

# Mediant 500 Gateway and E-SBC



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The device is an INDOOR unit and thus, must be installed only indoors. In addition, Ethernet port interface cabling must be routed only indoors and must not exit the building.



**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.



For deployment in Finland, Sweden and Norway, the device must be installed only in restricted access locations that are compliant with ETS 300253 guidelines where equipotential bonding has been implemented.



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

## Related Documentation

Document Name
<a href="#">Datasheet</a>
<a href="#">Mediant 500 E-SBC User's Manuals</a>

## Document Revision Record

LTRT	Description
10388	Max. power consumption updated.
10389	Status LED flashing for upgrade; miscellaneous formatting.
10390	Operating environment specifications updated.
10391	AC power cable warning (Japanese); STATUS LED update.
10392	Wall-mounting added.
10393	Logo updated.

LTRT	Description
10394	Duration of press updated for reset to defaults.
10395	Device replacement

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# 1 Introduction

This document provides a hardware description of the Mediant 500 E-SBC (hereafter referred to as *device*) and step-by-step procedures for mounting and cabling the device.

The device supports the following interfaces:

- Four Gigabit Ethernet (10/100/1000Base-T) LAN ports
- Single E1/T1 port interface over a single copper wire pair (PRI interface is a separate-orderable item)
- Two USB ports for optional, USB storage services
- Serial console port (RJ-45) for device management



- Serial Hardware configurations may change without notice. Currently available hardware configurations are listed in AudioCodes Price Book. For further 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 was shipped.

➤ **To unpack the device:**

1. Open the carton and carefully remove 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:
  - Four anti-slide bumpers for desktop installation
  - Two mounting brackets for 19-inch rack mounting
  - Serial cable adapter
  - One AC power cable
  - (Optional) Wall-mounting kit (separate-orderable item)
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

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

**Table 3-1: Physical Dimensions**

Physical Specification	Value
Dimensions (H x W x D)	4.37 (1U) x 31.0 cm x 21.0 cm (1.72 x 12.2 x 8.3 in.)
Weight	2.0 kg (4.4 lbs.)
Environmental	<ul style="list-style-type: none"> <li>Operational: 0 to 40°C (32 to 104°F)</li> <li>Storage: -25 to 70°C (-13 to 158°F)</li> <li>Humidity: 10 to 90% non-condensing</li> </ul>

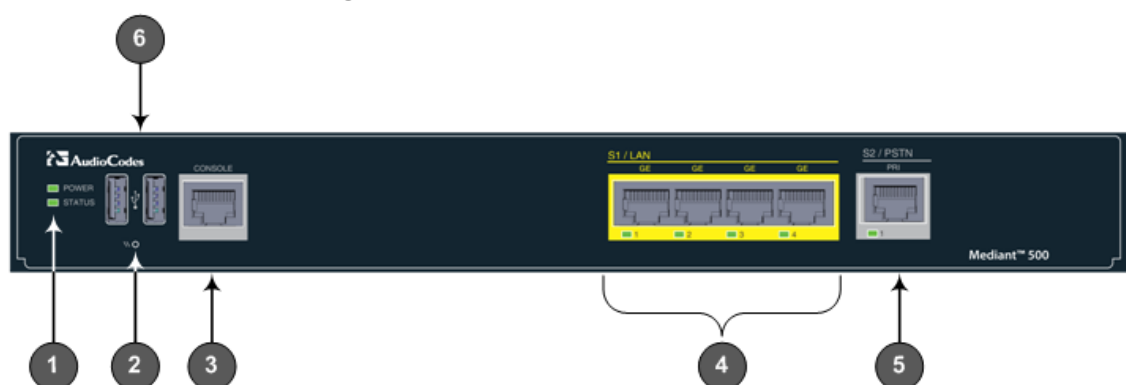
### Front Panel Description

This section describes the device's front panel.

### Ports and Buttons

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	<b>POWER / STATUS</b>	LEDs indicating the status of the power and reboot/initialization. For more information, see LED

Item #	Label	Description
		Descriptions.
2	//	Reset pinhole button for resetting the device and optionally, for restoring the device to factory defaults. To restore the device to factory defaults, do the following: With a paper clip or any other similar pointed object, press and hold down the pinhole button for at least 12 seconds, but no longer than 25 seconds
3	<b>CONSOLE</b>	RJ-45 port for RS-232 serial communication
4	<b>LAN</b>	Up to four Gigabit Ethernet (10/100/1000Base-T) ports for connecting to LAN network (IP phones, computers, or switches). These ports support half- and full-duplex modes, auto-negotiation, and straight or crossover cable detection.
5	<b>PRI</b>	Single E1/T1 port interface (RJ-48). <b>Note:</b> PRI interface is a customer-ordered item.
6	<b>USB</b>	Two USB 2.0 ports, which can be used, for example, for various storage capabilities using an external USB hard drive or flash disk (disk on key).

## LED Descriptions

This section describes the LEDs provided on the front panel.

### Operational Status LED

The **STATUS** LED indicates the operating status, as described in the following table.

