Mediant™ 500 MSBR

Multi-Service Business Router

Enterprise Session Border Controller

Hardware Installation Manual

Version 6.6

AudioCodes

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Reader's Notes

Notice

This Hardware Installation Manual describes the hardware installation of AudioCodes **Mediant 500 Multi-Service Business Router** (MSBR).

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.

Before consulting this document, check the corresponding Release Notes regarding feature preconditions and/or specific support in this release. In cases where there are discrepancies between this document and the Release Notes, the information in the Release Notes supersedes that in this document. Updates to this document and other documents as well as software files can be downloaded by registered customers at http://www.audiocodes.com/downloads.

Date Published: September-09-2015

Trademarks

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 Web site at www.audiocodes.com/support.

Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used.

Throughout this manual, unless otherwise specified, the term *device* refers to Mediant 500 MSBR.

Documentation Feedback

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Related Documentation

Document Name
SIP Release Notes
Mediant 500 MSBR SIP User's Manual
MSBR Series CLI Reference Guide for System and VoIP Functionalities
MSBR Series CLI Reference Guide for Data Functionality

General Notes

Note: Open source software may have been added and/or amended for this product. For further information, please visit our website at http://audiocodes.com/support or contact your AudioCodes sales representative.

Warnings and Safety Information

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.

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

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

Warning: 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.

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

Document Revision Record

LTRT	Description
10320	Initial document release for Version 6.6.
10328	SHDSL LEDs added.

1 Introduction

This document provides a hardware description of the Mediant 800 MSBR (hereafter referred to as *device*) and step-by-step procedures for mounting and cabling the device.

The device provides the following interfaces:

- Multiple WAN:
  - 1 x Gigabit Ethernet copper (10/100/1000Base-T) unshielded twisted pair (UTP) interface port (RJ-45)
  - Dual-mode of 1.25 Gbps Optical Fiber Small Form-Factor Pluggable (SFP)
  - ADSL2+ / VDSL2 (RJ-11 port interfaces)
  - 3G Cellular WAN access (primary or backup) using a USB modem
- Four Gigabit Ethernet (10/100/1000Base-T) LAN ports (RJ-45)
- (Optional, customer-ordered) Wireless LAN 802.11n (Wi-Fi) access point at 2.4 and 5 GHz, integrated 2 Tx and 2 Rx, enabling data rates of up to 300 Mbps. Two Wi-Fi antennas. The Wi-Fi interface also supports 802.11b/802.11g backward compatibility, allowing interoperability of multiple devices with different types of Wi-Fi.
- Two USB ports for an optional, 3G cellular WAN modem and/or USB storage services
- Serial console port (RJ-45) for device management
- (Optional, customer-ordered) Two BRI ports (RJ-45), supporting up to 4 voice channels as well as PSTN fallback
- (Optional, customer-ordered) Four FXS ports

Notes:

- 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*.

Reader's Notes

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 (customer-ordered item)
   - Two Wi-Fi antennas (depending on ordered model)
   - Serial cable adapter
   - One AC power cable
5. Check, retain and process any documents.

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

Reader's Notes

3 Physical Description

This section provides a physical description of the device.

3.1 Physical Dimensions

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

Table 3-1: Physical Dimensions

Physical Specification	Value
Dimensions (H x W x D)	4.37 (1U) x 31.0 x 21.0 cm (1.72 x 12.2 x 8.3 in.)
Weight	2.0 kg (4.4 lb)

3.2 Front Panel Description

The front panel provides the telephony port interfaces, various networking ports, reset pinhole button, and LEDs.

3.2.1 Ports and Buttons

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

Figure 3-1: Front Panel

Note: The figure above is used only as an example. The hardware configuration depends on the ordered model.

Table 3-2: Front Panel Description

Item #	Label	Description
1		Wi-Fi button for enabling and disabling Wi-Fi. **Notes:** ▪ The Wi-Fi button will be supported in the next applicable release. ▪ The Wi-Fi button is available only for models ordered with the Wi-Fi functionality.
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	**CONSOLE**	RJ-45 port for RS-232 serial communication
4	**S0 / WAN**	WAN interface, which can be any of the following (depending on ordered configuration): ▪ Copper GE ▪ SFP module (single pair, supporting 1 GbE) ▪ ADSL/2+ and VDSL2 **Note:** For available WAN configurations, contact your AudioCodes sales representative.
5	**S1 / LAN**	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.
6	**S2 / PSTN**	Telephony interfaces, depending on ordered configuration: ▪ Up to two ISDN BRI port interfaces (RJ-45) ▪ Up to four FXS port interfaces (RJ-11)
7	**POWER / STATUS / Wi-Fi**	LEDs indicating the status of the power, reboot/initialization, and Wireless LAN interface (depending on ordered model). For more information, see Section 3.2.2 on page 15. **Note:** The **Wi-Fi** LED is applicable only for models ordered with the Wi-Fi functionality.
8	**USB**	Two USB 2.0 ports, which can be used for the following: ▪ 3G cellular WAN modem for primary or backup WAN ▪ External USB hard drive or flash disk (disk on key) for USB storage capabilities

3.2.2 LEDs

The front panel provides various LEDs depending on the device's hardware configuration (e.g., the available telephony interfaces). These LEDs are described in the subsequent subsections.

3.2.2.1 WAN Ethernet LED

The WAN port(s) provides a LED for indicating operating status, as described in the table below.

Table 3-3: WAN LED Description

LED Color	LED State	Description
Green	On	WAN link established.
	Flashing	Data is being received or transmitted.
-	Off	No WAN link.
-	Off	No power received by the device.

3.2.2.2 WAN SHDSL LED

The WAN SHDSL port provides a LED for indicating operating status, as described in the table below.

Table 3-4: WAN SHDSL LED Description

LED Color	LED State	Description
Green	On	At least one of the links is synchronized (data received and transmitted).
	Fast Flashing	At least one of the links is negotiating with peers.
	Slow Flashing	SHDSL firmware is running.
-	Off	No WAN link or no power received by the device.

3.2.2.3 LAN Interface LED

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

Table 3-5: LAN LED Description

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

3.2.2.4 Wi-Fi LED

The **Wi-Fi** LED indicates the Wi-Fi link status, as described in the table below.

Table 3-6: Wi-Fi LED Description

LED Color	LED State	Description
Green	On	Wi-Fi is activated.
	Flashing	Traffic on the wireless LAN.
-	Off	Wi-Fi is not configured.

