

# SmartNode 4830 Series Leased-Line Extenders over IP

## User Manual



This is a Class A device and is not intended for use in a residential environment.

Sales Office: +1 (301) 975-1000  
Technical Support: +1 (301) 975-1007  
E-mail: [support@patton.com](mailto:support@patton.com)  
WWW: [www.patton.com](http://www.patton.com)

**Patton Electronics Company, Inc.**

7622 Rickenbacker Drive  
Gaithersburg, MD 20879 USA  
tel: +1 (301) 975-1000  
fax: +1 (301) 869-9293  
support: +1 (301) 975-1007  
web: [www.patton.com](http://www.patton.com)  
e-mail: [support@patton.com](mailto:support@patton.com)

**Trademark Statement**

The term *SmartNode* is trademarks of Patton Electronics Company. All other trademarks presented in this document are the property of their respective owners.

**Copyright © 2012, Patton Electronics Company. All rights reserved.**

The information in this document is subject to change without notice. Patton Electronics assumes no liability for errors that may appear in this document.

**Warranty Information**

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

**Patton Electronics** warrants all SmartNode extender components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of the shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If the product fails to perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

# Summary Table of Contents

- 1 General information ..... 14
- 2 Applications overview..... 19
- 3 Hardware installation ..... 21
- 4 Getting started with the SmartNode..... 32
- 5 LEDs status and monitoring ..... 36
- 6 Contacting Patton for assistance ..... 38
- A Compliance information ..... 41
- B Specifications ..... 44
- C Cabling ..... 47
- D Port pin-outs ..... 51
- E Installation checklist ..... 53

# Table of Contents

Summary Table of Contents .....	3
Table of Contents .....	4
List of Figures .....	6
List of Tables .....	7
About this guide .....	8
Safety when working with electricity .....	10
Preventing electrostatic discharge damage .....	12
General observations .....	12
General conventions .....	13
<b>1 General information</b> .....	<b>14</b>
SmartNode Series Leased-Line Extenders overview .....	15
SmartNode 4832 and 4834 Leased-Line Extenders .....	16
<b>2 Applications overview</b> .....	<b>19</b>
Typical application .....	20
Leased-line extension .....	20
<b>3 Hardware installation</b> .....	<b>21</b>
Planning the installation .....	22
Installation checklist .....	23
Site log .....	24
Network information .....	24
IP related information .....	24
Software tools .....	24
Power source .....	24
Location and mounting requirements .....	25
Installing the SmartNode extender .....	25
Mounting the SmartNode extender .....	25
Connecting cables .....	25
<b>4 Getting started with the SmartNode</b> .....	<b>32</b>
Introduction .....	33
Configure the IP address .....	34
Power connection and default configuration .....	34
Connect with the serial interface .....	34
Login .....	35
<b>5 LEDs status and monitoring</b> .....	<b>36</b>
Status LEDs .....	37
<b>6 Contacting Patton for assistance</b> .....	<b>38</b>
Introduction .....	39
Contact information .....	39
Warranty Service and Returned Merchandise Authorizations (RMAs) .....	39

Warranty coverage .....	39
RMA numbers .....	40
<b>A Compliance information .....</b>	<b>41</b>
Compliance .....	42
EMC .....	42
Safety .....	42
PSTN .....	42
Radio and TV interference .....	42
CE Declaration of Conformity .....	42
Authorized European Representative .....	43
<b>B Specifications .....</b>	<b>44</b>
Capacity .....	45
Audio connectivity .....	45
Data Services .....	45
Quality of Service .....	45
Voice Signaling .....	45
Voice Processing .....	46
Management .....	46
System .....	46
Temperature .....	46
Humidity .....	46
<b>C Cabling .....</b>	<b>47</b>
Introduction .....	48
Serial console .....	48
Ethernet 10Base-T and 100Base-T .....	49
Analog FXS .....	50
<b>D Port pin-outs .....</b>	<b>51</b>
Introduction .....	52
Console port .....	52
Ethernet 10Base-T and 100Base-T port .....	52
Voice port .....	52
<b>E Installation checklist .....</b>	<b>53</b>
Introduction .....	54

## List of Figures

1	SmartNode extender (SmartNode 4834 shown) . . . . .	15
2	Examples of SmartNode 4832 and 4834 Series rear panels . . . . .	16
3	SmartNode 4834 power input connectors . . . . .	17
4	SmartNode 4832 and 4834 front panels . . . . .	18
5	Leased-line extension application . . . . .	20
6	Rear view showing location of Ethernet connectors and voice ports (SmartNode 4834 shown) . . . . .	26
7	Analog connection . . . . .	26
8	Analog connection . . . . .	27
9	RJ-11 pinout diagram . . . . .	27
10	Connecting a SmartNode 4834 Series device to a hub . . . . .	28
11	Connecting to a host . . . . .	29
12	Power connector location on rear panel . . . . .	30
13	SmartNode extender front panel LEDs and Voice port locations (SmartNode 4834 shown) . . . . .	31
14	Steps for setting up a new SmartNode . . . . .	33
15	Connecting to the terminal . . . . .	34
16	Examples of SmartNode 4832 and 4834 Series front panels . . . . .	37
17	Connecting a serial terminal . . . . .	48
18	Ethernet cross-over . . . . .	49
19	Ethernet straight-through . . . . .	50
20	Connecting an FXS device . . . . .	50
21	EIA-561 (RJ-45 8-pin) port . . . . .	52

# List of Tables

1	General conventions	13
2	Rear panel ports	17
3	Installation checklist	23
4	Sample site log entries	24
5	RJ-11 socket	27
6	Ethernet 10/100Base-T (RJ-45) port pin-outs (SmartNode 4834 Series)	28
7	Factory default IP address and network mask configuration	34
8	SmartNode LED Indications	37
9	RJ-45 socket	52
10	RJ-11 socket	52
11	Installation checklist	54

# About this guide

---

This guide describes the SmartNode 4834 and 4832 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 A](#) on page 41 contains compliance and regulatory information for the extenders
- [Appendix B](#) on page 44 contains specifications for the extenders
- [Appendix C](#) on page 47 provides cable recommendations
- [Appendix D](#) on page 51 describes the extender's ports and pin-outs
- [Appendix E](#) on page 53 lists the tasks for installing a SmartNode 4832 or 4834 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.



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.

*Le symbole de danger de choc et la position **WARNING** indique un risque de choc électrique. Suivre strictement les instructions d'avertissement pour éviter les blessures causées par un choc électrique.*



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

*Le symbole alerte et **WARNING** rubrique indiquer un danger potentiel pour la sécurité. Suivre strictement les instructions d'avertissement pour éviter les blessures.*



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.

*Le symbole de danger de choc et la position **CAUTION** indique un risque de choc électrique. Suivre strictement les instructions pour éviter les dommages matériels causés par un choc électrique.*



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

*Le symbole d'alerte et indiquent la position **CAUTION** un danger potentiel. Suivre strictement les instructions afin d'éviter des dommages matériels.*

## Safety when working with electricity



- This device contains no user serviceable parts. The device can only be repaired by qualified service personnel.

*Cet appareil contient des pièces n'est réparable par l'utilisateur. Ce dispositif ne peut être réparé par du personnel qualifié.*
- Do not open the device when the power cord is connected. For systems without a power switch, and without an external power adapter, line voltages are present within the device when the power cord is connected.

*Ne pas ouvrir l'appareil lorsque le cordon d'alimentation est connecté. Pour les systèmes sans un commutateur de puissance et sans un adaptateur d'alimentation externe, des tensions de ligne sont présents au sein de l'appareil lorsque le cordon d'alimentation est connecté.*
- For devices with an external power adapter, the power adapter shall be a listed *Limited Power Source*. The mains outlet that is utilized to power the device shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker in compliance with local regulatory requirements.