**Table 3-3: STATUS LED Description**

LED Color	LED State	Description
Green	On	Device is operational.
	Fast Flashing	<ul style="list-style-type: none"> <li>Initial rebooting stage.</li> <li>Software upgrade (.cmp file) in process (currently supported only on Software Version 6.8).</li> </ul>
Red	On	Boot failure.
-	Off	Advanced rebooting stage.

## LAN Interface LED

Each Ethernet port provides a LED for indicating LAN operating status, as described in the following table.

**Table 3-4: LAN LED Description**

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

## E1/T1 LEDs

The E1/T1 trunk port provides a LED for indicating operating status, as described in the following table:

**Table 3-5: E1/T1 LED Description**

Color	State	Description
Green	On	Trunk is synchronized (normal operation).
Red	On	Loss due to any of the following signals: <ul style="list-style-type: none"> <li>■ LOS - Loss of Signal</li> <li>■ LOF - Loss of Frame</li> <li>■ AIS - Alarm Indication Signal (the Blue Alarm)</li> <li>■ RAI - Remote Alarm Indication (the Yellow Alarm)</li> </ul>
-	Off	Failure / disruption in the AC power supply or the power is currently not being supplied to the device through the AC power supply entry.

## Power LED

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

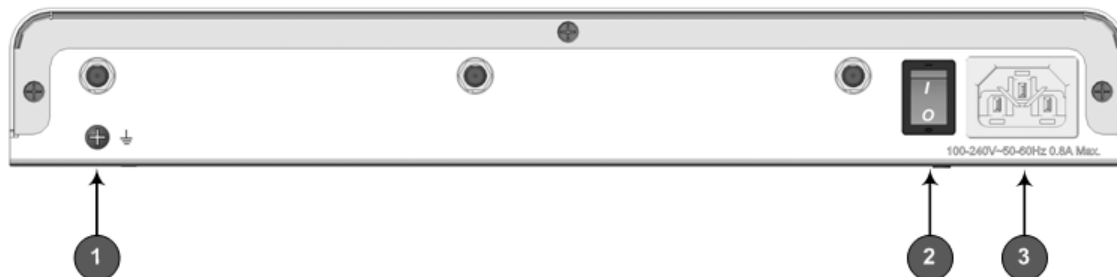
**Table 3-6: POWER LED Description**

LED Color	LED State	Description
Green	On	Power is received by the device.
-	Off	No power received by the device.


## Rear Panel Description

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

**Figure 3-2: Rear Panel**



**Table 3-7: Rear Panel Description**

Item #	Label	Description
1		Protective earthing screw.
2	I / O	Power switch (O is off; I is on).
3	100-240V~50-60Hz 0.8A Max.	Three-prong AC power supply entry.

## 4 Mounting the Device

The device can be mounted in one of the following ways:

- Placed on a desktop – see Desktop Mounting
- Installed in a standard 19-inch rack – see Wall Mounting



Do not place any equipment directly on top of the device or adjacent to its sides (at least 13-cm separation). In addition, if you are mounting the device in a 19-inch rack, ensure that at least a 3U separation is maintained between the device and other mounted devices or equipment.

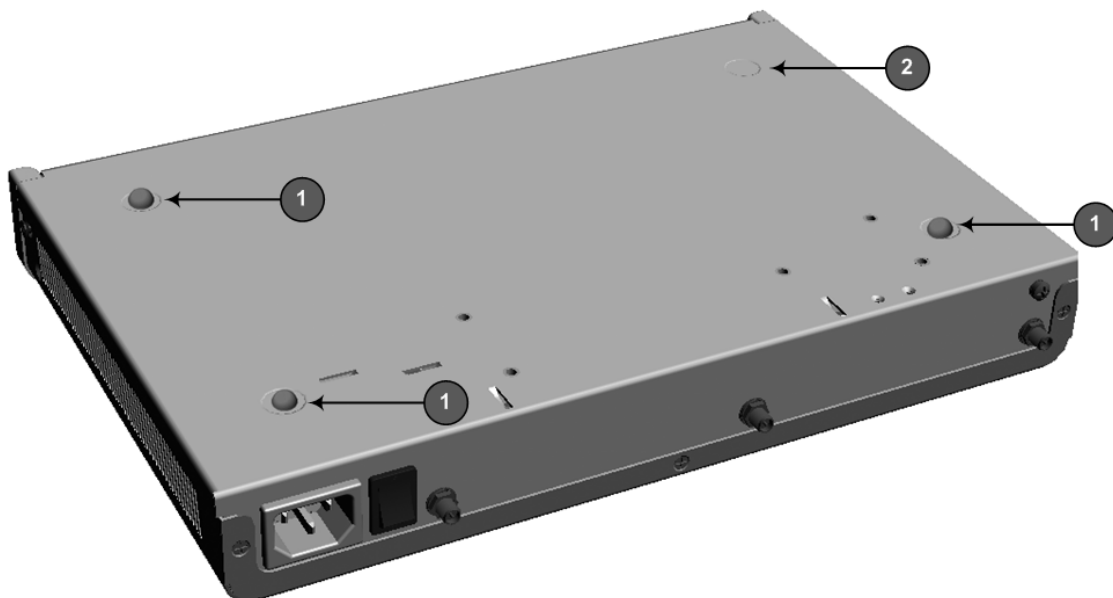
### Desktop Mounting

The device can be placed on a desktop when its four anti-slide bumpers (supplied) are attached to the underside of the device.

