# Table of Contents

1. **Introduction** .......................................................................................................................... 13
2. **Unpacking the Device** ........................................................................................................... 15
3. **Physical Description** ............................................................................................................. 17
   3.1 Front Panel Description ........................................................................................................... 18
   3.1.1 FXS Module ......................................................................................................................... 19
   3.1.1.1 Port Description .............................................................................................................. 19
   3.1.1.2 LED Description .............................................................................................................. 19
   3.1.2 FXO Module ......................................................................................................................... 20
   3.1.2.1 Port Description .............................................................................................................. 20
   3.1.2.2 LED Description .............................................................................................................. 20
   3.1.3 BRI Module ......................................................................................................................... 21
   3.1.3.1 Port Description .............................................................................................................. 21
   3.1.3.2 LED Description .............................................................................................................. 21
   3.1.4 TRUNKS (E1/T1) Module ...................................................................................................... 22
   3.1.4.1 Port Description .............................................................................................................. 22
   3.1.4.2 LED Description .............................................................................................................. 22
   3.1.5 MPM Module ....................................................................................................................... 23
   3.1.6 CRMX Module ..................................................................................................................... 24
   3.1.6.1 Port Description .............................................................................................................. 24
   3.1.6.2 LED Description .............................................................................................................. 25
   3.1.7 Power Supply Module and LED Description ........................................................................ 25
   3.2 Rear Panel Description ........................................................................................................... 26
4. **Mounting the Device** .............................................................................................................. 27
   4.1 Desktop Mounting ................................................................................................................... 27
   4.2 19-inch Rack Mounting .......................................................................................................... 29
5. **Cabling the Device** ................................................................................................................ 31
   5.1 Grounding the Device .............................................................................................................. 31
   5.2 Connecting to WAN ............................................................................................................... 32
   5.2.1 Gigabit Ethernet Copper Cabling ....................................................................................... 32
   5.2.2 Optical Fiber Cabling ......................................................................................................... 33
   5.2.3 T1 WAN DSU/CSU Cabling ............................................................................................... 34
   5.2.4 SHDSL WAN Cabling ....................................................................................................... 35
   5.3 Connecting to LAN ............................................................................................................... 36
   5.4 Connecting to FXS Interfaces ................................................................................................. 36
   5.5 Connecting to FXO Interfaces ............................................................................................... 37
   5.6 Connecting the Analog Lifeline Phone ................................................................................... 38
   5.7 Connecting to ISDN BRI Lines ............................................................................................... 39
   5.8 Connecting to E1/T1 Trunks ................................................................................................. 40
   5.9 Connecting the PSTN Fallback for E1/T1 ............................................................................. 41
   5.10 Connecting the RS-232 Serial Interface to a Computer ........................................................ 42
   5.11 Connecting to Power ............................................................................................................ 43
6. **Hardware Maintenance** .......................................................................................................... 45
   6.1 Installing and Replacing Modules ......................................................................................... 45
   6.1.1 Module Slot Assignment .................................................................................................... 45
   6.1.2 Removing Kapton Tape before Installing Modules .............................................................. 46
   6.1.3 Special Instructions for Installing the Power Supply Module ............................................ 47
6.1.4 Installing Modules into Previously Empty Front-Panel Slots .................................. 47
6.1.5 Installing and Removing AMC-Based Modules on the Rear Panel ........................ 48
   6.1.5.1 Installing an AMC Module ........................................................................ 48
   6.1.5.2 Removing an AMC Module ...................................................................... 48
6.1.6 Replacing I/O Modules on the Front-Panel Slots .................................................. 49
6.2 Replacing the Air Filter ............................................................................................ 51

7 Open Solution Network (OSN) Server Platform ......................................................... 53
7.1 OSN2 Server Platform ............................................................................................ 53
   7.1.1 OSN2 Server Modules .................................................................................. 53
   7.1.2 Installing the OSN2 Modules ....................................................................... 54
      7.1.2.1 Required Working Tools ...................................................................... 54
      7.1.2.2 Installing the iPMX Module .................................................................. 55
      7.1.2.3 Installing the HDMX Module ................................................................. 56
   7.1.3 Replacing the iPMX Module's Lithium Battery ............................................... 57
7.2 OSN3 Server Platform ............................................................................................ 59
   7.2.1 OSN3 Modules ............................................................................................ 59
      7.2.1.1 OSN3 Module ...................................................................................... 59
      7.2.1.2 HDMX Module .................................................................................... 63
   7.2.2 Replacing the Lithium Battery of OSN3 Module ............................................. 64
7.3 Installing Linux™ on the OSN Server ................................................................. 66
   7.3.1 Cabling ......................................................................................................... 66
      7.3.1.1 Cabling OSN2 ...................................................................................... 66
      7.3.1.2 Cabling OSN3 ...................................................................................... 68
   7.3.2 Installing the Linux Software ......................................................................... 69
7.4 Connecting Remotely to OSN Server using Windows ........................................... 71
   7.4.1 Modifying the OSN3 IP Address .................................................................. 71
   7.4.2 Cabling ......................................................................................................... 72
      7.4.2.1 Cabling OSN2 ...................................................................................... 72
      7.4.2.2 Cabling OSN3 ...................................................................................... 73
   7.4.3 Connecting using Remote Desktop Connection ............................................ 74

A Module Hardware Revision Compatibility ............................................................. 77
List of Figures

