TMG800 & TMG800 1+1 System Installation Guide

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TelcoBridges

HEAD OFFICE
TelcoBridges Inc.
91 rue de la Barre, Suite 01
Boucherville, QC, J4B 2X6
CANADA
www.telcobridges.com/en/tbsupport.aspx

T +1 450 655 8993
F +1 450 655 9511
info@telcobridges.com
support@telcobridges.com

TB Support - Technical Support
Tel: +1 438 338 2100
support@telcobridges.com

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 TMG800 and TMG800 +1.
Tmedia Standalone System	This term is used when a description, in this document, applies to the TMG800 operating as a standalone unit.
Tmedia 1+1 System	This term is used when a description, in this document, applies to the TMG800 operating in conjunction with the TMG800 +1. This term also includes the 1+1 patch panels.
TMG800	This term is used when a description, in this document, applies to all variations of the TMG800 units.
TMG800 +1	This term is used when a description, in this document, applies to all variations of the TMG800 +1 units.
1+1 Patch Panel	This term is used as a generic reference to 1+1 patch panels, which enable a TMG800 to connect to a TMG800 +1.

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: TMG800 operating in standalone mode.
- Tmedia 1+1 System: TMG800 operating in conjunction with a TMG800 +1, including its associated 1+1 patch panel.

The following topics are covered:

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

1.1 Installation Overview

The installation and setup a Tmedia system (see figure 1.1 on page 2) 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.

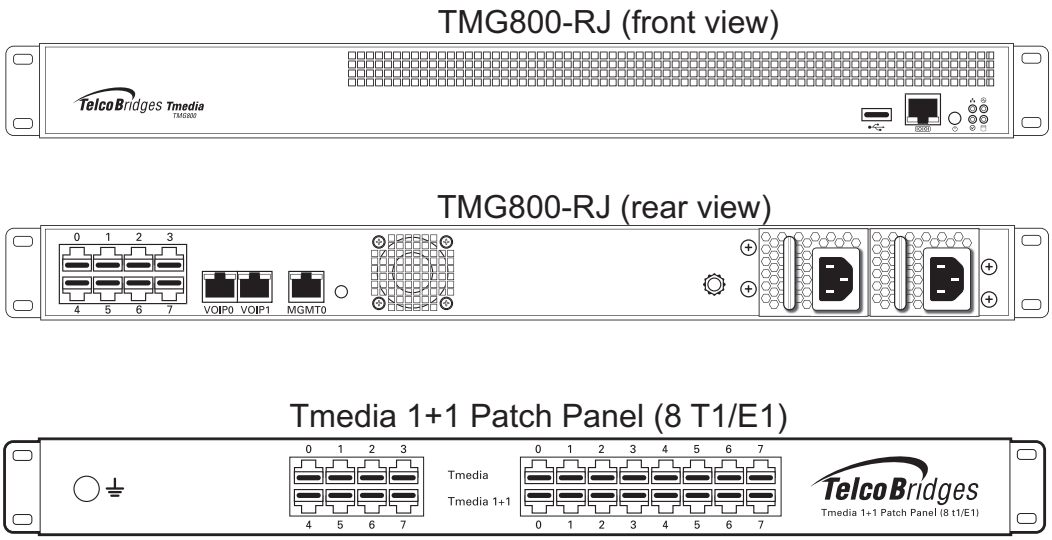


Figure 1.1 TMG800 and TMG800 +1 Front and Rear Views

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 TMG800 and TMG800 +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 the Tmedia VoIP gateways are 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 Tmedia VoIP Gateway 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 Tmedia VoIP Gateways, 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 the TelcoBridges Tmedia VoIP gateways and have been trained to work with the equipment. If you have any technical questions, TelcoBridges TB Support (technical support team) can be reached via 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 the 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 “TMG800” on page 6.
- Section 2.1.2 “TMG800+1 (includes its associated 1+1 patch panel)” on page 7.
- Section “1+1 Patch Panel” on page 7.

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

2.1.1 TMG800

In the TMG800 box, you will find the following items:

- One (1) TMG800-RJ. See figure 1.1 on page 2.
- One (1) set of mounting brackets and screws, used to mount the TMG800 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 TMG800.
- Three (3) CAT5 Ethernet 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).
- For AC powered units: One (1) or two (2) AC power cables
- For dual DC powered units: Two (2) DC power cables

Not included

- A 19” equipment rack. The TMG800 must be installed on a 19” wide equipment rack.

2.1.2 TMG800+1 (includes its associated 1+1 patch panel)

- One (1) TMG800+1 unit (TMG800-RJ). See figure 1.1 on page 2.
- One (1) set of mounting brackets and screws, used to mount the TMG800+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 TMG800.
- Three (3) CAT5 Ethernet 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 pictorial view of the equipment set-up).
- For AC powered units: One (1) or two (2) AC power cables
- For dual DC powered units: Two (2) DC power cables
- The associated 1+1 patch panel for your TMG800+1. See figure 1.1 on page 2 for further details.

Not included with the TMG800 +1:

- A 19" equipment rack. The TMG800 must be installed in a standard 19" wide equipment rack.

1+1 Patch Panel

A 1+1 patch panel is required for the proper connection of the Tmedia 1+1 system and is automatically included when a TMG800 +1 is ordered. Table 2.1 lists the patch panels that can be ordered for a TMG800 and TMG800 +1.

Table 2.1 Tmedia 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 TMG800 and TMG800 +1 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.

2.2 Rack Mounting the 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 TMG800 and TMG800 +1 are each housed in a 1U chassis, as tabulated in table 2.2 on page 8. It is important that you provide for enough room on the equipment rack to allow for the installation of the TMG800 and TMG800 +1.

Consider the available space on your equipment rack and the height of the TMG800 and TMG800 +1. 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 TMG800 and TMG800 +1 on the equipment rack.

Table 2.2 Tmedia VoIP Gateway Physical Height

Tmedia Model Number	Vertical Height
TMG800	1U (1.75 inches or 44.45 mm)
TMG800 +1	1U (1.75 inches or 44.45 mm)
Patch Panel	1U (1.75 inches or 44.45 mm)

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

The TMG800, TMG800 +1, and patch panels are mounted on the 19” equipment rack using the angle brackets and screws provided in the box.

To mount the TMG800 proceed as follows:

1. Using four metal screws, attach one angle bracket to the front, left-hand side of the TMG800, when viewed from the front, as shown in figure 2.1 on page 10. 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 8.

To mount the TMG800 +1 proceed as follows:

1. Install the TMG800 +1 below the TMG800, as shown in figure 2.1 on page 10.

2. To attach the TMG800 +1 to the equipment rack, follow the previous procedure.

To mount a patch panel proceed as follows:

