX, Tip, +	
23	RX-14	4	RX, Ring, -		57	TX-14	1	TX, Ring, -	14/30/46/62
24	RX+14	5	RX, Tip, +		58	TX+14	2	TX, Tip, +	
25	RX-13	4	RX, Ring, -		59	TX-13	1	TX, Ring, -	13/29/45/61
26	RX+13	5	RX, Tip, +		60	TX+13	2	TX, Tip, +	
27	RX-12	4	RX, Ring, -		61	TX-12	1	TX, Ring, -	12/28/44/60
28	RX+12	5	RX, Tip, +		62	TX+12	2	TX, Tip, +	
29	RX-11	4	RX, Ring, -		63	TX-11	1	TX, Ring, -	11/27/43/59
30	RX+11	5	RX, Tip, +		64	TX+11	2	TX, Tip, +	
31	RX-10	4	RX, Ring, -		65	TX-10	1	TX, Ring, -	10/26/42/58
32	RX+10	5	RX, Tip, +		66	TX+10	2	TX, Tip, +	
33	RX-9	4	RX, Ring, -		67	TX-9	1	TX, Ring, -	9/25/41/57
34	RX+9	5	RX, Tip, +		68	TX+9	2	TX, Tip, +	

➢ **To connect T1/E1 trunks using DB-68 ports:**

1. Connect the DB-68 male connector to one of the T1/E1 slots (S1, S2, S3 or S4) on the rear panel.

Figure 5-7: Connecting T1/E1 Interfaces



2. If you are using AudioCodes patch panels (otherwise, skip to Step 3):
   a. Mount the patch panels in the 19-inch rack, using the integrated mounting brackets on either side of the patch panel (screws not included). Mount the patch panels close enough to the device so that the RJ-48 connectors can reach the panel.
   b. Connect the RJ-48 connectors that are located on the other end of the DB-68 to RJ-48 cable adapter to the respective ports on the **rear** of the patch panel. The front of the patch panel shows the port numbers (**1** to **16**, **17** to **32**, **33** to **48**, and **49** to **64**).

c. Connect the ports on the front of the patch panel (shown below) to your PBX/PSTN, using RJ-48 cable connectors.

3. If you're not using AudioCodes patch panels, connect the RJ-48 connectors on the other end of the DB-68 to RJ-48 cable adapter to your PBX/PSTN.
4. Repeat steps 1 through 3 for each DB-68 connector.

Connecting PSTN Fallback for E1/T1 Trunks

The device supports PSTN Fallback. If the device loses power (e.g., due to a power outage or the power cable is unplugged), it automatically routes calls directly (without routing rules) between the Tel side (e.g., PBX) and the PSTN (instead of to the IP network).

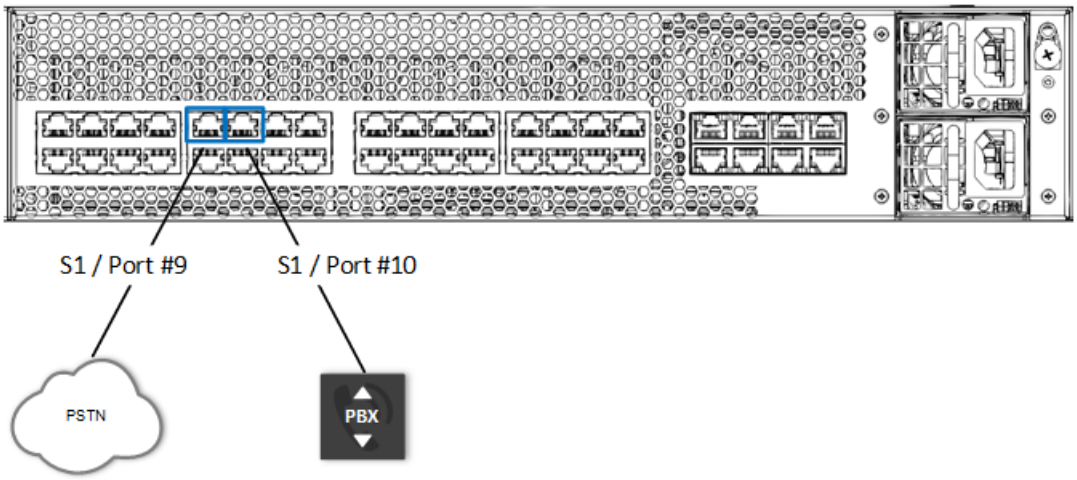
PSTN Fallback is supported by specific T1/E1 port pairs, where one port is connected to the Tel side and the other port to the PSTN. In normal operation (i.e., device has power), the port connected to the PSTN is not used because calls from the Tel side are routed to the IP network (and vice versa). However, upon a loss of power, an internal metallic relay switch **physically** connects the two ports, enabling calls to be routed directly between the Tel and PSTN sides.

PSTN Fallback is supported by the following T1/E1 port pairs:

Slot Number	T1/E1 Port Pairs for PSTN Fallback
S1	■ Port #1 and Port #2 ■ Port #9 and Port #10
S2	■ Port #17 and Port #18 ■ Port #25 and Port #26
S3	■ Port #33 and Port #34 ■ Port #41 and Port #42
S4	■ Port #49 and Port #50 ■ Port #57 and Port #58

It doesn't matter which port in the fallback port pair you connect to the Tel side or the PSTN.