➤ **To attach the anti-slide rubber bumpers to the device:**

1. Flip the device over so that its underside faces up.
2. Locate the four anti-slide grooves on the underside - one in each corner.
3. Peel off the adhesive, anti-slide rubber feet and stick one in each anti-slide groove.

**Figure 4-1: Location for Applying Rubber Feet**



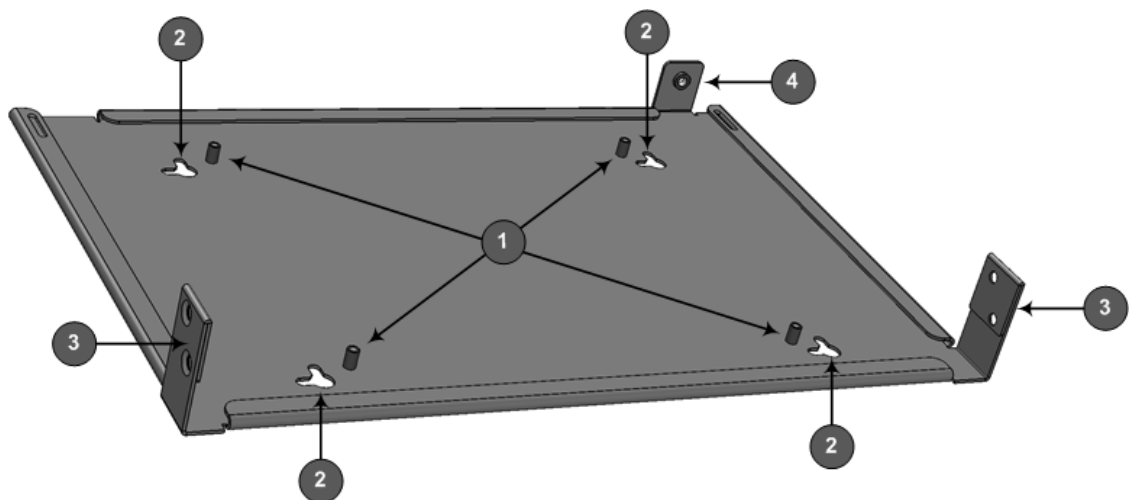
- 1 = Mounted anti-slide rubber feet
- 2 = Anti-slide groove

4. Flip the device over again so that it rests on the rubber feet and place it in the required position on a desktop.

## Wall Mounting

You can mount the device on a wall, using a special wall-mounting bracket. The bracket enables you to hang the device in a horizontal (rear panel facing up) or vertical (rear panel facing right) position. The bracket is a customer-ordered item and is shipped in a kit of five wall-mounting brackets. The areas of the wall-mounting bracket are shown below:

**Figure 4-2: Wall-Mounting Bracket Parts**



- 1 - Spacers to separate the device from the bracket.
- 2 - Keyholes for hanging the bracket on the wall.
- 3 - Screw-holes for attaching the bracket to the device's side panels
- 4 - Ground-screw hole for attaching the bracket to the device's grounding hole.

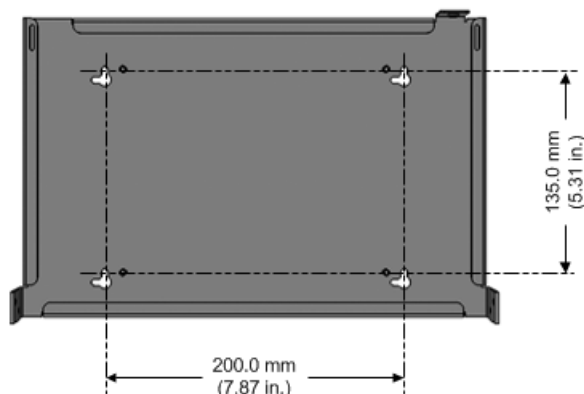
When choosing the area on the wall to mount the device, make sure that sufficient space is available for attaching the cables on the front and rear panels.

### ➤ To mount the device on a wall:

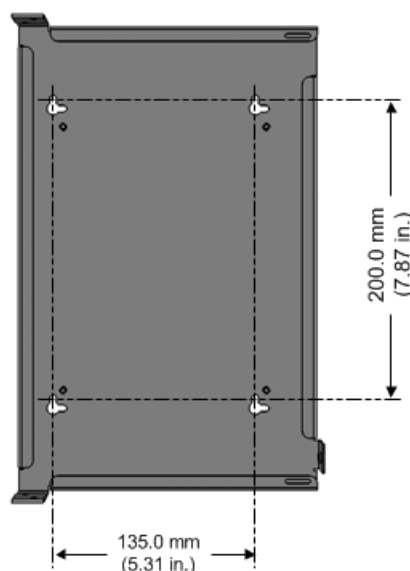
1. Mark the drilling locations of the four mounting holes on the wall. You can use the wall-mounting bracket as a template. Place the bracket flat against the wall in the desired hanging orientation - horizontal or vertical (see the following figures). Make sure that the bracket is horizontal with the floor (you can use a level). With a pencil, stencil the keyholes on the wall.

