Model 2292 & 2294
Leased-Line Extenders over IP

Getting Started Guide

SmartNode 2294
Leased Line Extender Over IP

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About this guide

This guide describes the SmartNode 2294 and 2292 Series hardware, installation and basic configuration. For detailed software configuration information refer to the *SmartWare Software Configuration Guide* and the available Configuration Notes.

Audience

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters and appendices:

- Chapter 1 on page 14 provides information about extender features and capabilities
- Chapter 2 on page 19 contains an overview describing extender operation and applications
- Chapter 3 on page 21 provides quick start hardware installation procedures
- Chapter 4 on page 32 describes getting started with the SmartNode extender
- Chapter 5 on page 36 contains definitions for the LED status indicators
- Chapter 6 on page 38 contains information on contacting Patton technical support for assistance
- Appendix B on page 43 contains specifications for the extenders
- Appendix C on page 46 provides cable recommendations
- Appendix D on page 50 describes the extender's ports and pin-outs
- Appendix E on page 57 lists the factory configuration settings for SmartNode 2294 Series devices
- Appendix F on page 59 lists the factory configuration settings for SmartNode 2292 Series devices
- Appendix E on page 52 lists the tasks for installing a SmartNode 2292 or 2294 Series extender

For best results, read the contents of this guide *before* you install the extender.

Precautions

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential extender problems. *Warnings* relate to personal injury issues, and *Cautions* refer to potential property damage.

Note Calls attention to important information.

WARNING
The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

WARNING
The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

CAUTION
The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

CAUTION
The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

Safety when working with electricity

WARNING

- **This device contains no user serviceable parts. The equipment shall be returned to Patton Electronics for repairs, or repaired by qualified service personnel.**

- **Mains Voltage: Do not open the case when the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.**

- **The external power adapter shall be a listed Limited Power Source. Ensure that the power cable used meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet which has earth ground. The mains outlet that is utilized to power the devise shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker.**

- **Hazardous network voltages are present in WAN ports regardless of whether power to the SmartNode is ON or OFF. To avoid electric shock, use caution when near WAN ports. When detaching cables, detach the end away from the SmartNode first.**

- **Do not work on the system or connect or disconnect cables during periods of lightning activity.**

- **Before opening the chassis, disconnect the telephone network cables to avoid contact with telephone line voltages.**

In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.

Preventing electrostatic discharge damage

When starting to install interface cards place the interface card on its shielded plastic bag if you lay it on your bench.

CAUTION

Electrostatic Discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Do the following to prevent ESD:

• Always follow ESD prevention procedures when removing and replacing cards.

• Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground.

• To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

General observations

• Clean the case with a soft slightly moist anti-static cloth
• Place the unit on a flat surface and ensure free air circulation
• Avoid exposing the unit to direct sunlight and other heat sources
• Protect the unit from moisture, vapors, and aggressive liquids

Typographical conventions used in this document

This section describes the typographical conventions and terms used in this guide.

General conventions

The procedures described in this manual use the following text conventions:

Table 1. General conventions

Convention	Meaning
Garamond blue type	Indicates a cross-reference hyperlink that points to a figure, graphic, table, or section heading. Clicking on the hyperlink jumps you to the reference. When you have finished reviewing the reference, click on the **Go to Previous View** button ⬅ in the Adobe® Acrobat® Reader toolbar to return to your starting point.
Futura bold type	Commands and keywords are in **boldface** font.
Futura bold-italic type	Parts of commands, which are related to elements already named by the user, are in ***boldface italic*** font.
Italicized Futura type	Variables for which you supply values are in *italic* font
Futura type	Indicates the names of fields or windows.
Garamond bold type	Indicates the names of command buttons that execute an action.
< >	Angle brackets indicate function and keyboard keys, such as <SHIFT>, <CTRL>, <C>, and so on.
[ ]	Elements in square brackets are optional.
{a | b | c}	Alternative but required keywords are grouped in braces ({ }) and are separated by vertical bars (|)
blue screen	Information you enter is in blue screen font.
screen	Terminal sessions and information the system displays are in screen font.
node	The leading IP address or nodename of a SmartNode is substituted with ***node*** in ***boldface italic*** font.
SN	The leading **SN** on a command line represents the nodename of the SmartNode
#	An hash sign at the beginning of a line indicates a comment line.

Chapter 1   General information

Chapter contents

SmartNode Series Leased-Line Extenders overview

The SmartNode 2292 and 2294 Series Leased-Line Extenders (see figure 1) combine IP routing, VPN/Security, and Quality of Service for up to 4 transparent voice channels and FAX calls over any IP or PSTN network. Leverage low-cost IP services with packet-voice for complete branch office voice and data connectivity.

Figure 1. SmartNode extender (SmartNode 2294 shown)

The SmartNode 2292 and 2294 Leased-Line Extenders, equipped with two 10/100Base-T Ethernet ports provide; voice over IP (VoIP) and Internet telephony plus Internet access routing, VPN and firewall functions, and extensive Quality of Service (QoS) functions.

The SmartNode 2292 and 2294 Leased-Line Extenders perform the following major functions:

- Voice over IP via 2 or 4 analog analogleased line voice ports.

- Standard compliant VoIP conversion in accordance with SIP and H.323 protocols.

- Internet access and IP Routing with IP Quality of Service (QoS) support for mixed voice and data traffic.

SmartNode 2292 and 2294 Leased-Line Extenders

The SmartNode 2292 and 2294 models are compact Leased-Line Extenderss over IP that support two or four VoIP channels, depending on the number of ports (see figure 2).
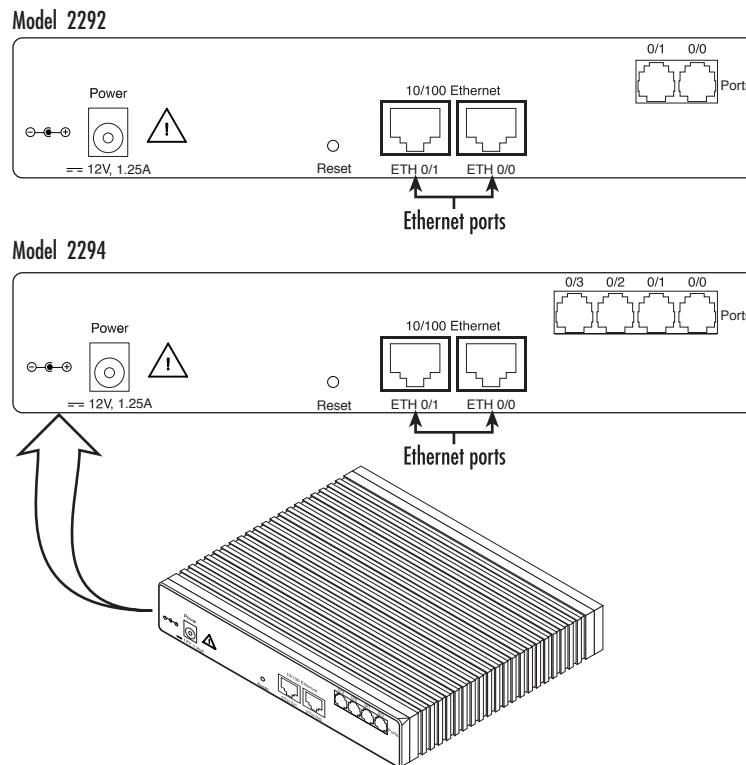
Figure 2. Examples of SmartNode 2292 and 2294 Series rear panels

The following base models (each equipped with two 10/100Base-T Ethernet ports) are available:

• SmartNode 2292/EUI (2 VoIP leased line channels)

• SmartNode 2294/EUI (4 VoIP leased line channels)

The port combinations are indicated in the extension of the model code. T he following model code conventions apply:

• The last number in the model code stands for the number of voice ports.