The following figure shows an example of PSTN Fallback cabling, using ports #9 and #10 on the S1 module. When PSTN Fallback is triggered, these two ports physically connect to one another, enabling calls to be routed directly between the PBX and PSTN.



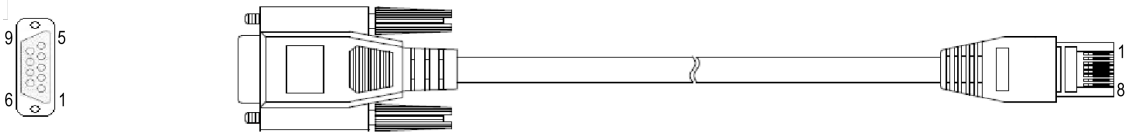
Connecting the Serial Interface to a Computer

The device provides an RS-232 serial interface port on the front panel, which you can use to access its command-line interface (CLI) for serial communication.

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

- **Port Type:** RJ-45
- **Cable:** RJ-45 to DB-9 female cable adapter (supplied)

Figure 5-8: RJ-45 to DB-9 Female Cable Adapter



- **Connector Pinouts:**

Table 5-3: RJ-45 to DB-9 Serial Cable Connector Pinouts

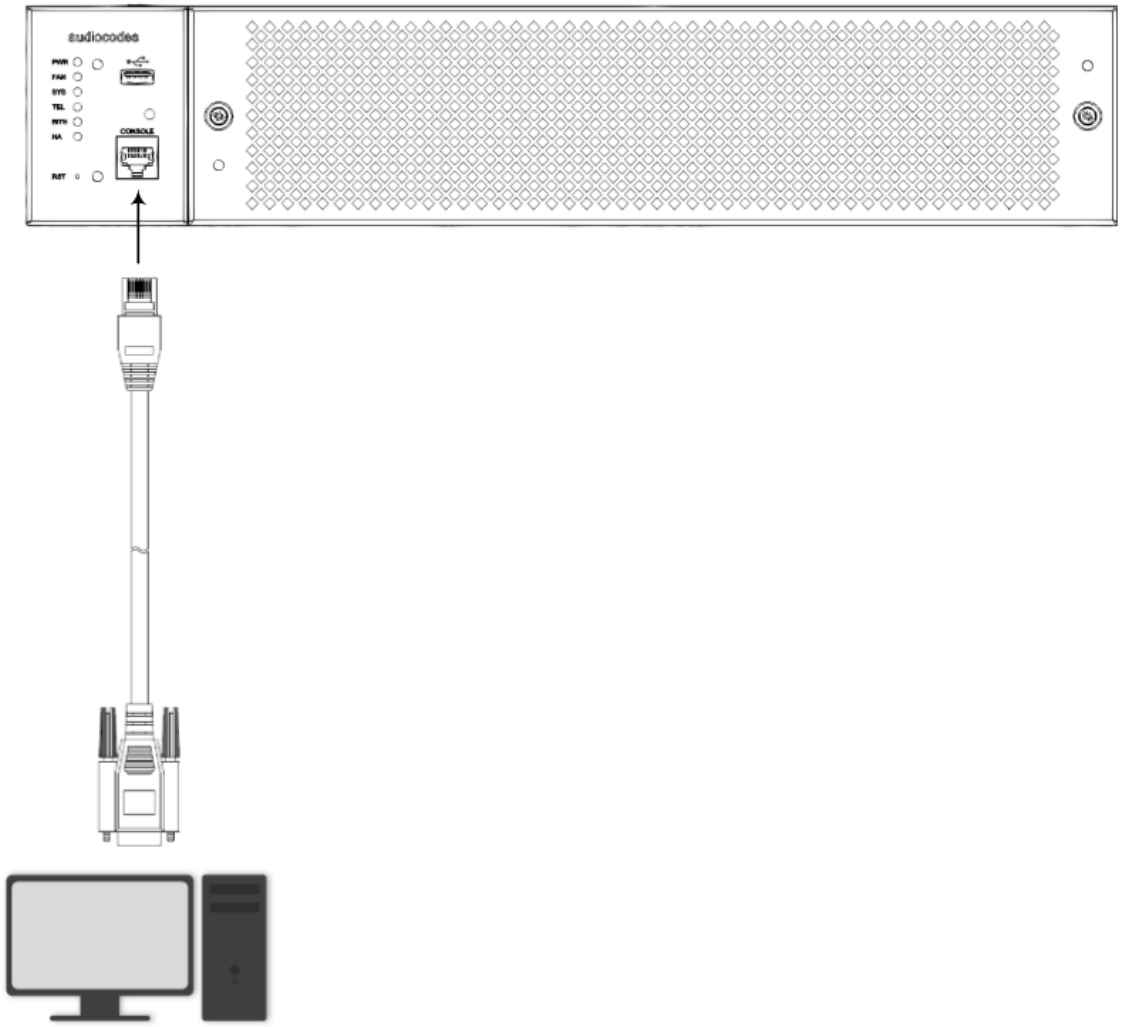
RJ-45		DB-9 Female	
Pin	**Signal**	**Pin**	**Signal**
1	Internally used	8	Not used
2	Ground (GND)	6	Ground (GND)
3	Transmit Data (TXD)	2	Receive Data (RXD)
4	Internally used	5	Not used

