Mediant™ 1000B Gateway & E-SBC

Session Border Controller (E-SBC)

Analog & Digital VoIP Media Gateway

Hardware Installation Manual

SAS
Stand Alone Survivability
Continuous VoIP Service

SBC

HD VoIP
Sounds Better

Version 6.6

February 2013

Document #: LTRT-41404

AudioCodes

Table of Contents

List of Figures

List of Tables

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Notice

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Abbreviations and Terminology

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

Throughout this manual and unless otherwise specified, the term *device* refers to the Mediant 1000B Gateway and E-SBC.

Related Documentation

Manual Name
SIP Release Notes
Mediant 1000B Gateway & E-SBC SIP User's Manual

Notes and Warnings

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.

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

Warning: The device is supplied as a sealed unit and must be installed and serviced only by qualified service personnel.

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

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.

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Regulatory Information

VoIP Gateway:

1. This equipment complies with Part 68 of the FCC Rules and the requirements adopted by the ACTA. On the bottom of the unit or on the Interface card of this equipment is a label that contains among other information, a product identifier in the format US:AC1IS00BM1KMIX or US:AC1ISNANM1000 and ringer equivalence. If requested, this number must be provided to the telephone company.

2. This equipment is designed to be connected to the telephone network using an RJ-48C and/or RJ-11C connector, which is Part 68 compliant. The service order codes (SOC) are 6.0F for digital interfaces and 9.0Y for analog interfaces and the Facility interface codes (FIC) are: 04DU9.1SN, 04DU9.1KN, 04DU9.BN, 04DU9.DN, 02LS2, O2GS2.

3. The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is 0.01.

4. Should the product cause harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, you will be notified as soon as possible. In addition, you will be advised of your right to file a complaint with the FCC if it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

6. If trouble is experienced with this equipment, for repair or warranty information please contact AudioCodes Inc. 27 World's Fair Drive, Somerset, NJ 08873, Tel: +1-888-586-4743, Fax: +1-732-469-2298. If the equipment is causing harm to the telephone network, the telephone company may request to disconnect the equipment until the problem is resolved.

7. Connection to Telephone Company Provided coin service is prohibited. Connection to party lines service is subject to state tariffs.

Reader's Notes

1   Introduction

This document provides a hardware description of the Mediant 1000B Gateway & E-SBC (hereafter referred to as *device*) and step-by-step procedures for cabling the device.

> **Note:**   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 is shipped.

➢ **To unpack the device:**

1. Open the carton and remove the packing materials.
2. Remove the chassis from the carton.
3. Check that there is no equipment damage.
4. Ensure that in addition to the chassis, the package contains the following items:
   - One or two AC power cables (depending on customer order)
   - Four anti-slide bumpers for desktop installation
   - Two-meter RS-232 DB-9 adaptor cable (for direct serial connection to PC)
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

The device is a 19-inch industrial platform chassis, 1U high and 13.8 inch deep. The chassis modular hardware design allows scalability to capacity demands and optional telephony interfaces to suite your network environment:

■   Up to 4 digital Trunks modules (1, 2, or 4 E1/T1/J1 PRI spans per module)

■   Up to 5 BRI modules (4 BRI ports per module)

■   Up to 6 FXO modules (4 FXO ports per module)

■   Up to 6 FXS modules (4 FXS ports per module)

■   Up to 3 Media Processing modules (MPM) for media processing such as announcements and conferencing

In addition, the chassis provides the following:

■   Up to 6 LAN Ethernet interfaces - 2 interfaces on a CRMX module and an additional 4 interfaces provided by a LAN Expansion module (SWX). These ports provide up to 3 port-pair redundancy groups.

■   Optional, Open Solution Network (OSN) server modules for hosting third-party applications (such as an IP PBX)

■   Fan Tray module

■   Up to two Power Supply modules

3.1 Front Panel Description

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

Figure 3-1: Front Panel of Mediant 1000B SBC and Gateway
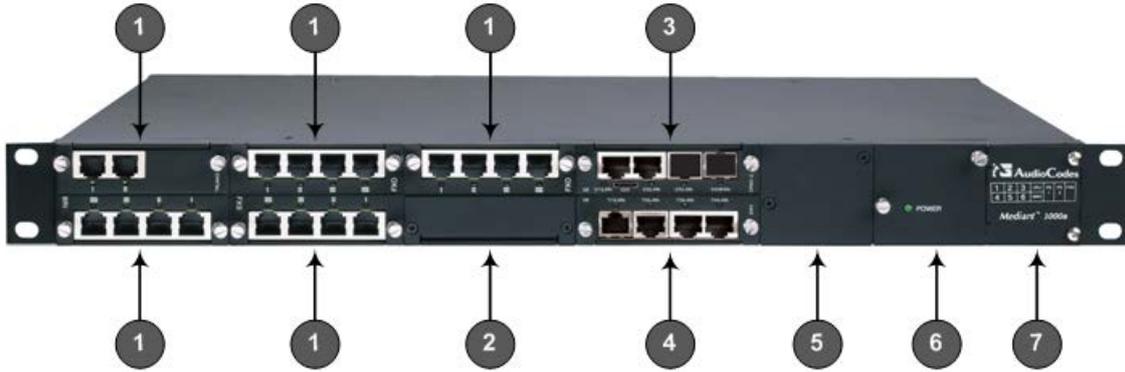
> **Notes:**
> - The figure above is used only as an example. The number and type of interface modules depends on the ordered configuration.
> - For module slot assignment, see Section 6.1.1 on page 45.

Table 3-1: Front-Panel Description

Item #	Label/ Module	Component Description
1	FXS	FXS module – see Section 3.1.1 on page 18 for a description. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately.
	FXO	FXO (or FXO G) module – see Section 3.1.2 on page 19 for a description. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately
	BRI	BRI module – see Section 3.1.3 on page 20 for a description. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately
	TRUNKS	TRUNKS (E1/TE/J1) module – see Section 3.1.4 on page 21 for a description. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately
2	MPM	MPM module – see Section 3.1.5 on page 22 for a description. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately

Item #	Label/ Module	Component Description
3	**CRMX**	CRMX module – see Section 3.1.6 on page 23 for a description.
4	**SWX**	LAN Extension (SWX) module – see Section 3.1.7 on page 25. **Note:** The presence of this module depends on the ordered configuration. If in the future you need to add such interfaces to your device, you can order this module separately
5	**Power 1**	(Optional) Spare Power Supply module slot. The device can provide two extractable power supply units (Power 1 and Power 2). Each power supply unit provides an AC power connector on its rear panel. If both Power 1 and Power 2 units are used, the load is shared between them. This (optional) load-sharing feature enables power failure protection (redundancy). When using this feature, you are advised to connect each power supply unit to a different AC supply circuit.
6	**Power 2**	Main Power Supply module (see description above).
7	**Schematic**	Extractable Fan Tray module with a schematic displayed on its front panel showing the chassis' slot numbers. The Fan Tray module cools the device's components. For more information, see Section 6.2 on page 51.

3.1.1 FXS Module

The FXS module provides the Foreign eXchange Subscriber (FXS) interfaces. Up to six FXS modules can be installed in the device. Each FXS module can provide up to four FXS interfaces and therefore, the device can support up to 24 FXS interfaces (i.e., 6 modules x 4 ports).

> ⚠️ **Note:** The FXS modules support both loop- and ground-start signaling.

3.1.1.1 Ports Description

Each FXS module provides up to four analog RJ-11 ports. The ports are labeled **I**, **II**, **III**, and **IIII**.

Figure 3-2: FXS Module

3.1.1.2 LEDs Description

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

Table 3-2: FXS Module LEDs Description

Color	State	Description
Green	On	Phone connected to the port is off-hooked.
	Blinking	Phone connected to the port rings.
Red	On	Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure.

3.1.2   FXO Module

The FXO module provides the Foreign eXchange Office (FXO) interfaces. Up to six FXO modules can be installed in the device. Each FXO module can provide up to four FXO interfaces and therefore, the device can support up to 24 FXO interfaces (i.e., 6 modules x 4 ports).

> **Notes:**
>
> - The standard FXO module supports outdoor and indoor (lightning protection) loop-start signaling. The **FXO G** module supports both loop- and ground-start signaling (but only supports indoor protection).
>
> - To enable ground-start signaling, use the *ini* file parameter GroundKeyDetection (refer to the device's *User's Manual*).

3.1.2.1   Ports Description

Each FXO module provides up to four analog RJ-11 ports. The ports are labeled **I**, **II**, **III**, and **IIII**.

Figure 3-3: FXO Module
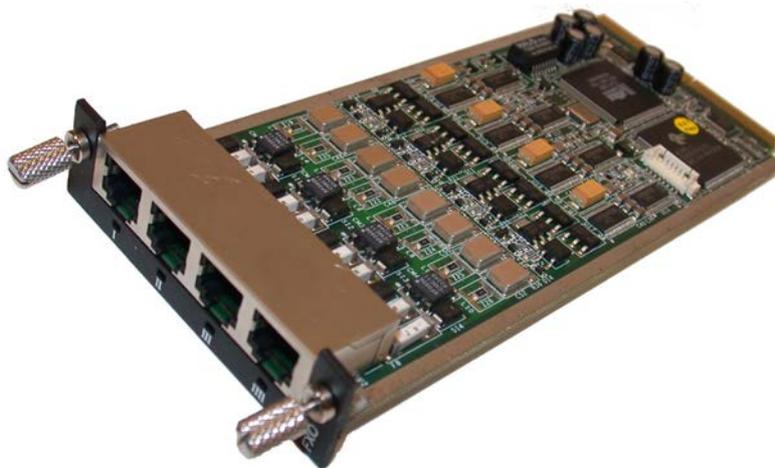
3.1.2.2   LEDs Description

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

Table 3-3: FXO Module LEDs Description

Color	State	Description
Green	On	Off-hooks the line toward the PBX.
	Blinking	Detects a ring signal from the PBX.
Red	On	Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure.

3.1.3 BRI Module

The BRI module provides the Integrated Services Digital Network (ISDN), Basic Rate Interface (BRI) interfaces. Up to five BRI modules can be installed in the device. Each BRI module can provide up to four BRI line interfaces and therefore, the device can support up to 20 BRI interfaces (i.e., 5 modules x 4 ports).

3.1.3.1 Ports Description

Each BRI module provides up to four analog RJ-45 ports. The ports are labeled **I**, **II**, **III**, and **IIII**.

