

PROFESSIONAL DIGITAL TWO-WAY RADIO SYSTEM



# MOTOTRBO™ CONNECT PLUS INTERCONNECT GATEWAY

## XRI INTERCONNECT GATEWAY QUICK REFERENCE GUIDE





# Declaration of Conformity

This declaration is applicable to your radio only if your radio is labeled with the FCC logo shown below.

## Declaration of Conformity



### Responsible Party

Name: Motorola Solutions, Inc.

Address: 1303 East Algonquin Road, Schaumburg, IL 60196-1078, U.S.A.

Phone Number: 1-800-927-2744

Hereby declares that the product:

Model Name: **XRI 9100**

conforms to the following regulations:

FCC Part 15, subpart A

### Class B Digital Device

**This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.**

**If this equipment does cause harmful interference in a residential area, the user is required to correct the interference at his own expense.**



**NOTICE:** The user is cautioned that changes or modifications not expressly approved by Motorola could result in the equipment being noncompliant with FCC Class A requirements and void the user's authority to operate the equipment.

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# Commercial Warranty

## Limited Warranty

### MOTOROLA COMMUNICATION PRODUCTS

#### What This Warranty Covers and For How Long

MOTOROLA SOLUTIONS INC. (“MOTOROLA”) warrants the MOTOROLA manufactured Communication Products listed below (“Product”) against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

XRI 9100 Interconnect Gateway	Two (2) Years
-------------------------------	---------------

Motorola, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of Product shall become the property of MOTOROLA.

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## How to Get Warranty Service

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- 2 Defects or damage from misuse, accident, water, or neglect.
- 3 Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
- 4 Breakage or damage to antennas unless caused directly by defects in material workmanship.
- 5 A Product subjected to unauthorized Product modifications, disassemblies or repairs (including, without limitation, the addition to the Product of non-Motorola supplied equipment) which adversely affect performance of the Product or interfere with Motorola's normal warranty inspection and testing of the Product to verify any warranty claim.
- 6 Product which has had the serial number removed or made illegible.
- 7 Rechargeable batteries if:
  - any of the seals on the battery enclosure of cells are broken or show evidence of tampering.
  - the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
- 8 Freight costs to the repair depot.
- 9 Product, does not function in accordance with MOTOROLA's published specifications or the FCC type acceptance labeling in effect for the Product at the time the Product was initially distributed from MOTOROLA.
- 10 Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
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- 2 that MOTOROLA will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and
- 3 should the Product or parts become, or in MOTOROLA's opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit MOTOROLA, at its



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## **Governing Law**

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<https://businessonline.motorolasolutions.com/>

Go to:

**Motorola Online>Resource Center>Product Information>Manuals>MOTOTRBO>Connect Plus**

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## Chapter 1

# Introduction

Thank you for choosing the XRI 9100 Interconnect Gateway, the centralized telephone interconnect equipment in MOTOTRBO™ Connect Plus digital trunking solutions. The XRI is a powerful multiprocessor computer designed to provide SIP-based telephone interconnection and real-time resource management. It is designed as an Ethernet Internet Protocol (IP) device that can be configured for MOTOTRBO Connect Plus single site or multisite trunking operation.

The main features supported by the MOTOTRBO Connect Plus Telephone Interconnect include:

The XRI will connect to up to four Cisco SPA8800 SIP Gateways which in turn connect to the PSTN via standard RJ-11 phone cables. Each SPA8800 can connect to four telephone lines. Alternatively, the XRI can connect to one Cisco Unified Call Manager (CUCM) when the XRI is enabled with the Connect Plus SIP Telephony feature license. When connected to the CUCM, the number of simultaneous phone calls supported by the XRI is determined by the feature license (up to a maximum of 20). The flexibility of the XRI allows it to be located anywhere in the Connect Plus IP network where it can reach both the SIP Gateway and the XRC. The SIP Gateways must be purchased separately, either through Motorola or another supplier.