1. Install the patch panel below the TMG800 +1, as shown in figure 2.1 on page 10.

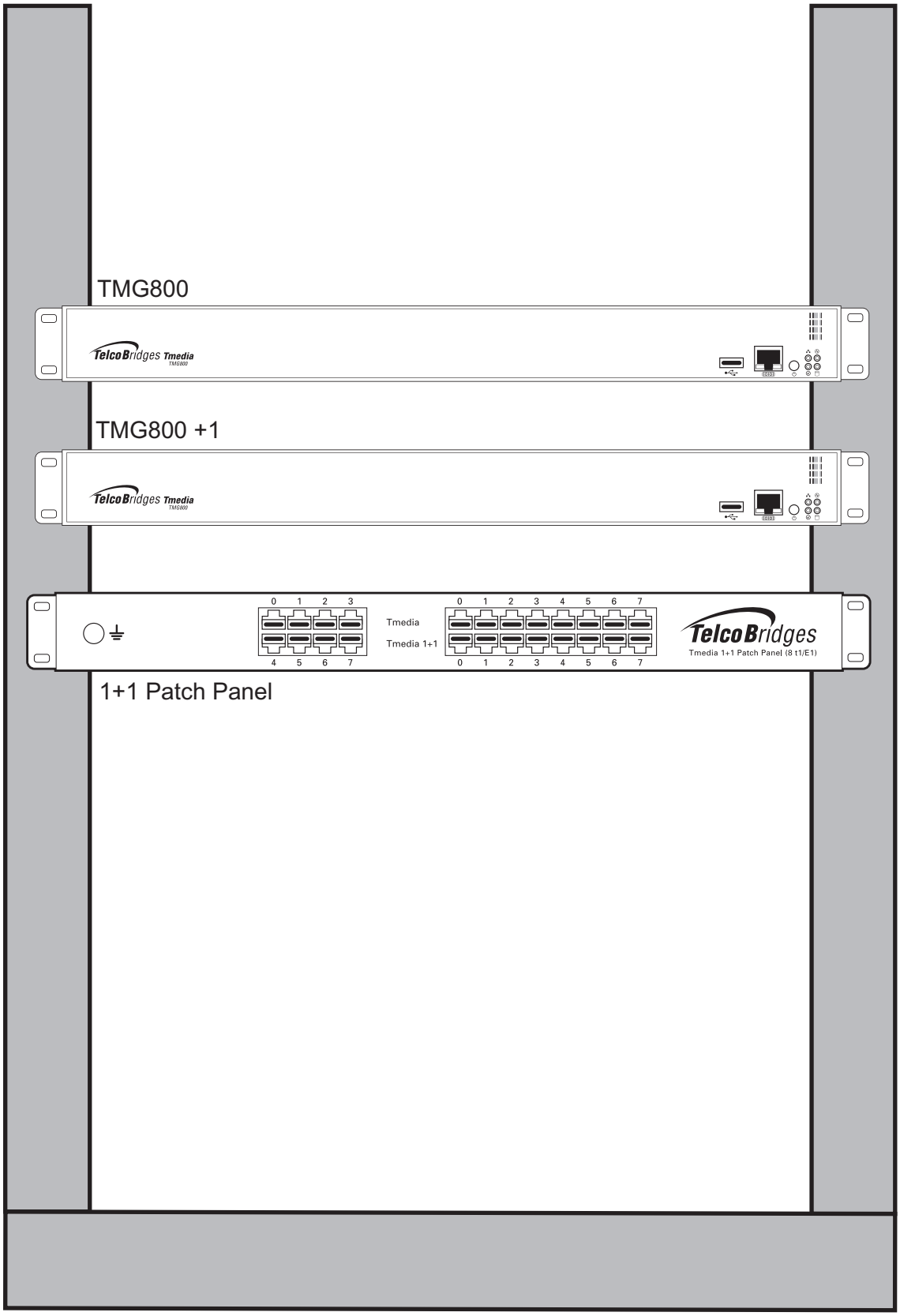


Figure 2.1 Rack Mounting a Tmedia 1+1 System

2.3 Choosing your Connection Procedures

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

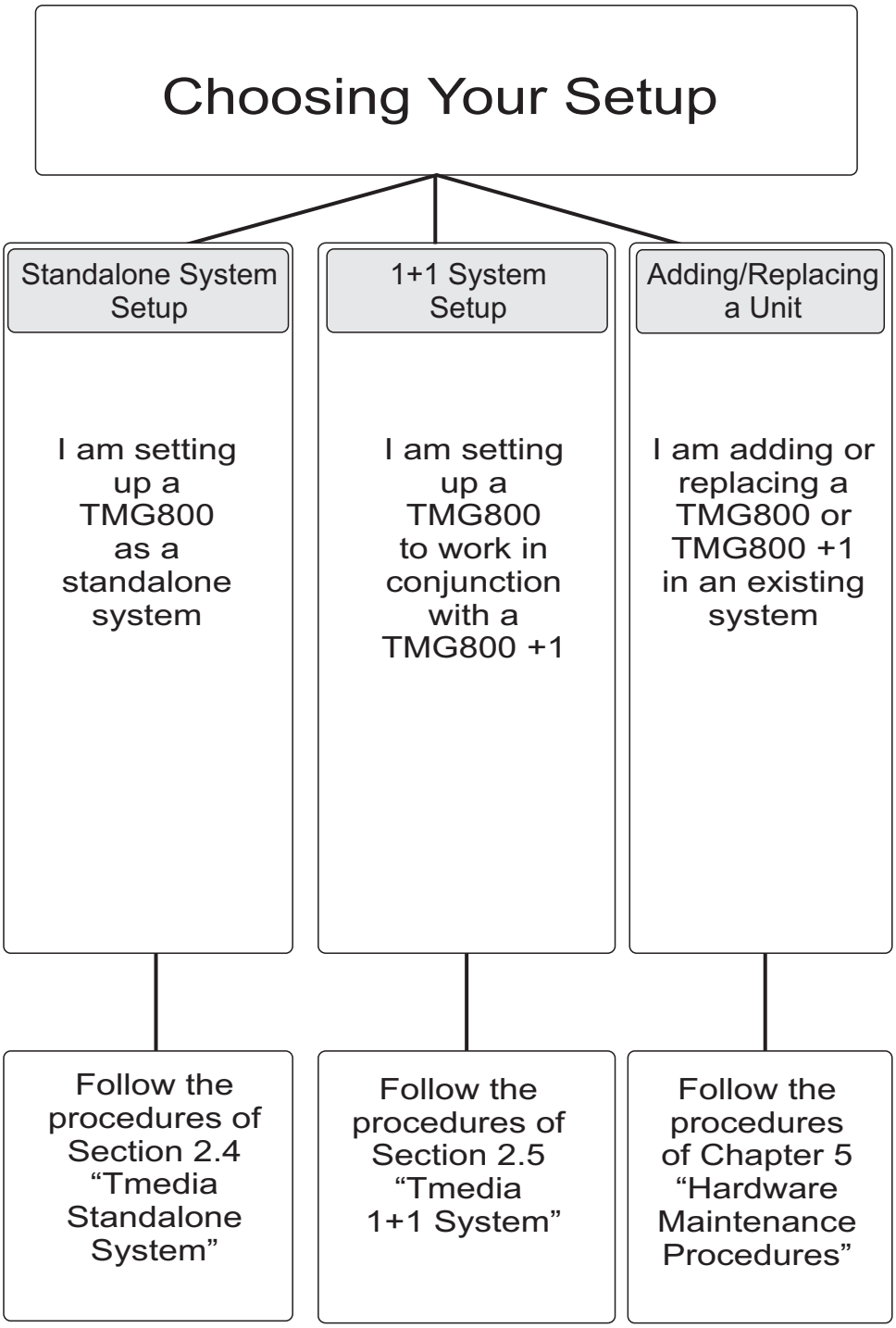


Figure 2.2 Choosing your setup.

2.4 Tmedia Standalone System

If you are here, you have a TMG800 that you will set up as a standalone system. This section covers the following procedures for a TMG800 standalone system:

2.4.1 Connecting to the Tmedia Management Interface

The Tmedia Management Interface enables administrators to perform management tasks on the TMG800.

Prerequisites

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

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

Interconnections

The TMG800 provides a Tmedia Management Interface, using one Gigabit Ethernet network link, as shown in figure 2.3 on page 13.

To communicate with the Tmedia Management Interface:

1. Connect the supplied CAT5 Ethernet cable to the port labelled “MGMT0” at the rear of the TMG800.

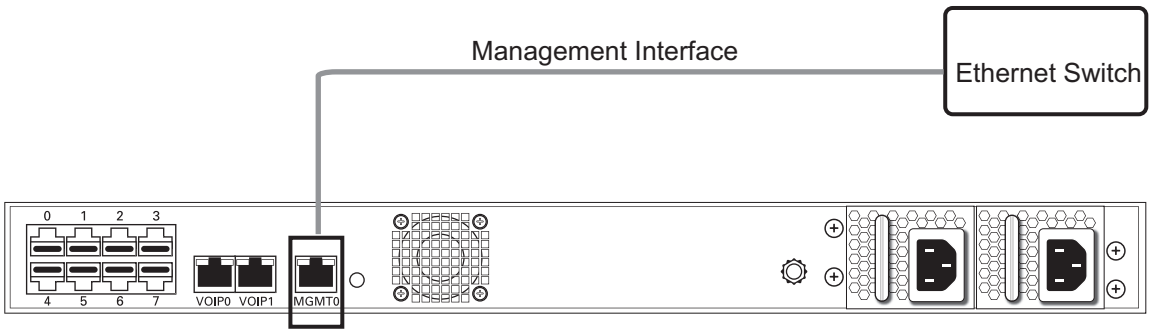


Figure 2.3 Tmedia Management Interface

2.4.2 Connecting to a VoIP Network

The TMG800 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 TMG800 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 TMG800 will exceed 100 Mbps, therefore 1000 Mbps is recommended.

Prerequisites

To connect the TMG800 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 TMG800 with an RJ45 (male-male) CAT5 Ethernet cable.

Connections

The TMG800 is connected to the VoIP network by one or optionally two Ethernet GigE network links, as shown in figure 2.4 on page 14.

To connect the TMG800 to the VoIP network:

1. Connect a CAT5 Ethernet cable to VoIP0 at the rear of the TMG800. 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 TMG800. Connect the other end of the same CAT5 cable to the second Gigabit Ethernet switch.

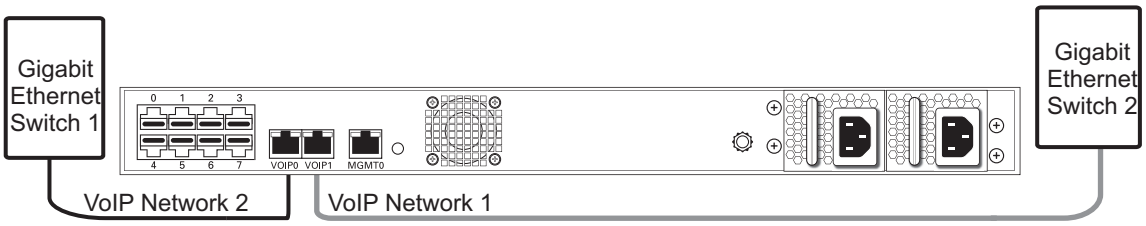


Figure 2.4 Connecting to the VoIP Network

2.4.3 Connecting to the PSTN

A TMG800 with 8 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 92 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 TMG800-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 15.

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

Figure 2.5 8-Port Interface to the PSTN

2.4.4 Powering Up

The TMG800 is furnished with one (1) or two (2) AC or DC power connections. Only once all other equipment installation work has been completed should the TMG800 be powered up.

2.4.4.1 Connecting to AC Power

Prerequisites

To power the TMG800, you will need:

- One to two power sources.
- Two power cables for the TMG800.

To connect the TMG800 to AC Power:

1. Connect an AC power cable between each AC connector of the TMG800 and an AC supply. See figure 2.6 on page 16.

Note If the TMG800 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 2.6 on page 16.

2. Power up the TMG800 by turning on its power switch(es).

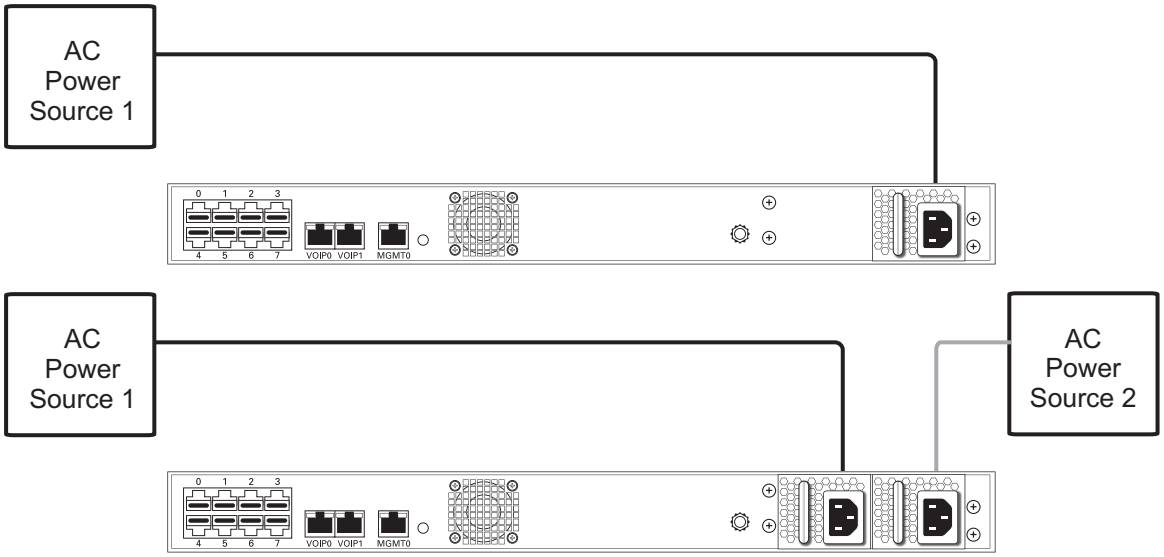


Figure 2.6 AC Power Connection

2.4.4.2 Connecting to DC Power

The TMG800 DC model is furnished with two DC power connection ports. In addition, each DC powered TMG800 is supplied with either one or optionally two DC power cables.

To connect the TMG800 to DC power:

Note Two types of cable with different coloring are available. Refer to figure 2.7 on page 17 for the appropriate wiring information.

The connection of DC power is described for:

- Single DC power connection port
- Dual DC power connection port

To connect a TMG800 with a single DC port to power:

1. Connect a ground wire to the ground plug located at the rear of the TMG800, as shown in figure 2.7 on page 17.
2. Connect a 14 AWG wire between the positive terminal of a DC power source and the terminal on the TMG800 labelled as ⎓.
3. Connect a 14 AWG wire between the negative terminal of a DC power source and the terminal on the TMG800 labelled as 48V.

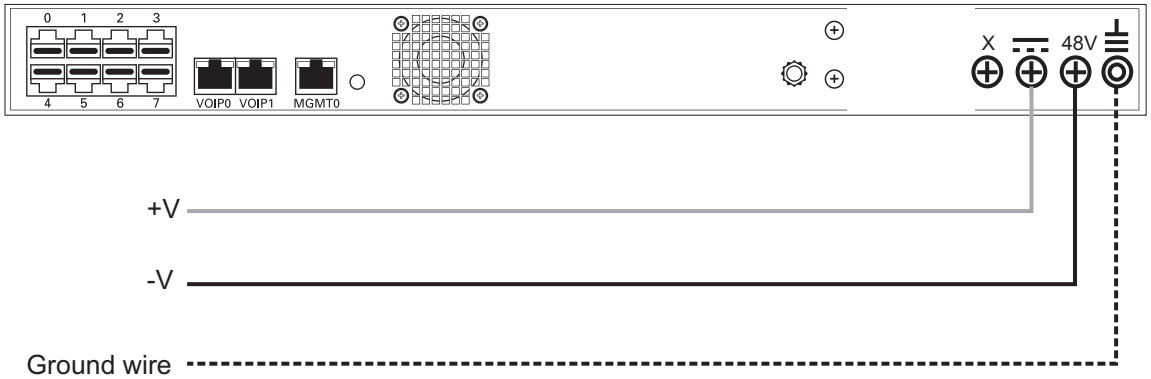


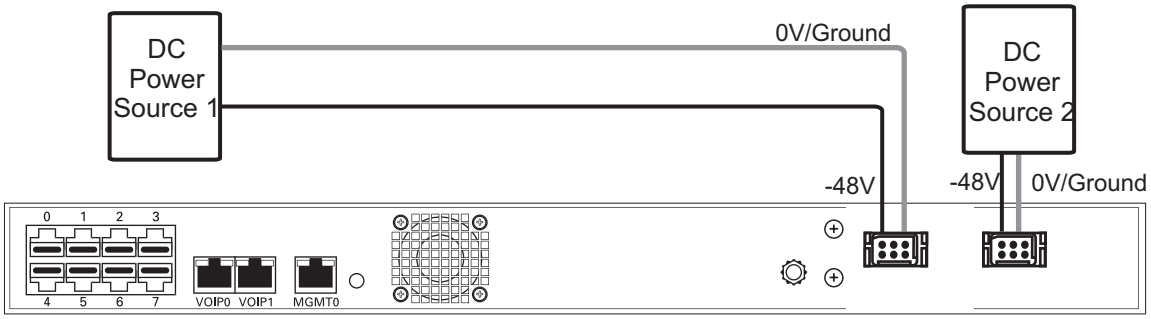
Figure 2.7 TMG800 DC Wiring Diagram

To connect a TMG800 with dual DC power ports to power:

1. Connect one DC cable supplied with the TMG800, as shown in figure 2.8 on page 18, to the DC outlet at the rear of the TMG800.