Figure 3-4: BRI Module
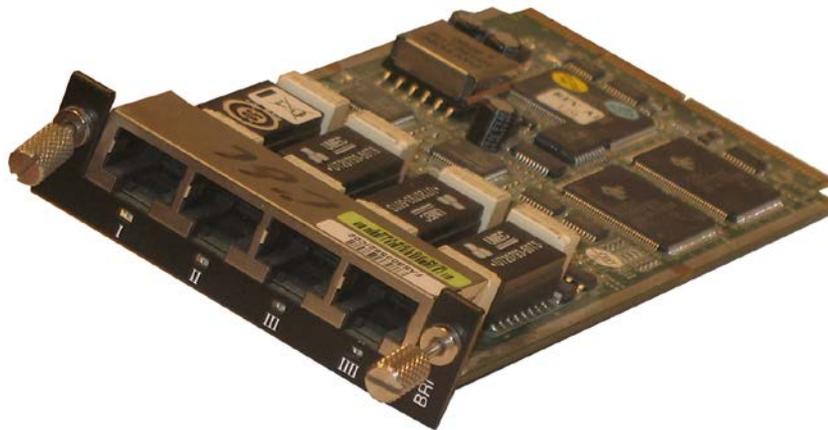
3.1.3.2 LEDs Description

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

Table 3-4: BRI Module 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.

3.1.4   TRUNKS (E1/T1) Module

The device supports up to four digital E1/T1/J1 trunks. If the power fails, a relay connects Trunk 1 to Trunk 2 (in the same module) acting as a fallback for PSTN trunk.

3.1.4.1   Ports Description

The module is available in 1-, 2-, or 4-span configurations, providing RJ-48c ports. The ports are labeled **I**, **II**, **III**, and **IIII**.

Figure 3-5: TRUNKS Module
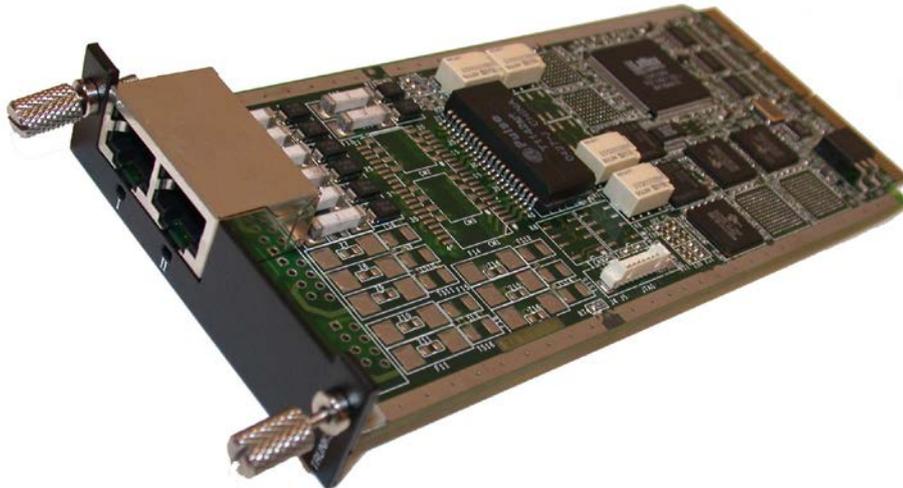
3.1.4.2   LEDs Description

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

Table 3-5: E1/T1 PRI TRUNKS Module 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.

3.1.5   Media Processing Module (MPM)

The device supports up to three MPMs for IP media server capabilities (i.e., conferencing, SBC, and IP-to-IP routing applications). Depending on required configuration, the MPM can be housed in chassis slots 3, 4, 5, or 6.

Note: For a description on channel resources using MPMs, see the device's *User's* Manua*l*.

Figure 3-6: Media Processing Module (MPM)
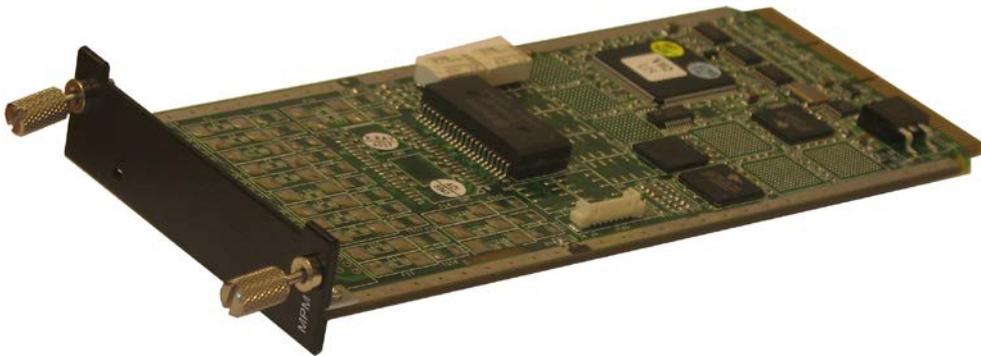
The module features a LED, described in the table below.

Table 3-6: MPM LED Description

Color	Description
Green	Following insertion of the MPM into the slot and an automatic hardware compatibility check, the LED lights up green to indicate (1) that the general status of the MPM is 'OK' and (2) that the device supports the module.
Red	If the LED lights up red following insertion of the MPM into the slot and the automatic hardware compatibility check, it indicates that the status of the MPM is 'General Failure', i.e., a hardware compatibility problem occurred or the DSPs cannot be identified. Contact support@audiocodes.com if you purchased the device / MPM from AudioCodes or if you're subscribed to AudioCodes Customer Technical Support (ACTS).

3.1.6   CRMX Module

The CRMX module provides LAN Ethernet interfaces and other system functionality.

3.1.6.1   Ports Description

The CRMX module provides LAN interfaces (providing port-pair redundancy), an RS-232 interface, and a reset pinhole button, as shown in the figure below and described in the subsequent table.

Figure 3-7: CRMX Module
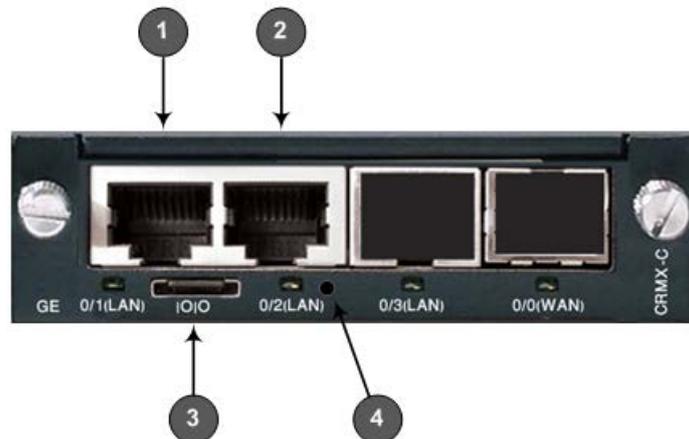
Table 3-7: CRMX Module Port Description

Item #	Label	Component Description
1	0/I(LAN)	10/100/1000Base-T Gigabit Ethernet LAN port. This is the active port in the port-pair group (for 1+1 LAN port protection) with Port **0/2**. If this port fails, a switchover is done to Port **0/2**.
2	0/2(LAN)	10/100/1000Base-T Gigabit Ethernet LAN port. This is the standby port in the port-pair group (for 1+1 LAN port protection) with Port **0/1**.
3	IOIO	RS-232 serial port for accessing the CLI. A 9-pin DB adaptor cable is supplied.
4	-	Reset pinhole button for resetting the device and restoring the device to factory defaults. This is done as follows: With a paper clip or any other similar pointed object, press and hold down the Reset button for **at least 12 seconds** (but **no longer than 25 seconds**).

3.1.6.2 LEDs Description

The LAN ports on the CRMX module provide LEDs for indicating operating status, as described in the table below:

Table 3-8: CRMX Module LED Description

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

3.1.7   SWX LAN Expansion Module

The SWX LAN Expansion module provides additional LAN Ethernet interfaces.

3.1.7.1   Ports Description

The SWX LAN Expansion module provides four LAN ports. These ports provide port-pair (group) redundancy, where one port is active and the other redundant. The module is shown in the figure below and described in the subsequent table.

Figure 3-8: SWX LAN Expansion Module
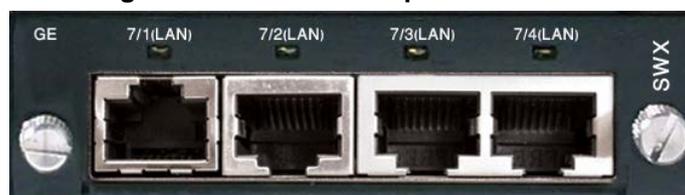
Table 3-9: SWX LAN Expansion Module Ports Description

Label	Component Description
7/1 & **7/2**	10/100/1000Base-T Ethernet LAN ports. These ports provide port-pair redundancy, where Port **7/2** serves as the redundant (standby) port in case of Port **I** failure.
7/3 & **7/4**	10/100/1000Base-T Ethernet LAN ports for connecting computers and/or switches. These ports provide port-pair redundancy, where Port **7/4** serves as the redundant (standby) port in case of Port **III** failure.

3.1.7.2   LED Description

The LAN ports on the SWX LAN Expansion module provide LEDs for indicating operating status, as described in the table below:

Table 3-10: SWX LAN Expansion Module LED Description

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

3.1.8   Power Supply Module and LED Description

The device can house up to two extractable power supply modules (Power 1 and Power 2), each providing an AC power connector on the device's rear panel. The dual power option provides the device with power redundancy.

Figure 3-9: Power Supply Module
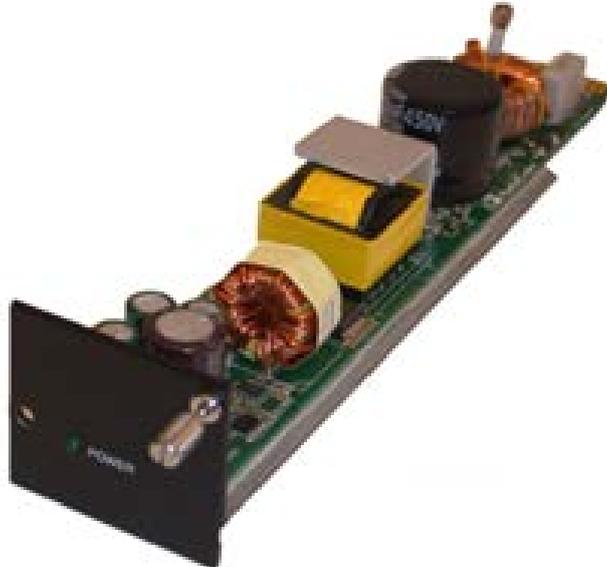
Table 3-11: Power Supply Module LED Description

LED	Color	State	Description
POWER	**Green**	On	Power supply is operating correctly.
	-	Off	Failure / disruption in the AC supply, or the power is currently not being supplied to the device through the AC power supply entry.

3.2   Rear Panel Description

The Mediant 1000B supports up to eight single and mid-sized Advanced Mezzanine Card (AMC) / AdvancedMC form-factor modules on its rear panel, used for the OSN3 platform. The chassis front panel is displayed in the figure below and described in the subsequent table.