- Inbound group and Inbound/Outbound private telephone calls
- Disable/enable phone feature privilege per Radio ID & Talkgroup ID
- Configurable call timers
- Manual Dial
- Over Dial, Buffer Dial, and Live Dial
- Manual or VOX keying options
- Custom Voice Announcements
- PIN access
- Event and Call logs



**NOTICE:** Refer to the MOTOTRBO Connect Plus System Planner for more details on system configurations and trunking features.

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## Chapter 2

# Safety Information

For your protection, this product has been tested to various national and international regulations and standards. The scope of this regulatory testing includes electrical and mechanical safety, radio frequency interference, acoustics, and known hazardous materials. Where applicable, approvals obtained from the third-party test agencies are shown on the product label.

### 2.1

## Grounding

This is a safety class I product and has protective grounding terminals. There must be an uninterruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set.



**IMPORTANT:** Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

If your LAN covers an area served by more than one power distribution system, ensure that their safety grounds are securely interconnected.



**CAUTION:** LAN cables may occasionally be subject to hazardous transient voltages such as lightning or disturbances in the electrical utilities power grid. Handle exposed metal components of the network with caution.

### 2.1.1

## Network Connected Equipment

The installation must provide a ground connection for the network equipment.

### 2.1.2

## Cable Connections

All Ethernet and serial ports are designed for connecting to equipment that is located in the same building as the device. Do **not** connect these ports directly to wiring that exits the building where the device is located.

### 2.2

## Servicing

There are no user-serviceable parts inside this product. Any servicing, adjustment, maintenance, or repair must be performed only by a service-trained personnel.

This product has a power switch that must be used to power on the unit after the power cord is plugged in.

### 2.2.1

## Lithium Battery Warning

The Lithium Battery used in device may not be replaced by the user. The Lithium Battery must be replaced by authorized service personnel with the same or equivalent type.

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## Chapter 3

# Installation



**WARNING:** This equipment must be provided with a proper AC protective earth (PE) ground connection.

### 3.1

## Unpacking and Checking Equipment

The device comes wrapped in a plastic bag and secured in Styrofoam protective packaging.

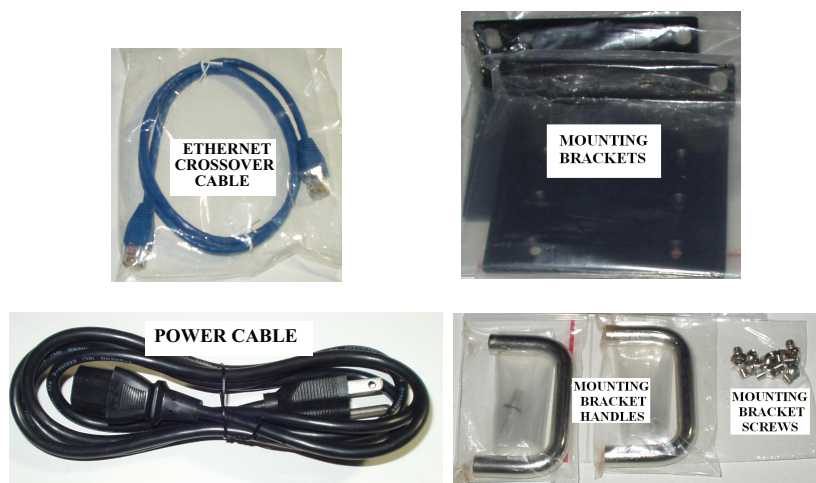
### Procedure:

- 1 Unpack all the individual parts.

The packaging comes with the following list of items:

- The device.
- Power cable terminating in 120 Volt, male, 3-prong connector, if specified in order.
- Ethernet Crossover Cable.
- Quick Start Guide CD.
- Mounting kit:
  - (2) Handles with screws.
  - (2) Rack mounting brackets.
  - (1) Bag of (12) Rack mounting screws.

**Figure 1: List of Supplied Items**



- 2 Inspect the unit for any shipping damage.

If you discover any damages, contact Motorola Solutions immediately. Keep the original packing material in case you need to ship the equipment.