*Pour les appareils avec un adaptateur d'alimentation externe, l'adaptateur d'alimentation doit être une source d'alimentation limitée cotée. La prise de courant qui est utilisé pour alimenter le dispositif doit être à 10 pieds (3 mètres) de l'appareil, doit être facilement accessible, et protégé par un disjoncteur en conformité avec les exigences réglementaires locales.*
- For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.

*Pour les appareils alimentés par AC, veiller à ce que le câble d'alimentation utilisé respecte toutes les normes applicables pour le pays dans lequel il doit être installé.*
- For AC powered devices which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.

*Pour les appareils alimentés en ca qui ont 3 prises de courant des conducteurs (L1, L2 et GND ou à chaud, neutre et de la sécurité / de protection au sol), la prise murale (ou socket) doit avoir une prise de terre.*
- For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.

*Pour les appareils alimentés par courant continu, veiller à ce que les câbles d'interconnexion sont conçus pour la tension appropriée, courant, température prévue, l'inflammabilité et d'entretien mécanique.*
- WAN, LAN & PSTN ports (connections) may have hazardous network voltages are present, regardless of whether the device is powered ON or OFF. PSTN relates to interfaces such as telephone lines. FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, etc. These are known as "hazardous network voltages" and to avoid electric shock use caution when working near these ports. When disconnecting cables for these ports, detach the far end connection of the SmartNode first.

**Ports WAN, LAN et PSTN (connexions) peuvent avoir des tensions dangereuses indépendamment du fait que l'appareil est allumé ou éteint. PSTN concerne des interfaces telles que les lignes téléphoniques, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voix, etc Ils sont connus comme "tensions dangereuses du réseau" et d'éviter un choc électrique preuve de prudence lorsque l'on travaille à proximité de ces ports. Lors de la déconnexion des câbles pour ces ports, détacher la connexion bout en premier.**

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

**Ne pas travailler sur l'appareil ou de connecter ou déconnecter les câbles pendant les périodes d'activité de foudre.**

- **If one has reason to open the chassis or case, then the precautions mentioned above shall be followed. This includes both the warnings relating to disconnection of the input power, and the warnings relating to the disconnection of WAN, LAN & PSTN ports.**

**Si l'on a raison d'ouvrir le châssis ou le cas, alors les précautions mentionnées ci-dessus doivent être respectées. Cela inclut les mises en garde relatives à la déconnexion de la puissance d'entrée et les avertissements relatifs à la déconnexion des ports WAN, LAN et PSTN.**



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.



**This device is NOT intended nor approved for connection to the PSTN. It is intended only for connection to customer premise equipment.**

### **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 <b>Go to Previous View</b> button  in the Adobe® Acrobat® Reader toolbar to return to your starting point.
<b>Futura bold type</b>	Commands and keywords are in <b>boldface</b> font.
<b><i>Futura bold-italic type</i></b>	Parts of commands, which are related to elements already named by the user, are in <b>boldface italic</b> font.
<i>Italicized Futura type</i>	Variables for which you supply values are in <i>italic</i> 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.
<b>node</b>	The leading IP address or nodename of a SmartNode is substituted with <b>node</b> in <b>boldface italic</b> font.
<b>SN</b>	The leading <b>SN</b> 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 .....	15
SmartNode 4832 and 4834 Leased-Line Extenders .....	16
Ports descriptions .....	17
Reset button behavior .....	17

## SmartNode Series Leased-Line Extenders overview

The SmartNode 4832 and 4834 Series Leased-Line Extenders (see [Figure 1](#)) combine ADSL WAN access, 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 4834 shown)

The SmartNode 4832 and 4834 Leased-Line Extenders, equipped with one 10/100Base-T Ethernet port and ADSL interface providing voice over IP (VoIP) and Internet telephony plus Internet access routing, VPN and firewall functions and extensive Quality of Service (QoS) functions.

The SmartNode 4832 and 4834 Leased-Line Extenders perform the following major functions:

- Voice over IP via 2 or 4 analog analog leased line voice ports.
- Standard compliant VoIP conversion in accordance with SIP and H.323 protocols.
- ADSL Internet access and IP Routing with IP Quality of Service (QoS) support for mixed voice and data traffic.

### SmartNode 4832 and 4834 Leased-Line Extenders

The SmartNode 4832 and 4834 models are compact Leased-Line Extenders over IP that support two or four VoIP channels, depending on the number of ports (see Figure 2).

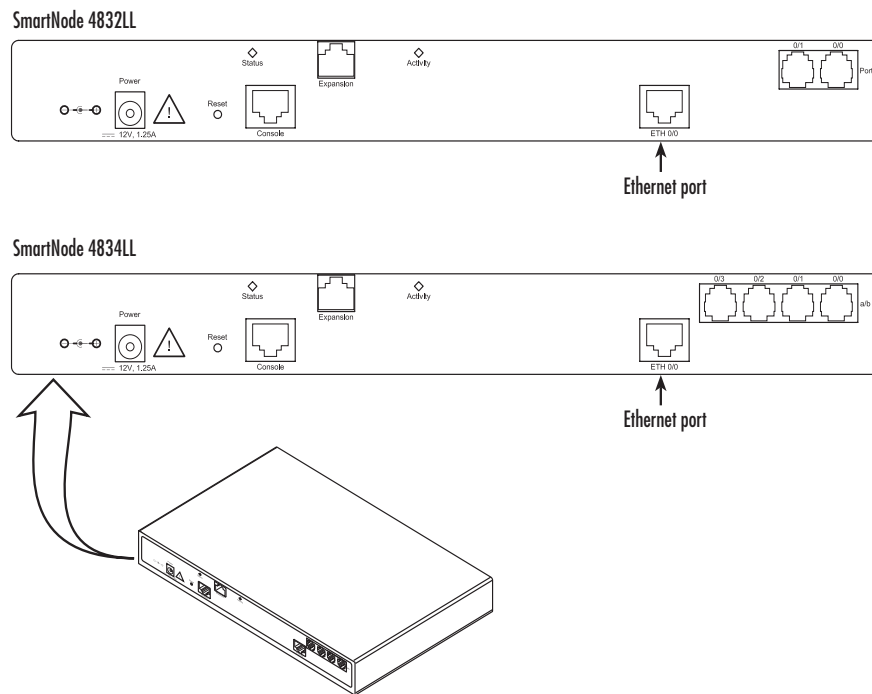


Figure 2. Examples of SmartNode 4832 and 4834 Series rear panels

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

- SmartNode 4832/EUI (2 VoIP leased line channels)
- SmartNode 4834/EUI (4 VoIP leased line channels)

The port combinations are indicated in the extension of the model code. The 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 *4834/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/>.