Figure 3-10: Rear Panel of Mediant 1000B SBC and Gateway
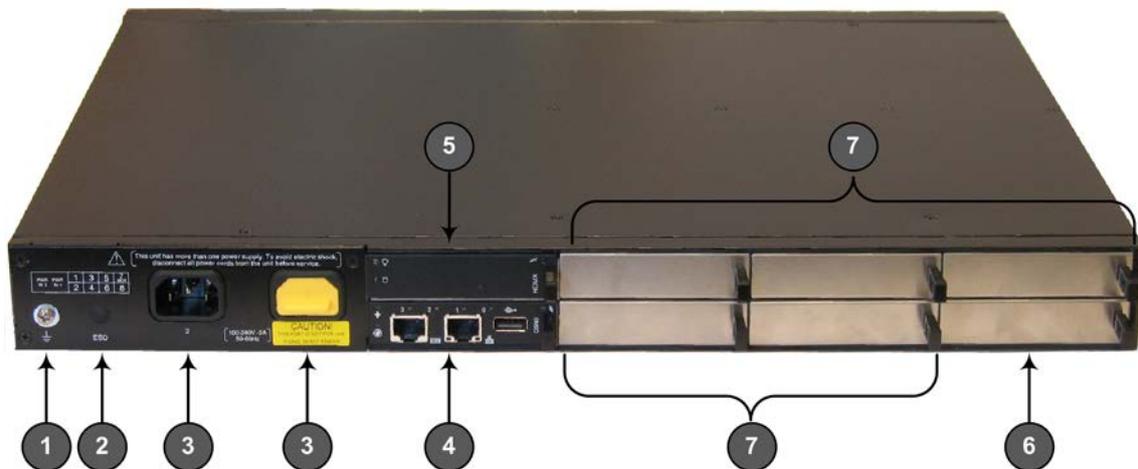
Table 3-12: Rear-Panel Description

Item #	Label	Description
1	⏚	Protective earthing screw.
2	ESD	Electrostatic Discharge (ESD) socket.
3	100-240V~1A	Dual AC Power Supply Entries.
4	OSN3	OSN3 AMC module.
5	HDMX	Main hard-disk drive (HDD) AMC module for OSN3 platform.
6	HDMX	Slot for second (optional) HDD for OSN3 platform.
7	-	Unused and covered AMC module slots.

Notes:

- The AMC chassis slots must **only** be installed with AMC modules that have been approved and homologated by AudioCodes.
- The OSN3 module can be customer ordered with the serial port type as RJ-45 or mini USB B-type.
- For installing the OSN3 platform, see Appendix A on page 53.

Reader's Notes

4 Mounting the Device

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

- Placed on a desk top (see Section 'Desktop Mounting' on page 29)
- Installed in a standard 19-inch rack (see Section '19-inch Rack Mounting' on page 30)

4.1 Desktop Mounting

The device can be mounted on a desktop by attaching the four anti-slide bumpers (supplied) to the underside of the device. Once you have attached these bumpers, simply place it on a desktop in the desired position.

➢ **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 on each of the four corners.

Figure 4-1: Location of Grooves for Rubber Feet
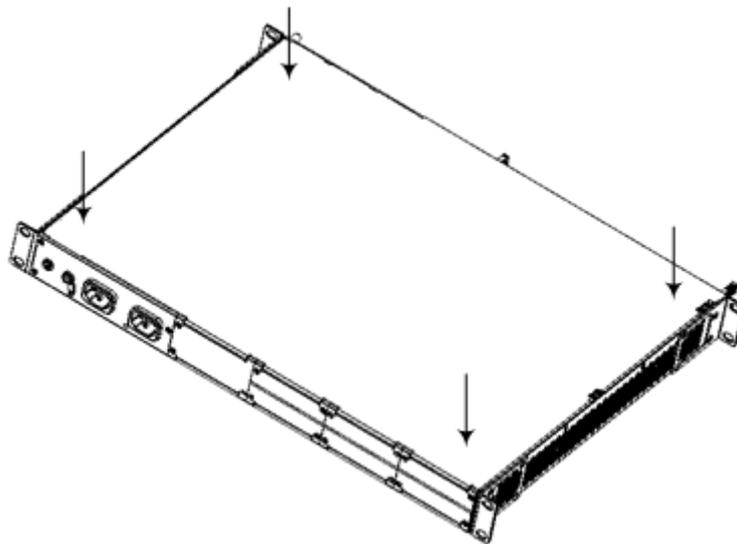
3. Peel off the adhesive, anti-slide rubber feet and stick one in each anti-slide groove.

4. Flip the device over again so that it rests on its underside 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 methods:

■ Placing it on a pre-installed shelf in a 19-inch rack (recommended method).

■ Attaching it directly to the rack's frame.

> ### Rack Mount Safety Instructions
>
> When installing the chassis in a rack, implement the following safety instructions:
>
> - **Elevated Operating Temperature:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (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.)

4.2.1   Mounting on a Pre-Installed Shelf in a 19-inch Rack

The device can be placed on a pre-installed shelf in a 19-inch rack, as described below.

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

1. Place the device on the pre-installed shelf in the rack.

2. Attach the device's integral front-mounting brackets to the rack's frame to prevent it from sliding off the shelf. Use standard 19-inch rack bolts (not provided) to fasten the front of the device to the frame of the rack.

4.2.2   Mounting to the 19-inch Rack Frame

The device can be mounted in a 19-inch rack by attaching it to the rack's frame, as described below.

➢   **To mount the device directly to the rack frame:**

1.   Position the device in a 19-inch rack and align the front and rear (see note below) bracket holes to the holes (of your choosing) in the vertical tracks of the 19-inch rack.

2.   Use standard 19-inch rack bolts (not provided) to fasten the device's integral front-mounting brackets to the frame of the rack.

3.   Attach third-party rear-mounting brackets (not provided) to the device and to the rack frame (see the note below).

⚠️	**Note:** The rear-mounting brackets are **not** provided by AudioCodes and must be purchased from a third-party vendor of your choosing. In addition, note the following: • The distance between the screws on each bracket is 28 mm (1.1 inches). • To attach the brackets, use 4-40 screws with a maximal box penetration length of 3.5 mm (0.14 inch).

Reader's Notes

5   Cabling the Device

This section describes how to cable the device:

- Connecting to earth or ground – see Section 5.1 on page 33
- Connecting to the LAN – see Section 5.2 on page 33
- Connecting the FXS interfaces – see Section 5.3 on page 36
- Connecting the FXO interfaces – see Section 5.3.1 on page 37
- Connecting the analog FXS Lifeline telephone – see Section 5.3.2 on page 38
- Connecting the BRI lines – see Section 5.4 on page 39
- Connecting the E1/T1 trunks – see Section 5.5.1 on page 41
- Connecting the E1/T1 trunks for PSTN Fallback – see Section 5.5.2 on page 42
- Connecting to a PC for serial communication – see Section 5.6 on page 43
- Connecting to power – see Section 5.7 on page 43

5.1   Grounding the Device

The procedure below describes how to ground the device.

Protective Earthing

The equipment is classified as Class I EN 60950 and UL 60950 and must be earthed at all times (using an equipment-earthing conductor).

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

➢   **To ground 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.

Figure 5-1: Grounding the Device

Earthing Connection
on Ground Lug

2. Connect the other end of the strap to a protective earthing. This should be in accordance with the regulations enforced in the country in which the device is installed.

5.2   Connecting to LAN with Port-Pair Redundancy

The LAN ports are provided on the CRMX and SWX LAN Expansion modules (see Section 3.1.6 on page 23 and Section 3.1.7 on page 25, respectively). These LAN ports operate in pairs (*groups*) to provide LAN port 1+1 redundancy. In each pair, one port serves as the active LAN port while the other as standby. When the active port fails, the device switches to the standby LAN port.

> **Note:**   The SWX module is a customer ordered item.

The figure below shows the LAN port-pair groups and the name of the ports and groups as displayed in the Web interface for configuring the port groups and assigning them to IP network interfaces (refer to the *User's Manual* for more information):

Figure 5-2: LAN Port-Pair Groups and Web Interface String Names
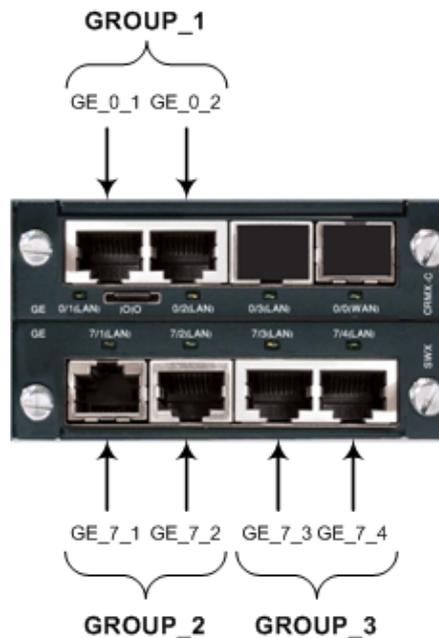
An RJ-45 cable connector with the following pinouts is used:

Figure 5-3: RJ-45 Connector Pinouts for LAN
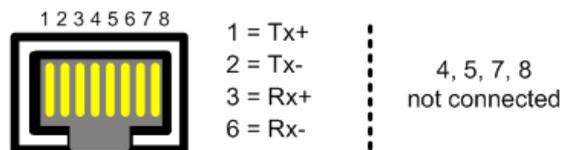
> ➤ **To connect to the LAN:**

1. Connect one end of a straight-through RJ-45 Ethernet Cat 5/5e cable to the active LAN port on the CRMX or SWX module.

Figure 5-4: Connecting to LAN
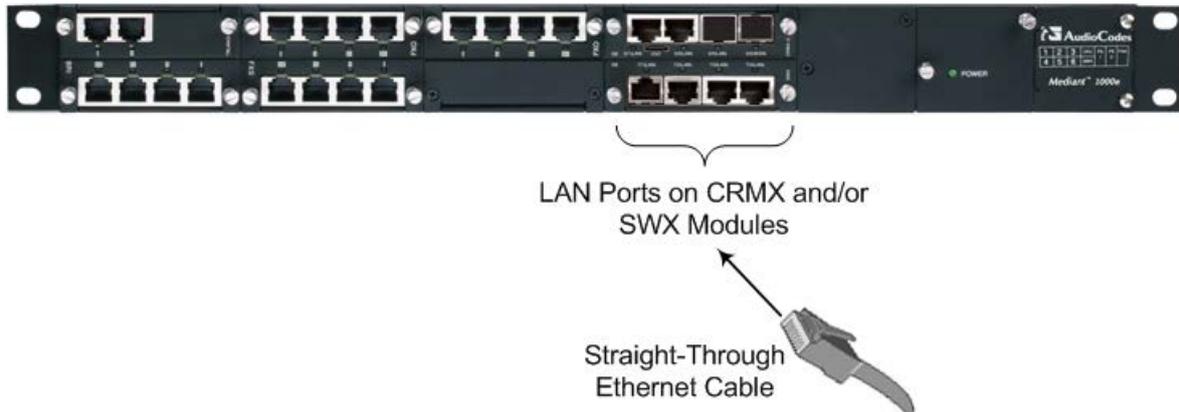
2. Connect the other end of the cable to the LAN.