The distances between the keyholes depend on the orientation in which you want to hang the device:

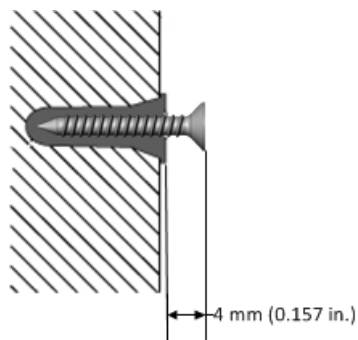
- Horizontal position: The horizontal distance between the keyholes is 200 mm (7.87 in.) and the vertical distance is 135 mm (5.31 in.):

**Figure 4-3: Keyhole Dimensions for Horizontal Wall-Mounting**

- Vertical position: The horizontal distance between the keyholes is 135 mm (5.31 in.) and the vertical distance is 200 mm (7.87 in.):

**Figure 4-4: Keyhole Dimensions for Vertical Wall-Mounting**

2. Drill holes in the wall where you marked the keyholes.
3. Insert wall anchors of appropriate size into each drilled hole.
4. Thread screws (not supplied) into each of the wall anchors. The recommended screw type is DIN 7982 3.5x25 Phillips flat head. Make sure that the heads of the screws extend sufficiently (about 4 mm or 0.157 in.) from the wall to allow you to hang the bracket's keyholes:

**Figure 4-5: Protruded Screw Distance from Wall Surface**

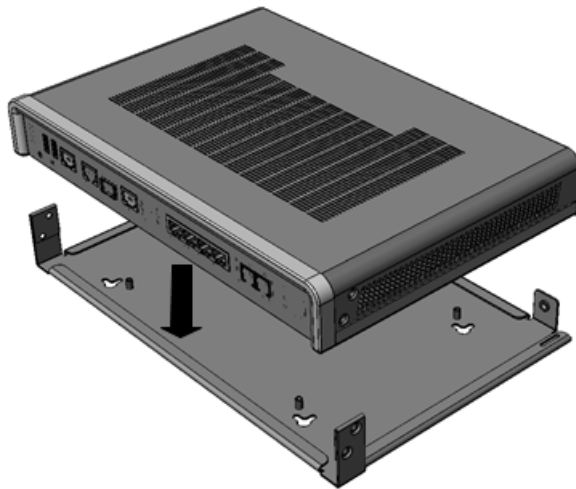
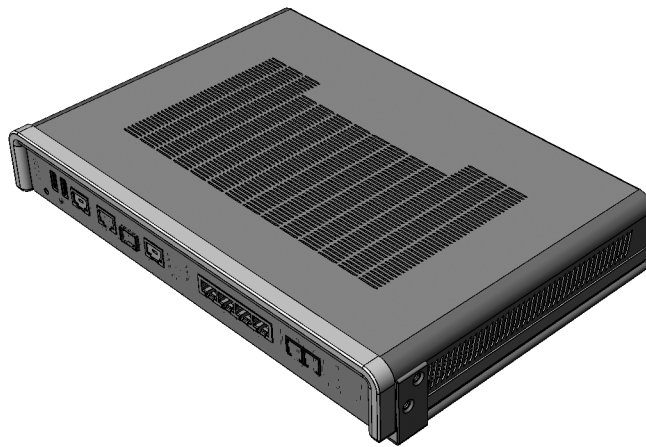
5. Using a Phillips-head screwdriver, remove the grounding-lug screw located on the rear panel (keep the screw in a safe place for later use):

**Figure 4-6: Removing Ground Screw**

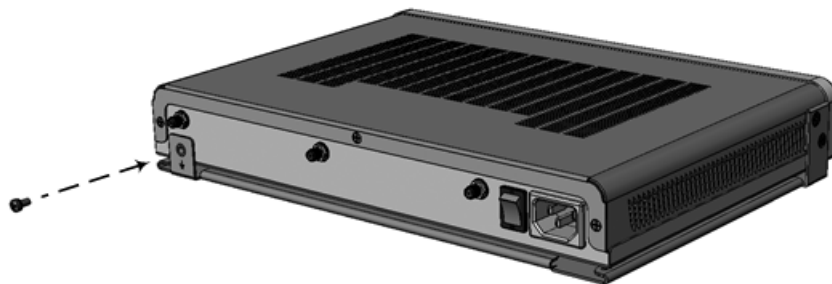
6. Using a Phillips-head screwdriver, remove the two screws located on the left- and right-side panels (keep the screws in a safe place for later use):

**Figure 4-7: Removing Side-Panel Screws**

7. Place the bracket on a flat surface, and then with two hands, hold the device above the bracket so that its bottom panel faces the bracket and its rear panel is on the same side as the bracket's grounding-screw hole. Gently lower the device into the bracket until it snaps into place:

**Figure 4-8: Lowering Device into Wall-Mounting Bracket****Figure 4-9: Device Inserted into Wall-Mounting Bracket**

8. Using a Phillips-head screwdriver, attach the bracket to the rear panel, using the grounding-lug screw (which you removed in previously in Step 5):

