4

Optixia XM12 Chassis

This chapter provides details about the Optixia XM12 chassis—its specifications and features.

The Optixia XM12 is a next generation chassis that is a combination of the Optixia backplane architecture and a XM form factor. The 12-slot platform allows for higher port density load modules. The XM12 High Performance version has two 2.0 kW powersupplies, while the Standard version has two 1.6 kW power supplies. An upgrade kit is available to convert the Standard XM12 to the High Performance version. See *High Performance Upgrade Kit* on page 18.

> **Caution:** This equipment is intended to be installed and maintained by Service Personnel.

The Optixia XM12 Chassis has 12 slots for support of up to 12 single wide load modules. The Optixia XM12 supports all load modules with improved system power and cooling. The Optixia XM12, shown in *Figure 4-1,* was specifically designed to allow the hot-swapping of modules, without requiring the chassis to be powered down.

> **Warning:** To prevent accidental injury to personnel, do not leave unused SFP (or SFP+) ports on load modules uncovered. When transceivers are not installed, end caps must be used. For details, see *Use End Caps on Open Ports* on page xxxvii.

Figure 4-1.   Optixia XM12 Chassis

The Optixia family of chassis has improved data throughput between Load Modules and the chassis, with improved backplane performance.

The Optixia chassis provides improved modularity of major components to reduce downtime of a failed chassis and reduce the probability of needing to remove a failed chassis from the test environment. Among the modular features provided are:

- Power supplies
- Motherboard and support components (RAM, Hard Drive)
- Fans

The motherboard and power supplies are accessible from the front of the chassis. Each of the modular components is capable of being removed in the field and replaced with minimum downtime for the customer.

> **Note**: In the event of indications of inadequate power, remove load modules starting from the low-number slots (slot 1, 2, 3), then working upward toward slot 12 until the problem is solved.

Warning
Multiple Sources
of Supply. Disconnect
All Sources before
Servicing

Avertissement
Présence de plusieurs
sources d'alimentation
électrique. Débrancher
toutes les sources
d'alimentation
avant intervention

Achtung
Mehrfachstromquellen!
Alle Versorgungskabel
vor Wartung entfernen.

警告
複数のパワーサ
プライがあります
ので、保守する
際には必ず全て
の電源ケーブル
を抜いてください

Warning
High Touch Current.
Earth Connection
Essential Before
Connecting Supply

Avertissement
Fort courant
de contact
Raccordement à la
Terre impératif
Avant branchement
de l'alimentation

Achtung
Stellen Sie eine
sichere Erdverbindung
her, bevor Sie
die Stromquelle
anschließen.

警告
高漏洩電流に気を
付け、適切に設置
してから電源を
接続してください

Specifications

XM12 Chassis

The Optixia XM12 computer and chassis specifications are contained in *Table 4-1*.

Table 4-1.   Optixia XM12 Specifications

CPU	Intel Pentium D, 3.0 GHz
	Caution–Battery replacement
	There is danger of explosion if battery is incorrectly replaced. Do not attempt to replace the battery.
	Return to Ixia Customer Service for replacement with the same or equivalent type of battery. Ixia disposes of used batteries according to the battery manufacturer's instructions.
Memory	4 GB
Disk	250GB SATA Disk
	DVD Drive
Operating System	Windows XP Professional
Physical	
Load Module Slots	12
Size	19.25 in. W x 17.5 in. H x 21 in. D (48.9cm W x 44.45cm H x 53.34cm D)
Weight (empty)	83 lb (37.65 kg)
Avg. Shipping Wt.	88 lb (39.92 kg)
Shipping Vibration	FED-STD-101C, Method 5019.1/5020.1
Environmental	
Temperature	
Operating	41°F to 104°F, (5°C to 40°C)
	Note: Some high-density/high performance load modules require a lower maximum ambient operating temperature than the standard for the chassis. When a load module that requires the lower maximum operating temperature is installed in an XM chassis, the maximum operating temperature of the chassis is adjusted downward to match the maximum operating temperature of the load module. The operating temperature range specification is specified in the published datasheet for these load modules.
Storage	41°F to 122°F, (5°C to 50°C)
Humidity	
Operating	0% to 85%, non-condensing