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 the LAN port-pair redundancy, ensure that the two ports making up a pair are each connected to a different network (in the same subnet).

5.3   FXS Interfaces

The procedure below describes how to connect to FXS interfaces such as fax machines, modems, and plain old telephone system (POTS) telephones.

> **Warnings:**
>
> • Ensure that FXS ports are connected to the appropriate external devices; otherwise, damage to the device may occur.
> • The FXS ports are considered as TNV-2.

> **Note:** The FXS module is a customer ordered item. This section is applicable only if your device is installed with such a module.

An RJ-11 cable connector with the following pinouts is used:

Figure 5-5: RJ-11 Connector Pinouts for FXS
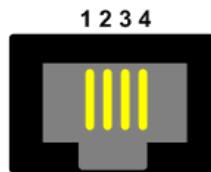
1 - Not connected
2 - Tip
3 - Ring
4 - Not connected

➢ **To connect to FXS interfaces:**

■ Using an RJ-11 connector, connect the FXS port/s to the required telephone interface.

5.3.1   Connecting to Analog Devices

The procedure below describes how to connect the FXO port interfaces to telephone exchange analog lines or PBX extensions.

Warnings:

- To protect against electrical shock and fire, use a 26 AWG min wire to connect FXO ports to the PSTN.
- Ensure that FXO ports are connected to the appropriate external devices; otherwise, damage to the device may occur.
- FXO ports are considered as TNV-3.

Note: The FXO module is a customer ordered item. This section is applicable only if your device is installed with such a module.

An RJ-11 cable connector with the following pinouts is used:

Figure 5-6: RJ-11 Connector Pinouts for FXO
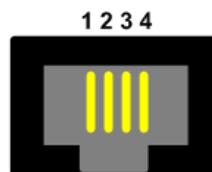
1 - Not connected
2 - Tip
3 - Ring
4 - Not connected

➢   **To connect to FXO interfaces:**

■   Using an RJ-11 connector, connect the FXO port/s to the required telephone interface.

5.3.2 Connecting the Analog Lifeline

The device supports an analog Lifeline phone feature, whereby upon a power outage or IP network connectivity loss, IP calls are re-routed to the PSTN. Therefore, this feature guarantees call continuity.

> **Notes:**
>
> - Analog Lifeline is supported only on FXS modules.
> - An analog Lifeline can be setup for each FXS module installed in the chassis.
> - The scenarios (i.e., power outage and/or IP network loss) upon which Lifeline is triggered is configured by the LifeLineType parameter. For more information, see the *User's Manual*.

The analog Lifeline is provided only by Port **I** on an FXS module. This port connects to the POTS phone and the PSTN or PBX, using a splitter cable. The splitter cable connects pins 1 and 4 to another source of an FXS port, and pins 2 and 3 to the POTS phone, as shown in the figure below:

Figure 5-7: RJ-11 Connector Pinouts for Analog Lifeline

1 - Not connected
2 - Tip
3 - Ring
4 - Not connected
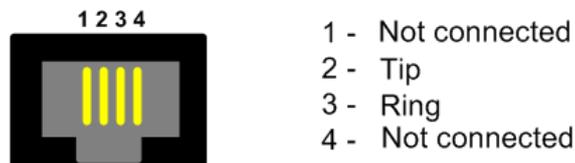
➢ **To cable the analog Lifeline:**

1. Connect the Lifeline Splitter (supplied) to Port **I** on an FXS module.
2. Connect the Lifeline POTS phone to Port **A** on the Lifeline Splitter.
3. Connect an analog PSTN line to Port **B** on the Lifeline Splitter.

Figure 5-8: Cabling the Analog Lifeline
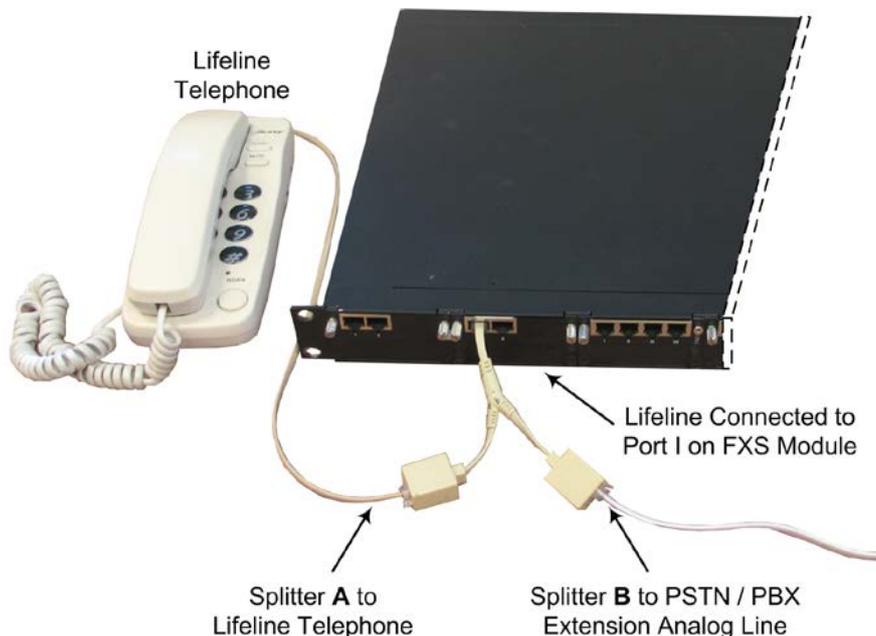
5.4   ISDN BRI Interfaces

5.4.1   Connecting to BRI Lines

The procedure below describes how to connect to BRI lines.

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

> **Note:**   The BRI module is a customer ordered item. This section is applicable only if your device is installed with such a module.

➢   **To connect to BRI lines:**

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.

A BRI port can be configured either as TE (Termination Equipment/user side) or NT (Network Termination/network side). The connector pinouts vary according to the configuration, as shown below:

Figure 5-9: RJ-45 Connector Pinouts for BRI
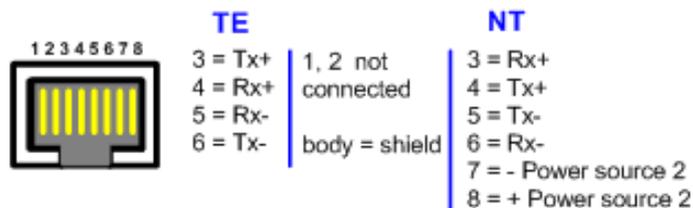
When configured as NT, the BRI port drives a nominal voltage of 38 V with limited current supply of up to 100 mA. The voltage is of Power Source 1 type (line voltage). Power Source 2 is optional.

5.4.2 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.

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**), and / or line Port 3 (**III**) to Port 4 (**IIII**) of the same 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.

➢ **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 5-10: Cabling (Ports 1 and 2) PSTN Fallback
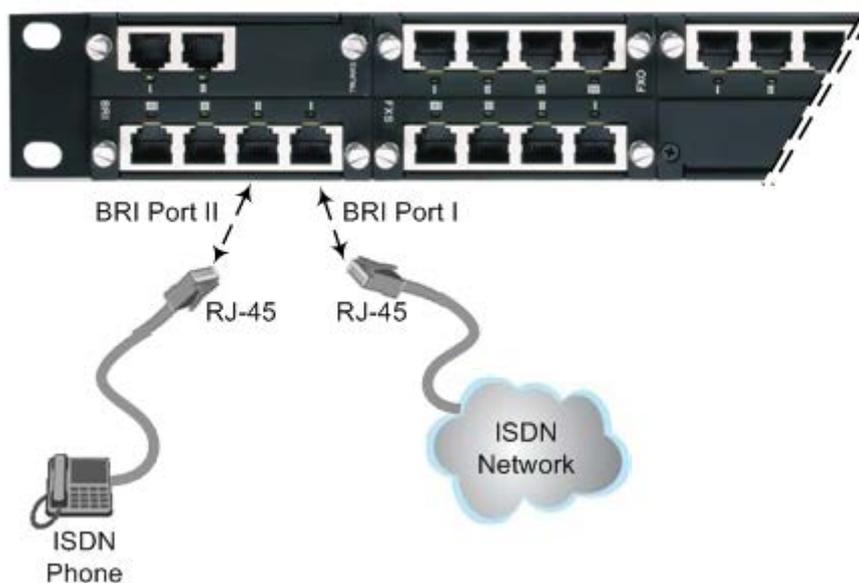
	Notes:
⚠️	• PSTN Fallback is supported only on the BRI module.
	• PSTN Fallback is supported only between ports on the same BRI module.
	• The scenarios that trigger PSTN Fallback (i.e., power outage and/or IP network loss) are configured by the **TrunkLifeLineType** parameter. For more information, see the *User's Manual*.
	• This PSTN Fallback feature has no relation to the PSTN Fallback Software Upgrade Key.

5.5   ISDN E1/T1 Interfaces

5.5.1   Connecting to E1/T1 Trunks

The procedure below describes how to connect to E1/T1 trunks.

> **Warning:** To protect against electrical shock and fire, use a 26 AWG min wire to connect T1 or E1 ports to the PSTN.

> **Note:**   The TRUNKS module is a customer ordered item. This section is applicable only if your device is installed with such a module.

An RJ-48c trunk cable connector with the following pinouts is used:

Figure 5-11: RJ-48c Connector Pinouts for E1/T1

```
1 2 3 4 5 6 7 8      1 = Rx RING   |   3, 6, 7, 8
                     2 = Rx TIP    |   Not Connected
                     4 = Tx RING   |
                     5 = Tx TIP    |   Body = Shield
```

➢   **To connect to E1/T1l trunks:**

1.   Connect the E1/T1 trunk cables to the ports on the device's TRUNKS module(s).
2.   Connect the other ends of the trunk cables to a PBX/PSTN switch.

5.5.2 Connecting the PSTN Fallback for E1/T1 Trunks

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

PSTN Fallback is supported if the device houses one or two E1/T1 ("TRUNKS") modules, where each module provides two or four spans. In the event of a PSTN fallback, the module's metallic relay switch automatically connects trunk Port 1 (**I**) to Port 2 (**II**), and / or trunk Port 3 (**III**) to Port 4 (**IIII**) of the same 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.