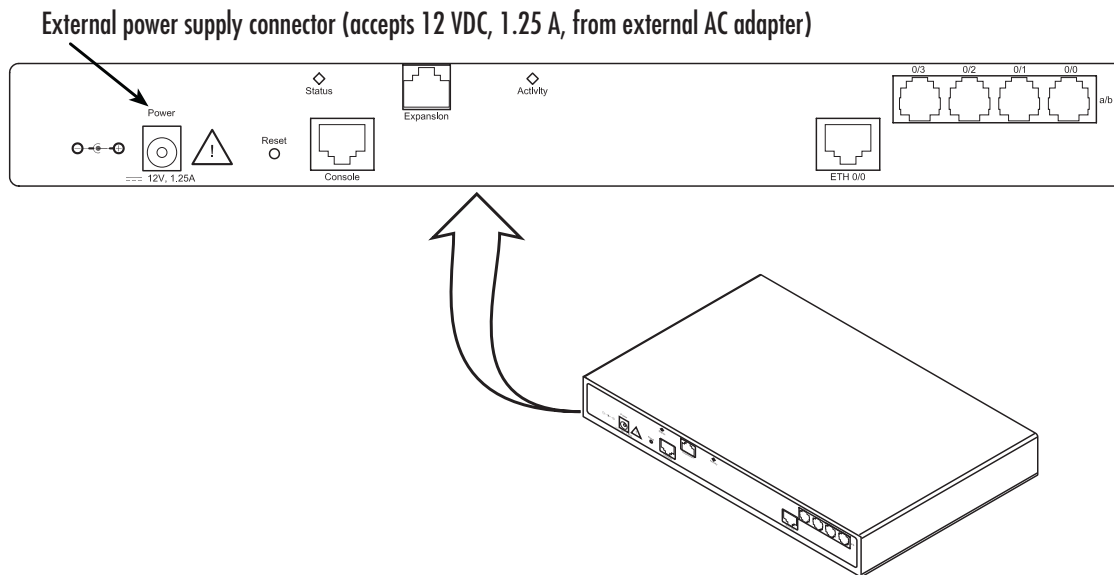


Figure 3. SmartNode 4834 power input connectors

### Ports descriptions

The SmartNode 4832 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 <a href="#">Figure 6</a> 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 <a href="#">Figure 6</a> 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 <a href="#">Figure 3</a> ), labeled as follows: <ul style="list-style-type: none"> <li>AC version (Internal power supply): 100–240 VAC, 50/60 Hz, 200 mA</li> <li>DC version: 12 VDC, 1.25 A</li> </ul>
Console	Front panel	Used for service and maintenance, the Console port (see <a href="#">Figure 4</a> 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).
ADSL	Rear panel	The ADSL LEDs are located on either side of the DSL port. ACT, when lit or blinking, shows Activity. LINK, when lit, shows the DSL port is connected.

### 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.

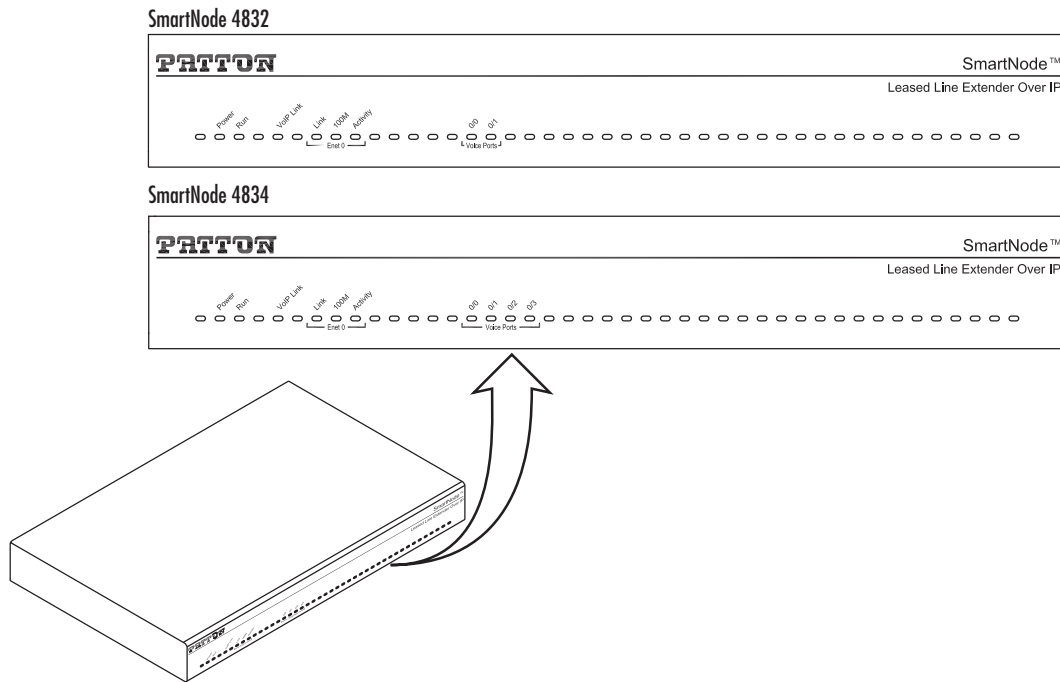


Figure 4. SmartNode 4832 and 4834 front panels

**Note** For LED descriptions, refer to Chapter 5, “LEDs status and monitoring” on page 36.

# Chapter 2 **Applications overview**

## **Chapter contents**

Typical application .....	20
Leased-line extension .....	20

## Typical application

### **Leased-line extension**

The SmartNode 4832 and 4834 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 4 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 ADSL, 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 4832/4834 leverages low-cost IP services with packet-voice for complete branch office voice and data connectivity.

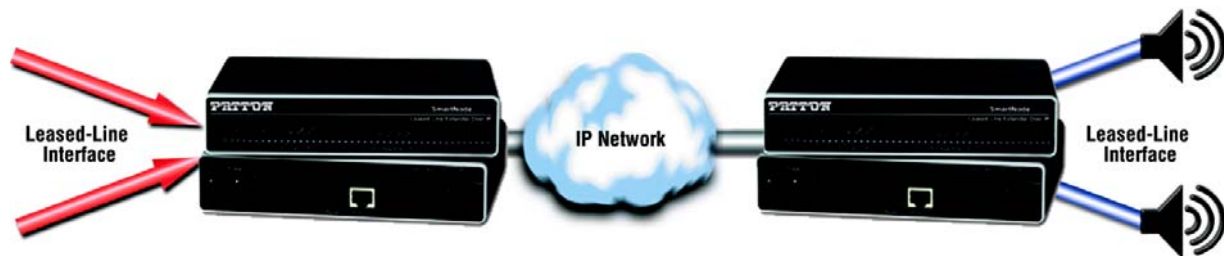


Figure 5. Leased-line extension application

## Chapter 3 **Hardware installation**

### **Chapter contents**

Planning the installation .....	22
Installation checklist .....	23
Site log .....	24
Network information .....	24
Network Diagram .....	24
IP related information .....	24
Software tools .....	24
Power source .....	24
Location and mounting requirements .....	25
Installing the SmartNode extender .....	25
Mounting the SmartNode extender .....	25
Connecting cables .....	25
Installing an interface cable on the extender's voice ports .....	26
Installing the Ethernet cable .....	28
Connecting to external power source .....	30

## Planning the installation

Before you start the actual installation, it is strongly recommended that you gather all information needed to install and setup the device. See [Table 3](#) for an example of what pre-installment checks you may need to carry out. Completing the pre-installation checks enables you to install and set up your SmartNode extender into an existing infrastructure with confidence.



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 4832 or 4834 Series extender. Make a copy of this checklist and mark the entries as you complete each task. For each SmartNode 4832 or 4834 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 described for several types of network interfaces 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 4832 or 4834, 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 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



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



**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).

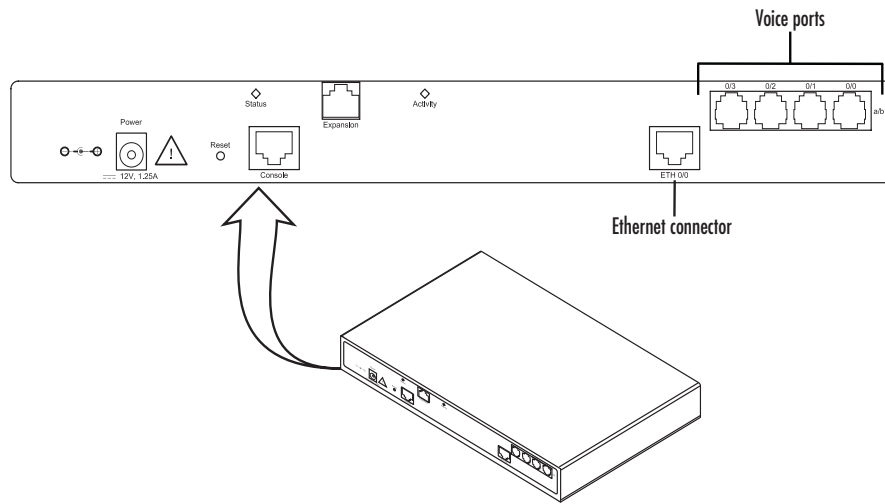


Figure 6. Rear view showing location of Ethernet connectors and voice ports (SmartNode 4834 shown)