Note Two types of cable with different coloring are available. Refer to figure 2.8 on page 18 for the appropriate wiring information.

2. Connect one lead of the DC power cable to the positive terminal of the DC power source, as shown in figure 2.8 on page 18.
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

NOTE: DC power cable supplied with TMG3202
(Two types: Black/Red and Yellow/Black)

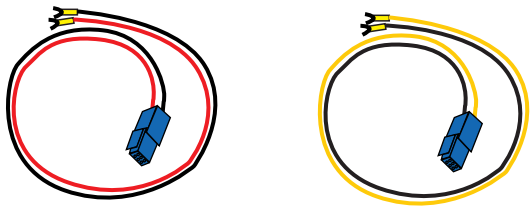


Figure 2.8 TMG800 Redundant DC Supply Wiring Diagram

2.4.5 Start Up

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

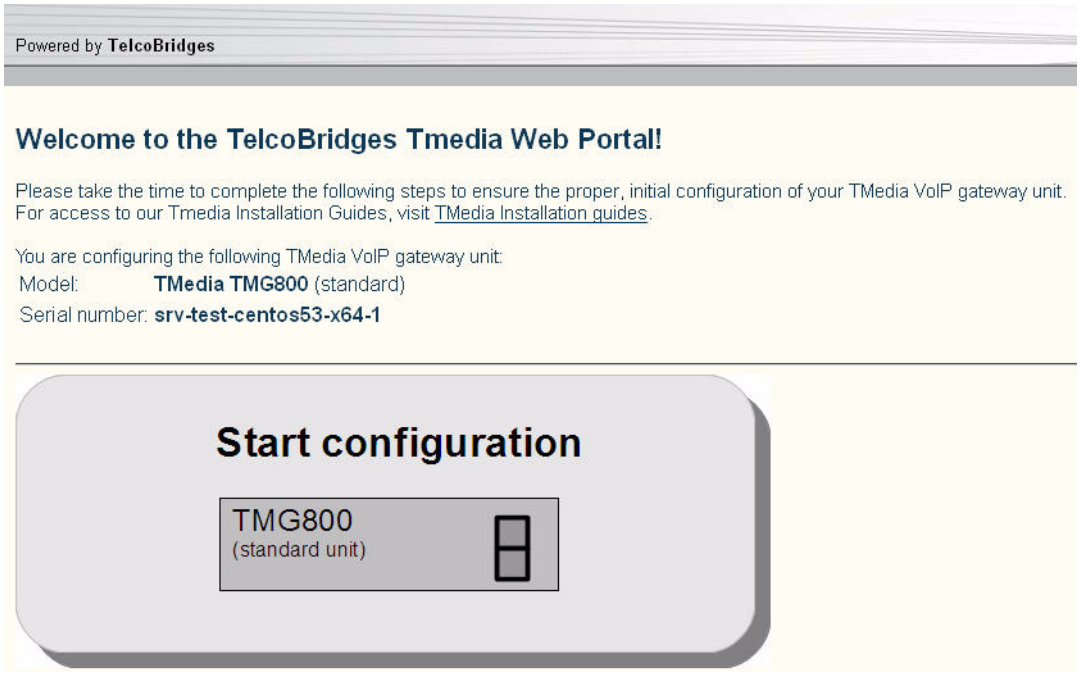
Once the configuration settings have been applied, your TMG800 will start up and display the web portal configuration management tool.

Note To access the web portal, refer to Section 7.1 “Connecting to the Serial Port of the Tmedia VoIP Gateway” on page 62.

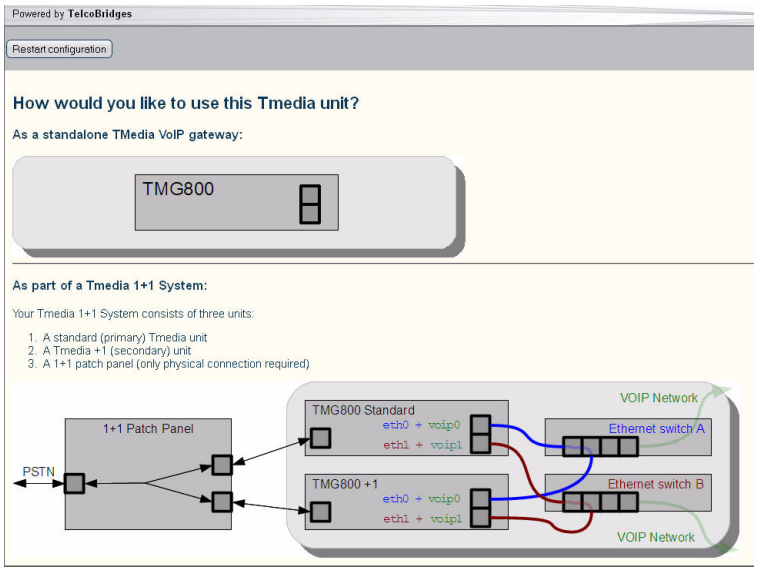
2.4.5.1 Configuring the Role

To configure the role of your TMG800 as a standalone unit, do the following:

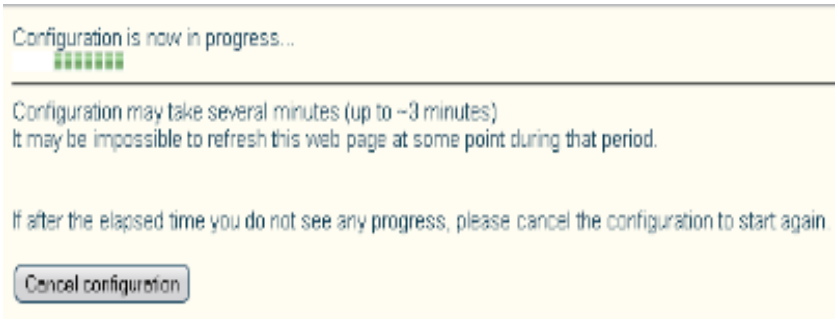
1. Connect to the web portal of the standalone unit. The Welcome page appears.



2. Click the TMG800 image to set the role of the TMG800 as a Standalone system.



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 2.9 on page 22.

To communicate with the Tmedia Management Interface:

1. Connect an RJ45 cable from the TMG800 to an Ethernet switch.
2. Connect an RJ45 cable from the TMG800 +1 to an Ethernet switch.

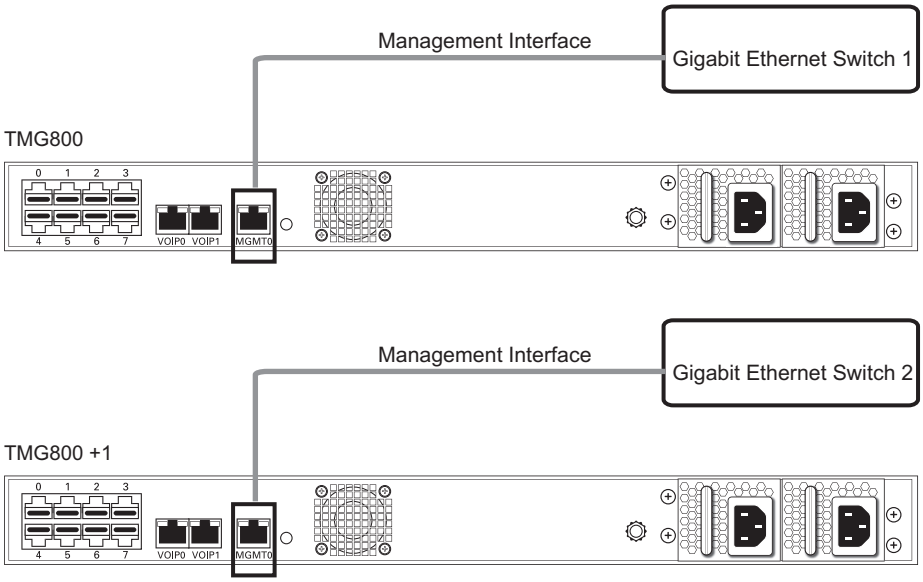


Figure 2.9 Tmedia Management Interface

2.5.2 Connecting to the Tmedia 1+1 System Control Network and VoIP Network(s)

Each TMG800 and TMG800 +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. These ports are also used to connect to the Tmedia Control Network, which allows both units to communicate with one another.

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

Note: The TMG800 1+1 system requires two (2) gigabit layer 2 Ethernet switches.

Prerequisites

To connect the TMG800 and TMG800 +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 for VoIP.

Connections

The TMG800 and TMG800 +1 VoIP ports must to be connected on both Ethernet GigE network links, as shown in figure 2.10 on page 23.

To connect to the VoIP network:

1. Connect the VoIP0 connector from both the TMG800 and TMG800 +1 to the first Ethernet switch.
2. Connect the VoIP1 connector from both the TMG800 and TMG800 +1 to the second Ethernet switch.

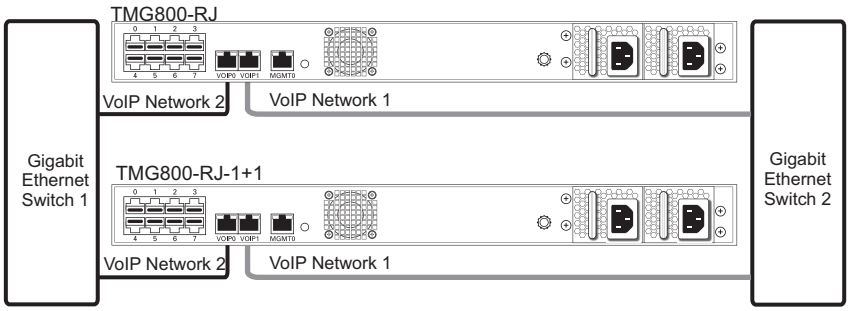


Figure 2.10 Connecting to the Tmedia Control Network and VoIP Network

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

A Tmedia 1+1 system has a TDM interface featuring 8 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 92 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 TMG800-RJ and TMG800-RJ+1 (RJ48C type) to the PSTN:

1. Connect T1/E1 lines 0-7 of the network section of the patch panel to the remote equipment. See figure 2.11 on page 25.
2. Connect T1/E1 lines 0-7 from the 'Tmedia' section of the patch panel to the RJ48C connectors of the TMG800-RJ.
3. Connect T1/E1 lines 0-7 from the 'Tmedia 1+1' section of the patch panel to the RJ48C connectors of the TMG800-RJ.

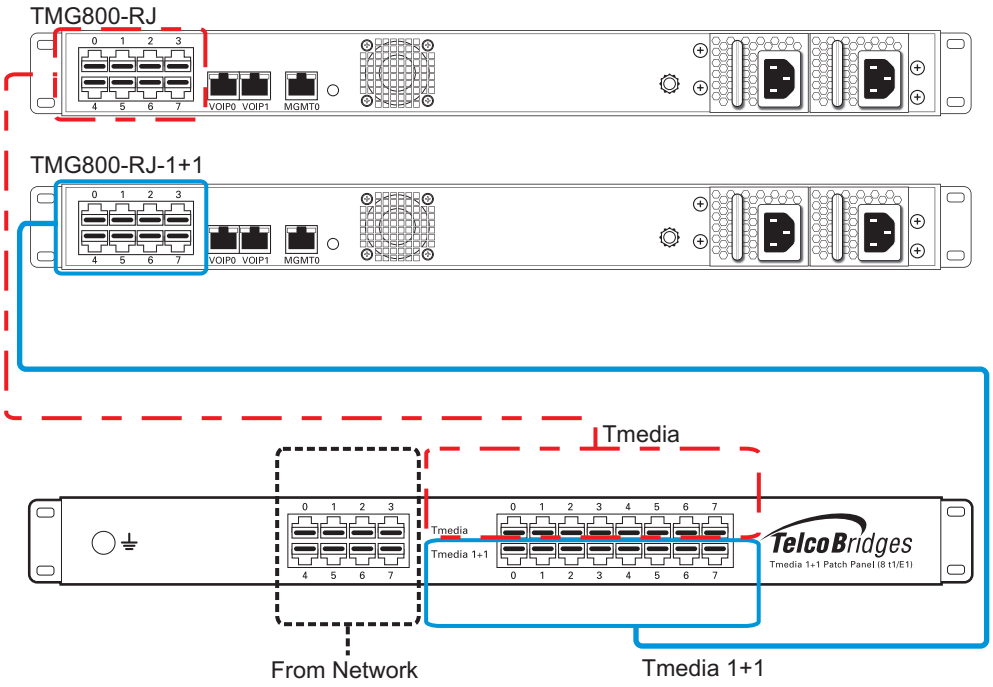


Figure 2.11 TMG800-RJ and TMG800-RJ-1+1 connecting to the TDM 1+1 8/T1/E1 patch panel

2.5.4 Powering Up

The TMG800 and TMG800 +1 are furnished with one (1) or two (2) AC or 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 TMG800 and TMG800 +1, you will need:

- One to two power sources.
- Two power cables for each TMG800 and TMG800 +1.