• *EUI* stands for external universal input power supply (see figure 3)

For example, the model code *2294/EUI* describes a SmartNode configured as follows:

• 4 voice ports

• External power supply

> **Note**   For a complete listing of available models, refer to the SmartNode VoIP page at **http://www.patton.com/voip/**.
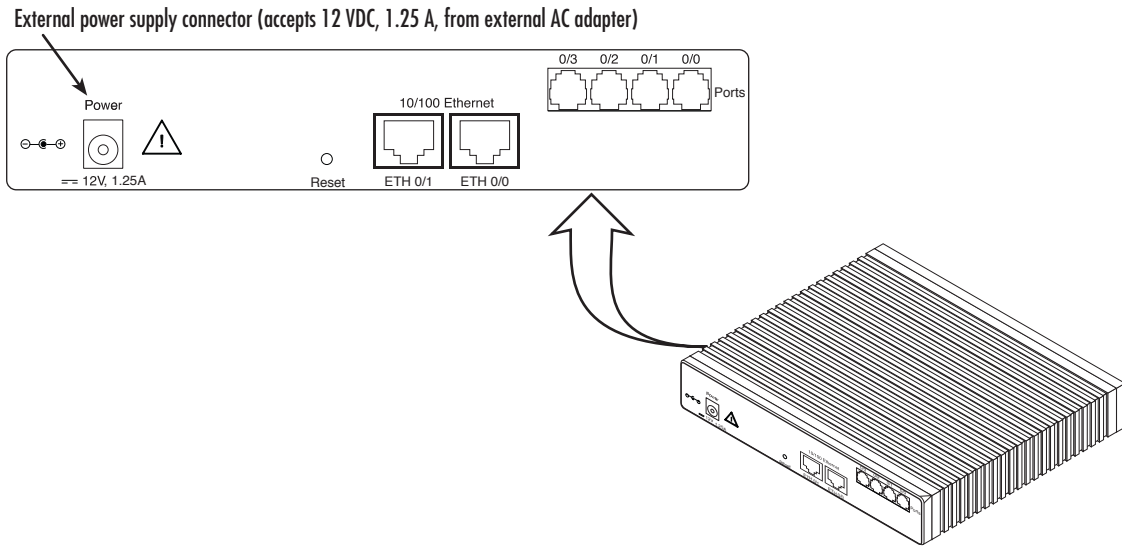
Figure 3. SmartNode 2294 power input connectors

Ports descriptions

The SmartNode 2292 Series rear panel ports are described in table 2.

Table 2. Rear panel ports

Port	Location	Description
10/100 Ethernet ETH 0/0 & ETH 0/1	Rear panel	RJ-45 connectors (see figure 6 on page 26) that connect the extender to an Ethernet device (e.g., a cable or DSL modem, LAN hub or switch).
Analog voice port	Rear panel	FXS RJ-11(6 position, 4 wire) connectors (see figure 6 on page 26) that connect the extender with an analog terminal.
Power	Rear panel	The gateway is available in a DC or AC power input version (see figure 3), labeled as follows: • AC version (Internal power supply): 100–240 VAC, 50/60 Hz, 200 mA • DC version: 12 VDC, 1.25 A
Console	Front panel	Used for service and maintenance, the Console port (see figure 4 on page 18), an RS-232 RJ-45 connector, connects the extender to a serial terminal such as a PC or ASCII terminal (also called a dumb terminal).

Reset button behavior

The SmartNode devices have a *Reset* button on the rear panel. It is used as follows:

• To restart the unit with the current startup configuration—Press for less than 1 second and release the *Reset* button. The SmartNode will restart with the current startup configuration.

• To restart the unit with factory default configuration—Press the *Reset* button for 5 seconds until the Power LED starts blinking. The unit will restart with factory default configuration.

- To restart the unit in bootloader mode (to be used only by trained SmartNode technicians)—Start with the unit powered off. Press and hold the *Reset* button while applying power to the unit. Release the *Reset* button when the *Power* LED starts blinking so the unit will enter bootloader mode.
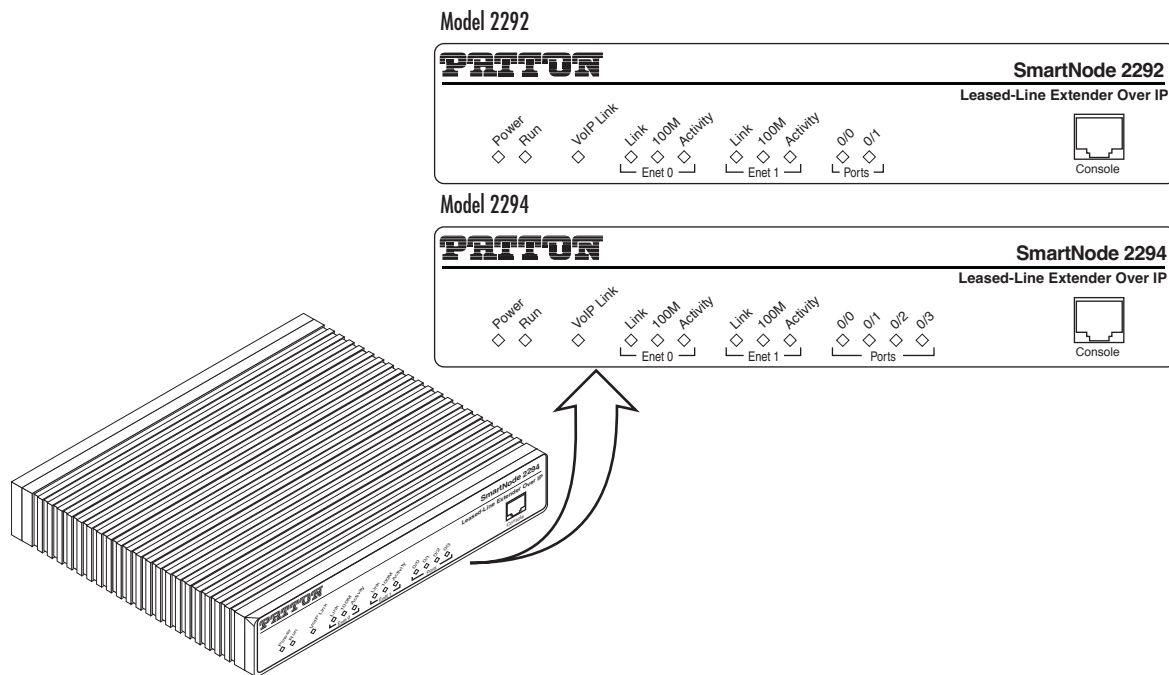
Figure 4. SmartNode 2292 and 2294 front panels

Note   For LED descriptions, refer to chapter 5, "LEDs status and monitoring" on page 36.

Chapter 2 Applications overview

Chapter contents

Typical application

Leased-line extension

The SmartNode 2292 and 2294 Series Leased-Line Extenders allow you to save big on leased line costs. Using only one extender on each side, audio information on up to four leased-lines can be transported over a packet-based network. This essentially ensures that with just Internet access at two locations, four leased lines between these two locations can be established.

Combine this with IP routing, VPN/Security, and Quality of Service for up to 4 transparent voice channels and FAX calls over any IP or PSTN network, the 2292/2294 leverages low-cost IP services with packet-voice for complete branch office voice and data connectivity.

Patton SmartNode Models 2292 and 2294 are equipped with two Ethernet ports and provide gateway and Voice-over-IP line extension services.

Figure 5. Leased-line extension application

Chapter 3 Hardware installation

Chapter contents

Planning the installation

Before you start the actual installation, it is strongly recommended that you gather all the information needed to install and setup the device. See table 3 for an example of what pre-installment checks you might need to carry out. Having carried out the pre-installation checks enables you to install and set up your SmartNode extender into an existing infrastructure with confidence.

> ⚠️
> **CAUTION**
>
> The mains outlet that is utilized to power the equipment must be within 1 foot (0.3048 meters) of the device and shall be easily accessible.

Note   When setting up your SmartNode extender consider cable length limitations, and potential electromagnetic interference (EMI) as defined by the applicable local and international regulations. Ensure that your site is properly prepared before beginning installation.

Before installing the SmartNode extender device, the following tasks should be completed:

- **Create a network diagram** (see section "Network information" on page 24)

- **Gather IP related information** (see section "IP related information" on page 24 for more information)

- **Install the hardware and software needed to configure the SmartNode**. (See section "Software tools" on page 24)

- **Verify power source reliability** (see section "Power source" on page 24).

When you finish preparing for SmartNode extender installation, go to section "Installing the SmartNode extender" on page 25 to install the device.

Installation checklist

The installation checklist (see table 3) lists the tasks for installing a SmartNode 2292 or 2294 Series extender. Make a copy of this checklist and mark the entries as you complete each task. For each SmartNode 2292 or 2294 Series extender, include a copy of the completed checklist in your site log.

Table 3. Installation checklist

Task	Verified by	Date
Network information available & recorded in site log		
Environmental specifications verified		
Site power voltages verified		
Installation site pre-power check completed		
Required tools available		
Additional equipment available		
All printed documents available		
SmartWare release & build number verified		
Rack, desktop, or wall mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Cable length limits verified		
Initial configuration performed		
Initial operation verified		

Site log

Patton recommends that you maintain a site log to record all actions relevant to the system, if you do not already keep such a log. Site log entries should include information such as listed in table 4.

