Hardware Installation Manual

AudioCodes Mediant™ Family of Media Gateways & Session Border Controllers

Mediant 800B

Media Gateway & Enterprise SBC

HD VoIP Sounds Better

AudioCodes

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Notice

This document describes the hardware installation for AudioCodes **Mediant 800B Gateway and E-SBC**.

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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 800B Gateway and E-SBC.

Related Documentation

Document Name
SIP Release Notes
Mediant 800B Gateway and E-SBC User's Manual
CLI Reference Guide

Notes and Warnings

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

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

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.

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: For deployment in Finland, Sweden and Norway, the device must be installed ONLY in restricted access locations that are compliant with ETS 300 253 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
10259	FXO warning statement.
10260	Power amperage updated.
10261	E1 cabling warning statement regarding STP.
10262	Max. power consumption.
10263	Power surge warnings; AC input current.
10265	Miscellaneous formatting.
10266	E1/T1 PSTN fallback added.
10267	AC power cable warning (Japanese).

Documentation Feedback

AudioCodes continually strives to produce high quality documentation. If you have any comments (suggestions or errors) regarding this document, please fill out the Documentation Feedback form on our Web site at http://www.audiocodes.com/downloads. Your valuable feedback is highly appreciated.

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1 Introduction

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

The device supports the following interfaces (customer ordered):

- Up to 2 E1/T1 port interfaces (over single copper wire pair).
- Up to 8 BRI ports (supporting up to 16 voice channels).
- Up to 12 FXS port interfaces.
- Up to 12 FXO port interfaces.
- 12 LAN Ethernet interfaces - up to 4 Gigabit Ethernet ports and up to 8 Fast Ethernet ports. These ports operate in port-pair redundancy, providing up to 6 port-pair groups.
- Open Solutions Network (OSN) server platform for hosting third-party applications such as an IP PBX.

Notes:

- Hardware configurations may change without notice. Currently available hardware configurations are listed in AudioCodes Price Book. For available hardware configurations, contact your AudioCodes sales representative.
- The Fast Ethernet ports are available only on "pure" SBC Mediant 800B models (i.e., without PSTN / Gateway interfaces).
- For configuring the different interfaces, refer to the *User's Manual*.

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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 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
   - One FXS Lifeline cable adapter (only for models with FXS interfaces)
   - One AC power cable
5. Check, retain and process any documents.

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

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3 Physical Description

This section provides a physical description of the device.

Note: The Mediant 800 chassis platform has been upgraded. This revised chassis is referred to as *Mediant 800B*. The shipped chassis version depends on your ordered hardware configuration. For more information, contact your AudioCodes sales representative. In addition, throughout this manual, the Mediant 800B is used in illustrations, unless specific instructions are necessary for the Mediant 800 chassis. In such a case, both chassis versions are shown.

3.1 Physical Dimensions and Operating Environment

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

Table 3-1: Physical Dimensions and Operating Environment

Physical Specification	Description
Dimensions (H x W x D)	1U x 32 x 34.5 cm (12.6 x 13.6 inches)
Weight	2.5 kg (5.5 lbs.)
Environmental	▪ Operational: 5 to 40°C (41 to 104°F) ▪ Storage: -25 to 85°C (-13 to 185°F) ▪ Humidity: 10 to 90% non-condensing

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: Mediant 800B Front Panel

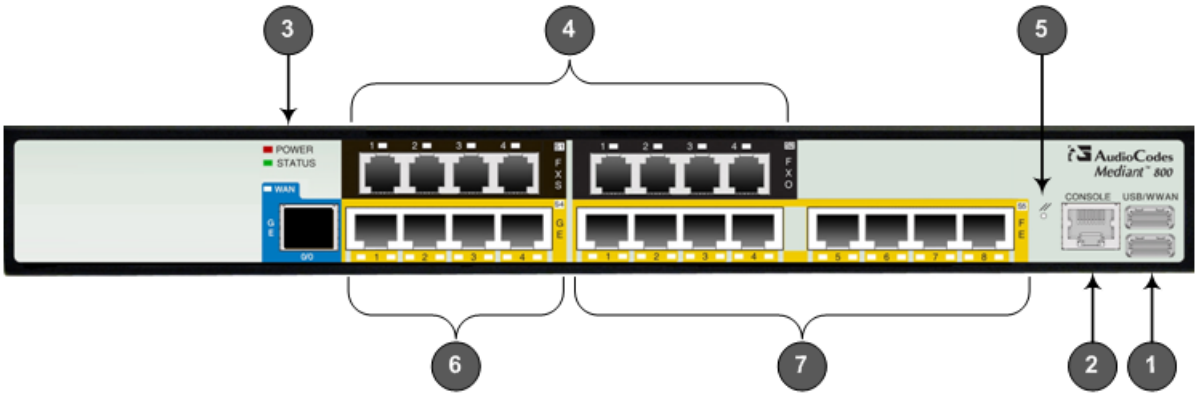
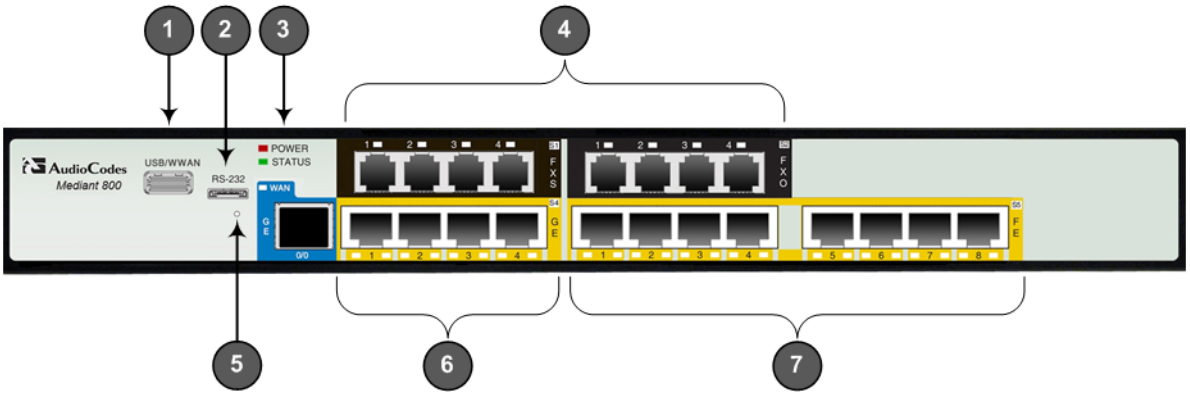


Figure 3-2: Mediant 800 Front Panel



Note: The figures above are used only as an example. The number and type of port interfaces depends on the ordered model.