2.5.4.1 Connecting to AC Power

To connect the TMG800 and TMG800 +1 to AC Power:

1. Connect an AC power cord between AC connector of the TMG800 and TMG800 +1 and AC supplies. See Figure 2.12.

2. Connect the second power connector of each unit to the second power source.

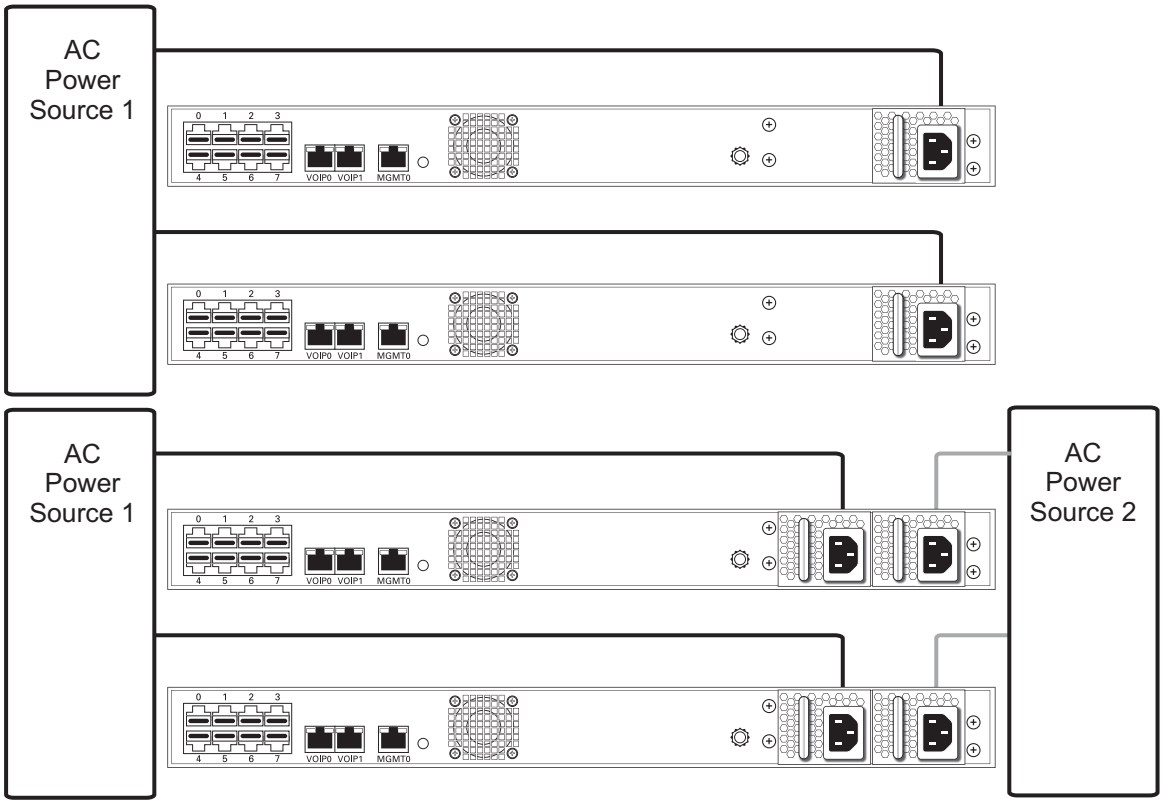


Figure 2.12 TMG800 and TMG800 +1 AC Power Connections

2.5.4.2 Connecting to DC Power

The TMG800 and TMG800 +1 DC models are furnished with two DC power connection ports. In addition, each DC powered TMG800 is supplied with two DC power cables.

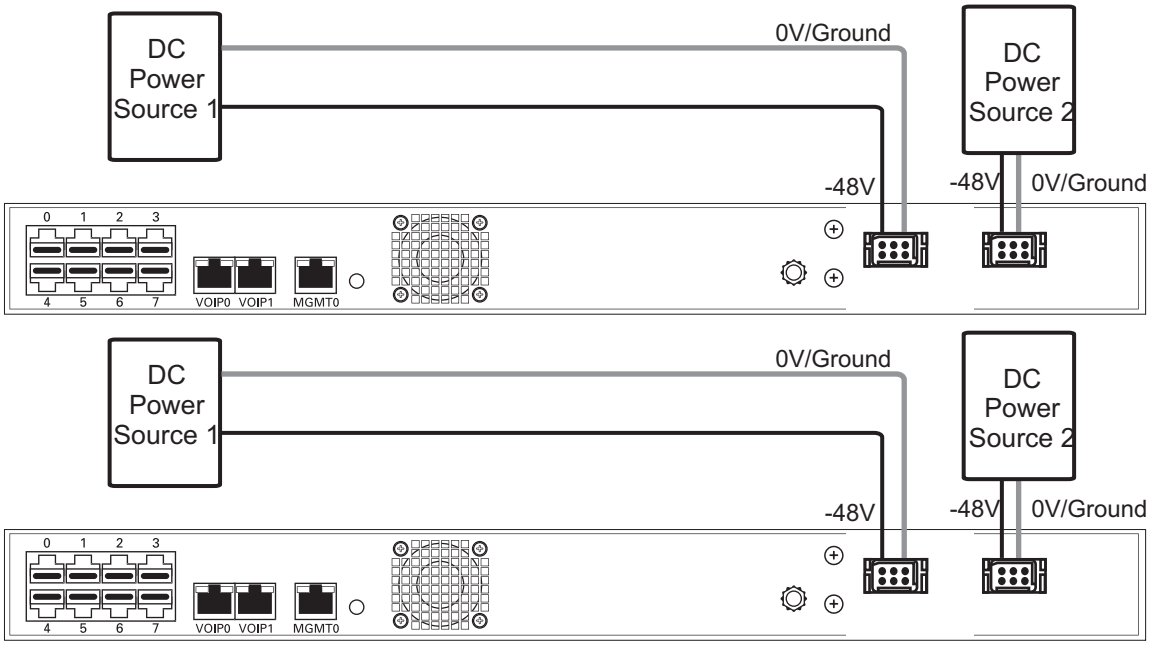
To connect the TMG800 and TMG800 +1 to DC Power

1. Connect the first DC power connector of the TMG800 and TMG800 +1 to DC power source one. See figure 2.13 on page 27.

   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 TMG3202 (Two types: Black/Red and Yellow/Black)

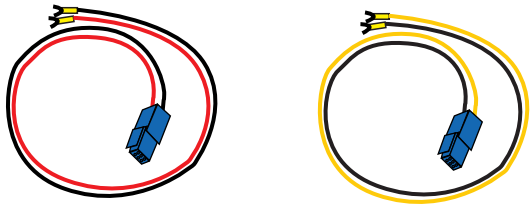


Figure 2.13 TMG800 and TMG800 +1 DC Power Connections

2.5.5 Start Up

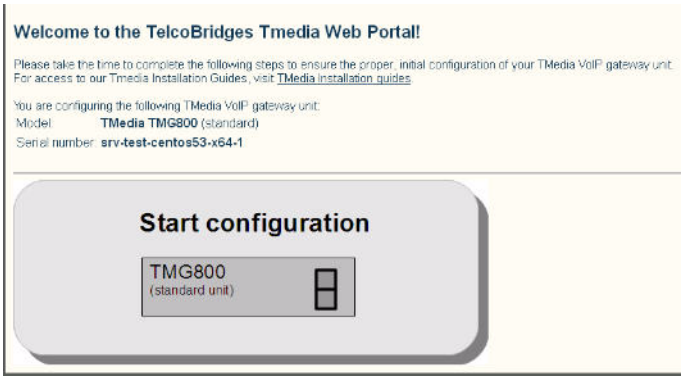
After powering up the Tmedia 1+1 system, you must configure both units, one as a primary and the other as secondary unit.

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

Note To access the web portal, refer to Section 7.1 “Connecting to the Serial Port of the Tmedia VoIP Gateway” on page 62.

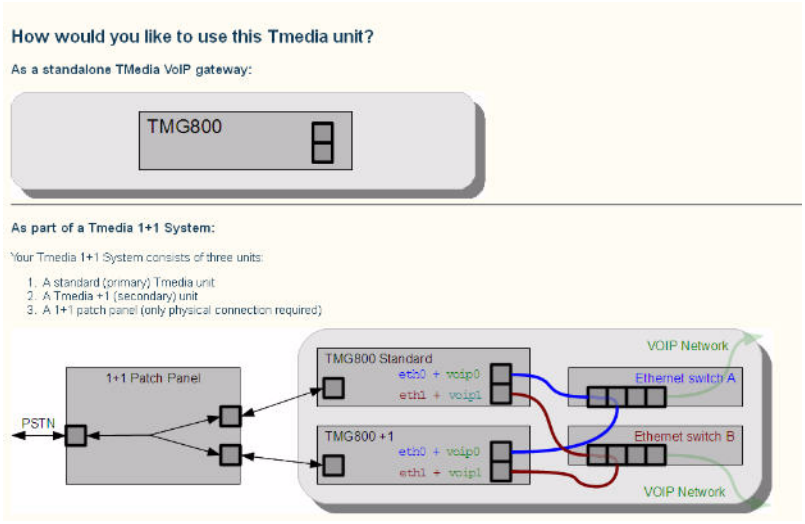
2.5.5.1 Primary Unit

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

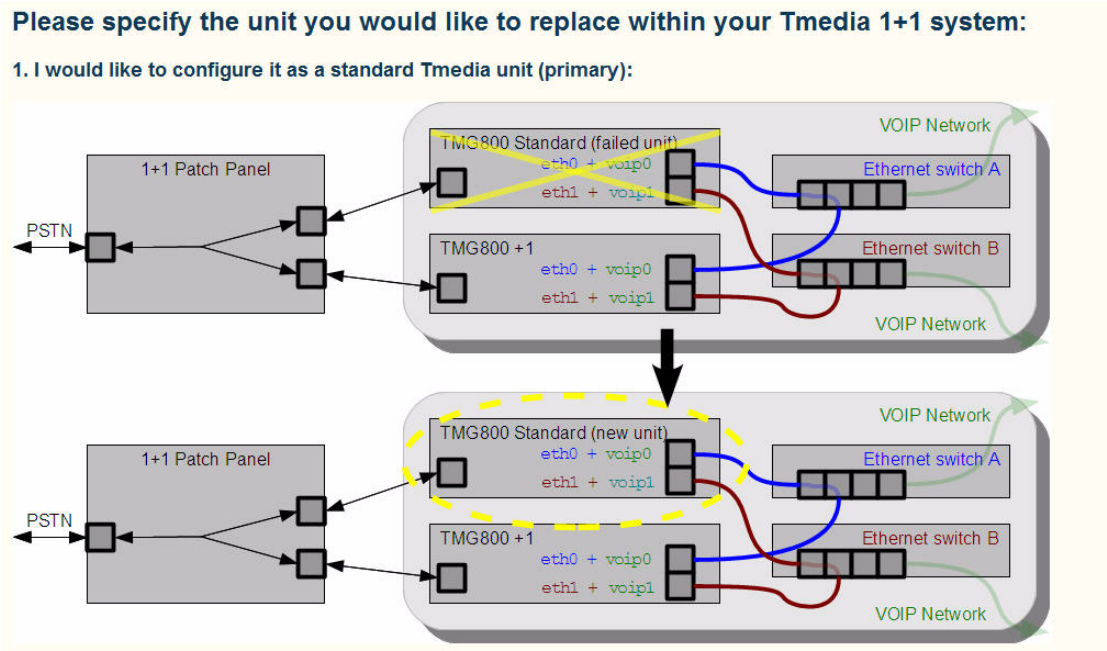


Note: The Welcome page indicates whether the TMG800 is a primary or secondary unit.

