TMG3200 & TMG3200 +1
Installation Guide

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Preface

About this Guide

This guide provides installation, setup, and maintenance procedures for Tmedia Standalone systems and Tmedia 1+1 systems.

Conventions

Terminology	Description
Tmedia VoIP Gateway	This term is used when a description, in this document, applies to both the TMG3200 and TMG3200 +1.
Tmedia Standalone System	This term is used when a description, in this document, applies to the TMG3200 operating as a standalone unit.
Tmedia 1+1 System	This term is used when a description, in this document, applies to the TMG3200 operating in conjunction with the TMG3200 +1. This term also includes the 1+1 patch panels.
TMG3200	This term is used when a description, in this document, applies to all variations of the TMG3200 units, such as the TMG3200-RJ, TMG3200-TE, TMG3200-DS3, and TMG3200-STM1.
TMG3200 +1	This term is used when a description, in this document, applies to all variations of the TMG3200 +1 units, such as the TMG3200-RJ+1, TMG3200-TE+1, TMG3200-DS3+1, TMG3200-STM1+1.
1+1 Patch Panel	This term is used when a description, in this document, applies to all variations of 1+1 patch panels, which enable a TMG3200 to connect to a TMG3200 +1. 1+1 Patch panels are comprised of the TMG800 1+1 patch panel, TMG3200-TE 1+1 patch panel, TMG3200-DS3 1+1 patch panel, and TMG3200-STM1 1+1 patch panel.

Contact Us

If you have comments about this guide or any other TelcoBridges technical documentation, please send an E-mail to support@telcobridges.com.

Table of Contents

Chapter 1 Introduction

This chapter provides an introduction to the installation and setup for the following system configurations:

- Tmedia Standalone System: TMG3200 operating in standalone mode.
- Tmedia 1+1 System: TMG3200 operating in conjunction with a TMG3200 +1, including associated 1+1 patch panels

The following topics are covered:

- Recognizing your Tmedia 1+1 system (shown in figure 1.1 and figure 1.2).
- Installation overview
- Installation prerequisites
- Other recommended reading

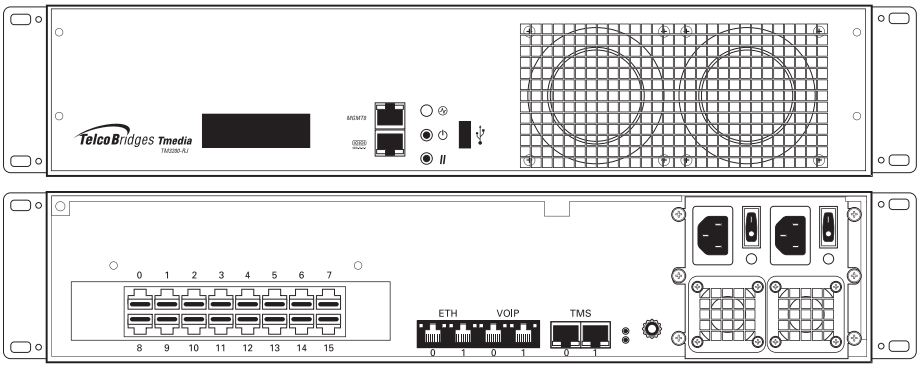
1.1 Installation Overview

The installation and setup of a Tmedia 1+1 system (see figure 1.1 on page 3 and figure 1.2 on page 4) is described by a series of topics in the following order:

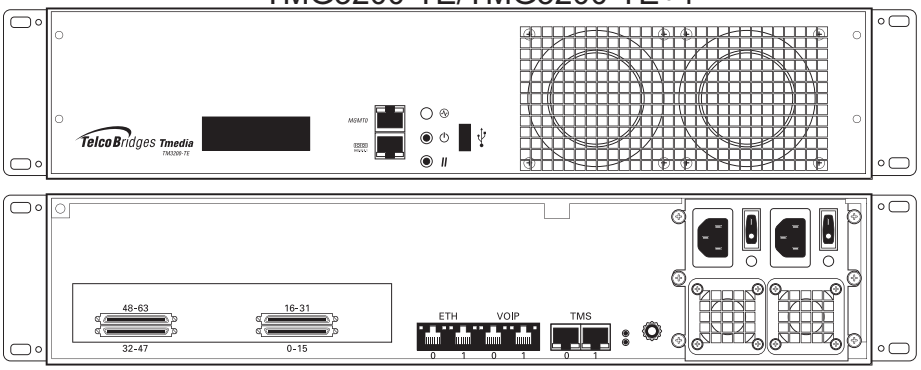
- Rack mounting the Tmedia 1+1 system
- Connecting to the Tmedia Management Interface
- Connecting to the VoIP network
- Connecting to the PSTN
- Powering Up
- Initial System Configuration

Note: In addition to installation procedures, a series of topics are provided describing upgrades, maintenance, and troubleshooting of a Tmedia 1+1 system.

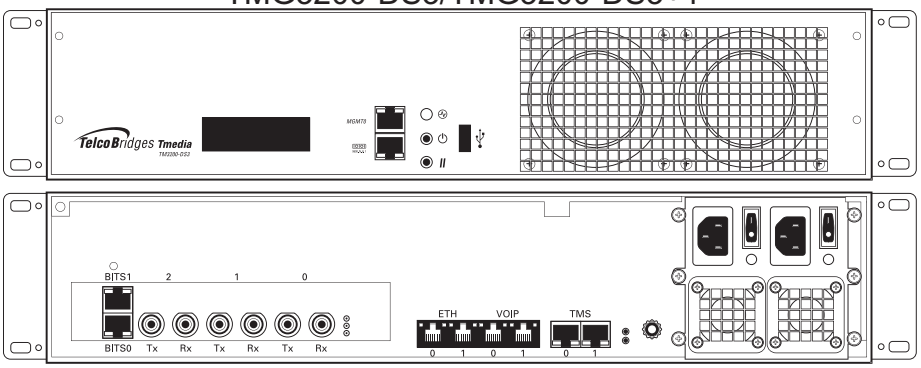
TMG3200-RJ/TMG3200-RJ+1



TMG3200-TE/TMG3200-TE+1



TMG3200-DS3/TMG3200-DS3+1



TMG3200-STM1/TMG3200-STM1+1

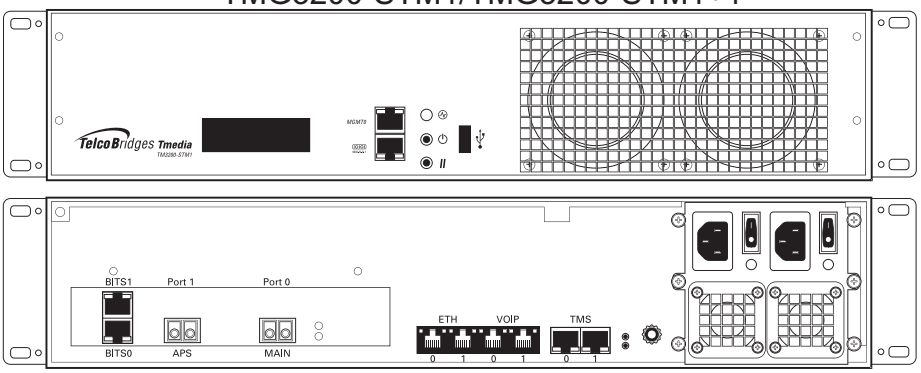


Figure 1.1 TMG3200 and TMG3200 +1 Front and Rear Views

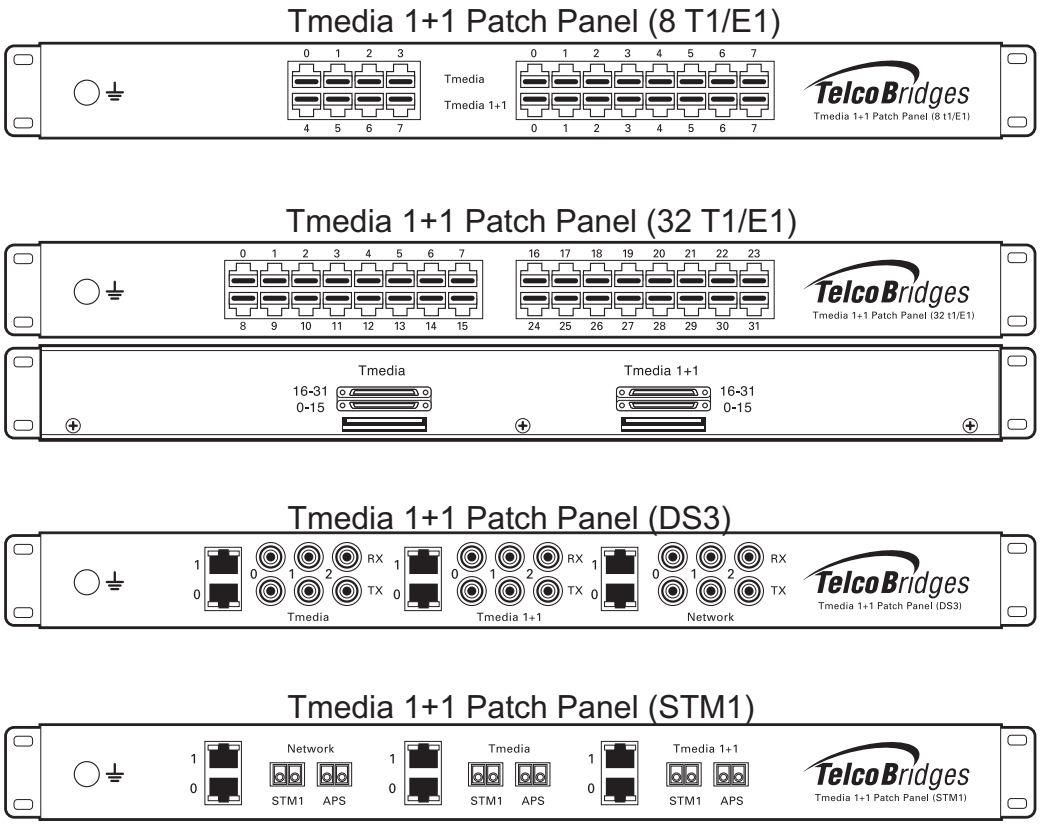


Figure 1.2 1+1 Patch Panels

1.2 Installation Prerequisites

For the installation to proceed without interruption, it is important that you verify that you have all necessary materials on hand.

Prior to the installation, you should have:

- Adequate space for the installation of your Tmedia 1+1 system. You will need to mount the Tmedia 1+1 system on a 19” equipment rack (customer provided).
- Adequate power supply and power connections. The TMG3200 and TMG3200 +1 require one to two power connections each. To guarantee an uninterrupted supply, each power connection must be fed by a dedicated power source.
- An IP address for the management port. To avoid delays, you should have the IP address, netmask and gateway addresses on hand. Take note that the management port supports DHCP, see Section 2.5.1 “Connecting to the Tmedia 1+1 System Management Interfaces” on page 29 for further information.

1.3 Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It may occur if electronic printed circuit cards are improperly handled and may cause complete or intermittent failure.

Always follow ESD prevention procedures when removing and replacing modules:

- Ensure that all equipment is properly grounded.
- Wear an ESD-preventive wrist strap and ensure that it makes good contact with your skin. Connect the wrist strap clip to an unpainted surface of the equipment or the grounded equipment rack in order to channel away all ESD voltage safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must be in proper working condition.
- If no wrist strap is available, and you must work with the equipment, ground yourself by touching a metal part of the chassis.

1.4 Recommended Reading

This document assumes that you have a clear understanding of the installation of TelcoBridges Tmedia 1+1 systems and have been trained to work with the equipment. If you have any technical questions, TelcoBridges TB Support (technical support team) can be reached by telephone or e-mail:
Telephone: 1-866-438-4703
support@telcobridges.com.

Documents exploring various aspects of the Tmedia system are available at the TelcoBridges TBWiki:
http://docs.telcobridges.com/mediawiki/index.php/Main_Page

Chapter 2 Installing the Equipment

This chapter provides information about the following topics:

- Package contents
- Rack mounting a Tmedia 1+1 system
- Connecting to the Tmedia management interface
- Connecting to a VoIP network
- Connecting to a PSTN network
- Connecting power
- Powering down

2.1 Package Contents

Depending on your system requirements, you may receive one or more of the following items:

- Section 2.1.1 “TMG3200” on page 8.
- Section 2.1.2 “TMG3200 +1 (includes its associated 1+1 patch panel)” on page 9.
- Section “1+1 Patch Panels” on page 10.

The contents of these devices are described in the following sections.

2.1.1 TMG3200

In the TMG3200 box, you will find the following items:

- One (1) TMG3200 unit (TMG3200-RJ, TMG3200-TE, TMG3200-DS3, or TMG3200-STM1). See figure 1.1 on page 3.
- One (1) set of mounting brackets and screws, used to mount the TMG3200 to a 19" rack.
- One (1) DB-9 to RJ-45 adapter to interface the serial port of your computer with the RJ-45 port of the TMG3200.
- Three (3) CAT5 Ethernet (blue) straight cables (male-male), 3 meters in length.
- One (1) Important Notice (two-sided document containing pertinent product serial numbers, and other important information).
- One (1) Product Warranty.
- One (1) packing slip.
- One (1) Quick Installation Guide (two-sided document that provides a pictorial view of the equipment setup).
- Two (2) AC or DC power cables

Specifically with the TMG3200-TE, you will also have:

- One (1) or two (2) patch panel(s)
- Two (2) SCSI cables per patch panel.

Not included

- A 19” equipment rack. The TMG3200 must be installed on a 19” wide equipment rack.

2.1.2 TMG3200 +1 (includes its associated 1+1 patch panel)

- One (1) TMG3200 +1 unit (TMG3200-RJ+1, TMG3200-TE+1, TMG3200-DS3+1, or TMG3200-STM1+1). See figure 1.1 on page 3.
- One (1) set of mounting brackets and screws, used to mount the TMG3200 +1 to a 19" rack.
- One (1) DB-9 to RJ-45 adapter, to interface the serial port of your computer with the RJ-45 port of the TMG3200.
- Five (5) CAT5 Ethernet (blue) straight cables (male-male), 3 meters in length.
- One (1) Important Notice (two-sided document containing pertinent product serial numbers, and other important information).
- One (1) Product Warranty.
- One (1) packing slip.
- One (1) Quick Installation Guide (two-sided document that provides a pictorial view of the equipment set-up).
- Two (2) AC or DC power cables.
- The associated 1+1 patch panel for the TMG3200 +1. See figure 1.2 on page 4 for further details.

Specifically for the TMG3200-TE+1, you will also have:

- The associated TMD network cables. See figure 1.2 on page 4 for further details.

Not included with the TMG3200 +1:

- A 19" equipment rack. The TMG3200 must be installed on a standard 19" wide equipment rack.

1+1 Patch Panels

1+1 patch panels are required for the proper connection of the Tmedia 1+1 system, and are automatically included when a TMG3200 +1 is ordered. Table 2.1 lists the various 1+1 patch panels that you will receive based upon the Tmedia VoIP gateway used by the Tmedia 1+1 system.

Table 2.1 1+1 Patch Panels

1+1 Patch Panel (8/T1/E1)	Provides connection for up to 8 T1/E1 lines from the network to the 1+1 Patch Panel (8 T1/E1) and then links to the TMG3200-RJ and TMG3200-RJ+1 To connect the TMG3200-RJ-8 to its +1 unit you require one (1) 1+1 Patch Panel (8 T1/E1). To connect the TMG3200-RJ-9 and greater capacity (up to the TMG3200-RJ-16) to its respective +1 unit, you require two (2) 1+1 Patch Panels (8 T1/E1). Cables provided: You will be provided with 16 RJ48C cables (yellow), two meters in length, per 1+1 Patch Panel (8 T1/E1) you receive.
1+1 Patch Panel (32/T1/E1)	Provides connection for up to 32 T1/E1 lines from the network to the TMG3200-TE and TMG3200-TE+1. To connect the TMG3200-TE-16 and the TMG3200-TE-32 to their respective +1 units and the network, you will required one (1) 1+1 Patch Panel (32 T1/E1). To connect the TMG3200-TE-48 and the TMG3200-TE-64 to their respective +1 units and the network, you will require two (2) 1+1 Patch Panel (32 T1/E1). Cables provided: 4 SCSI straight cables per 1+1 Patch Panel (32 T1/E1). Three meters in length. This provides connection for up to 32 lines.
1+1 Patch Panel (DS3)	Provides connection for up to 3 DS3 lines from the network to the TMG3200-TE and TMG3200-TE+1. Cables provided (with each 1+1 Patch Panel (DS3)): • 12 DS3 cables, each two meters in length. • 4 RJ48C straight cables (yellow), two meters in length.
1+1 Patch Panel (STM1)	Provides connection of 1 STM1 line from the network to the TMG3200-STM1 and TMG3200-STM1+1. Cables provided (with each 1+1 Patch Panel (STM1)): • 4 pairs of fiber optic cables, two meters in length. • 4 RJ48C straight cables (yellow), two meters in length.

2.2 Rack Mounting Tmedia Equipment

The Tmedia equipment is mounted on a customer provided equipment rack using the mounting hardware packaged in the box.

2.2.1 Prerequisites

To rack mount the Tmedia equipment, you will need:

- One 19” customer-provided equipment rack. The rack must be solidly anchored to the floor with appropriate support at the top of the racks.
- Climate controlled room: 0 to +50 Celsius, 0 to 95% non-condensing humidity.

2.2.2 Vertical Placement of Tmedia Equipment

The TMG3200 and TMG3200 +1 are each housed in a 2U chassis, as tabulated in table 2.2 on page 11. It is important that you provide for enough room on the equipment rack to allow for the installation of the TMG3200 and TMG3200 +1. Consider the available space on your equipment rack and the height of the TMG3200, TMG3200 +1, and a 1+1 patch panel. Due to the rear-exhaust heat vents and the efficient heat dissipation design, there is no need to leave any physical vertical space above or below the TMG3200 and TMG3200 +1 on the equipment rack.

Table 2.2 Tmedia 1+1 System: Physical Height

Tmedia Model Number	Vertical Height
TMG3200	2U (3.5 inches or 89.10 mm)
TMG3200 +1	2U (3.5 inches or 89.10 mm)
Patch Panels	1U (1.75 inches or 44.45 mm)

2.2.3 Installing the Tmedia 1+1 System on an Equipment Rack

The TMG3200, TMG3200 +1, and patch panels are mounted on a 19” equipment rack using the angle brackets and screws provided in the box.

To mount the TMG3200 proceed as follows:

1. Using four metal screws, attach one angle bracket to the front, left-hand side of the TMG3200, when viewed from the front, as shown in figure 2.1 on page 13. Do the same for the angle bracket on the right-hand side.

2. Start mounting equipment at the top-most position of the rack, keeping in mind the space required on the equipment rack as described in Section 2.2.2 “Vertical Placement of Tmedia Equipment” on page 11.