Table 3-2: Front Panel Description

Item #	Label	Description
1	**USB/WWAN**	USB port, used for various functionalities such as saving debug captures to a USB storage device. The number of ports depends on chassis version: • Mediant 800B: 2 USB ports • Mediant 800: 1 USB port

Item #	Label	Description
2	**RS-232**	RS-232 port for serial communication. The type of port connector depends on chassis version: • Mediant 800B: RJ-45 • Mediant 800: 12-pin female LX40-12P Hirose connector
3	**POWER / STATUS**	LEDs indicating the status of the power and reboot/initialization. For more information, see Section 3.2.2 on page 18.
4	**FXS / FXO / BRI / Digital**	Telephony port interfaces that can include one or a combination of the following, depending on the ordered model: • FXS port interfaces (RJ-11) • FXO port interfaces (RJ-11) • ISDN BRI port interfaces (RJ-45) • E1/T1 port interfaces (RJ-48) **Notes:** • The FXS/FXO interfaces support loop-start signalling (indoor only). • For supported hardware configuration options, refer to the *Release Notes*.
5	**-**	Reset pinhole button for resetting the device and optionally, for restoring the device 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 Reset pinhole button for **at least 12 seconds, but no more than 25 seconds**.
6	**GE**	Up to four 10/100/1000Base-T (Gigabit Ethernet) LAN ports for connecting IP phones, computers, or switches. These ports support the following features: ▪ **1+1 LAN port redundancy:** These ports are grouped in pairs, where one port is active and the other redundant. When a failure occurs in the active port, a switchover is done to the redundant port. ▪ **Half- and full-duplex modes** ▪ **Auto-negotiation** ▪ **Straight or crossover cable detection**
7	**FE**	Eight Fast Ethernet (10/100Base-TX) RJ-45 LAN ports for connecting IP phones, computers, or switches. The supported port features are the same as the GE ports (see Item #6 above). **Note:** The Fast Ethernet ports are available only on "pure" SBC Mediant 800B models (i.e., without PSTN / Gateway interfaces).

3.2.2 LEDs Description

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 LAN Interface LEDs

Each LAN port provides a LED (located on its left) for indicating LAN operating status, as described in the table below.

Table 3-3: LAN LEDs Description

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

3.2.2.2 FXS LEDs

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

Table 3-4: FXS LEDs Description

LED Color	LED State	Description
Green	On	Phone is off-hooked.
	Flashing	Rings the extension line.
Red	On	▪ Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure. ▪ Disabled port initiated by user (using the CLI command, `analog-port-enable`)
-	Off	Phone is on hook.
-	Off	No power received by the device.

3.2.2.3 FXO LEDs

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

Table 3-5: FXO LEDs Description

LED Color	LED State	Description
Green	On	FXO line is off-hooked toward the PBX.
	Flashing	Ring signal detected from the PBX.
Red	On	▪ Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure. ▪ Disabled port initiated by user (using the CLI command, `analog-port-enable`)
-	Off	Line is on hook.
-	Off	No power received by the device.

3.2.2.4 BRI LEDs

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

Table 3-6: BRI LEDs 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.

3.2.2.5 E1/T1 LEDs

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

Table 3-7: E1/T1 LEDs Description

Color	State	Description
Green	On	Trunk is synchronized (normal operation).
Red	On	Loss due to any of the following signals: ▪ LOS - Loss of Signal ▪ LOF - Loss of Frame ▪ AIS - Alarm Indication Signal (the Blue Alarm) ▪ RAI - Remote Alarm Indication (the Yellow Alarm)
-	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.

3.2.2.6 Operational Status LEDs

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

Table 3-8: STATUS LEDs Description

LED Color	LED State	Description
Green	On	The device is operational and in Standalone mode (not in High-Availability mode).
	Flashing	Initial rebooting stage.
	Slow Flash	HA mode - LED on Active device.
	Slow-Fast Flash	HA mode - LED on Redundant device.
Red	On	Boot failure.
	Off	Advanced rebooting stage.

3.2.2.7 Power LEDs

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

Table 3-9: POWER LEDs 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 3-3: Rear Panel

Note: The figure above is used only as an example. The Open Network Solution (OSN) server ports are a customer ordered item and depend on the ordered OSN server platform.

Table 3-10: Rear Panel Description

Item #	Label	Description
1	**OSN USB**	Three USB ports (Standard-A type) for connecting computer peripherals (e.g., mouse and keyboard). These are used when implementing the OSN. **Note:** These ports are available only if the device is equipped with the OSN server (customer ordered).
2	**OSN VGA**	15-Pin DB-type female VGA port for connecting to a monitor (screen). This port is used when implementing the OSN. **Note:** This port is available only if the device is equipped with the OSN server (customer ordered).
3	**-**	Reset button for resetting the OSN server.
4	**GE 1** **GE 2**	10/100/1000Base-T Ethernet ports (RJ-45) for connecting directly to the OSN server. For example, one port can be connected to the LAN (to IP Phones) and the second port to the WAN interface (to an IP PBX). **Note:** the number of ports depends on ordered OSN server platform (see Section 5.7 on page 41).
5	⏚	Protective earthing screw.
6	**100-240V~4A** **50-60Hz**	3-Prong AC power supply entry.

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4 Mounting the Device

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

- Placed on a desktop – see Section 4.1 on page 23
- Installed in a standard 19-inch rack – see Section 4.2 on page 24

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.

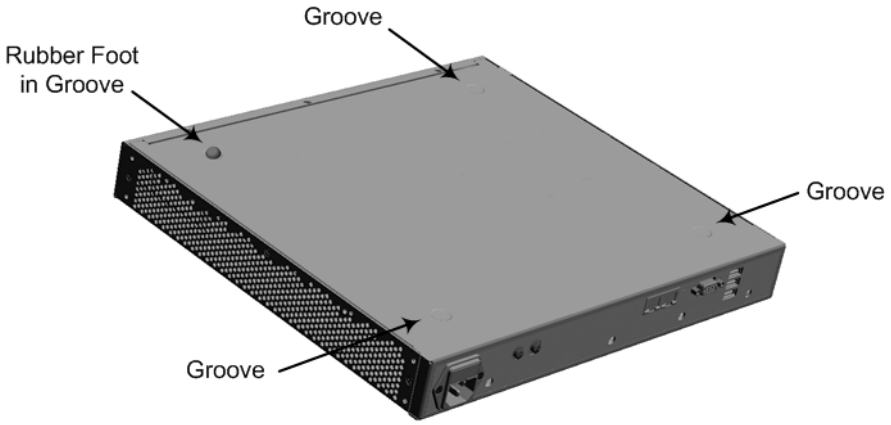
4.1 Desktop Mounting

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 4-1: Rubber Foot Attached to Underside of Device



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

4.2 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 4.2.1 on page 24
- 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 4.2.2 on page 25

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 5.1 on page 27.

4.2.1 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.

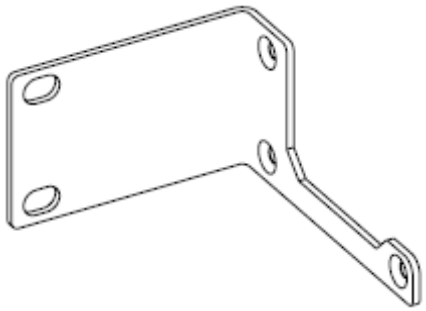
➢ **To mount the device on a pre-installed shelf in the rack:**

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.

4.2.2 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.