➢ **To connect the digital trunk interfaces for 1+1 PSTN Fallback:**

1. Connect Trunk 1 to a PBX.
2. On the same TRUNKS module, connect Trunk 2 to the PSTN.

Figure 5-12: Cabling (Ports 1 and 2) PSTN Fallback

Notes:

- PSTN Fallback is supported only on the TRUNKS module.
- PSTN Fallback is supported only between ports on the same TRUNKS module.
- PSTN Fallback is supported only for ISDN when the number of supported channels (e.g., 30) is less than the maximum number of possible channels provided by the physical ports (e.g., two E1 trunks). When the number of supported channels (e.g., 60) equals the maximum number of channels provided by the physical ports (e.g., two E1 trunks), then other protocols such as CAS are also supported.
- The scenarios (i.e., power outage and/or IP network loss) upon which PSTN Fallback is triggered is 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.

5.6 Connecting the RS-232 Serial Interface to a Computer

The device's RS-232 interface port is used to access the CLI for serial communication. The cable adapter shown below is provided for this purpose:

Figure 5-13: 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
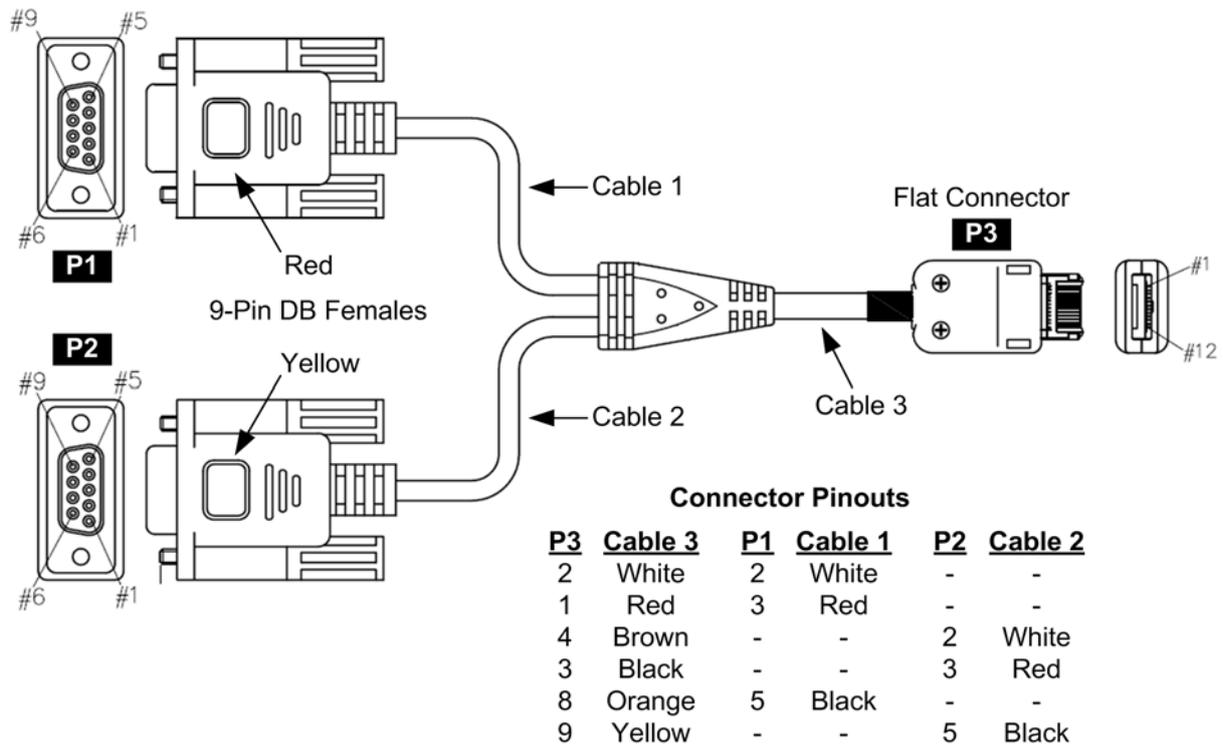
➢ **To connect the serial interface port to a computer:**

1. Connect the flat connector (labeled "P3" in the figure above) to the serial port (labeled **1010**) on the device's CRMX module.

2. Connect the DB-9 connector labeled "P1" (red) to the COM1 or COM2 RS-232 communication port of your computer.

Notes:

- The RS-232 port is not intended for permanent connection.
- The DB-9 connector labeled "P2" is used only for debugging.

5.7   Connecting to Power

The procedure below describes how to connect the device to the AC power supply.

> **Warnings:**
>
> - Units must be connected (by service personnel) to a socket-outlet with a protective earthing connection.
> - Use only the AC power cord supplied with the device.

> **Notes:**
>
> - You can install up to two Power Supply modules (Power 1 and Power 2), each providing an AC power connector on the device's rear panel. The dual power option provides the device with power redundancy. If both power units are used (for load sharing - failure protection / redundancy), ensure that you connect each power supply unit to a different AC supply circuit.
> - The two AC power sources must have the same ground potential.

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

■ On the device's rear panel, connect the left (active) 100-240V~50-60 Hz power socket to a standard electrical outlet using the supplied AC power cord.

When the device receives powers, the **POWER** LED on the front panel of the Power Supply module is lit green. If the LED is off, a power supply problem may be present.

6   Hardware Maintenance

The device is a modular chassis and allows you to order any module as a Field Replacement Unit (FRU). This section describes the procedures for installing or replacing modules.

⚠ **Warning:** To prevent static electrical damage to the module's printed circuit board, do not touch the components on the module. Instead, hold the module only on the edges where no electrical components are located.

⚠ **Note:** Cover all unoccupied module slots with blank panels. This ensures optimal internal airflow pressure within the chassis.

6.1   Installing and Replacing Modules

This section describes step-by-step procedures for installing or replacing modules.

6.1.1   Module Slot Assignment

The device's front-panel chassis provides slots (numbered as shown in the figure below) for housing the main input/output (I/O) interface modules (i.e., **TRUNKS**, **BRI**, **FXS**, **FXO**, **MPM**, and **CRMX**).

Figure 6-1: Module Chassis Slot Assignment

The guidelines for slot assignment for these modules include the following:

- The CRMX module must always be housed in the slot located to the left of the Spare Power Supply slot (as illustrated in the figure above).
- The SWX LAN Expansion module must always be housed in the slot below the CRMX module.
- The TRUNKS, BRI, FXS, and FXO modules must be housed in consecutive slots. In other words, if the device houses three modules, then they must occupy slots 1, 2, and 3 (no skipping of slots).
- It is recommended to assign the TRUNKS, BRI, FXS, and FXO modules to the slots (starting from Slot 1) according to the order of priority listed below:
  1. TRUNKS
  2. BRI
  3. FXS and/or FXO

  For example, if the device requires one TRUNKS module and two FXS modules, then you must insert the TRUNKS module in Slot 1 and the two FXS modules in slots 2 and 3 respectively. If at a later stage, you wish to add a BRI module (for example), then you must replace the FXS module in Slot 2 with the new BRI module, and then re-insert this replaced FXS module in Slot 4.

The figure below displays an example illustration of correct module slot assignment:

Figure 6-2: Recommended Priority Module Slot Assignment (Example)

| Slot #1
TRUNKS Module | Slot #2
TRUNKS Module | Slot #3
BRI Module | CRMX Module | Spare
Power
Supply
Slot | Main
Power
Supply
Unit | Fan
Tray
Unit |
| Slot #4
FXO Module | Slot #5
FXS Module | Slot #6
MPM Module | SWX LAN
Expansion
Module | | | |

- The MPM module provides IP media channels for applications such as announcements, conferencing, SBC, and IP-to-IP call routing:
  - When no other modules are used, up to three MPM modules can be housed in the device.
  - For conferencing, one MPM module must be housed in Slot 6, providing 20 media channels. For additional media channels, you can add MPM modules to slots 4 (40 channels) and 5 (40 channels) as well, thereby providing a total of 100 media channels for conferencing.
  - For applications other than conferencing (e.g., SBC, IP-to-IP routing, and announcements), the MPM modules can be housed in slots 3, 4, and 5. Each module provides 40 channels; thereby, providing a total of 120 channels (60 for IP-to-IP call sessions).
  - The device can acquire additional media channel resources (for SBC, IP-to-IP routing, and conferencing) from the TRUNKS modules. For a description of this configuration, refer to the device's *User's Manual*.

6.1.2 Removing Kapton Tape before Installing Modules

The following modules are supplied with Kapton tape covering their gold fingers (i.e., edge of the module):

- FXS, FXO, BRI, and TRUNKS (PRI)
- CMX and CRMX
- HDMX (OSN3 hard drive)
- Fan
- Power Supply

The Kapton tape is used to protect the module's BUS line. Before installing a new module, you must remove this Kapton tape. If not removed, the module may not be functional, chassis operation may be compromised and irreversible damage may be caused to the chassis.

The figure below shows an example of a module with the Kapton tape over the gold finger:

Figure 6-3: Kapton Tape Covering Module's Gold Finger

Kapton Tape
Covering Gold Finger →
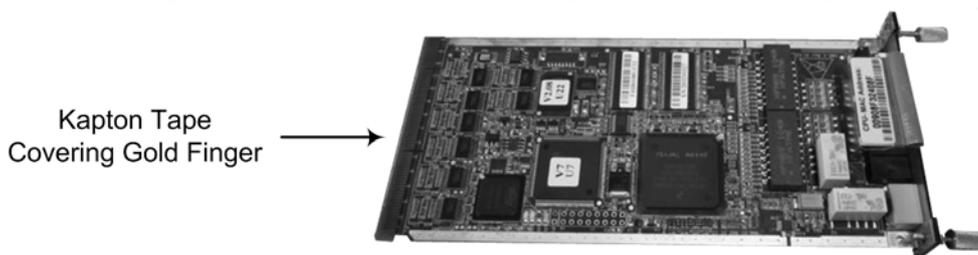
6.1.3 Special Instructions for Installing the Power Supply Module

The correct insertion of the Power Supply module in the chassis slot is crucial in preventing irreversible hardware damage to the module (and more specifically, to the capacitor) and resulting in the inability to operate and power the chassis.

To avoid damaging the module, when inserting or removing the Power Supply module from the chassis slot, ensure that you adhere to the following precautions:

■ Keep the module aligned with the slot's guiding rail.

■ Keep the module lifted up towards the roof of the slot so that the base of the module does not touch the floor of the slot (and damage the electrical components located on the underside of the module).

The figure below shows the correct orientation of the module when inserting it into the chassis slot:

Figure 6-4: Incorrect Slot Insertion for Power Supply Module

Component on Power
Supply Module
In Collision with Chassis

6.1.4   Installing Modules into Previously Empty Front-Panel Slots

The procedure below describes how to install modules to previously empty slots in the device's chassis.

Warning: Ensure that you power down the device before installing a module to a previously empty slot.