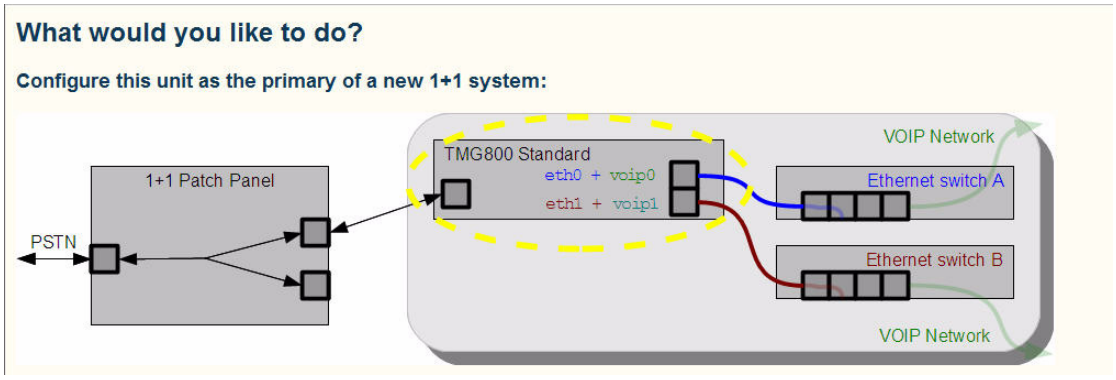
2. To select the manner in which you wish to use the TMG800, click the Tmedia 1+1 system image.



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



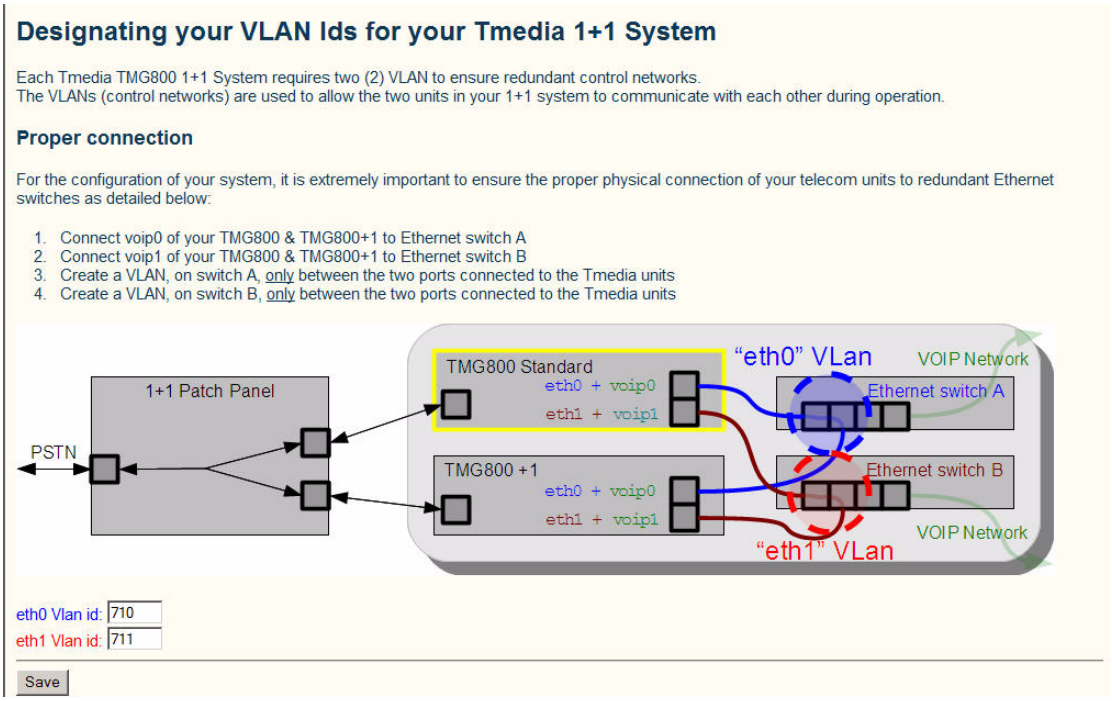
4. To indicate that this unit is a new unit in a Tmedia 1+1 system, click **Configure this unit as the primary of a new 1+1 system.**



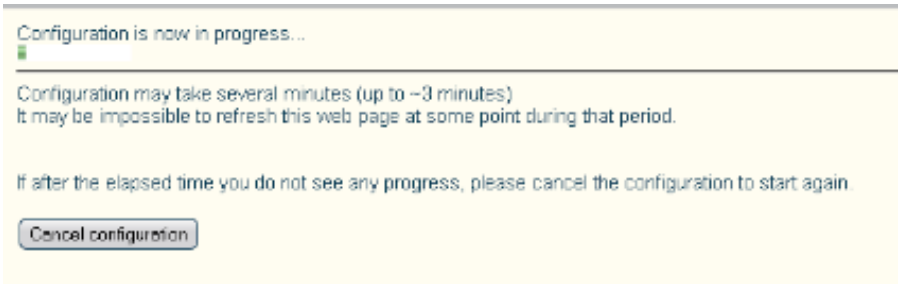
5. For VLAN configuration and connection, the TMG800 1+1 system requires 2 VLANs for the Tmedia Control Network. Both gigabyte layer 2 Ethernet switches MUST have their VLANs configured and the Tmedia must be properly connected BEFORE proceeding. The default VLAN IDs are:

   - ETH0: 710
   - ETH1: 711

   Once you are ready, click **Save** to configure the VLANs.

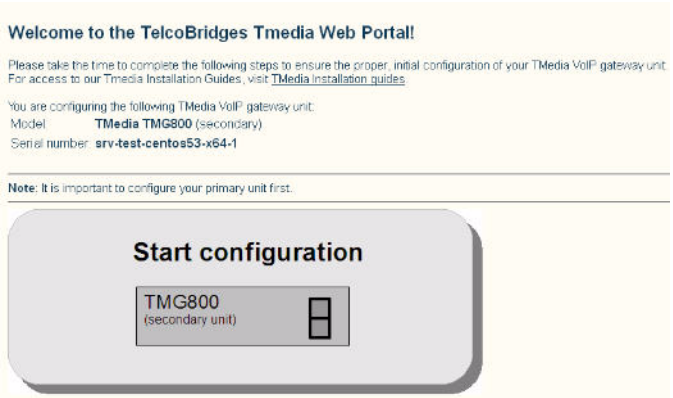


The progress page is displayed.



2.5.5.2 Secondary Unit

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

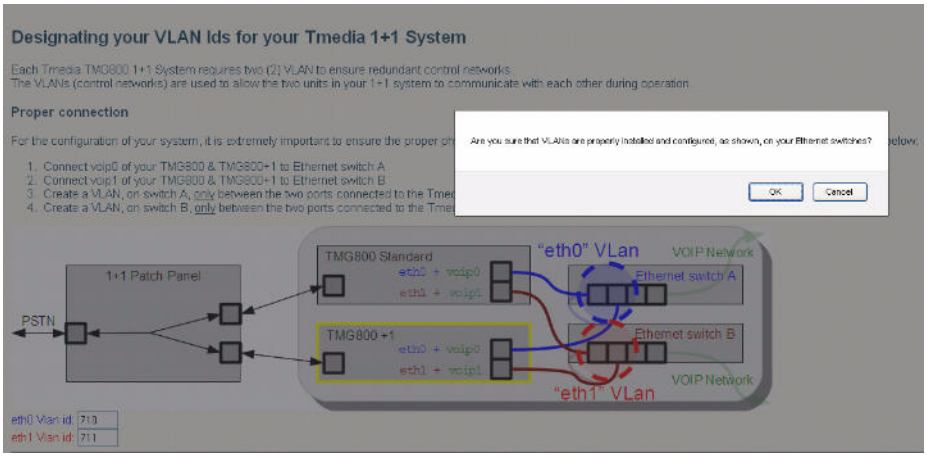


2. For Vlan configuration and connection, the TMG800 1+1 system requires 2 VLANs for the Tmedia Control Network. Both gigabyte layer 2 Ethernet switches MUST have their VLANs configured and the Tmedia must be properly connected BEFORE proceeding. The default VLAN IDs are:

   - ETH0: 710
   - ETH1: 711

   Once you are ready, click **Save** to configure the VLANs.

3. Click **Yes** to configure the Vlans



2.6 Verifying the LED Status Indications

Front of Unit

When the Tmedia VoIP Gateway has been powered, verify the front panel to determine that all indications are normal. See Table 2.3 on page 32.

Table 2.3 Tmedia Unit Displays

LED	Description
	• Unused
	• Off: Not Ready • Flashing Red: Unit has failed during the boot up process. • Flashing Orange: The unit will shut down in a few minutes. • Flashing Green: The unit is performing a boot up. • Steady Green. The unit has successfully performed a boot up.
	• Off: Unpowered • Steady Red: Initial Startup sequence • Steady Green: Powered
	• Off: No hard drive activity • Steady Green: Read/Write activity on the hard drive.

Note An alarm will sound if one of the power supplies is faulty. There is no alarm button to disable the alarm. To stop the alarm, you must remove the faulty power supply.

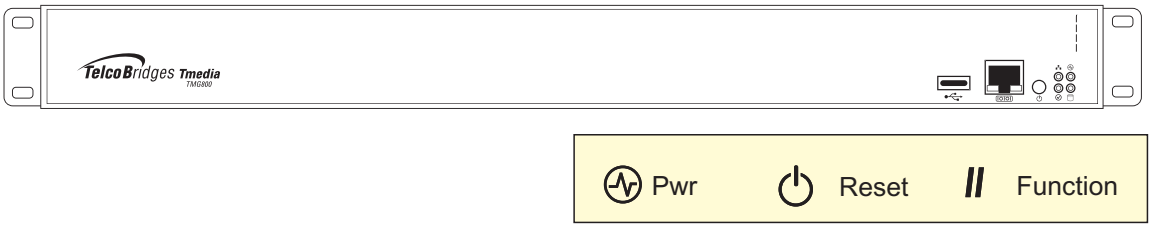


Figure 2.14 Front display and LEDs

Note Pressing the Reset button for 1 second will force the unit into a **graceful** shutdown. This will take a few minutes.

Pressing the reset button for 10 seconds will force the Tmedia VoIP Gateway into an **ungraceful** shutdown. This method should only be used in extreme cases.

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 using the power switch located at the rear, unless the Linux host has been properly shut down beforehand, using the reset button display, or manually using the shutdown command. Allow enough time for the Linux host to shut down before turning the power to the Tmedia VoIP Gateway off (e.g. 1 min.). 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 32, 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 rear 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.

Note The management port is configured as DHCP by default. Refer to Section 7.1 “Connecting to the Serial Port of the Tmedia VoIP Gateway” on page 62, to connect to the Tmedia using the serial port. Refer to Section 3.3 on page 37 to learn how to change the IP address.

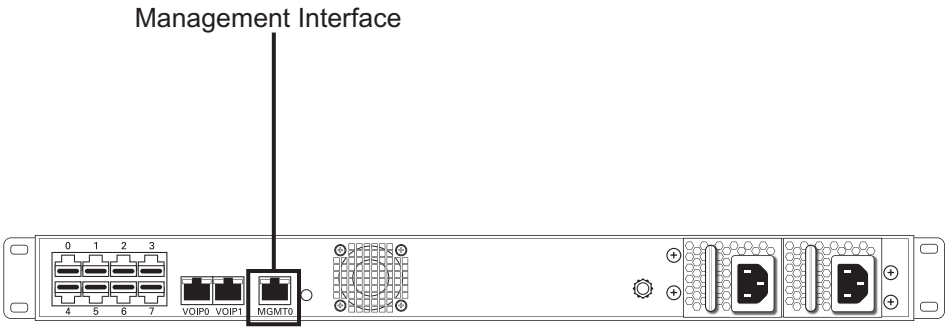


Figure 3.1 Tmedia Management Interface

3.2 Retrieving Tmedia VoIP Gateway Information

Note The following procedure must be performed on both the TMG800, as well as the TMG800 1+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 TMG800, as well as the TMG800 1+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 Tmedia VoIP Gateway Management Port Passwords

Note The following procedure must be performed on both the TMG800, as well as the TMG800 1+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 TMG800, as well as the TMG800 1+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 Tmedia VoIP Gateway.