3.2.2.5 BRI LED

Each BRI port provides a LED for indicating operating status, as described in the table below:

Table 3-7: BRI LED Description

Color	State	Description
Green	On	Physical layer (Layer 1) is synchronized (normal operation).
Red	On	Physical layer (Layer 1) is not synchronized.
-	Off	Trunk is not active.

3.2.2.6 FXS LED

Each FXS port provides a LED for indicating operating status, as described in the table below.

Table 3-8: FXS LED Description

LED Color	LED State	Description
Green	On	Phone is in off-hook state.
	Flashing	Extension line ringing.
Red	On	Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure.
-	Off	Phone is in on-hook state.
-	Off	No power received by the device.

3.2.2.7 Operational Status LED

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

Table 3-9: STATUS LED Description

LED Color	LED State	Description
Green	On	The device is operational.
	Flashing	The device is rebooting.
Red	On	Boot failure.

3.2.2.8 Power LED

The **POWER** LED indicates the operating status, as described in the table below.

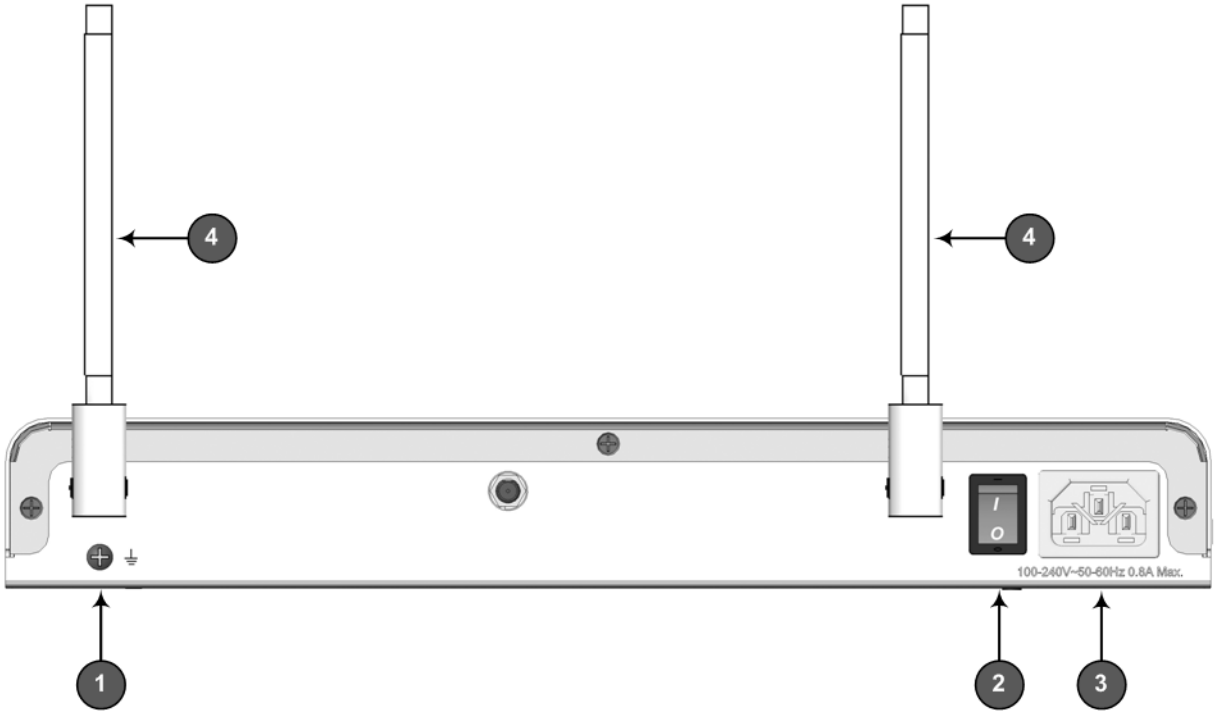
Table 3-10: POWER LED Description

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

3.3 Rear Panel Description

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

Figure 3-2: Rear Panel



Note: The figure above is used only as an example. The Wi-Fi antennas are available only if customer ordered.

Table 3-11: Rear Panel Description

Item #	Label	Description
1	⏚	Protective earthing screw.
2	**I / 0**	Power switch (**O** is off; **I** is on).
3	**100-240V~50-60Hz 0.8A Max.**	Three-prong AC power supply entry.
4	**-**	Wi-Fi antennas, providing wireless LAN 802.11n access point at 2.4 GHz and 5 GHz, 2 Tx and 2 Rx, enabling data rates of up to 300 Mbps. The Wi-Fi interface also supports 802.11b/802.11g backward compatibility, allowing interoperability of multiple devices with different types of Wi-Fi. **Notes:** ▪ The Wi-Fi antennas are applicable only to models ordered with the Wi-Fi functionality. ▪ The Wi-Fi antennas are supplied unattached.

4 Attaching the Wi-Fi Antennas

The device is shipped with two unattached Wi-Fi antennas. You can attach any number of these antennas, according to your network requirements. Once attached, you can position each antenna in the vertical and/or horizontal plane for optimal transmission and reception.

Notes:

- Attach antennas before mounting the device; you may have difficulty attaching the antennas once the device is mounted.
- This section is applicable only for models ordered with the Wi-Fi functionality.

➢ To attach the Wi-Fi antennas:

1. Manually screw the antennas on to the SMA coaxial RF connector located on the rear panel, as shown in the figure below:

Figure 4-1: Attaching Antennas on Rear Panel

2. Orient the antennas as desired for optimal wireless performance. The antenna can be orientated in the vertical and horizontal planes. For best performance, it is recommended that the antennas be perpendicular (90 degrees) to the floor. In other words, orient the antennas straight up.

Reader's Notes

5 Mounting the Device

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

- Placed on a desktop – see Section 5.1 on page 21
- Installed in a standard 19-inch rack – see Section 5.2 on page 22

Warning: 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.