RJ-45		DB-9 Female	
5	Internally used	5	Not used
6	Receive Data (RXD)	3	Transmit Data (TXD)
7	Ground (GND)	4	Ground (GND)
8	Internally used	7	Not used

➢ **To connect the serial interface port to a computer:**

1. Connect the RJ-45 connector to the device's serial port (labeled **CONSOLE**), located on the chassis' front panel.

Figure 5-9: Connecting Serial Interface



2. Connect the DB-9 connector to the RS-232 serial communication port on your PC.

Connecting a USB Storage Device

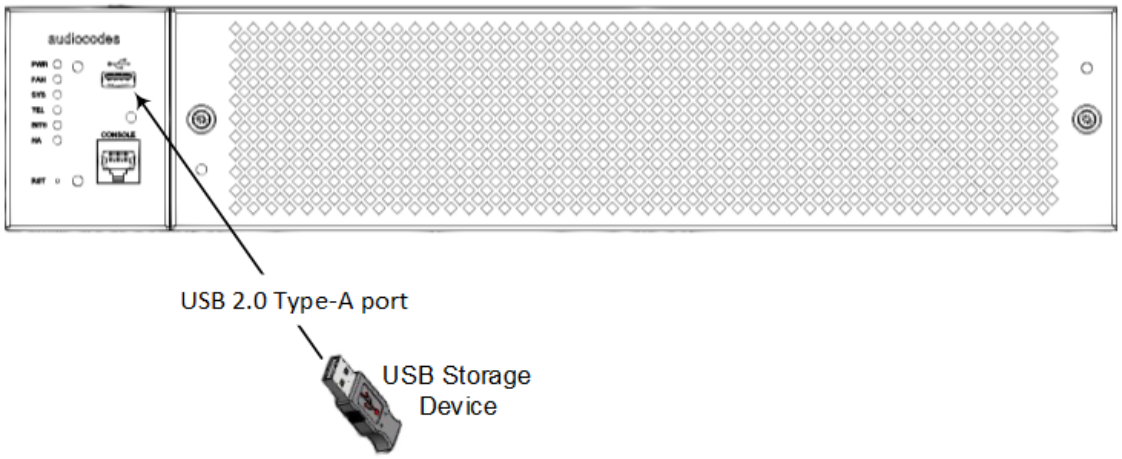
The device supports USB storage capabilities, using an external USB hard drive or flash disk (disk on key) connected to the device's USB port. The storage capabilities are configured through CLI and include the following:

- Updating the device's firmware or configuration from USB
- Saving the current configuration to USB as a backup
- Saving network captures to USB

➢ **To connect the USB storage device:**

- Connect your USB storage device to the USB port, located on the front panel.

Figure 5-10: Connecting USB Storage Device



Only a single USB storage (formatted to FAT/FAT32) operation is supported at any given time.

Connecting to Power

The device can be powered from an AC (see Connecting to AC Power below) or a DC (see Connecting to DC Power on page 27) power source, depending on ordered hardware configuration.

Connecting to AC Power

The device provides two hot-swappable Power Supply modules for load-sharing and power redundancy in case of failure in one of the modules. To replace a faulty Power Supply module, see Replacing Power Supply Modules on page 34.

The device receives power from a standard AC electrical outlet. The connection is made using the supplied AC power cord.

The following table lists the AC power supply specifications:

Table 5-4: AC Power Specifications

Item	Description
Power Supply	Hot swappable, load-sharing, 1+1 power redundant
Input Ratings	100-240 VAC; 4-9 A, 50-60 Hz
Inlet type	C-14
Safety Standards	IEC 62384-1 and UL 62384-1

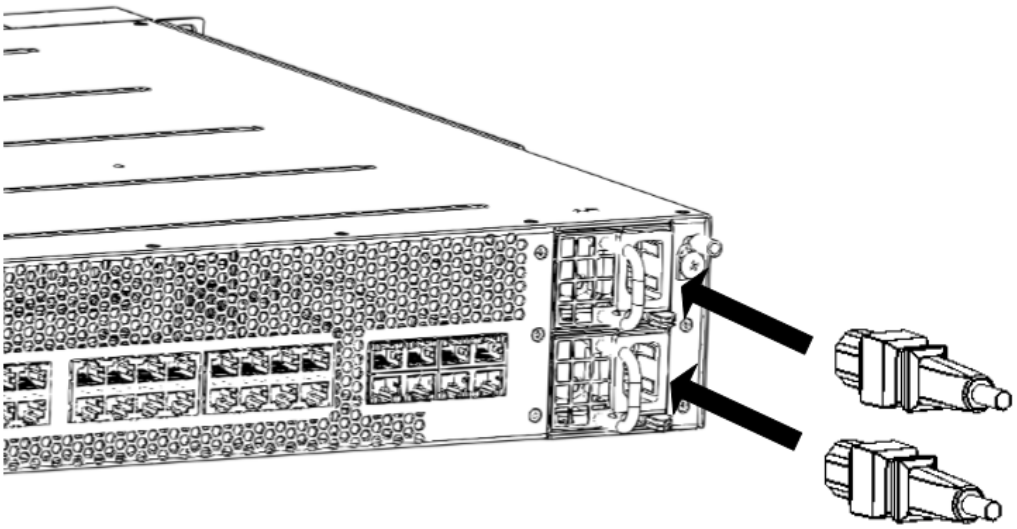
- For efficient power redundancy, make sure that you connect each Power Supply module to a different AC power source.
- The two AC power sources must have the same ground potential.
- The device must be connected (by service personnel) to a socket-outlet with a protective earthing connection.
- Use only a certified 3-conductor power cord, utilizing 18 AWG or 1 mm^2 wires, and no longer than 4.5 meters (14.8 ft).
- If a failure occurs in any one of the Power Supply modules, replace the module immediately. For replacing the Power Supply modules, see Replacing Power Supply Modules on page 34.