### 3.2

## Initial Power Up

### 3.2.1

## Power Requirements

Input Voltage	100 to 240 VAC auto-ranging (47 to 63 Hz for AC power)
Power Consumption	40 Watts

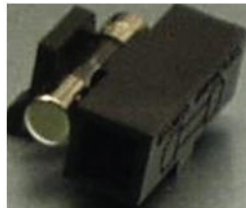
### 3.2.2

## Fuse

The fuse is located underneath the AC Power Input connector (located on the right side of the rear panel).

The fuse can be replaced by using a small flathead screwdriver to remove the fuse holder.

**Figure 2: Fuse**



### 3.2.3

## Connecting the Power Cable

**When and where to use:**

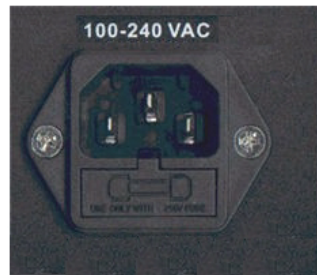


**IMPORTANT:** Power should not be applied until all cables are attached and the unit is ready to operate.

**Procedure:**

- 1 Attach the cable-mounted female connector of the power cord to the panel-mounted male connector (inlet) of the device.
- 2 Attach the male end of the power cord to a properly grounded 100/240 VAC, 50/60 Hz outlet, UPS, power strip, or wall socket.

**Figure 3: Power Input Connector**



### 3.2.4

## On/Off Switch

The device activates once it has power applied through the power cord.

A short press of the On/Off switch powers the device up or down. Powering down by this method can take up to 30 seconds.

A long press of the On/Off switch powers down the device immediately. However, this method should be avoided, if at all possible (see the following caution).



**NOTICE:** If the device is powered down with the On/Off switch and then, the power is removed from the unit (unplugging the cord, power failure, etc), the device automatically powers up when power is restored to the unit.



**CAUTION:** Immediate shutdown (long press of the On/Off switch) can result in loss and/or corruption of data. This method should only be used if the normal power-down is unsuccessful. Any sudden loss of power (such as removing the power cord) can result in loss and/or corruption of data. This is why it is critical to utilize a UPS with the device.

### 3.2.5

## Power Indicator

On the front panel of the unit is a green LED marked with the power symbol.

The LED illuminates when power is properly supplied to the unit and the power switch is turned to the on position.

If the LED does not illuminate, check to see if the fuse is blown.



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## Chapter 4

# Getting Acquainted with the 9100 Model

The sections which follow introduce the front panel and rear panel of the 9100 model device.

### 4.1

## Front Panel

This section explains the indicators and ports found in the front panel of the device.

### 4.1.1

## Front Panel Photo

The following image shows the front panel of the XRI 9100:

**Figure 4: XRI 9100 Front Panel**



### 4.1.2

## Indicators

### 4.1.2.1

## Power LED

On the front panel of the device is a green LED marked with the POWER symbol. The LED illuminates when power is properly supplied to the unit and the POWER switch is turned to the on position.

**Figure 5: Power LED**



### 4.1.2.2

## Storage Activity LED

The yellow LED is located on the left side of the front panel and below the Power LED.

The yellow LED indicates the storage (Hard Drive) activity, eg., the LED lights up when the Hard Drive is being accessed.

**Figure 6: Storage Activity LED**



#### 4.1.2.3

### PWR1 and PWR2 LEDs

PWR1 and PWR2 are red LEDs that are not currently used.

They are located to the immediate right of the Power and Storage Activity LEDs.

#### 4.1.2.4

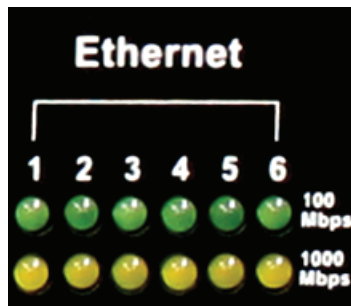
### Ethernet Activity LEDs

The six pairs of Ethernet LEDs are labeled 1-6.