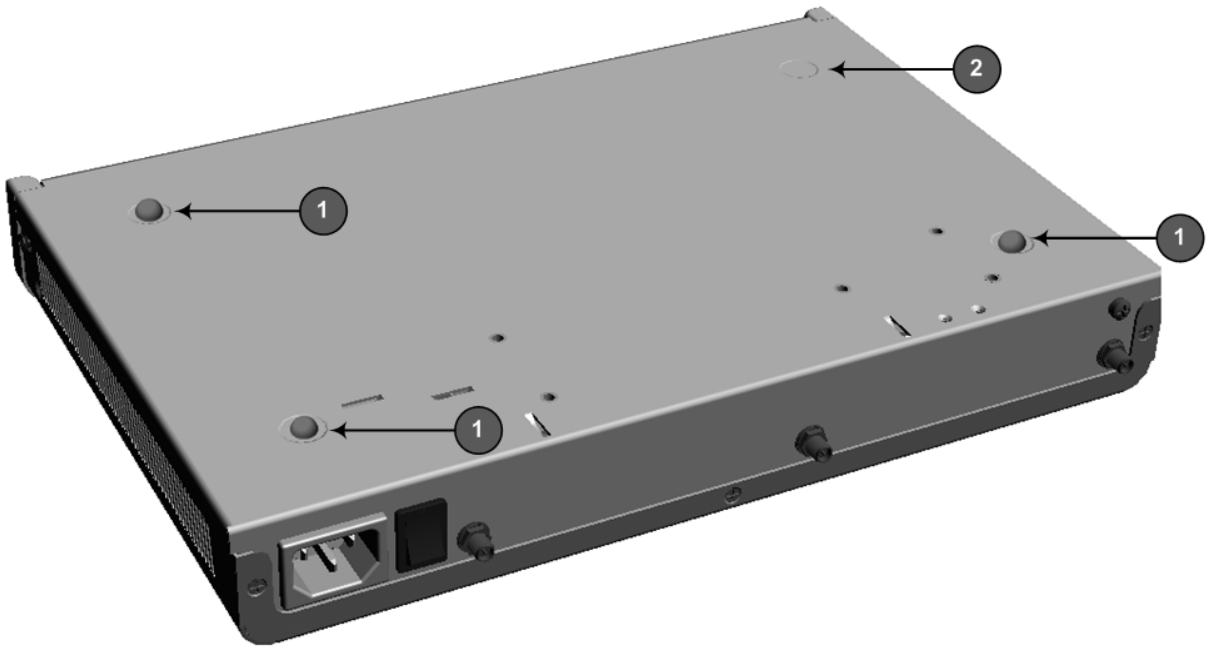
5.1 Desktop Mounting

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 5-1: Location for Applying Rubber Foot



- 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.

5.2 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 Section 5.2.1 on page 22
- Attaching it directly to the rack's frame using the device's mounting brackets (supplied) that need to be attached to the chassis – see Section 5.2.2 on page 23

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 (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). For earthing the device, see Section 6.1 on page 25.

5.2.1 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.

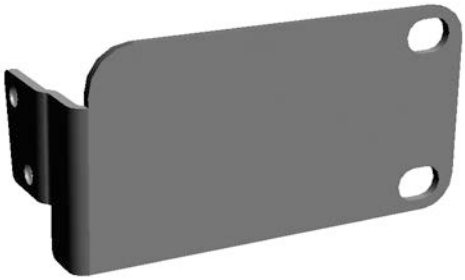
5.2.2 Using Mounting Brackets

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:

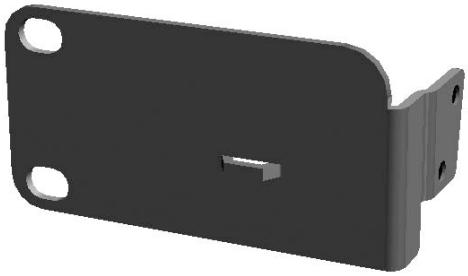
- Left mounting bracket:

Figure 5-2: Left Mounting Bracket



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

Figure 5-3: Right Mounting Bracket

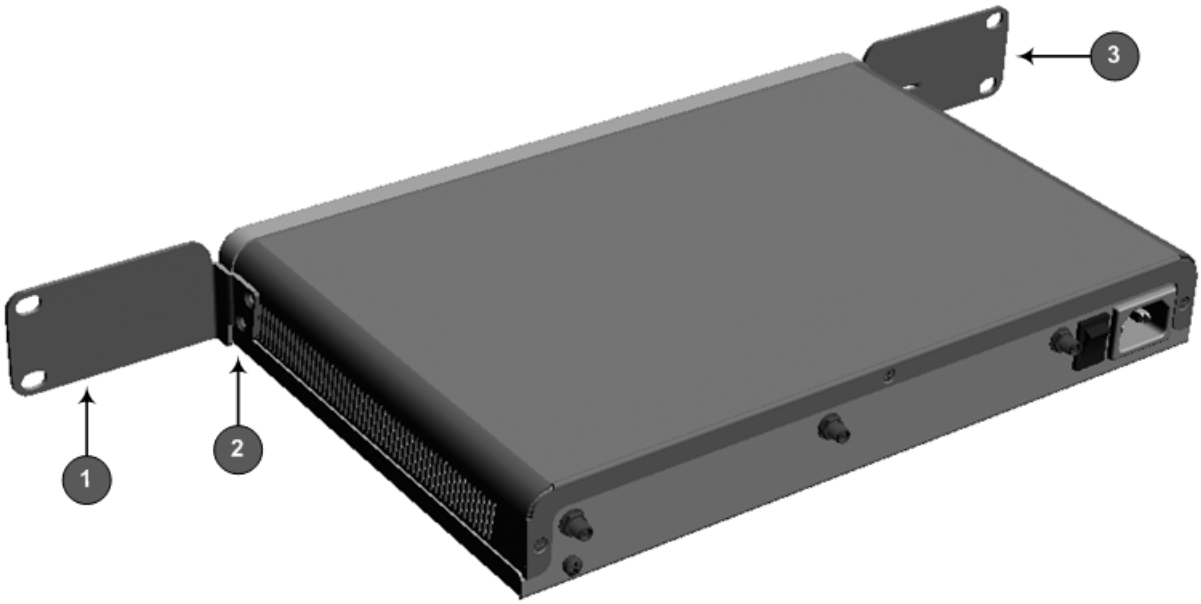


Note: The mounting brackets for 19-inch rack mounting are customer-ordered items.

➢ 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 figure below:

Figure 5-4: 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).

6 Cabling the Device

This section describes the cabling of the device, which includes the following:

- Grounding (earthing) the device – see Section 6.1 on page 25
- Connecting to the WAN – see Section 6.2 on page 25
- Connecting to the LAN – see Section 6.3 on page 31
- Connecting to BRI lines – see Section 6.4.1 on page 32
- Connecting the PSTN Fallback for BRI Lines – see Section 6.4.2 on page 33
- Connecting the FXS interfaces – see Section 6.5 on page 34
- Connecting to a computer for serial communication – see Section 6.6 on page 36
- Connecting a USB storage device – see Section 6.7 on page 32
- Connecting to the power supply – see Section 6.8 on page 38

6.1 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 liltettava suojamaadoituskoskettimilla varustettuun pistorasiaan."