To mount the TMG3200 +1 proceed as follows:

1. Install the TMG3200 +1 below the TMG3200, as shown in figure 2.1 on page 13.

2. To attach the TMG3200 +1 to the equipment rack, follow the previous procedure.

To mount a 1+ 1patch panel proceed as follows:

1. Install the 1+1 patch panel below the TMG3200 +1, as shown in figure 2.1 on page 13.

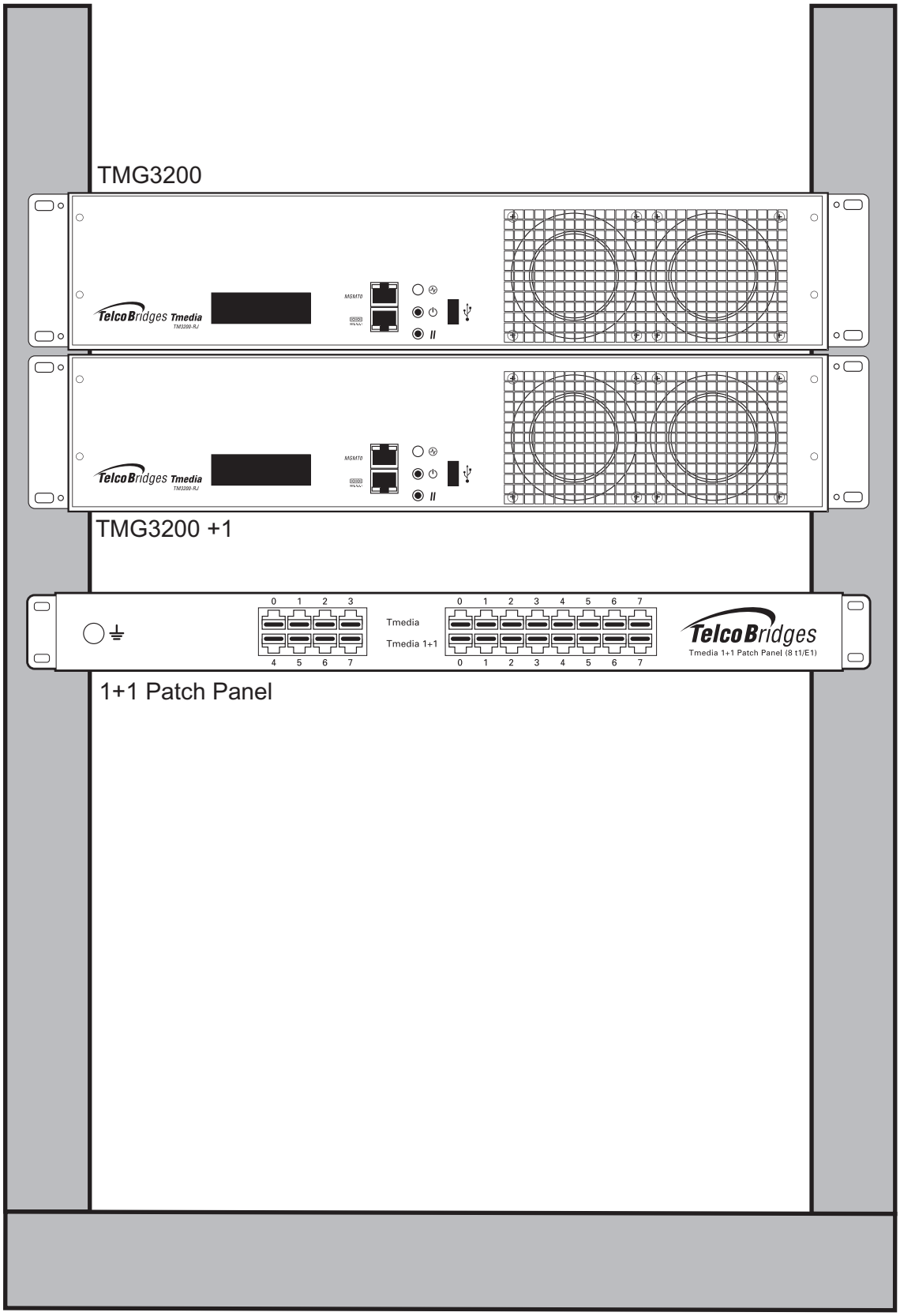


Figure 2.1 Rack Mounting a Tmedia 1+1 System

2.3 Choosing your Connection Procedures

Use the following diagram to guide you in selecting your installation section.

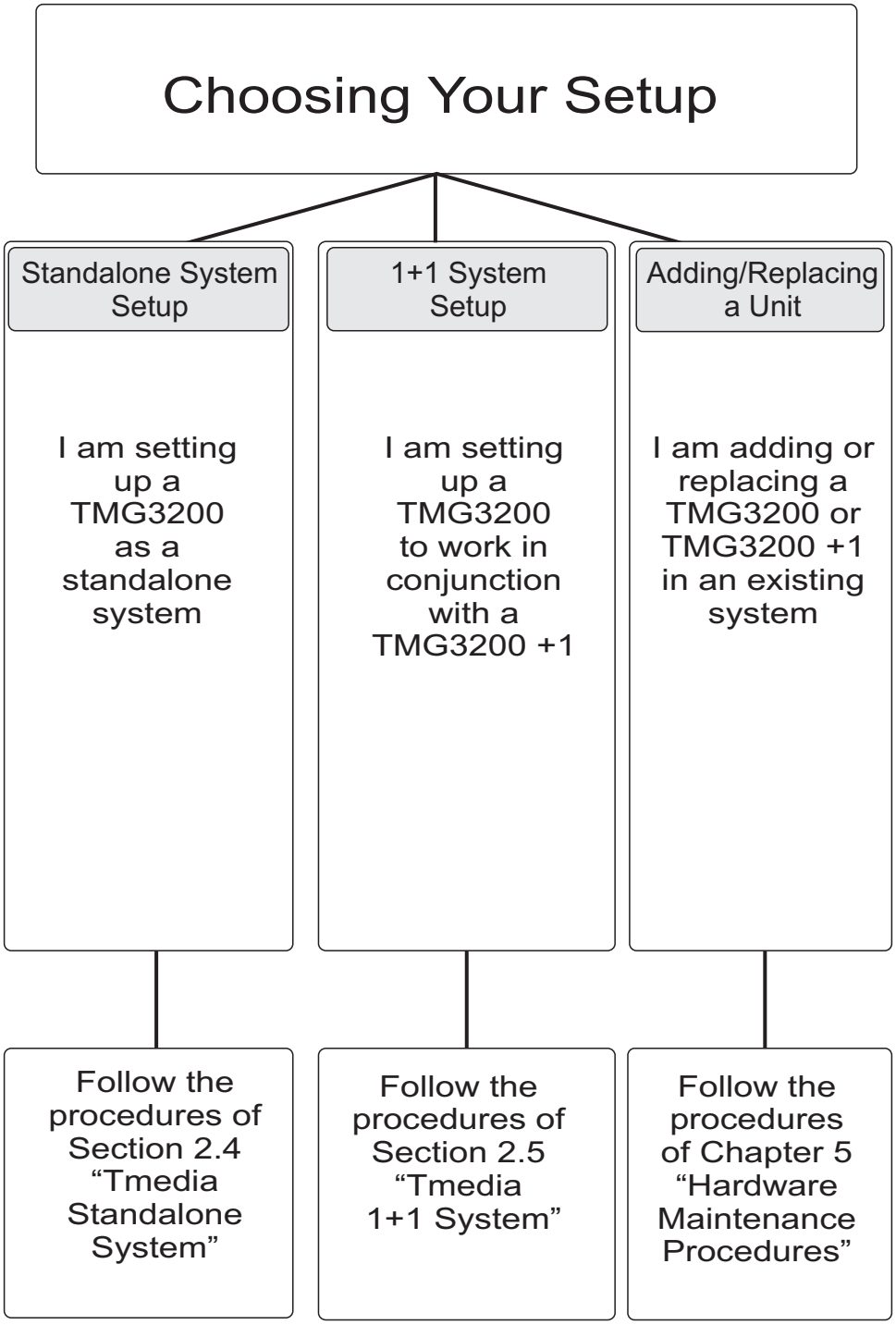


Figure 2.2 Choosing your setup.

2.4 Tmedia Standalone System

If you are here, you have a TMG3200 that you will setup as a standalone system. This section covers the following procedures for a TMG3200 standalone system:

2.4.1 Connecting to the Tmedia Management Interface

The Tmedia Management interface enables administrators to perform management tasks on the TMG3200.

Prerequisites

To communicate with the Tmedia Management Interface, the following is needed:

- One CAT5 Ethernet cable with RJ45 male-male terminations.

Interconnections

The TMG3200 provides a Tmedia Management Interface, using one Gigabit Ethernet network link, as shown in figure 2.3 on page 16.

To communicate with the Tmedia Management Interface:

1. Connect the supplied CAT5 Ethernet cable to the port labelled “MGMT0” at the front of the TMG3200.

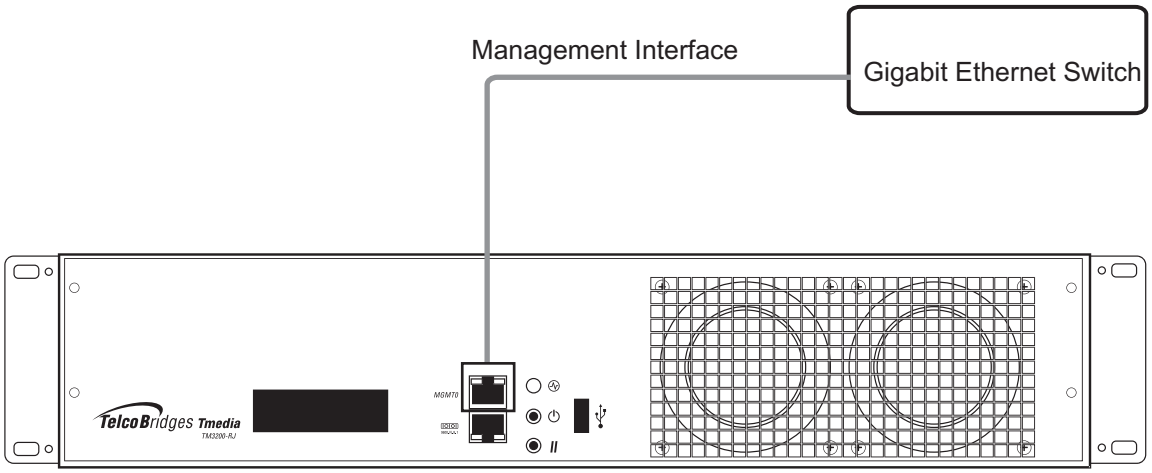


Figure 2.3 Tmedia Management Interface

2.4.2 Connecting to a VoIP Network

The TMG3200 features dual GigE ports for connection to different VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the TMG3200 will continue to manage VoIP traffic using the alternate network.

The IP address of the VoIP ports can be modified using the web portal.

Note: Certain configurations of the TMG3200 will exceed 100 Mbps, therefore 1000 Mbps is recommended.

Prerequisites

To connect the TMG3200 to the VoIP network, you will need:

- Gigabit layer 2 Ethernet switch. A second one is required to support redundancy of the VoIP interface.
- One or two CAT5 Ethernet cables with RJ45 male-male terminations.
- If your system has access to a second VoIP network, you can connect it to a second VoIP interface of the TMG3200 with an RJ45 (male-male) CAT5 Ethernet cable.

Connections

The TMG3200 is connected to the VoIP network by one or optionally two Ethernet GigE network links, as shown in figure 2.4 on page 17.

To connect the TMG3200 to the VoIP network:

1. Connect a CAT5 Ethernet cable to VoIP0 at the rear of the TMG3200. Connect the other end of the same CAT5 cable to the Gigabit Ethernet switch.

2. If your system employs a second Gigabit Ethernet switch for redundancy, connect a second CAT5 Ethernet cable to VoIP1 at the rear of the TMG3200. Connect the other end of the same CAT5 cable to the second Gigabit Ethernet switch.

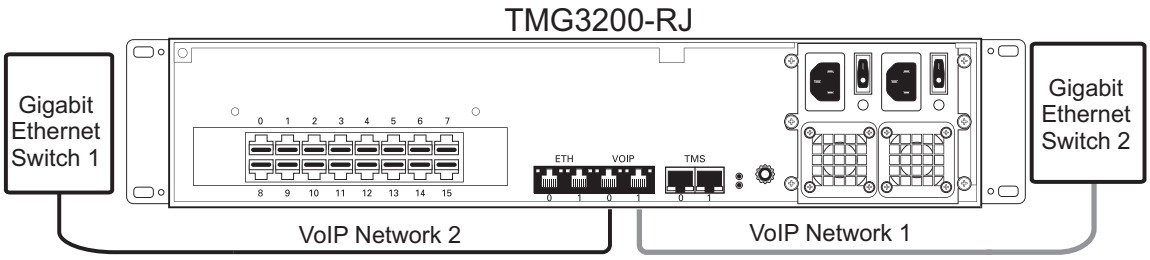


Figure 2.4 Connecting to the VoIP Network

2.4.3 Connecting to the PSTN

The TMG3200 features a variety of interfaces to the PSTN network.

Prerequisites

To connect the TMG3200 to the PSTN network, you must comply with one of the following:

- Your TMG3200-RJ features 16 modular 8-conductor RJ48C type jacks for connection to T1/E1 lines. You will need one cable for each (T1/E1) interface. If you are making your own cables, refer to page 91 in Appendix A in for crossover or straight cable wiring connections.
- Your TMG3200-TE features SCSI connectors for connection to T1/E1 lines. You will require one 1+1 patch panel for each 32-line grouping of T1/E1 line interfaces on the TMG3200.
- Your TMG3200-DS3 features BNC connectors for connection to DS3 lines. You will require two coaxial cables for each DS3 interface.
- Your TMG3200-STM1 features electrical or optical STM-1 connectors. You will require two fibre optic cables for each STM-1 interface.

2.4.3.1 RJ48C Type Interface (T1/E1) for the TMG3200-RJ

A TMG3200-RJ with 16 RJ48C type ports enables the connection to T1/E1 lines. The termination impedance is set at 100 ohms for T1 lines and 120 ohms for E1 lines. It is possible to connect an external balun in order to convert the line impedance to 75 ohms.

If you are making your own cables, refer to page 91 in Appendix A for crossover or straight cable wiring connections.

Note All ports may not be active. T1/E1 ports are activated by software license; the number of active ports depends on the licenses purchased.

To connect the TMG3200-RJ (RJ48C type) to the PSTN:

1. Start with port 0 located at the top and leftmost position. Connect one cable between this port and the T1/E1 line. See figure 2.5 on page 19.

2. Repeat step 1, using the next available port.

TMG3200-RJ

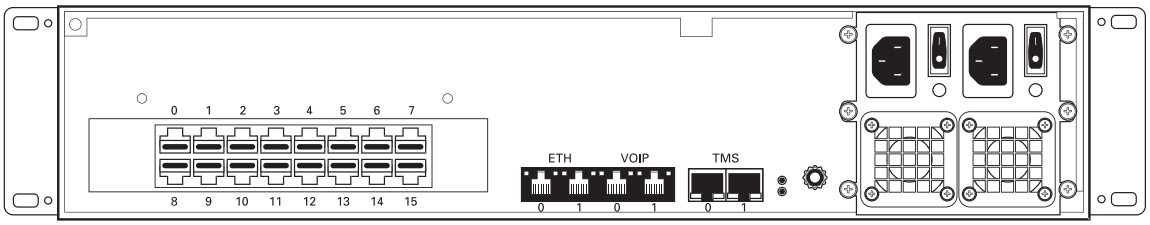


Figure 2.5 16-Port Interface to the PSTN

2.4.3.2 SCSI Interface (T1/E1) for the TMG3200-TE

A TMG3200-TE with 4 SCSI connectors enables the connection to T1/E1 lines. The termination impedance is set at 120 ohms. It is possible to connect an external balun in order to convert to 75 ohms.

Note All ports may not be active. T1/E1 ports are activated by software license; the number of active ports depends on the licenses purchased.

Note Patch panels use straight connections. In other words, they do not cross the RX and TX signals. Connections between the patch panels and the TMG3200 require straight cables. The supplied SCSI cables are straight cables. Cables used to connect the network to the patch panel must do the cross connection.

To connect the TMG3200-TE to the PSTN:

1. Start with SCSI ports 0-15 located at the bottom right as shown in figure 2.6 on page 21. Connect one SCSI cable between this port and SCSI patch panel number 1, ports 0-15. Connect SCSI ports 16-31 to patch panel number 1, ports 16-31.

2. Repeat step 1, using lines 32-63 and a second patch panel. Connect lines 32-47 to patch panel 2, ports 0-15. Connect lines 48-63 to patch panel 2, ports 16-31.

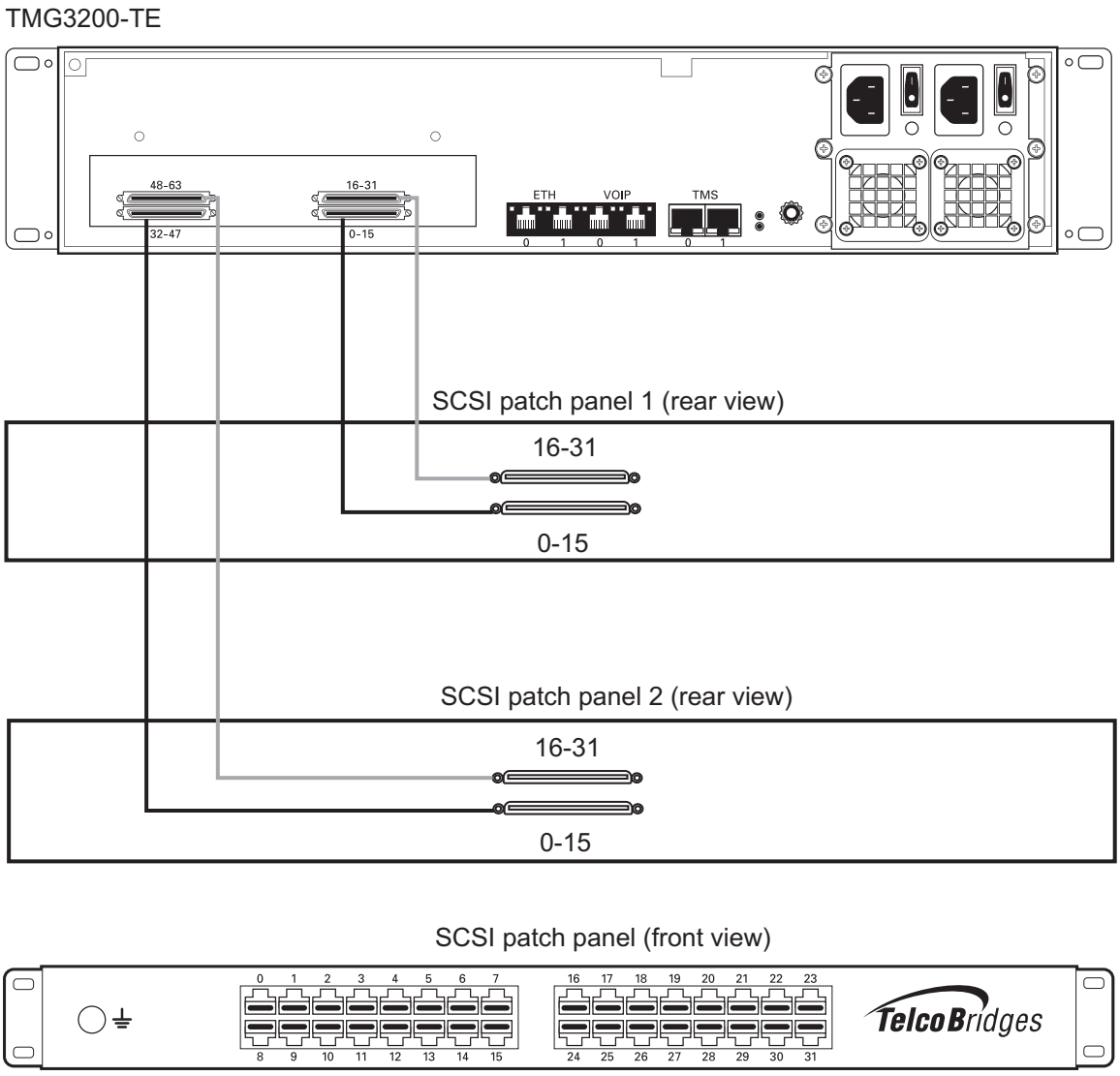


Figure 2.6 TMG3200 with SCSI connectors

2.4.3.3 Dual BNC Interface (DS3) for the TMG3200-DS3

A TMG3200-DS3 with 3 sets of BNC connectors enables the connection to DS3 lines. See figure 2.7 on page 22.

Note All ports may not be active. DS3 ports are activated by software license; the number of active ports depends on the licenses purchased.

To connect the TMG3200-DS3 to the PSTN:

1. Start with the Dual BNC port pair #0 (right-most) as shown in figure 2.7 on page 22. Connect one pair of BNC cables between this port and the DS3 line.

2. Repeat step 1, using the next available pair of BNC PSTN interface ports.

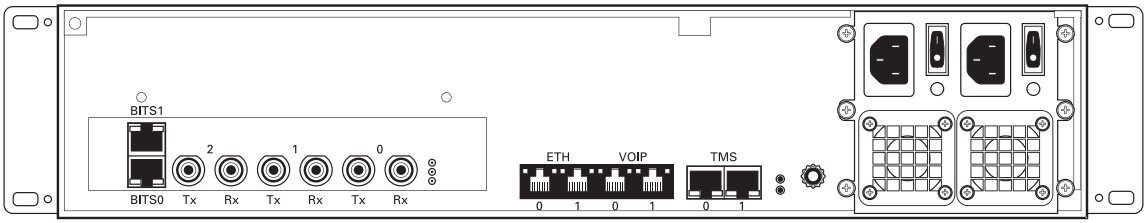


Figure 2.7 DS3 Interface to the PSTN

2.4.3.4 Optical Interface (OC3/STM-1) for the TMG3200-STM1

A TMG3200-STM-1, with one main and one backup OC3 or STM1 port enables connection to OC3/STM1 lines. See figure 2.8 on page 23. Refer to table 2.3 on page 23 for a listing of optical interfaces. The default SFP module for OC3/STM1 connection is SMF, intermediate reach, (SFP-OC3-IR1) 1310 nm with LC type connectors.

Note Please make certain that the correct SFP model is selected at the time of ordering. If your installation requires a different model from the one that has been provided, you must replace it.