Table 4-1.   Optixia XM12 Specifications

Storage	0% to 85%, non-condensing
Clearance	Rear: 4 in (10 cm); fan openings should be clear of all cables or other obstructions. Sides: 2 in (5 cm) unless rack mounted.
Power	Upper line cord 1: 200-240V 60/50Hz Standard: 10A, High Performance: 15A
	Lower line cord 2: 200-240V 60/50Hz Standard: 8A, High Performance: 11A
	Note: Both power cords must be connected to the AC power source to provide sufficient power to the chassis.
	The upper line cord power supply provides power to the motherboard, fans, and some load modules. and the lower line cord power supply provides power to the remainder of the load modules. The chassis does not power up unless the upper power cord is installed.
	For North American customers, the power cords have NEMA L6-20P plugs for attachment to the power source and IEC-60320-C19 connectors that attach to the XM12 chassis.
	Caution: The chassis' safety approvals (UL and CE) are only valid when the unit is operating from 200-240VAC mains.
	Caution: The socket/outlets used to power the unit must be installed near the equipment and be easily accessible because the power plug may be used to disconnect the unit from the power source.
	Caution: Replacement of the power supply cord must be conducted by a Service Person. The same type cord and plug configuration shall be utilized.
Power Supplies	Standard: two 1.6 kW; High Performance: two 2.0 kW
Front Panel Switches	On/Off momentary power push button
Front Panel Connectors	
Mouse	PS/2 6-pin DIN
Keyboard	PS/2 6-pin DIN
Monitor	HD-DB15 Super VGA
Printer	Female DB25 parallel port
Ethernet	RJ-45 10/100/1000Mbps Gigabit Ethernet Management Port
Firewire	IEEE 1394
Serial	1 male DB9 port
USB	4 USB dual type A, 4-pin jack connectors

Table 4-1.   Optixia XM12 Specifications

Sync In	4-pin RJ11
Sync Out	4-pin RJ11
Line In/Line Out/Mic	3.5mm mini-TRS stereo jacks (qty 3)
Front Panel Indicators	See *LEDs/LCD Display* on page 6
	2 Paired LEDs above each slot position indicating Power and Active status
	LCD on front panel indicating chassis information
Back Panel Switches/ Connectors	Power On/Off rocker switch/Circuit Breakers (qty 2)
Power	2 male receptacles (IEC 60320-C19)
Noise	The XM12 chassis running at maximum fan speed capacity may produce noise levels up to 84 db (A).

Electrical Grounding requirements for Multi-Chassis system configuration

To ensure consistent grounding:

- All equipment must be mounted and screwed in to grounded 19" racks.
- Equipment should not be powered via distribution units with isolated grounding.

If equipment grounding is not consistent, the software will detect this and shutdown to protect equipment from damage.

LEDs/LCD Display

The Optixia XM12 has the following set of front panel LEDs, for each load module slot:

Table 4-2.   Optixia XM12 LEDs

Label	Color	Description
Power	Green	For each load module slot, the Power LED is illuminated when the board is being powered. When the Power LED is flashing, the board is being detected or initialized.
In Use	Green	For each load module slot, the Active LED is illuminated when a Load Module in a particular slot is owned by you.

LCD Display

An LCD display is provided on the chassis to indicate the status of the chassis without an external display device (monitor). The LCD operates in two modes:

- Startup: The LCD displays messages from IxServer to indicate the operation of IxServer as it initializes.

- Run: The LCD display provides chassis information. Information displayed includes chassis name, IxOS version, IP address, master/subordinate, and chassis status.

Supported Modules

The modules that are supported on the Optixia XM12 are listed in Table 4-3..