Table 4. Sample site log entries

Entry	Description
Installation	Make a copy of the installation checklist and insert it into the site log
Upgrades and maintenance	Use the site log to record ongoing maintenance and expansion history
Configuration changes	Record all changes and the reasons for them
Maintenance	Schedules, requirements, and procedures performed
Comments	Notes, and problems
Software	Changes and updates to SmartWare software

Network information

Network connection considerations that you should take into account for planning are provided for several types of network interfaces are described in the following sections.

Network Diagram

Draw a network overview diagram that displays all neighboring IP nodes, connected elements and telephony components.

IP related information

Before you can set up the basic IP connectivity for your SmartNode 2292 or 2294, you should have the following information:

• IP addresses used for Ethernet LAN and WAN ports

• Subnet mask used for Ethernet LAN and WAN ports

• IP addresses of central H.323 Gatekeeper (if used)

• IP addresses of central PSTN Gateway for H.323 and/or ISoIP based calls

• IP addresses of central TFTP Server used for configuration upload and download

Software tools

You will need a PC (or equivalent) with a VT-100 emulation program (e.g. HyperTerminal) to configure the software on your SmartNode extender.

Power source

If you suspect that your AC power is not reliable, for example if room lights flicker often or there is machinery with large motors nearby, have a qualified professional test the power. Install a power conditioner if necessary.

Location and mounting requirements

The SmartNode extender is intended to be placed on a desktop or similar sturdy, flat surface that offers easy access to the cables. Allow sufficient space at the rear of the chassis for cable connections. Additionally, you should consider the need to access the unit for future upgrades and maintenance.

Installing the SmartNode extender

SmartNode extender installation consists of the following:

- Placing the device at the desired installation location (see section "Mounting the SmartNode extender" on page 25)

- Installing the interface and power cables (see section "Connecting cables" on page 25)

When you finish installing the SmartNode, go to chapter 4, "Getting started with the SmartNode" on page 32.

Mounting the SmartNode extender

Place the extender on a desktop or similar sturdy, flat surface that offers easy access to the cables. The extender should be installed in a dry environment with sufficient space to allow air circulation for cooling.

> **Note**   For proper ventilation, leave at least 2 inches (5 cm) to the left, right, front, and rear of the SmartNode extender.

Connecting cables

⚠️ **WARNING**   **Do not work on the system or connect or disconnect cables during periods of lightning activity.**

⚠️ **WARNING**   **The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.**

Installing extender cables takes place in the following order:

1. Installing the RJ-11 voice port cable or cables (see "Installing an interface cable on the extender's voice ports" on page 26)

2. Installing the 10/100 Ethernet port cable or cables (see "Installing the Ethernet cable" on page 28)

3. Installing the power input (see "Connecting to external power source" on page 30)

Installing an interface cable on the extender's voice ports
The SmartNode extender comes with at least two voice ports (see figure 6) located on the back of the extender. The voice ports are connected to analog devices via cables (see figure 7) terminated with RJ-11 connectors (see figure 9 and table 5 on page 27 for pin-out information).
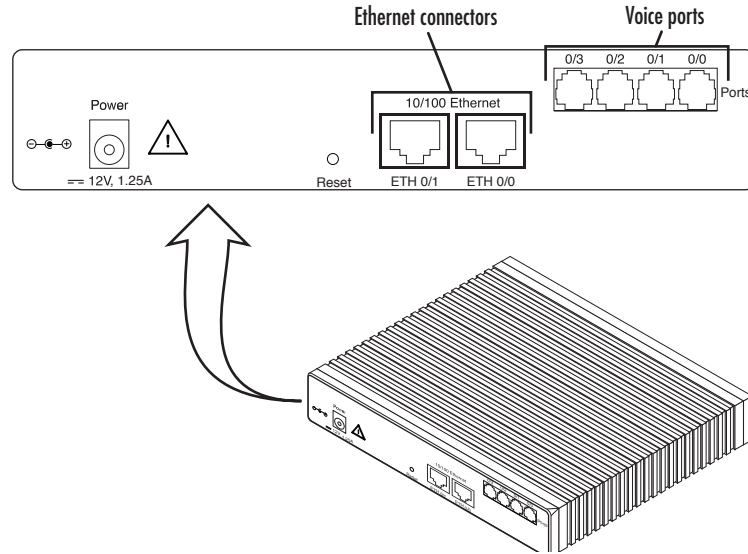
Figure 6. Rear view showing location of Ethernet connectors and voice ports (SmartNode 2294 shown)

RJ-11, male   **RJ-11, male**

Ring (-)   3 ———————————————————————— 3   Ring (-)

Tip (+)   4 ———————————————————————— 4   Tip (+)
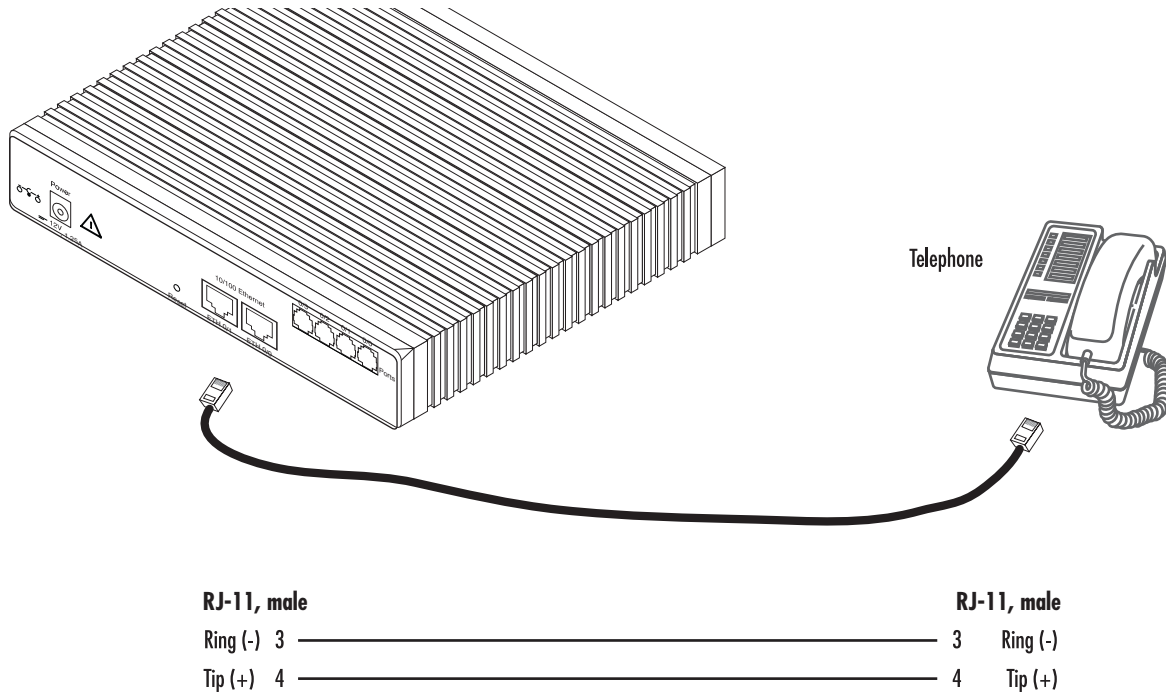
Figure 7. Analog connection
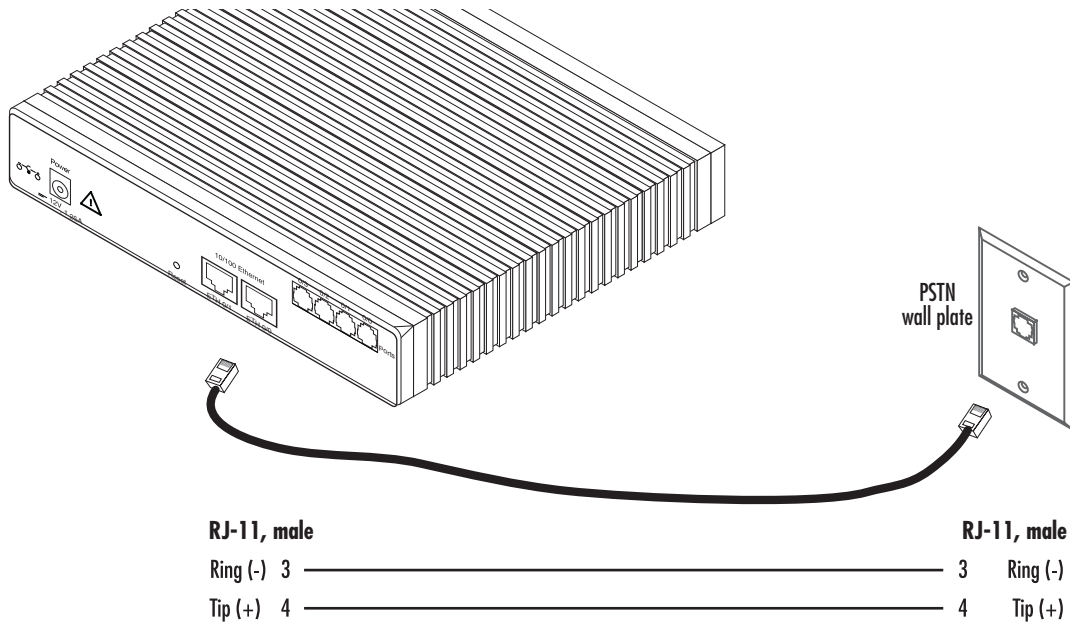
Figure 8. Analog connection
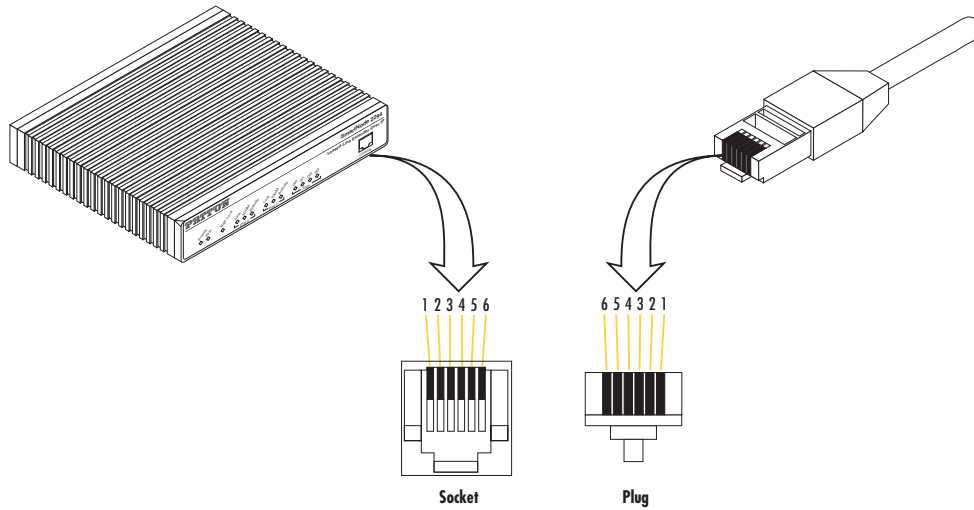
Figure 9. RJ-11 pinout diagram