Figure 4-2: Mounting Bracket (Right)

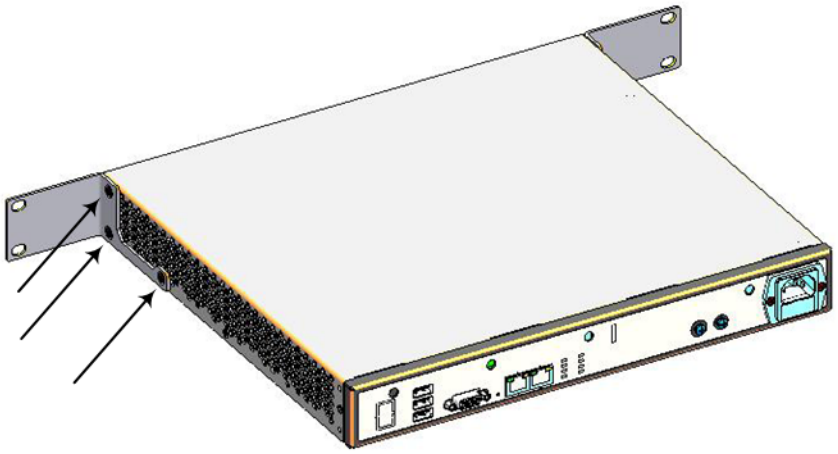


Note: 19-inch rack mounting using mounting brackets is a customer ordered feature.

➢ **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 4-3: Attaching the Mounting Brackets



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).

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5 Cabling the Device

This chapter describes the cabling of the device.

5.1 Grounding and Surge Protection

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."

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 mm2 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 mm2. The length of this cable must be as short as possible (no longer than 3 meters).
- The device does **not** include primary telecom protection**!** When the **FXO** telephone lines are routed **outside the building**, additional protection - usually a 350V three-electrode Gas Discharge Tube (GDT) as described in ITU-T K.44 - **must** be provided at the entry point of the telecom wires into the building (usually on the main distribution frame / MDF), in conjunction with proper grounding. The center pin of the GDT (MDF grounding bar) must be connected to the equipotential grounding bus bar of the Telecommunication room.
- Failing to install primary surge protectors and failing to comply with the grounding instructions or any other installation instructions, may cause permanent damage to the device!
- As most of the installation is the responsibility of the customer, AudioCodes can assume responsibility for damage only if the customer can establish that the device does not comply with the standards specified above (and the device is within the hardware warranty period).
- The device complies with protection levels as required by EN 55024/EN 300386. Higher levels of surges may cause damage to the device.
- To protect against electrical shock and fire, use a minimum of 26-AWG wire size to connect the FXO ports.

➢ **To ground the device:**

1. Connect an electrically earthed strap of 16 AWG wire (minimum) to the chassis' grounding screw (located on the rear panel), using the supplied washer and fasten the wire securely using a 6-32 UNC screw.

Figure 5-1: Grounding the Device

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.

5.2 Connecting to LAN

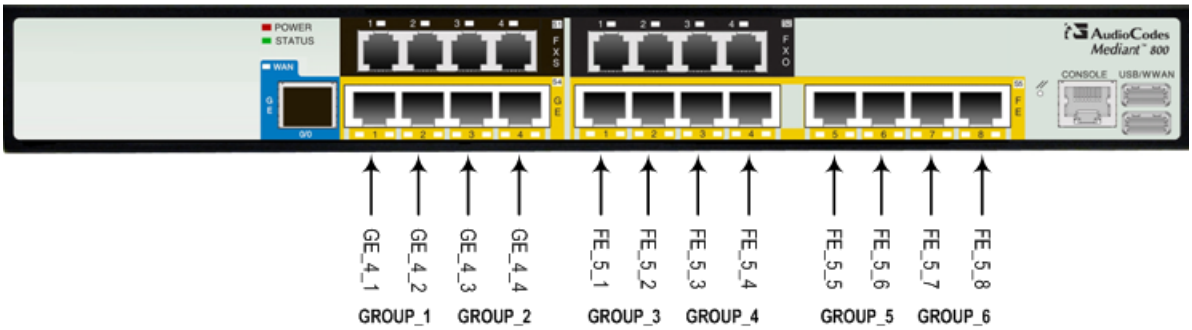
The device provides up to four 10/100/1000Base-T (Gigabit Ethernet) RJ-45 ports and up to eight 10/100Base-TX (Fast Ethernet) RJ-45 ports for connection to the LAN. These Ethernet ports can operate in pairs (*groups*) to provide 1+1 port redundancy. In each pair, one port serves as the active port while the other as standby. When the active port fails, the device switches to the standby port.

Notes:

- The type and number of Ethernet ports depends on ordered hardware configuration.
- The Fast Ethernet ports are available only on "pure" SBC Mediant 800B models (i.e., without PSTN / Gateway interfaces).

By default, the Ethernet ports are grouped into pairs as shown in the figure below. You can change this port assignment, including assigning only a single port to an Ethernet Group. For more information, refer to the *User's Manual*.

Figure 5-2: LAN Port-Pair Groups and Web Interface String Names



These ports support half- and full-duplex modes, auto-negotiation, and straight or crossover cable detection.

Cable specifications:

- **Cable:** Cat 5e or Cat 6
- **Connector Type:** RJ-45
- **Connector Pinouts:**

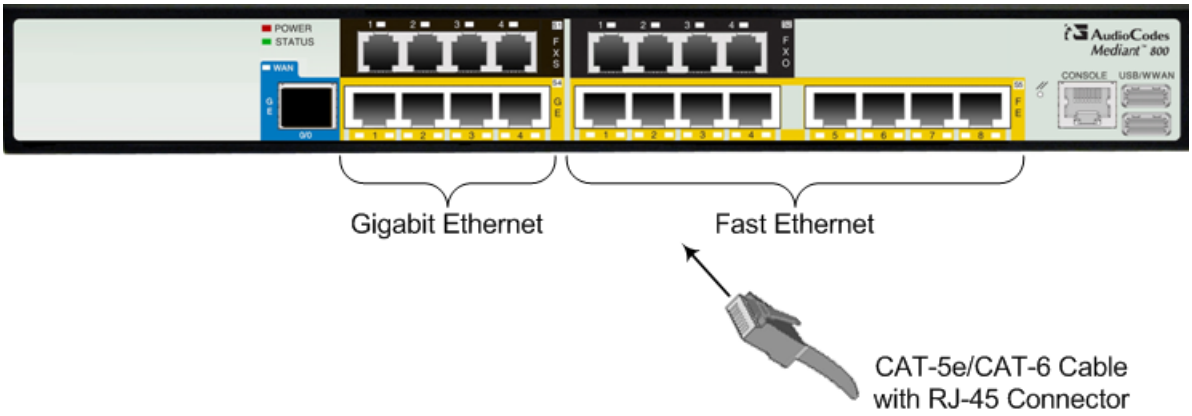
Table 5-1: RJ-45 Connector Pinouts for GbE/FE

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 **GE** (for Gigabit Ethernet ports) and/or **FE** (for Fast Ethernet ports).

Figure 5-3: Connecting the LAN Ports



2. Connect the other end of the cable to the Gigabit Ethernet network (for the **GE** ports) and/or Fast Ethernet network (for the **FE** ports).
3. For 1+1 LAN protection, repeat steps 1 and 2 for the standby port, but connect it to another network (in the same subnet).