Figure 3-1: Front Panel of Mediant 1000B MSBG ................................................................. 18
Figure 3-2: FXS Module ........................................................................................................ 19
Figure 3-3: FXO Module ........................................................................................................ 20
Figure 3-4: BRI Module ........................................................................................................ 21
Figure 3-5: TRUNKS Module ............................................................................................... 22
Figure 3-6: MPM Module ..................................................................................................... 23
Figure 3-7: CRMX Module (Example, with WAN SbE) ........................................................ 24
Figure 3-8: Power Supply Module ........................................................................................ 25
Figure 3-9: Rear Panel of Mediant 1000B MSBG ............................................................... 26
Figure 4-1: Rubber Foot on Underside of Chassis ............................................................... 27
Figure 4-2: Location of Grooves for Rubber Feet ............................................................... 28
Figure 4-3: Peeled-off Rubber Foot .................................................................................... 28
Figure 5-1: Grounding the Device ...................................................................................... 31
Figure 5-2: RJ-45 Connector Pinouts for WAN Ethernet .................................................... 32
Figure 5-3: Connecting the SbE WAN Port ......................................................................... 32
Figure 5-4: Connecting the SFP Fiber Optic WAN Port ....................................................... 33
Figure 5-5: RJ-48c Connector Pinouts for T1 WAN ............................................................. 34
Figure 5-6: Connecting the T1 WAN DSU/CSU Port ............................................................ 34
Figure 5-7: Connecting the SHDSL WAN Port .................................................................. 35
Figure 5-8: RJ-45 Connector Pinouts for LAN .................................................................... 36
Figure 5-9: RJ-11 Connector Pinouts for FXS ..................................................................... 36
Figure 5-10: RJ-11 Connector Pinouts for FXO ................................................................. 37
Figure 5-11: RJ-11 Connector Pinouts for Analog Lifeline ................................................. 38
Figure 5-12: Cabling the Analog Lifeline .......................................................................... 38
Figure 5-13: RJ-45 Connector Pinouts for BRI ................................................................. 39
Figure 5-14: RJ-48c Connector Pinouts for E1/T1 .............................................................. 40
Figure 5-15: Cabling (Ports 1 and 2) PSTN Fallback .......................................................... 41
Figure 5-16: RS-232 Cable Adapter .................................................................................... 42
Figure 17: Serial Connection with PC for CLI Communication .............................................. 42
Figure 6-1: Module Chassis Slot Assignment .................................................................... 45
Figure 6-2: Recommended Priority Module Slot Assignment (Example) ......................... 46
Figure 6-3: Kapton Tape Covering Module's Gold Finger .................................................. 46
Figure 6-4: Incorrect Slot Insertion for Power Supply Module .......................................... 47
Figure 6-5: Removing AMC Modules ................................................................................. 49
Figure 6-6: Module Orientation in Top and Bottom Chassis Slots ..................................... 50
Figure 6-7: Partially Removed Fan Try Module .................................................................. 51
Figure 6-8: Fan Tray with Removed Filter .......................................................................... 52
Figure 7-1: iPMX Module .................................................................................................... 54
Figure 7-2: Hard Drive Module (HDMX) ............................................................................ 54
Figure 7-3: Cover Plates Removed from Chassis Slots ...................................................... 55
Figure 7-4: Cutting Metal Strip on Chassis Slot .................................................................. 55
Figure 7-5: Inserting the iPMX Module ............................................................................. 56
Figure 7-6: Inserting the HDMX Module .......................................................................... 57
Figure 7-7: Removing Lithium Battery from iPMX Module ................................................. 58
Figure 7-8: OSN3 Module Ports .......................................................................................... 60
Figure 7-9: RJ-45-to-DB-9 Serial Cable Adapter ............................................................... 61
Figure 7-10: OSN3 LEDs ..................................................................................................... 61
Figure 7-11: HDMX Module Components ......................................................................... 63
Figure 7-12: Removing Lithium Battery from the OSN3 Module ....................................... 65
Figure 7-13: Cabling OSN2 (iPMX Module in Rear Panel) ............................................... 67
Figure 7-14: Cabling OSN3 for Installing Linux ................................................................. 68
Figure 7-15: System BIOS Setup Window .......................................................................... 69
Figure 7-16: Enabling System Management BIOS ............................................................. 70
Figure 7-17: Saving BIOS Settings .................................................................................... 70
Figure 7-18: Cabling OSN2 for Remote Desktop Connection from PC with Windows XP .... 72
Figure 7-19: Cabling OSN3 for Remote Desktop Connection from PC with Windows XP ....... 73
Figure 7-20: Changing the PC's IP Address................................................................. 74
Figure 7-21: Entering IP Address in Remote Desktop Connection ............................ 75
Figure 7-22: Entering User Name and Password in Remote Desktop Connection ....... 75
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>Front-Panel Description</td>
<td>18</td>
</tr>
<tr>
<td>3-2</td>
<td>FXS Module LED Description</td>
<td>19</td>
</tr>
<tr>
<td>3-3</td>
<td>FXO Module LED Description</td>
<td>20</td>
</tr>
<tr>
<td>3-4</td>
<td>BRI Module LED Description</td>
<td>21</td>
</tr>
<tr>
<td>3-5</td>
<td>E1/T1 PRI TRUNKS Module LED Description</td>
<td>22</td>
</tr>
<tr>
<td>3-6</td>
<td>CRMX Module Port Description</td>
<td>24</td>
</tr>
<tr>
<td>3-7</td>
<td>CRMX Module LED Description</td>
<td>25</td>
</tr>
<tr>
<td>3-8</td>
<td>Power Supply Module LED Description</td>
<td>25</td>
</tr>
<tr>
<td>3-9</td>
<td>Rear-Panel Description</td>
<td>26</td>
</tr>
<tr>
<td>5-1</td>
<td>RJ-45 Connector Pinouts for SHDSL</td>
<td>35</td>
</tr>
<tr>
<td>7-1</td>
<td>OSN3 Specifications</td>
<td>59</td>
</tr>
<tr>
<td>7-2</td>
<td>OSN3 Module Description</td>
<td>60</td>
</tr>
<tr>
<td>7-3</td>
<td>Gigabit Ethernet Interface (RJ-45) Connector Pinouts</td>
<td>60</td>
</tr>
<tr>
<td>7-4</td>
<td>RS-232 Serial Cable Connector Pinouts</td>
<td>61</td>
</tr>
<tr>
<td>7-5</td>
<td>OSN3 Module LED Description</td>
<td>62</td>
</tr>
<tr>
<td>7-6</td>
<td>HDMX Module LED Description</td>
<td>63</td>
</tr>
<tr>
<td>A-1</td>
<td>Module Compatibility</td>
<td>77</td>
</tr>
</tbody>
</table>
Reader’s Notes
Notice

This Installation Manual describes the hardware installation for AudioCodes Mediant 1000B Multi-Service Business Gateway (MSBG).

Information contained in this document is believed to be accurate and reliable at the time of printing. However, due to ongoing product improvements and revisions, AudioCodes cannot guarantee accuracy of printed material after the Date Published nor can it accept responsibility for errors or omissions. Before consulting this document, check the corresponding Release Notes regarding feature preconditions and/or specific support in this release. In cases where there are discrepancies between this document and the Release Notes, the information in the Release Notes supersedes that in this document. Updates to this document and other documents as well as software files can be downloaded by registered customers at http://www.audiocodes.com/downloads.

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Date Published: October-5-2011

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WEEE EU Directive

Pursuant to the WEEE EU Directive, electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

Customer Support

Customer technical support and service are generally provided by AudioCodes’ Distributors, Partners, and Resellers from whom the product was purchased. For technical support for products purchased directly from AudioCodes, or for customers subscribed to AudioCodes Customer Technical Support (ACTS), contact support@audiocodes.com.

Abbreviations and Terminology

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

<table>
<thead>
<tr>
<th>Manual Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP Release Notes</td>
</tr>
<tr>
<td>Mediant 1000B MSBG SIP User’s Manual</td>
</tr>
<tr>
<td>MSBG Series CLI Reference Guide</td>
</tr>
<tr>
<td>Product Reference Manual</td>
</tr>
</tbody>
</table>

General Notes

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

**Notes:** Throughout this manual and unless otherwise specified, the term *device* refers to the Mediant 1000B MSBG gateway.