The number above the LED corresponds to the Ethernet port number (LAN1-LAN6) on the Rear Panel of the device. For each Ethernet port, there is a green LED and a yellow LED. The LED illuminates continuously when carrier is present but no messages are being passed. The LED blinks when messages are present.

- The green LED lights up if the corresponding Ethernet port has activity at a 100 Mbps communications rate.
- The yellow LED lights up if the corresponding Ethernet port has activity at a 1000 Mbps communications rate.

**Figure 7: Ethernet Activity LEDs**



#### 4.1.2.5

### Serial Activity LEDs

The eight pairs of Serial LEDs are labeled 1-8.

The number above the LED corresponds to the Serial port number (P1-P8) on the Rear Panel of the device. For each Serial port, there is a green LED and a yellow LED.

- The green LED lights up for transmit (TX) activity on the corresponding Serial port.
- The yellow LED lights up for receive (RX) activity on the corresponding Serial port

**Figure 8: Serial Activity LEDs**

## 4.1.2.6

**Programmable LEDs**

The eight LEDs located in the area labeled “Programmable LED” are not currently used.

## 4.2

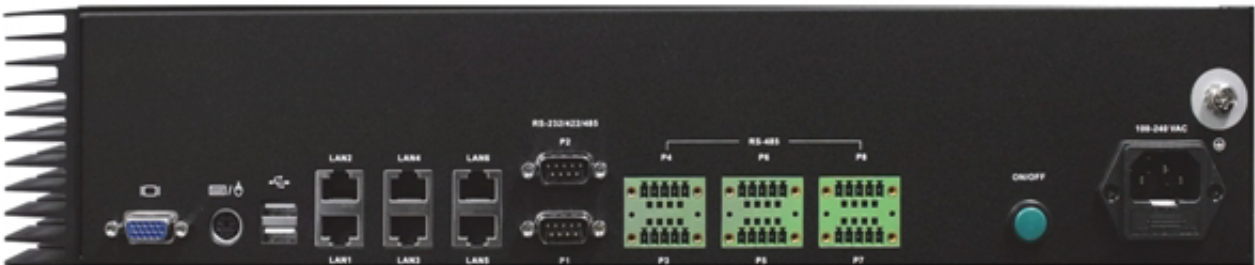
**Rear Panel**

This section explains the ports found in the rear panel of the device.

## 4.2.1

**Rear Panel Photo**

The following image shows the rear panel of the device.

**Figure 9: XRI Rear Panel**

## 4.2.2

**Ports**

## 4.2.2.1

**Video (VGA) Port**

The VGA port is located on the left side of the rear panel. It can be used to attach a display monitor to the unit.

**Figure 10: Video (VGA) Port**

#### 4.2.2.2

### PS/2 Port

The PS/2 port is located on the left side of the rear panel and to the right of the VGA port. It is used for connecting a keyboard or a mouse.

**Figure 11: PS/2 Port**



#### 4.2.2.3

### Universal Serial Bus (USB)

There are two USB ports located on the right side of the front panel. The USB port is used for memory expansion, where applicable.

**Figure 12: Universal Serial Bus (USB)**



#### 4.2.2.4

### Ethernet Ports (6)

There are six Gigabit Ethernet LAN ports (labeled LAN1 to LAN6) are located on the rear panel and to the right of the USB ports.

**Figure 13: Ethernet Ports**



#### 4.2.2.5

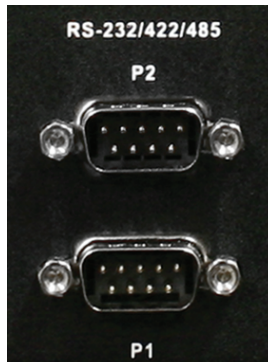
### RS-232/422/485 Serial Ports (P1-P2)

There are two RS-232/422/485 Serial (COM) Ports labeled P1 and P2. They are located on the rear panel and to the right of the Ethernet LAN ports.