Table 5. RJ-11 socket

Pin	Signal
3	Ring (-)
4	Tip (+)

Note   Unit must not connect directly to telecom network voltage (TNV).

Installing the Ethernet cable

The SmartNode 2292 Series has automatic MDX (auto-cross-over) detection and configuration on the Ethernet ports. Any of the two ports can be connected to a host or hub/switch with a straight-through wired cable (see figure 10 on page 28). Ethernet devices (10Base-T or 100Base-T) are connected to the SmartNode's Ethernet ports (see table 6 for port pin-out listing) via a cable terminated with RJ-45 plugs. Because the SmartNode 2294 Series does not have the MDX feature, a cross-over cable is required when connecting SmartNode 2294 Series devices to a host (see figure 11 on page 29).

Table 6. Ethernet 10/100Base-T (RJ-45) port pin-outs (SmartNode 2294 Series)

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Note   Pins not listed are not used.
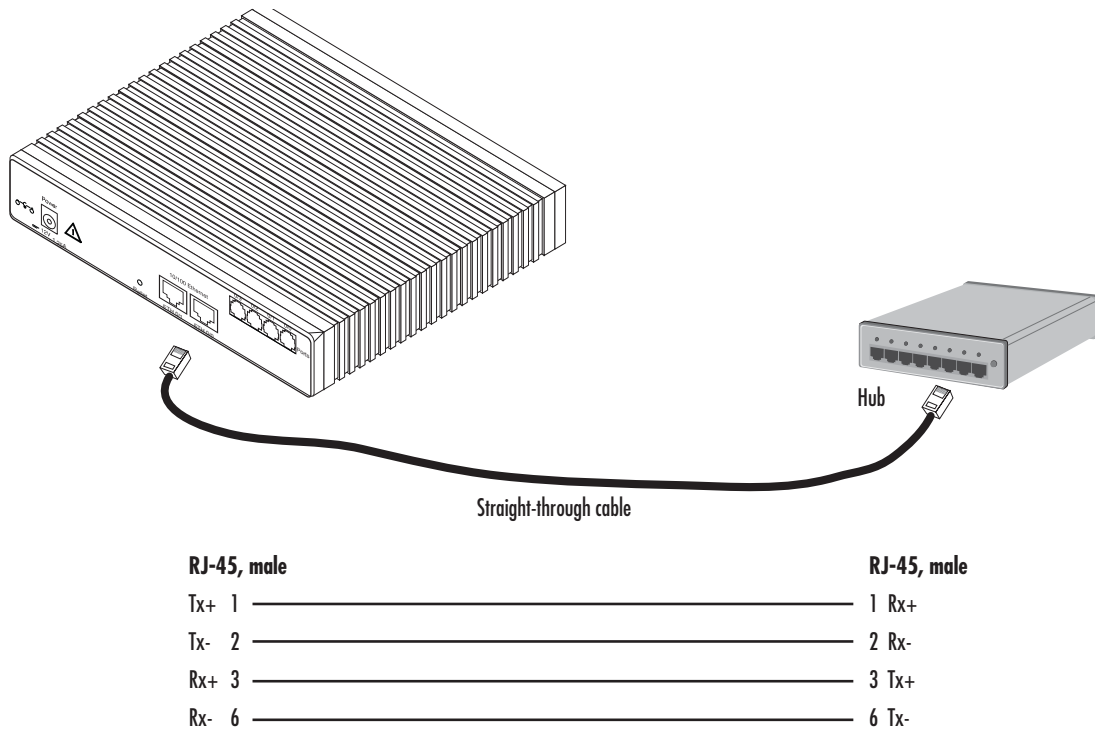
Figure 10. Connecting a SmartNode 2294 Series device to a hub

Cross-over cable

Host

RJ-45, male   **RJ-45,**

Twisted pair 1 { Tx+ 1 —————————————————————————— 1 TX+
                 Tx-   2 —————————————————————————— 2 TX-

Twisted pair 2 { Rx+ 3 —————————————————————————— 3 RX+
                 Rx-   6 —————————————————————————— 6 RX-
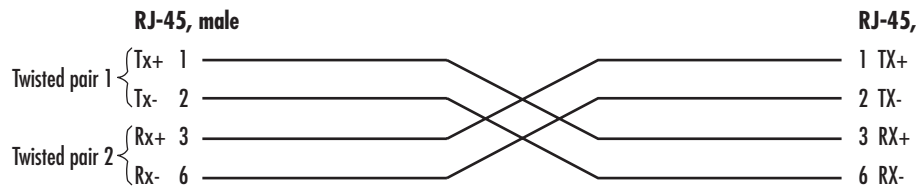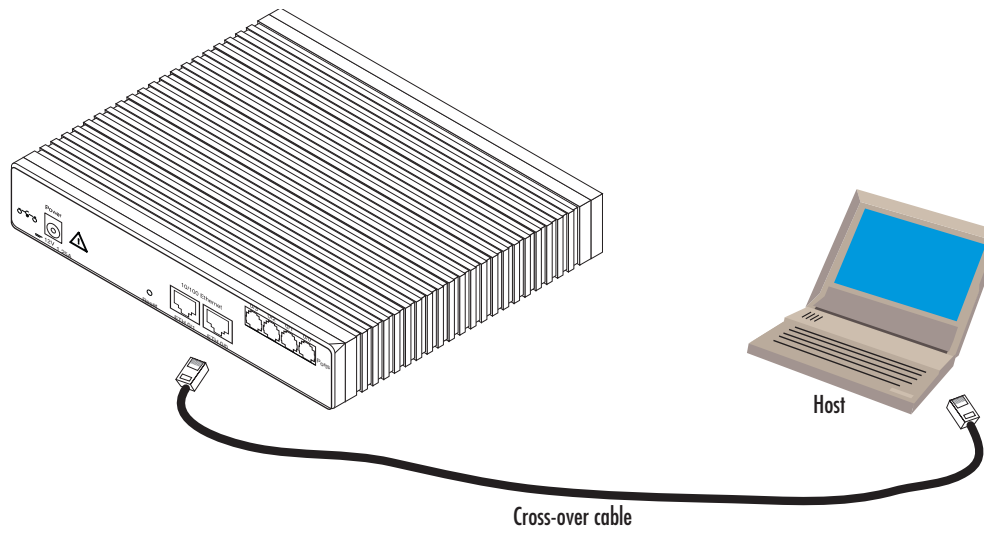
Figure 11. Connecting to a host