**Figure 4-10: Attaching Bracket to Device using Grounding Screw**

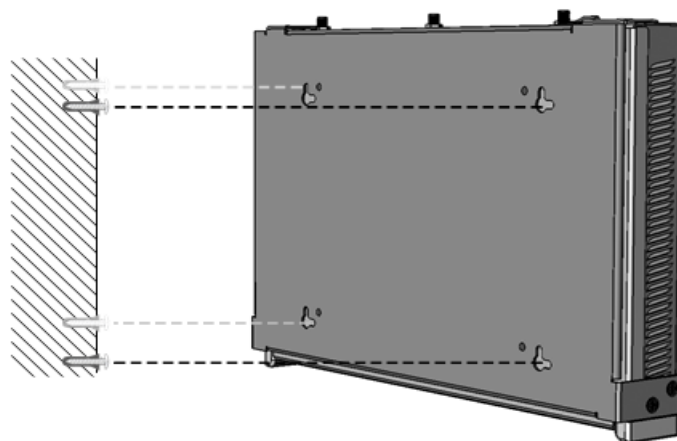
If you are grounding the device, attach the grounding lug at the same time:

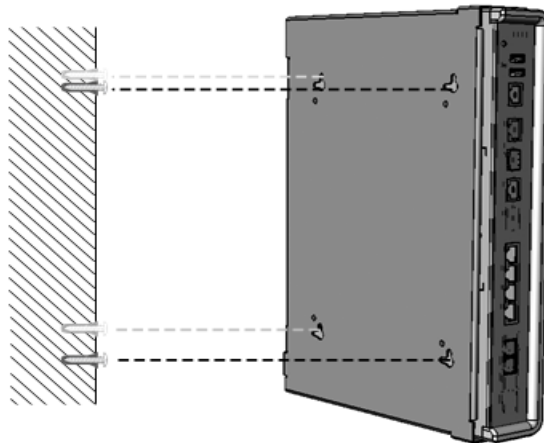
**Figure 4-11: Attaching Bracket to Device using Ground Screw with Grounding Lug**

9. Using a Phillips-head screwdriver, attach the bracket to the left- and right-side panels, using two screws for each side (which you removed previously in Step 6):

**Figure 4-12: Attaching Bracket to Device using Side-Panel Screws**

10. With two hands, hold the device (attached to the bracket) so that the bracket's keyholes are facing the screw heads in the wall and that the device is orientated according to the desired hanging position (horizontal or vertical). Gently hang the device onto the screw heads, using the bracket's keyholes:

**Figure 4-13: Hanging Device on Screw Heads for Horizontal Orientation**

**Figure 4-14: Hanging Device on Screw Heads for Vertical Orientation**

## 19-Inch Rack Mounting

The device can be installed in a standard 19-inch rack by implementing one of the following mounting methods:

- Placing it on a pre-installed shelf in a 19-inch rack – see Using a Pre-Installed Rack Shelf
- Attaching it directly to the rack's frame using the device's mounting brackets (supplied) that need to be attached to the chassis – see Using Mounting Brackets



**Rack Mount Safety Instructions:** When installing the chassis in a rack, 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 with maximum ambient temperature (T<sub>ma</sub>) 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). For earthing the device, see Grounding the Device.

## Using a Pre-Installed Rack Shelf

The procedure below describes how to place the device on a pre-installed shelf in a 19-inch rack.

➤ **To mount the device on a pre-installed shelf in the rack:**

1. Before installing it in the rack, ensure that you have a pre-installed rack shelf on which the device can be placed.
2. Place the device on the pre-installed shelf in the rack.

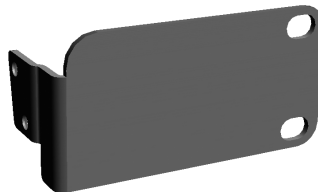
## Using Mounting Brackets

The procedure below describes how to mount the device in a 19-inch rack. Rack mounting involves placing the device on a pre-installed rack shelf and then attaching the device's mounting brackets to the device and rack frame. The purpose of the mounting brackets is to secure the device to the rack.

Two mounting brackets are provided:

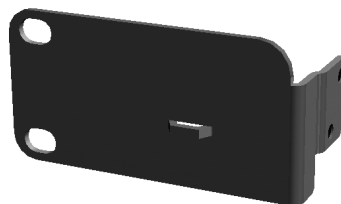
- Left mounting bracket:

**Figure 4-15: Left Mounting Bracket**



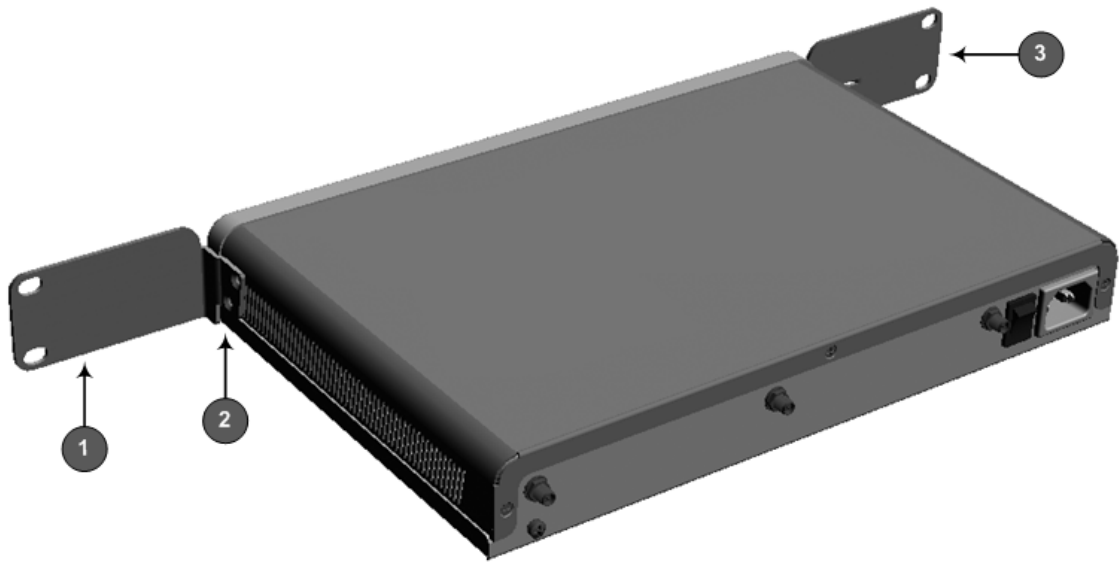
- Right mounting bracket with hole for looping through an optional cable tie (not supplied) for securing cables:

**Figure 4-16: Right Mounting Bracket**



➤ **To mount the device in a 19-inch rack using mounting brackets:**

1. Attach the two mounting brackets (supplied) to each side of the device's chassis, using the supplied screws, as shown in the following figure:

**Figure 4-17: Attaching the Mounting Brackets**

- 1 = Left mounting bracket
  - 2 = Attached screws
  - 3 = Right mounting bracket
2. Place the device on a pre-installed shelf in the rack.
  3. Attach the ends of the mounting brackets (that you installed in Step 1) to the vertical track of the rack's frame, using standard 19-inch rack bolts (not supplied).

## 5 Cabling the Device

This section describes the cabling of the device.

### Grounding the Device

The device must be connected to earth (grounded) using an equipment-earthing conductor.



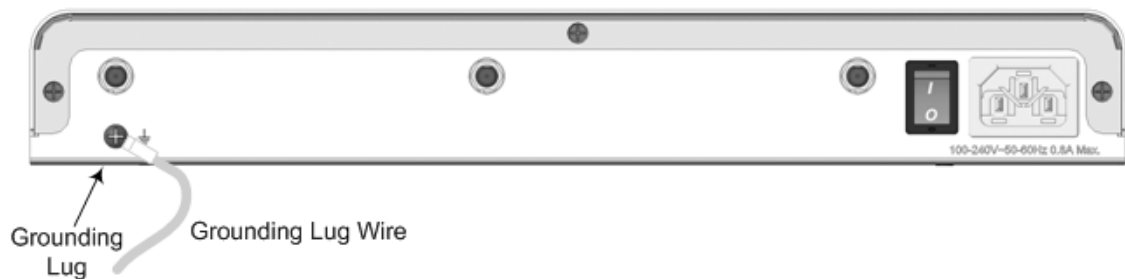
**Protective Earthing:** The equipment is classified as Class I EN60950 and UL60950 and must be earthed at all times.

- For Finland: "Laite on lilitettava suojamaadoituskoskettimilla varustettuun pistorasiaan."
- For Norway: "Apparatet rna tilkoples jordet stikkontakt."
- For Sweden: "Apparaten skall anslutas till jordat uttag."

#### ➤ To earth the device:

1. Connect an electrically earthed strap of 16 AWG wire (minimum) to the chassis' earthing screw (located on the rear panel), using the supplied washer.
2. Connect the other end of the strap to a protective earthing. This should be in accordance with the regulations enforced in the country of installation.

Figure 5-1: Earthing the Device



### Connecting to the LAN

The device provides up to four Gigabit Ethernet (10/100/1000Base-T) ports for connection to the LAN (e.g., computers, switches, and IP phones). These ports support half- and full-duplex modes, auto-negotiation, and straight or crossover cable detection.