Table 4-3.   Optixia XM12 Supported Modules

Module	SFF - Requires Adapter	Function
HSE40GETSP1-01 HSE100GETSP1-01 HSE40/100GETSP1-01		40 and 100 Gigabit Ethernet 1-port, 2-slot CFP interface (Full feature) dual-speed, 1-port, 2-slot CFP interface (Full feature)
HSE40GEQSFP1-01		1-port, 1-slot, QFSP interface (Full feature)
Xcellon-Ultra NP-01		12-port 10/100/1000 Mbps and 1-port 1GE aggregated and 1-port 10GE aggregated, Base T Ethernet copper, single-slot load module
Xcellon-Ultra XP-01		12-port 10/100/1000 Mbps and 1-port 1GE aggregated and 1-port 10GE aggregated, Base T Ethernet copper, single-slot load module
Xcellon-Ultra NG-01		12-port 10/100/1000 Mbps and 1-port 1GE aggregated and 1-port 10GE aggregated, Base T Ethernet copper, single-slot load module
ASM1000XMV12X-01		12-port 10/100/1000 Mbps and 1-port 1GE aggregated and 1-port 10GE aggregated, Base T Ethernet copper, single-slot load module
LSM1000XMSP12-01		12-Port Gigabit Ethernet Load Module, Dual-PHY RJ45 10/100/1000 Mbps and SFP fiber
LSM1000XMVDC4-01 LSM1000XMVDC-NG LSM1000XMVDC8-01 LSM1000XMVDC12-01 LSM1000XMVDC16-01 LSM1000XMVDC16NG		4/8/12/16-Port Dual-PHY RJ45 10/100/1000 Mbps and SFP fiber. FCoE enabled
LSM1000XMS12-01		10/100/1000 Ethernet 12 port module
LSM1000XMSR12-01		10/100/1000 Ethernet 12 port module, reduced feature set

Table 4-3.   Optixia XM12 Supported Modules

Module	SFF - Requires Adapter	Function
LSM10GXM2XP-01 LSM10GXM2GBT-01 LSM10GXM2S-01		10 Gigabit Ethernet 2 port module, 1GHz, 1GB, Extra Performance. Includes 10GBASE-T version and SFP+ version.
LSM10GXMR2-01 LSM10GXMR2GBT-01 LSM10GXMR2S-01		10 Gigabit Ethernet 2 port module, 400MHz, 128MB, single slot, reduced L2/3 support with limited L3 routing, Linux SDK, and L4-7 applications. Includes 10GBASE-T version and SFP+ version.
LSM10GXM3-01		10 Gigabit Ethernet 3 port module
LSM10GXMR3-01		10 Gigabit Ethernet 3 port module, reduced feature set
LSM10GXM4-01		10 Gigabit Ethernet 4 port single slot, full-featured load module, 800MHz, 512MB. Full L2/7 support. Linux SDK, and L4-7 applications.
LSM10GXM4XP-01 LSM10GXM4GBT-01 LSM10GXM4S-01		10 Gigabit Ethernet 4 port module, 1GHz, 1GB, Extra Performance. Includes 10GBASE-T version and SFP+ version.
LSM10GXMR4-01 LSM10GXMR4GBT-01 LSM10GXMR4S-01		10 Gigabit Ethernet 4 port module, 400MHz, 128MB, single slot, reduced L2/3 support with limited L3 routing, Linux SDK, and L4-7 applications. Includes 10GBASE-T version and SFP+ version.
LSM10GXM8-01		10 Gigabit Ethernet 8 port single slot, full-featured module, 800MHz, 512MB. Full L2/7 support. Linux SDK, and L4-7 applications.
LSM10GXM8XP-01 LSM10GXM8GBT-01 LSM10GXM8S-01		10 Gigabit Ethernet 8 port module, 800MHz, 1GB, Extra Performance Includes 10GBASE-T version and SFP+ version.
LSM10GXMR8-01 LSM10GXMR8GBT-01 LSM10GXMR8S-01		10 Gigabit Ethernet 8 port module, 400MHz, 128MB, single slot, reduced L2/3 support with limited L3 routing, Linux SDK, and L4-7 applications. Includes 10GBASE-T version and SFP+ version.
NGY-NP8-01 NGY-NP4-01 NGY-NP2-01		10 Gigabit Application Network Processor Load Module, 2/4/8-Port LAN/WAN, SFP+ interface