Table 2.3 Optical Interfaces

Transceiver Model	Description	Spec	Mode	Type	Range (Km.)	Wavelength (NM)	Connection
SFP-OC3-IR1	OC3/STM1	Hot Pluggable	Single-mode	Intermediate reach	15	1310	LC
SFP-STM1E	STM1E (Electrical)	Hot Pluggable	75 ohms Cooper	Max 180m	1	NA	DIN (mini-coax)

Automatic Protection Switching

The APS port is used for OC3/STM1 redundancy. Switchover occurs automatically based on configurable parameters. It is recommended that APS be used if the installation provides this feature.

To connect the TMG3200-STM1 (Optical Interface) to the PSTN:

1. Connect a fiber optic cable between the Port 0 (Main) port and OC3/STM1 line, as shown in figure 2.8 on page 23.

2. Connect a fiber optic cable between the Port 1 (APS) port and OC3/STM1 line.

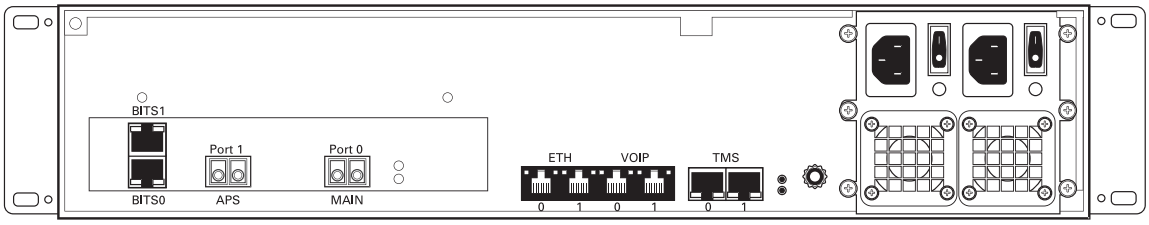


Figure 2.8 Optical Interface to the PSTN

2.4.4 Powering Up

The TMG3200 is furnished with two AC or DC power connections. Only once all other equipment installation work has been completed should the TMG3200 be powered up.

2.4.4.1 Connecting to AC Power

Prerequisites

To power the TMG3200, you will need:

- One to two power sources.
- Two power cables for the TMG3200.

The TMG3200 AC model is furnished with two AC power connectors.

To connect the TMG3200 to AC Power:

1. Connect an AC power cable between the AC connector of the TMG3200 and an AC supply. See figure 2.9 on page 24.

Note If the TMG3200 features a second power supply and it is not connected to an AC power source, press the green button located at the rear of the unit to disable the audible alarm. See figure 2.9 on page 24.

2. Power up the TMG3200 by turning on its power switch(es).

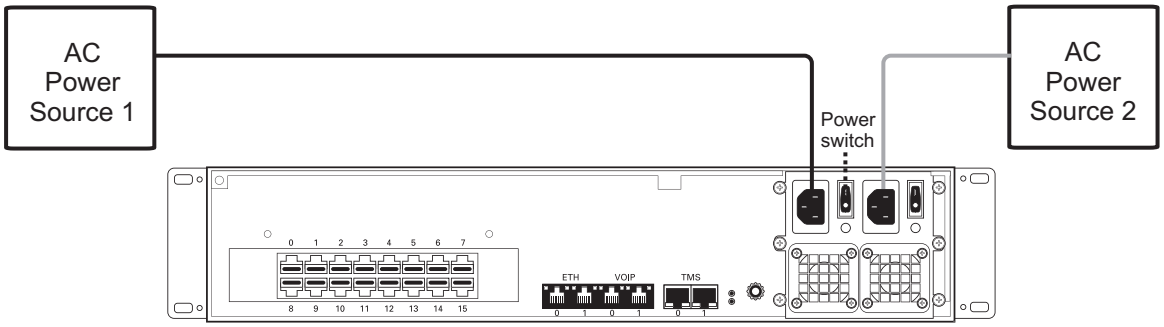


Figure 2.9 AC Power Connection

2.4.4.2 Connecting to DC Power

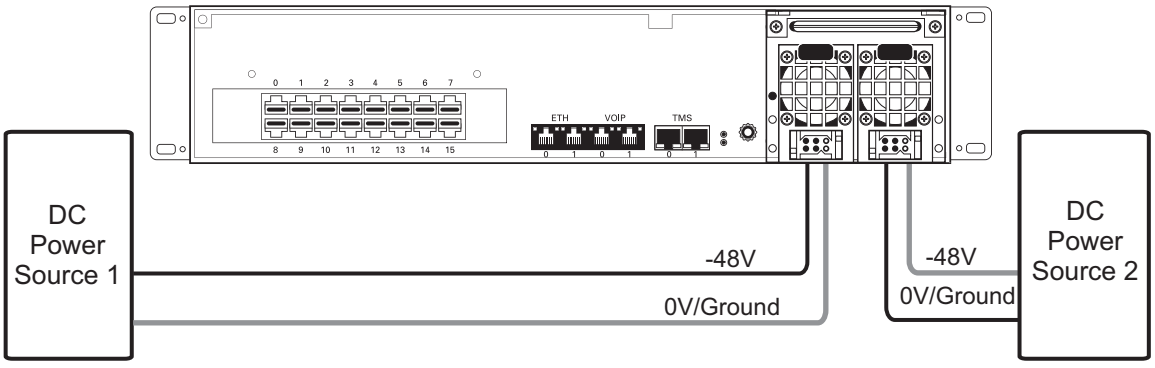
The TMG3200 DC model is furnished with two DC power connection ports. In addition, each DC powered TMG3200 is supplied with two DC power cables.

To connect the TMG3200 to DC power:

1. Connect one DC cable, supplied with the TMG3200, as shown in figure 2.10 on page 25, to the DC outlet at the rear of the TMG3200.

Note Two types of cable with different coloring are available. Refer to figure 2.10 on page 25 for the appropriate wiring information.

2. Connect one lead of the DC power cable to the positive terminal of the DC power source.
3. Connect the other lead of the DC power cable to the negative side of the DC power source.
4. Repeat steps 1-3 for the second power DC power source.



Cable Type	Voltage	
	Ov/Ground	-48V
Yellow/Black	Black	Yellow
Red/Black	Red	Black

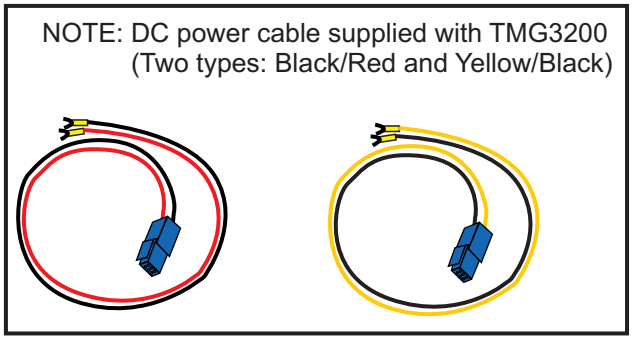


Figure 2.10 TMG3200 DC Wiring Diagram

2.4.5 Start Up

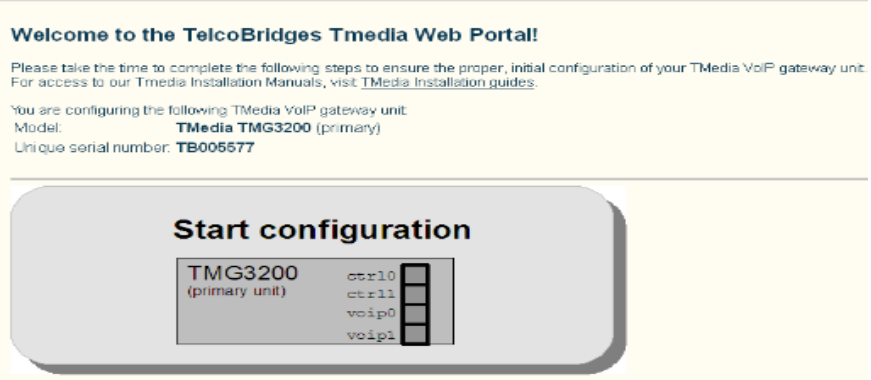
The first time that you connect to a Tmedia VoIP gateway, you must configure it as a standalone unit.

Once the configuration settings have been applied, your TMG3200 will start up and display the web portal configuration management tool.

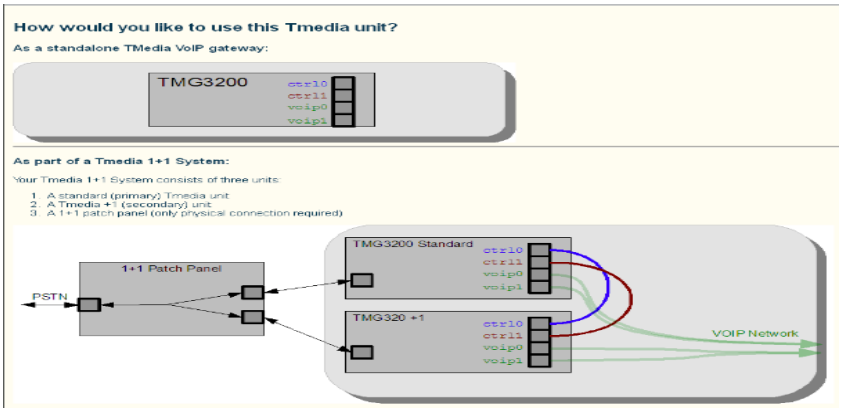
2.4.5.1 Configuring the Role

To configure the role of your TMG3200 as a standalone unit, do the following:

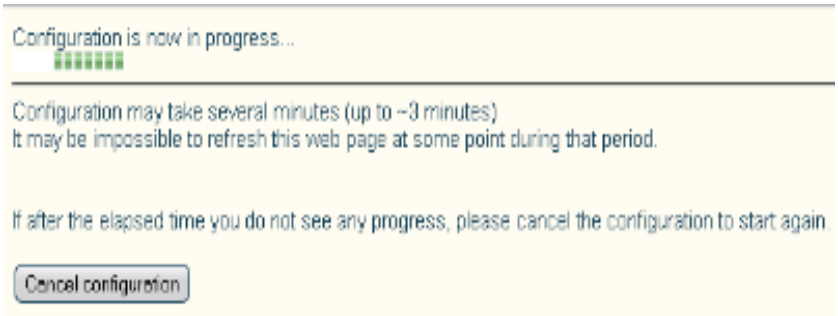
1. Connect to the web portal of the standalone unit. The Welcome page appears.



2. Click the TGM3200 image to set the role of the TMG3200 as a Standalone Tmedia VoIP gateway.



The Progress page is displayed, confirming the change.



2.5 Tmedia 1+1 System

If you are here, you have a Tmedia 1+1 system. This section covers the following procedures for a Tmedia 1+1 system:

2.5.1 Connecting to the Tmedia 1+1 System Management Interfaces

The Tmedia Management Interface enables administrators to perform management tasks on a Tmedia 1+1 system.

Prerequisites

To communicate with the Tmedia Management Interface, the following is needed:

- Two CAT5 Ethernet cables with RJ45 male-male terminations.

Interconnections

Within a 1+1 system there is a management interface for a TMG3200 and a TMG3200 +1, each requiring a Gigabit Ethernet network link. See figure 2.11 on page 29.

To communicate with the Tmedia Management Interface:

1. Connect an RJ45 cable from the TMG3200 to a Gigabit Ethernet switch.
2. Connect an RJ45 cable from the TMG3200 +1 to a Gigabit Ethernet switch.

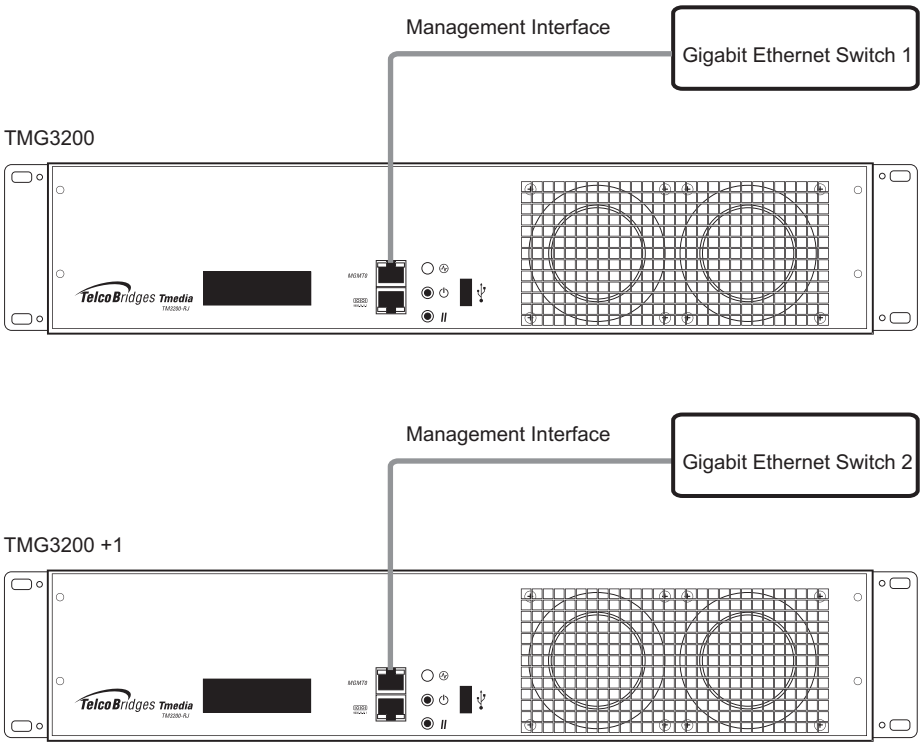


Figure 2.11 Tmedia 1+1 System Management Interface

2.5.2 Connecting to the Tmedia Control Network

The Tmedia Control network enables a TMG3200 to be connected to a TMG3200 +1, allowing for a sharing of system resources.

Prerequisites

To connect the TMG3200 and TMG3200 +1 to the Tmedia control network, you will need:

- Two CAT5 Ethernet cables with RJ45 male-male terminations.

Connections

The TMG3200 and TMG3200 +1 are connected to the Tmedia control network using two CAT5 Ethernet cables, as shown in figure 2.12 on page 30.

To connect to the Tmedia control network:

1. Connect the ETH0 connector on the TMG3200 to the ETH0 connector on the TMG3200 +1.
2. Connect the ETH1 connector on the TMG3200 to the ETH1 connector on the TMG3200 +1.

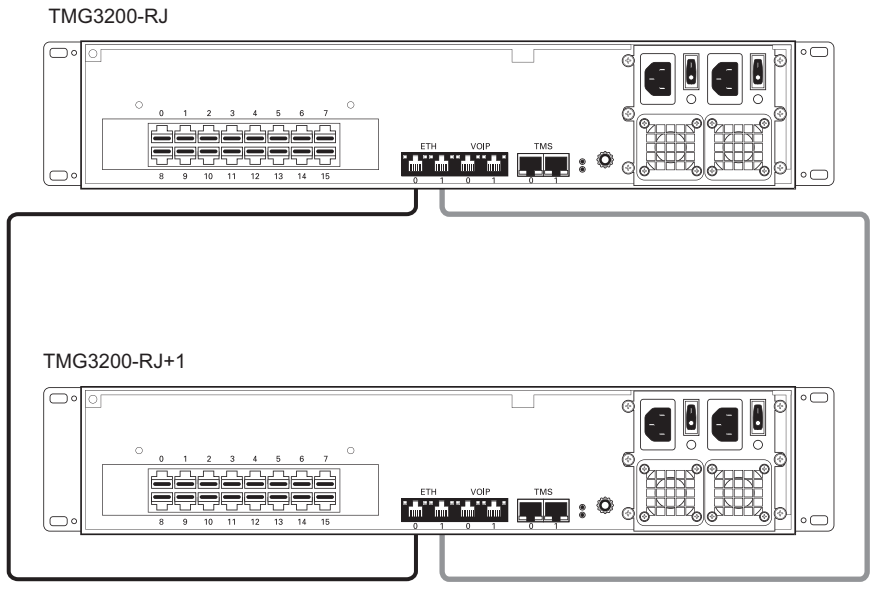


Figure 2.12 Connecting to the Tmedia Control Network

2.5.3 Connecting the Tmedia 1+1 System VoIP Network(s)

Each Tmedia TMG3200 and TMG3200 +1 features dual GigE ports for connection to different VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the Tmedia 1+1 system will continue to manage VoIP traffic using the alternate network.

The IP address of the VoIP ports can be modified using the web portal.

Note: Certain configurations of a Tmedia 1+1 system will exceed 100 Mbps, therefore 1000 Mbps is recommended.

Prerequisites

To connect the TMG3200 and TMG3200 +1 to the VoIP network, you will need:

- Two gigabit layer 2 Ethernet switches. A second one is required to support redundancy of the VoIP interface.
- Four CAT5 Ethernet cables with RJ45 male-male terminations.
- Two IP addresses located on different subnets.

Connections

The TMG3200 and TMG3200 +1 are connected to the VoIP network by one or optionally two Ethernet GigE network links, as shown in figure 2.13 on page 31.

To connect to the VoIP network:

1. Connect the VoIP0 connector from both the TMG3200 and TMG3200 +1 to the first Gigabit Ethernet switch.
2. Connect the VoIP1 connector from both the TMG3200 and TMG3200 +1 to the second Gigabit Ethernet switch.

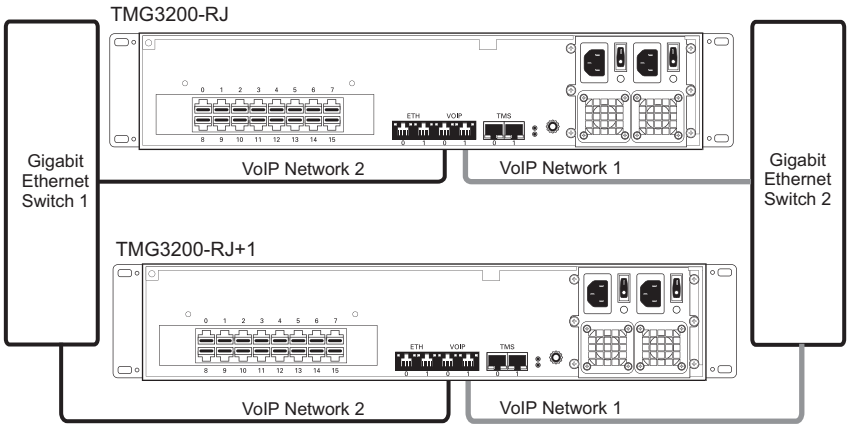


Figure 2.13 Connecting to the VoIP Network

2.5.4 Connecting to the PSTN in a Tmedia 1+1 System

The Tmedia 1+1 system features a variety of interfaces to the PSTN network.

Prerequisites

To connect the Tmedia 1+1 system to the PSTN network, you must comply with one of the following:

- Your TMG3200-RJ and TMG3200-RJ+1 feature 16 modular 8-conductor RJ48C type jacks for connection to T1/E1 lines. You will need one cable for each (T1/E1) interface. If you are making your own cables, refer to figure a.1 on page 92 in Appendix A for crossover or straight cable wiring connections.
- Your TMG3200-TE and TMG3200-TE+1 feature SCSI connectors for connection to T1/E1 lines. You will require one 1+1 patch panel for each 32 line grouping of T1/E1 line interfaces on a Tmedia 1+1 system.
- YourTMG3200-DS3 and TMG3200-DS3+1 feature BNC connectors for connection to DS3 lines. You will require two coaxial cables for each DS3 interface.
- Your TMG3200-STM1 and TMG3200-STM1+1 feature electrical or optical STM-1 connectors. You will require two fibre optic cables for each STM-1 interface.

2.5.4.1 RJ48C Type Interface (T1/E1) for the TMG3200-RJ and TMG3200-RJ+1

A Tmedia 1+1 system with an RJ TDM interface featuring 16 RJ48C type ports enables the connection to T1/E1 lines. The termination impedance is set at 100 ohms for T1 lines and 120 ohms for E1 lines. It is possible to connect an external balun in order to convert to 75 ohms. If you are making your own cables, refer to page 91 in Appendix A in Appendix A for crossover or straight cable wiring connections.

Note All ports may not be active. T1/E1 ports are activated by software license; the number of active ports depends on the licenses purchased.

Note Patch panels use straight connections. In other words, they do not cross the RX and TX signals. Connections between the patch panels and a Tmedia 1+1 system require straight cables. The supplied T1/E1 cables are straight cables. Cables used to connect the network to the 1+1 patch panel must do the cross connection.

To connect both the TMG3200-RJ and TMG3200-RJ+1 (RJ48C type) to the PSTN:

1. Connect T1/E1 lines 0-7 from the network section of the 1+1 patch panel to the remote equipment. See figure 2.14 on page 34.