**NOTICE:** Only P1 (COM1) port is currently supported by Connect Plus for external serial communications.

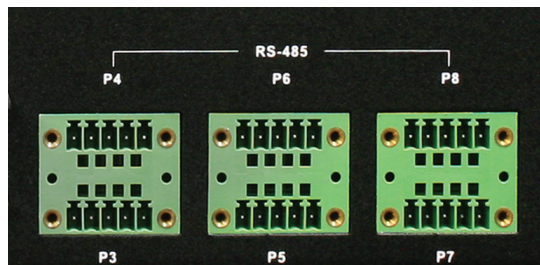


**Figure 14: RS-232/422/485 Serial Ports (P1-P2)**

## 4.2.2.6

**RS-485 Serial Ports (P3-P8)**

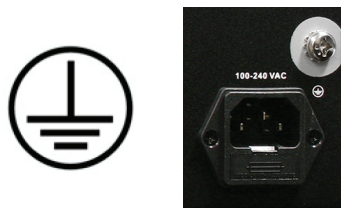
There are six RS-485 Serial (COM) Ports labeled P3 through P8. These ports are located on the rear panel and to the right of the P1 and P2 Serial Ports. They are not currently used.

**Figure 15: RS-485 Serial Ports (P3-P8)**

## 4.2.2.7

**Grounding Connection**

The device panel provides a screw as a grounding point. The screw is identified with the symbol for Earth Ground and is located above and to the right of the Power Input.