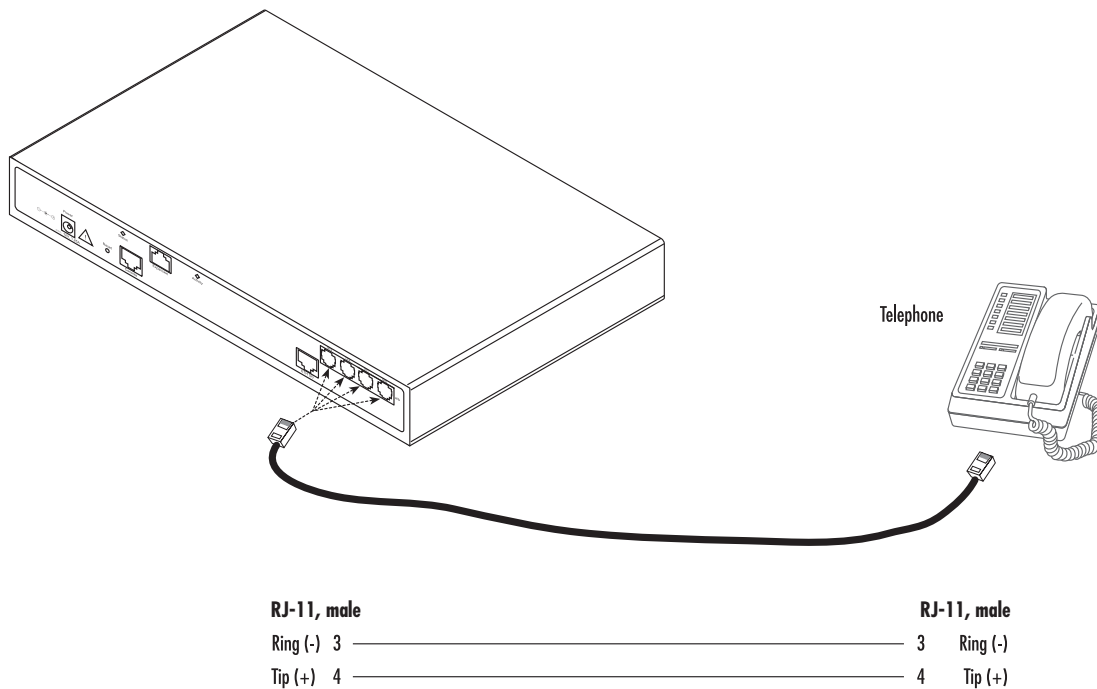


Figure 7. Analog connection

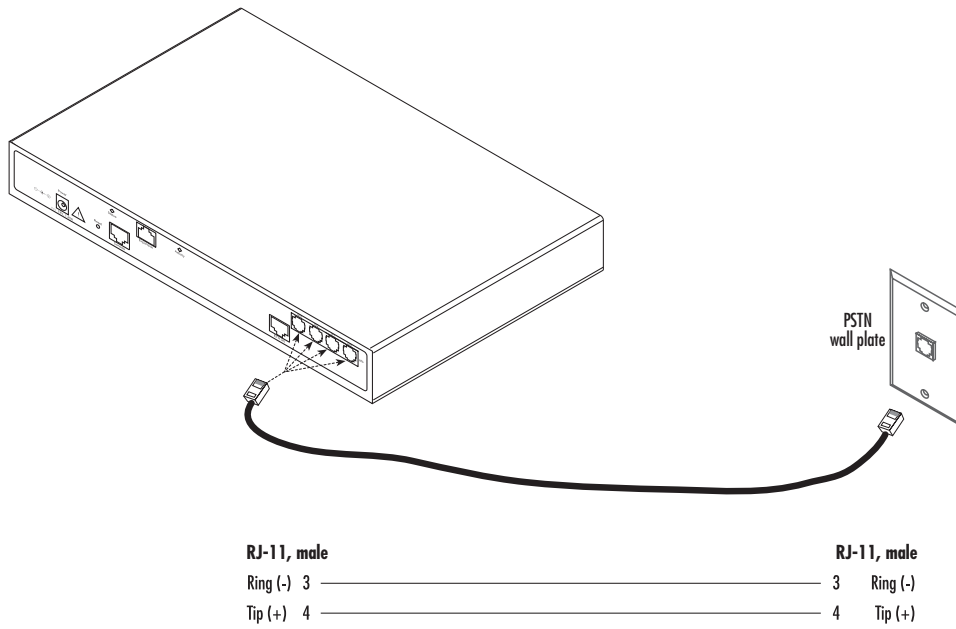


Figure 8. Analog connection

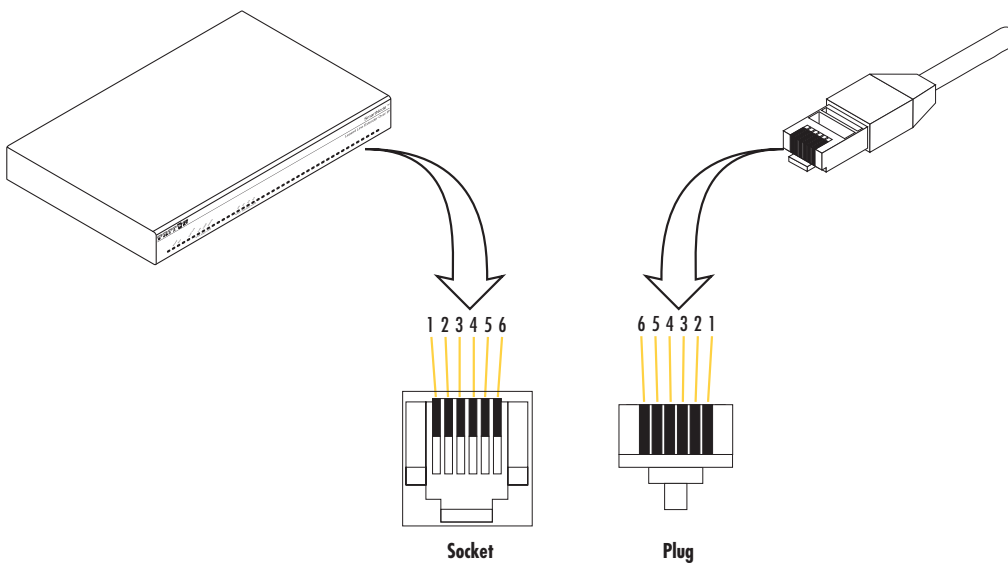


Figure 9. RJ-11 pinout diagram

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 4832 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 port (see [Table 6](#) for port pin-out listing) via a cable terminated with RJ-45 plugs. Because the SmartNode 4834 Series does not have the MDX feature, a cross-over cable is required when connecting SmartNode 4834 Series devices to a host (see [Figure 11](#) on page 29).