2. Connect T1/E1 lines 0-7 from the RJ48C connectors of the TMG3200-RJ section of the 1+1 patch panel to the TMG3200-RJ.

3. Connect T1/E1 lines 0-7 from the RJ48C connectors of the TMG3200-RJ+1 section of the 1+1 patch panel to the TMG3200-RJ+1.

Note: To connect eight more lines to the TMG3200-RJ and the TMG3200-RJ-1+1, install another 1+1 patch panel and connect the additional eight lines to ports 8-15 on each unit.

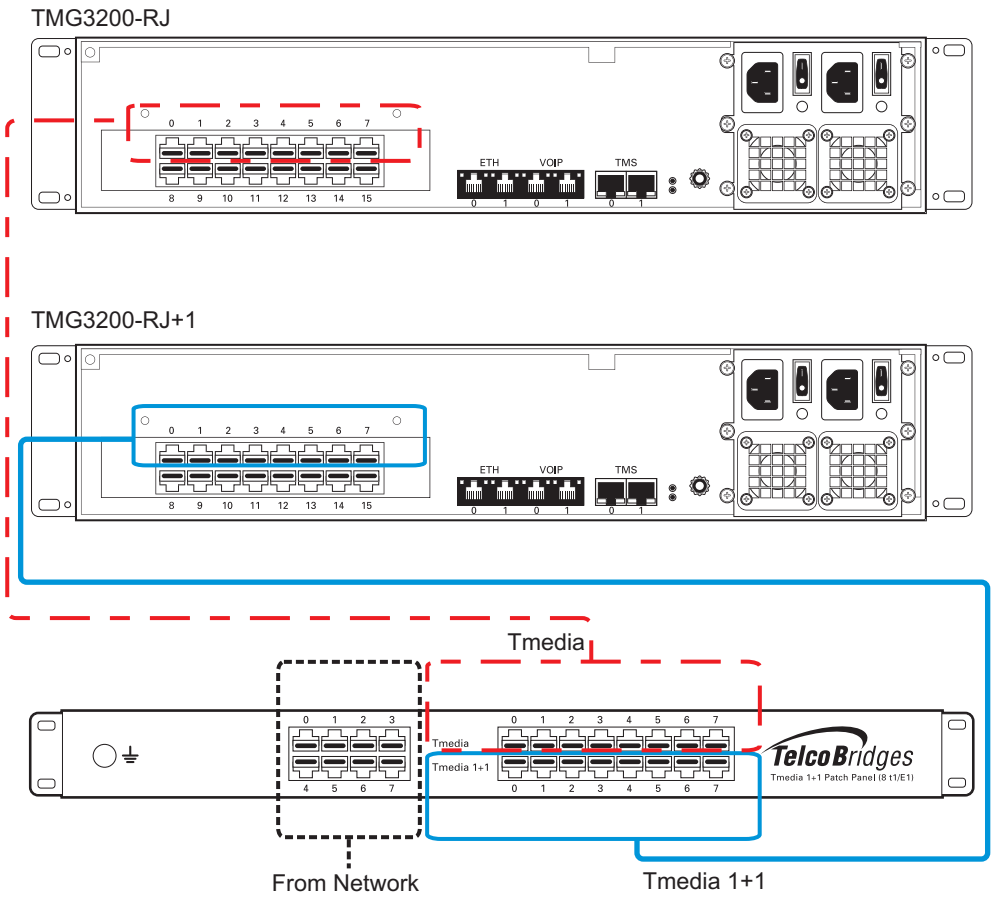


Figure 2.14 TMG3200-RJ and TMG3200-RJ+1 connecting to the TDM 1+1 8/T1/E1 1+1 patch panel

2.5.4.2 SCSI Interface (T1/E1) for the TMG3200-TE and TMG3200-TE+1

A TMG3200-TE and TMG3200-TE+1 each with 4 SCSI connectors enables the connection to T1/E1 lines. The termination impedance is set at 120 ohms. It is possible to connect an external balun in order to convert to 75 ohms.

Note All ports may not be active. T1/E1 ports are activated by software license; the number of active ports depends on the licenses purchased.

Note Patch panels use straight connections. In other words, they do not cross the RX and TX signals. Connections between patch panels and Tmedia 1+1 systems requires straight cables. (The supplied SCSI cables are straight cables.) Cables that are used to connect the network to the 1+1 patch panel must make the cross connection.

To connect both the TMG3200-TE and TMG3200-TE+1 (SCSI) to the PSTN:

1. Connect each T1/E1 line from the network section of the 1+1 patch panel to the remote equipment. See figure 2.15 on page 36.
2. Connect SCSI ports 0-15 from the Tmedia section at the rear of the 1+1 patch panel to the SCSI ports 0-15 of the TMG3200-TE.
3. Connect SCSI ports 16-31 from the Tmedia section at the rear of the 1+1 patch panel to the SCSI ports 16-31 of the TMG3200-TE.
4. Connect SCSI ports 0-15 from the Tmedia 1+1 section at the rear of the 1+1 patch panel to the SCSI ports 0-15 of the TMG3200-TE+1.
5. Connect SCSI ports 16-31 from the Tmedia 1+1 section at the rear of the 1+1 patch panel to the SCSI ports 16-31 of the TMG3200-TE+1.

Note: To connect 32 more lines to the TMG3200-TE and the TMG3200-TE+1, install another 1+1 patch panel and connect the additional 32 lines to ports 32-63 on each unit.

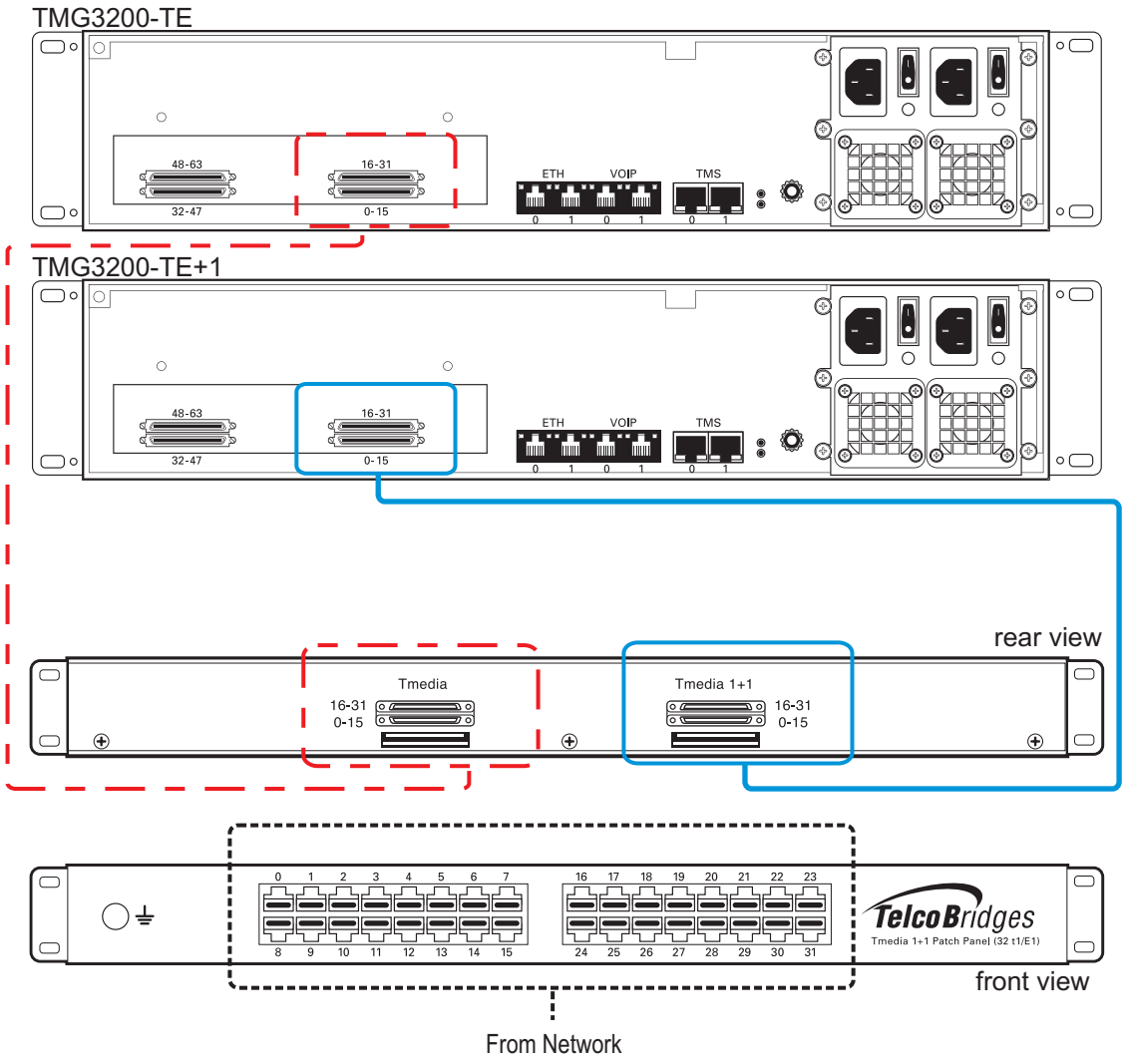


Figure 2.15 TMG3200-TE and TMG3200-TE+1 connecting to the TDM 1+1 32/T1/E1 1+1 patch panel

2.5.4.3 Dual BNC Interface (DS3) for the TMG3200-DS3 and TMG3200-DS3+1

A TMG3200-DS3 and TMG3200-DS3+1 each with 3 sets of BNC connectors enables the connection to DS3 lines. See figure 2.16 on page 37.

Note All ports may not be active. DS3 ports are activated by software license; the number of active ports depends on the licenses purchased.

Note Patch panels use straight connections. In other words, they do not cross the RX and TX signals. You must connect RX to RX, and TX to TX. Connections between patch panels and Tmedia 1+1 systems require straight cables. Cables used to connect the network to the 1+1 patch panel must do the cross connection.

To connect both the TMG3200-DS3 and TMG3200-DS3+1 to the PSTN:

1. Connect each DS3 line from the network section of the 1+1 patch panel to the remote equipment. See figure 2.16 on page 37.
2. Connect each DS3 line from the DS3 connectors of the Tmedia section of the 1+1 patch panel to the TMG3200-DS3.
3. Connect each DS3 line from the DS3 connectors of the Tmedia 1+1 section of the 1+1 patch panel to the TMG3200-DS3+1.

Optional

1. Connect bits port 0 and 1 from the TMG3200-DS3 to the 1+1 patch panel
2. Connect bits port 0 and 1 from the TMG3200-DS3+1 to the 1+1 patch panel

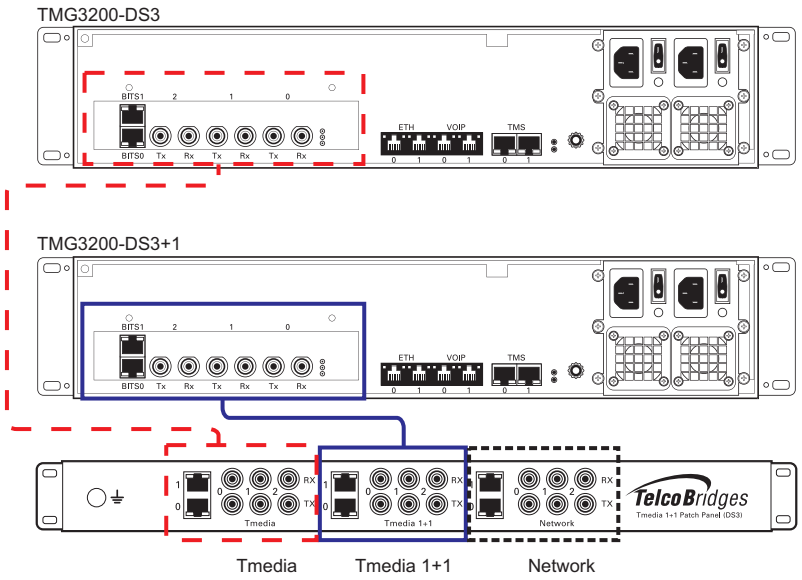


Figure 2.16 TMG3200-DS3 and TMG3200-DS3+1 connecting to the TDM 1+1 DS3 1+1 patch panel

2.5.4.4 Optical Interface (OC3/STM-1)

A TMG3200-STM1 and TMG3200-STM+1, each with one main and one backup OC3 or STM1 port enables the connection to OC3/STM1 lines. See figure 2.17 on page 39. Refer to table 2.4 on page 38 for a listing of optical interfaces. The default SFP module for OC3/STM1 connection is SMF, intermediate reach, (SFP-OC3-IR1) 1310 nm with LC type connectors.

Note Make certain that the correct SFP model is selected at the time of ordering. If your installation requires a different model from the one that has been provided, you must replace it.

Table 2.4 Optical Interfaces

Transceiver Model	Description	Spec	Mode	Type	Range (Km.)	Wavelength (NM)	Connection
SFP-OC3-IR1	OC3/STM1	Hot Pluggable	Single-mode	Intermediate reach	15	1310	LC
SFP-STM1E	STM1E (Electrical)	Hot Pluggable	75 ohms Cooper	Max 180m	1	NA	DIN (mini-coax)

Automatic Protection Switching

The APS port is used for OC3/STM1 redundancy. Switchover occurs automatically based on configurable parameters. It is recommended that APS be used if the installation provides this feature.

Note Patch panels use straight connections. In other words, they do not cross the RX and TX signals. You must connect RX to RX, and TX to TX. Connections between patch panels and Tmedia 1+1 systems require straight cables. Cables used to connect the network to the 1+1 patch panel must do the cross connection.

To connect both the TMG3200-STM1 and TMG3200-STM +1 (Optical Interface) to the PSTN:

1. Connect each OC3/STM1 line of the network section of the 1+1 patch panel to the remote equipment. See figure 2.17 on page 39.
2. Connect a fiber optic cable between STM1 of the Tmedia section of the 1+1 patch panel and the main port of the TMG3200-STM1.
3. Connect a fiber optic cable between APS of the Tmedia section of the 1+1 patch panel and the APS port of the TMG3200-STM1.
4. Connect a fiber optic cable between STM1 of the Tmedia 1+1 section of the 1+1 patch panel and the main port of the TMG3200-STM1 +1.
5. Connect a fiber optic cable between APS of the Tmedia 1+1 section of the 1+1 patch panel and the APS port of the TMG3200-STM1 +1.

Optional

1. Connect bits port 0 and 1 from the TMG3200-STM1 to the 1+1 patch panel
2. Connect bits port 0 and 1 from the TMG3200-STM1+1 to the 1+1 patch panel

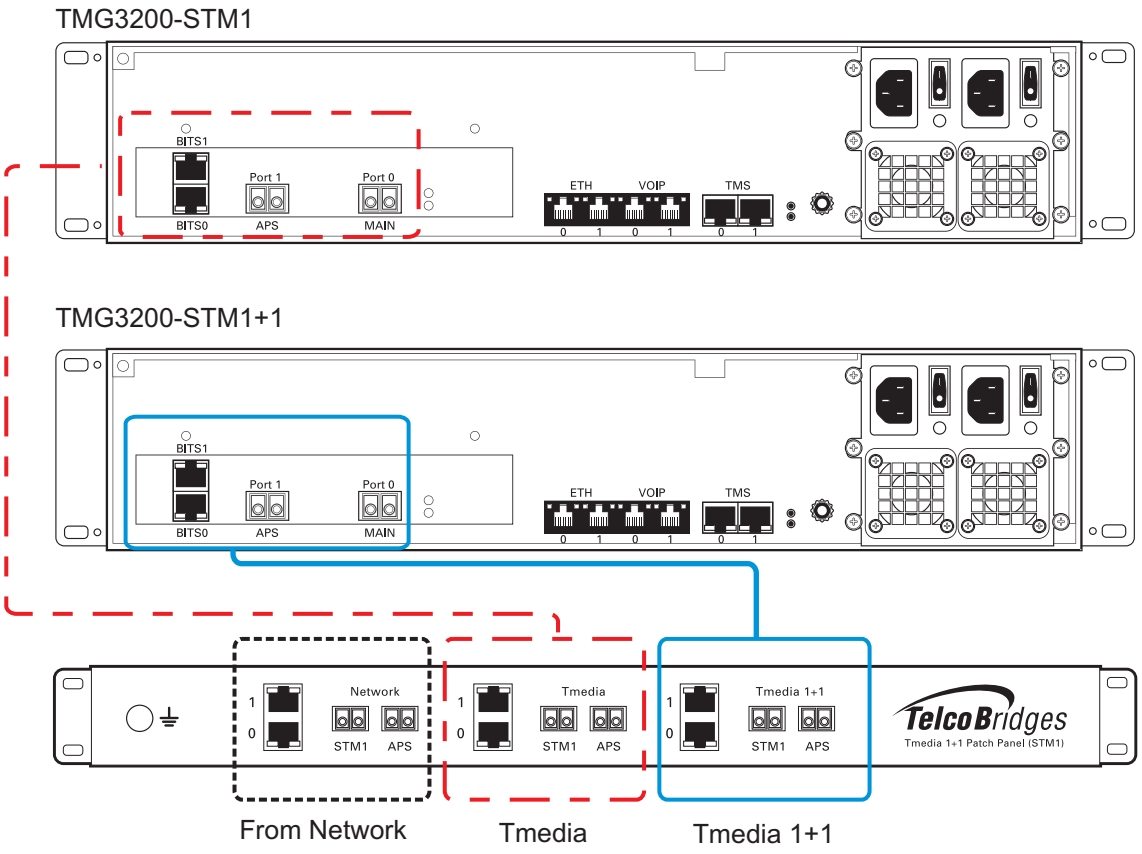


Figure 2.17 TMG3200-STM1 and TMG3200-STM1 +1 connecting to the STM1 1+1 1+1 patch panel

2.5.5 Powering Up

Tmedia 1+1 systems are furnished with either two AC or two DC power connections. Only once all other equipment installation work has been completed should the Tmedia 1+1 system be powered up.

Prerequisites

To power the TMG3200 and TMG3200 +1, you will need:

- Two independent AC power sources.
- Two power cables for each TMG3200 and TMG3200 +1.

2.5.5.1 Connecting to AC Power

The TMG3200 and TMG3200 +1 AC models are furnished with two AC power connectors.

To connect the TMG3200 and TMG3200 +1 to AC Power:

1. Connect the first power connector of each unit to the first power source. See Figure 2.18.
2. Connect the second power connector of each unit to the second power source.

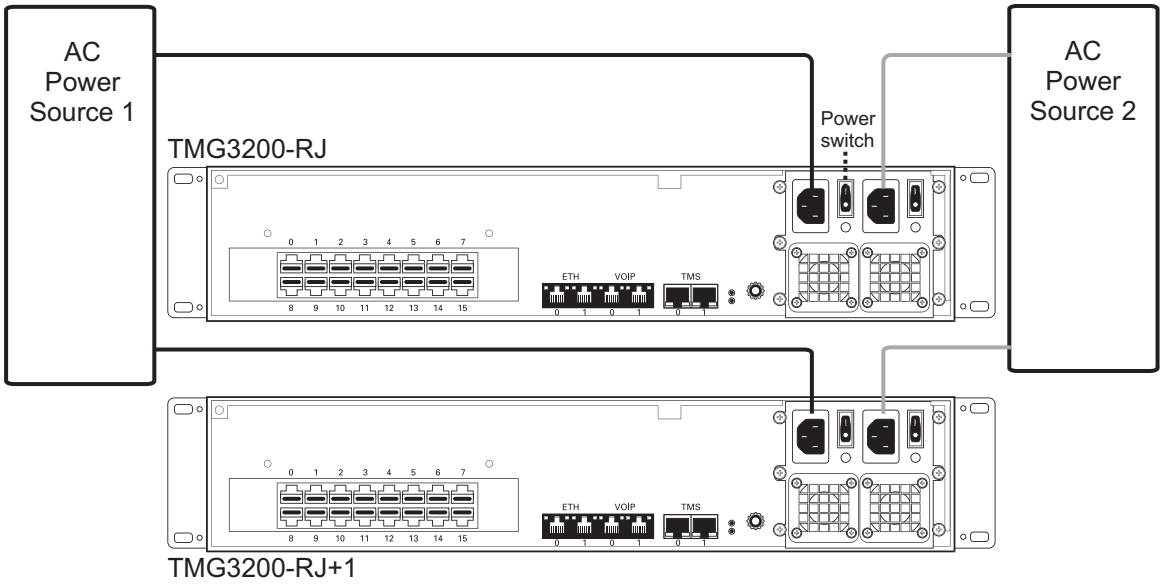


Figure 2.18 TMG3200 and TMG3200 +1 AC Power Connections

2.5.5.2 Connecting to DC Power

The TMG3200 and TMG3200 +1 DC models are furnished with two DC power connection ports. In addition, each DC powered TMG3200 is supplied with two DC power cables.