Warnings and Safety Information

**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.
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:AC1IS00BM1K MIX or US:AC1ISANIM1000 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.
CRMX-T Module (T1 WAN)

1. This equipment, RMX module (CRMX-SD) complies with Part 68 of the FCC Rules and the requirements adopted by the ACTA. On the front panel of the module is a label that contains among other information, a product identifier in the format US:6NPDDNANRMX. If requested, this number must be provided to the telephone company.

2. This equipment is designed to be connected to the telephone network using RJ-48C connector, which complies with Part 68 rules and requirements adopted by ACTA. The service order codes (SOC) are 6.0F for digital interfaces and the Facility interface codes (FIC) are: 04DU9.1SN, 04DU9.1KN, 04DU9.BN, 04DU9.DN.

3. 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. Also, you will be advised of your right to file a complaint with the FCC, if necessary.

4. 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.

5. 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, website www.audiocodes.com. If the equipment is causing harm to the telephone network, the telephone company may request to disconnect the equipment until the problem is resolved.

6. Connection to Telephone Company provided coin service is prohibited. Connection to party lines service is subject to state tariffs.

CRMX-SD Module (SHDSL)

1. The RMX module (CRMX-SD) complies with Part 68 of the FCC Rules and the requirements adopted by the ACTA. On the bottom of the module is a label that contains among other information, a product identifier in the format US:6npDLNANRMX. 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 connector, which is Part 68 compliant. The service order code (SOC) is 6.0F and the Facility interface codes (FIC) is: 02LS2

3. 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. Also, you will be advised of your right to file a complaint with the FCC if it is necessary.

4. 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.

5. 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.

Connection to Telephone Company Provided coin service is prohibited. Connection to party lines service is subject to state Tariffs.
1 Introduction

This document provides a hardware description of the Mediant 1000B MSBG (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)
   - One E1/T1 splitter cable adapter (RJ-45 male to two RJ-45 female shielded) for T1 WAN interface
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. The chassis can host the following replaceable modules:

- Up to six analog (FXS and/or FXO) modules (optional)
- Up to four E1/T1 TRUNKS modules (optional)
- Up to five BRI modules (optional)
- CRMX module for LAN and WAN interfaces
- Up to three MPM modules for media processing module (optional)
- Open Solution Network (OSN) server modules (optional) for hosting third-party applications (such as an IP PBX):
  - OSN Version 2 server modules (see note below)
  - OSN Version 3 server modules
- Fan Tray module
- Up to two Power Supply modules

Note: The OSN2 server platform (also used for hosting BroadSoft's PacketSmart embedded agent) is supported only on the legacy Mediant 1000 chassis. This chassis provides the same functionality as the Mediant 1000B chassis. For further information, please contact your AudioCodes sales representative.
3.1 **Front Panel Description**

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

![Front Panel of Mediant 1000B MSBG](image)

**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>
<thead>
<tr>
<th>Item #</th>
<th>Label/Module</th>
<th>Component Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FXS</td>
<td>FXS module – see Section 3.1.1 on page 19 for a description.</td>
</tr>
<tr>
<td></td>
<td>FXO</td>
<td>FXO (or FXO G) module – see Section 3.1.2 on page 20 for a description.</td>
</tr>
<tr>
<td></td>
<td>BRI</td>
<td>BRI module – see Section 3.1.3 on page 21 for a description.</td>
</tr>
<tr>
<td></td>
<td>TRUNKS</td>
<td>TRUNKS (E1/TE/J1) module – see Section 3.1.4 on page 22 for a description.</td>
</tr>
<tr>
<td>2</td>
<td>MPM</td>
<td>MPM module – see Section 3.1.5 on page 23 for a description.</td>
</tr>
<tr>
<td>3</td>
<td>CRMX</td>
<td>CRMX module – see Section 3.1.6 on page 24 for a description.</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>This slot is currently not used and is covered by a blank panel. In the next applicable release this slot is intended to host a LAN extension module (for more information, contact AudioCodes sales representative).</td>
</tr>
<tr>
<td>5</td>
<td>Power 1</td>
<td>(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.</td>
</tr>
<tr>
<td>6</td>
<td>Power 2</td>
<td>Main Power Supply module (see description above).</td>
</tr>
</tbody>
</table>
3. Physical Description

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 Port 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 LED Description

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

<table>
<thead>
<tr>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Phone connected to the port is off-hooked.</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Phone connected to the port rings.</td>
</tr>
<tr>
<td>Red</td>
<td>On</td>
<td>Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure.</td>
</tr>
</tbody>
</table>
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 Port Description

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

Figure 3-3: FXO Module

3.1.2.2 LED Description

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

Table 3-3: FXO Module LED Description

<table>
<thead>
<tr>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Off-hooks the line toward the PBX.</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Detects a ring signal from the PBX.</td>
</tr>
<tr>
<td>Red</td>
<td>On</td>
<td>Error - malfunction in line or out of service due to Serial Peripheral Interface (SPI) failure.</td>
</tr>
</tbody>
</table>
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 Port 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 LED Description

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

<table>
<thead>
<tr>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Physical layer (Layer 1) is synchronized (normal operation).</td>
</tr>
<tr>
<td>Red</td>
<td>On</td>
<td>Physical layer (Layer 1) is not synchronized.</td>
</tr>
<tr>
<td>-</td>
<td>Off</td>
<td>Trunk is not active.</td>
</tr>
</tbody>
</table>
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  Port 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  LED Description

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

<table>
<thead>
<tr>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Trunk is synchronized (normal operation).</td>
</tr>
<tr>
<td>Red</td>
<td>On</td>
<td>Loss due to any of the following signals:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LOS - Loss of Signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LOF - Loss of Frame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AIS - Alarm Indication Signal (the Blue Alarm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• RAI - Remote Alarm Indication (the Yellow Alarm)</td>
</tr>
<tr>
<td>-</td>
<td>Off</td>
<td>Failure / disruption in the AC power supply or the power is currently not being supplied to the device through the AC power supply entry.</td>
</tr>
</tbody>
</table>
3.1.5 MPM Module

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

**Note:** For a description on channel resources using MPM modules, see the device's User's Manual.

![Figure 3-6: MPM Module](image)
3.1.6 CRMX Module

The CRMX module supports data routing, switching, security, and voice security (SBC) capabilities.

3.1.6.1 Port Description

The CRMX module provides three LAN ports, a WAN port (available in different interfaces), and an RS-232 interface port, as shown in the figure below and described in the subsequent table.