Table 6. Ethernet 10/100Base-T (RJ-45) port pin-outs (SmartNode 4834 Series)

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

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

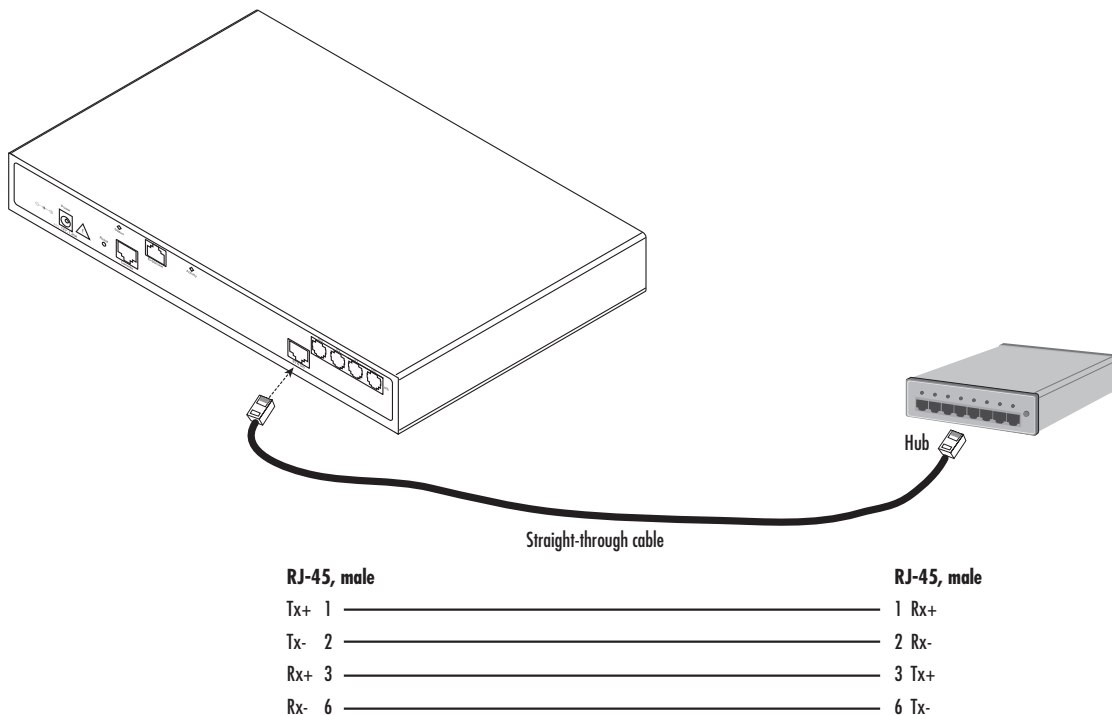


Figure 10. Connecting a SmartNode 4834 Series device to a hub

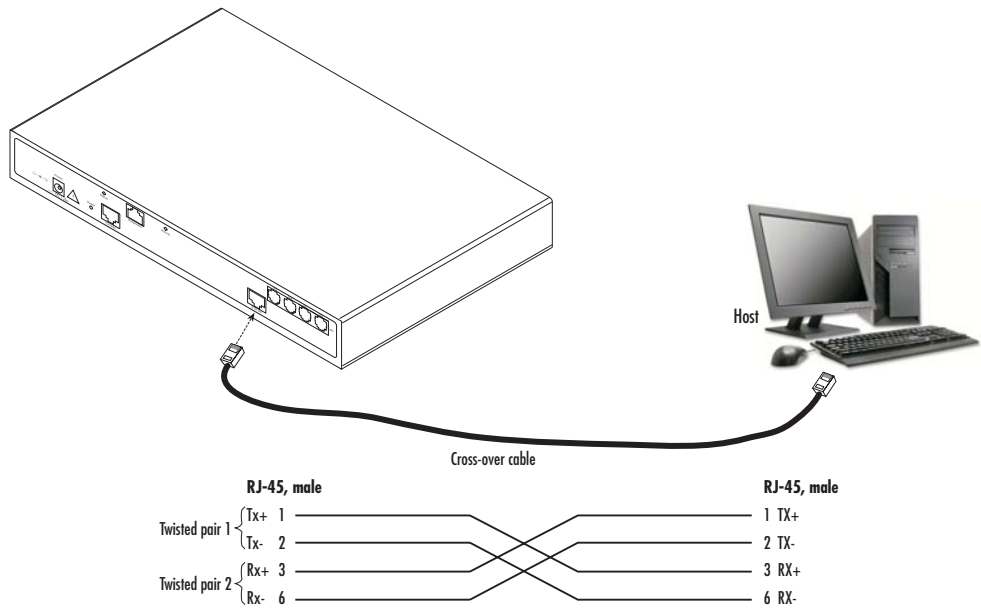


Figure 11. Connecting to a host

### 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).

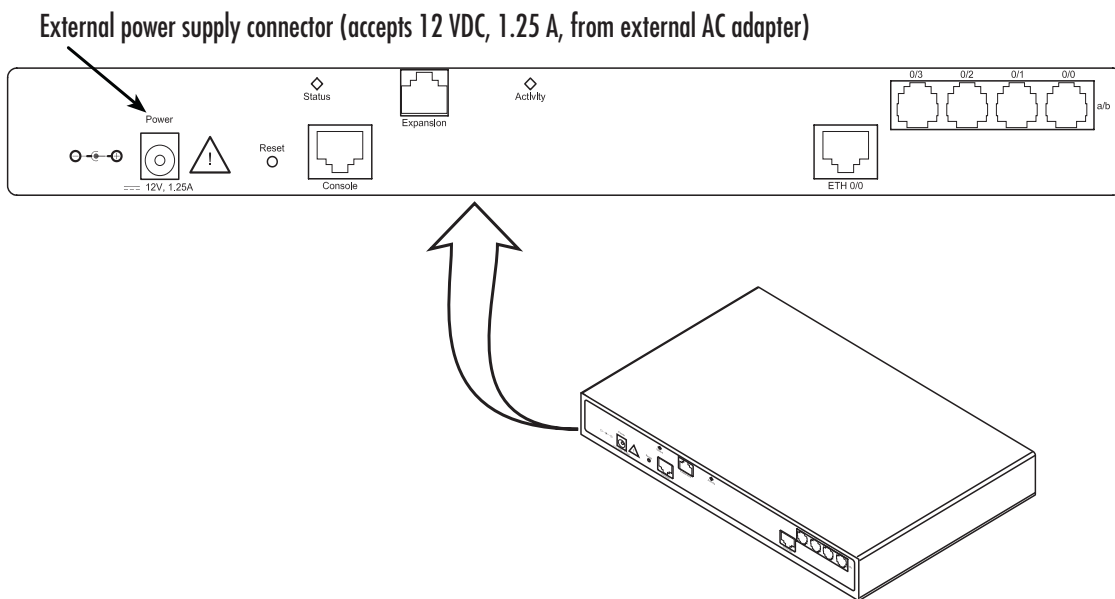


Figure 12. Power connector location on rear panel



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.