**Figure 16: Grounding Connection**

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**Chapter 5**

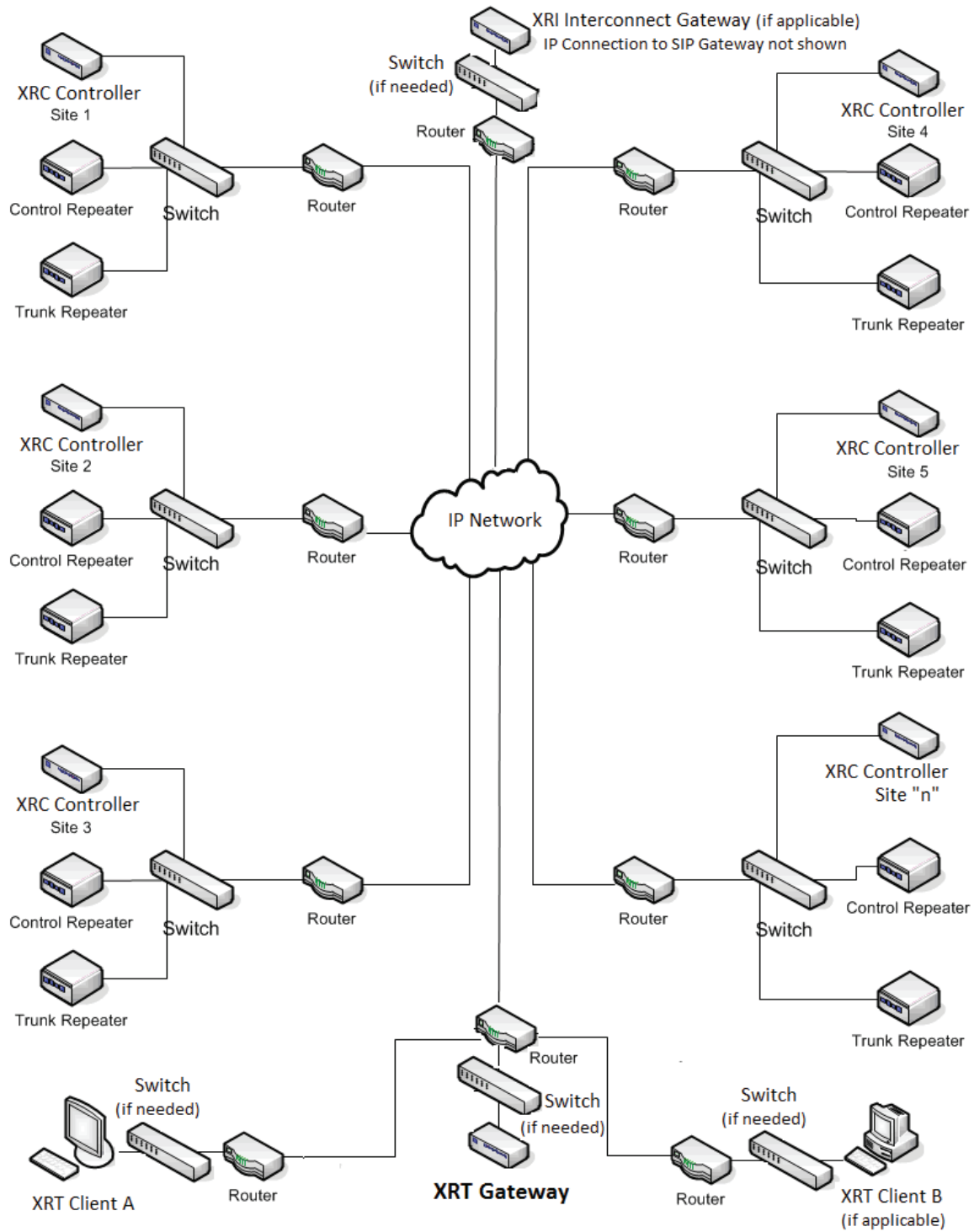
# System Connections


This section describes how to connect the device into a Connect Plus system.

**5.1**

## Block Diagram

The following figure provides a general overview of Connect Plus network hardware. The figure is provided as example, and is not representative of every network or topology. Please note that the XRC, XRT, and XRI do not currently support multicast IP traffic. The System Administrator must design or configure the IP network such a way that no Multicast messages are sent to the XRC, XRT or XRI. The XRT and XRT Client can be co-located, if desired, as long as this important guideline is followed.



 **NOTICE:** See the MOTOTRBO Connect Plus System Planner for more information on network topologies and IP considerations.

## 5.2

### PC Connection for Initial Configuration

There are multiple methods to connect to the device. The two most common methods are described in the following sections.

#### 5.2.1

#### Ethernet Port Connection of the Device

The Network Parameters of the PC will have to be temporarily changed to match the default Network Parameters of the device. Once the Network Parameters of the device are set for your network, then the Network Parameters of the PC can be returned to their original settings. See [PC Connection for Initial Configuration on page 29](#)

#### 5.2.2

#### Direct Connection: PC to Device

Plug one end of a Category 5 Ethernet crossover cable into the LAN1 port, located on the left side of the rear panel of the device. Plug the other end of the cable into any available Ethernet port on the PC.

**Figure 17: Connect the PC to the device using a LAN cable**



#### 5.2.2.1

#### Connecting to the Device Through An Ethernet Switch

**Prerequisites:** Minimum switch requirements:

- 100 Mbps ports
- Managed (recommended but not required)

**Procedure:**

- 1 Plug one end of a straight-through Category 5 Ethernet cable into the LAN1 port located on the left side of the rear panel of the device.
- 2 Plug the other end of the cable into any available port on the Ethernet Switch.
- 3 Plug the other end into the site Ethernet switch.

#### 5.2.3

#### Connecting Through the Serial Port of the Device

**Procedure:**

- 1 Plug one end of a null modem cable into P1 serial port (COM1 port) located in the middle of the rear panel of the device.
- 2 Plug the other end of the cable into any available serial port on a Personal Computer.

**Figure 18: Null Modem Cable**



### 5.3

## Site Installation

Because the device connects via IP to the SIP Gateway(s) and to the Controller sites of the device, this provides flexibility as to where the device is physically installed. For information on installing the device in a rack, see [Mounting the Device In A Rack on page 31](#)

### 5.3.1

## Power Recommendations

### 5.3.1.1

## Backup Power Source

Emergency backup power systems usually consist of two components: a UPS and a generator. This section only describes the UPS; the selection of the generator is beyond the scope of this document.

A UPS can serve a number of purposes such as filtering out power events, conditioning and providing power if primary power source fails. On the average, the time a UPS is expected to do this, is under five minutes which gives enough time to shut down equipment and for the backup power generator to take over the load.