Connecting to external power source

The extender comes with an external power supply. This section describes installing the power cord into the extender. Do the following:

Note   *Do not connect the power cord to the power outlet at this time.*

1. Insert the barrel type connector end of the AC power cord into the external power supply connector (see figure 12).

External power supply connector (accepts 12 VDC, 1.25 A, from external AC adapter)
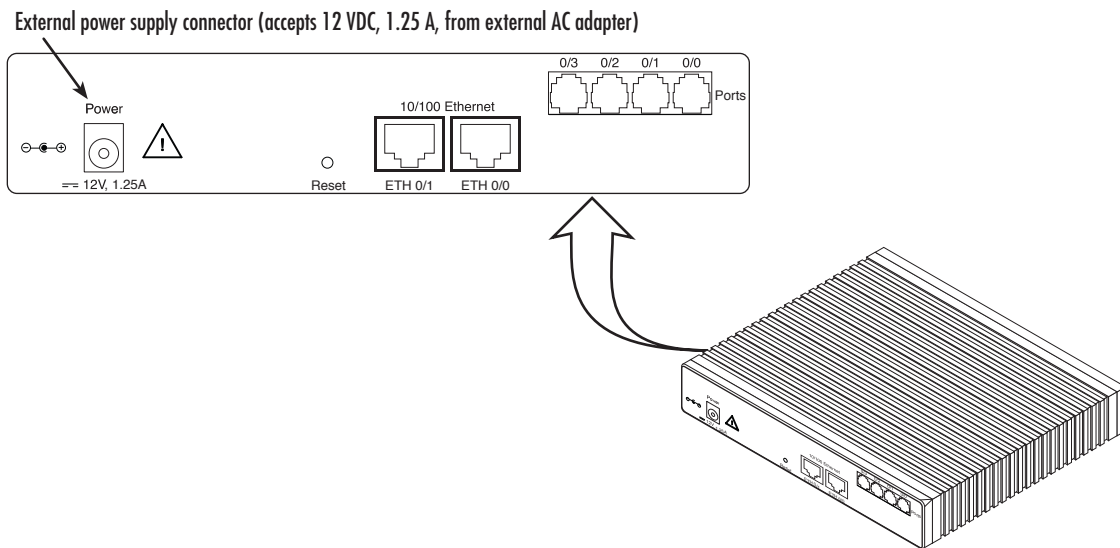
Figure 12. Power connector location on rear panel

⚠ **CAUTION**   The extender power supply automatically adjusts to accept an input voltage from 100 to 240 VAC (50/60 Hz).
Verify that the proper voltage is present before plugging the power cord into the receptacle. Failure to do so could result in equipment damage.

2. Verify that the AC power cord included with your extender is compatible with local standards. If it is not, refer to "Contacting Patton for assistance" on page 38 to find out how to replace it with a compatible power cord.

3. Connect the male end of the power cord to an appropriate power outlet.
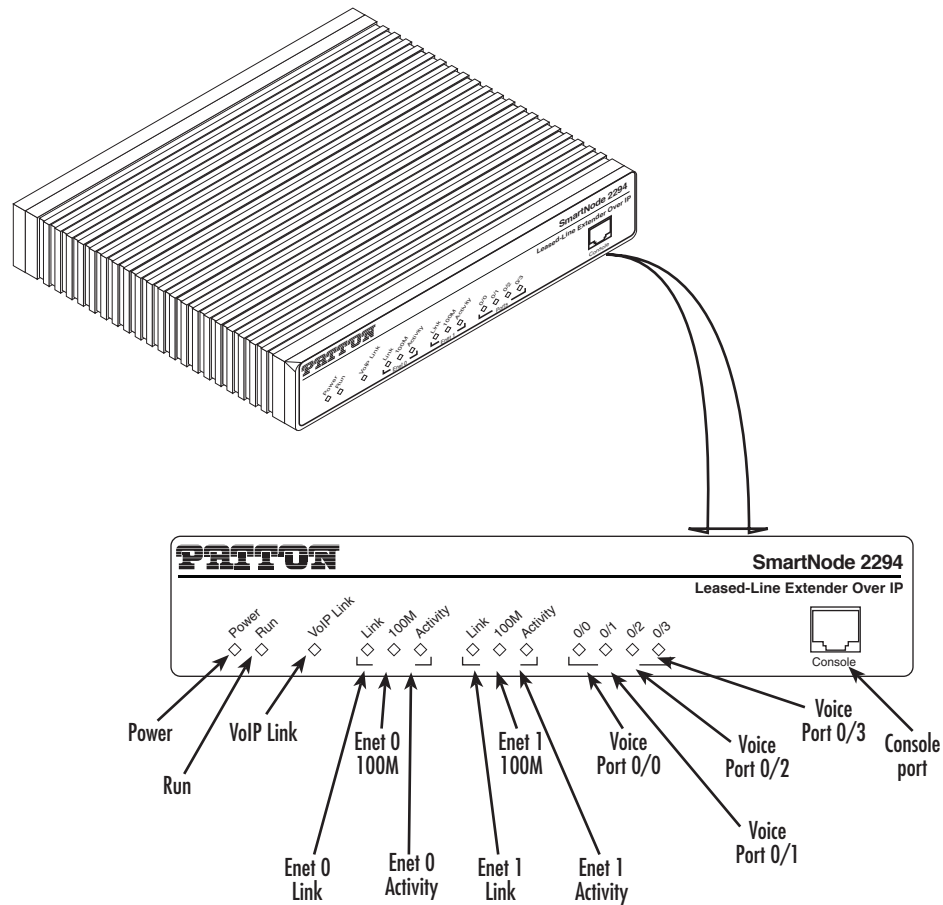
Figure 13. SmartNode extender front panel LEDs and Console port locations (SmartNode 2294 shown)

4.   Verify that the green *Power* LED is lit (see figure 13).

Congratulations, you have finished installing the SmartNode extender! Now go to chapter 4, "Getting started with the SmartNode" on page 32.

Chapter 4 Getting started with the SmartNode

Chapter contents

Introduction

This chapter leads you through the basic steps to set up a new SmartNode and to download a configuration.

Patton SmartNodes can be used for a wide variety of IP-based network applications. To support and ease the configuration of the SmartNodes configuration, templates for the most important applications are available on the Patton server at www.patton.com/voip.

The main steps for setting up a new SmartNode are shown in figure 14.