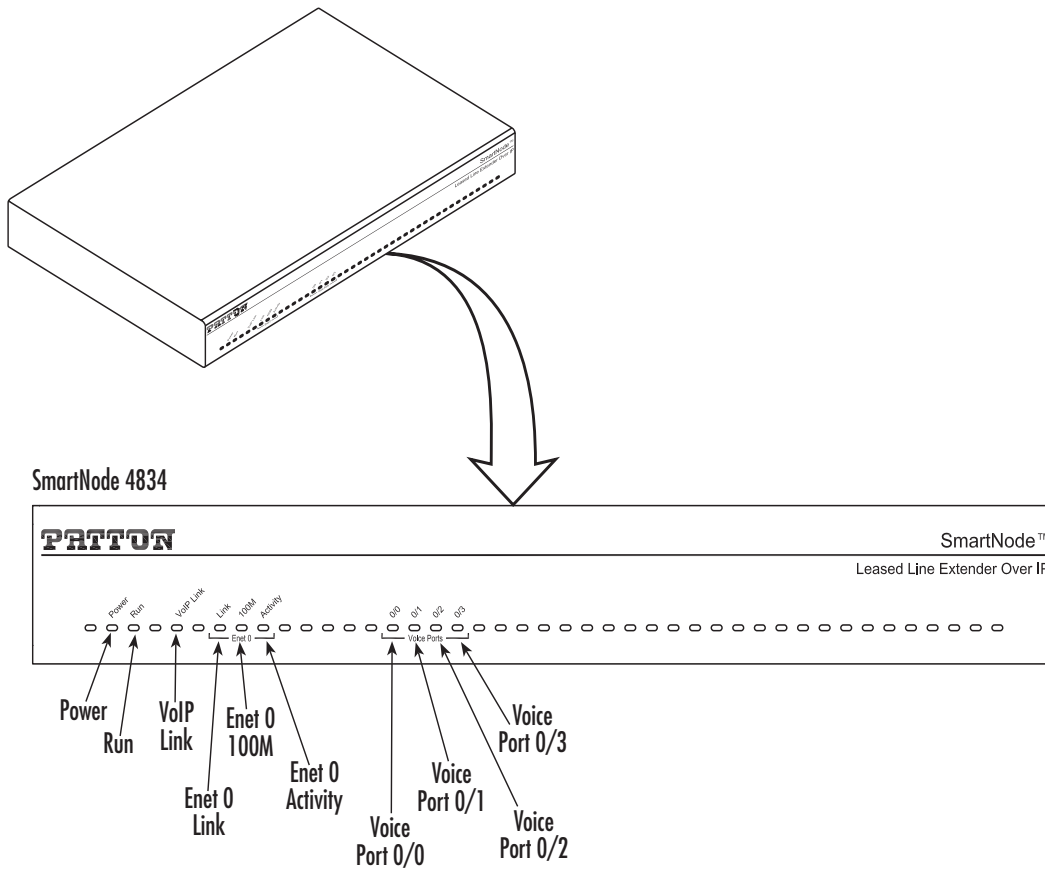


Figure 13. SmartNode extender front panel LEDs and Voice port locations (SmartNode 4834 shown)

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.....	33
Configure the IP address.....	34
Power connection and default configuration .....	34
Connect with the serial interface .....	34
Login .....	35



## 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 SmartNode's configuration, templates for the most important applications are available on the Patton server at [www.patton.com/voip](http://www.patton.com/voip).

The main steps for setting up a new SmartNode are shown in [Figure 14](#).

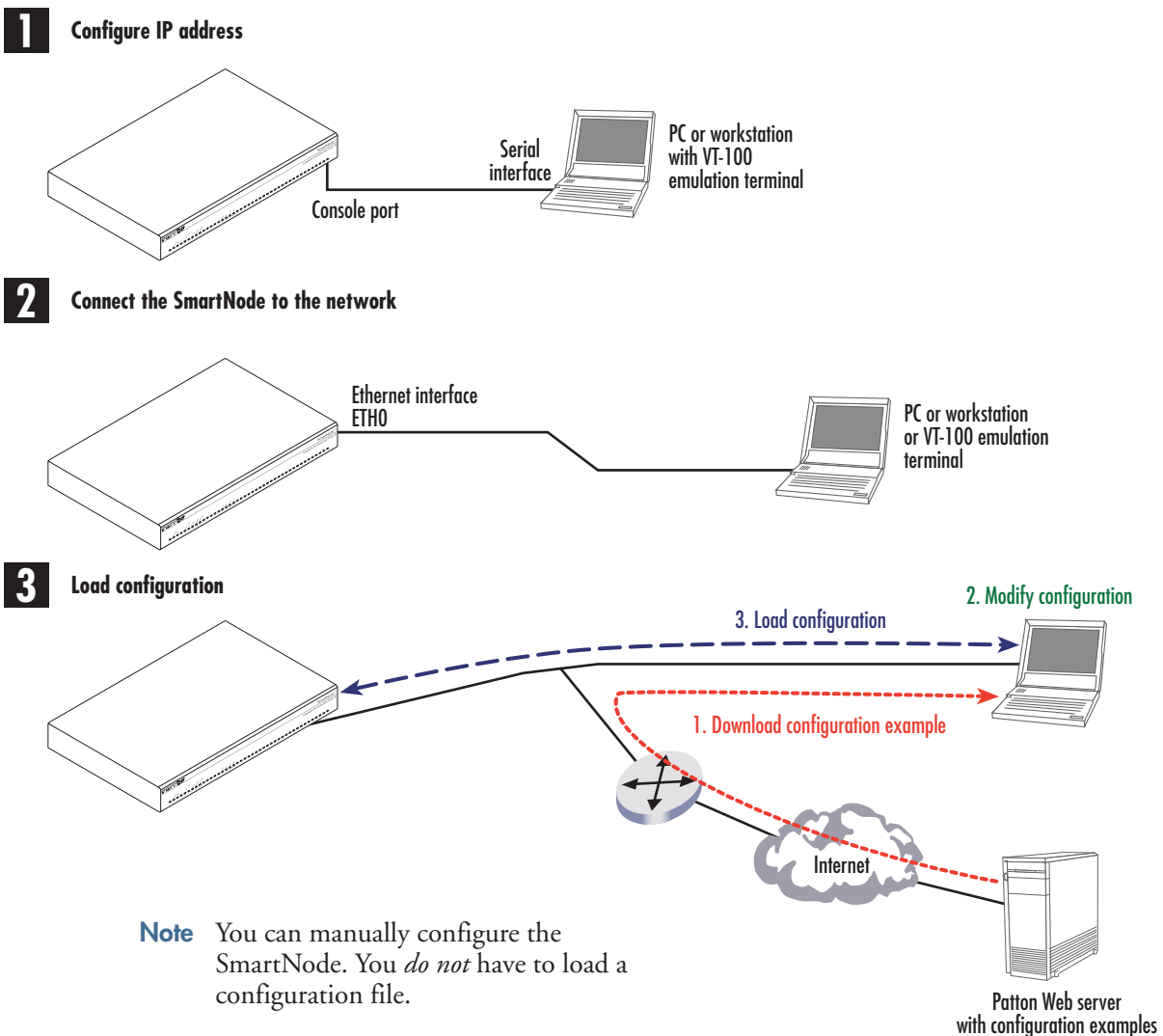


Figure 14. Steps for setting up a new SmartNode

## Configure the IP address

### Power connection and default configuration

First the SmartNode must be connected to the main 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](#).

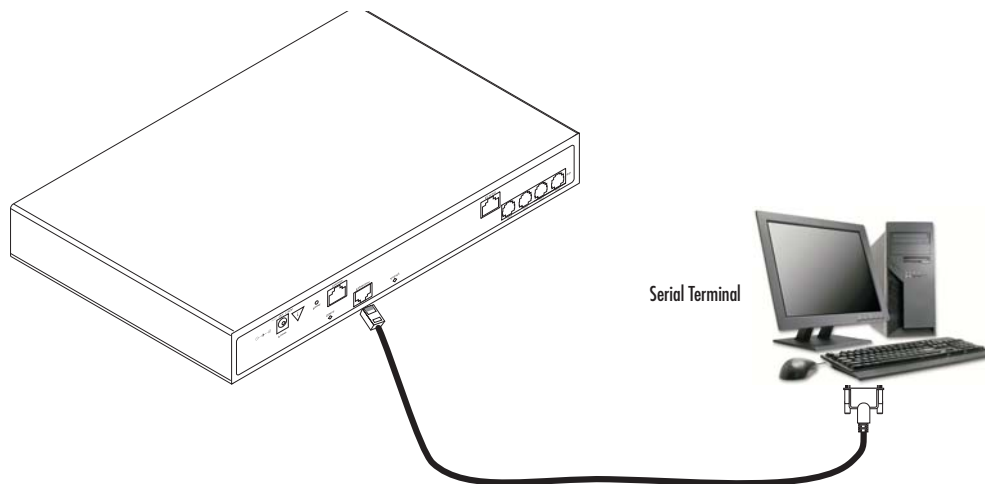
Table 7. Factory default IP address and network mask configuration

	IP Address	Network Mask
<b>Interface Ethernet 0 (ETH0)</b>	DHCP	DHCP

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).



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

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 483x 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 483x 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 guidance, set up procedures, and troubleshooting, refer to the *SmartNode Series SmartWare Software Configuration Guide* available online at [www.patton.com/manuals](http://www.patton.com/manuals).

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.....	37
------------------	----

## Status LEDs

This chapter describes SmartNode VoIP extender front panel LEDs. Figure 16 shows SmartNode 4832 and 4834 Series LEDs. LED definitions are listed in Table 8 on page 37.