Note: If you are implementing LAN port-pair redundancy, make sure that each port in the Ethernet Group is connected to a different network (but in the same subnet).

5.3 Analog Devices

This section describes how to connect the device to analog equipment.

5.3.1 Connecting the FXS Interfaces

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

Warnings:

- The device is an **INDOOR** unit and therefore, must be installed only indoors.
- FXS port interface cabling must be routed only indoors and must not exit the building.
- Make sure that the FXS ports are connected to the appropriate, external devices; otherwise, damage to the device may occur.
- FXS ports are considered TNV-2.

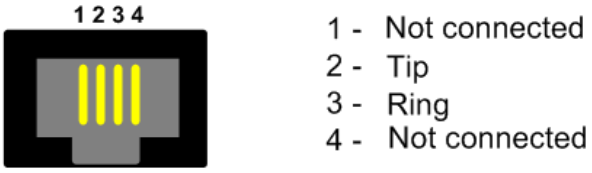
Notes:

- FXS interfaces are a customer-ordered item.
- 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.

Cable specifications:

- **Cable:** Standard straight-through RJ-11-to-RJ-11 telephone cable
- **Connector Type:** RJ-11
- **Connector Pinouts:**

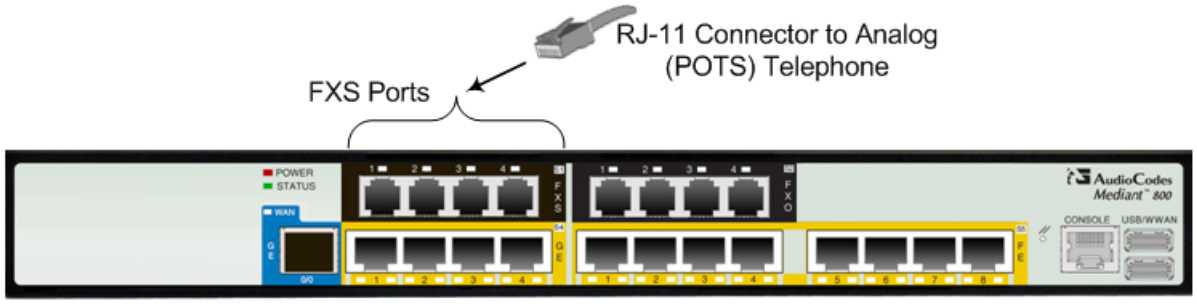
Figure 5-4: RJ-11 Connector Pinouts for FXS Interface



➢ **To connect the FXS interfaces:**

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

Figure 5-5: Connecting FXS Interfaces



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

5.3.2 Connecting the FXO Interfaces

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

Warnings:

- The device does **not** include primary telecom protection**!** When the **FXO** telephone lines are routed **outside the building**, additional protection - usually a 350V three-electrode Gas Discharge Tube (GDT) as described in ITU-T K.44 - **must** be provided at the entry point of the telecom wires into the building (usually on the main distribution frame / MDF), in conjunction with proper grounding. The center pin of the GDT (MDF grounding bar) must be connected to the equipotential grounding bus bar of the Telecommunication room.
- To protect against electrical shock and fire, use a minimum 26-AWG wire to connect FXO ports to the PSTN.
- Ensure that the FXO ports are connected to the appropriate, external devices; otherwise, damage to the device may occur.
- FXO ports are considered TNV-3.

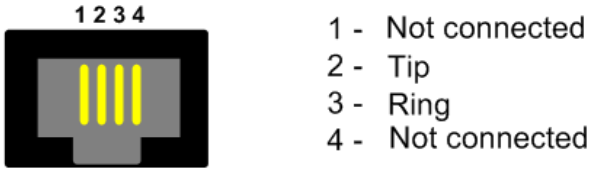
Notes:

- FXO interfaces are a customer-ordered item.
- FXO is the interface replacing the analog telephone and connects to a Public Switched Telephone Network (PSTN) line from the Central Office (CO) or to a Private Branch Exchange (PBX). The FXO is designed to receive line voltage and ringing current, supplied from the CO or the PBX (similar to an analog telephone). An FXO VoIP device interfaces between the CO/PBX line and the Internet.

Cable specifications:

- **Cable:** 26 AWG min
- **Connector Type:** RJ-11
- **Connector Pinouts:**

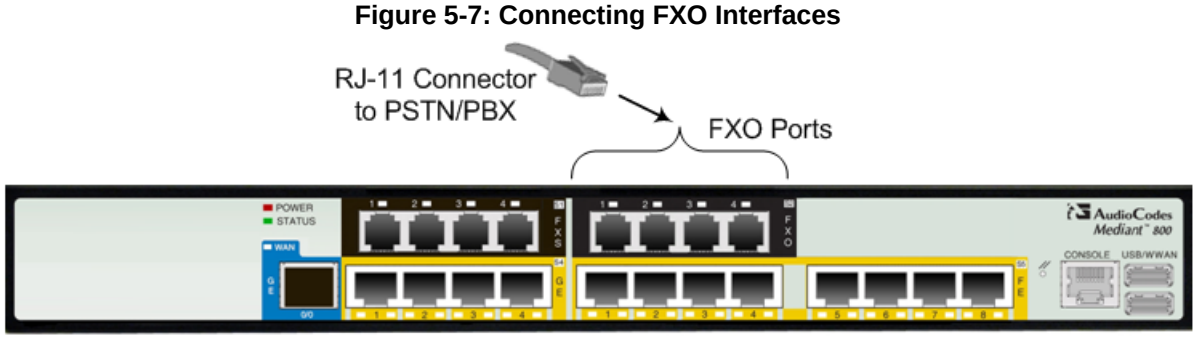
Figure 5-6: RJ-11 Connector Pinouts for FXO Interface



➢ **To connect the FXO interfaces:**

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

Figure 5-7: Connecting FXO Interfaces



2. Connect the other end of the cable to the required telephone interface: (e.g., telephone exchange analog lines or PBX extensions).

5.3.3 Connecting the FXS Analog Lifeline

The device's analog Lifeline phone feature redirects IP calls to the PSTN upon a power outage or loss of IP network connectivity, thereby guaranteeing call continuity. The Lifeline is provided by FXS Port # **1**. This port connects to the analog POTS phone and the PSTN / PBX using a splitter cable. The Lifeline splitter connects pins 1 and 4 to another source of an FXS port, and pins 2 and 3 to the POTS phone.

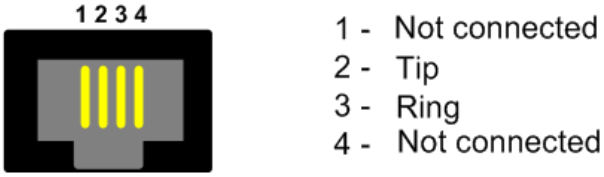
Notes:

- Analog Lifeline cabling is applicable only if the device is ordered with FXS interfaces.
- The number of supported Lifelines depends on the device's hardware configuration. For the combined FXS/FXO configuration, one Lifeline is available; for the 12-FXS configuration, up to three Lifelines are available.
- The scenario upon which the Lifeline is activated is configured by the LifeLineType *ini* file parameter. For more information, refer to the *User's Manual*.