Figure 3-7: CRMX Module (Example, with WAN GbE)

<table>
<thead>
<tr>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>I, II, III</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
3.1.6.2 LED Description

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

Table 3-7: CRMX Module LED Description

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN</td>
<td>Green</td>
<td>On</td>
<td>Ethernet link established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flashing</td>
<td>Data is being received or transmitted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>No Ethernet link.</td>
</tr>
<tr>
<td>WAN</td>
<td>Green</td>
<td>On</td>
<td>WAN link established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flashing</td>
<td>Data is being received or transmitted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>No WAN link.</td>
</tr>
</tbody>
</table>

3.1.7 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 3-8: Power Supply Module

Table 3-8: Power Supply Module LED Description

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Green</td>
<td>On</td>
<td>Power supply is operating correctly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>Failure / disruption in the AC supply, or the power is currently not being supplied to the device through the AC power supply entry.</td>
</tr>
</tbody>
</table>
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 3-9: Rear Panel of Mediant 1000B MSBG](image)

Table 3-9: Rear-Panel Description

<table>
<thead>
<tr>
<th>Item #</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ESD</td>
<td>Electrostatic Discharge (ESD) socket.</td>
</tr>
<tr>
<td>2</td>
<td>ESX</td>
<td>ESX Electrostatic Discharge (ESD) socket.</td>
</tr>
<tr>
<td>3</td>
<td>100-240V~1A</td>
<td>Dual AC Power Supply Entries.</td>
</tr>
<tr>
<td>4</td>
<td>OSN3</td>
<td>OSN3 AMC module.</td>
</tr>
<tr>
<td>5</td>
<td>HDMX</td>
<td>Main hard-disk drive (HDD) AMC module for OSN3 platform.</td>
</tr>
<tr>
<td>6</td>
<td>HDMX</td>
<td>Slot for second (optional) HDD for OSN3 platform.</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>Unused and covered AMC module slots.</td>
</tr>
</tbody>
</table>

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 Section 7 on page 53.
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 27)
- Installed in a standard 19-inch rack (see Section '19-inch Rack Mounting' on page 29)

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.

Figure 4-1: Rubber Foot on Underside of Chassis
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 4-2: Location of Grooves for Rubber Feet

3. Peel off the adhesive, anti-slide rubber feet and stick one in each anti-slide groove.

Figure 4-3: Peeled-off Rubber Foot

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 using the device's integral front mounting brackets and the user-adapted rear mounting brackets (not supplied). This method is required for racks that don't provide shelves.

---

**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.)

---

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

- Place the device on a pre-installed shelf in the rack. It's recommended to attach the device's integral front mounting brackets to the rack's frame to prevent it from sliding off the shelf during cabling. Use standard 19-inch rack bolts (not provided) to fasten the front of the device to the frame of the rack.
To install the device in a rack without shelves:

1. Position the device in a 19-inch rack and align the front and rear (see Section 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 brackets to the frame of the rack.

Note: If you are assembling the rear brackets, please 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).
5 Cabling the Device

This section describes how to cable the device:

- Connecting to earth or ground (see Section 5.1 on page 31)
- Connecting to the WAN (see Section 5.2 on page 32)
- Connecting to the LAN (see Section 5.3 on page 35)
- Connecting the FXS interfaces (see Section 5.4 on page 36)
- Connecting the FXO interfaces (see Section 5.5 on page 37)
- Connecting the analog FXS Lifeline telephone (see Section 5.6 on page 38)
- Connecting the BRI lines (see Section 5.7 on page 39)
- Connecting the E1/T1 trunks (see Section 5.8 on page 40)
- Connecting the E1/T1 trunks for PSTN Fallback (see Section 5.9 on page 41)
- Connecting to a PC for serial communication (see Section 5.10 on page 42)
- Connecting to power (see Section 5.11 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 liitetty suojamaadoituskoskettimilla varustettuun pistorasiaan."
- Norway: "Apparatet må 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

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 WAN

This section describes how to connect to the WAN. The type of WAN port interface depends on the CRMX module installed in the chassis and can be one of the following:

- **RJ-45 port** (4-twisted pair copper cabling) providing 1 Gigabit Ethernet (GbE) interface (see Section 5.2.1 on page 32)
- **1000Base-SX optical multi-mode fiber port** (see Section 5.2.2 on page 33)
- **1000Base-LX optical single-mode fiber port** (see Section 5.2.2 on page 33)
- **RJ-48c Channel Service Unit/Data Service Unit (DSU/CSU) dual T1 WAN port**, for connecting up to two T1 lines (see Section 5.2.3 on page 34)
- **RJ-45 Symmetric High-Speed Digital Subscriber Line (SHDSL) interface port** (see Section 5.2.4 on page 35)

#### 5.2.1 Gigabit Ethernet Copper Cabling

The procedure below describes how to connect to the WAN through the 100/1000Base-TX Gigabit Ethernet RJ-45 port provided on the CRMX-C module.

An RJ-45 cable connector with the following pinouts is used:

*Figure 5-2: RJ-45 Connector Pinouts for WAN Ethernet*

1. Attach one end of a straight-through RJ-45 Ethernet Cat 6 or Cat 5e (two-pair Category 5 UTP) cable to the module's WAN port, labeled **WAN**.

*Figure 5-3: Connecting the GbE WAN Port*

2. Attach the other end of the cable directly to the WAN network (e.g., to an ADSL or Cable modem).
5.2.2 Optical Fiber Cabling

The CRMX-S and CRMX-L modules provide a 1000Base-SX and 1000Base-LX Gigabit Ethernet optical fiber port (multi- or single-mode fiber), respectively. This port provides a 1.25 Gbps optical small form-factor pluggable (SFP) transceiver. To interface with this SFP transceiver, you need to provide (i.e., not supplied) the following items:

- **Cable**: twin, single-mode or multi-mode optic fiber
  - **Single-Mode Fiber 1000Base-LX**:
    - Input Sensitivity: -20 dBm maximum
    - Output Power: -9 dBm minimum; -3 dBm maximum
  - **Multi-Mode Fiber 1000Base-SX**:
    - Input Sensitivity: -18 dBm maximum
    - Output Power: -9 dBm minimum; -3 dBm maximum

- **Connector**: LC-type plug

### Caution Laser

- If the CRMX-S or CRMX-L modules are used, then the device is considered a Class 1 LED/Laser emitting device, as defined by 21CFR 1040 and IEC825.
- Do not stare directly into the beam or into fiber optic terminations as this can damage your eyesight.
- Avoid exposure to laser radiation by ensuring that you insert dust / EMI plugs into SFP transceiver modules to which no cables are connected. Laser radiation may be emitted from the aperture of the SFP transceiver modules when no cables are connected.
- Excessive bending of the fiber optic cable can cause distortion and signal losses. Ensure that you adhere to the minimum bending radius (and ratio) recommended by the fiber optic cable manufacturer.
- The maximum fiber optic cable length for multi-mode fiber is 550 m.