Depending on your configuration and needs, the following areas require different emphasis:

- Surge Suppression
- Power Conditioning
- Battery Backup

It is strongly recommended that the XRI and its supporting network equipment (router and switches) are backed up by UPS. The XRI is a 40 W unit. Check the power requirements of other devices (such as network equipment) when calculating the required capacity of a UPS system.

See [Appendix A Determining the UPS Capacity](#).

### 5.3.1.1.1

## Primary Power Source

The primary power source can be supplied through the following:

- AC power receptacles (wall sockets)
- Rack mount power distribution unit
- Rack mount power strip
- Vertical power strips

**Figure 19: Primary Power Source**

#### 5.3.1.1.2

### Importance of Providing Back-Up Power

This device is a power-computing device, and like other computers, a power-loss causes the device to lose information not saved to the hard drive or non-volatile memory.

#### 5.3.2

### Mounting the Device In A Rack

The device can be mounted in a system rack.

**Prerequisites:** There are different types of racks, as follows:

- Rails and base only



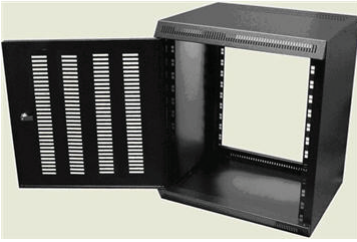
- Enclosure without a door



- Enclosure without a door on wheels



- Enclosure with a door



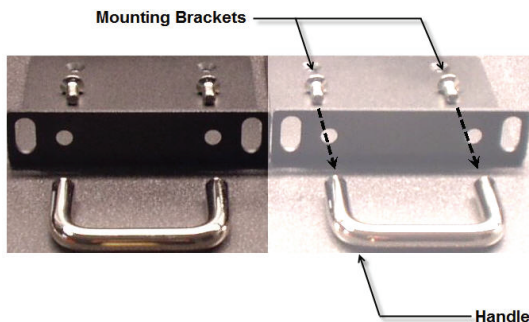
- Enclosure with a glass door



Select the mounting type that is suitable for your environment.

**Procedure:**

- 1 Using four screws, attach the handles to the mounting brackets by fastening them via the through holes.



- 2 Line up the six screw holes in the mounting brackets with the six screw receptacles in each side panel of the device. Use the mounting bracket screws to attach the brackets to the device.
- 3 Install the device in the rack.
- 4 Adjust the mounting bracket to fit.  
Adjustment should not be required for standard EIA racks.
- 5 Using four rack screws, secure the unit to the mounting rails.

5.3.3

### Connection of the Device to the SIP Gateway

The device is not directly connected to the SIP Gateway.

The two devices communicate via IP networking via the LAN or WAN. There are configuration parameters in both devices that allow them to communicate via the network. The LAN1 port of the device is the primary LAN port that is used for all network communications.



## Chapter 6

# Communicating with the Device

This chapter describes the communication with the device after physical installation and after electrical connections are in place.

Before proceeding, ensure that all the connections are still in place and secure.

### 6.1

## Configuring the PC Network for Initial Configuration

**Prerequisites:** The following procedure is for Microsoft® Windows Vista™ Operating System. For other operating systems, consult your IT department.

### Procedure:

- 1 From the **Start** menu select the **Control Panel**.
- 2 Select **Network and Internet**.
- 3 Select **Network and Sharing Center**.
- 4 Click **Manage network connections**.
- 5 Select **Local Area Connection** from the list.
- 6 From the sub-menu, select **Change settings of this connection**.  
The Local Area Connection Properties window appears.
- 7 Select **Internet Protocol Version 4 (TCP/IPv4)** connection and click the **Properties** button.  
The Internet Protocol (TCP/IP) Properties window appears.
- 8 Select the **Use the following IP address** radio button and enter the following information:  
IP address: 192.168.1.21 (192.168.1.15 through 192.168.1.20 are the default IP addresses for LAN1 – LAN6 of the device respectively)  
Subnet mask: 255.255.255.0  
Default gateway: 192.168.1.1
- 9 Click the **OK** button to return to the Local Area Connection Properties window.
- 10 Click the **OK** button in the Local Area Connection Properties window to complete the PC Network Communications setup.