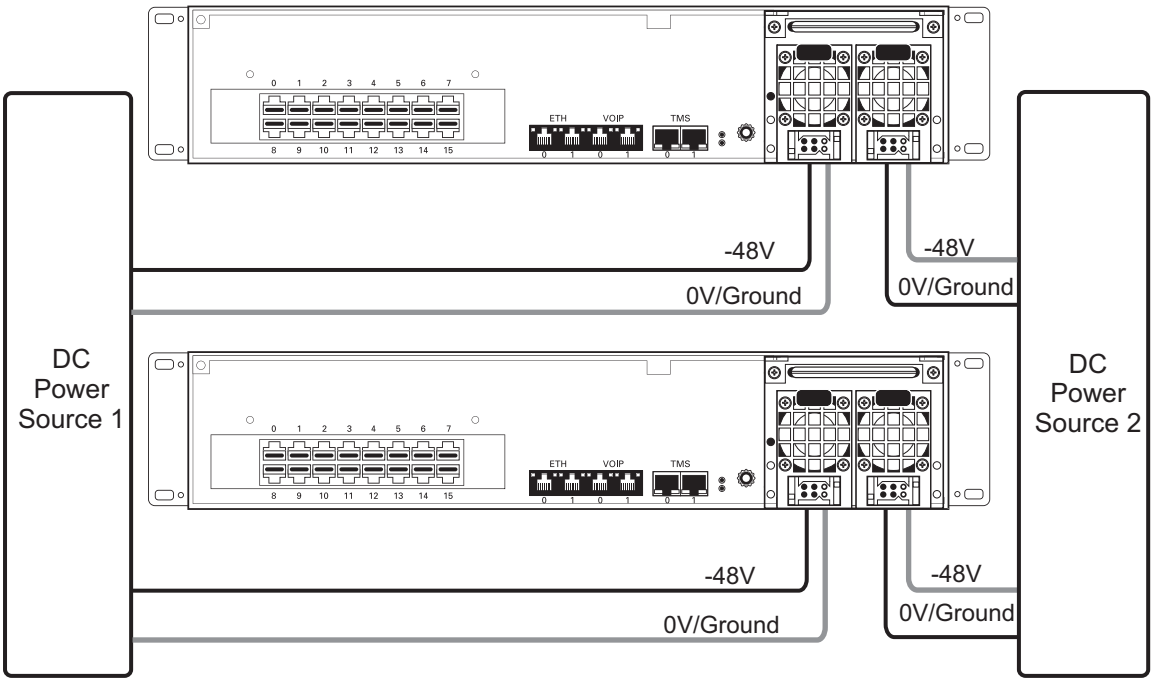
To connect the TMG3200 and TMG3200 +1 to DC Power

1. Connect the first DC power connector of the TMG3200 and TMG3200 +1 to DC power source one. See figure 2.19 on page 41.

   1a. Connect one lead of each DC power cable to the positive terminal of the DC power source.

   1b. Connect the other lead of each DC power cable to the negative side of the DC power source.

2. Repeat the previous steps for DC power source two.



Cable Type	Voltage	
	Ov/Ground	-48V
Yellow/Black	Black	Yellow
Red/Black	Red	Black

NOTE: DC power cable supplied with TMG3200 (Two types: Black/Red and Yellow/Black)

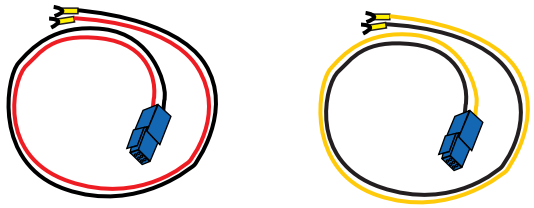


Figure 2.19 TMG3200 and TMG3200 +1 DC Power Connections

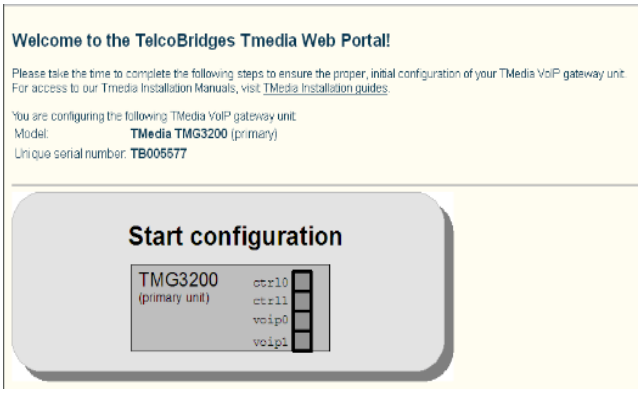
2.5.6 Start Up

The first time that you connect to a Tmedia VoIP gateway, you must configure it as either a primary or secondary unit in a Tmedia 1+1 system.

Once these configuration settings have been applied, your Tmedia 1+1 system will start up and display the web portal configuration management tool.

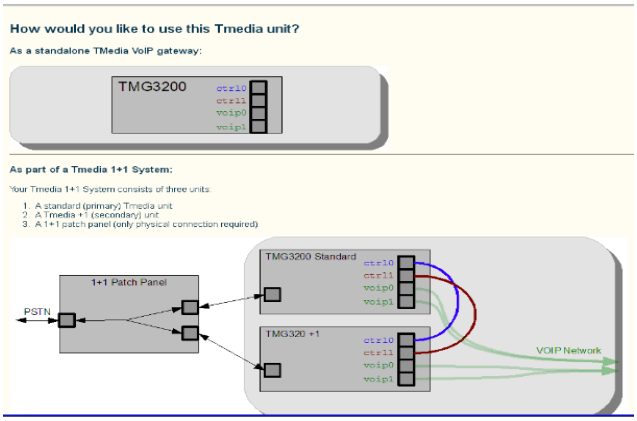
2.5.6.1 Primary Unit

1. Connect to the web portal. The Welcome page appears.

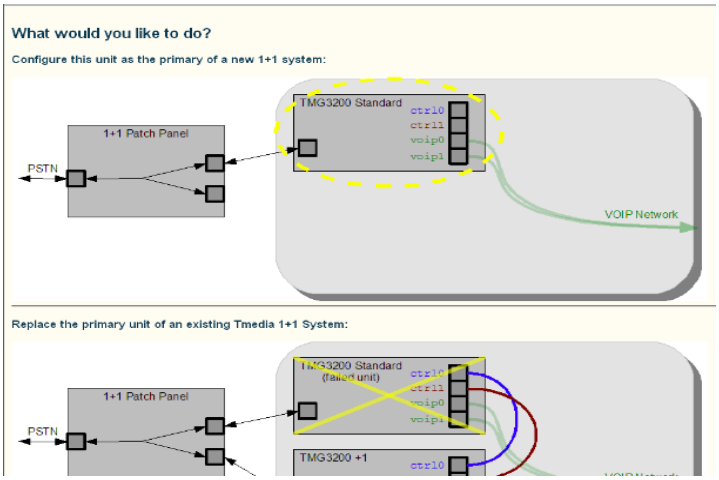


Note: The Welcome page indicates whether the TMG3200 is a primary or secondary unit.

2. To select the manner in which you wish to use the TMG3200, click the Tmedia 1+1 image.

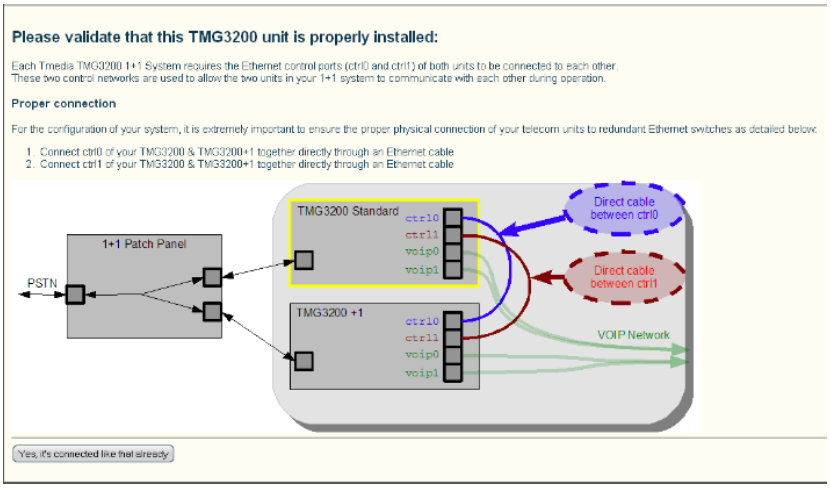


3. To indicate that this unit will be used as the primary unit in a Tmedia 1+1 system, click the top image.

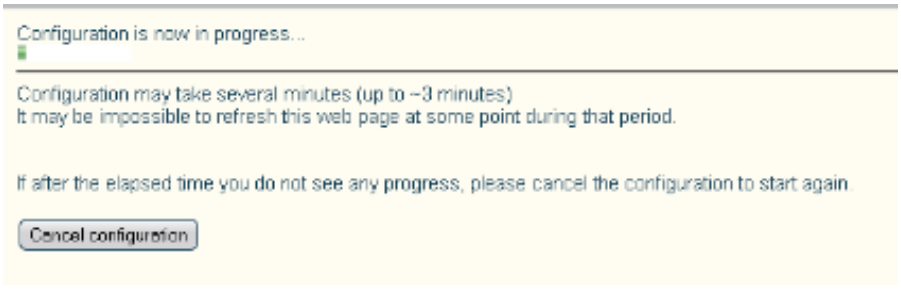


The Validation page is displayed.

4. Click **Yes, it's connected like that already**.

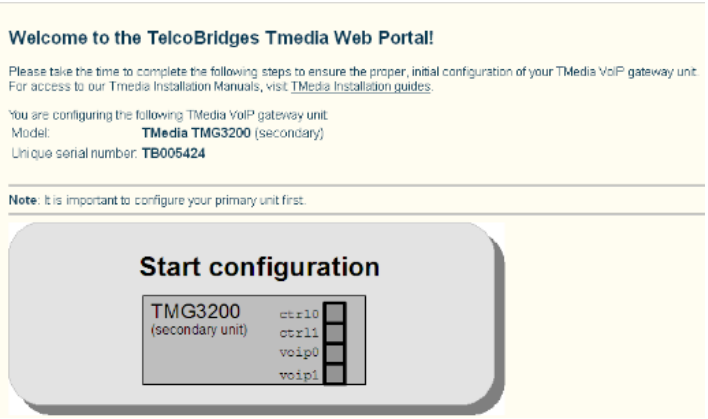


The Progress page is displayed.

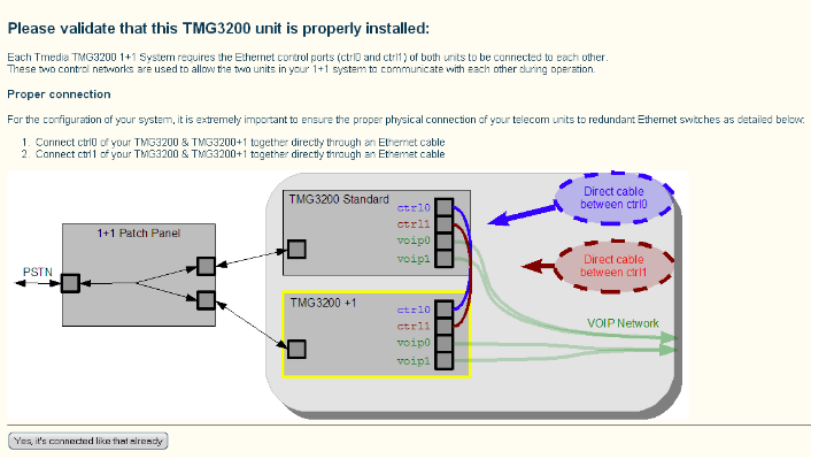


2.5.6.2 Secondary Unit

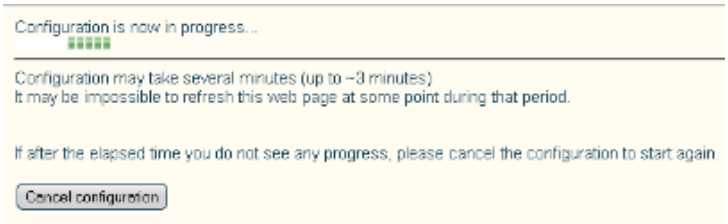
1. Connect to the web portal of the Tmedia 1+1. The Welcome page appears.



2. Click **Yes, it's already connected like that**.



The Progress page is displayed.



2.6 Verifying the LED Status Indications

When the Tmedia VoIP gateway has been powered up, verify the front panel of the unit to determine that all indications are normal.

Once the Tmedia VoIP gateway has run successfully through its system boot procedures, the following will be displayed in an alternating fashion as described in table 2.5 on page 46:

Table 2.5 Tmedia VoIP Gateway system Displays

Display Order	Display
First Screen	IP 0: <ip address of eth0. E.g. 192.168.0.2> IP 1: <ip address of eth1 E.g. 192.168.0.3>
Second Screen	<board type.. eg. TMP-STM1, TMS-16, TMP-DS3, TMP-16, TMP-32, TMP-64> <adapter name e.g. TB002821> <serial number e.g. TB002821> <release used e.g V2.2.0 RC1>

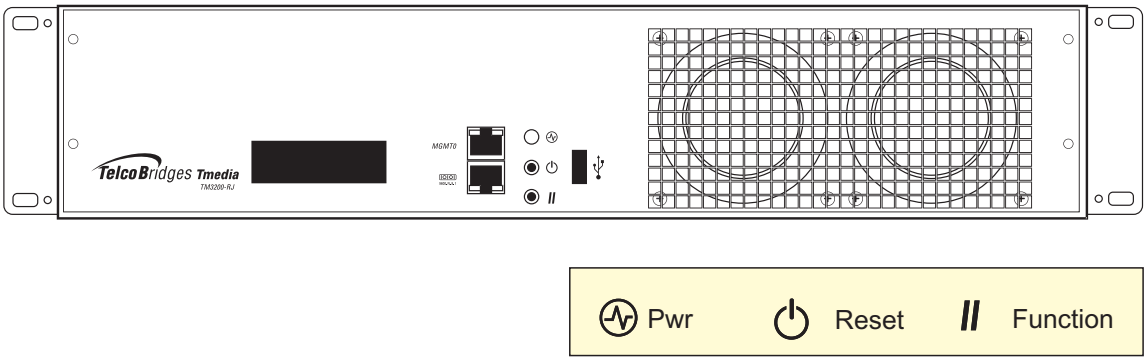


Figure 2.20 Front display and LEDs

If the reset button is pressed a software menu will appear on the display at the front of the unit. Press the function button to select one of the three actions listed in table 2.6 on page 47. Once your selection is made, press the reset button to acknowledge your choice.

Table 2.6 Reset Menu Options

Menu Choices	Description
M | Options:	
e | >Shutdown	Graceful shutdown of the Tmedia VoIP gateway. This takes a few minutes. Press the reset button to restart the Tmedia VoIP gateway.
n | Rst telecom	Reboots the telecom platform of the Tmedia VoIP gateway.
u | Rst host	Reboots the linux host of the Tmedia VoIP gateway.

2.7 Powering Down

Powering down the Tmedia VoIP gateway requires that the Linux embedded host be shut down. In order to do this, you must connect to the management interface using SSH, and enter:

```
shutdown -hP now
```

Attention DO NOT TURN OFF the power to the Tmedia VoIP gateway system using the power switch located at the rear, unless the Linux host has been properly shut down beforehand, instead use the reset button display, or manually use the shutdown command.

Allow enough time for the Linux host to shut down before turning off the power to the Tmedia VoIP gateway (ex. 1 minute). Be aware that the shutdown procedure of the unit is logged and traceable for support and warranty purposes.

Note As an alternate method to this procedure, refer to Section 2.6 “Verifying the LED Status Indications” on page 46, to power down the Tmedia VoIP gateway with the reset button.

Chapter 3 Initial System Configuration

This chapter provides information about the following topics:

- Connecting to the Tmedia VoIP gateway
- Retrieving Tmedia VoIP gateway information
- Changing the Tmedia VoIP gateway management port IP address
- Changing the Tmedia VoIP gateway management port passwords
- Setting the Tmedia VoIP gateway time zone
- Configuring the Tmedia VoIP gateway using the web portal
- Changing VoIP IP interface addresses

3.1 Connecting to the Tmedia VoIP Gateway

The Tmedia VoIP Gateway is shipped with the TMG-CTRL preinstalled. In order to make changes to the system configuration, you must connect the port labelled MGMT0 at the front of the Tmedia VoIP Gateway to a terminal.

To access the Tmedia VoIP Gateway, you must use an SSH connection. The password is set at the factory and is indicated on the shipment sheet.

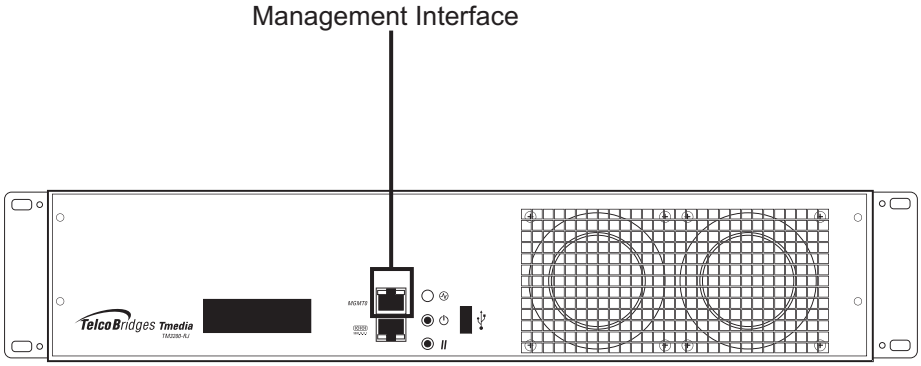


Figure 3.1 Tmedia Management Interface

3.2 Retrieving Tmedia VoIP Gateway Information

Note The following procedure must be performed on both the TMG3200, as well as the TMG3200 +1.

The Tmedia VoIP Gateway enables you to retrieve system information with the following shell commands:

- tbproduct (retrieve the Tmedia product type). See http://docs.telcobridges.com/mediawiki/index.php/TMG:Get_Product_Type, for further information.
- tbserial (retrieve the Tmedia serial number). See http://docs.telcobridges.com/mediawiki/index.php/TMG:Get_Serial_Number, for further information.

3.3 Changing the Tmedia VoIP Gateway Management Port IP Address

Note The following procedure must be performed on both the TMG3200, as well as the TMG3200 +1.

The management port of the Tmedia VoIP Gateway (labeled MGMT0) is configured using DHCP by default. It can be modified it using the following shell script:

- tbchangeip. See http://docs.telcobridges.com/mediawiki/index.php/TMG:Change_Management_IP_Address, for further information.

3.4 Changing TMG3200 Management Port Passwords

Note The following procedure must be performed on both the TMG3200, as well as the TMG3200 +1.