➢ **To connect to the WAN using optical fiber cabling:**

1. Remove the protective dust plug covering the WAN port's SFP transceiver.
2. Connect the LC-type plugs at the end of the fiber optic cable to the WAN port's SFP transceiver (labeled **WAN**).

### Figure 5-4: Connecting the SFP Fiber Optic WAN Port

3. Connect the other end of the cable to the fiber network.
5.2.3 **T1 WAN DSU/CSU Cabling**

The CRMX-T module provides a WAN connection through a dual T1 line interface (according to ANSI T1.403-1999). The module's dual T1 WAN DSU/CSU port interface transmits and receives data using IP over Point-to-Point Protocol (PPP), IP over High-Level Data Link Control (HDLC), or IP over Multilink Point-to-Point Protocol (MLP) framing. An RJ-48c T1 WAN cable connector with the following pinouts is used:

![Figure 5-5: RJ-48c Connector Pinouts for T1 WAN](image)

**Warning:** To protect against electrical shock and fire, use a 26 AWG min wire to connect the T1 WAN port.

- **To connect the dual T1 WAN DSU/CSU port to one or two T1 lines:**
  1. Connect the supplied splitter cable (RCBA50002 - cable adapter E1/T1 RJ-45 male to two RJ-45 female shielded) to the device’s T1 WAN port (labeled T1 WAN).

![Figure 5-6: Connecting the T1 WAN DSU/CSU Port](image)

  2. Connect the other two ends of the splitter cable to one or two T1 lines, as desired.
5.2.4 **SHDSL WAN Cabling**

The CRMX-SD module provides a WAN connection through an SHDSL interface port. The SHDSL port has four wire-pairs, supporting up to four SHDSL ports on a single physical RJ-45 connector. The specifications of the SHDSL interface are listed below:

- Conforms to ITU G.991.2 Annexes A, B, E, F and G SHDSL
- Up to 5,696 Kbps over a single wire pair
- Up to 22,784 Kbps over four wire pairs bonding, according to SHDSL.bis (ITU G.991.2 Annexes F, G)
- EFM and ATM support
- Wetting current support on the CPE side, according to G991.2
- Supports both Central Office (CO) and CPE (wetting current on CO - excluded)
- TC-PAM 16/32 Line Code

An RJ-45 cable connector with the following pinouts is used:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>CH0-TIP</td>
</tr>
<tr>
<td>5</td>
<td>CH0-RING</td>
</tr>
<tr>
<td>1</td>
<td>CH1-TIP</td>
</tr>
<tr>
<td>2</td>
<td>CH1-RING</td>
</tr>
<tr>
<td>3</td>
<td>CH2-TIP</td>
</tr>
<tr>
<td>6</td>
<td>CH2-RING</td>
</tr>
<tr>
<td>7</td>
<td>CH3-TIP</td>
</tr>
<tr>
<td>8</td>
<td>CH3-RING</td>
</tr>
</tbody>
</table>

➢ **To connect the SHDSL WAN port to an SHDSL access point:**

1. Connect an RJ-45 SHDSL cable to the device’s SHDSL WAN port (labeled **SHDSL WAN**).

   ![Figure 5-7: Connecting the SHDSL WAN Port](image)

2. Connect the other end of the cable to the access point.
5.3 Connecting to LAN

The procedure below describes how to connect to the LAN (e.g., computer or switch). The CRMX module provides three 10/100/1000Base-T Gigabit Ethernet RJ-45 LAN ports. An RJ-45 cable connector with the following pinouts is used:

![Figure 5-8: RJ-45 Connector Pinouts for LAN](image)

- To connect to the LAN:
  - Using a straight-through RJ-45 Ethernet Cat 6 or Cat 5e (two-pair Category 5 UTP) cable, connect the CRMX module's LAN port/s (labeled I, II, and III) to the LAN.

5.4 Connecting to 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:** This section is applicable only if your device is installed with an FXS module.

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

![Figure 5-9: RJ-11 Connector Pinouts for FXS](image)

- To connect to FXS interfaces:
  - Using an RJ-11 connector, connect the FXS port/s to the required telephone interface.
5.5 Connecting to FXO Interfaces

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:** This section is applicable only if your device is installed with an FXO module.

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

**Figure 5-10: RJ-11 Connector Pinouts for FXO**

1 2 3 4  
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.
5.6 Connecting the Analog Lifeline Phone

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 5-11: RJ-11 Connector Pinouts for Analog Lifeline](image)

- **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 5-12: Cabling the Analog Lifeline](image)
5.7 Connecting to ISDN 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:** This section is applicable only if your device is installed with a BRI 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 5-13: RJ-45 Connector Pinouts for BRI**

![Connector Pinouts for BRI](image)

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.
5.8 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:** This section is applicable only if your device is installed with a TRUNKS module.

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

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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rx RING</td>
</tr>
<tr>
<td>2</td>
<td>Rx TIP</td>
</tr>
<tr>
<td>3</td>
<td>6, 7, 8</td>
</tr>
<tr>
<td>4</td>
<td>Tx RING</td>
</tr>
<tr>
<td>5</td>
<td>Body = Shield</td>
</tr>
</tbody>
</table>

- To connect to E1/T1 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.
5.9 Connecting the PSTN Fallback for E1/T1

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 (IV) 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 5-15: Cabling (Ports 1 and 2) PSTN Fallback

Notes:

- PSTN Fallback is supported only by 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.
5.10 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 5-16: RS-232 Cable Adapter

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.

Figure 17: Serial Connection with PC for CLI Communication

Notes:
- The RS-232 port is not intended for permanent connection.
- The DB-9 connector labeled "P2" is used only for debugging.
5.11 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.
Reader’s Notes
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**

<table>
<thead>
<tr>
<th>Slot #1</th>
<th>Slot #2</th>
<th>Slot #3</th>
<th>Slot #4</th>
<th>Slot #5</th>
<th>Slot #6</th>
<th>CRMX Module</th>
<th>Spare Power Supply Slot</th>
<th>Main Power Supply Unit</th>
<th>Fan Tray Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Module</td>
<td>I/O Module</td>
<td>I/O of MPM Module</td>
<td>I/O of MPM Module</td>
<td>Blank Panel</td>
<td>Blank Panel</td>
<td>CRMX Module</td>
<td>Spare Power Supply Slot</td>
<td>Main Power Supply Unit</td>
<td>Fan Tray Unit</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Slot #1 TRUNKS Module</th>
<th>Slot #2 TRUNKS Module</th>
<th>Slot #3 BR Module</th>
<th>CRMX Module</th>
<th>Spare Power Supply Slot</th>
<th>Main Power Supply Unit</th>
<th>Fan Tray Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slot #4 FXO Module</td>
<td>Slot #5 FXS Module</td>
<td>Slot #6 MPM Module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 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
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, 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](image)

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. Carefully insert the module into the slot until it makes contact with the AMC card-edge connector located on the backplane.
2. Connect all external interfacing cables to the module, as required.
3. Using the module handle, engage the module with the chassis backplane.
4. When the handle is locked, the module is engaged and the HS LED turns off.