Figure 14. Steps for setting up a new SmartNode

Configure the IP address

Power connection and default configuration

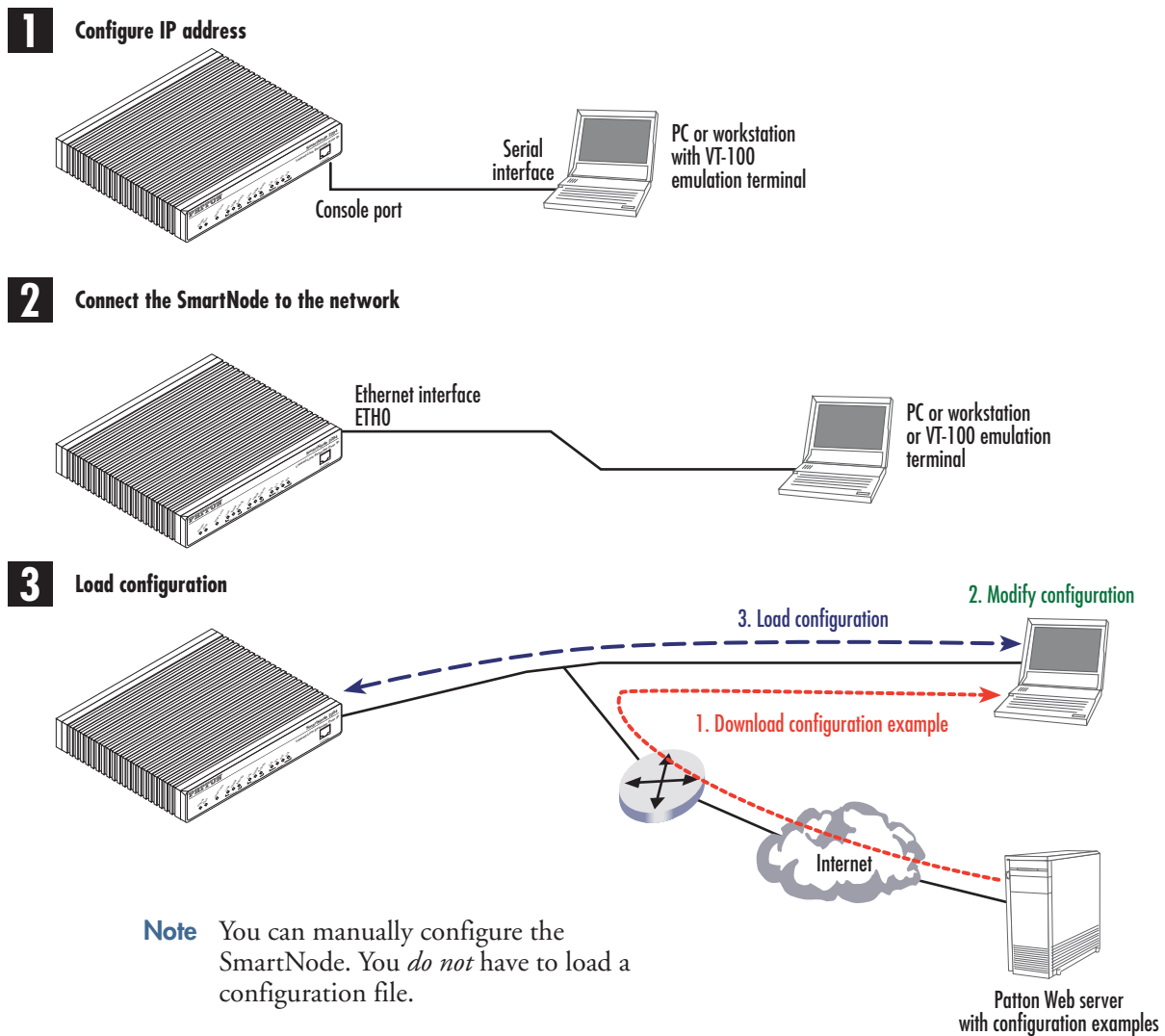First the SmartNode must be connected to the mains power supply with the power cable. Wait until the 'Run' LED stops blinking and lights constantly. Now the SmartNode is ready.

The factory default configuration for the Ethernet interface IP addresses and network masks are listed in table 7.

Table 7. Factory default IP address and network mask configuration

	IP Address	**Network Mask**
Interface Ethernet 0 (ETH0)	DHCP	DHCP
Interface Ethernet 1 (ETH1)	192.168.1.1	255.255.255.0

Both Ethernet interfaces are activated upon power-up.

Connect with the serial interface

The *Console* port is wired as an EIA-561, RS-232 port. Use the included Model 16F-561 adapter and cable (see figure 15) between the SmartNode's *Console* port and a PC or workstation's RS-232 serial interface. Activate the terminal emulation program on the PC or workstation that supports the serial interface (e.g. HyperTerm).
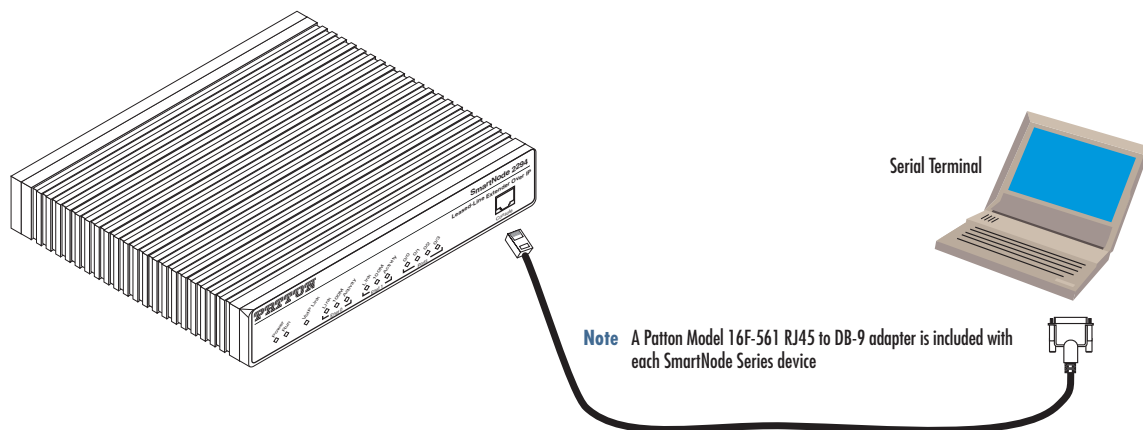

Figure 15. Connecting to the terminal

Terminal emulation program settings:

- 9600 baud
- no parity
- 8 bit
- 1 stop bit
- 1 start bit
- No flow control

Login

1. Accessing your SmartNode via the local console port (or via a Telnet session) causes the login screen to display. Type the factory default login: *administrator* and leave the password empty. Press the *Enter* key after the password prompt.

   ```
   login:administrator
   password: <Enter>
   172.16.40.1>
   ```

2. After you have successfully logged in you are in the operator execution mode, indicated by > as command line prompt. With the commands *enable* and *configure* you enter the configuration mode.

   ```
   172.16.40.1>enable
   172.16.40.1#configure
   172.16.40.1(cfg)#
   ```

3. Enter the following commands for the first SmartNode 229x device in the pair:

   ```
   Copy nvram:a-side-config startup-config
   Copy running-config startup-config
   ```

4. Follow the same procedure for the other SmartNode 229x device in the pair:

   ```
   Copy nvram:b-side-config startup-config
   Copy running-config startup-config
   ```

   Note The configuration above is only a sample configuration that you may use as an example. You should specify your own parameters such as your IP address and other related parameters as required. For detailed information about configuring and operating your SmartNode, set-up procedures, and troubleshooting, refer to the *SmartNode Series SmartWare Software Configuration Guide* on the CD-ROM that came with your unit.

5. Reboot both units and connect them back-to-back through their Ethernet 0/1 ports. Voice connections will automatically be set up between the units.

The steps above will configure the IP addresses as well as the required configurations for voice connections.

Chapter 5   LEDs status and monitoring

Chapter contents

Status LEDs

This chapter describes SmartNode VoIP extender front panel LEDs. Figure 16 shows SmartNode 2292 and 2294 Series LEDs. LED definitions are listed in table 8 on page 37.
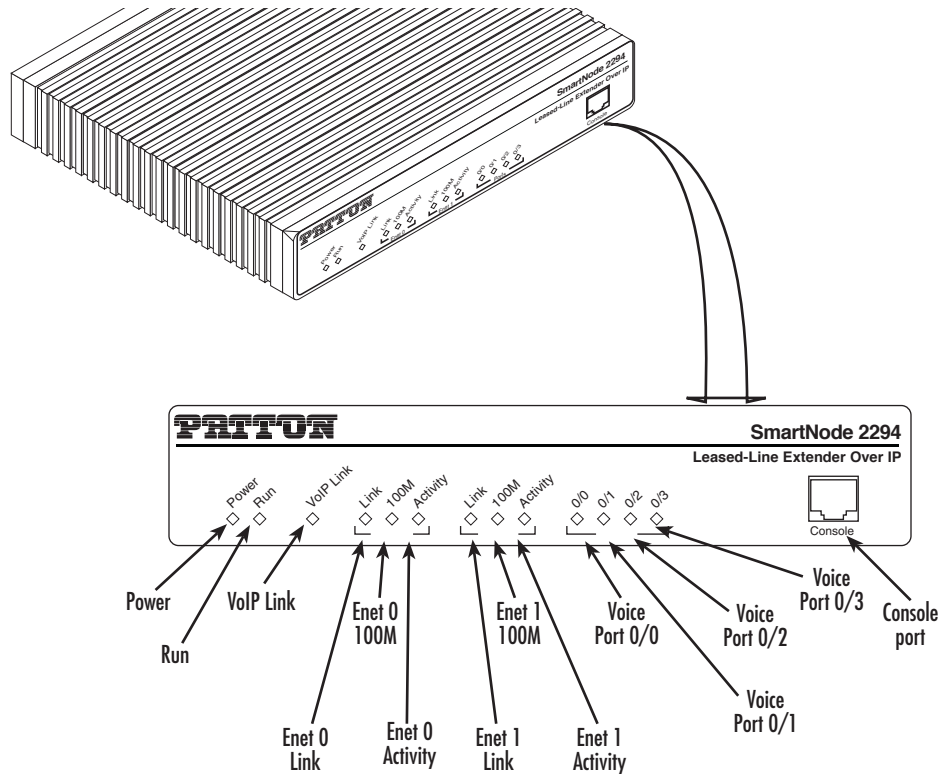