Cable specifications:

- **Cable:** Splitter cable with RJ-11 connector on one end and two RJ-11 jacks (plugs) on the other end
- **Connector Type:** RJ-11
- **Connector Pinouts:**

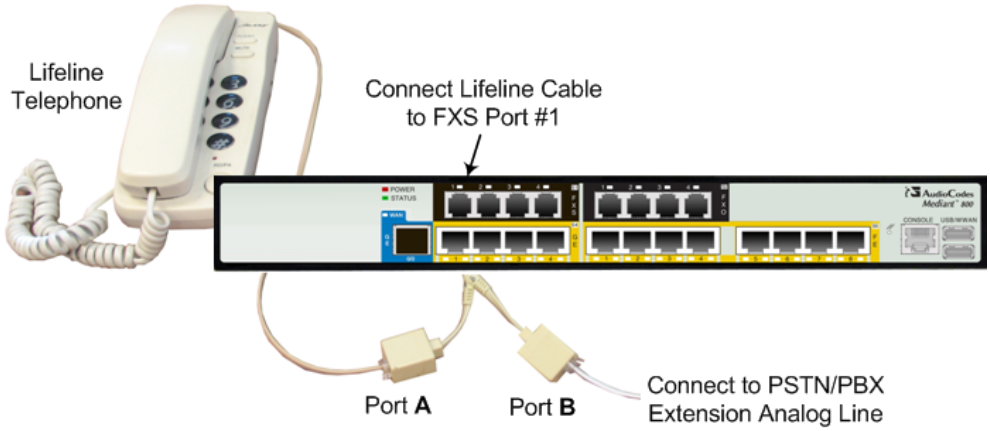
Figure 5-8: RJ-11 Connector Pinouts for FXS Lifeline



➢ **To cable the FXS Lifeline:**

1. Connect the Lifeline Splitter (supplied) to FXS Port **1**.
2. On the Lifeline splitter cable, do the following:
   a. Connect the analog telephone to Port **A**.
   b. Connect an analog PSTN line to Port **B**.

Figure 5-9: Cabling FXS Lifeline



5.4 ISDN BRI Interfaces

This section describes how to cable the BRI interfaces.

5.4.1 Connecting to BRI Lines

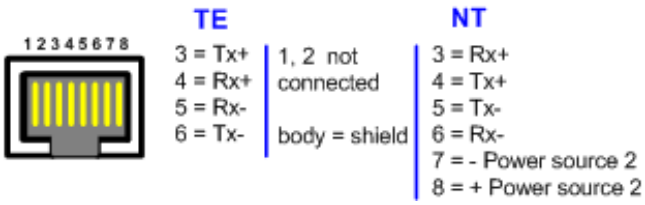
The device provides up to four BRI S/T ports. These ports connect to ISDN terminal equipment such as ISDN telephones. Each BRI port can be configured either as termination equipment/user side (TE) or network termination/network side (NT). Up to eight terminal equipment (TE) devices can be connected per 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.

Note: BRI interfaces are a customer-ordered item.

Cable specifications:

- **Cable:** 26 AWG min.
- **Connector Type:** RJ-45
- **Connector Pinouts:**

Figure 5-10: RJ-45 Connector Pinouts for BRI Ports

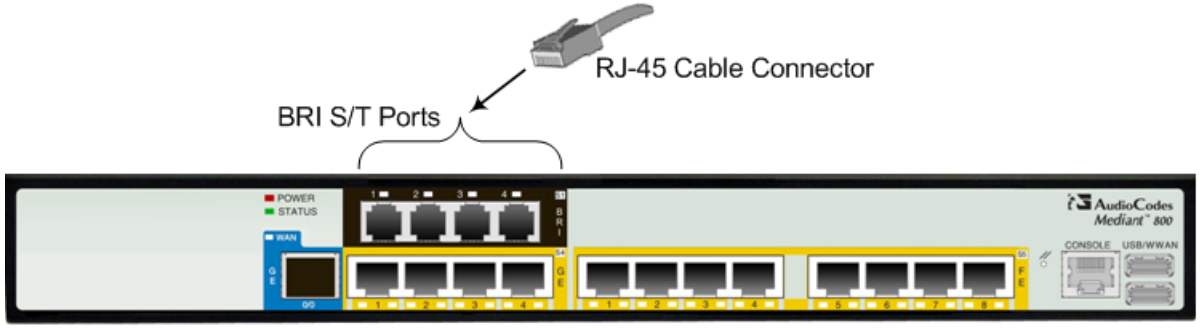


Warning: To protect against electrical shock and fire, use a 26 AWG min wire to connect the BRI ports to the PSTN.

➢ **To connect the BRI ports:**

1. Connect the BRI cable to the device's BRI RJ-45 port.
2. Connect the other end of the cable to your ISDN telephone or PBX/PSTN switch.

Figure 5-11: Cabling BRI Ports



5.4.2 Connecting 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.

PSTN Fallback is supported if the device houses one or more BRI modules, where each BRI module provides two or four spans.

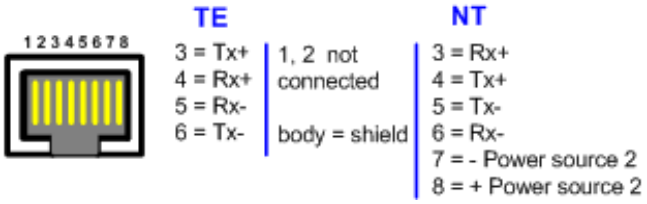
In the event of a PSTN fallback, the BRI module's metallic relay switch automatically connects line Port 1 (**I**) to Port 2 (**II**) of the BRI module.

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.

Cable specifications:

- **Cable:** 26 AWG min.
- **Connector Type:** RJ-45
- **Connector Pinouts:**

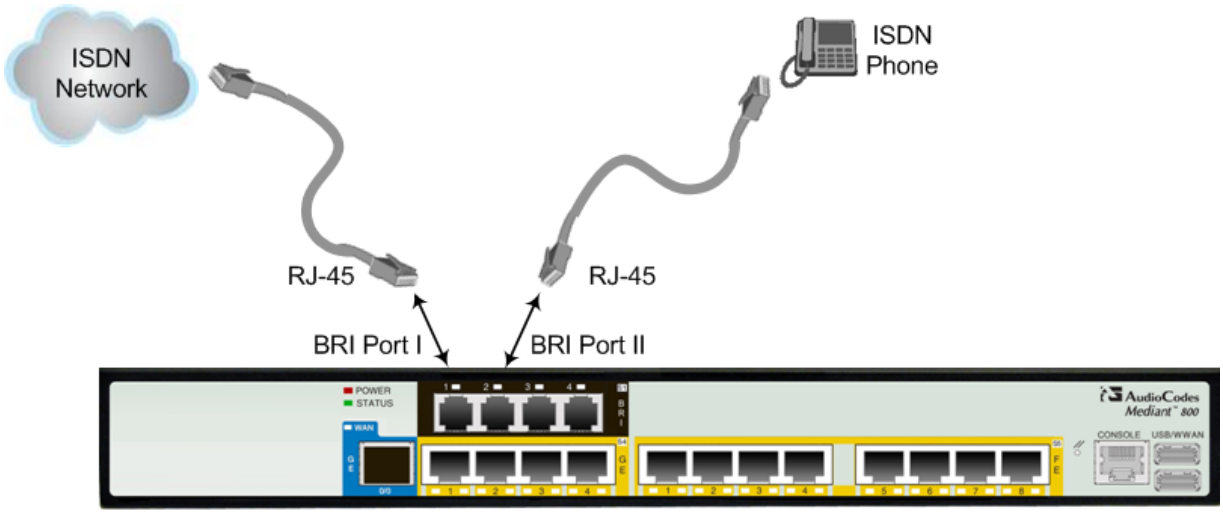
Figure 5-12: RJ-45 Connector Pinouts for BRI PSTN Fallback