6.1.5.2 Removing an AMC Module

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

➢ To remove an AMC module:
1. Pull on the module handle and partially extract the module to the first “click”; the module performs a shutdown sequence, which is indicated by the flashing blue Hot Swap LED (see stages 1 and 2 in the figure below).
2. When the LED stops flashing and remains constantly on, disconnect any cables that may be connected to the module.
3. 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.
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.

   ![Module Orientation in Top and Bottom Chassis Slots](image)

   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.
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 Tray Module](image-url)
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. The figure below shows the air filter extracted from the Fan Tray module.

Figure 6-8: Fan Tray with Removed Filter

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.

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.
7 Open Solution Network (OSN) Server Platform

This section is intended for customers who want to install the optional Open Solution Network (OSN) server 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.

The device supports the following OSN platforms:
- OSN Version 2 – see Section 7.1 on page 53
- OSN Version 3 – see Section 7.2 on page 59

7.1 OSN2 Server Platform

The OSN2 is supported only on the legacy Mediant 1000 chassis.

**Note:** The OSN2 server platform is supported only on the legacy Mediant 1000 chassis. However, this chassis provides the same functionality as the Mediant 1000B chassis. For further information, please contact your AudioCodes sales representative.

The OSN2 server is Intel Pentium based (1.4 GHz), standalone entity, integrated within the device. It uses a separate Ethernet interface and IP configuration from that used by the device. The OSN2 also hosts an integrated BroadSoft PacketSmart agent.

7.1.1 OSN2 Server Modules

**Warning:** Before installing the OSN Server modules, ensure that the device is disconnected from the power supply. These modules are not hot-swappable and damage to these modules can occur if replaced under voltage.

**Note:** IP connectivity is done by cabling the iPMX's RJ-45 port to the network (e.g., connecting a cable between the iPMX and a LAN port). Alternatively, the OSN2 server's iPMX module connects (internally) to the IP network through the device's CRMX module, and therefore, physical cabling of the iPMX to the IP network is not necessary.
The OSN2 platform includes the following modules:

- **iPMX module:**

![iPMX Module](image1)

- **HDMX (hard drive) module:**

![Hard Drive Module (HDMX)](image2)

### 7.1.2 Installing the OSN2 Modules

This section describes how to install the OSN2 modules.

#### 7.1.2.1 Required Working Tools

The following tools are required for installing the OSN2 modules:

- Phillips screwdriver
- Flathead screwdriver
- Wire cutter
7.1.2.2 Installing the iPMX Module

The iPMX module is installed on the rear panel of the device, as described in the following procedure:

➢ To install the iPMX module:

1. On the device's rear panel, remove the black metal cover plates in the first and second slots located on the right side of the power connection, as shown in the figure below.

   Figure 7-3: Cover Plates Removed from Chassis Slots

2. Use the cutter tool to remove the small metal strip between the upper and lower slots, as shown in the figure below.

   Figure 7-4: Cutting Metal Strip on Chassis Slot
3. Insert the iPMX module into the first slot, closest to the power connection, as shown in the figure below.

Figure 7-5: Inserting the iPMX Module

4. Push the iPMX 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 two captive mounting screws located on the bottom right and left corners.

6. Using a Philips screwdriver, tighten the module's two Philips screws located on the top right and left corners.

7.1.2.3 Installing the HDMX Module

The HDMX module is installed on the rear panel of the device, as described in the following procedure:

➢ To install the HDMX module:

1. Place the device so that the rear panel is facing you.
2. Remove the black metal cover plates in the first and second slots located on the right side of the power connection.
3. Use the cutter tool to remove the small metal strip between the upper and lower slots.
4. Insert the HDMX module into the second slot, as shown in the figure below.

Figure 7-6: Inserting the HDMX Module

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

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

7.1.3 Replacing the iPMX Module's Lithium Battery

The iPMX module is equipped with a 3-volt CR-1225 Lithium battery (AudioCodes product number: ACL P/N RBAT00001). Typically, battery life is estimated at two years. However, for various reasons, the battery may last for a shorter duration.

Warnings:
- When replacing the battery, all BIOS settings revert to factory defaults.
- When removing and inserting the battery, be careful not to touch other components on the iPMX printed circuit board (PCB) with the extracting tool. This may cause irreversible damage to the iPMX module.
- Dispose of used batteries according to the manufacturer's instructions. Failure to do so could result in environmental damage.
- The Lithium battery must only be replaced with an identical or equivalent battery, as recommended by the manufacturer.

Electrical Component Sensitivity

Electronic components on printed circuit boards are extremely sensitive to static electricity. Normal amounts of static electricity generated by clothing can damage electronic equipment. To reduce the risk of damage due to electrostatic discharge (ESD) when installing or servicing electronic equipment, it is recommended that anti-static earthing straps and mats be used.
The following procedure describes how to replace the Lithium battery in the iPMX module.

➢ **To replace the Lithium battery in the iPMX:**

1. Remove the iPMX module from the slot in which it's housed in the device rear panel, by performing the following:
   a. Using a flathead screwdriver, loosen the module's two lower mounting captive screws.
   b. Using a Philips screwdriver, loosen the two upper screws.
   c. Holding the two mounting captive screws, gently pull the module out of the slot.

2. Flip the module over so that it lies face down with the PCB visible.

3. Locate the Lithium battery in its battery holder on the circuit board.

4. Using a tweezer-like tool (or small flathead screwdriver), carefully leverage the battery out of the battery holder. Be careful not to touch other components on the board with your tool.

   ![Figure 7-7: Removing Lithium Battery from iPMX Module](image)

5. For installing the new battery, simply push the battery into the battery holder using your fingers. Ensure that you install the battery in the correct orientation such that the positive side is facing up (i.e., the side containing the battery description is visible).

6. Re-insert the iPMX module into the slot of the device's chassis as described in the previous section.
7.2 **OSN3 Server Platform**

The OSN3 server is installed on the Mediant 1000B chassis. The OSN3 is based on single and mid-sized Advanced Mezzanine Card / AMC (or AdvancedMC form-factor) modules. These are housed in the AMC slots on the Mediant 1000B rear panel.

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

7.2.1 **OSN3 Modules**

The OSN3 platform consists of the following modules:
- OSN3 – see Section 7.2.1.1 on page 59
- HDMX – see Section 7.2.1.2 on page 63

7.2.1.1 **OSN3 Module**

The OSN3 module provides the port connector interfaces and is housed in Slot #2 on the Mediant 1000B rear panel.