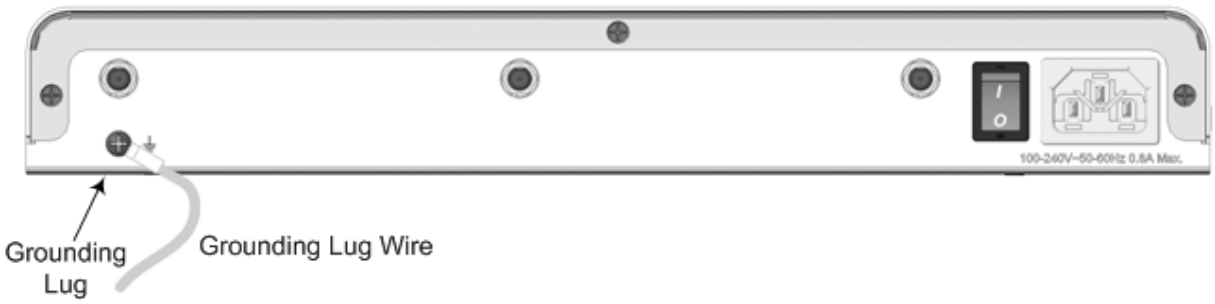
For Norway: "Apparatet rna tilkoples jordet stikkontakt."

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 6-1: Earthing the Device



6.2 Connecting to WAN

This section provides a description on how to cable the WAN port. The cabling procedure depends on the ordered WAN interface:

- Copper Gigabit Ethernet (GbE) – see Section 6.2.1 on page 26
- Fiber-optic GbE – see Section 6.2.2 on page 27
- ADSL/2+ and VDSL2 – see Section 6.2.3 on page 28
- 3G Cellular WAN modem – see Section 6.2.4 on page 30

Note: The device supports multiple WAN redundancies, where multiple WAN interfaces can serve as backups for the primary or a backup WAN interface. For example, if the main WAN interface is Copper GbE and it fails, the device switches over to the SHDSL WAN interface. If this WAN interface also fails, the device switches over to the 3G WAN interface, and so on. For configuring WAN redundancy, refer to the *MSBR Series CLI Reference Guide*.

6.2.1 Copper Gigabit Ethernet Cabling

The procedure below describes how to connect the copper Gigabit Ethernet RJ-45 port to the WAN. Before you do this, ensure that the RJ-45 connector pinouts of the used cable are as follows:

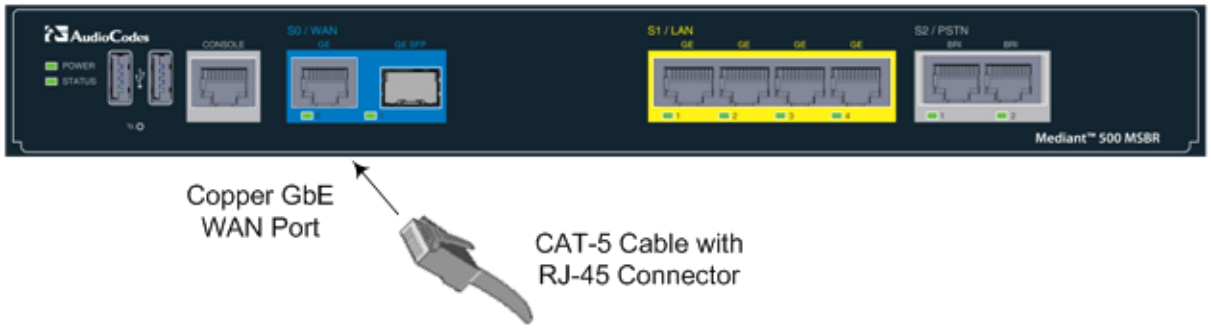
Table 6-1: RJ-45 Connector Pinouts for Copper GbE WAN

Pin	Signal Name
1	Ethernet signal pair
2	
3	Ethernet signal pair
6	
4	Ethernet signal pair
5	
7	Ethernet signal pair
8	
Shield	Chassis ground

➢ **To connect the WAN copper GbE port:**

1. Connect one end of a straight-through RJ-45 Ethernet cable to the RJ-45 port labeled **S0 / WAN GE** (located on the front panel).

Figure 6-2: Cabling the WAN Copper GbE Port



2. Connect the other end of the cable to the WAN network (e.g., ADSL or Cable modem).

6.2.2 Fiber-Optic Gigabit Ethernet Cabling

The device supports up to two pairs of 1.25 Gbps optical small form-factor pluggable (SFP) transceiver modules.

Note that SFP modules and fiber-optic cables are not supplied. It is recommended that you purchase the SFP modules from AudioCodes. For a list of orderable SFP modules, see Appendix A on page 39, or contact your AudioCodes sales representative.

Caution Laser

This device contains 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:

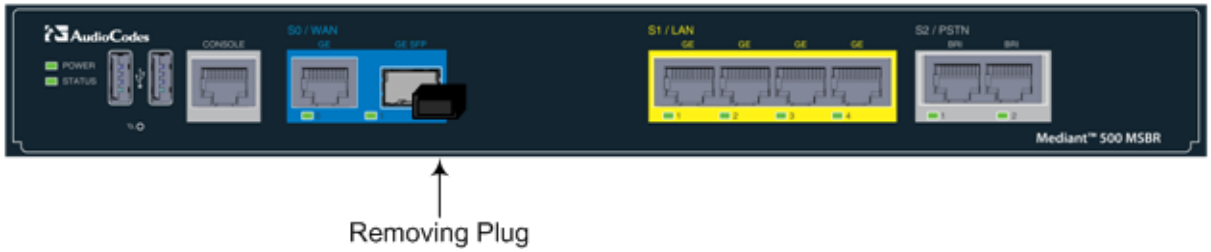
1. Excessive bending of the Fiber Optic Cable can cause distortion and signal losses.
2. Ensure the minimum bending radius recommended by the Fiber Optic Cable supplier.
3. Incoming optic cabling from the network infrastructure can originate from the top of the rack or from another shelf within the rack. Preserve the minimum-bending ratio indicated by the cable manufacturer.
4. 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.