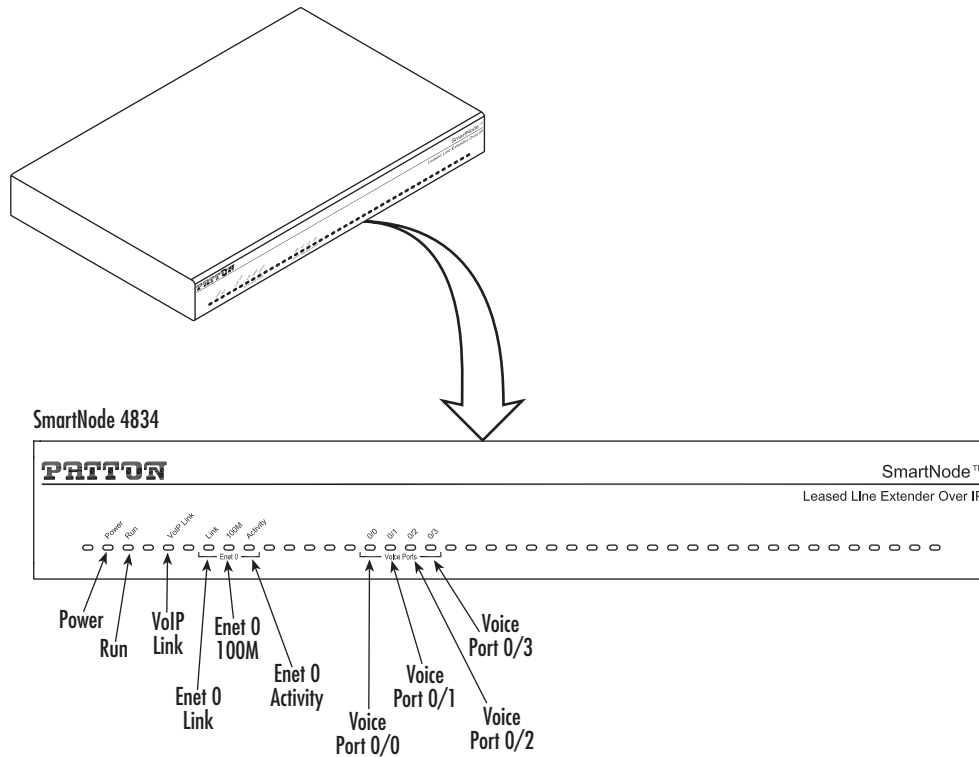


Figure 16. Examples of SmartNode 4832 and 4834 Series front panels

Table 8. SmartNode LED Indications

LED	Description
<b>Note</b> If an error occurs, all LEDs will flash once per second.	
<b>Power</b>	When lit, indicates power is applied. Off indicates no power applied.
<b>Run</b>	When lit, indicates normal operation. Flashes once per second during boot (startup).
<b>VoIP Link</b>	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
<b>Voice port</b>	Solid when leased line channel is operational. Should not be off or blinking.
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>• <b>Link</b>: Lit when Ethernet link is up.</li> <li>• <b>100M</b>: On when 100-Mbps Ethernet is selected.</li> <li>• <b>Activity</b>: Flashes when data is received or transmitted from the unit to the LAN.</li> </ul>

# Chapter 6 **Contacting Patton for assistance**

## **Chapter contents**

- Introduction.....39
- Contact information.....39
- Warranty Service and Returned Merchandise Authorizations (RMAs).....39
  - Warranty coverage .....39
    - Out-of-warranty service .....39
    - Returns for credit .....39
    - Return for credit policy .....40
  - RMA numbers .....40
  - Shipping instructions .....40

## 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](http://www.patton.com)
- E-mail support—e-mail sent to [support@patton.com](mailto: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](http://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](mailto: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 .....	42
EMC .....	42
Safety .....	42
PSTN .....	42
Radio and TV interference .....	42
CE Declaration of Conformity .....	42
Authorized European Representative .....	43

## Compliance

---

### EMC

- FCC Part 15, Class A
- EN55022, Class A
- EN55024

### Safety

- UL60950-1/CSA C22.2 No. 60950-1
- IEC/EN 60950-1, 2nd edition
- AS/NZS 60950-1

### PSTN

- ACA TIA/EIA/IS-968 A5
- Industry Canada CS-03
- This device is not intended nor approved for connection to the PSTN

## Radio and TV interference

---

The SmartNode router generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The SmartNode router has been tested and found to comply with the limits for a Class A computing device in accordance with specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the SmartNode router does cause interference to radio or television reception, which can be determined by disconnecting the unit, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

## CE Declaration of Conformity

---

Patton Electronics, Inc declares that this device is in compliance with the essential requirements and other provisions 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 device shall be obeyed. The conformity to the above directive is indicated by CE mark on the device.

The signed Declaration of Conformity can be downloaded at [www.patton.com/certifications](http://www.patton.com/certifications).

## **Authorized European Representative**

---

D R M Green

European Compliance Services Limited.

Oakdene House, Oak Road,

Watchfield, Swindon, Wilts SN6 8TD, UK

## Appendix B **Specifications**

---

### **Chapter contents**

Capacity .....	45
Audio connectivity .....	45
Data Services .....	45
Quality of Service .....	45
Voice Signaling.....	45
Voice Processing.....	46
Management .....	46
System .....	46
Temperature.....	46
Humidity .....	46

## Capacity

---

2 audio lines (4832)

4 audio lines (4834)

## Audio connectivity

---

2-wire RJ-11

Bandwidth 4kHz, Impedance 600-ohm

Narrow Band FXS style hybrid transmit/receive

## Data Services

---

10/100 Ethernet port

Complete IP access router

DHCP Client & server

Packet fragmentation

Static firewall, NAT, NATP 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.....	48
Serial console.....	48
Ethernet 10Base-T and 100Base-T.....	49
Analog FXS.....	50

## 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](#).

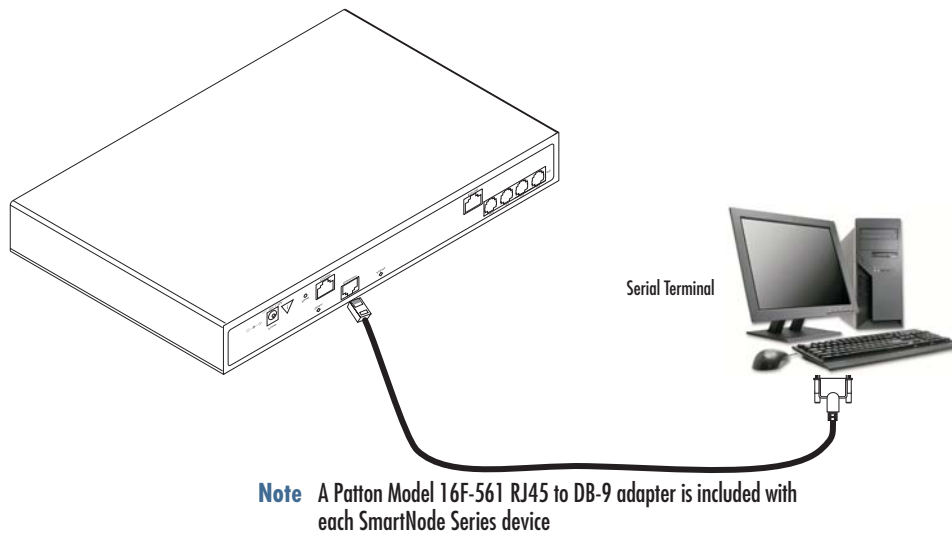


Figure 17. Connecting a serial terminal

**Note** See section “Console port” on page 52 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 50 (hub) for the different connections.