If your system features a TMG800 standalone unit, refer to Section 2.4.5 “Start Up” on page 19.

If your system features a TMG800 working in conjunction with a TMG800 1+1, refer to Section 2.5.5 “Start Up” on page 28.

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 TMG800 and TMG800 +1 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 about 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 about 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 device.

To learn about 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 how to restore 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 TMG800
- Adding a TMG800 +1 to a standalone TMG800
- 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

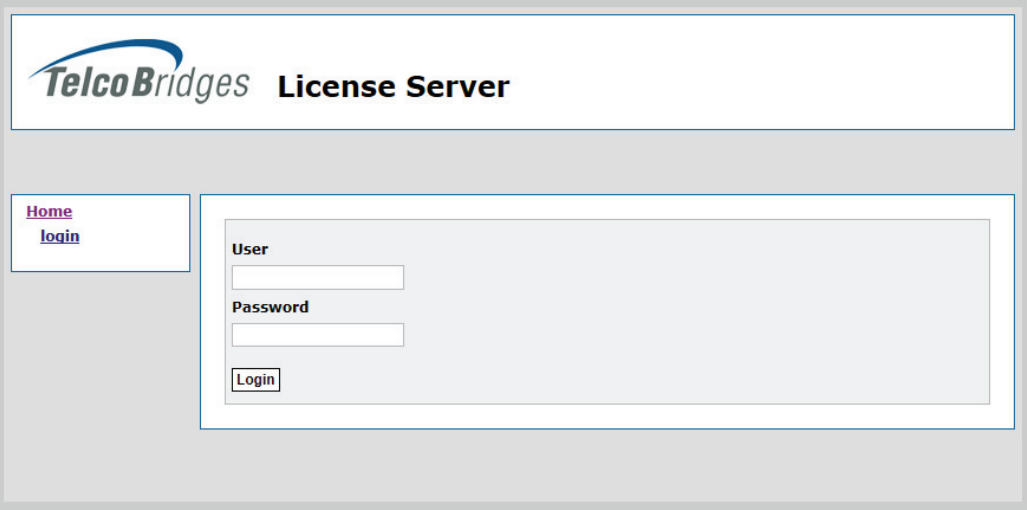


Figure 5.1 License Server

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.

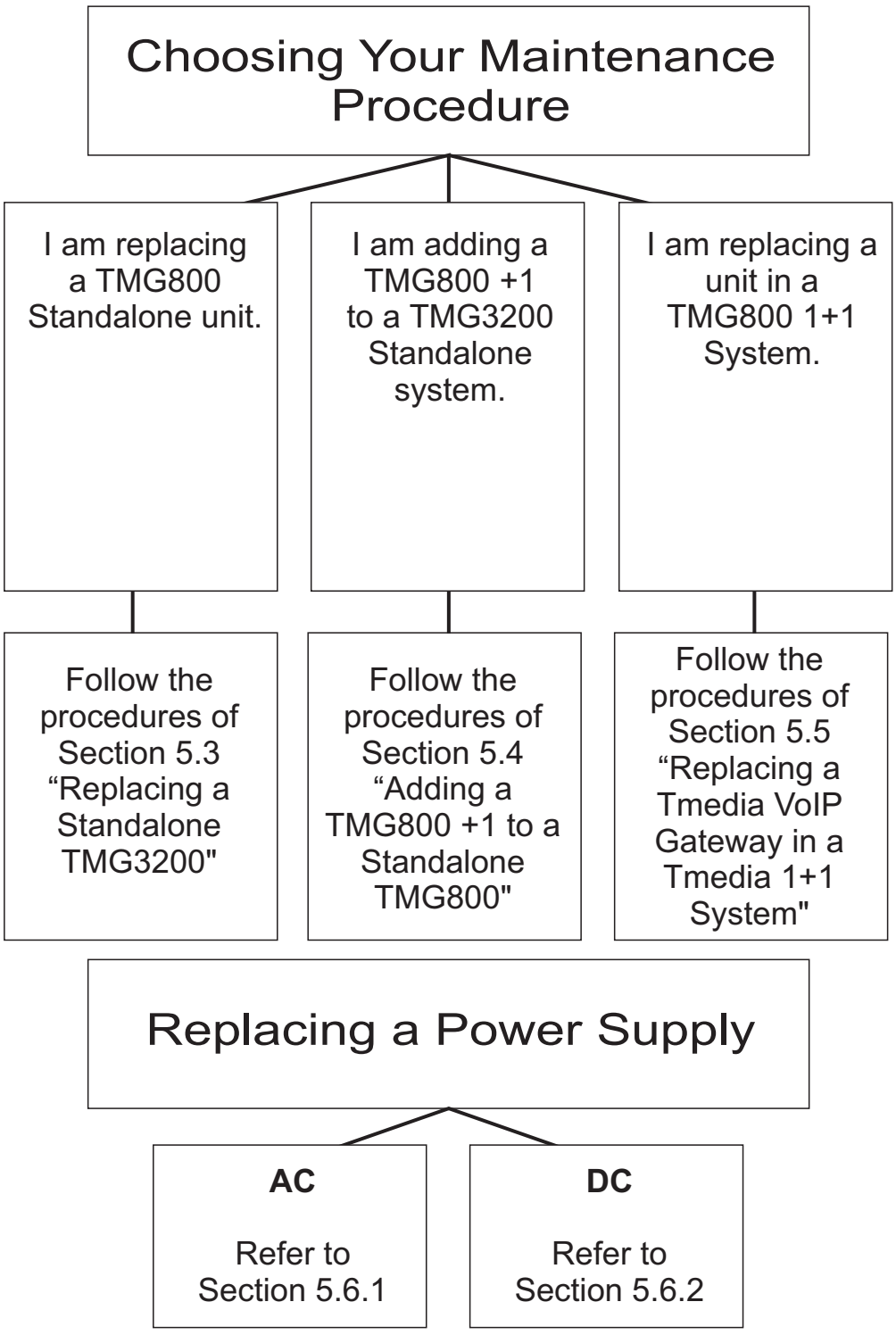


Figure 5.2 Choosing your Maintenance Procedure

5.3 Replacing a Standalone TMG800

Warning: This procedure will require some system downtime.

Prerequisites

The replacement of a standalone TMG800 is comprised of three parts:

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

5.3.1 Removing a Defective Unit

Prerequisites

To complete this procedure, you will need:

- A database backup of the defective unit

To remove a defective unit:

1. Shutdown the TMG800

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 37.

If you need to configure the unit in Standalone mode, refer to Section 2.4.5 “Start Up” on page 19.

2. Disconnect from the PSTN network
3. Disconnect from the VoIP ports
4. Disconnect from the Management network
5. Remove the TMG800 from the equipment rack

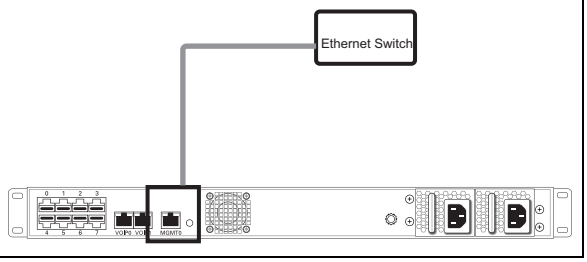
5.3.2 Installing a Replacement Unit

5.3.2.1 Rackmount the Replacement Unit

The TMG800 is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting the Tmedia Equipment” on page 8.

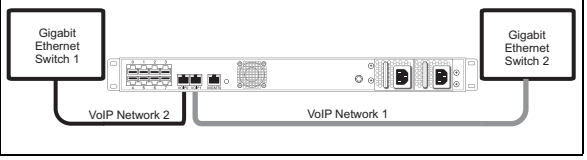
5.3.2.2 Connect to the Management Interface

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

Follow the procedure described in Section 2.4.1 “Connecting to the Tmedia Management Interface” on page 13.	

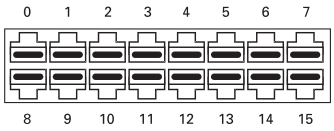
5.3.2.3 Connect to the VoIP Network and Tmedia Control Networks

The TMG800 features dual GigE ports for connection to Tmedia Control networks and VoIP networks. This provides an access point to manage VoIP traffic. Should one of the IP networks fail, the TMG800 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 14.	

5.3.2.4 Connect to the PSTN Network

The TMG800 features a variety of interfaces to the PSTN network.

If your system features a TMG800-RJ TDM interface, refer to Section 2.4.3 “Connecting to the PSTN” on page 15.	

5.3.3 Starting Up the TMG800

To start up a unit:

1. Power up the TMG800. Follow the instructions as described in Section 2.4.4 “Powering Up” on page 16.

2. Start up the TMG800. Follow the instructions as described in Section 2.4.5 “Start Up” on page 19.

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 40, will need to be restored after the replacement of the defective unit. Restoring a database backup is described in Section 4.4 on page 40.

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 TMG800 +1 to a Standalone TMG800

Warning: This procedure will require some system downtime.

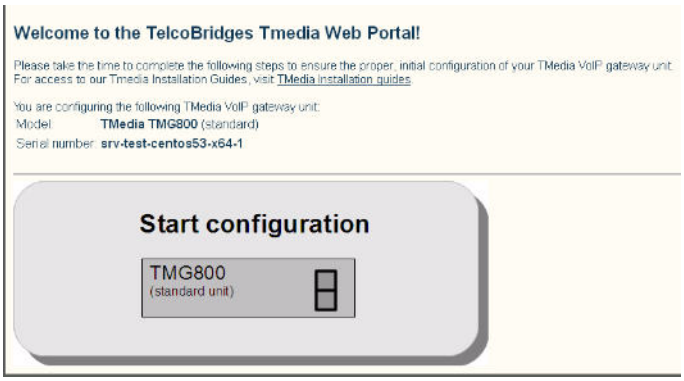
Prerequisites

To add a TMG800 1+1 to a Standalone TMG800, perform the following procedures:

- Install the TMG800 1+1 on the equipment rack
- Install a patch panel
- Connect to the TMG800 1+1 Management interface
- Connect to the Tmedia Control network
- Connect to the VoIP network
- Connect to the PSTN network
- Power up the TMG800 1+1
- Start up

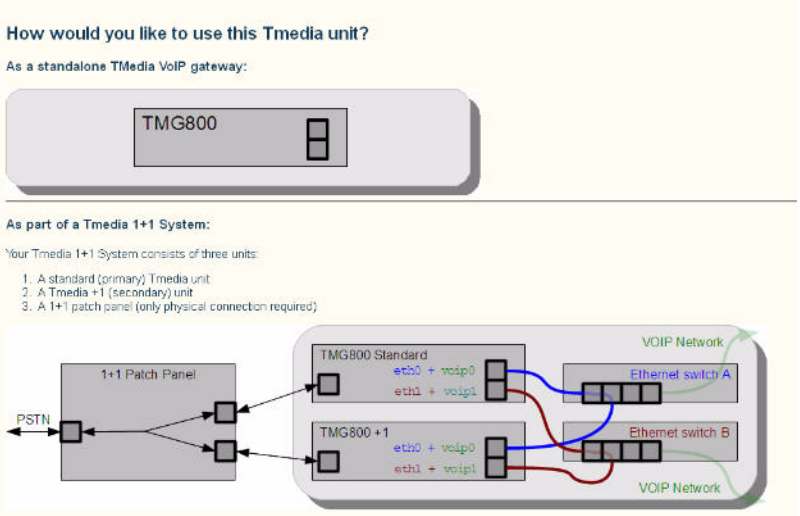
5.4.1 Reconfigure a Standalone Unit as a Primary Unit in a 1+1 System