### 6.2

## Connect Plus Network Manager Connection Tool Software

Microsoft .NET Framework Requirement: A PC can (and frequently does) have multiple versions of Microsoft .NET Framework. To utilize Network Manager versions prior to Connect Plus System Release 1.3, the PC must have at least one of the following .NET Framework versions: 2.0, 3.0 or 3.5.

To utilize a Network Manager version for Connect Plus System Release 1.3 (or later), the PC must have .NET Framework version: 4.0. To see what versions are on your PC, check Control Panel>Add or Remove Programs.

### 6.2.1

## Installing MOTOTRBO Connect Plus Network Manager Connection Tool on the PC

**Prerequisites:** Download the Installation folder from Motorola Online (MOL). The folder includes two (2) files:

#### **Setup.exe**

This is the application that is used to install the MOTOTRBO Connect Plus Network Manager Connection Tool software on your PC.

#### **MOTOTRBO Connect Plus Network Manager Connection Tool Setup.msi**

Microsoft Windows Installation file.

#### **Procedure:**

- 1 From the Installation folder, double-click the setup.exe file.
- 2 Answer the questions and follow the prompts provided by the Installation Wizard.
- 3 The Installation Wizard provides a message when installation is complete. Follow the prompt to close the message and to exit the Installation Wizard.

### 6.2.2

## Launching the MOTOTRBO Connect Plus Network Manager Connection Tool Software

#### **When and where to use:**



**IMPORTANT:** Do not open more than one instance of the MOTOTRBO Connect Plus Network Manager Connection Tool on the same computer, as this can result in unexpected and undesirable operation.

#### **Procedure:**

Launch the MOTOTRBO Connect Plus Network Manager Connection Tool Software through one of the following applications:

- **Desktop Icon**

Double-click on the icon shown as follows. The Setup Wizard creates an icon on the Desktop that is a shortcut to the MOTOTRBO Connect Plus Network Manager Connection Tool Application during installation.



- **Start Menu**

To run the MOTOTRBO Connect Plus Network Manager Connection Tool application through the Start menu, select **Start**, choose **All Programs**, then **Motorola Solutions**, and then select **MOTOTRBO Connect Plus Network Manager Connection Tool**.

- **Program Files Folder**

To run the MOTOTRBO Connect Plus Network Manager Connection Tool Application through the **Program Files** folder, navigate to the Program Files folder, open **Motorola Solutions** folder, locate and open the MOTOTRBO Connect Plus Network Manager Connection Tool folder, and then double-click on the **MOTOTRBO Connect Plus Network Manager Connection Tool.exe**.

### 6.2.3

## Establishing Connection with the Device

### 6.2.3.1

#### Device Power Up and Power Down

The device activates once it has power applied through the power cord. When there is no loss of power, normal power-up accomplished with a momentary press of the On/Off switch.

The device can be powered down with a short press of the On/Off switch. This can take up to 30 seconds. This is the recommended method for powering down. If the device is powered down with the On/Off switch, and then the power is removed from the unit (unplugging the cord, power failure, etc.), the device automatically powers up when power is restored to the unit.

If the On/Off switch is pressed with a long press (about 10 seconds) then the unit immediately shuts down. This power-down method should be avoided, if at all possible.



**CAUTION:** Immediate shutdown (long press of the On/Off switch) can result in loss and/or corruption of data. It should only be used if the normal power-down is unsuccessful. Any sudden loss of power (such as removing the power cord) can result in loss and/or corruption of data. This is why it is critical to utilize a UPS with the device.

### 6.2.3.2

#### MOTOTRBO Connect Plus Network Manager Connection Tool

The MOTOTRBO Connect Plus Network Manager Connection Tool program is used to connect your PC to the XRI Interconnect Gateway and/or the XRC controller. Upon connecting to the XRI or XRC, the Network Manager Connection Tool starts the MOTOTRBO Connect Plus Network Manager, the software program that is used to monitor and configure the XRC controller and the XRI.

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**MN000961A01-BB**