Figure 16. Examples of SmartNode 2292 and 2294 Series front panels

Table 8. SmartNode LED Indications

LED	Description
Note	If an error occurs, all LEDs will flash once per second.
Power	When lit, indicates power is applied. Off indicates no power applied.
Run	When lit, indicates normal operation. Flashes once per second during boot (startup).
VoIP Link	When lit, indicates the gateway is registered on a gatekeeper, media gateway controller, associated to a remote unit, or has an active VoIP connection. Off indicates the unit is not configured or registered and has no active VoIP connection. Flashing green indicates that the unit is attempting or has failed to associate/register
Voice port	Solid when leased line channel is operational. Should not be off or blinking.
Ethernet (each port)	• **Link**: Lit when Ethernet link is up. • **100M**: On when 100-Mbps Ethernet is selected. • **Activity**: Flashes when data is received or transmitted from the unit to the LAN.

Chapter 6 Contacting Patton for assistance

Chapter contents

Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.

- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the RAS warranty and obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems:

- Online support—available at **www.patton.com**

- E-mail support—e-mail sent to **support@patton.com** will be answered within 1 business day

- Telephone support—standard telephone support is available five days a week—from **8:00 am** to **5:00 pm EST** (**1300** to **2200 UTC**)—by calling **+1 (301) 975-1007**

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

> **Note** If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-warranty service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return for credit policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.

- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).

- Over 60 days: Products will be accepted for repairs only.

RMA numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com**

- By calling **+1 (301) 975-1007** and speaking to a Technical Support Engineer

- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A **Compliance information**

Chapter contents

Compliance

EMC
- EN55022, Class A
- EN55024

Safety
- EN60950

CE Declaration of Conformity

This equipment conforms to the requirements of Council Directive 1999/5/EC on the approximation of the laws of the member states relating to Radio and Telecommunication Terminal Equipment and the mutual recognition of their conformity.

The safety advice in the documentation accompanying this product shall be obeyed. The conformity to the above directive is indicated by **CE** sign on the device.

The signed Declaration of Conformity can be downloaded at www.patton.com/certifications.

Appendix B **Specifications**

Chapter contents

Capacity

2 audio lines (2292)

4 audio lines (2294)

Audio connectivity

2-wire RJ-11

Bandwidth 4kHz, Impedance 600-ohm

Narrow Band FXS style hybrid transmit/receive

Data Services

Two 10/100 Ethernet ports

Complete IP access router

DHCP Client & server

Packet fragmentation

Static firewall, NAT, NAPT RFC 1631 access control lists

DMZ port

IPsec, IKE, AES/DES/3DES Encryption

Quality of Service

Audio priority

DownStreamQoS™

Traffic management, shaping and policing

IEEE 802.1p, TOS, DiffServ labeling

IEEE 802.1Q, VLAN tag insertion/deletion (simultaneous support of multiple VLANs)

Voice Signaling

H.323v4, SIPv2 (B2BUA

capable, multi-instance, simultaneous

support of multiple registrars and direct

IP dialing) • SIP call transfer, redirect

DTMF in-band & out-of-band

Voice Processing

CODEC G.711 a-law/mu-law, G.723, G.729ab,

G.726, G.727. T.38 fax relay (9.6 k, 14.4k)

G.711 transparent fax and bypass

Management

Web/HTTP, CLI with local console and remote Telnet access

TFTP configuration & firmware loading

SNMP MIB II and product MIB

Secure Mass provisioning for both firmware and unit configuration

Built-in diagnostic tools (trace, debug, call generator)

System

CPU Motorola MPC875 @66MHz

Memory 32MB SDRAM/8MB Flash

Power 100–240 VAC (50/60Hz)

Power dissipation 4-8W, model dependent

Temperature

32–104°F (0–40°C)

Humidity

5–80%, non-condensing

Appendix C **Cabling**

Chapter contents

Introduction

This section provides information on the cables used to connect the SmartNode and the interface cards to the existing network infrastructure and to third party products.

Serial console

The SmartNode can be connected to a serial terminal over its serial console port, as depicted in figure 17.
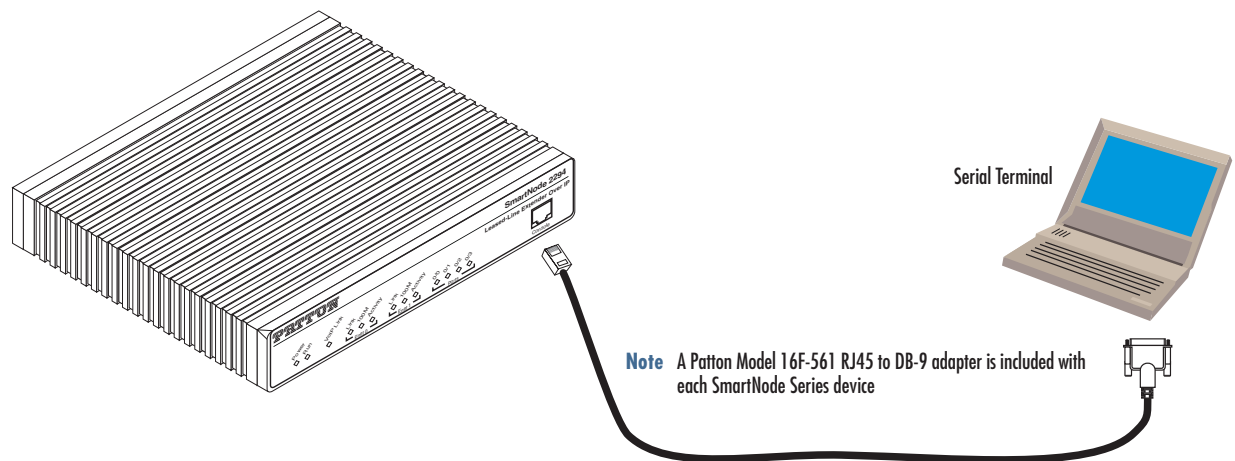

Serial Terminal

Note A Patton Model 16F-561 RJ45 to DB-9 adapter is included with each SmartNode Series device

Figure 17. Connecting a serial terminal

Note See section "Console port" on page 51 for console port pin-outs.

Ethernet 10Base-T and 100Base-T

Ethernet devices (10Base-T/100Base-T) are connected to the SmartNode over a cable with RJ-45 plugs. Use a cross-over cable to a host, or a straight cable to a hub. See figure 18 (host) and figure 19 on page 49 (hub) for the different connections.