The table below lists the OSN3 module specifications:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel® Core™ 2 Duo 1.5 GHz processors L7400 with Intel 3100 Chipset (64-bit)</td>
</tr>
<tr>
<td>RAM Memory</td>
<td>2 G or 4 G DDR2 with ECC</td>
</tr>
<tr>
<td>Hard Drives</td>
<td>Up to 2 hard drives (HDMX modules)</td>
</tr>
<tr>
<td>Bus/Chipset</td>
<td>64 Bit</td>
</tr>
<tr>
<td>L2 Cache</td>
<td>2 M</td>
</tr>
<tr>
<td>Interfaces</td>
<td>• Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>• USB 2.0 via Connection Module</td>
</tr>
<tr>
<td></td>
<td>• RS-232 COM</td>
</tr>
</tbody>
</table>
The module is shown below and described in the subsequent table.

**Figure 7-8: OSN3 Module Ports**

![OSN3 Module Ports](image)

**Table 7-2: OSN3 Module Description**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image" alt="RS-232 Serial Interface" /></td>
<td>RJ-45 port for RS-232 serial interface (COM1)</td>
</tr>
<tr>
<td>2</td>
<td><img src="image" alt="Gigabit Ethernet" /></td>
<td>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).</td>
</tr>
<tr>
<td>3</td>
<td><img src="image" alt="USB 2.0" /></td>
<td>USB 2.0 port</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>Handle for inserting and extraction module from slot</td>
</tr>
</tbody>
</table>

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

**Table 7-3: Gigabit Ethernet Interface (RJ-45) Connector Pinouts**

<table>
<thead>
<tr>
<th>Pin</th>
<th>100Base-Tx</th>
<th>1000Base-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I/O</td>
<td>Signal</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Tx+</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>Tx-</td>
</tr>
<tr>
<td>3</td>
<td>I</td>
<td>Rx+</td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>I</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>I</td>
<td>Rx-</td>
</tr>
<tr>
<td>7</td>
<td>I</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>-</td>
</tr>
</tbody>
</table>
For serial cabling, an RJ-45-to-DB-9 female cable adapter is used, as shown below:

**Figure 7-9: RJ-45-to-DB-9 Serial Cable Adapter**

The RJ-45 connector pinouts for RS-232 interface are listed in the table below:

**Table 7-4: RS-232 Serial Cable Connector Pinouts**

<table>
<thead>
<tr>
<th>RJ-45 Pin</th>
<th>DB-9 Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

The OSN3 LEDs are shown in the figure below and described in **Table 7-5**.

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

The HDMX module provides the hard-disk drive functionality for the OSN3 platform, providing storage capacity of 160 GB. This module is housed in Slot #1 on the Mediant 1000B rear panel.

**Notes:**
- For additional storage capacity per HDMX module, please contact your AudioCodes representative.
- The OSN3 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 7-11: HDMX Module Components](image)

**Table 7-6: HDMX Module LED Description**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Label</th>
<th>Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image" alt="Green" /></td>
<td>Green</td>
<td>On</td>
<td>Power received by module.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Off" /></td>
<td></td>
<td>Off</td>
<td>No power received by module.</td>
</tr>
<tr>
<td>2</td>
<td><img src="image" alt="Blue" /></td>
<td>Blue</td>
<td>On</td>
<td>Module can be extracted from chassis slot once dismounted from the OSN3 operating system.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Off" /></td>
<td></td>
<td>Off</td>
<td>Module correctly inserted in chassis slot</td>
</tr>
<tr>
<td>1</td>
<td><img src="image" alt="Red" /></td>
<td>Red</td>
<td>On</td>
<td>Hard disk drive in use (active).</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Off" /></td>
<td></td>
<td>Off</td>
<td>Hard disk drive not in use.</td>
</tr>
</tbody>
</table>
7.2.2 Replacing the Lithium Battery of OSN3 Module

The OSN3 module is equipped with a 3-volt CR-1225 Lithium battery (AudioCodes product number: ACL P/N RBAT00001). Typically, battery life is estimated at two years. However, for various reasons, the battery may last for a shorter duration.

**Warnings:**
- When replacing the battery, all BIOS settings revert to factory defaults.
- When removing and inserting the battery, be careful not to touch other components on the OSN3 printed circuit board (PCB) with the extracting tool. This may cause irreversible damage to the OSN3 module.
- Dispose of used batteries according to the WWE Recycling Passport document located on AudioCodes Website at [http://www.audiocodes.com/library/type=1410356/page=1](http://www.audiocodes.com/library/type=1410356/page=1). Failure to do so could result in environmental damage.
- The Lithium battery must only be replaced with an identical or equivalent battery, as cited above.

**Electrical Component Sensitivity**

Electronic components on printed circuit boards are extremely sensitive to static electricity. Normal amounts of static electricity generated by clothing can damage electronic equipment. To reduce the risk of damage due to electrostatic discharge (ESD) when installing or servicing electronic equipment, it is recommended that anti-static earthing straps and mats be used.

The following procedure describes how to replace the Lithium battery in the OSN3 module.

- **To replace the Lithium battery of the OSN3 module:**

  1. Gently pull the AMC module handle of the OSN3 module from the OSN front panel until you hear a click; the OSN3 shutdown process commences and the **Power LED** flashes blue.
  2. Once the **Power LED** stops flashing, gently pull the AMC module handle all the way to extract the module from the chassis.
  3. Locate the Lithium battery in its battery holder on the circuit board (see figure below).
  4. Using a wooden or plastic tweezers like tool, carefully leverage the battery out of the battery holder from the + end (as illustrated below). Be careful not to touch other components on the board with your tool (see figure below).
5. For installing the new battery, simply push the battery into the battery holder (from the ‘-’ label end on the battery holder) using your fingers. Ensure that you install the battery in the correct orientation such that the positive side is facing up (i.e., the side containing the battery description is visible).

6. Gently re-insert the OSN3 module into the slot of the device's chassis.

7. Push the AMC module handle all the way until you hear a click.

8. Wait for the blue Power LED to turn off.

The OSN module has been successfully reinserted in the device's chassis.
7.3 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

7.3.1 Cabling

The cabling of the OSN2 and OSN3 platforms for installing Linux is described in the subsections below.

7.3.1.1 Cabling OSN2

The procedure below describes the OSN2 cabling for Linux installation. The cabling is performed on the iPMX module (on the rear panel).

![Note: If you want to use the VGA port, you can order the VGA cable separately from AudioCodes.]