Note: This AudioCodes device has been evaluated with the laser transceiver modules (SFP) listed in Appendix A on page 39. If other SFP modules are used, the person installing the device is solely responsible for the usage of correct SFP modules to comply with local, applicable laser safety requirements and certification. AudioCodes will not be held responsible for any damage to human body or equipment caused as a result from the usage of SFP modules that are not listed in Appendix A on page 39.

➢ **To connect the fiber-optic WAN GbE port:**

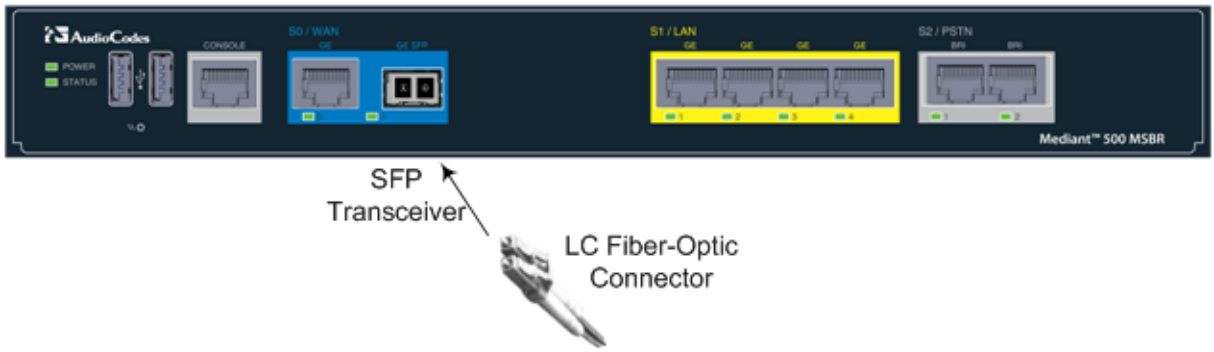
1. Remove the protective dust plug from the SFP transceiver module.

Figure 6-3: Removing Protective Dust Plug



2. Connect a cable with LC-type plugs to the SFP transceivers (labeled **GE SFP**).

Figure 6-4: Cabling the Fiber-Optic WAN GbE Port



6.2.3 ADSL/2+ and VDSL2 WAN Cabling

The ADSL/2+ and VDSL2 (xDSL) WAN port provides a single xDSL interface through an RJ-11 port. The specifications of the xDSL interface include the following:

- ADSL/2+:
  - RFC 2684 in Routed (IPoA) and Bridged (ETHoA) modes, supporting LLC-SNAP and VC-Multiplexed encapsulations over AAL5
  - ATM UNI 4.1 compliant
  - UBR, CBR, VBR classes of service
  - RFC 2364 PPPoA
  - RFC 2516 PPPoE over ATM
  - Up to 8 PVCs
- VDSL2:
  - ITU G.991.2 Annex E for Ethernet, also known as EFM or 2Base-TL, as defined in IEEE 802.3ah
  - 802.1q VLANs over EFM
  - PPPoE

Before you connect the xDSL port, ensure that the RJ-11 connector pinouts on the cable used is as follows:

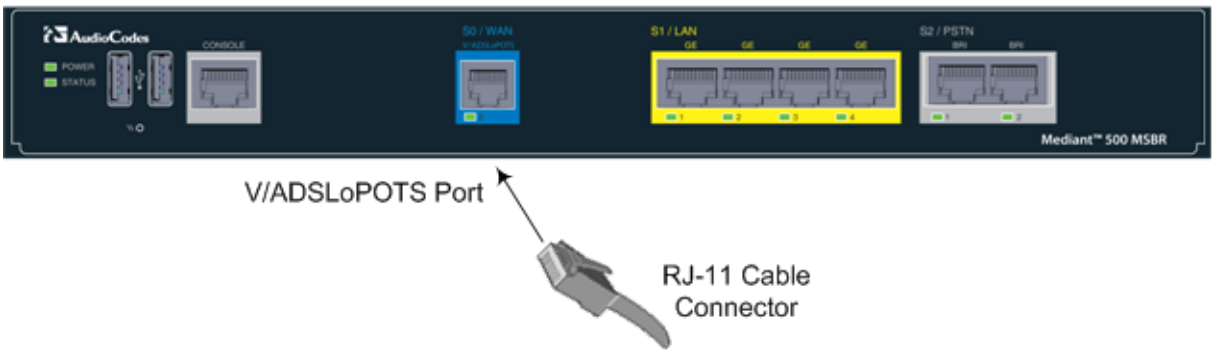
Table 6-2: RJ-11 Connector Pinouts for xDSL

Pin	Function
3	CH0 – P/TIP
4	CH0 – N/RING
1	Not connected
2	Not connected
3	Not connected
6	Not connected

➢ To connect the WAN xDSL WAN port:

1. Connect an RJ-11 cable connector to the device's xDSL WAN port (labeled **V/ADSLoPOTS**).

Figure 6-5: Cabling the xDSL WAN Port



2. Connect the other end of the cable to the access point.

Note: The xDSL filter/splitter should be provided by your service provider.

6.2.4 3G/3.5G Cellular WAN USB Modem Cabling

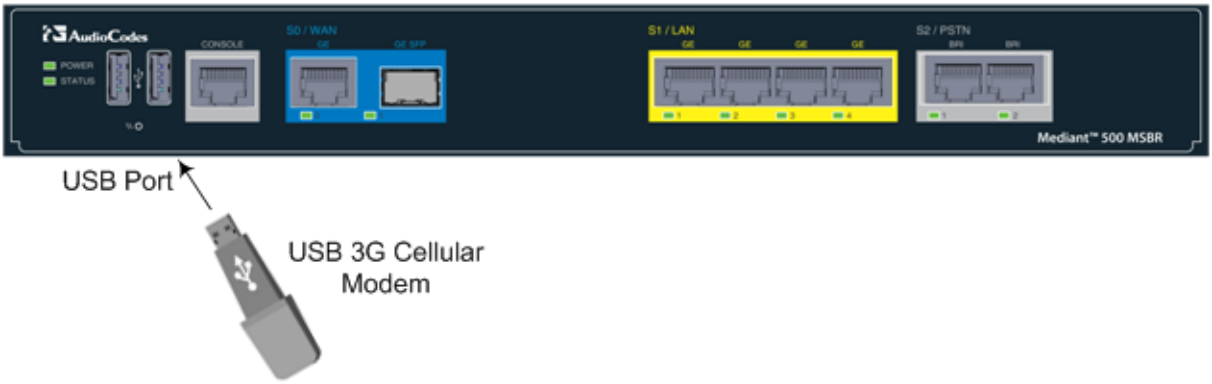
The device supports a 3G cellular WAN interface using a USB-based 3G cellular modem. The 3G cellular WAN interface can be used as the primary WAN interface or as an optional WAN backup when the primary WAN (e.g., WAN Ethernet) fails. The WAN connection type is a point-to-point protocol (PPP) over cellular.