➢ **To install a module into a previously empty slot:**

1. Power off the device.

2. On the device's front panel, using a Phillips screwdriver, remove the black metal cover plate protecting the module slot.

3. Insert the required module into the empty slot, aligning the module with the rails in the slot in the following module orientation depending on whether you are inserting it in the top- or bottom-row slots:

● **Top-row slots:** ensure that the module is orientated such that the port number labels are located at the bottom of the module's front panel. This module orientation is considered as facing up.

● **Bottom-row slots:** ensure that the module is orientated such that the port number labels are located at the top of the module's front panel. This module orientation is considered as facing down.

4. Push the module into the slot and press on it firmly to ensure it has been fully inserted.

5. Using a flathead screwdriver, tighten the module's mounting pins.

6. Power on the device.

6.1.5   Installing and Removing AMC-Based Modules on the Rear Panel

The OSN3 modules are hot-swappable and can be installed and removed without disrupting other non-related OSN3 services running on the device. If two HDMX modules are used and you need to replace or remove one, you can also do this without affecting OSN3 functionality. Therefore, you can replace or remove faulty modules without taking the entire device out of service (i.e., powering down the device).

The AMC modules provide a handle that allows you to easily install or remove them, as described in the subsequent subsections.

6.1.5.1   Installing an AMC Module

The procedure below describes how to install an AMC module into the chassis slot.

➢ **To install an AMC module:**

1. Remove the new AMC module from its ESD shielding packet in which it was shipped.
2. If the gold fingers of the module have Kapton tape covering, remove the tape.
3. Carefully insert the module into the slot and slide it along the slot's guide rails until it makes contact with the AMC card-edge connector located on the backplane.
4. Using **only** the AMC module handle, press the AMC module into the chassis. This engages the module with the chassis backplane.
5. Connect all external interfacing cables to the module, as required.

6.1.5.2   Removing an AMC Module

The procedure below describes how to remove an AMC module from the chassis.

> **Note:** Before removing the HDMX module (if required), you must do a hard-disk drive dismount (i.e., a logical disconnection of the hard drive).

➢ **To remove an AMC module:**

1. Gently pull the AMC module handle until you hear a click sound. The module is now partially extracted and undergoes a shutdown sequence.
2. Wait until the **Hot Swap Blue** LED is lit, indicating that the shutdown sequence is complete.
3. Grip and pull the module handle firmly to slide the module out of the slot.

4. Using the module handle, pull the module out of the slot (see stage 3 in the figure below).

Figure 6-5: Removing AMC Modules

6.1.6   Replacing I/O Modules on the Front-Panel Slots

This section describes how to replace front-panel modules. The device's I/O modules are hot-swappable (except for the OSN Server modules and the CRMX module). The physical replacement of the I/O modules is done together with a software replacement procedure using the device's Web interface. Once you have 'software-removed' the module, you can then physically remove the module and replace it with a new module. Once the new module is inserted in the chassis slot, you then need to 'software-insert' it.

Warnings:

- Replace the module with the same module type and in the same chassis slot. For example, a damaged TRUNKS module with two digital spans in Slot 1 must be replaced with a TRUNKS module with two digital spans in Slot 1.

- When only one I/O module is housed in the chassis, the software-removal procedure is not applicable; instead, power down the device, physically replace the module, and then power up the device.

Note: For replacing the CRMX module, no software procedure is required (i.e., ignore steps 2 and 7 in the procedure below).

➢ **To replace I/O modules:**

1. If you are replacing the CRMX module, power down the device, and then skip to Step 3.

2. Software-remove the module, using the device's Web interface's 'Home' page (refer to the device's *User's Manual*).

3. Disconnect the cables from the module that you want to replace.

4. Physically remove the module from the device's front-panel slot, by performing the following:

   a. Using a flathead screwdriver, loosen the module's two mounting screws.
   b. Gently extract the module from the slot.

5. Physically insert the new module into the same slot from where the module that you are replacing resided, by performing the following:

   a. Insert the module into the empty slot, with the orientation of the module as follows:

   ♦ **Top-row slots:** ensure that the module is orientated such that the port number labels are located at the bottom of the module's front panel. This module orientation is considered as facing up.

   ♦ **Bottom-row slots:** ensure that the module is orientated such that the port number labels are located at the top of the module's front panel. This module orientation is considered as facing down.

Figure 6-6: Module Orientation in Top and Bottom Chassis Slots
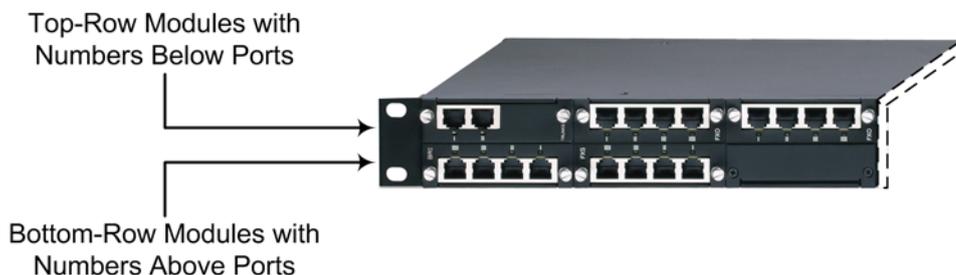
   b. Align the module with the slot rails.
   c. Gently push the module into the slot and press on it firmly to ensure it has been fully inserted.
   d. Using a flathead screwdriver, tighten the module's mounting pins.

6. Reconnect the cables to the module. If you are replacing the CRMX module, skip to Step 8.

7. Software-insert the module, using the device's Web interface's 'Home' page (refer to the device's *User's Manual*).

8. If you have replaced the CRMX module, power up the device's chassis.

6.2   Replacing the Air Filter

The Fan Tray module includes six integrated fans, which cool the device's internal components. The Fan Tray module draws in air through a perforated grill on the right side of the chassis. The incoming air passes through an air filter, whose honeycombed design prevents radio frequency (RF) interference. The filtered air passes through the entire set of modules, cooling each one, and then exits the device through perforated vents on the left side of the chassis.

The Fan Tray module includes a removable air filter (located within the fan assembly, immediately inside the perforated grill). The air filter should be replaced approximately every three months and should be checked weekly to ensure that it is not saturated and that it does not require cleaning/replacement. You should clean the air filter no more than three times, after which the air filter should be replaced. Cleaning or replacing the air filter can be carried out while the system is fully functioning.

Warnings:

- When removing the Fan Tray module while the power is on (or after it has recently been switched off), the blades may still be rotating at high speeds. Therefore, to avoid bodily harm ensure that you don't touch the fan blades.

- Before removing the Fan Tray module for cleaning the air filter, prepare all the required equipment. It is imperative that the chassis does not remain without the Fan Tray module for a lengthy period. Ensure that you re-insert the Fan Tray module (without the air filter) while you are cleaning the air filter, and then re-insert the air filter as soon as it is clean.

➢ **To clean/replace the air filter:**

1. Release the two screws on the top right-hand corner and the bottom right-hand corner of the front panel of the Fan Tray module.

2. Pull the Fan Tray module outward. The figure below shows the Fan Tray module slightly extracted.

Figure 6-7: Partially Removed Fan Try Module
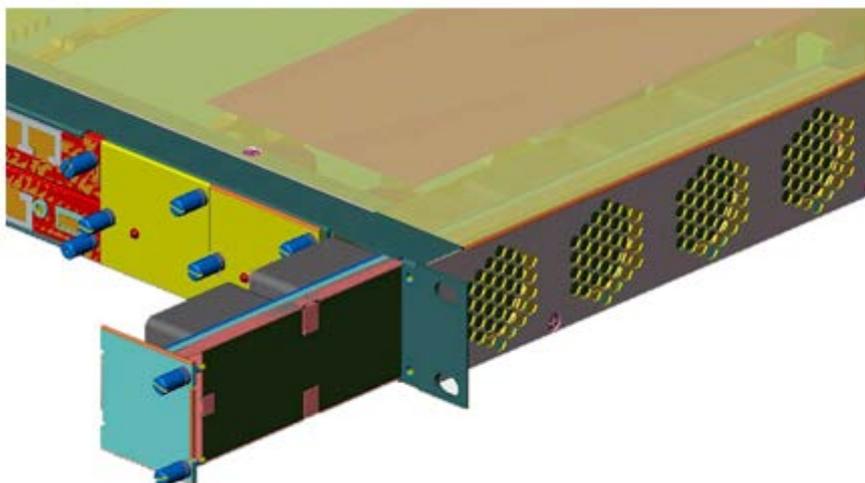
3. With your fingertips, grasp the steel frame of the air filter and separate it from the Fan Tray module; you should be able to remove it relatively easily.

---

4. Take one of the following steps:

- If you are cleaning the filter, use a vacuum cleaner (set to light suction) to remove dust particles from the filter.
- If you are replacing the filter, discard the old air filter and replace it with an air filter purchased from AudioCodes.

5. Attach the (new or cleaned) air filter to the Fan Tray module; position the two holes on the filter over the pins on the Fan Tray.

Figure 6-8: Fan Tray with Removed Filter

6. Insert the Fan Tray module into its slot, until the front panel is flush with the chassis plate.

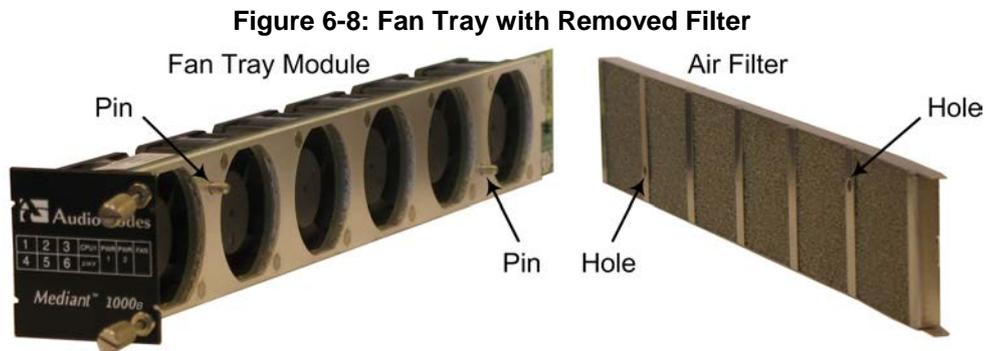**7.** Fasten the two screws on the top right-hand corner and the bottom right-hand corner of the front panel of the Fan Tray module.

A   Open Solution Network Server Platform

This section is intended for customers who want to install the optional Open Solution Network (OSN) server (Version 3) platform functionality. The OSN platform also includes a hard disk to provide a complete solution within the device's chassis. The OSN platform allows you to host third-party applications such as an IP PBX, Pre-Paid, and IP PBX redundancy.

A.1   OSN Modules Description

The OSN platform is provided by the OSN server modules, which are installed in the chassis rear-panel slots. These modules are designed as single and mid-sized Advanced Mezzanine Card / AMC (or AdvancedMC form-factor) modules.