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

- **Hardware requirements:**
  - Ethernet cable cord
  - 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 OSN2:

1. On the device's iPMX module (located on the rear panel), perform the following:
   a. Connect to the PC using one of the following methods:
      - Connect the RS-232 port to a PC, using the RS-232 cable.
      - Connect the VGA port to the monitor
   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 7-13: Cabling OSN2 (iPMX Module in Rear Panel)
7.3.1.2 Cabling OSN3

The procedure below describes the OSN3 cabling for Linux installation. The cabling is performed on the OSN3 module.

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 OSN3:

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 7-14: Cabling OSN3 for Installing Linux*
7.3.2 Installing the Linux Software

Once you have cabled 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. For OSN 2 only (skip to Step 4 for OSN3): Enable console installation from the system BIOS:
   a. When the system starts, press the <Delete> key; after several seconds, the following BIOS setup window is displayed:

   ![Figure 7-15: System BIOS Setup Window](image)

   b. Select the Features Configuration option.
c. Change the System Management BIOS parameter to “Enabled”.

Figure 7-16: Enabling System Management BIOS

![System BIOS Setup - Features Configuration](image)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACPI 1.0</td>
<td>Enabled</td>
</tr>
<tr>
<td>Advanced Power Management</td>
<td>Disabled</td>
</tr>
<tr>
<td>BIOS Memory Manager</td>
<td>Enabled</td>
</tr>
<tr>
<td>System Management BIOS</td>
<td>Enabled</td>
</tr>
<tr>
<td>Quick Boot</td>
<td>Enabled</td>
</tr>
<tr>
<td>Primary IDE UDMA</td>
<td>Enabled</td>
</tr>
<tr>
<td>Console Redirection</td>
<td>Redirect</td>
</tr>
<tr>
<td>Legacy USB</td>
<td>Disabled</td>
</tr>
<tr>
<td>AtaMassStorage</td>
<td>Disabled</td>
</tr>
<tr>
<td>Ubi20</td>
<td>Enabled</td>
</tr>
<tr>
<td>Shell</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

d. Press the <Esc> key to return to the main BIOS window:

Figure 7-17: Saving BIOS Settings

![System BIOS Setup - Utility v5.0](image)

e. Choose the Write to CMOS and Exit option, and then press the <Y> key to save changes and exit.

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

5. At the prompt, type the following:

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

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

6. Press the <Enter> key; the Linux installation begins.

7. Continue installation according to the Linux installation instructions.
7.4 Connecting Remotely to OSN Server using Windows

Typically, for customers requiring Microsoft Windows® operating system (OS), 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 7.4.1 on page 71.

7.4.1 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 7.2.1.1 on page 59).
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 click <Enter>:

```
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
```

### 7.4.2 Cabling

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.

#### 7.4.2.1 Cabling OSN2

The OSN2 server connects to the IP network through the LAN port of the iPMX module.

- **To cable OSN2 for Remote Desktop Connection:**
  - Connect the Ethernet LAN port of the iPMX module to the 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 7-18: Cabling OSN2 for Remote Desktop Connection from PC with Windows XP](image-url)
7.4.2.2 Cabling OSN3

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 7-19: Cabling OSN3 for Remote Desktop Connection from PC with Windows XP](image-url)
7.4.3 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 changing a PC's IP address:

   **Figure 7-20: 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 7-21: 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 7-22: 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
## A Module Hardware Revision Compatibility

The input/output voice interface module hardware revisions that are compatible with the Mediant 1000 MSBG chassis are listed in the table below.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>H/W Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>FASB00334</td>
<td>M1K-SMX-1A1V1 Quad FXS w/ Life-Line Module</td>
<td>C08</td>
</tr>
<tr>
<td>FASB0035</td>
<td>M1K-SMX-1A1V1 Dual FXS w/ Life-Line Module</td>
<td>C08</td>
</tr>
<tr>
<td>FASB00397</td>
<td>M1K-TMX-1A1V1 Quad Trunks w/ Life-line module</td>
<td>C08</td>
</tr>
<tr>
<td>FASB00398</td>
<td>M1K TMX-1A1V1 Dual Trunks w/ Life-line module</td>
<td>C08</td>
</tr>
<tr>
<td>FASB00399</td>
<td>M1K TMX-1A1V1 Single trunks w/ Life-line module</td>
<td>C08</td>
</tr>
<tr>
<td>FASB00510</td>
<td>M1K-OMX-S 4 Indoor Ports With GS Rev.A1</td>
<td>C05</td>
</tr>
<tr>
<td>FASB00511</td>
<td>M1K-CFMX-1 Conference Module Rev A1v1</td>
<td>C06</td>
</tr>
<tr>
<td>FASB00520</td>
<td>M1K-OMX-S 4 Outdoor Ports W/O GS Rev. A1</td>
<td>C04</td>
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<tr>
<td>FASB00582</td>
<td>M1K-BMX-4A1</td>
<td>C03</td>
</tr>
<tr>
<td>GTPM00046</td>
<td>M1K-VM-2FXS</td>
<td>P03</td>
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<tr>
<td>GTPM00050</td>
<td>M1K-VM-1SPAN</td>
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</tr>
<tr>
<td>GTPM00052</td>
<td>M1K-VM-2SPAN</td>
<td>P03</td>
</tr>
<tr>
<td>GTPM00051</td>
<td>M1K-VM-4SPAN</td>
<td>P03</td>
</tr>
<tr>
<td>GTPM00056</td>
<td>M1K-VM-4FXS</td>
<td>P03</td>
</tr>
<tr>
<td>GTPM00125</td>
<td>M1K-VM-4FXO-LS</td>
<td>P02</td>
</tr>
<tr>
<td>GTPM00126</td>
<td>M1K-VM-4FXO-GS/LS</td>
<td>P02</td>
</tr>
<tr>
<td>GTPM00127</td>
<td>M1K-M-CONF</td>
<td>P02</td>
</tr>
<tr>
<td>GTPM00174</td>
<td>M1K-VM-4BRI</td>
<td>P02</td>
</tr>
<tr>
<td>FASU00587</td>
<td>CRMX-T (LAN 1, 2, 3, Dual T1 WAN DSU/CSU Trunk)</td>
<td>P1.2</td>
</tr>
<tr>
<td>FASU00557</td>
<td>CRMX-L (LAN 1, 2, 3, GE WAN 1000Base-LX)</td>
<td>P1.5</td>
</tr>
<tr>
<td>FASU00556</td>
<td>CRMX-C (LAN 1, 2, 3, GE WAN copper Ethernet)</td>
<td>P2</td>
</tr>
<tr>
<td>FASU00557</td>
<td>CRMX-S (LAN 1, 2, 3, GE WAN 1000Base-SX)</td>
<td>P1.5</td>
</tr>
<tr>
<td>FASU00636</td>
<td>CRMX-SD (LAN 1, 2, 3, SHDSL WAN)</td>
<td>No Revision Constraint</td>
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