➢ **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 5-13: Cabling (Ports 1 and 2) PSTN Fallback



Notes:

- PSTN Fallback is supported only on BRI interfaces.
- PSTN Fallback is supported only between ports on the same BRI module.
- The scenarios that trigger PSTN Fallback (i.e., power outage and/or IP network loss) are configured by the TrunkLifeLineType parameter.
  For more information, refer to the *User's Manual*.
- This PSTN Fallback feature has no relation to the PSTN Fallback Software Upgrade Key.

5.5 ISDN E1/T1 Interfaces

This section describes how to cable the PRI interfaces.

5.5.1 Connecting to ISDN PRI (E1/T1) Trunks

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

Warning:

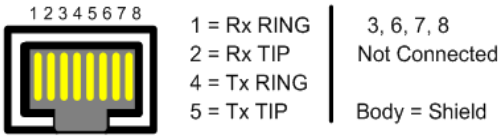
- To protect against electrical shock and fire, use a 26 AWG min wire to connect T1 or E1 ports to the PSTN.
- To comply with EMC rules and regulations, use shielded twisted pair (STP) cables for E1 interfaces on the Mediant 800B model.

Note: PRI interfaces are a customer-ordered item.

Cable specifications:

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

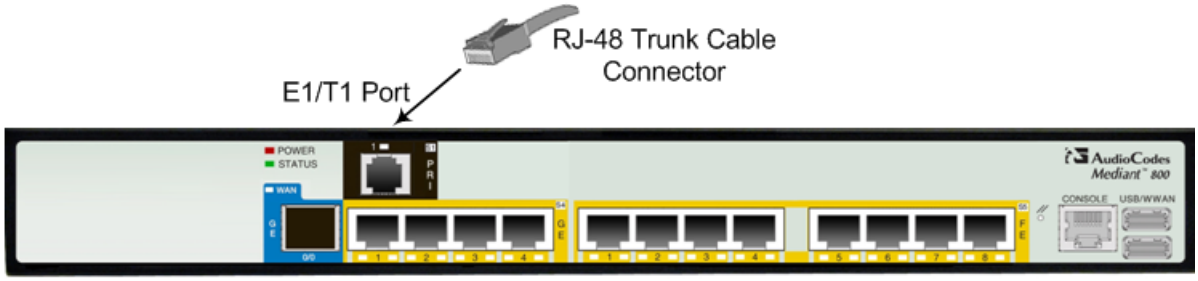
Figure 5-14: RJ-48c Connector Pinouts for E1/T1



➢ **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 5-15: Cabling E1/T1 Ports



5.5.2 Connecting PSTN Fallback for E1/T1 Trunks

The device supports E1/T1 (PRI) PSTN Fallback, whereby it automatically re-routes Tel calls initially destined to the IP network to the PSTN instead, upon power outage or IP connectivity loss (e.g., no ping). PSTN Fallback guarantees call continuity in such scenarios.

Note: PSTN Fallback is supported only on devices with specific hardware configurations (orderable) and where dual E1/T1 ports are provided. For more information, contact your AudioCodes sales representative.

PSTN Fallback is provided by two PRI ports, where in the event of a PSTN Fallback the device automatically connects the two ports using a metallic relay switch. For example, if one port is connected to a PBX and the second port to the PSTN, upon a power outage or loss in IP connectivity, calls originating from the PBX are routed directly to the PSTN (instead of to the IP network).

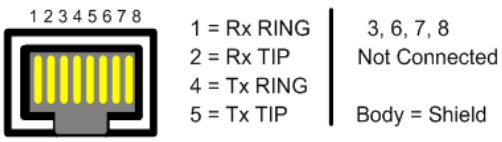
Warning:

- To protect against electrical shock and fire, use a 26 AWG min. wire to connect the PRI ports to the PSTN.
- To comply with EMC rules and regulations, use shielded twisted pair (STP) cables for E1 interfaces on the Mediant 800B model.

Cable specifications:

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

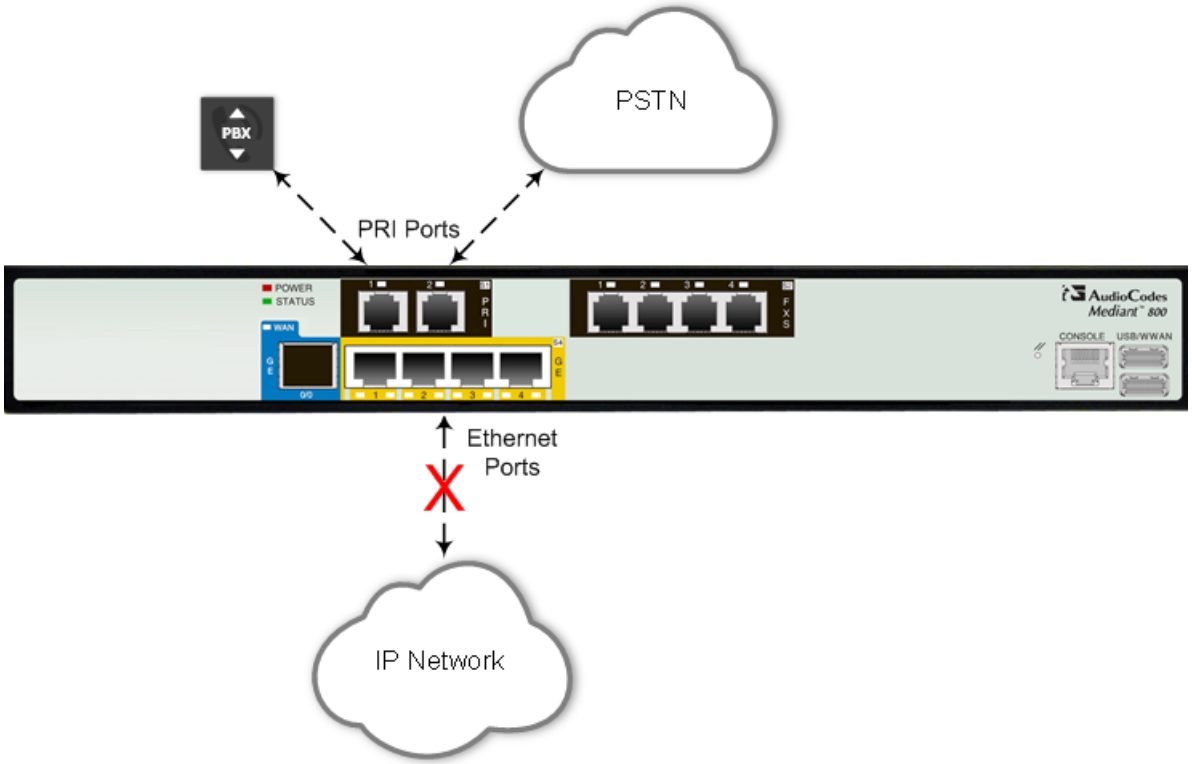
Figure 5-16: RJ-48c Connector Pinouts for E1/T1 PSTN Fallback