ご注意
本製品に添付の電源ケーブルは、Mediant 3100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.

➢ **To connect the device to power:**

1. Plug the female end of the AC power cord (supplied) into the power inlet.

Figure 5-11: Connecting to Power



2. Connect the male end of the power cord to a standard AC electrical outlet.
3. If you are using both Power Supply modules, repeat steps 1 through 2 for connecting the second Power Supply module, but using the power socket associated with the second Power Supply module and connecting this to a different supply circuit.
4. Turn on the power at the power source (if required).
5. Check that the LED on each Power Supply module (front panel) is lit green, indicating that the Power Supply is operating properly.

Connecting to DC Power

The device houses two hot-swappable Power Supply modules, providing 1+1 load-sharing and power redundancy in case of a Power Supply module failure.

Table 5-5: DC Power Specifications

Physical Specification	Value
Power Supplies	Two redundant extractable power cassettes, hot swappable, load sharing, DC input.
Input Voltage Rating	48VDC, +25%/-15%
Connector Type	Terminal block, 14-AWG wires
Safety Standards	IEC 62368-1, UL 62368-1

DC Power Safety Notice:

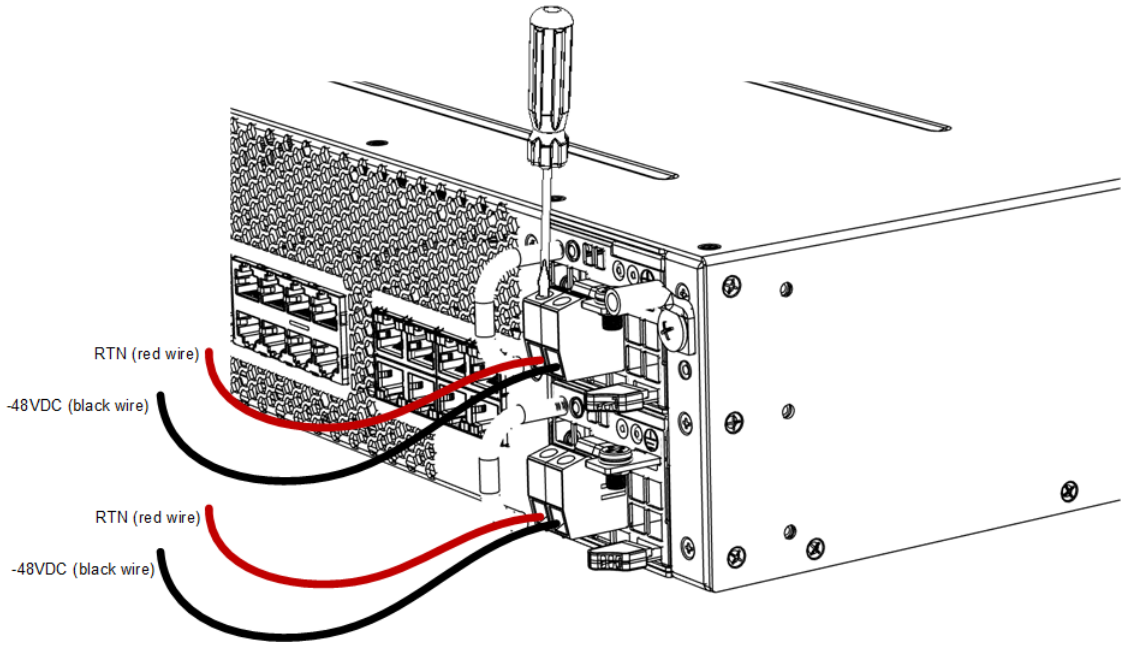
- The device must be permanently connected to earth (ground), as described in Grounding and Surge Protection on page 14.
- Connection of the device to the DC mains power must be done only by a certified electrician and in accordance with local national electrical regulations.
- The two DC power sources must have the same ground potential.
- To avoid possible conducted emission interferences, the device should be powered using one of the following options:
  - ✓ AC-to-48VDC filtered power source with a feeding cable no longer than 3 m.
  - ✓ Direct 48V battery connection.
- Connect the device to a safety extra-low voltage (SELV) source that is sufficiently isolated from the mains.
- You must connect both Power Supply modules. Make sure that you connect each one to a different DC power supply source.
- If a failure occurs in any one of the Power Supply modules, replace the module immediately.

The Power Supply module provides an integrated DC terminal block for connecting two 14-AWG power leads (positive and negative).