Table 4-3.   Optixia XM12 Supported Modules

Module	SFF - Requires Adapter	Function
AFM1000SP-01	X	10/100/1000 3 port Stream extraction module
LSM1000XMV4-01		4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LSM1000XMVR4-01		4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module, reduced performance
LSM1000XMV8-01		8-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LSM1000XMVR8-01		8-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module, reduced performance
LSM1000XMV12-01		12-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LSM1000XMVR12-01		12-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module, reduced performance
LSM1000XMV16-01		16-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LSM1000XMVR16-01		16-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module, reduced performance
CPM1000T8	X	Special 10/100/1000 Ethernet load module
MSM10G1-02	X	LAN/WAN/POS Multimode load module
LM100TXS2	X	10/100 Ethernet load module
LM100TXS8	X	8-port multilayer 10/100Mbps Ethernet load module
LM100TX8	X	8-port 10/100Mbps Ethernet, reduced features
LM1000STXR4	X	4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module, reduced feature set
LM1000STXS2	X	2-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module.
LM1000STXS4	X	4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module

Table 4-3.   Optixia XM12 Supported Modules

Module	SFF - Requires Adapter	Function
LM1000STXS4-256	X	4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module; -256 version has 256MB of processor memory per port
LM1000STX2	X	2-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LM1000STX4	X	4-port Dual-PHY (RJ45 and SFP) 10/100/1000 Mbps Ethernet load module
LM1000TXS4	X	4-port 10/100/1000 Mbps Base-T Ethernet copper
LM1000TXS4-256	X	4-port 10/100/1000 Mbps Base-T Ethernet copper; -256 version has 256MB of processor memory per port
LM1000TX4	X	4-port 10/100/1000 Mbps Base-T Ethernet copper, reduced features
LM1000SFPS4	X	4-port Gigabit Ethernet fiber
ALM1000T8	X	Special 10/100/1000 Ethernet load module
ELM1000ST2	X	Special 10/100/1000 Ethernet load module
LSM10G1-01	X	10 Gigabit Ethernet load module
LSM10G1-01M	X	10 Gigabit Ethernet load module
LSM10GL1-01	X	10 Gigabit Ethernet load module
LSM1000POE4-02	X	4-port PoE load module
PLM1000T4-PD	X	Power over Ethernet load module
LM622MR	X	ATM/POS load module
LM622MR-512	X	ATM/POS load module
MSM2.5G1-01	X	OC-48c load module

Table 4-3. Optixia XM12 Supported Modules

| Module	SFF - Requires Adapter	Function
VQM01XM		Voice Quality Resource Module performs real-time processing of speech quality analysis using PESQ algorithm, on streams received on ports of the following load modules: • Xcellon-Ultra NP-01 • Xcellon-Ultra XP-01 • Xcellon-Ultra NG-01 • ASM1000XMV12X-01 • LSM1000XMV4-01 • LSM1000XMV16-01 • ALM1000TS • CPM1000TS See *Voice Quality Resource Module* on page 19.
EIM10G4S	SFP adapter	10 Gigabit Ethernet LAN Impairment module, 1-slot with 4-ports of SFP+ interfaces
EIM1G4S	SFP adapter	1Gigabit Ethernet LAN Impairment module, 1-slot with 4-ports of SFP interfaces
LavaAP40/100GE 2P	CFP to QSFP	This is the dual speed 40GE/100GE Ethernet Lava load module with Accelerated Performance. Each load module consists of 2-ports and 1-slot with CFP MSA interfaces. This load module supports full feature for layer 1 to layer 7 testing
LavaAP40/100GE 2RP	CFP to QSFP	This is the dual speed 40GE/100GE Ethernet Lava load module with data plane support only. It is an economic alternative to the Accelerated Performance load module, perfectly suitable for testing layer 1 to layer 3 applications that does not require routing protocol emulation. Each load module consists of 2-ports and 1-slot with CFP MSA interfaces

Hot-Swap Procedure

Each Optixia XM12 chassis provides the ability of removing and reinstalling a Load Module without requiring the removal of power from the rest of the chassis. The process of removing/installing a Load Module does not impact either the operation of the OS or load modules installed in the chassis.

The hot-swap procedure is detailed in Appendix D, *Hot-Swap Procedure*.