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

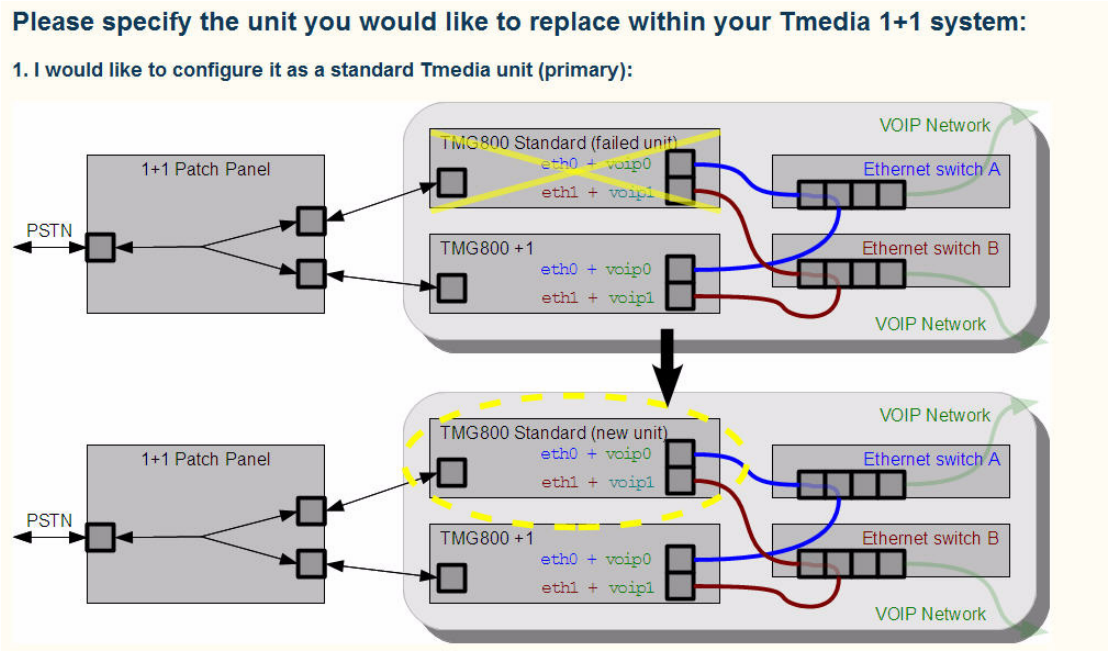


Note: The Welcome page indicates whether the TMG800 is a primary or secondary unit.

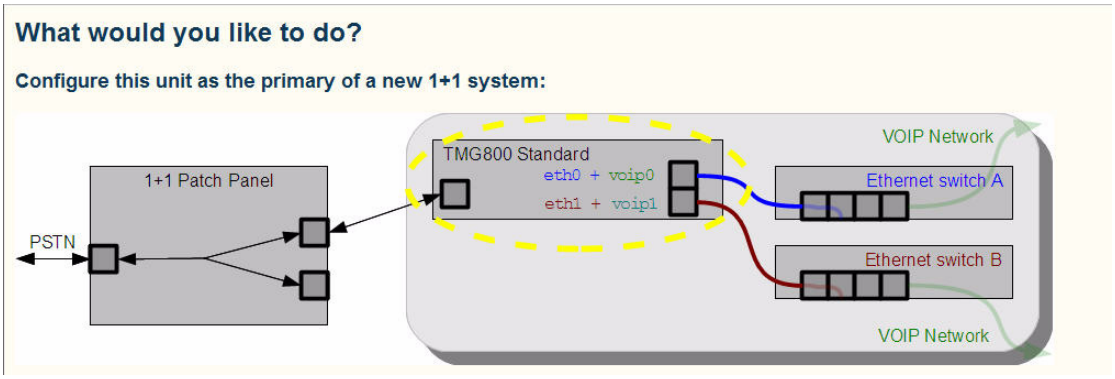
2. To select the manner in which you wish to use the TMG800, click the Tmedia 1+1 system image.



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



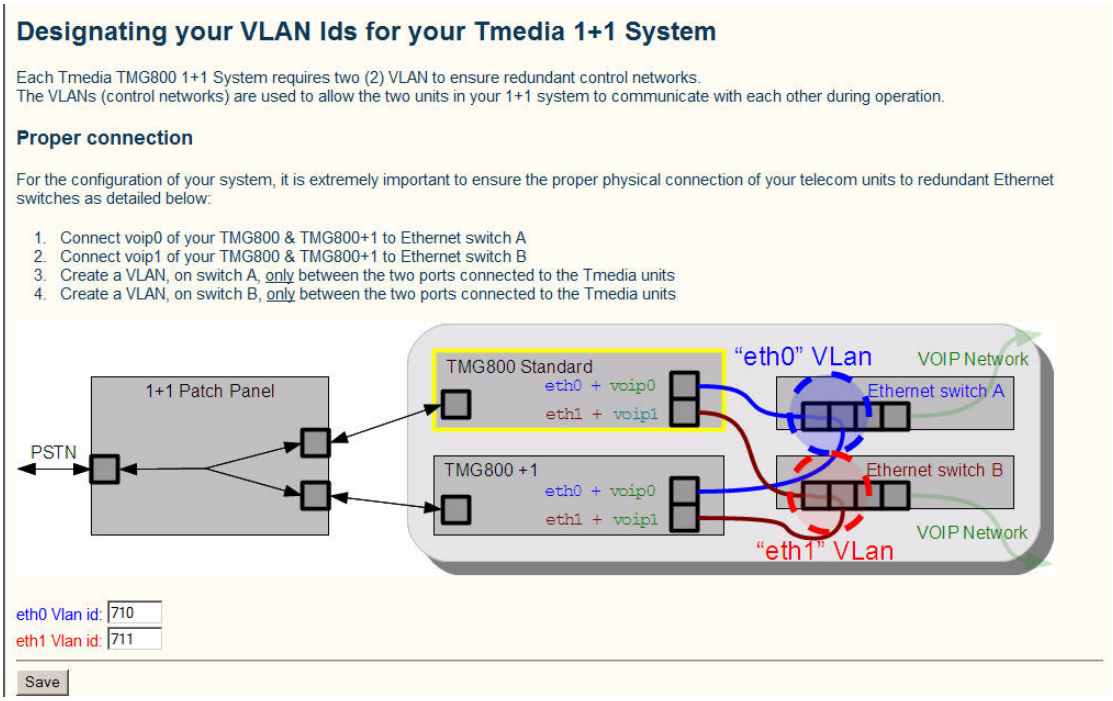
4. To indicate that this unit is a new unit in a Tmedia 1+1 system, click **Configure this unit as the primary of a new 1+1 system.**



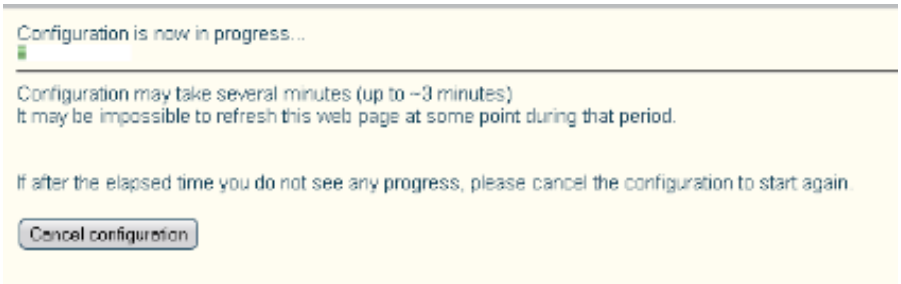
5. For Vlan configuration and connection, the TMG800 1+1 system requires 2 VLANs for the Tmedia Control Network. Both gigabyte layer 2 Ethernet switches MUST have their VLANs configured and the Tmedia must be properly connected BEFORE proceeding. The default VLAN IDs are:

   - ETH0: 710
   - ETH1: 711

   Once you are ready, click **Save** to configure the VLANs.



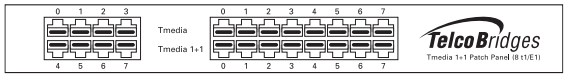
   The progress page is displayed.



5.4.2 Install the TMG800 +1 on the Equipment Rack

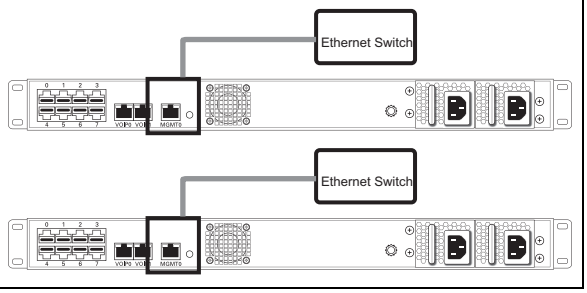
The TMG800 +1 is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting the Tmedia Equipment” on page 8.

5.4.3 Install a Patch Panel

If your system features a TMG800-RJ TDM interface, use a 1+1 8/T1/E1 patch panel. Refer to Section 2.4.3 “Connecting to the PSTN” on page 15.	

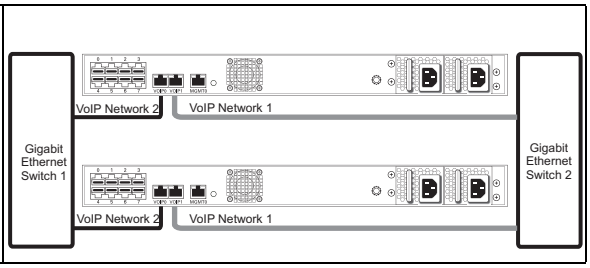
5.4.4 Connect to the TMG800 1+1 Management Interface

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

Follow the procedure described in Section “To connect both the TMG800-RJ and TMG800-RJ+1 (RJ48C type) to the PSTN:” on page 24.	

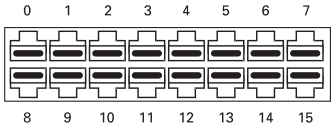
5.4.5 Connect to the Tmedia 1+1 Control Network and VoIP Network(s)

Each TMG800 and TMG800 +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. These ports are also used to connect to the Tmedia Control Network, which allows both unit to communicate with each another.

Follow the procedure described in Section 2.5.2 “Connecting to the Tmedia 1+1 System Control Network and VoIP Network(s)” on page 23.	

5.4.6 Connect to the PSTN Network

The TMG800+1 features 8 RJ48C interfaces to the PSTN network.

If your system features a TMG800-RJ TDM interface, refer to Section 2.4.3 “Connecting to the PSTN” on page 15.	

5.4.7 Power Up the Tmedia VoIP Gateway

The TMG800 and TMG800 +1 are furnished with one (1) or two (2) AC or DC power connections. Only once all other equipment installation work has been completed should the Tmedia 1+1 system be powered up. Refer to Section 2.5.4 “Powering Up” on page 26.

5.4.8 Start Up

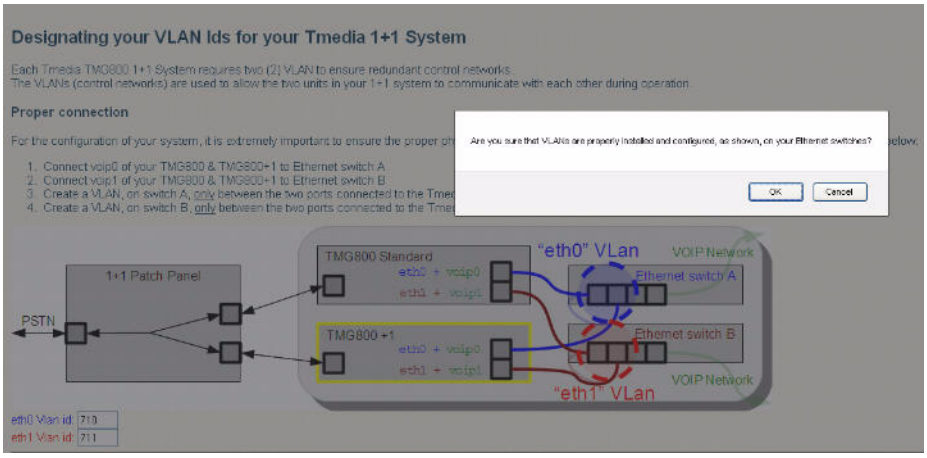
1. Connect to the web portal of the Tmedia 1+1. The Welcome page appears.