> **Note:** Any usage of AMC modules that are not described or mentioned in this document needs approval by AudioCodes.

The OSN platform consists of the following modules:

■   OSN3 – see Section A.1.1 on page 53
■   HDMX – see Section A.1.2 on page 57

A.1.1   OSN3 Module

The OSN3 module provides the port connector interfaces and is housed in Slot #2 on the rear panel. The table below lists the OSN3 module specifications:

Table A-1: OSN3 Module Specifications

Parameter	Specification
CPU	Intel® Core™ 2 Duo 1.5 GHz processors L7400 with Intel 3100 Chipset (64-bit)
RAM Memory	2 G or 4 G DDR2 with ECC
Hard Drives	Up to 2 hard drives (HDMX modules)
Bus/Chipset	64 Bit
L2 Cache	2 M
Interfaces	▪ Gigabit Ethernet ▪ USB 2.0 via Connection Module ▪ RS-232 COM

A.1.1.1 Ports Description

The OSN3 module is shown below and described in the subsequent table.

Figure A-1: OSN3 Module Ports
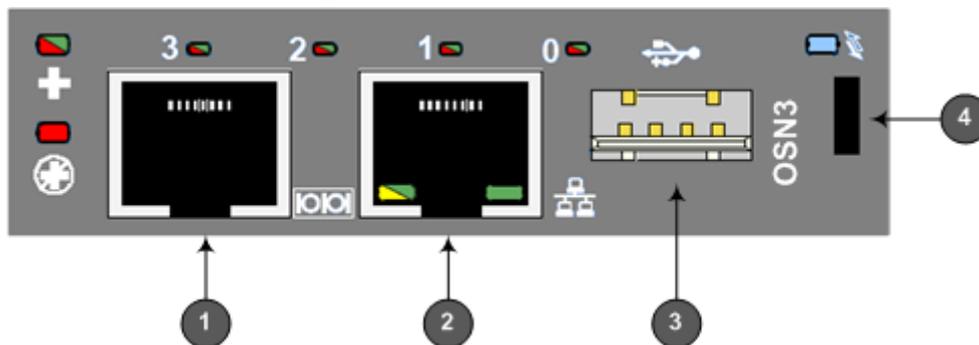
Table A-2: OSN3 Module Port Description

Item #	Label	Description
1	IOIOI	RJ-45 port for RS-232 serial interface (COM1).
2	🖧	RJ-45 port for Gigabit Ethernet. The interface provides automatic detection and switching between 10Base-T, 100Base-TX and 1000Base-T data transmission (Auto-Negotiation). Auto-wire switching for crossed cables is also supported (Auto-MDI/X).
3	⟿	USB 2.0 port.
4	-	Handle for inserting and extraction module from slot.

The RJ-45 connector pinouts for Gigabit Ethernet interface are listed in the table below:

Table A-3: Gigabit Ethernet Interface (RJ-45) Connector Pinouts

Pin	100Base-Tx		1000Base-T	
	I/O	Signal	Signal	Function
1	O	Tx+	I/O	BI_DA+
2	0	Tx-	I/O	BI_DA-
3	I	Rx+	I/O	BI_DB+
4			I/O	BI_DC+
5			I/O	BI_DC-
6	I	Rx-	I/O	BI_DB-
7			I/O	BI_DD+
8			I/O	BI_DD-

For serial cabling, an RJ-45-to-DB-9 female cable adapter is used, as shown below:

Figure A-2: RJ-45-to-DB-9 Serial Cable Adapter
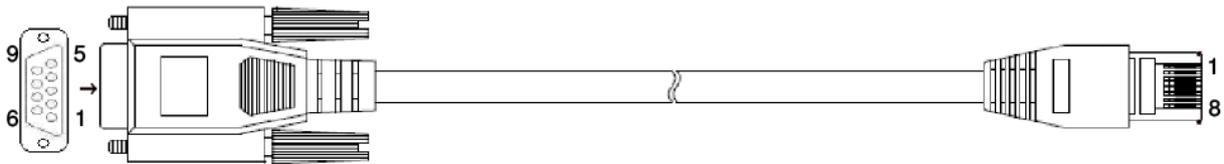
The RJ-45 connector pinouts for RS-232 interface are listed in the table below:

Table A-4: RS-232 Serial Cable Connector Pinouts

RJ-45 Pin	DB-9 Pin
1	8
2	6
3	2
4	5
5	5
6	3
7	4
8	7

A.1.1.2   LEDs Description

The OSN3 module LEDs are shown in the figure below and described in the subsequent table.

Figure A-3: OSN3 Module LEDs
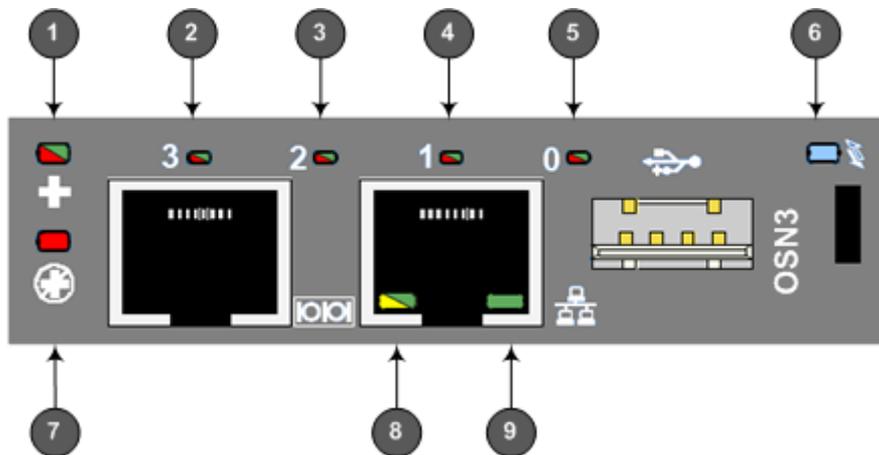
Table A-5: OSN3 Module LEDs Description

Item	Label	Color	State	Description
1	✚	**Green**	Flashing	Hardware normal operation
		Red	On	Hardware fault (over-temperature or excess voltage feed).
2	**3**	**Red**	On	When lit during boot-up, indicates power failure.
			Flashing	Processor over-temperature above 100°C. If LEDs 0, 1, and 2 are also flashing, there is a processor over-temperature above 125°C and as a result, the module shuts down.
		-	Off	Normal operation.
3	**2**	**Red**	On	When lit during boot-up, indicates clock failure.
			Flashing	Chipset over-temperature above 105°C. If LEDs 0, 1, and 3 are also flashing, there is a processor over-temperature above 125°C and as a result, the module shuts down.
		-	Off	Normal operation.
4	**1**	**Red**	On	When lit during boot-up, indicates a hardware reset.
			Flashing	Processor over-temperature above 125°C and as a result, OSN3 shuts down (if LEDs 0, 2, and 3 are also flashing)
		-	Off	Normal operation.
5	**0**	**Red**	On	When lit up during boot-up, indicates a BIOS boot failure.
			Flashing	Processor over-temperature above 125°C and as a result, OSN3 shuts down (if LEDs 1, 2, and 3 are also flashing)
		-	Off	Normal operation.
6	⬙	**Blue**	Flashing	Module undergoing shutdown sequence when module pulled out to first extraction position.
			On	Module shutdown sequence complete and the module can be extracted from the chassis slot.
			Off	Module correctly inserted in chassis slot.
7	⊕	**Red**	On	Hardware failure (supplied voltage is not within normal operating range – ensure CRMX is installed in chassis).
			Flashing	Upgrade in progress
		-	Off	Normal operation
8	**SPEED**	**Green**	On	100Base-TX connection
		Yellow	On	1000Base-T connection
		-	Off	10Base-T connection if ACT LED active

Item	Label	Color	State	Description
9	ACT	Green	On	Valid Ethernet link (cable connection) has been established
		-	Off	The LED goes temporarily off if network packets are sent or received. When this LED remains off, a valid link has not been established due to a missing or a faulty cable connection.

A.1.2   HDMX Module

The HDMX module provides the hard-disk drive functionality for the OSN platform, providing storage capacity of 160 GB. This module is housed in Slot #1 on the rear panel.

> **Notes:**
> - For additional storage capacity per HDMX module, contact your AudioCodes representative.
> - The OSN platform can optionally be ordered with dual hard-disk drives (i.e., two HDMX modules). This second module is housed in Slot #8 on the rear panel of the chassis.

The HDMX module is shown below and described in the subsequent table.

Figure A-4: HDMX Module

Table A-6: HDMX Module LEDs Description

Item #	Label	Color	State	Description
1	💡	Green	On	Power received by module.
		-	Off	No power received by module.
2		Blue	On	Module can be extracted from chassis slot once dismounted from the OSN3 operating system.
			Off	Module correctly inserted in chassis slot
1	🛢	Red	On	Hard disk drive in use (active).
		-	Off	Hard disk drive not in use.

A.2 Installing Linux™ on the OSN Server

This section describes the installation of the Linux operating system on the OSN server.

The OSN server supports the following Linux OS distributions:

■ Linux RedHat (and Fedora)

■ Linux Debian

■ Linux SUSE

■ Linux CentOS

A.2.1 Cabling OSN

The procedure below describes the OSN cabling for Linux installation.

Before installing Linux, ensure the following hardware and software requirements are fulfilled:

■ **Hardware requirements:**

- External USB CD ROM or DVD ROM (not supplied)
- USB cable (not supplied) to connect the external USB CD ROM to the device
- RS-232 cable (supplied)
- Linux Distributions Installation CDs

■ **Software requirements:**

- RS-232 console / terminal software (e.g., HyperTerminal)

➢ **To cable OSN:**

1. On the OSN3 module, perform the following:
   a. Connect the RS-232 interface port (RJ-45) to a PC, using the RS-232 cable.
   b. Connect the USB port to an external CD-ROM drive, using the USB cable.
   c. Connect the RJ-45 Ethernet port, using the Ethernet cable.
2. Connect the external CD-ROM to the power supply.
3. Connect the device to the power supply.