Once logged you are logged on to the Tmedia VoIP Gateway, type “passwd”, to change the password being used. The following information will be displayed:

```
[root@TB003540 ~]# passwd
Changing password for user root.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

3.5 Setting the Time Zone

Note The following procedure must be performed on both the TMG3200, as well as the TMG3200 +1.

You can change the time zone of the Tmedia VoIP Gateway using the *tbtimezone* shell command. For information and examples about changing time zones refer to:

http://docs.telcobridges.com/mediawiki/index.php/TMG:Change_Time_Zone

3.6 Configuring the Tmedia VoIP Gateway Using the Web Portal

Note: The first time that you connect to the web portal, you will need to configure the role of the TMG3200.

If your system features a TMG3200 standalone unit, refer to Section 2.4.5 “Start Up” on page 26.

If your system features a TMG3200 working in conjunction with a TMG3200 +1, refer to Section 2.5.6 “Start Up” on page 42.

To change the default configuration of a Tmedia VoIP Gateway using the Web Portal, follow the steps described in the Web Portal System Configuration Tutorial Guide. This document can be obtained from TelcoBridges TB Wiki at:

http://docs.telcobridges.com/mediawiki/index.php/Web_Portal

The Web Portal can be accessed with a Web browser. The default url is: http://[Tmedia MGMT0 IP address]:12358

Note A TMG3200 and TMG3200 +1 system can access the Web Portal from either one of their IP addresses.

The default login information to access the Web Portal application is:

- Username: root
- Password: root

3.7 Changing VoIP Interface Addresses

The default address of the VoIP interfaces of the Tmedia VoIP Gateway can be modified. To learn how this is done, refer to the Web Portal tutorial guide on the Telcobridges TB Wiki at:

http://docs.telcobridges.com/mediawiki/index.php/Change_VoIP_Interface_IP_Address

Chapter 4 System Backups

This chapter provides information about the following topics:

- Creating a database backup
- Downloading a database backup
- Uploading a database backup
- Restoring a database backup

4.1 Creating a Database Backup

It is important that backups be made of system configuration settings in the event of a system failure. It is recommended that a backup be made once the system has been configured. Backups are performed using the web portal.

To learn how to create backups, refer to:

http://docs.telcobridges.com/mediawiki/index.php/Toolpack_v2.5:Database_Backup

4.2 Downloading a Database Backup

A backup of system data is stored on the hard drive of the Tmedia VoIP gateway. It is important that system backups be downloaded to an external storage device.

To learn how to download system backups, refer to:

http://docs.telcobridges.com/mediawiki/index.php/Toolpack_v2.5:Downloading_a_Database_Backup

4.3 Uploading a Database Backup

An external backup of your database can be uploaded to your Tmedia VoIP Gateway.

To learn how to upload a database backup. refer to:

http://docs.telcobridges.com/mediawiki/index.php/Toolpack_v2.5:Uploading_a_Database_Backup

4.4 Restoring a Database Backup

In the event of a system failure requiring the replacement of a Tmedia VoIP gateway, a previously saved backup of system settings can be restored to the new unit.

To learn about restoring system backups, refer to:

http://docs.telcobridges.com/mediawiki/index.php/Toolpack_v2.5:Restoring_a_Database_Backup

Chapter 5 Hardware Maintenance Procedures

This chapter provides information about the following topics:

- Preparing for hardware replacement
- Choosing your maintenance procedure
- Replacing a standalone TMG3200
- Adding a TMG3200 +1 to a standalone TMG3200
- Replacing a unit on a Tmedia 1+1 system
- Replacing a Power Supply

5.1 Preparing for Hardware Replacement

Note: This section applies to on-site spare units only. This procedure is not required for RMA units.

Prior to replacing hardware, you must have the following:

- A license key
- A backup of your system settings

Obtaining a License Key

To obtain a license key, connect to the license server at: https://licenses.telcobridges.com

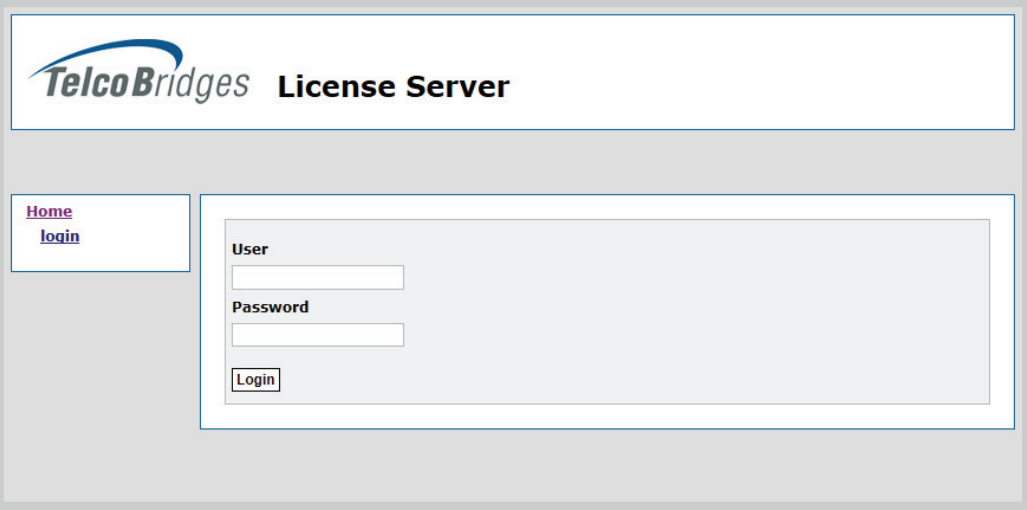


Figure 5.1 License Server

To learn more about how to obtain a license key, refer to:

http://docs.telcobridges.com/mediawiki/index.php/Support:License_server

5.2 Choosing your Maintenance Procedure

Use the following diagram to guide you in selecting your maintenance procedure.

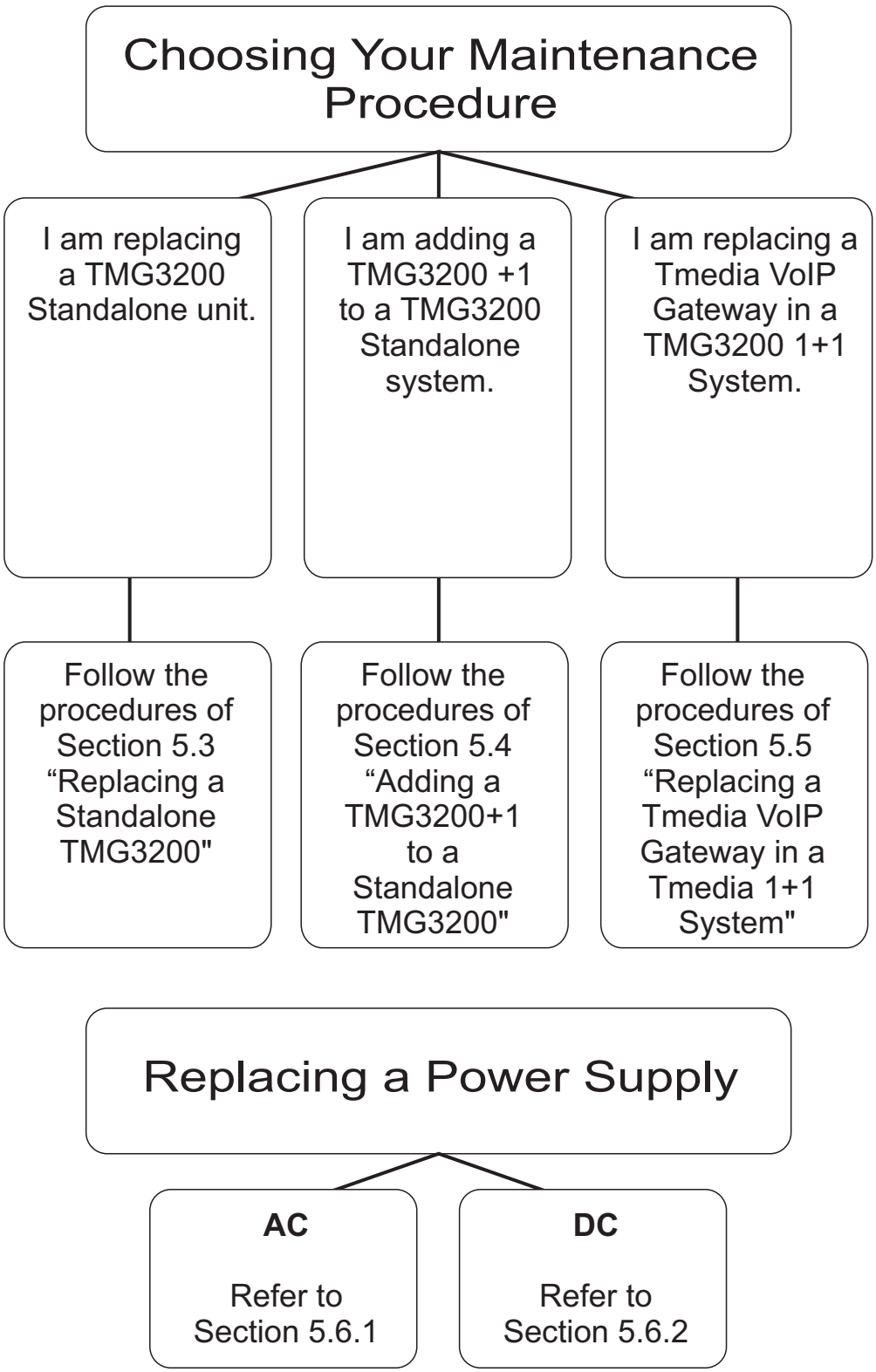


Figure 5.2 Choosing your Maintenance Procedure

5.3 Replacing a Standalone TMG3200

Warning: This procedure will require some system downtime.

Prerequisites

The replacement of a standalone TMG3200 is comprised of three parts:

- Removing a defective unit
- Installing a replacement unit
- Startup

5.3.1 Removing a Defective Unit

Prerequisites

To complete this procedure, you will need:

- A database backup of the defective unit
- A license key from license server

Note: This only applies to on-site spare units, refer to Section 5.1 “Preparing for Hardware Replacement” on page 56. For repaired units returned from the factory, the license key is already installed.

To remove a defective unit:

1. If you are replacing an on-site spare unit, delete the previous configuration on the TMG3200
2. Shutdown the TMG3200

Note: If you need to modify the Tmedia Management port, refer to Section 3.3 “Changing the Tmedia VoIP Gateway Management Port IP Address” on page 51.

If you need to configure the unit in Standalone mode, refer to Section 2.4.5 “Start Up” on page 26.

3. Disconnect from the PSTN network
4. Disconnect from the VoIP network
5. Disconnect from the Tmedia Control network
6. Disconnect from the Management network
7. Remove the TMG3200 from the equipment rack

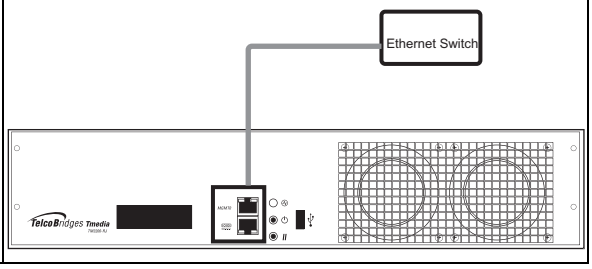
5.3.2 Installing a Replacement Unit

5.3.2.1 Rackmount the Replacement Unit

The TMG3200 is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting Tmedia Equipment” on page 11.

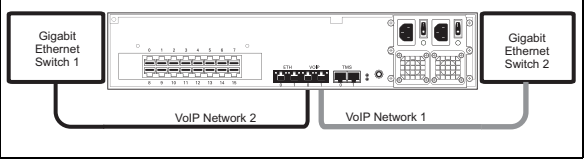
5.3.2.2 Connect to the Management Interface

The Tmedia Management Interface enables administrators to perform management tasks on the TMG3200.

Follow the procedure described in Section 2.4.1 “Connecting to the Tmedia Management Interface” on page 16.	

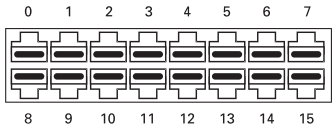
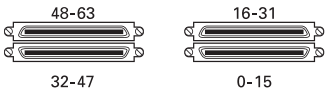
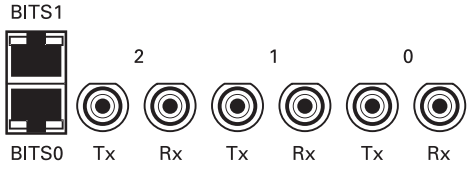
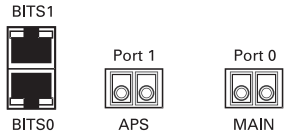
5.3.2.3 Connect to the VoIP Network

The TMG3200 features dual GigE ports for connection to different VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the TMG3200 will continue to manage VoIP traffic using the alternate network.

Follow the procedure described in Section 2.4.2 “Connecting to a VoIP Network” on page 17.	

5.3.2.4 Connect to the PSTN Network

The TMG3200 features a variety of interfaces to the PSTN network.

If your system features a TMG3200-RJ TDM interface, refer to Section 2.4.3.1 “RJ48C Type Interface (T1/E1) for the TMG3200-RJ” on page 19.	
If your system features a TMG3200-TE TDM interface, refer to Section 2.4.3.2 “SCSI Interface (T1/E1) for the TMG3200-TE” on page 20.	
If your system features a TMG3200-DS3 TDM interface, refer to Section 2.4.3.3 “Dual BNC Interface (DS3) for the TMG3200-DS3” on page 22.	
If your system features a TMG3200-STM1 TDM interface, refer to Section 2.4.3.4 “Optical Interface (OC3/STM-1) for the TMG3200-STM1” on page 23.	

5.3.3 Starting Up the TMG3200

To start up a unit:

1. Power up the TMG3200. Follow the instructions as described in Section 2.4.4 “Powering Up” on page 24.

2. Start up the TMG3200. Follow the instructions as described in Section 2.4.5 “Start Up” on page 26.

3. Connect to the web portal

   3a. If a database backup is available:

   - Import database using the Web Portal Backup menu
   - Apply the configuration on the system

   3b. If a database backup is not available:

   - Configure the system using the web portal
   - Apply the configuration on the system

5.3.4 Restoring a Backup Copy of a Database

The backup of your system configuration settings, described in Section 4.1 “Creating a Database Backup” on page 54, will need to be restored after the replacement of the defective unit. Restoring a database backup is described in Section 4.4 on page 54.

To learn about how to restore system backups, refer to:

http://docs.telcobridges.com/mediawiki/index.php/Toolpack_v2.5:Restoring_a_Database_Backup

5.4 Adding a TMG3200 +1 to a Standalone TMG3200

Warning: This procedure will require some system downtime.

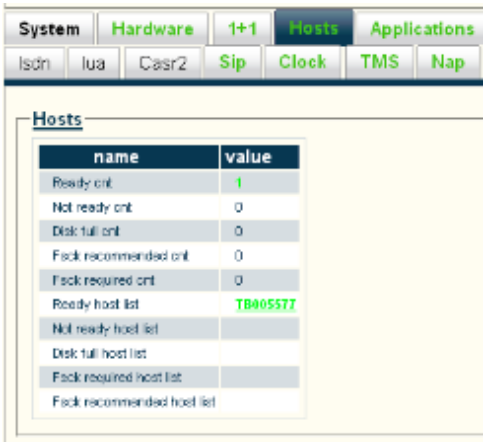
Prerequisites

To add a TMG3200 +1 to a Standalone TMG3200, perform the following procedures:

- Install the TMG3200 +1 on the equipment rack
- Install a patch panel
- Connect to the TMG3200 +1 Management interface
- Connect to the Tmedia Control network
- Connect to the VoIP network
- Connect to the PSTN network
- Power up the TMG3200 +1
- Start up

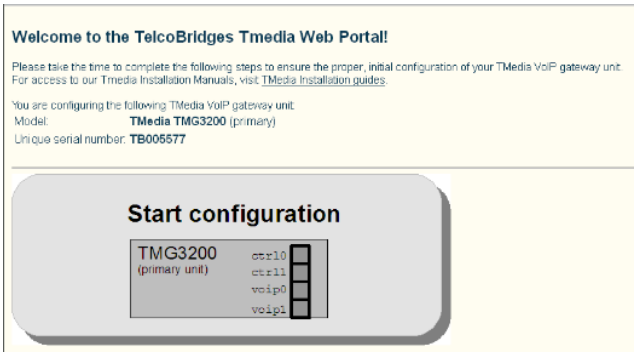
5.4.1 Reconfigure a Standalone Unit as a Primary Unit in a 1+1 system

1. Connect to the web portal of the Standalone TMG3200.
2. Select **Status** from the navigation panel.
3. Select the **Hosts** status tab.

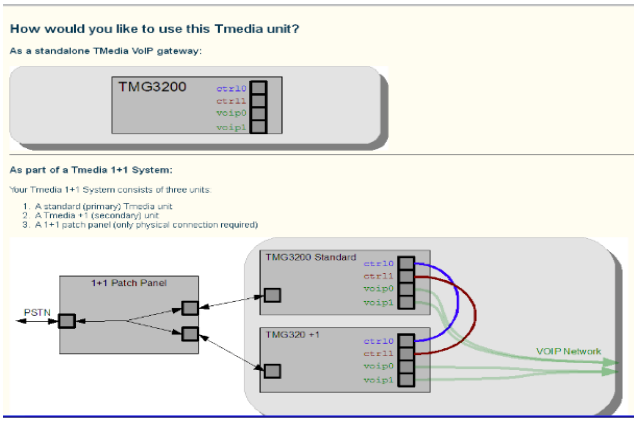


4. Select **ResetHostRole** for the action, and click **Apply Action**.

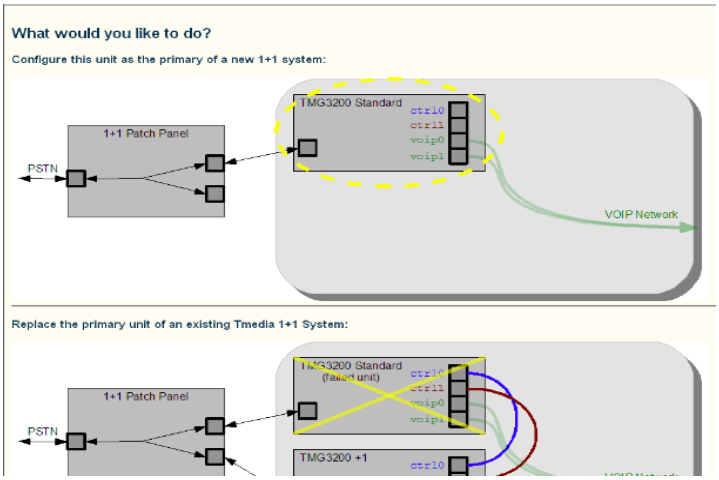
5. Reconnect to the same TMG3200. The Welcome page appears.



6. To select the manner in which you wish to use the TMG3200. Click the Tmedia 1+1 image.

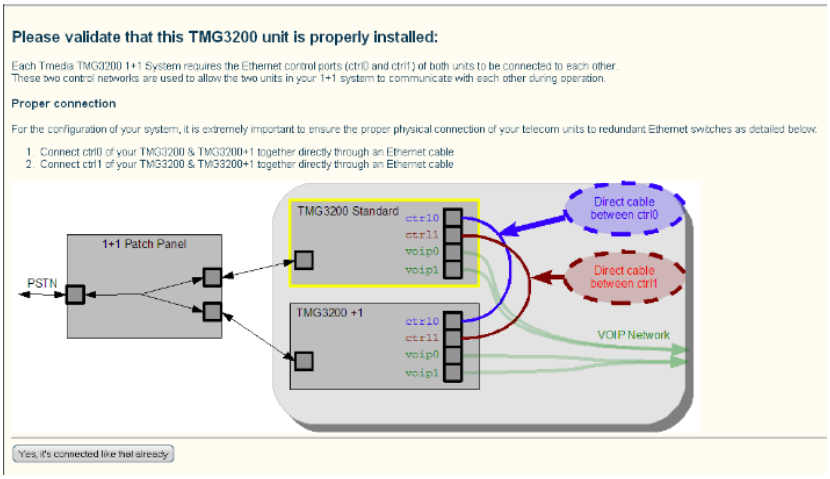


7. To indicate that this unit will be used as the primary unit in a Tmedia 1+1 system, click the TMG3200 Standard image.

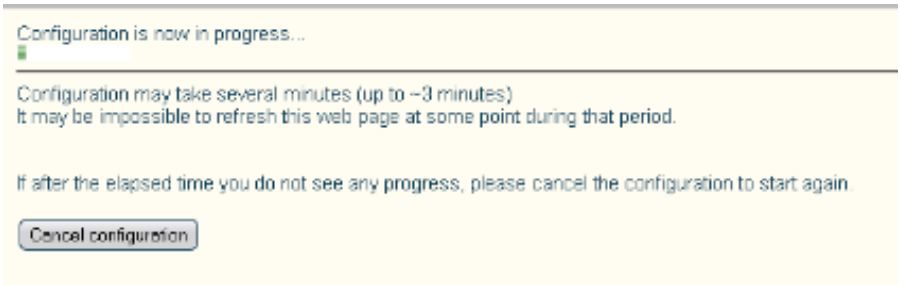


The Validation page is displayed.

8. Click **Yes, it's connected like that already**.



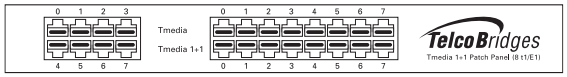
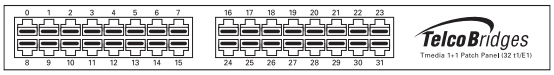
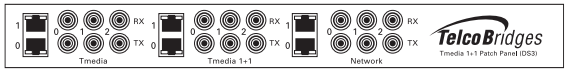
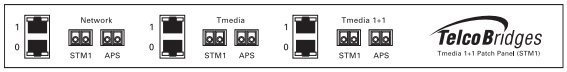
The Progress page is displayed.



5.4.2 Install the TMG3200 +1 on the Equipment Rack

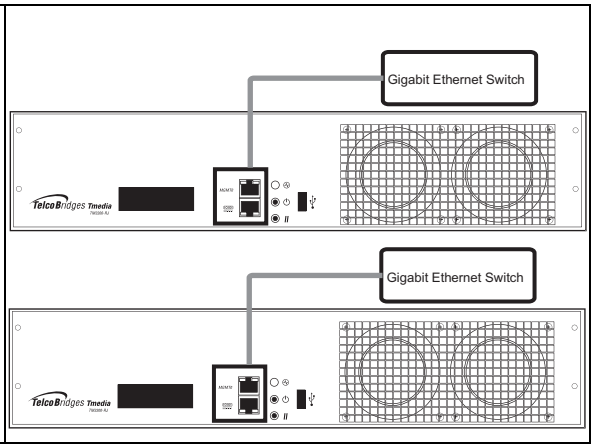
The TMG3200 +1 is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting Tmedia Equipment” on page 11.

5.4.3 Install a Patch Panel

If your system features a TMG3200-RJ TDM interface, use a 1+1 patch panel (8/T1/E1). Refer to Section 2.5.4.1 “RJ48C Type Interface (T1/E1) for the TMG3200-RJ and TMG3200-RJ+1” on page 33.	
If your system features a TMG3200-TE TDM interface, use a 1+1 patch panel (32/T1/E1). Refer to Section 2.5.4.2 “SCSI Interface (T1/E1) for the TMG3200-TE and TMG3200-TE+1” on page 35. Note: Patch panels must be replaced by the TMG3200-TE-1+1 patch panels.	
If your system features a TMG3200-DS3 TDM interface, use a 1+1 patch panel (DS3). Refer to Section 2.5.4.3 “Dual BNC Interface (DS3) for the TMG3200-DS3 and TMG3200-DS3+1” on page 37.	
If your system features a TMG3200-STM1 TDM interface, use a 1+1 patch panel (STM1). Refer to Section 2.5.4.4 “Optical Interface (OC3/STM-1)” on page 38.	

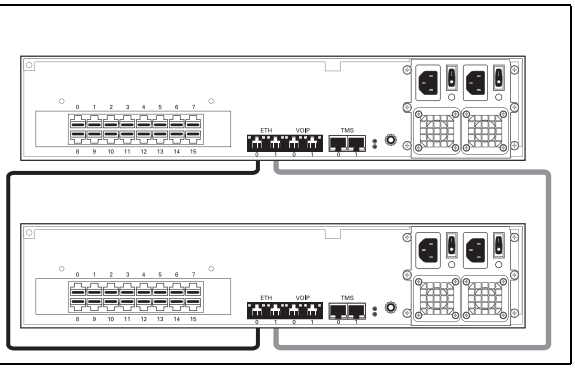
5.4.4 Connect to the Tmedia Management Interface

The Tmedia Management interface enables administrators to perform management tasks on a Tmedia 1+1 system.

Follow the procedure described in Section 2.5.1 “Connecting to the Tmedia 1+1 System Management Interfaces” on page 29.	

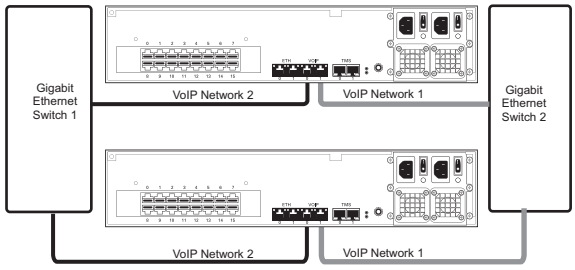
5.4.5 Connect to the Tmedia Control Network

The Tmedia Control network permits a TMG3200 to be connected to a TMG3200 +1, thereby enabling a sharing of system resources.

Follow the procedure described in Section 2.5.2 “Connecting to the Tmedia Control Network” on page 30.	

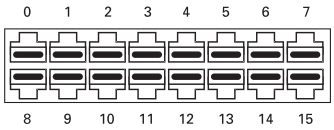
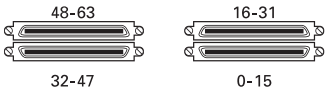
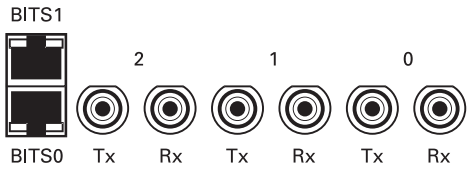
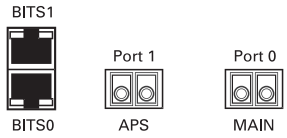
5.4.6 Connect to the VoIP Network

The Tmedia 1+1 system features dual GigE ports for connection to different VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the Tmedia 1+1 system will continue to manage VoIP traffic using the alternate network.

Follow the procedure described in Section 2.5.3 “Connecting the Tmedia 1+1 System VoIP Network(s)” on page 31.	

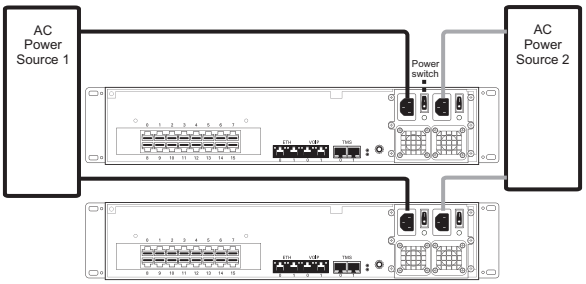
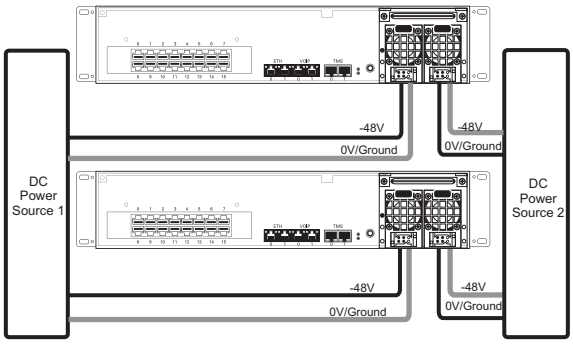
5.4.7 Connect to the PSTN Network

Tmedia VoIP gateways feature a variety of interfaces to the PSTN network.

If your system features a TMG3200-RJ TDM interface, refer to Section 2.5.4.1 “RJ48C Type Interface (T1/E1) for the TMG3200-RJ and TMG3200-RJ+1” on page 33.	
If your system features a TMG3200-TE TDM interface, refer to Section 2.5.4.2 “SCSI Interface (T1/E1) for the TMG3200-TE and TMG3200-TE+1” on page 35. **Patch panels must be replaced by the 1+1 patch panel.**	
If your system features a TMG3200-DS3 TDM interface, refer to Section 2.5.4.3 “Dual BNC Interface (DS3) for the TMG3200-DS3 and TMG3200-DS3+1” on page 37.	
If your system features a TMG3200-STM1 TDM interface, refer to Section 2.5.4.4 “Optical Interface (OC3/STM-1)” on page 38.	

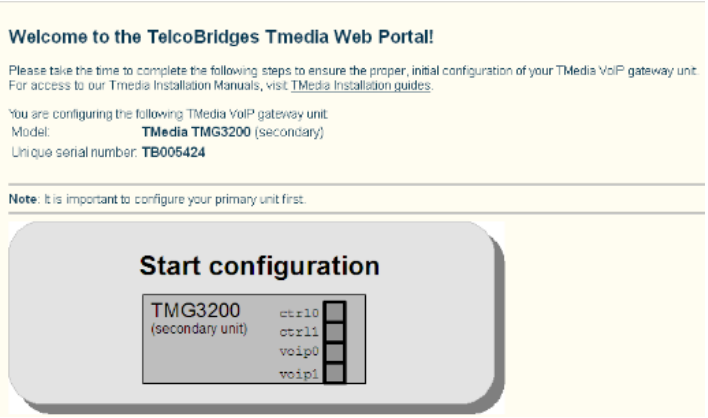
5.4.8 Power Up the Tmedia VoIP gateway

Tmedia VoIP gateways are furnished with either two AC or DC power connections. Only once all other equipment installation work has been completed should the Tmedia 1+1 system be powered up.

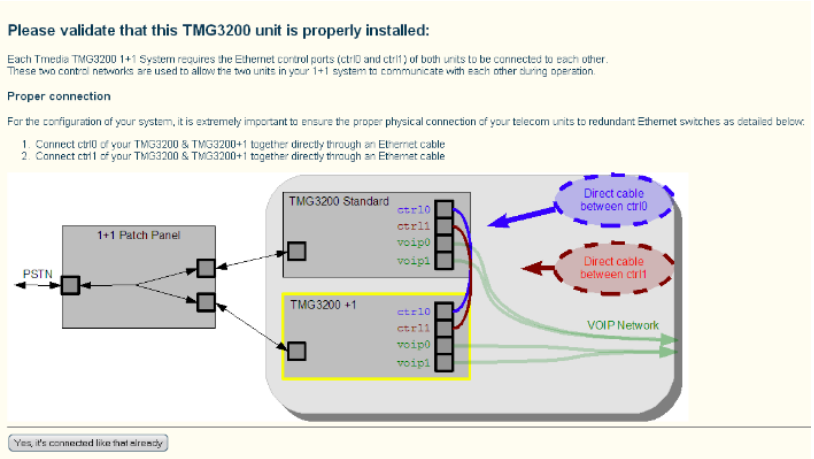
If your system operates on AC power, refer to Section 2.5.5.1 “Connecting to AC Power” on page 40.	
If your system operates on DC power, refer to Section 2.5.5.2 “Connecting to DC Power” on page 41.	

5.4.9 Start Up

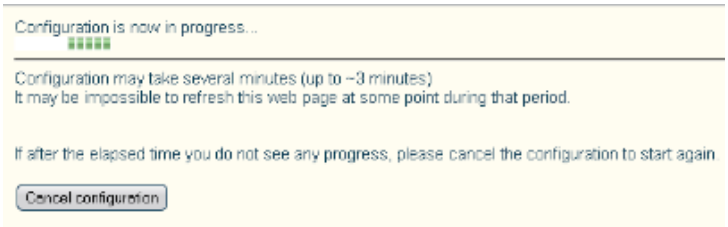
1. Connect to the web portal of the Tmedia 1+1. The Welcome page appears.



2. Click **Yes, it's already connected like that**.



The Progress page is displayed.



5.5 Replacing a Unit on a Tmedia 1+1 System

Warning: This procedure will require some system downtime.

Prerequisites

To replace a unit on a Tmedia 1+1 system, you will need a license from the license server (if replacement is a spare unit only). The replacement of a Tmedia VoIP gateway is comprised of three parts:

- Removal of the defective unit
- Installation of a replacement unit
- Startup unit

5.5.1 Removing a Defective Unit

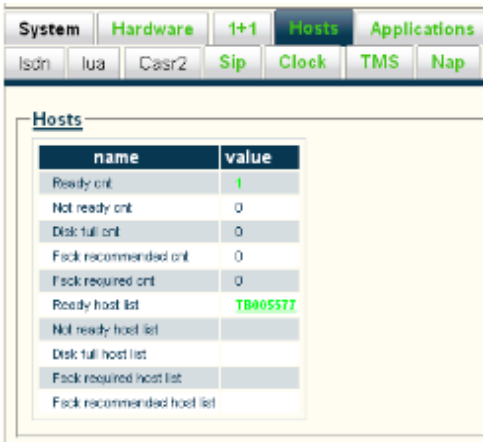
To remove a defective unit:

1. If you are replacing a spare unit, you must reset the role. Refer to Section 5.5.1.1 “Resetting the Role of the Spare Unit”.
2. Shutdown the TMG3200 or TMG3200 +1
3. Disconnect from the PSTN network
4. Disconnect from the VoIP network
5. Disconnect from the Tmedia Control network
6. Disconnect from the Management network
7. Dismount the defective unit

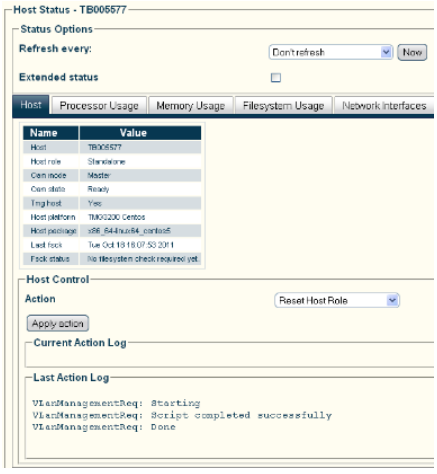
5.5.1.1 Resetting the Role of the Spare Unit

1. Connect to the spare unit web portal.
2. Select **Status** from the navigation panel.

3. Select the **Hosts** status tab.



4. Select **ResetHostRole** for the action, and click **Apply Action**.



5.5.2 Installing a Replacement Unit

To install a replacement unit on a Tmedia 1+1 system, you will need to perform the following procedures:

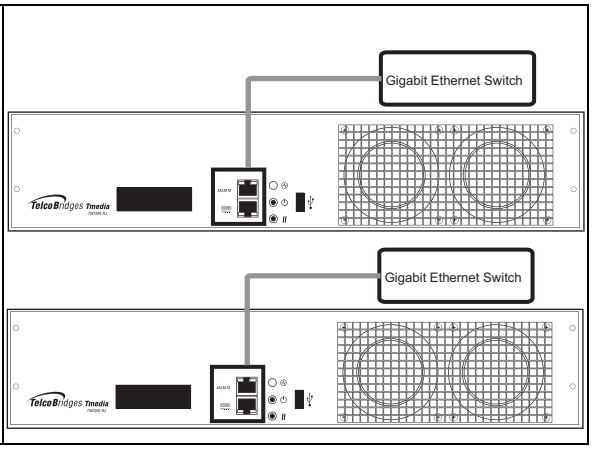
- Rackmount the replacement unit
- Connect to the Management interface
- Connect to the VoIP network
- Connect to the PSTN network

5.5.2.1 Rackmount the Replacement Unit

The Tmedia 1+1 system is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting Tmedia Equipment” on page 11.

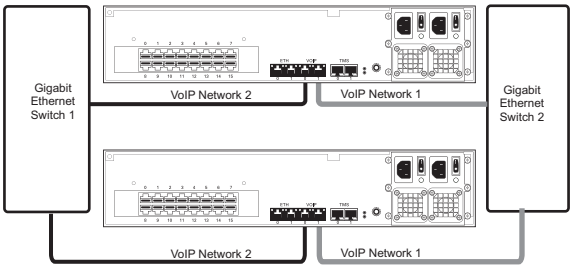
5.5.2.2 Connect to the Management Interface

The Tmedia Management Interface enables administrators to perform management tasks on the Tmedia 1+1 system.

Follow the procedure described in Section 2.5.1 “Connecting to the Tmedia 1+1 System Management Interfaces” on page 29.	

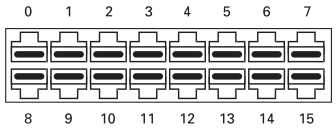
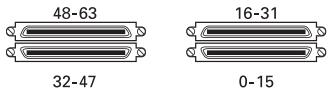
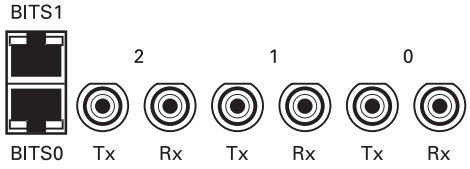
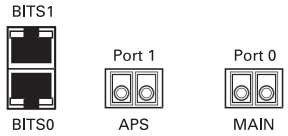
5.5.2.3 Connect to the VoIP Network

Tmedia VoIP gateways feature dual GigE ports for connection to different VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the Tmedia 1+1 will continue to manage VoIP traffic using the alternate network.

Follow the procedure described in Section 2.5.3 “Connecting the Tmedia 1+1 System VoIP Network(s)” on page 31.	

5.5.2.4 Connect to the PSTN Network

Tmedia VoIP gateways feature a variety of interfaces to the PSTN network.

If your system is using a TMG3200-RJ TDM interface, refer to Section 2.5.4.1 “RJ48C Type Interface (T1/E1) for the TMG3200-RJ and TMG3200-RJ+1” on page 33.	
If your system is using a TMG3200-TE TDM interface, refer to Section 2.5.4.2 “SCSI Interface (T1/E1) for the TMG3200-TE and TMG3200-TE+1” on page 35.	
If your system is using a TMG3200-DS3 TDM interface, refer to Section 2.5.4.3 “Dual BNC Interface (DS3) for the TMG3200-DS3 and TMG3200-DS3+1” on page 37.	
If your system is using a TMG3200-STM1 TDM interface, refer to Section 2.5.4.4 “Optical Interface (OC3/STM-1)” on page 38.	

5.5.3 Starting Up the Tmedia 1+1 System

To start up a unit:

1. Power up the Tmedia 1+1 system. Follow the instructions described in Section 2.5.5 “Powering Up” on page 40.

2. Configure the Tmedia 1+1 system

   2a. If you need to modify the Tmedia Management port IP address, refer to Section 3.3 “Changing the Tmedia VoIP Gateway Management Port IP Address” on page 51.

   2b. If you need to configure the unit in primary mode, when replacing a TMG3200, refer to Section 2.5.6.1 “Primary Unit” on page 42.

   2c. If you need to configure the unit in Secondary mode, when replacing a TMG3200 +1, refer to Section 2.5.6.2 “Secondary Unit” on page 45.

5.5.4 Start Up

Depending on how a new primary or secondary unit will be used, you will need to select from one of the four following possibilities:

- Replacing a primary unit with another replacement primary unit
- Replacing a primary unit with a spare unit
- Replacing a secondary unit with another replacement secondary unit
- Replacing a secondary unit with a spare unit

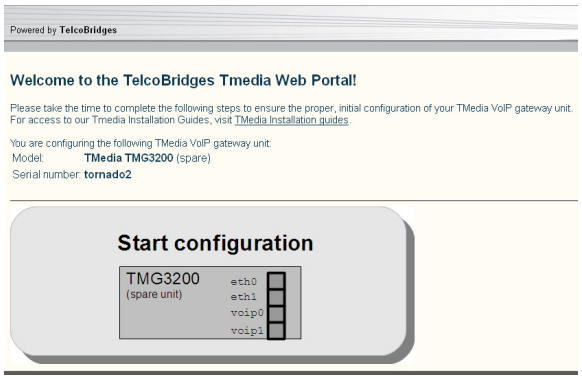
5.5.4.1 Replacing a Primary Unit with another Replacement Primary Unit

If you are replacing a primary unit with another replacement primary unit, follow the procedure in Section 2.5.6.1 “Primary Unit” on page 42.

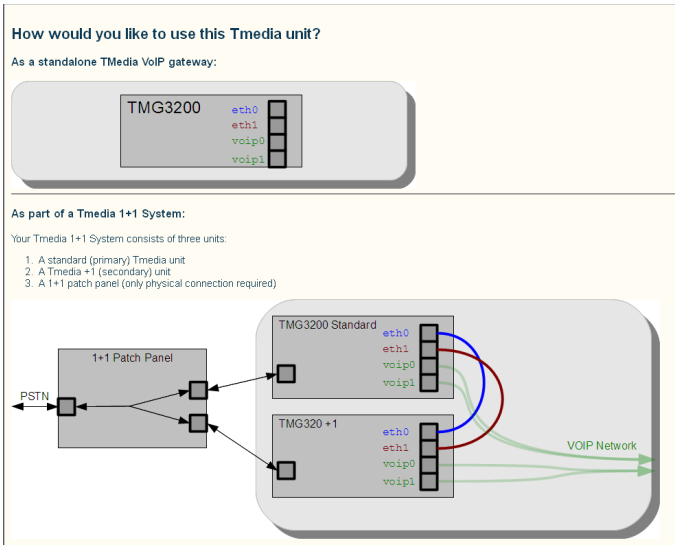
5.5.4.2 Replacing a Primary Unit with a Spare Unit

If you are replacing a primary unit with a spare unit, do the following steps:

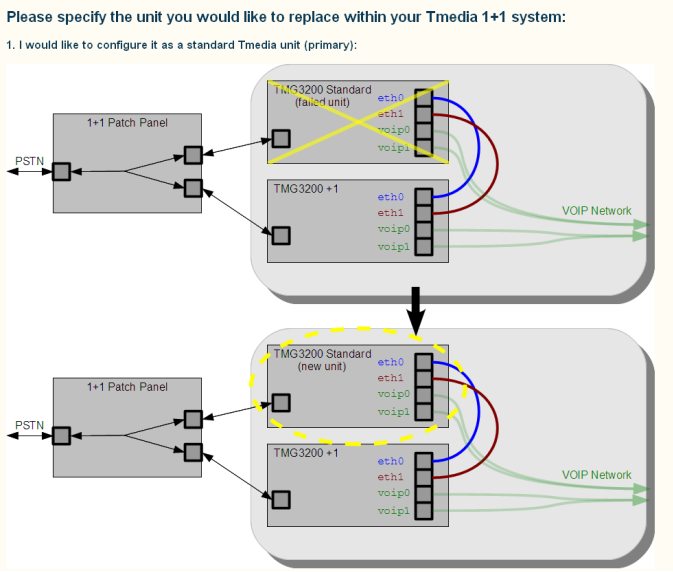
1. Connect to the web portal of the spare unit. The Welcome page appears.



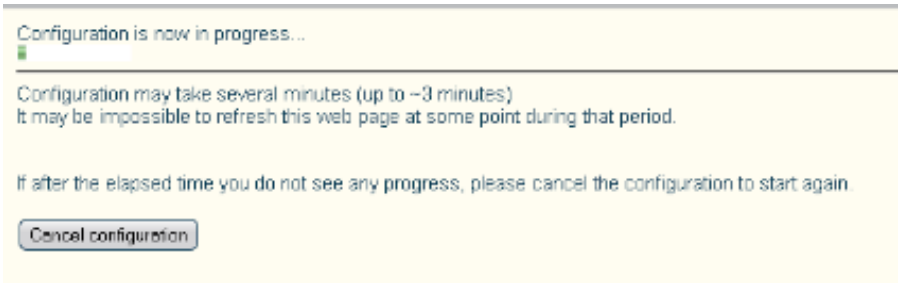
2. To select the manner in which you wish to use the TMG3200, click the Tmedia 1+1 image.



3. To indicate that this unit will be used as the primary unit in a Tmedia 1+1 system, click the bottom image.



4. The Progress page is displayed.



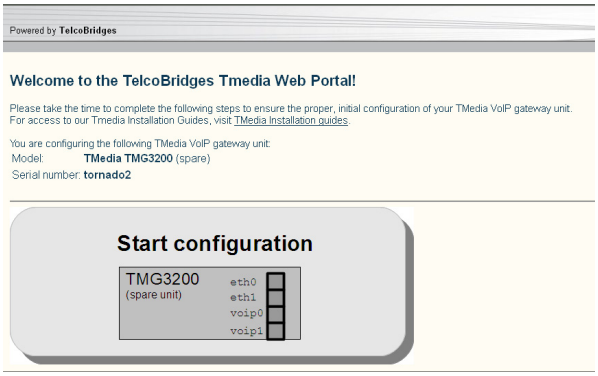
5.5.4.3 Replacing a Secondary Unit with another Replacement Secondary Unit

If you are replacing a secondary unit with another replacement secondary unit, follow the procedure in Section 2.5.6.2 “Secondary Unit” on page 45.

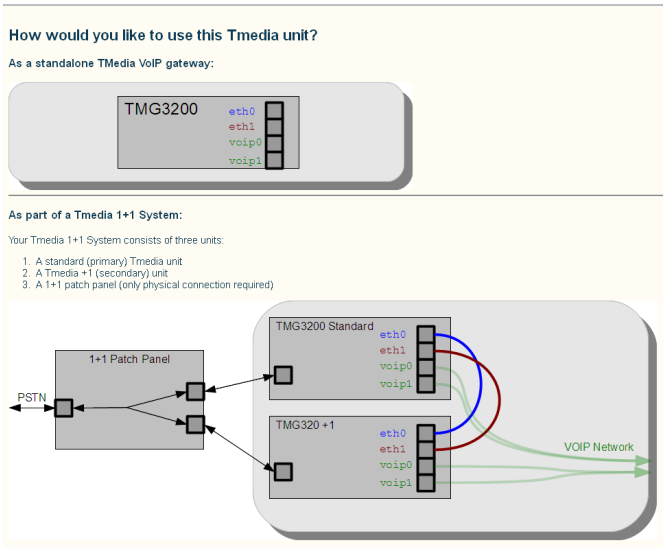
5.5.4.4 Replacing a Secondary Unit with a Spare Unit

If you are replacing a secondary unit with a spare unit, do the following steps:

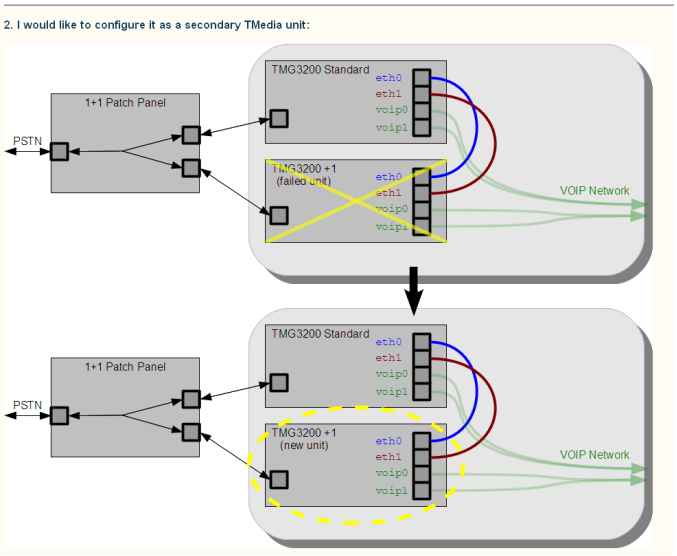
1. Connect to the web portal of the spare unit. The Welcome page appears.



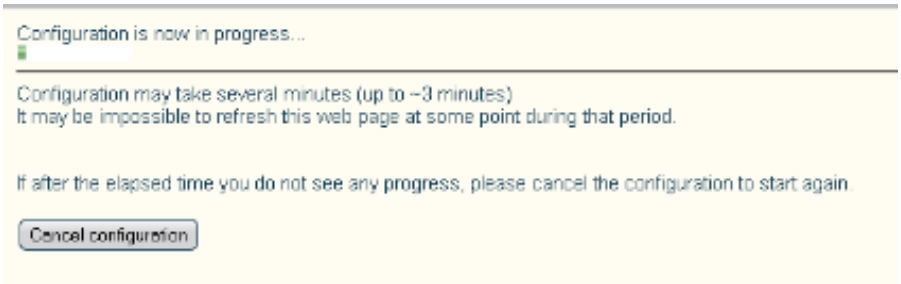
2. To select the manner in which you wish to use the TMG3200, click the bottom image.



3. To indicate that this unit will be used as the secondary unit in a Tmedia 1+1 system, click the bottom image.



4. The Progress page is displayed.



5.6 Replacing a Power Supply

The replacement of a power supply will vary according to the type of power supply:

- AC power
- DC power

5.6.1 Replacing AC Power Supply

1. Unplug the power cord from the defective power supply
2. Hold down the red lever of the power supply and pull it out of the chassis
3. Insert the new power supply and make sure it is properly seated
4. Connect the power cord

5.6.2 Replacing DC Power Supply

1. Unplug the power cord from the defective power supply
2. Hold down the lever and pull it out of the chassis
3. Insert the new power supply and make sure it is properly secured in its case
4. Connect the power cord

Chapter 6 System Upgrades

Refer to the TB Wiki for information about system upgrades at:

http://docs.telcobridges.com/mediawiki/index.php/Tmedia_Upgrade

6.1 Installing a New License

The TMG3200 and TMG3200 +1 each require separate licenses. To install a new license on a Tmedia system, follow the steps described at the following link:

http://docs.telcobridges.com/mediawiki/index.php/Add/Change_Licenses

Note: A license upgrade may require an interruption of service. A time extension of a temporary license will not cause a service interruption, however changing features will.

Chapter 7 Troubleshooting Tools

This chapter provides information about the following topics:

- Connecting to the Serial Port of a Tmedia VoIP Gateway
- Configuring the Terminal Emulator Application
- Reporting a Problem
- Preparing your Setup Information
- TbDebug Debug Dump Files
- Application Logs
- Backdoor Tools
- tbsigtrace Signaling Traces

7.1 Connecting to the Serial Port of the Tmedia VoIP Gateway

The serial port interface enables administrators to perform management tasks on the Tmedia VoIP gateway.

To connect to the serial port of a Tmedia VoIP gateway:

1. Connect a CAT5 RJ-45 (male-male) cable (supplied with unit) between the com port of your computer and the serial port (labelled 10101) of the Tmedia VoIP gateway as shown in figure 7.1 on page 84. See Section A.2 on page 93 for a RJ-45 console wiring diagram.

2. If your computer's serial port features a DB9 connector, use the DB9 to RJ-45 adapter supplied with your Tmedia VoIP gateway. If your computer's serial port features a USB connector, you will need to provide a USB to DB9 adaptor. Refer to figure 7.2 on page 84.

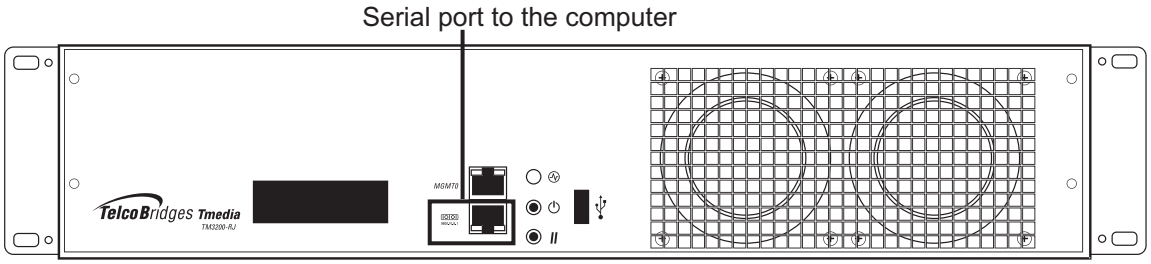


Figure 7.1 Computer to Tmedia VoIP Gateway Serial Port Connection

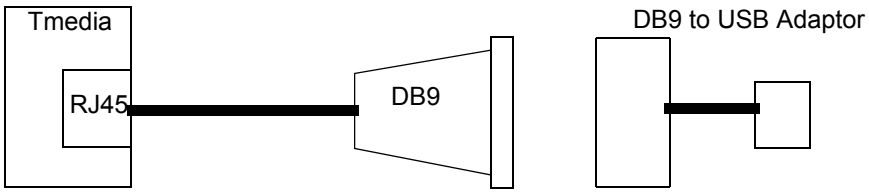


Figure 7.2 Conceptual View of a Serial Connection from the Tmedia VoIP Gateway to a Computer

7.2 Configuring the Terminal Emulator Application

Before communicating with the Tmedia Management Interface, you must first configure a terminal emulator or console application to communicate with the Tmedia VoIP gateway in order to configure initial settings. Available terminal emulation software includes:

- HyperTerminal
- Putty
- Minicom

To configure the terminal emulator application:

1. Set the baud rate (bits per second) to **9600**
2. Set the data rate to **8 bits**
3. Set the parity to **None**
4. Set the stop bits to **1**
5. Set the flow control to **None**

7.3 Reporting a Problem

TelcoBridges has developed extensive tools to gather information about a Tmedia system to solve problems quickly. Users **MUST** gather all related logs before reporting a problem to TelcoBridges Support via Email or MSN. Various logging methods are described in the following sections.

Once information is gathered and sent to the TelcoBridges Support group (support@telcobridges.com), the Support group will assign a tracking number to the problem. All follow-up correspondence, whether it be by E-mail, MSN, or phone call must refer to the tracking number to which the problem has been assigned.

For further information about reporting a problem, refer to Telcobridges TB Wiki at:

http://docs.telcobridges.com/mediawiki/index.php/Support:Contacting_TelcoBridges_technical_support

7.4 Setup Information

The setup information must include:

- Physical connections. If necessary, describe it in a network diagram.
- Specifying the product name.
- Telecommunication connectivity diagram (for example: E1/T1, DS3, STM-1/OC-3, VoIP Ethernet switch, etc)
- Remote access to system (SSH, VPN, VNC, Remote desktop, etc.)
- For a signaling-related problem, specify which side is initiating the call

7.5 Tbdebug Dump Files (Mandatory)

The tbdebug copies information about Telcobridges libraries and Tmedia VoIP gateway to log files. This includes the software release running on the host, the firmware release running on the Tmedia VoIP gateway, and other system information, such as: available features, configuration, and status information.

The tbdebug files must be sent when a problem is reported. If the problem is reproducible, the tbdebug dump files are verified before and after the problem is reproduced. This will aid in identifying the problem quickly.

For further information about Tbdebug, refer to Telcobridges TB Wiki at:
http://docs.telcobridges.com/mediawiki/index.php/Toolpack_Debug_Application:Tbdebug

7.6 Application Logs

All Toolpack applications will produce logs. The trace level can be set to vary the amount of logs that are received from the system. Trace level 0 is the most verbose and 4 is the least. Important errors are always logged. To learn about:

- Application logs, see: http://docs.telcobridges.com/mediawiki/index.php/Web_Portal_Sections:Logs
- Database backups, see: http://docs.telcobridges.com/mediawiki/index.php/Web_Portal_Sections:Backups

Note This data is collected by tbdebug.

7.7 Backdoor Tools

A number of backdoor tools are available as follows:

- tbx_cli_tools_remote
- tbshowls
- VoIP Traffic Capture
- Wireshark
- tbstreamlisten
- Stream server audio packets to wave file
- tbsigtrace

7.7.1 tbx_cli_tools_remote

The tbx_cli_tools_remote tool can be used to get the text-based GUI control of TB applications like Toolpack_Engine, Toolpack_sys_manager, tbstreamserver, and others which are run in background.

For further information about tbx_cli_tools, refer to Telcobridges TB Wiki at: http://docs.telcobridges.com/mediawiki/index.php/Toolpack_Application:tbx_cli_tools_remote

7.7.2 Line/Trunk Status (Tbshowls)