Note   The SmartNode 2292 Series is equipped with Auto-MDX Ethernet ports. Use straight-through wired cables for host or hub/switch connections
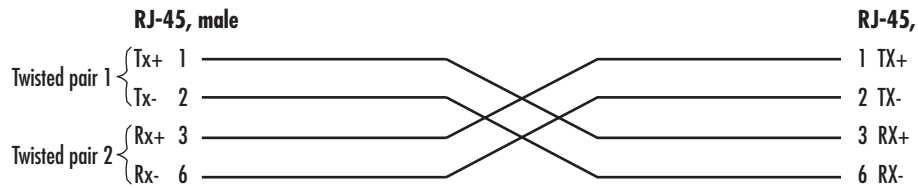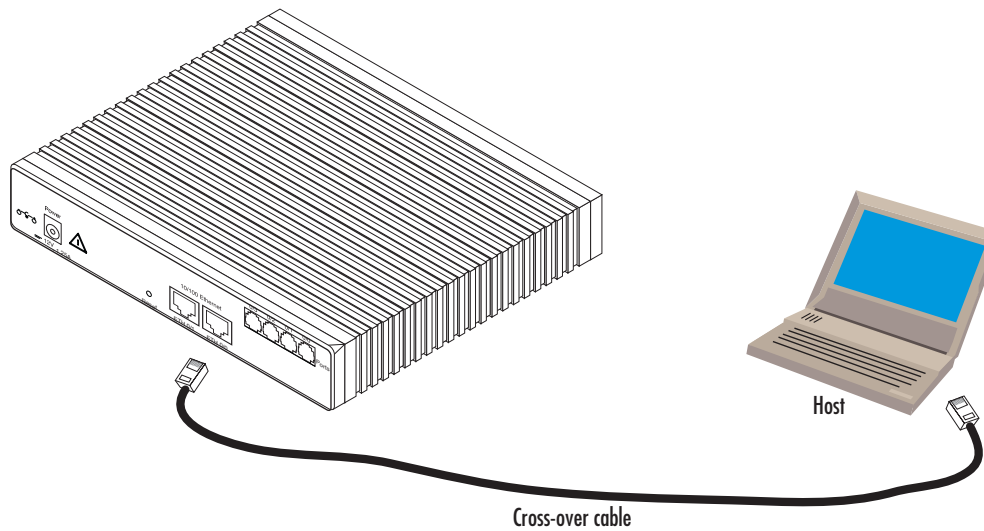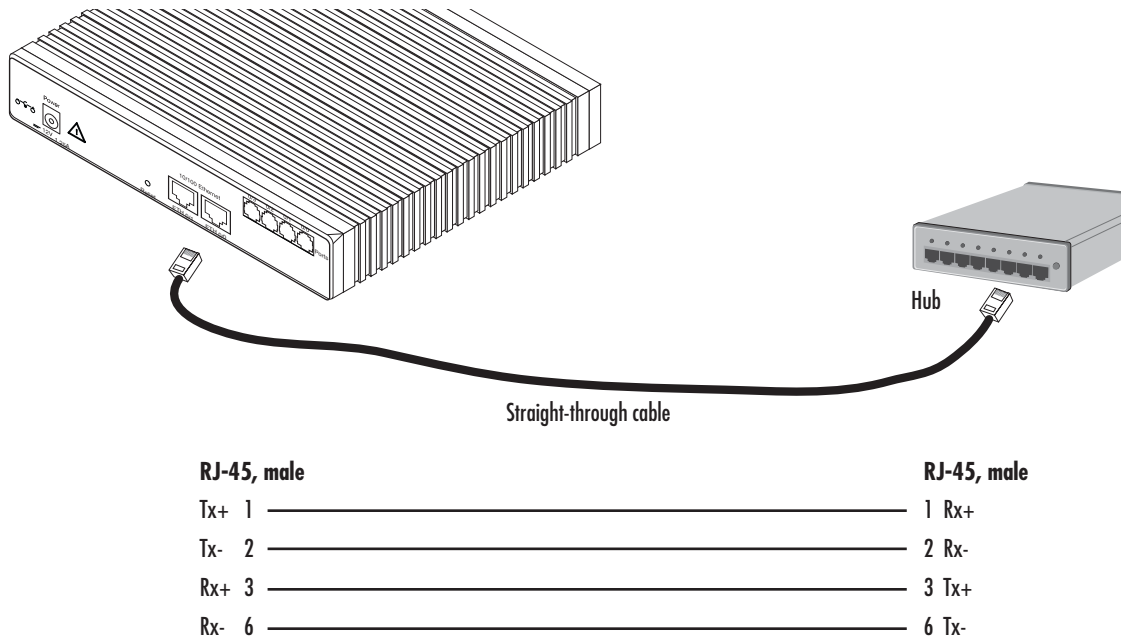
Figure 18. Ethernet cross-over

RJ-45, male   **RJ-45, male**

Tx+ 1 ————————————————————————————————— 1 Rx+

Tx-   2 ————————————————————————————————— 2 Rx-

Rx+ 3 ————————————————————————————————— 3 Tx+

Rx-   6 ————————————————————————————————— 6 Tx-

Figure 19. Ethernet straight-through

Analog FXS

Applicable to SmartNodes equipped with FXS ports. The FXS ports are connected to analog terminals (phones, fax machines, answering machines) via cables terminated with RJ-11 connectors (see section "Voice port" on page 51 for details on port pinouts).

RJ-11, male   **RJ-11, male**

Ring (-) 3 ————————————————————————————————— 3   Ring (-)

Tip (+)   4 ————————————————————————————————— 4   Tip (+)
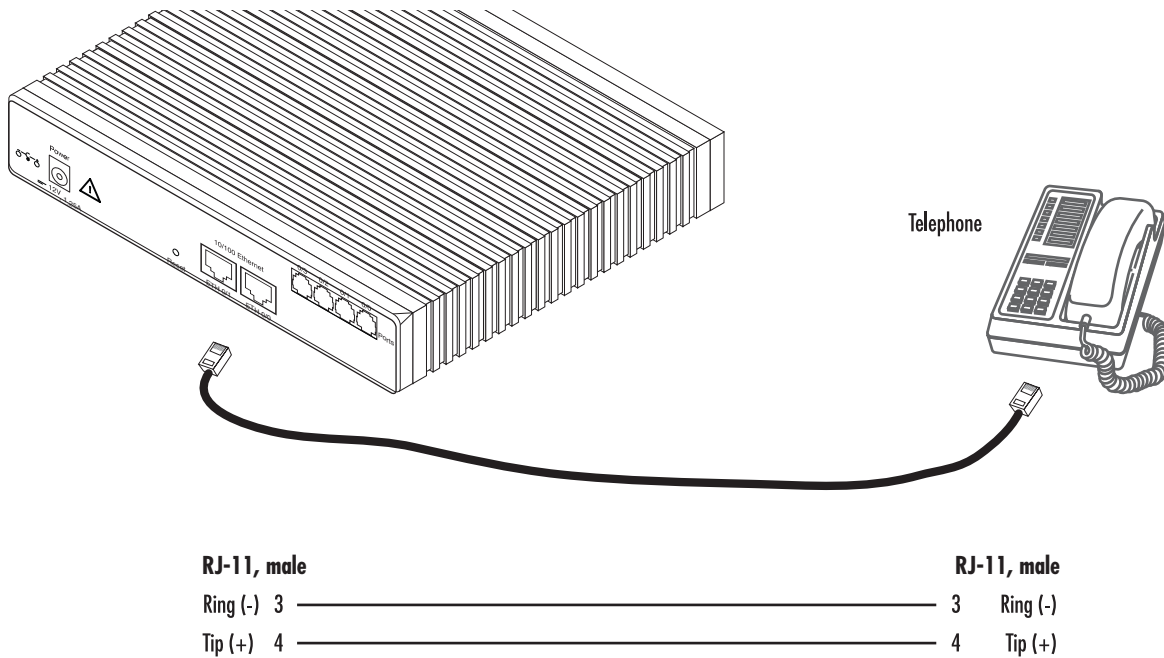
Figure 20. Connecting an FXS device

Appendix D **Port pin-outs**

Chapter contents

Introduction

This section provides pin-out information for the ports of the SmartNode.

Console port

```
8—RTS
7—CTS
6—TD
5—RD
4—SG
3—DTR
2—CD
1—RI

      1 2 3 4 5 6 7 8
```
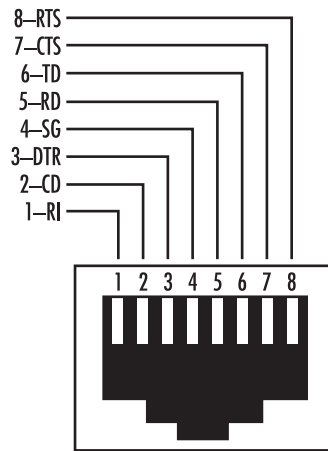
Figure 21. EIA-561 (RJ-45 8-pin) port

> **Note**   Pins not listed are not used.

Ethernet 10Base-T and 100Base-T port

Table 9. RJ-45 socket

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

> **Note**   Pins not listed are not used.

Voice port

The voice ports use an RJ-11 connector with 6 positions. The midle two positions 3 and 4 are used according to table 10.

Table 10. RJ-11 socket

Pin	Signal
3	Ring (-)
4	Tip (+)

> **Note**   Pins not listed are not used.

Appendix E **Installation checklist**

Chapter contents

Introduction

This appendix lists the tasks for installing a SmartNode 2292 or 2294 Series extender (see table 11) . Make a copy of this checklist and mark the entries as you complete each task. For each SmartNode 2292 or 2294 Series extender, include a copy of the completed checklist in your site log.

Table 11. Installation checklist

Task	Verified by	Date
Network information available & recorded in site log		
Environmental specifications verified		
Site power voltages verified		
Installation site pre-power check completed		
Required tools available		
Additional equipment available		
All printed documents available		
SmartWare release & build number verified		
Rack, desktop, or wall mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Cable length limits verified		
Initial configuration performed		
Initial operation verified		