2. For Vlan configuration and connection, the TMG800 1+1 system requires 2 VLANs for the Tmedia Control Network. Both gigabyte layer 2 Ethernet switches MUST have their VLANs configured and the Tmedia must be properly connected BEFORE proceeding. The default VLAN IDs are:

   - ETH0: 710
   - ETH1: 711

   Once you are ready, click **Save** to configure the VLANs.

3. Click **Yes** to configure the Vlans



5.5 Replacing a Unit on a Tmedia 1+1 System

Warning: This procedure will require some system downtime.

Prerequisites

The replacement of a standalone TMG800 1+1 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. Shutdown the TMG800 or TMG800 +1
2. Disconnect from the PSTN network
3. Disconnect from the VoIP ports
4. Disconnect from the Management network
5. Dismount the defective unit

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:

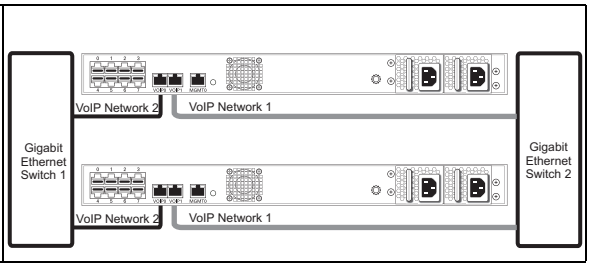
- Rackmount the replacement unit
- Connect to the VoIP network and Tmedia control network
- Connect to the PSTN network

5.5.2.1 Rackmount the Replacement Unit

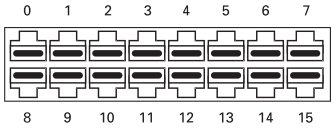
The Tmedia VoIP Gateway is mounted on a customer provided equipment rack using the mounting hardware packaged in the box. Refer to Section 2.2 “Rack Mounting the Tmedia Equipment” on page 8.

5.5.2.2 Connect to the Tmedia 1+1 System Control Network and VoIP Network(s)

Each TMG800 and TMG800 +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. These ports are also used to connect to the Tmedia Control Network, which allows both units to communicate with each another.

Follow the procedure described in Section 2.5.2 “Connecting to the Tmedia 1+1 System Control Network and VoIP Network(s)” on page 23.	

5.5.2.3 Connect to the PSTN Network

If your system is using a TMG800-RJ TDM interface, refer to Section 2.4.3 “Connecting to the PSTN” on page 15.	

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 as described in Section 2.5.4 “Powering Up” on page 26.

2. Configure the TMG800 1+1 System

   2a. 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 37.

   2b. If you need to configure the unit in primary mode, when replacing a TMG800, refer to Section 2.5.5.1 “Primary Unit” on page 28.

   2c. If you need to configure the unit in Secondary mode, when replacing a TMG800 +1, refer to Section 2.5.5.2 “Secondary Unit” on page 31.

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 two following possibilities:

- Replacing a primary unit with another replacement primary unit
- Replacing a secondary unit with another replacement secondary 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 2.5.5.1 “Primary Unit” on page 28.

5.5.4.2 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 2.5.5.2 “Secondary Unit” on page 31.

5.6 Replacing Power Supplies

The replacement of power supplies will vary according to whether the Tmedia unit features single or dual AC or DC power supplies.

5.6.1 Single Powered Tmedia Units

Note The power supplies of TMG800 single powered units cannot be replace in the field. If a problem occurs, follow Telcobridges‘ RMA procedure.

5.6.2 Dual Powered Tmedia Units

Dual powered Tmedia units feature either AC or DC power supplies. The replacement of these power supplies is described in the following subsections:

- Section 5.6.3 “Replacing the AC Power Supply”
- Section 5.6.4 “Replacing the DC Power Supply”

5.6.3 Replacing the 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

5.6.4 Replacing the 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 TMG800 and TMG800 +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 the 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 one end of a CAT5 RJ-45 (male-male) cable to the DB-9 to RJ-45 adapter (both supplied with unit). Connect the DB-9 to RJ-45 to your computer serial port and the other end of the CAT5 RJ-45 (male-male) cable to the Tmedia serial port (labelled 10101) of the Tmedia VoIP Gateway as shown in figure 7.1 on page 62. See page 93 in Appendix A for a RJ-45 pinout description.

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 62.

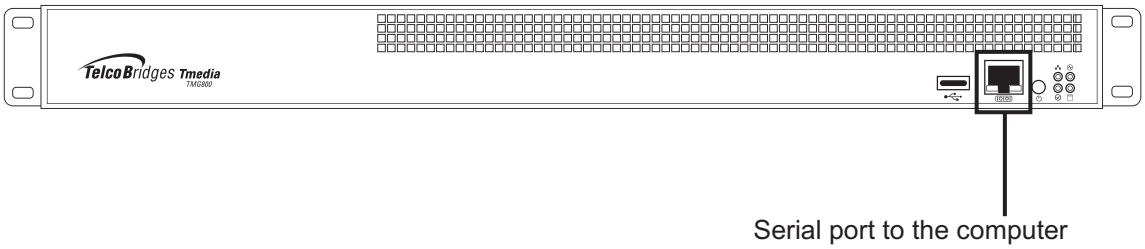


Figure 7.1 Computer to Tmedia VoIP Gateway Serial Port Connection

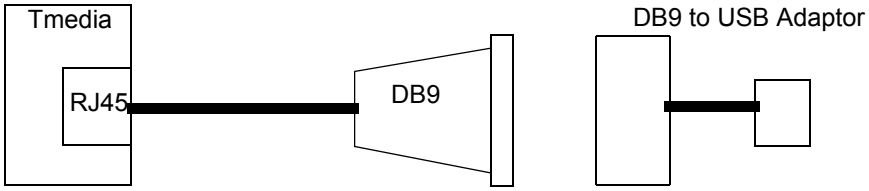


Figure 7.2 Conceptual View of a Serial Connection from the Tmedia VoIP Gateway to a Computer

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 E-mail 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 Tmedia VoIP Gateway 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 VoIP port mirroring to capture all incoming and outgoing network packets from a VoIP network interface using the TMG800. ‘

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 do the following:

1. Start 2 an ssh session and connect to the TMG800
2. With the first session, start tcpdump to capture packets from the 'vlan3' interface, for example:

   ```
   tcpdump -w test.pcap -s 1550 -i vlan3
   ```

3. With the second session, telnet to the telecom platform:

   ```
   telnet 172.31.1.1
   ```

4. Start forwarding VoIP packets to the 'vlan3' interface using the mv88eMonitor. Choose one of the following commands in accordance with your needs:

   - To capture VOIP0 only, enter **. mv88eMonitor 0x1 0x1 2 60**
   - To capture VOIP1 only, enter **. mv88eMonitor 0x2 0x2 2 60**
   - To capture both VOIP 0 and VOIP1, enter **. mv88eMonitor 0x3 0x3 2 60**

   The value of 60 in the previous commands, represents a time duration for port forwarding expressed in seconds.

5. Make a test call

6. Once the test is completed, enter Crtl-C to stop tcpdump.

7. Retrieve the test.pcap file from the TMG800 using an FTP client, such as FileZilla.

Note Alternatively, it is possible to use 1 VOIP port to capture the packets from the other VOIP port. For further information, refer to:

http://docs.telcobridges.com/mediawiki/index.php/VoIP_Ethernet_Capture#TMG800

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

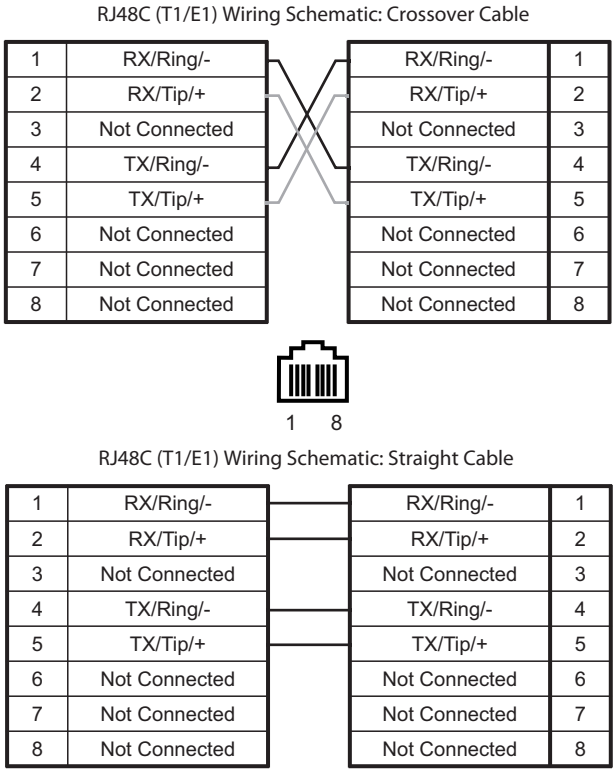


Figure A.1 RJ48C Wiring Diagram

A.2 RJ48 Console Wiring Diagram

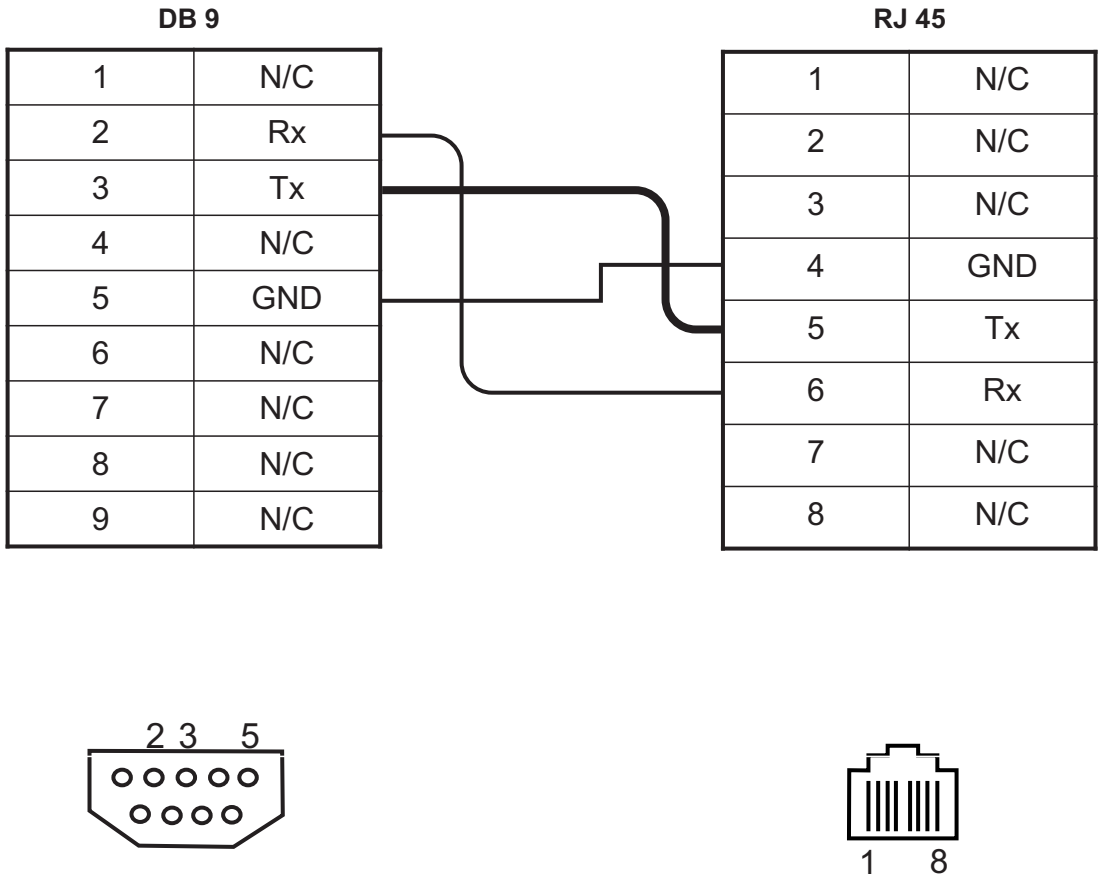


Figure A.2 Console Pinout