Figure A-5: Cabling OSN3 Module for Installing Linux
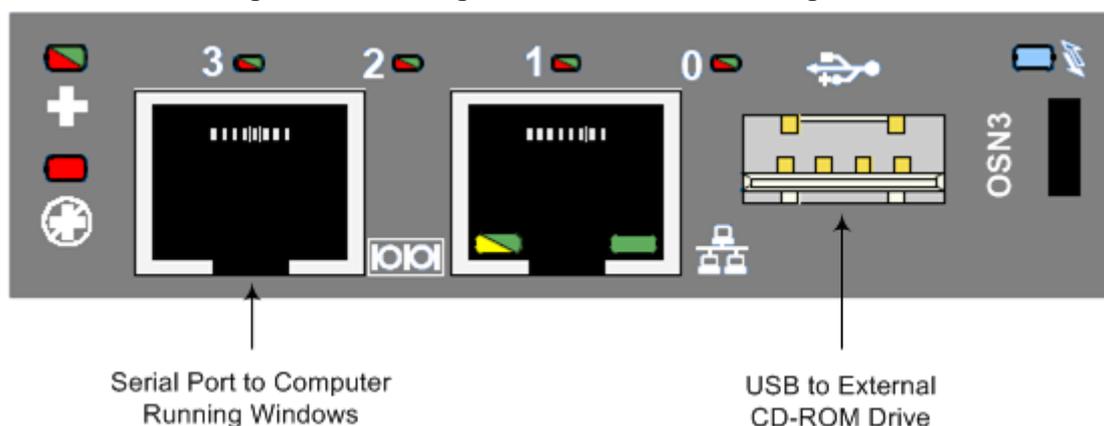
A.2.2 Installing the Linux Software

Once you have cable the OSN platform as described in the previous section, you can install the Linux OS.

➢ **To install Linux on the OSN server:**

1. Start a terminal application (e.g. HyperTerminal) on your PC, and create a new connection with the following settings:

   - Connect Port: COM1
   - Baudrate: 115200 (bits per second)
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None

2. Power up the device.

3. Insert the Linux installation CD into the USB CD-ROM drive; the terminal application prompt appears.

4. At the prompt, type the following:

   ```
   linux text console=ttyS0,115200#
   ```

> **Note:** Only one character is displayed each time you press a key.

5. Press the Enter key; the Linux installation begins.

6. Continue installation according to the Linux installation instructions.

A.3   Connecting Remotely to OSN Server using Windows

Typically, for customers requiring Microsoft Windows® operating system, the OSN Server is provided with Windows pre-installed. You can connect to the OSN Server using Microsoft's Remote Desktop Connection program.

> **Notes:**
>
> - To connect remotely to the OSN server running Windows, ensure that Remote Desktop is enabled.
>
> - The remote PC must be in the same subnet as the OSN server (default IP address is 10.1.10.12).
>
> - If, for any reason, you use an HDMX module taken from another chassis with OSN3 running Windows 2008, the default static IP address (10.1.10.12) is no longer applicable. This is because the module becomes a DHCP client and acquires a different IP address. To configure a specific IP address, you need to use a serial console, as described in Section A.3.1 on page 60.

A.3.1   Modifying the OSN3 IP Address

If, for any reason, you use an HDMX module taken from another chassis with OSN3 running Windows 2008, the default static IP address (10.1.10.12) is no longer applicable. This is because the module becomes a DHCP client and acquires a different IP address. To configure a specific IP address, you need to use a serial console, as described below.

➢ **To manually configure an IP address (for the scenario described in the note above):**

1. Connect the OSN3 serial interface port to a PC console using the RJ-45-to-DB-9 cable adapter (see Section A.1.1 on page 53).

2. Use a serial communication software (e.g., HyperTerminal) to establish a serial communication link, using the following communication port settings:

   - Baud Rate: 115,200 bps
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None

3. Wait until the following Windows 2008 message is displayed:

   ```
   EVENT: The CMD command is now available.
   ```

4. To view the current IP address, at the SAC prompt, type i, and then press Enter:

   ```
   SAC>i
   Net: 55, Ip=169.254.225.21   Subnet=255.255.0.0
   Gateway=0.0.0.0
   Net: 55, Ip=fe80::8154:57cb:6b0e:e115
   ```

   Note: For Kontron OSN3, three Net's are displayed - two are disconnected and one is the same as above.

5. Identify the "On-Lne" Net (e.g., in the above, the Net ID is 55).

6. To change the IP address, at the CLI prompt, enter the following command and then press Enter:

```
SAC>i<space>55<space>10.1.10.15<space>255.255.0.0<space>
0.0.0.0
SAC>i 55 10.1.10.15 255.255.0.0 0.0.0.0
```

7. At the CLI prompt, type i to view the new IP address:

```
SAC>i
Net: 55, Ip=10.1.10.15  Subnet=255.255.0.0  Gateway=0.0.0.0
Net: 55, Ip=fe80::8154:57cb:6b0e:e115
```

A.3.2   Cabling OSN

Before you can connect remotely to the OSN Server, you need to cable a PC (running Remote Desktop Connection) to the OSN Server's IP network interface.

The OSN3 server connects initially to the IP network through the LAN port of the OSN3 module.

➢ **To cable OSN3 for Remote Desktop Connection:**

■ Connect the Ethernet LAN port of the OSN3 module to the LAN network, by performing one of the following:

- **Remote PC connection:** using a straight-through cable, connect the LAN port to a switch that is connected to the IP network.

- **Local PC connection:** using a crossover cable, connect the LAN port directly to the PC's LAN port.

**Figure A-6: Cabling OSN3 Module for Remote Desktop Connection from PC with Windows XP**
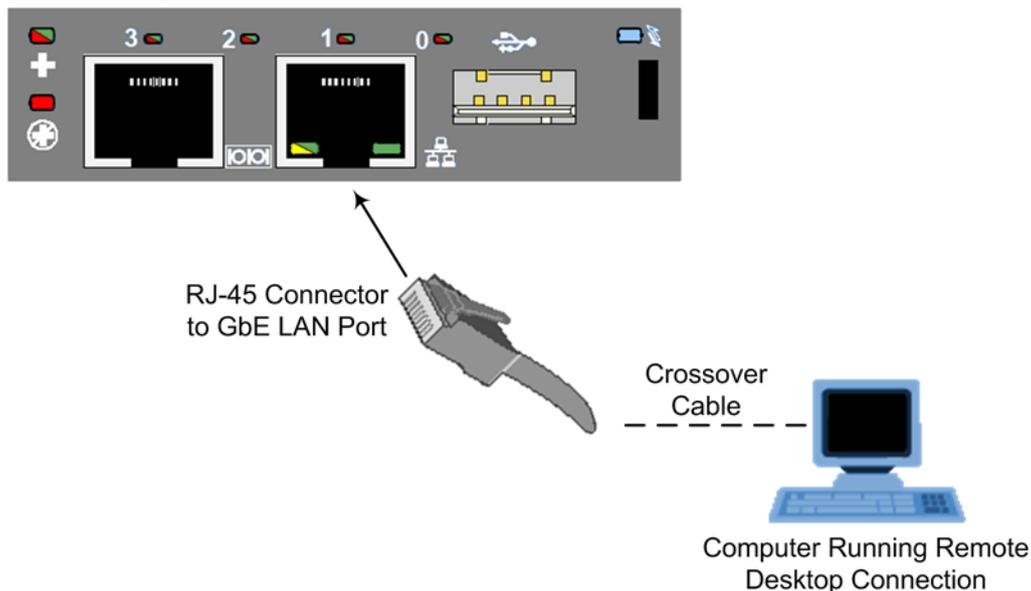
A.3.3   Connecting using Remote Desktop Connection

Once you have cabled the PC to the OSN Server, perform the procedure below for connecting the PC remotely to the OSN Server (running Windows) using the Remote Desktop Connection program.

➢ **To remotely connect a PC to the OSN Server running Windows:**

1. Change the PC's IP address so that it is in the same subnet as the default OSN Server's IP address (i.e., 10.1.10.12). The figure below displays an example of a changing a PC's IP address:

Figure A-7: Changing the PC's IP Address
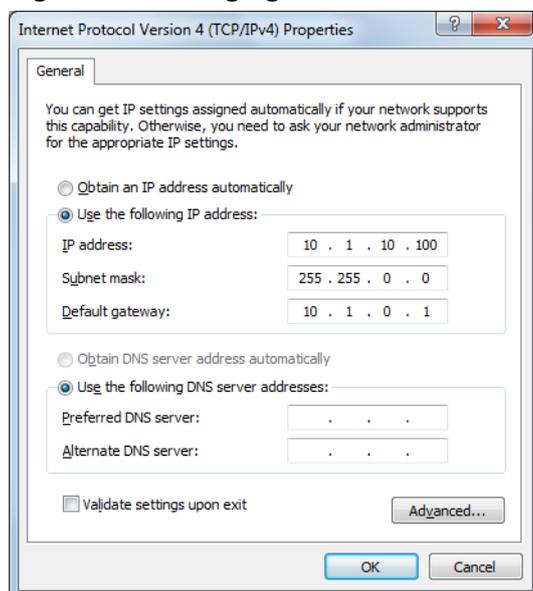
2. Start Microsoft's Remote Desktop Connection program - from the **Start** menu, point to **Programs**, to **Accessories**, to **Communications**, and then click **Remote Desktop Connection**.

Figure A-8: Entering IP Address in Remote Desktop Connection

3. In the 'Computer' field, enter the OSN Server's default IP address (i.e., 10.1.10.12).

4. Click **Connect**.

Figure A-9: Entering User Name and Password in Remote Desktop Connection

5. Enter the OSN Server's default user name (i.e., "administrator") and password (i.e., "123456").

6. Click **OK**; Remote Desktop Connection connects you to the desktop of the device's OSN server.

Reader's Notes

B   Module Hardware Revision Compatibility

The input/output voice interface module hardware revisions that are compatible with the chassis are listed in the table below.

Table B-1: Module Compatibility

Item No.	Description	H/W Revision
FASB00334	M1K-SMX-1A1V1 Quad FXS w/ Life-Line Module	C08
FASB00335	M1K-SMX-1A1V1 Dual FXS w/ Life-Line Module	C08
FASB00397	M1K-TMX-1A1V1 Quad Trunks w/ Life-line module	C08
FASB00398	M1K TMX-1A1V1 Dual Trunks w/ life-line module	C08
FASB00399	M1K TMX-1A1V1 Single trunks w/ life-line module	C08
FASB00510	M1K-OMX-S 4 Indoor Ports With GS Rev.A1	C05
FASB00511	M1K-CFMX-1 Conference Module Rev A1v1	C06
FASB00520	M1K-OMX-S 4 Outdoor Ports W/O GS Rev. A1	C04
FASB00582	M1K-BMX-4A1	C03
GTPM00046	M1K-VM-2FXS	P03
GTPM00050	M1K-VM-1SPAN	P03
GTPM00052	M1K-VM-2SPAN	P03
GTPM00051	M1K-VM-4SPAN	P03
GTPM00056	M1K-VM-4FXS	P03
GTPM00125	M1K-VM-4FXO-LS	P02
GTPM00126	M1K-VM-4FXO-GS/LS	P02
GTPM00127	M1K-M-CONF	P02
GTPM00174	M1K-VM-4BRI	P02
FASU00556	CRMX-C (LAN 1, 2, 3, GE WAN copper Ethernet)	P2
FASU00736	SWX Copper Switch Extension for Mediant 1000B	All

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