Note: To verify whether your third-party, 3G cellular modem is supported by the device, please provide the modem's model details to your AudioCodes sales representative.

➢ To connect the 3G cellular WAN modem:

- Plug a 3G cellular USB modem into any one of the USB ports located on the front panel, as shown below:

Figure 6-6: Plugging the 3G Cellular Modem into the USB Port



Note: For configuring the 3G cellular WAN support, refer to the *User's Manual*.

6.3 Connecting to 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 table below:

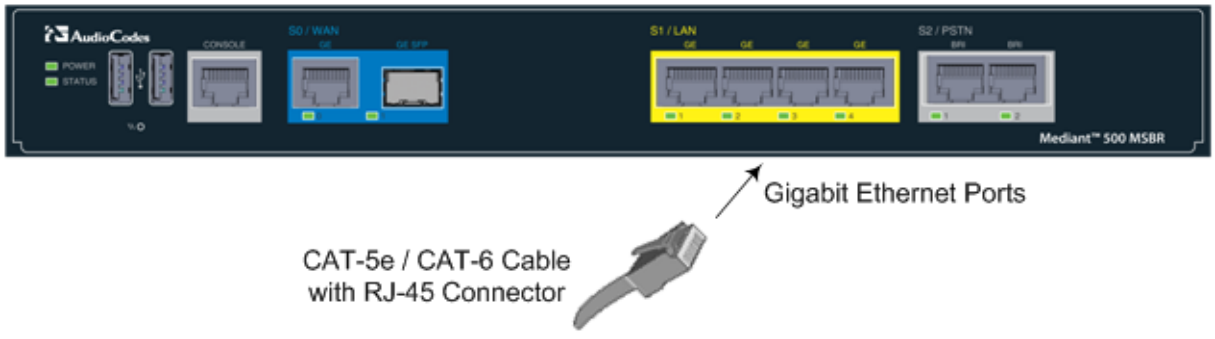
Table 6-3: RJ-45 Connector Pinouts for GbE

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 6-7: Cabling the LAN Ports



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

6.4 ISDN BRI Interfaces

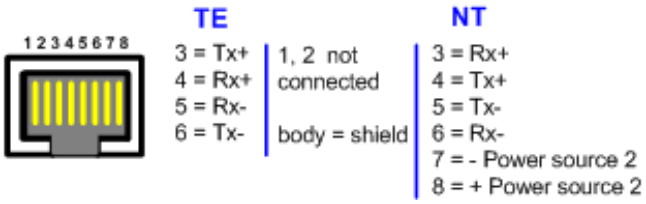
Note: The BRI port interfaces are a customer ordered item.

6.4.1 Connecting to BRI Lines

The device provides up to two BRI S/T ports, if ordered. These ports connect to ISDN terminal equipment such as ISDN telephones. Each BRI port can be configured either as termination equipment/user side (TE) or network termination/network side (NT). Up to eight terminal equipment (TE) devices can be connected per BRI S/T port, using an ISDN S-bus that provides eight ISDN ports. When configured as NT, the BRI port drives a nominal voltage of 38 V with limited current supply of up to 100 mA.

The connector pinouts for the BRI port when configured as TE or NT are shown below:

Figure 6-8: RJ-45 Connector Pinouts for BRI Ports

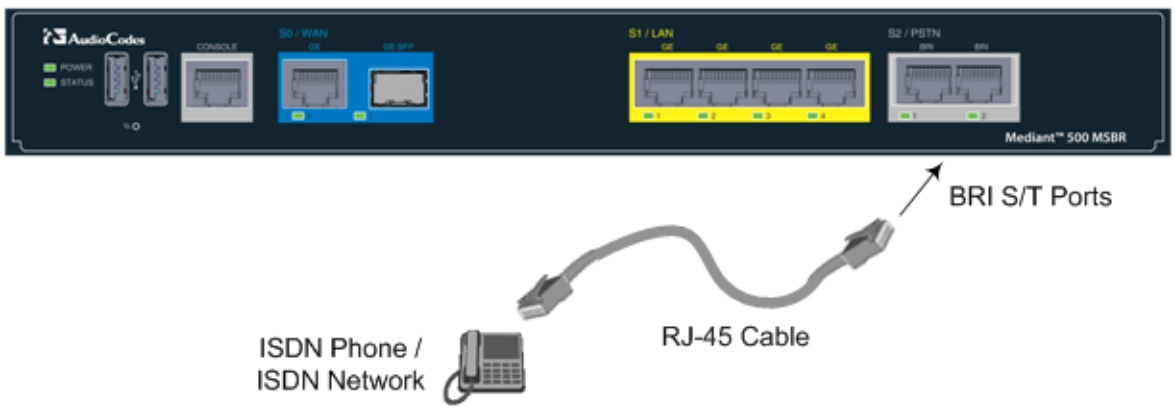


Warning: To protect against electrical shock and fire, use a 26 AWG min wire to connect the BRI ports to the PSTN.

➢ To connect the BRI ports:

1. Connect the BRI cable to the device's BRI RJ-45 port, labeled **S2 / PSTN BRI**.

Figure 6-9: Cabling BRI Ports



2. Connect the other end of the cable to your ISDN telephone or PBX/PSTN switch.

6.4.2 Connecting the PSTN Fallback for BRI Lines

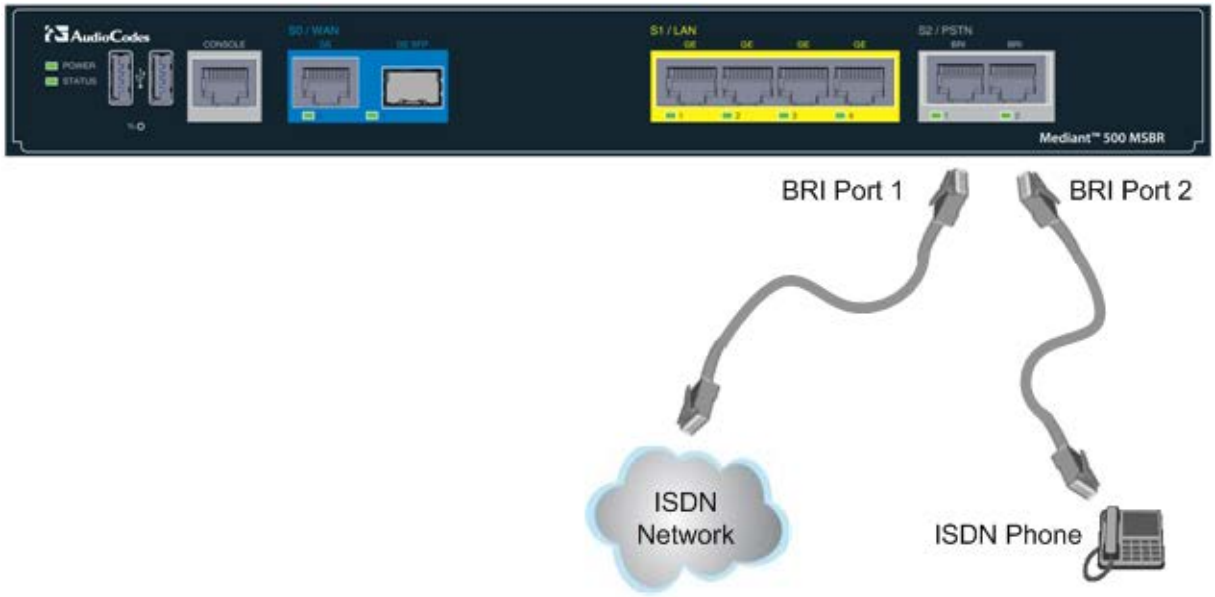
The device supports a PSTN Fallback feature for BRI lines, whereby if a power outage or IP connectivity problem (e.g., no ping) occurs, IP calls are re-routed to the PSTN. This guarantees call continuity.

In the event of a PSTN fallback, the BRI module's metallic relay switch automatically connects line Port 1 (**I**) to Port 2 (**II**). For example, if a PBX trunk is connected to Port 1 and the PSTN network is connected to Port 2, when PSTN Fallback is activated, calls from the PBX are routed directly to the PSTN through Port 2.

➢ To connect the BRI line interfaces for 1+1 PSTN Fallback:

1. Connect line 1 to a PBX.
2. On the same BRI module, connect line 2 to the PSTN.

Figure 6-10: Cabling (Ports 1 and 2) BRI PSTN Fallback



Notes:

- The scenarios that trigger PSTN Fallback (i.e., power outage and/or IP network loss) are configured by the TrunkLifeLineType parameter. For more information, see the *User's Manual*.
- This PSTN Fallback feature has no relation to the PSTN Fallback Software Upgrade Key.

6.5 Connecting the FXS Interfaces

The procedure below describes how to cable the device's FXS interfaces.

Warnings:

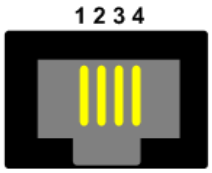
- The device is an **INDOOR** unit and thus, must be installed and located only indoors.
- Ensure that the FXS ports are connected to the appropriate, external devices; otherwise, damage to the device may occur.
- FXS ports are considered TNV-2.

Notes:

- FXS cabling is applicable only if the device is ordered with FXS interfaces.
- The FXS/FXO interfaces support loop-start signalling (indoor only).
- FXS is the interface replacing the Exchange (i.e., the CO or the PBX) and connects to analog telephones, dial-up modems, and fax machines. The FXS is designed to supply line voltage and ringing current to these telephone devices. An FXS VoIP device interfaces between the analog telephone devices and the Internet.

The RJ-11 connector pinouts used for this connection are shown in the figure below:

Figure 6-11: RJ-11 Connector Pinouts for FXS Interface

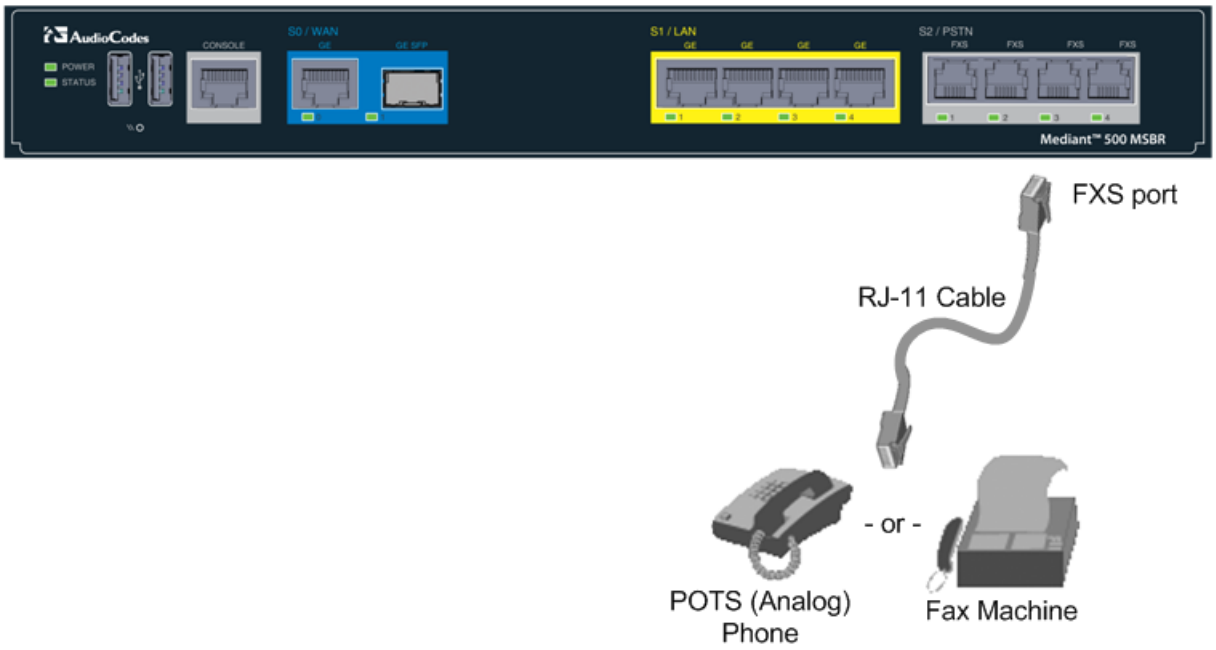


1 - Not connected
2 - Tip
3 - Ring
4 - Not connected

➢ To connect the FXS interfaces:

1. Connect one end of an RJ-11 cable to an FXS port (labeled **FXS**).

Figure 6-12: Connecting FXS Interfaces



2. Connect the other end of the cable to the required telephone interface (e.g., fax machine, dial-up modem, or analog POTS telephone).