➢ **To connect to a DC power supply:**

1. Disconnect your DC wires from your DC power source.
2. Using a wire-stripping tool, strip the ends of the two wires (14-AWG) to a length that is sufficient for inserting into the supplied terminal block. Make sure that you do not strip too much of the insulation so that wire is not exposed when it exits the terminal block plug after it has been secured to the terminal block.
3. Identify the polarity (negative and positive) of the two DC power feed wires. Polarity of power feed wires are typically color-coded, where red is positive (RTN) and black is negative (-48VDC).
4. Insert the exposed wire of one of the two DC-input power source wires into the correct opening (according to polarity) on the terminal block plug, as shown in the figure. Make sure that only wire with insulation exits the terminal block.
5. Using a flat-head screwdriver, tighten the captive screw located above the installed wire lead to secure the wire to the terminal block.
6. Repeat steps 1 through 5 for the second wire.
7. Make sure that no wire strands are left outside the connector and that all strands have been clamped under the terminal block screw. Gently try and pull the wires from the terminal block. If the wires become free, repeat Step 5 to secure the wires to the terminal block.

Figure 5-12: Connecting Wire Leads to Terminal Block



8. Connect the DC power leads to a 48-VDC power source.

6 Hardware Maintenance

The device is designed as a modular chassis and allows you to order certain parts as a Field Replacement Unit (FRU). This section describes the procedures for replacing these parts.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) due to improper handling of the device's Fan Tray or Power Supply modules can cause irreversible damage. Therefore, adhere to the following guidelines for preventing ESD:

- When handling these modules, always wear a grounded ESD wrist strap or ankle strap at a grounded work area to prevent ESD. Connect the equipment end of the strap to the chassis' ground lug.
- To prevent static electrical damage to a module, do not touch its electrical components.

Replacing the Fan Tray Module

The section describes how to replace the Fan Tray module.

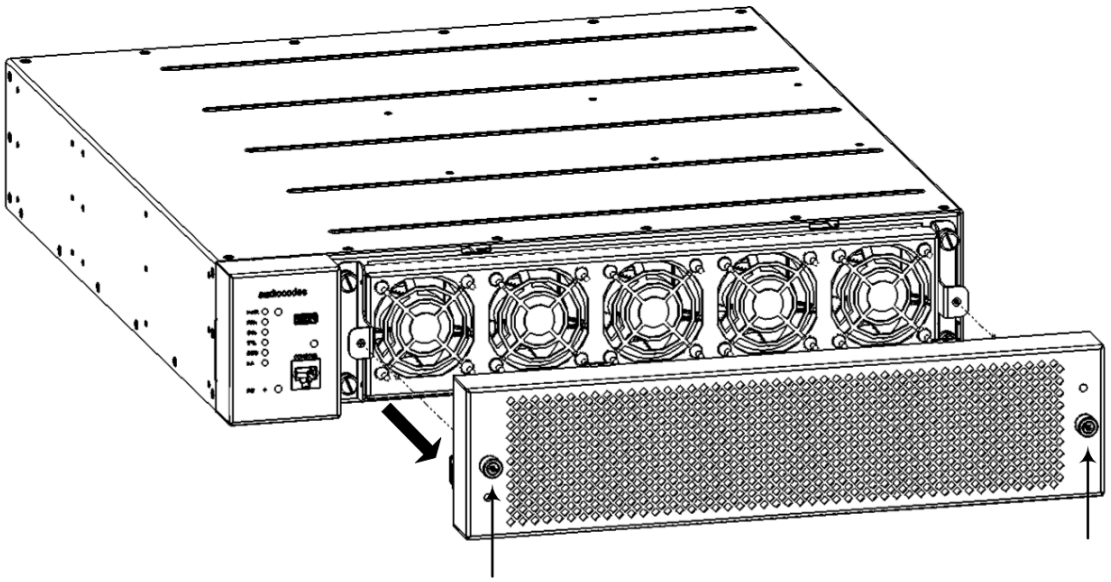
- **DO NOT** operate the device without the Fan Tray module.
- Before replacing a failed Fan Tray module, make sure that you have the replacement Fan Tray module on hand so that you can replace the module immediately.
- When removing the Fan Tray module, the fan blades may still be rotating at high speeds (even if you power off the device). Therefore, partially extract the module from the chassis and then wait a few seconds to allow the fan blades to stop, prior to extracting the module entirely from the chassis.

Avertissements:

- N'opérez pas l'appareil sans module de Caisse de ventilateur ! Avant de remplacer le module de Caisse de ventilateur, assurez-vous que vous avez le module de remplacement en main.
- Avant de retirer le module de Caisse de ventilateur et une fois l'appareil mis hors tension, les lames risquent de continuer à tourner à grande vitesse. Aussi, patientez quelques secondes pour permettre aux lames de s'arrêter, avant d'extraire le module du châssis.

➢ **To replace the Fan Tray module:**

1. Remove the Fan Tray module:
   a. Remove the Fan Tray cover:
      i. Loosen the two Philips-head, spring-loaded captive screws, which are located on both sides of the Fan Tray cover.
      ii. Remove the Fan Tray cover.