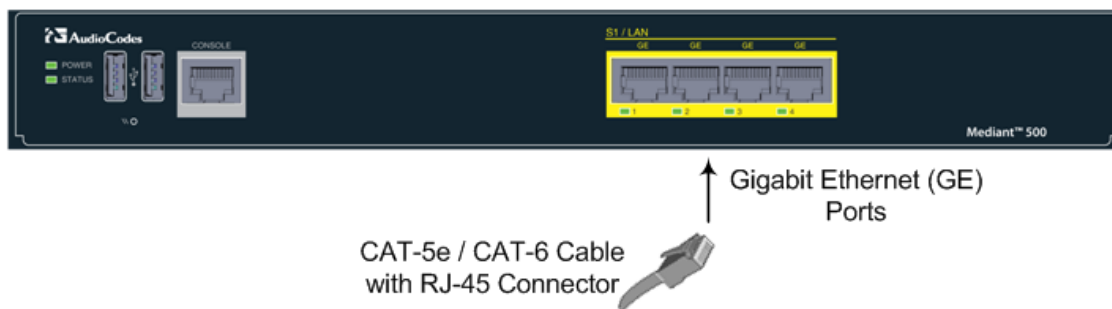
The RJ-45 connector pinouts are described in the following table:

**Table 5-1: RJ-45 Connector Pinouts for GbE**

Pin	Signal Name
1	Ethernet signal pair (10/100/1000Base-T)
2	
3	Ethernet signal pair (10/100/1000Base-T)
6	
4	Ethernet signal pair (1000Base-T)
5	
7	Ethernet signal pair (1000Base-T)
8	
Shield	Chassis ground

➤ **To connect the device to the LAN:**

1. Connect one end of a straight-through RJ-45 Cat 5e or Cat 6 cable to the RJ-45 port labeled **S1 / LAN GE**.

**Figure 5-2: Cabling the LAN Ports**

2. Connect the other end of the cable to the Gigabit Ethernet network.

## Connecting to an ISDN PRI (E1/T1) Trunk

The procedure below describes the cabling of the device's E1/T1 (PRI) trunk interface.



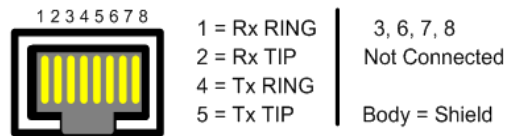
To protect against electrical shock and fire, use a 26 AWG min wire to connect the E1 / T1 port to the PSTN.



PRI interface is a separate orderable item.

The RJ-48c trunk connector used in the cabling is wired according to the following figure:

**Figure 5-3: RJ-48c Connector Pinouts for E1/T1**



➤ **To connect the E1/T1 trunk interface:**

1. Connect the E1/T1 trunk cable to the device's E1/T1 port.
2. Connect the other end of the trunk cable to your PBX/PSTN switch.

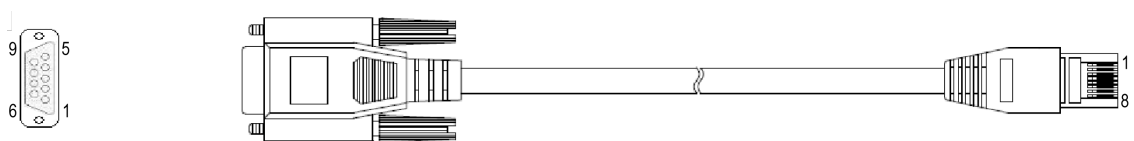
**Figure 5-4: Cabling E1/T1 Port**



## Connecting the Serial Interface to a PC

The device provides an RS-232 serial interface port on its front panel. The serial cable adapter used for connecting the RS-232 interface is shown below:

**Figure 5-5: RS-232 Cable Adapter**



**Table 5-2: DB-9 to RJ-45 Serial Cable Connector Pinouts**

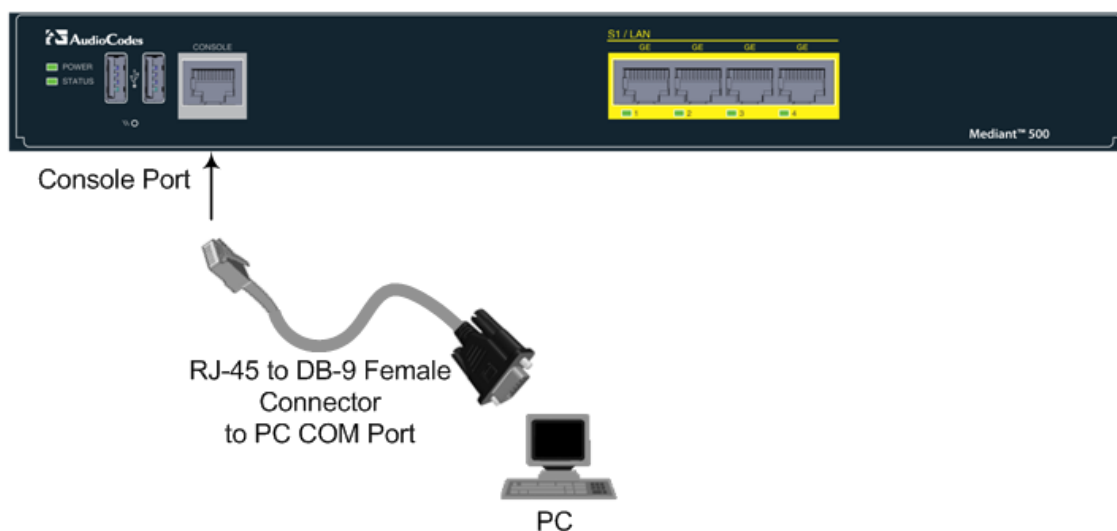
DB-9 Female	RJ-45
8	1
6	2
2	3
5	4

DB-9 Female	RJ-45
5	5
3	6
4	7
7	8

➤ **To connect the device's serial interface port to a PC:**

1. Connect the end of the cable providing the RJ-45 connector to the device's serial port located on the front panel, labeled **CONSOLE**.