SFF Adapter Module

The Optixia XM12 adapter module allows legacy modules to be fit into the XM12 chassis. Figure 4-2 on page 4-12 shows an SFF adapter module.

Figure 4-2.   SFF Adapter
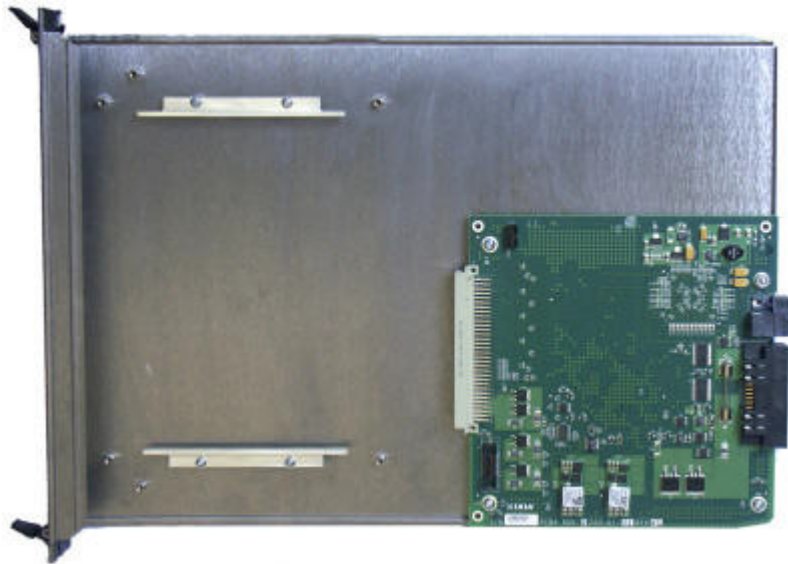
A legacy module is inserted into the front of the adapter module and connects to the pins in the rear of the adapter. The entire assembly can then be inserted into any Optixia XM12 slot.

Once an adapter module is installed in a chassis, legacy load modules can be hot-swapped without removing the adapter module from the chassis.

Figure 4-3 on page 4-12 shows an SFF Adapter module with a legacy ATM card.

Figure 4-3.   SFF Adapter with ATM Module

Table 4-3 on page 4-7 identifies the modules that can be used with the SFF Adapter.

Installing Filler Panels

The airflow in an Optixia XM12 chassis is inefficient if load modules are installed in a few slots and the rest of the chassis is left open. For best cooling results, filler panels are required. It is required that filler panels are used in situations where the slots in the chassis are not all in use.

An empty Optixia XM12 chassis includes:

*   5 ea. 1-slot wide XM12 Filler Panel/Air Baffle units (p/n 652-0648-04)

*   1 ea. 6-slot wide XM12 Filler Panel/Air Baffle unit (p/n 652-0353)

Prerequisites for Filler Panel Installation:

*   The technician should use industry-standard grounding techniques, such as wrist and ankle grounding straps, to prevent damage to electronic components on any Ixia Load Modules.

Filler Panel Installation Procedure:

> **ESD Caution:** Use industry-standard grounding techniques to prevent Electrostatic Damage to the delicate electronic components on the Ixia Load Modules.

Example: Slide the one-slot filler panel, with the Ixia logo at the top, into the correct slot. The panel slides in on the slot rails in the chassis. Secure the faceplate of the filler panel to the chassis with two of the supplied screws.

> **Caution:** Use extreme care to prevent damage to delicate electronic components on an adjacent load module.
>
> Not using filler panels could cause random failures in port operations or damage installed modules.

Cooling Fan Speed Control

The XM12 chassis automatically senses the temperature of specified modules and adjusts the cooling fan speed. If the system and board heat load is low enough, the cooling fan operates at a lower (quieter) speed.

The following modules have thermal sensors that report temperature readings:

*   LSM1000XMS(R)12

*   LSM1000XMV(R)16/12/8/4

*   LSM10GXM(R)3

*   NGY LSM10GXM2/4/8(R), LSM10GXM2/4/8XP, LSM10GXM(R)2/4/8S, and 10GBASE-T versions LSM10GXM(R)2/4/8GBT-01, NGY-NP2/4/8, and NGY SFP+ 2/4/8.