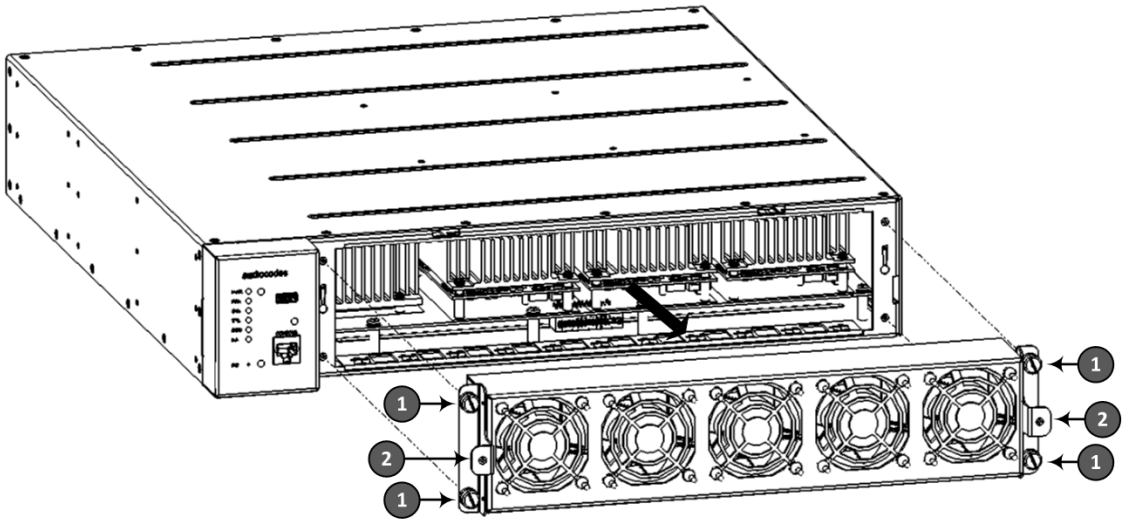


b. Remove the Fan Tray module:

i. Loosen the four flat-head, spring-loaded captive screws (see #**1** in following figure) securing the Fan Tray module to the chassis, using a flat-head or Phillips screwdriver.

ii. Grip the handles (see #**2** in following figure) of the Fan Tray module, and then gently pull the module away from the chassis in the same plane.

Figure 6-1: Removing Fan Tray Module



2. Install the new Fan Tray module:

a. Install the Fan Tray:

i. Orientate the Fan Tray module like in the previous figure.

ii. Grip the handles of the Fan Tray module, and then gently insert the module into the front panel opening, while making sure that it is horizontally aligned with the chassis.

iii. Secure the Fan Tray module to the chassis by tightening the four flat-head, spring-loaded captive screws on the front panel of the module. You can use a flat-head screwdriver.

b. Install the Fan Tray cover:

i. Orientate the Fan Tray cover as shown in Step 1 above and then place it over the Fan Tray module so that the screws are flush with screw holes on the handles of the Fan Tray module. Secure the cover by tightening the two Philips-head spring-loaded captive screws located on the cover.

Replacing the Air Filter

The air filter is intended to prevent dust and other airborne particles from entering the chassis and adversely affecting its components. To maintain proper operation of the device, you must periodically replace the air filter. The frequency of replacing the air filter depends on the cleanness at the installation site. In installation rooms with extra-building openings (exposed to dust and/or air particles), you may need to replace the air filter once every 3 months. In cleaner rooms (e.g., no extra-building openings), you may need to replace the air filter once every 6 months. In air-purified (conditioned) rooms, air filter replacement can be done annually. It's the user's responsibility to determine the cleanness level and the air filter replacement frequency.

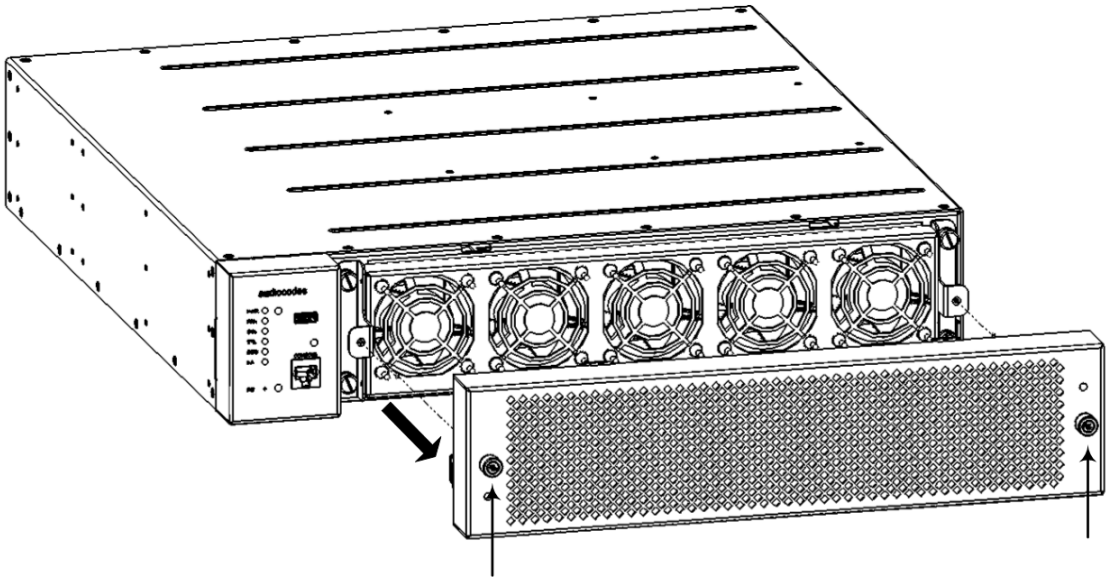
- The device's components may be damaged due to a dirty or blocked air filter.
- Replace the air filter only with an air filter purchased from AudioCodes.
- Before removing the air filter, make sure that you have the replacement air filter on hand so that you can replace it immediately.