```
tbshowls (/tb/bin/release/[OS version]/)
```

tbshowls can be used to show trunk alarm and performance counters. The tool will check the trunk status periodically to show the most updated trunk status. Users can use the up/down/left/right arrow keys to show the performance data on different trunks. Use a-s-d-x to scroll and view other line services.

Options 'G' and 'S' enable you to get and set the trunk interface parameters.

Option 'R' can be used to reset the performance counter value to zero.

It is also possible to allocate all line interfaces in different configurations. This is useful for DS3 and OC3/STM-1 configurations, in order to help users understand the configuration.

Note Trunk status and alarms can be viewed from the *Status* menus of the Web Portal.

7.7.3 VoIP Traffic Capture

When troubleshooting VoIP related issues, you can use to use VoIP port mirroring to capture all incoming and outgoing network packets from a VoIP network interface using the other VoIP interface. A direct physical connection can be established with a host's Gigabit Ethernet interface and the other VoIP interface. Wireshark or tcpdump is used on the host to capture network packets.

To capture VoIP Traffic from VoIP0 using VoIP1, do the following:

1. Connect the VoIP1 interface to the Ethernet port of a server
2. Connect to the telecom platform

   2a. Using telnet, for example: [root@TB005375]# telnet 172.31.1.1
   or

   2b. Using minicom, for example: [root@TB005375]# minicom

3. Enter the following command:

   ```
   mv88eMonitor 0x4 0x4 3
   ```

4. Start pcap capture on the server Ethernet port (either wireshark or tcpdump)
5. To stop the tracing:

   ```
   mv88eMonitor 0 0 3
   ```

For further information, refer to the TelcoBridges TB Wiki at:
http://docs.telcobridges.com/mediawiki/index.php/VoIP_Ethernet_Capture#TMG3200

7.7.4 Network Analysis Tools

The following network analysis tools may be used:

- Wireshark
- tcpdump

7.7.4.1 Wireshark (formerly called Ethereal)

Wireshark is useful for capturing both VoIP traffic as well as IP-based protocol packets

This program is available at this site: www.wireshark.org

7.7.4.2 tcpdump

tcpdump is a packet analyzer for Linux systems. This tool is available using your Linux distribution package manager.

This program is available at this site: www.tcpdump.org

7.7.5 Tbstreamlisten