➢ **To connect the PRI ports for PSTN Fallback:**

1. Connect one of the PRI ports to the PBX.
2. Connect the second PRI port to the PSTN.

Figure 5-17: Cabling PRI Ports for PSTN Fallback



Notes:

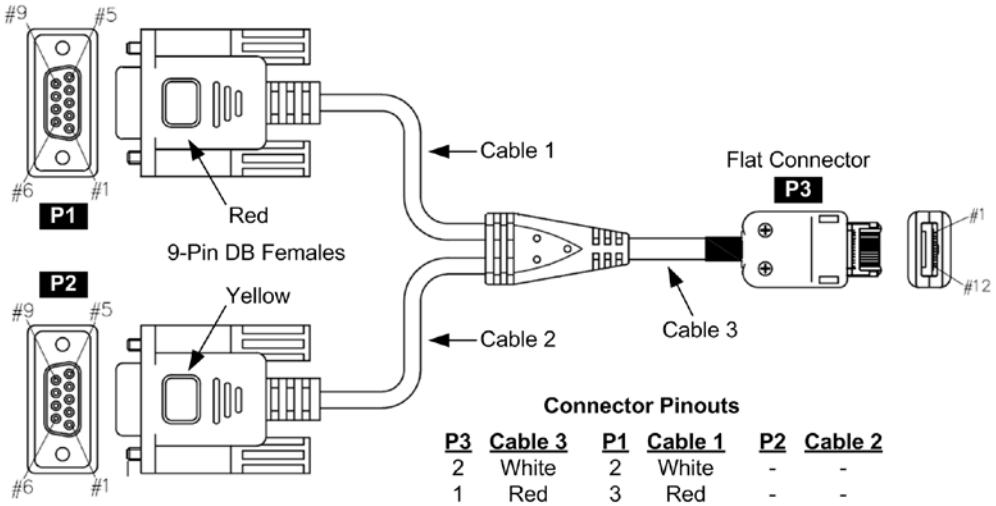
- It does not matter which PRI port connects to which Tel entity (i.e., PBX or PSTN).
- To enable PSTN Fallback upon IP network connectivity issues, use the TrunkLifeLineType parameter (PSTN Fallback upon power outage is done by default). For more information, refer to the *User's Manual*.

5.6 Connecting to a Computer for Serial Communication

The device provides an RS-232 serial interface port on its front panel for serial communication with a PC. The serial port interface connector depends on your device's hardware chassis platform:

- **Mediant 800B:**
  - **Port Type:** RJ-45
  - **Cable:** RJ-45 to DB-9
- **Mediant 800:**
  - **Port Type:** 12-pin female LX40-12P Hirose connector
  - **Cable:** Can be purchased from AudioCodes - RS-232 cable adapter (9-pin DB to flat connector). The Customer Product Number is ***PicoBlade-Serial***. This orderable item is supplied in a kit of 10 cables. The figure below displays this cable adapter, where "P1" and "P2" are standard 9-pin DB for PC COM connectivity and "P3" is the Hirose male connector.

Figure 5-18: Orderable RS-232 Cable Adapter



Connector Pinouts

P3	Cable 3	P1	Cable 1	P2	Cable 2
2	White	2	White	-	-
1	Red	3	Red	-	-
4	Brown	-	-	2	White
3	Black	-	-	3	Red
8	Orange	5	Black	-	-
9	Yellow	-	-	5	Black

➢ **To connect the device's serial interface to a computer:**

- **Mediant 800B:**
  a. Connect the RJ-45 cable connector to the device's serial port, labeled **CONSOLE**.
  b. Connect the other end of the cable to the COM1 or COM2 RS-232 communication port on your PC.

Figure 5-19: Cabling Serial Interface (RJ-45) on Mediant 800B

- **Mediant 800** (using AudioCodes serial cable adapter - not supplied):
  a. Connect one end of the crossover RS-232 cable ("P3") to the device's serial port, labeled **CONSOLE**.
  b. Connect the red 9-pin DB connector ("P1"**)** on the other end of the cable, to the COM1 or COM2 RS-232 communication port on your PC.

5.7 Connecting the OSN Server

The device may be ordered with an embedded, Open Network Solution (OSN) platform for hosting third-party services such as an IP PBX. The OSN modules are located on the device's rear panel.

The table below lists available, orderable OSN server platforms:

Table 5-2: OSN Server Platforms

OSN Platform	CPU	Memory	Storage	Interfaces
OSN2	2nd Generation Intel Core Celeron 1.6 GHz	2 or 4 GB	HDD 500 GB	▪ Two external Gigabit Ethernet ▪ Internal Gigabit Ethernet ▪ Three USB 2.0 via Connection Module ▪ VGA
OSN4	3rd Generation Intel Core i7 Quad Core	16 GB ECC DDR3	HDD (500 GB) or SSD (240 GB)	▪ Two external Gigabit Ethernet ▪ Internal Gigabit Ethernet ▪ Three USB 2.0 via Connection Module ▪ VGA
OSN5	Intel Atom N2800 1.86 GHz Dual Core	2G	HDD 500 GB	▪ External Gigabit Ethernet ▪ Internal Gigabit Ethernet ▪ Three USB 2.0 via Connection Module ▪ VGA

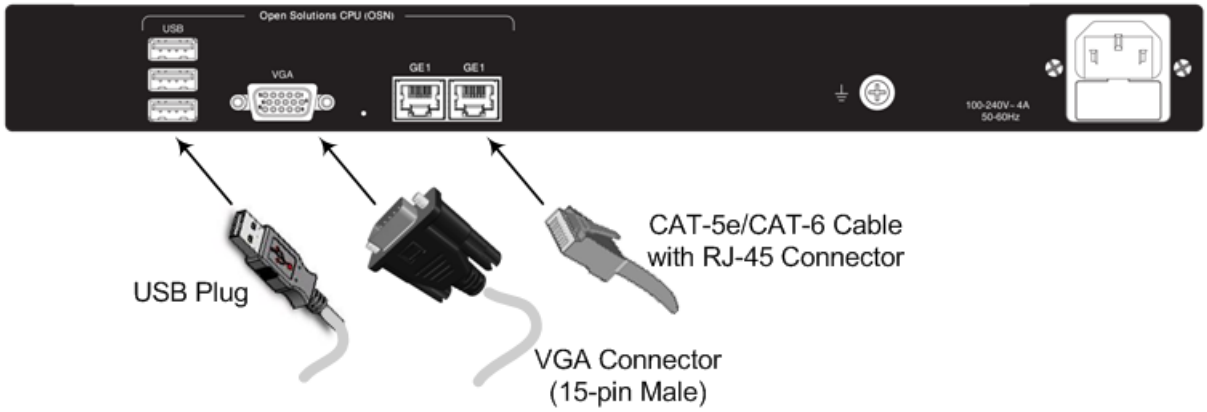
Notes:

- The OSN server platform is a customer ordered feature and thus, the OSN interface ports, located on the rear panel are available only when the device is purchased with the OSN server.
- The OSN server also provides an internal interface connection to the Mediant 800B LAN switch. In other words, instead of using the Gigabit Ethernet port on the rear panel, you can use the LAN port #1 located on the front panel for connecting to the OSN server.
- If your device is shipped with an OSN server, you can download the latest OSN drivers from AudioCodes Web site at http://www.audiocodes.com/downloads.
- The table above lists the currently available OSN platforms. This list may change without notice. To check for any updated information on available OSN platforms, contact your AudioCodes sales representative.