**Note** The SmartNode 4832 Series is equipped with Auto-MDX an Ethernet port. Use straight-through wired cables for host or hub/switch connections

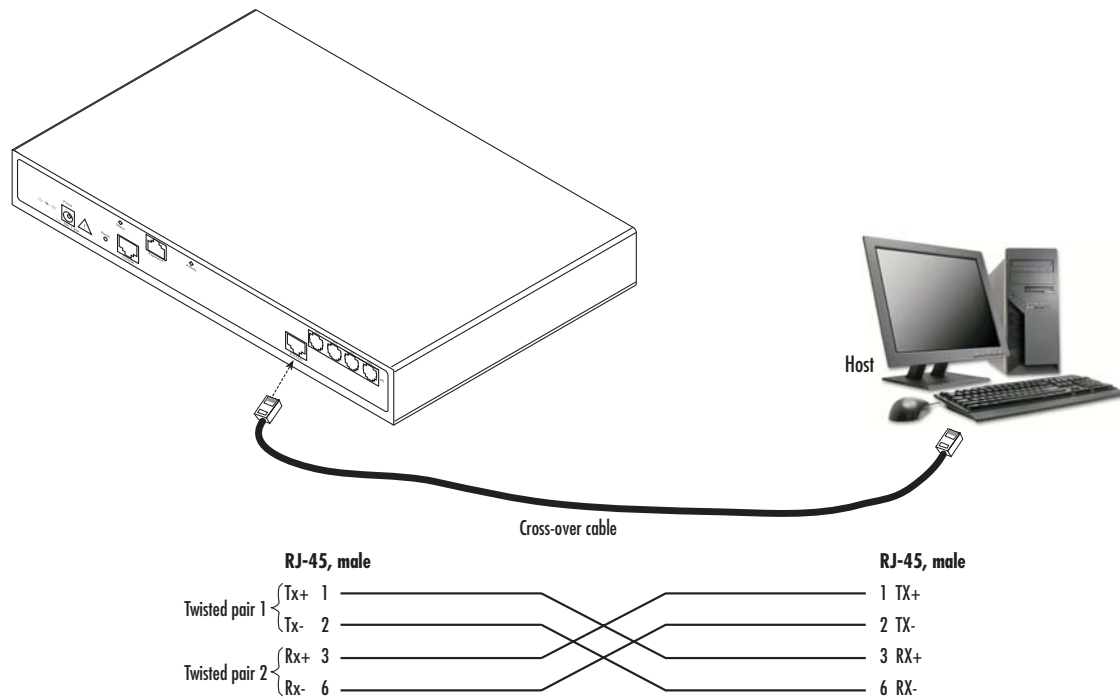


Figure 18. Ethernet cross-over

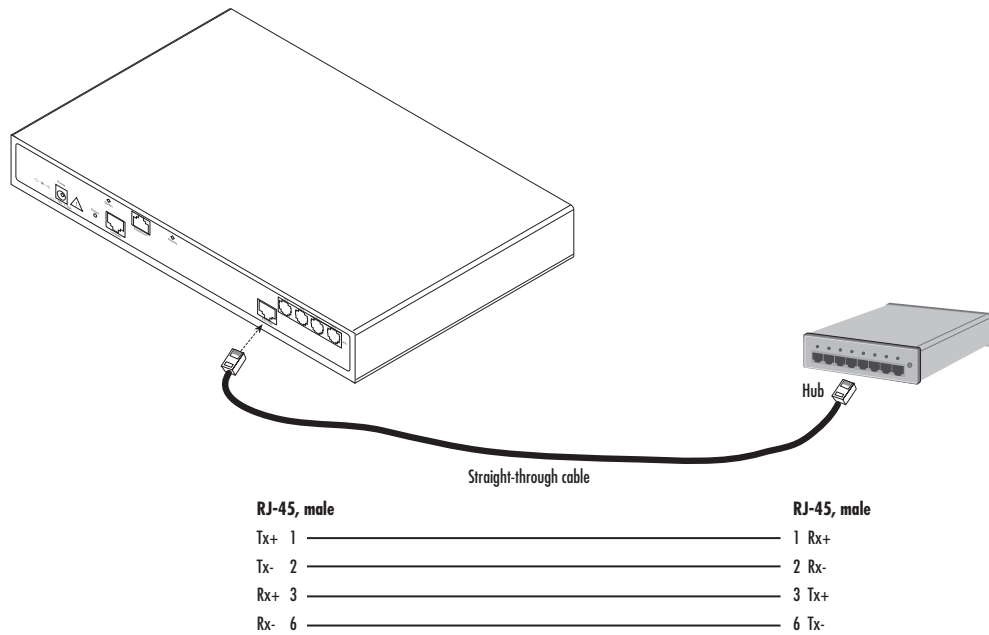


Figure 19. Ethernet straight-through

## 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 52 for details on port pinouts).

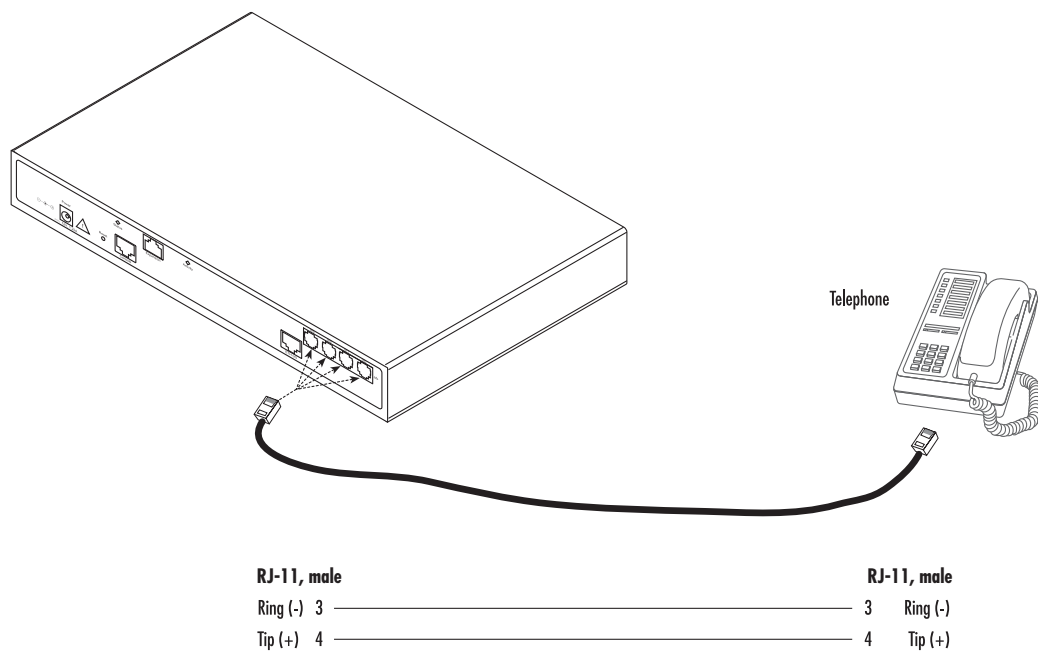


Figure 20. Connecting an FXS device

## Appendix D **Port pin-outs**

---

### **Chapter contents**

Introduction.....	52
Console port.....	52
Ethernet 10Base-T and 100Base-T port .....	52
Voice port .....	52

## Introduction

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

## Console port

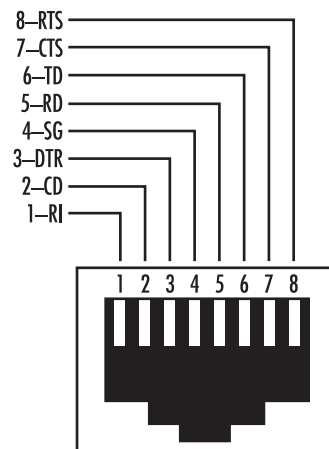


Figure 21. EIA-561 (RJ-45 8-pin) port

**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 middle 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.....	54
-------------------	----

## Introduction

This appendix lists the tasks for installing a SmartNode 4832 or 4834 Series extender (see [Table 11](#)) . Make a copy of this checklist and mark the entries as you complete each task. For each SmartNode 4832 or 4834 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		