The air filter is hot-swappable (i.e., you can replace it while the device is powered on).

➢ **To replace the air filter:**

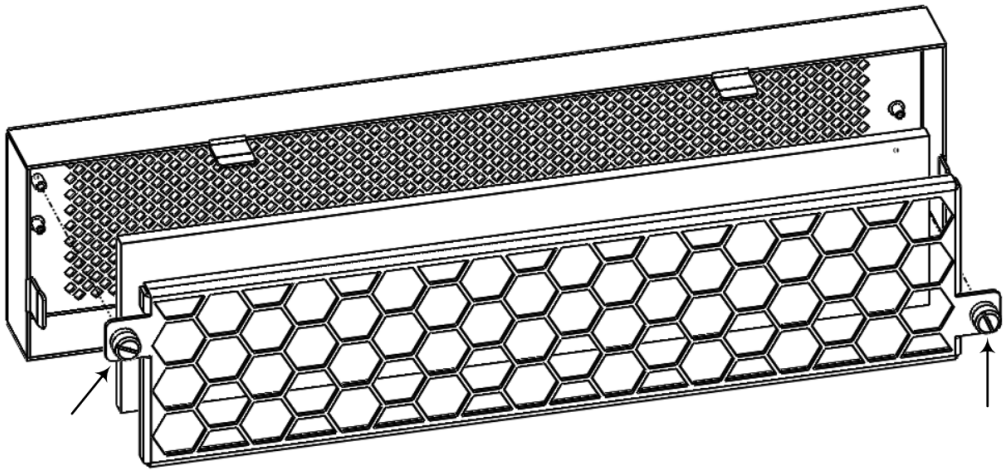
1. On the front panel, remove the Fan Tray cover, by loosening the two Philips-head spring-loaded captive screws located on each side of the cover, and then gently pulling the cover away from the chassis:

Figure 6-2: Removing Fan Tray Cover on Front Panel



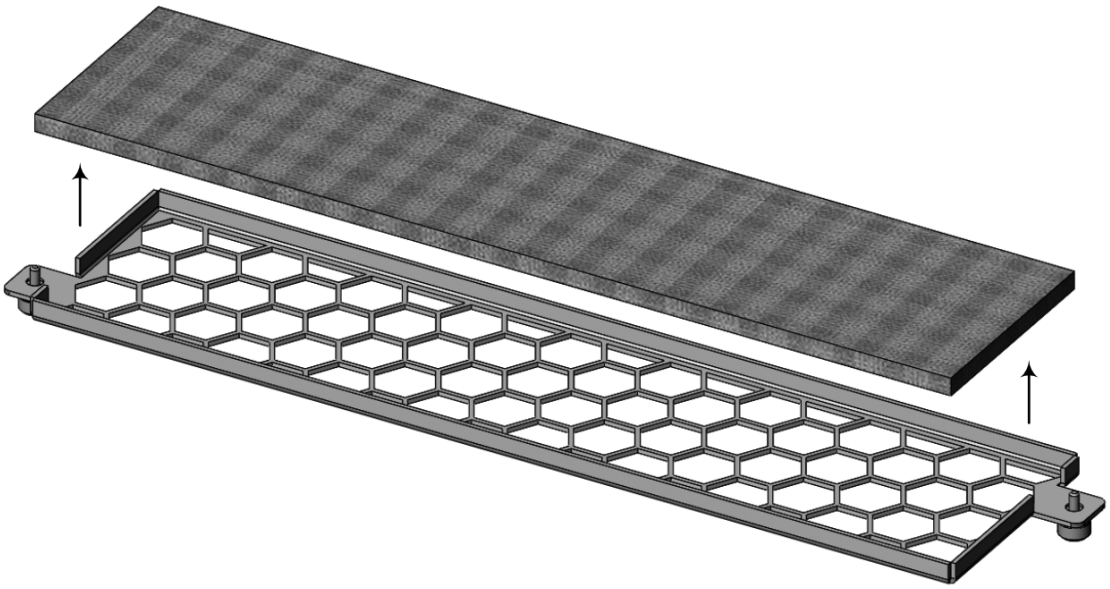
2. Remove the Air Filter cover, located on the inside of the Fan Tray cover, by removing the two flat-head, spring-loaded captive screws located on either side of the Air Filter cover, using a flathead screwdriver:

Figure 6-3: Removing Air Filter Cover from Fan Tray Cover



3. Pull out the exposed air filter from the enclosure of the Air Filter cover and dispose of it:

Figure 6-4: Removing Air Filter from Air Filter Cover



4. Insert the new filter into the enclosure of the Air Filter cover.
5. Attach the Air Filter cover to the Fan Tray cover, by using the two spring-loaded captive screws (see the figure in Step 2).
6. Attach the Fan Tray cover to the chassis (see the figure in Step 1).

Replacing Power Supply Modules

This section describes how to replace a Power Supply module.

The Power Supply modules are hot-swappable. Therefore, if you are replacing only one module, you can leave the second module connected to its power source.

Before removing a Power Supply module:
- DC Power Supply module: Shut off the power from the power source.
- AC Power Supply module: Disconnect the power cable.