➢ **To connect to the OSN server:**

1. Perform the following cabling procedures on the OSN server, located on the rear panel:
   a. Connect computer peripherals (e.g., mouse and keyboard) to the USB ports (Standard-A type) labeled **USB**.
   b. Connect the USB storage device containing the operating system installation files (Linux or Microsoft Windows) to one of the USB ports, labeled **USB**.
   c. Connect a monitor using a 15-Pin D-type male connector to the VGA female port, labeled **VGA**.
   d. Connect to the network using an RJ-45 Ethernet cable connector to the Gigabit Ethernet port/s (labeled **GE 1** and **GE 2**).

Figure 5-20: Cabling OSN Server Ports



2. Connect the device to power.
3. Follow the operating system's installation instructions to install the operating system.

➢ **To reset the OSN server:**

- Insert a sharp-pointed object (such as a drawing pin) into the Reset pinhole and then extract it after a second; the OSN server performs a reset.

5.8 Powering up the Device

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	1.5 A
Max. Power Consumption	▪ **SBC Only (no PSTN):** 27W ▪ **Gateway (without OSN):** 60W* ***** Max. power consumption varies according to the assembled hardware configuration.

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.
- For replacing the power fuse, see Section 6 on page 45.

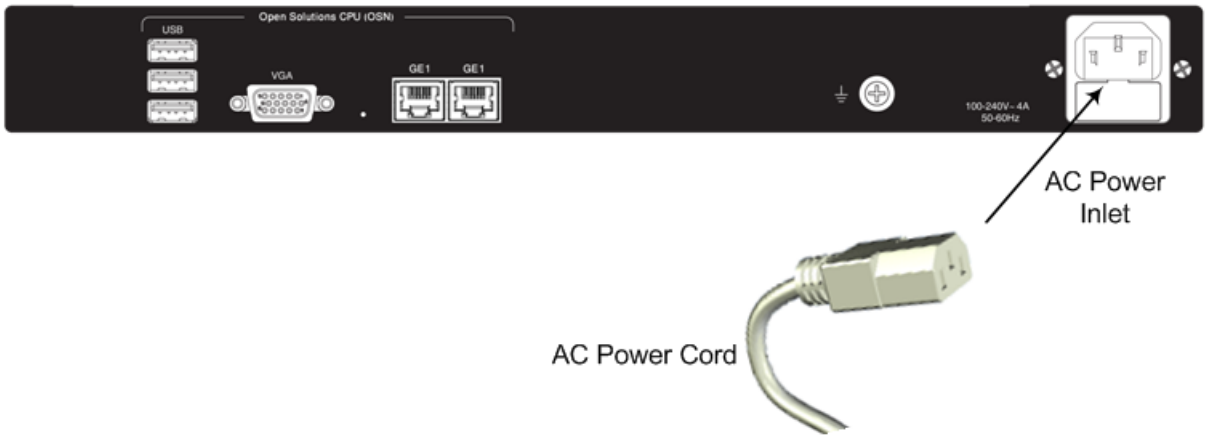
ご注意

本製品に添付の電源ケーブルは、Mediant 800/B Gateway & E-SBC 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 the power supply:**

1. Connect the line socket of the AC power cord (supplied) to the device's AC power socket (labeled **100-240V ~ 4A 50-60Hz**), located on the rear panel.

Figure 5-21: Connecting to the Power Supply



2. Connect the plug at the other end of the AC power cord to a standard electrical outlet.

Once you have cabled and powered-up the device, the **POWER** LED on the front panel lights up green. For a description of this LED, see Section 3.2.2.7 on page 20.

6 Maintenance – Replacing the Power Fuse

The device contains a fuse that protects the device from excessive current. The fuse is located on the rear panel, below the power socket. To replace the fuse, use only one of the following fuses described in the table below:

Table 6-1: Allowed Fuses for the Device

Manufacturer	Manufacturer Part Number
BEL	5ET2.5-R
CONQUER	UDL 2.50
LITTEFUSE	021302.5MXP

Caution

For continuous protection, replace only with the same fuse type and rating fuse.

➢ **To replace the fuse:**

1. Unplug the power cord from the electrical outlet.
2. Using a small flathead screwdriver, gently pries open the fuse cavity as illustrated in the figure below:

Figure 6-1: Opening the Fuse Cavity

3. Carefully remove the fuse from the fuse cavity.

Figure 6-2: Removed Power Fuse

4. Insert the new fuse securely into the fuse cavity until you hear a click sound.
5. Reconnect the power cord and verify that the **Power** LED is lit green.

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A Installing CentOS Ver. 4.7 on OSN Server

This appendix provides important information for installing CentOS Ver. 4.7 Linux Distribution on the OSN server:

- When installing CentOS, ensure that you type **linux irqpoll** at the **boot:** prompt.
- For CentOS to identify the OSN server's Gigabit Ethernet (GE) interfaces, do the following:

1. Obtain the following files from AudioCodes:
   - Binary compiled CentOS 4.7 driver for Intel e1000e Ethernet controller on Mediant 800B Gateway and SBC (**e1000e.ko**)
   - Manual pages (**e1000e.7.gz**)
2. Copy the files to the **/root** directory.
3. Remove any old e1000e modules (if any) and install the new module and manual pages:

```
#> find /lib/modules/2.6.9-78.ELsmp –name e1000e.ko –exec
rm –rf {}\;
#> find /lib/modules/2.6.9-78.ELsmp –name e1000e.ko.gz –
exec rm –rf {}\;
#> install –D –m 644 /root/e1000e.ko /lib/modules/2.6.9-
78.ELsmp/kernel/drivers/net/e1000e/e1000e.ko
#> /sbin/depmod –a
#> echo "alias eth1 e1000e" >> /etc/modprobe.conf
#> echo "alias eth2 e1000e" >> /etc/modprobe.conf
#> install –D –m 644 /root/e1000e.7.gz
/usr/share/man/man7/e1000e.7.gz
#> man –c –P`cat > /dev/null` e1000e
#> modprobe e1000e
```

   Note: The character **#>** depicts the CLI prompt and is not part of the command.
4. Restart networking, by running the following command:

   #> service network restart

   Note: The character **#>** depicts the CLI prompt (i.e., this is not part of the command).

   The final result should be as follows:

```
Eth0 = r8169 (INTERNAL and not in use)
Eth1 = e1000e (GE LAN)
Eth2 = e1000e (GE LAN)
```

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