```
tb\apps\tbstreamlisten\release\[OS version]
```

This allows for the recording of the raw data from a TDM stream. Please ask customer support for instructions regarding this function.

7.7.6 Stream Server Audio Packets to Wave File

You can capture all audio packets transmitted to and from the Stream Server and convert them into wave files for analysis. You can use Wireshark or tcpdump on the server running the tbstreamserver application.

The conversion tool, streamserver_pkt_to_wav can be found at the following location:

/tb/bin/release/[OS version].

7.7.7 tbsigtrace Signaling Traces

The tbsigtrace program is a tool used to capture TDM-based (SS7, ISDN, CAS) and IP-based (SIP, SIGTRAN, H.248/MEGACO) protocols packets.

Note This application can be started using the Web Portal. For further information, refer to the TelcoBridges TB Wiki at: http://docs.telcobridges.com/mediawiki/index.php/Toolpack_Debug_Application:Tbsigtrace

Appendix A Wiring Diagrams

A.1 RJ48C Wiring Diagram: Crossover and Straight Cables

RJ48C (T1/E1) Wiring Schematic: Crossover Cable

1	RX/Ring/-	RX/Ring/-	1
2	RX/Tip/+	RX/Tip/+	2
3	Not Connected	Not Connected	3
4	TX/Ring/-	TX/Ring/-	4
5	TX/Tip/+	TX/Tip/+	5
6	Not Connected	Not Connected	6
7	Not Connected	Not Connected	7
8	Not Connected	Not Connected	8

1 8

RJ48C (T1/E1) Wiring Schematic: Straight Cable

1	RX/Ring/-	RX/Ring/-	1
2	RX/Tip/+	RX/Tip/+	2
3	Not Connected	Not Connected	3
4	TX/Ring/-	TX/Ring/-	4
5	TX/Tip/+	TX/Tip/+	5
6	Not Connected	Not Connected	6
7	Not Connected	Not Connected	7
8	Not Connected	Not Connected	8

Figure A.1 RJ48C Wiring Diagram

A.2 RJ48 Console Wiring Diagram

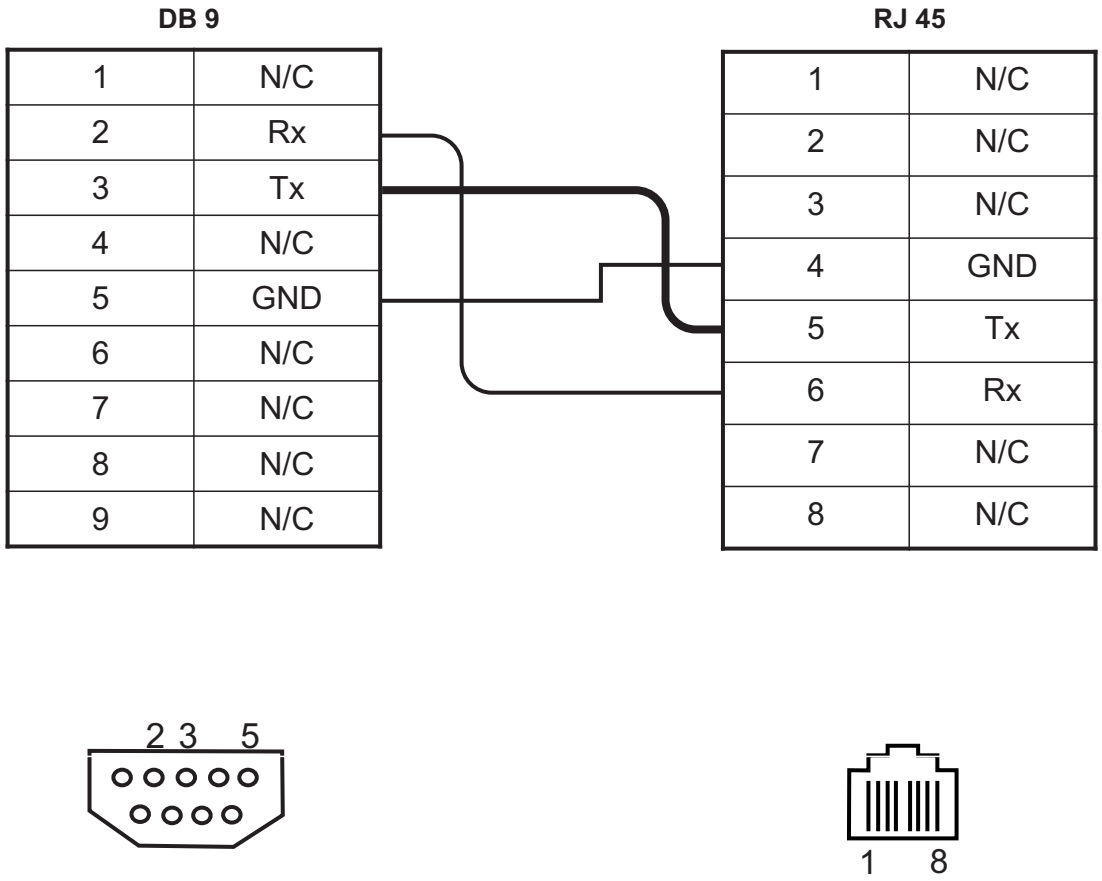


Figure A.2 Console Pinout