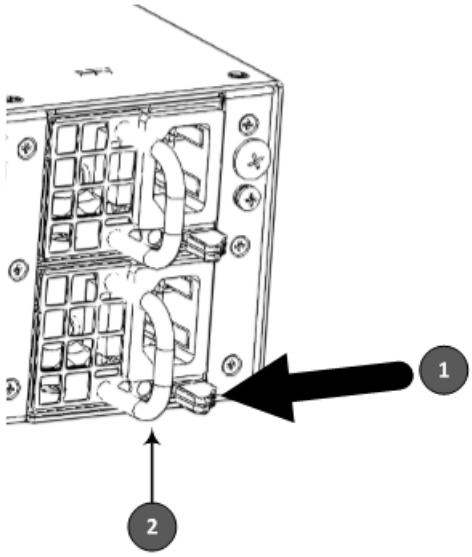
➢ **To replace a Power Supply module:**

1. Remove the faulty Power Supply module, located on the rear panel:
   a. Disconnect the power to the faulty module:
      - DC Power Supply module: Turn off the circuit breaker for the power feed to the module. Make sure that the power LED on the module is off. Remove the DC wires from the module's terminal block.
      - AC Power Supply module: Disconnect one end of the power cord from your power source, by pulling the power plug out of the electrical wall outlet. Remove the plug

at the other end of the power cord from the power inlet on the faulty Power Supply module. Make sure that the power LED on the module is off.

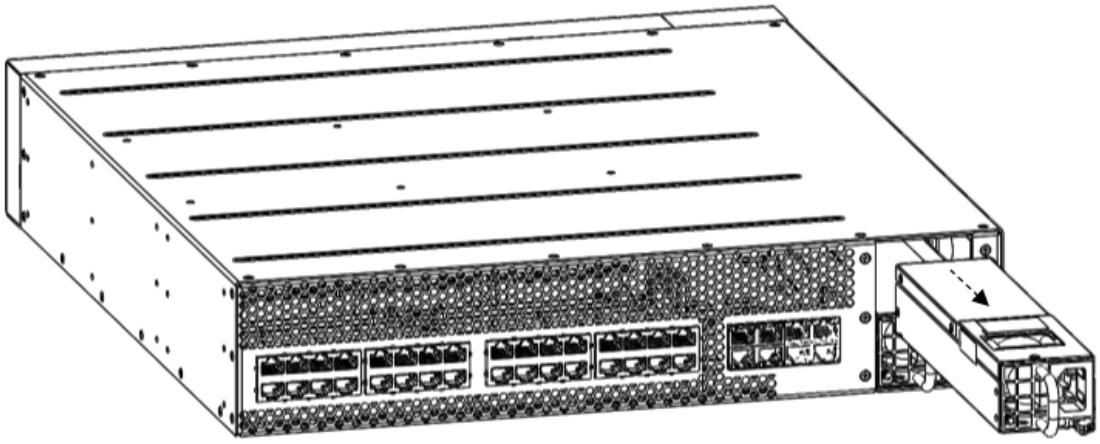
b. On the faulty Power Supply module, push the release latch leftward toward the extraction handle (see **#1** in the following figure) and keep it in this position; this retracts the latch that secures the module to the chassis. While keeping the release latch in the left position, grip the handle of the faulty Power Supply module (see **#2** in the following figure) and gently pull the module halfway out of the chassis slot:

Figure 6-5: Handle and Release Latch on Power Supply Module (e.g., AC Power Supply Module)



c. Place your other hand under the faulty module for support and then slide the module completely out of the chassis. Avoid touching the top of the module as it may be hot from being in the chassis.

Figure 6-6: Removing Power Supply Module from Chassis (e.g., AC Power Supply Module)



2. Install the new Power Supply module:

a. Grip the handle of the module with one hand while supporting it underneath with the other hand.

b. Orientate the module as shown in the previous figure and align it with the chassis slot from which you removed the faulty module.

c. Gently insert the module into the slot until it has engaged fully with the chassis backplane and a "click" sound heard when the release latch of the module locks it into the slot.

d. Connect the module to the power source.

Replacing a Faulty Device

If you need to replace a faulty device, for whatever reason, with a new device having the same hardware configuration, follow the below procedure:

➢ **To replace a faulty device:**

1. Make sure that you have a new License Key for the device. If not, ask your AudioCodes sales representative for the License Key.
2. Disconnect the faulty device from your power supply, and then unplug all cables connected to it.
3. Plug all the relevant cables into the new device, and then power it up.
4. From your local computer, access the device's Web interface with the device's default IP address (192.168.0.2/24), through one of the first two Ethernet ports GE 1 or GE 2 on the top row (rear panel).

the rear pane

5. Load the software file (.cmp) to the device. If you don't have the file, ask your AudioCodes sales representative for it.
6. Load the License Key file to the device.
7. Load your backup (saved) Configuration Package file or individual files (e.g., ini file, certificate files, Dial Plan file, and CPT file), if you have, to the device.
8. Check that the required certificate is installed on the device (TLS Context). If not, load it.
9. Disconnect your computer from the device, and then connect the device's Ethernet port to your network.
10. Verify that the device is operating correctly (e.g., alarms are cleared and call traffic is being routed) and that it is successfully communicating with third-party equipment (e.g., monitoring system, billing system, or routing system), if relevant.
11. If the device is monitored by OVOC, access the OVOC web-based management interface, remove the device from the OVOC topology, and then re-add it.

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Document #: LTRT-89815