**Figure 5-6: Cabling Serial Port**



2. Connect the other end of the cable providing the 9-pin DB connector to the COM RS-232 communication port on your computer.

## Connecting a USB Storage Device

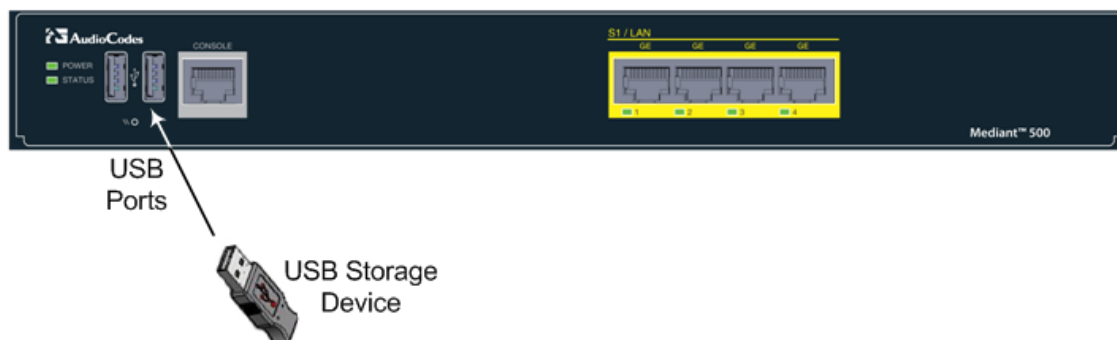
The device supports USB storage capabilities, using an external USB hard drive or flash disk (disk on key) connected to the device's USB port. The storage capabilities are configured through CLI and include the following:

- Saving network captures to the USB
- Updating the device's firmware from the USB
- Updating the device's configuration from the USB
- Saving the current configuration to the USB

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

- Connect the USB storage device to one of the USB ports located on the front panel.

**Figure 5-7: Connecting a USB Storage Device**



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

## Connecting to the Power Supply

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

**Table 5-3: Power Specifications**

Physical Specification	Value
Input Voltage	Single universal AC power supply 100 to 240V
AC Input Frequency	50 to 60 Hz
AC Input Current	0.8A
Max. Power Consumption	20W



- The device must be connected to a socket-outlet providing a protective earthing connection.
- Use only the AC power cord that is supplied with the device.



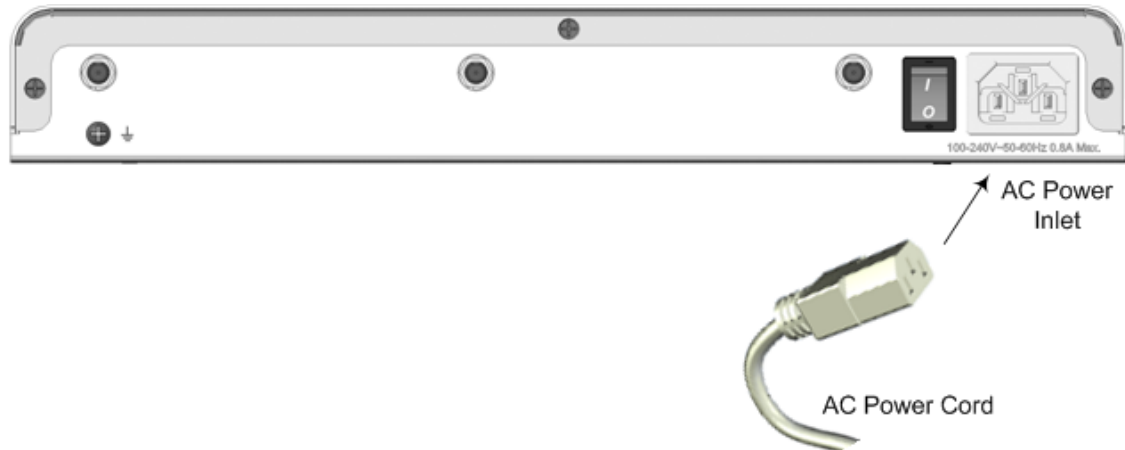
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➤ **To connect the device to the power supply:**

1. Connect the line socket of the AC power cord (supplied) to the device's AC power socket (labeled 100-240V~50-60 Hz 0.8A), located on the rear panel.

**Figure 5-8: Connecting to the Power Supply**



2. Connect the plug at the other end of the AC power cord to a standard electrical outlet.
3. Press the power switch to on (I) position so that the device receives power; the **POWER** LED on the front panel is lit green (for more information, see Power LED).

## 6 hardware-maintenance

This section describes hardware maintenance procedures.

### 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 GE Port 1.
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. **Standalone** device: 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.  
  
    **HA** device: Load only the ini file (the other files are transferred to the device from the active device when you connect it to the network - see below).
8. **Standalone** device: 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. If the device is part of an HA system, it synchronizes with the active device (and obtains all the configuration files etc. from it).
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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