6.6 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 6-13: RS-232 Cable Adapter

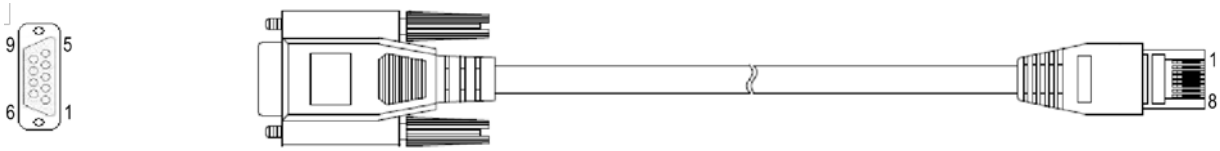


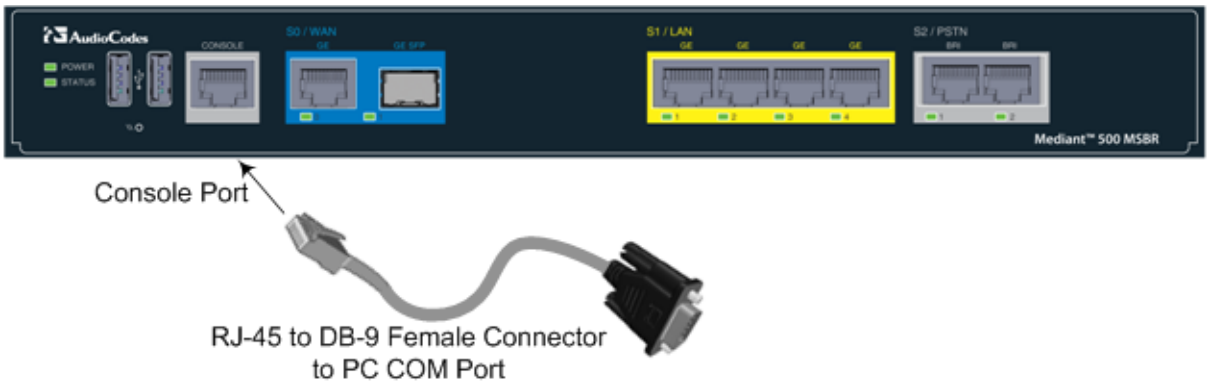
Table 6-4: DB-9 to RJ-45 Serial Cable Connector Pinouts

DB-9 Female	RJ-45
8	1
6	2
2	3
5	4
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 6-14: 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.

6.7 Connecting a USB Storage Device

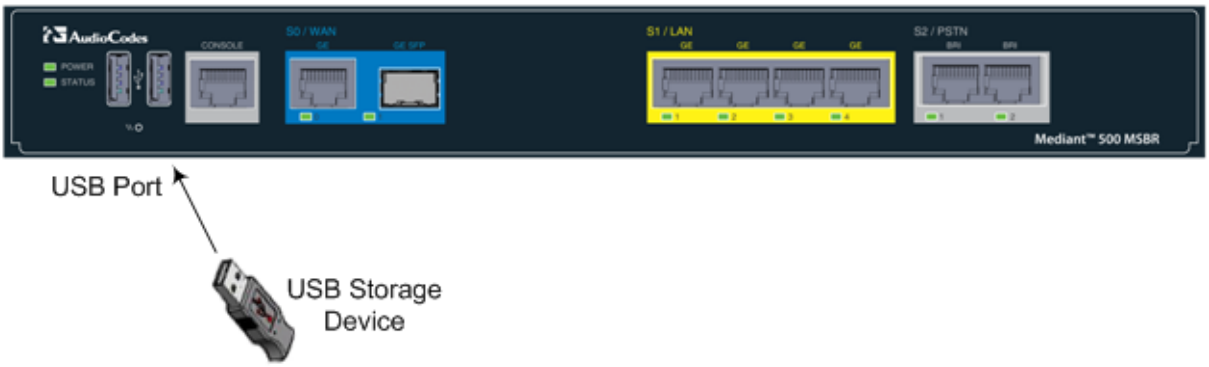
The device supports USB storage capabilities, using an external USB hard drive or flash disk (disk on key) connected to the device's USB port. The storage capabilities are configured through CLI and include the following:

- Saving network captures to the USB.
- Upgrading 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 6-15: Connecting USB Storage Device



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

6.8 Connecting to a Power Supply

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

Warnings:

- 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.

➢ 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 6-16: 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 Section 3.2.2.8 on page 17).

A Approved Laser SFPs

The table below lists the recommended SFPs, which can be ordered from AudioCodes. For installing the SFPs and for fiber-optic WAN cabling, see Section 6.2.2 on page 27.

Table A-1: Approved SFP Modules

Object / Part No.	Manufacturer / Trademark	Optional Types / Models	Technical Data	Standard (Edition / Year)	Mark(s) of Conformity
Laser SFP Insert	Source Photonics	▪ SPL-35-03-EBX-CDFM ▪ SPL-53-03-EBX-CDFM ▪ SPL-35-03-EBX-CDFM ▪ SPL-34-GB-BX-CDFM ▪ SPL-43-GB-BX-CDFN ▪ SP-GB-LX-CDFN ▪ SP-GB-SX-CDFB	Class 1 ▪ 1310 nm ▪ 1550 nm ▪ 1850 nm ▪ 1490 nm	▪ EN60950-1:2006+A11 ▪ EN60825-1:2007, EN60825-2:2004+A1 ▪ UL60950-1	▪ UR ▪ TUV
Alternate Laser SFP Insert	Neo Photonics	▪ PT7320-51-1W+ ▪ PTB3350-3331W-LC/PC+ ▪ PTB3530-3331W-LC/PC+ ▪ PTB3370-553CW-LC/PC+ ▪ PTB3830-553CW-LC/PC+ ▪ PT7320-51-1W+	Class 1 ▪ 1310 nm ▪ 1550 nm ▪ 1850 nm ▪ 1490 nm	▪ EN60950-1:2006+A11 ▪ EN60825-1:2007 ▪ EN60825-2:2004+A1 ▪ UL60950-1	▪ UR ▪ TUV

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