*   LavaAP40/100GE 2P and LavaAP40/100GE 2RP

Other modules control the fan speed by means of a fixed speed setting. For a list of supported modules, see Table 4-3 on page 4-7.

XM12 Sound Reducer Installation

The XM12 Sound Reducer (PN 942-0021) is an optional accessory that installs on the rear of the XM12 chassis to reduce the sound of the cooling fans. It reduces the sound by approximately 10 dB.

Refer to the following figure when performing the installation.

Figure 4-4.   XM12 Sound Reducer Installation
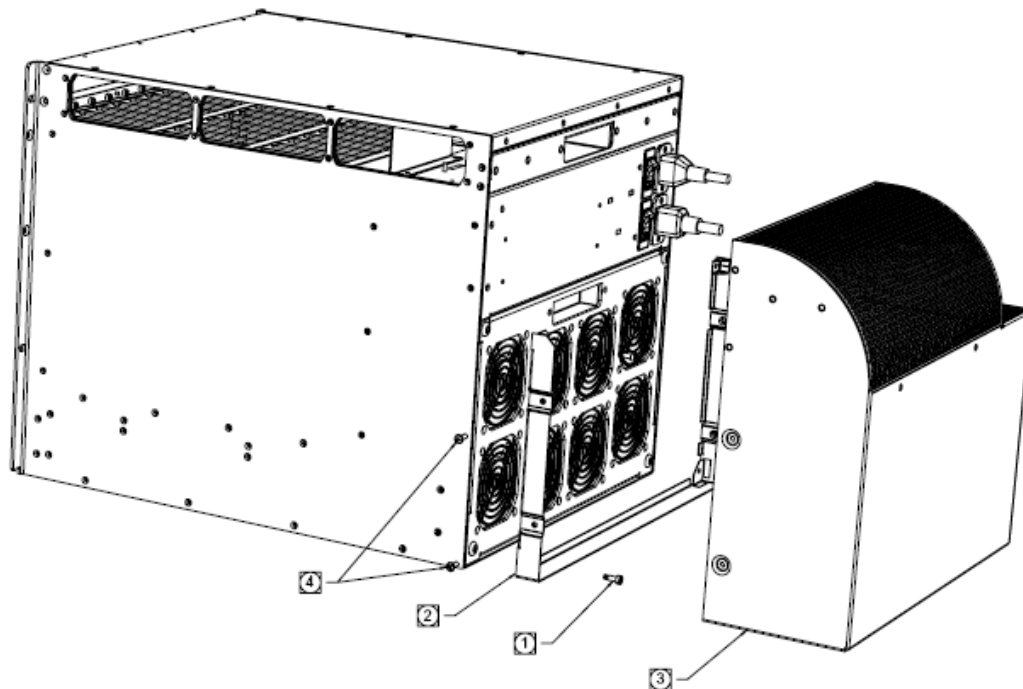
Note: The chassis should be placed in a horizontal position, in a well-lighted work area.

1. On the XM12 chassis rear, remove the four shoulder screws that hold the fan panel in place. Do not remove the fan panel.

2. Attach the sound reducer mounting bracket to the fan panel using the same four shoulder screws removed in Step 1.

3. Slide the sound reducer onto the mounting bracket.

4. Secure the sound reducer onto the mounting bracket using the four pan-head screws included in the XM12 Sound Reducer kit.

Install XM12 Chassis

The following steps describe the procedure of installing an XM12 chassis:

1. On the XM12 chassis rear, remove the four shoulder screws (marked in red circles) that hold the fan panel in place. Do not remove the fan panel.
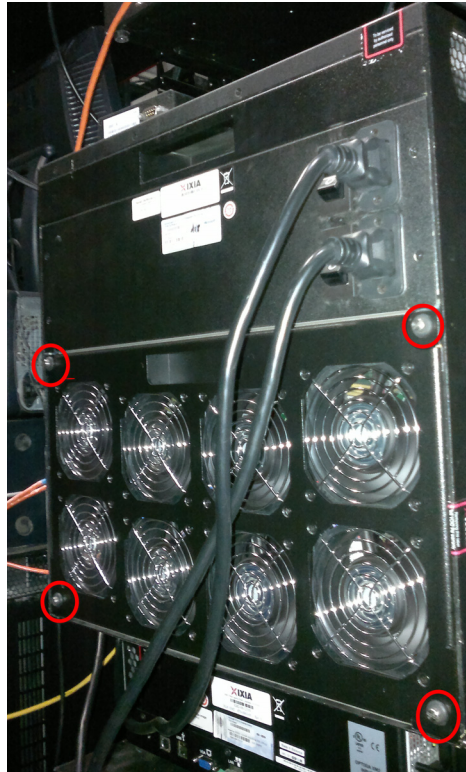
2. Put two screws in the rack. Screw them in half way.

3. Put the empty chassis into the rack.

4. Reset the bottom of the empty XM12 chassis on top of the two screws. (refer to the area marked using red circles in the image below). The entire weight of the empty XM12 will be supported by these two screws.

5. Locate the two holes above that line up with the rack and screw in the other two screws (preferably the upper hole or one right below that)

6. Screw-in the bottom two screws all the way.

7. Find two or four more screws and screw them in. Do this optionally, and only if the holes line up.

8. Insert modules (ensure that any empty slots have the blank metal covers in them as marked in red in the image below).

.

Rack Mount Cautions

> **Caution:** If this unit is installed in a Rack Mount, observe the following precautions.

a: Elevated Operating Ambient Temperature: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consider installing the equipment in an environment that is compatible with the maximum allowable ambient temperature specified for the chassis (40° C).

b: Reduced Air Flow: Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not reduced.
Do not block the back or sides of the chassis, and leave approximately two inches of space around the unit for proper ventilation.

c: Mechanical Loading: Mount the equipment in the rack so that a hazardous condition is not caused due to uneven mechanical loading.

d: Circuit Overloading: Consider the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Pay attention to equipment nameplate ratings when addressing this concern.

e: Reliable Earthing: Maintain reliable earthing (grounding) of rack-mounted equipment. Chassis frame should be screwed down to racks to ensure proper grounding path. In Addition, Pay special attention to supply connections other than direct connections to the branch circuit (such as use of power strips).

f: Replacement of the power supply cord must be conducted by a Service Person. The same type cord and plug configuration shall be utilized.

High Performance Upgrade Kit

A standard XM12 chassis (with two 1.6 kW power supplies) can be converted to a high performance XM12 (with two 2.0 kW power supplies) using an upgrade kit that is available from Ixia. Request 'Field Replaceable Unit, Power Supply Upgrade Kit' (FRU-OPTIXIAXM12-01) PN 943-0005.

> **Note**: Standard XM12 chassis that are running more than ten NGY load modules must have a power supply upgrade kit installed.
>
> We recommend the upgrade kit for existing XM12s with a fully loaded chassis combined with one or more NGY modules.

> **Caution:** This equipment is intended to be installed and maintained by Service Personnel.

Voice Quality Resource Module

Voice Quality Resource Module (VQM01XM) performs real-time processing of speech quality analysis using PESQ algorithm, on streams received on ports of the following load modules:

- Xcellon-Ultra NP-01

- Xcellon-Ultra XP-01

- Xcellon-Ultra NG-01

- ASM1000XMV12X-01

- LSM1000XMV4-01

- LSM1000XMV16-01

- ALM1000TS

- CPM1000TS

The VQM01XM communicates with load modules through the chassis backplane. A single VQM01XM module can perform PESQ analyses, including necessary decoding, on up to 300 narrowband streams concurrently in real time. The PESQ stats are published in Stats View just after the last RTP packet of the analyzed sequence is received on port.

Statistics and Measurements

The following real time metrics (Min, Max, and Average values) are provided by the Voice Quality Resource Module, depending on the application being run:

- Active level

- Activity factor

- Noise level

- Peak level

- Listening effort (effort required to understand the meaning of spoken material)

- Listening quality (quality of speech)

These statistics are available in aggregated mode and individual per stream, as part of 'VoIP RTP Per Channel' statistics.