

SmartNode™ 4980A & 4990A Series Multi-Port T1/E1/PRI VoIP eSBC and IAD

User Manual



Important

This is a Class A device and is intended for use in a light industrial environment. It is not intended nor approved for use in an industrial or residential environment.

REGULATORY MODEL NUMBER: 13223D4-001

Note for SN4990A/F models: This product is intended for Fiber SFP modules only. If a copper SFP module is used, it may void the CE Certification.

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Important Information

To use virtual private network (VPN) and/or AES/DES/3DES encryption capabilities with the SmartNode 4980A and 4990A Series, you may need to purchase additional licenses, hardware, software, network connection, and/or service. Contact sales@patton.com or +1 (301) 975-1000 for assistance.

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. For information about the license, see [Appendix G, "End User License Agreement"](#) on page 61 or go to www.patton.com.

Patton Electronics warrants all SmartNode 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.

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About This Guide

This guide describes the SmartNode 4980A and 4990A Series hardware, installation and basic configuration. For detailed software configuration information refer to the *Trinity 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 13 provides information about SmartNode features and capabilities
- [Chapter 2](#) on page 20 contains an overview describing SmartNode operation and applications
- [Chapter 3](#) on page 23 provides hardware installation procedures
- [Chapter 4](#) on page 29 provides quick-start procedures for configuring the SmartNode
- [Chapter 5](#) on page 34 contains information on contacting Patton technical support for assistance
- [Appendix A](#) on page 37 contains compliance information for the SmartNode
- [Appendix B](#) on page 40 contains specifications for the SmartNodes
- [Appendix C](#) on page 46 provides cable recommendations
- [Appendix D](#) on page 51 describes the SmartNode's ports and pin-outs
- [Appendix E](#) on page 55 lists the factory configuration settings for the SmartNode
- [Appendix F](#) on page 57 describes the *Reset* button functions
- [Appendix G](#) on page 61 provides license information that describes acceptable usage of the software provided with the SmartNode

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

Precautions

Notes, cautions, and warnings, which have the following meanings, are used throughout this guide to help you become aware of potential problems. **Warnings** are intended to prevent safety hazards that could result in personal injury. **Cautions** are intended to prevent situations that could result in property damage or impaired functioning.

Note A note presents additional information or interesting sidelights.



IMPORTANT

The alert symbol and **IMPORTANT** heading calls attention to important information.



CAUTION

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



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.



WARNING

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



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.

Safety when working with electricity



- 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.
- 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.
- For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.
- 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.
- For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.
- WAN, LAN & PSTN ports (connections) may have hazardous voltages 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 first.
- Do not work on the device or connect or disconnect cables during periods of lightning activity



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



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.



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 corrosive 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 <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 ()
screen	Terminal sessions and information the system displays are in <code>screen</code> 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**

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SmartNode 4980A and 4990A Series Overview

The SmartNode 4980A and 4990A T1/E1 PRI VoIP Router (see Figure 1) combines Universal SIP Trunking, IP routing, VPN/Security, and Quality of Service with high-quality Voice over IP (VoIP) delivered on 1 to 4 Primary Rate Interfaces (PRI T1/E1). This combination paves the way for enterprises' migration to unified communications by integrating legacy telephone systems with PSTN and VoIP networks.



Figure 1. SmartNode 4980A (left) and SmartNode 4990A (right)

The SmartNode 4980A Gateway-Router and SmartNode 4990A IAD perform the following major functions:

- **Up to 120 VoIP Calls**—Up to 120 simultaneous voice or T.38 fax calls with one to four T1/E1/PRI ports and dual Gigabit Ethernet ports. Use any CODEC or fax on any port, any time.
- **Unified Communications Agent™**—Provides any-to-any multi-path switching with VoIP and data survivability, VoIP-over-VPN (software license—additional charge) security with AES/DES strong encryption, Internet Key Exchange (IKE), and SIP Registrar
- **Universal SIP and T.38 Support**—Softswitch-certified signaling support between all T1 RBS CAS, ISDN PRI, Q.SIG, and SIP.
- **Secure Toll-Quality VoIP**—Patton's DownStreamQoS™ and Voice-over-VPN with adaptive traffic management and shaping for maximum voice quality and secure voice communication.
- **IP Routing**—RIP v1/v2, BGP, GRE, VRRP, policy-based routing, and loopback interface.
- **Transparent Telephony Features**—Complex number manipulation and mapping for seamless integration with existing infrastructures, CLIP, CLIR, hold, transfer and much more.
- **Management & Provisioning**—Web-based management, SNMP v1-v3, TR-069, Http, Https, Command Line Interface. Automated provisioning for easy large-scale deployments.
- **Optional High Precision Clock**—Delivers DECT PBX interoperability with reliable fax performance.
- **G.SHDSL, VDSL-ADSL, Fiber Broadband or Ethernet Access**—Complete Access Router with integrated:
 - G.SHDSL.bis WAN interface (EFM&ATM) delivering symmetrical throughput of up to 11.4 Mbps over four wires or up to 5.7 Mbps over two wires
 - VDSL - ADSL WAN interface (Annex A,L,M or B,J)with upstream up to 100 Mbps and downstream up to 150 Mbps all supporting ATM QoS with multiple PVCs and outstanding DSLAM interoperability.

- SFP—Fiber WAN 100 Mbps/1000 Mbps
- 3rd RJ45 Ethernet 10/100 Mbps

SN4980A Series model codes

The SmartNode 4980A-90 series consists of several models. They differ in the number of PRI ports and voice channels supported. All models come equipped with two 10/100/1000Base-T Ethernet ports and high precision Stratum III clock that provides a clock source of < 5 ppm.

For additional specific model information, refer to the product webpage at <https://www.patton.com/voip-router/sn4980A/>

SN4990A Series model codes

The SmartNode 4990A series consists of several models. They differ in the number of PRI ports and voice channels supported. All SN4990A models come equipped with two 10/100/1000Base-T Ethernet ports and a high precision clock.

For additional specific model information, refer to the product webpage at <https://www.patton.com/voip-iaad/sn4990/>

SmartNode 4980A and 4990A Series Rear Panels

The SmartNode 4980A and 4990A rear panel ports are described in [Table 2](#) on page 17.

SN4980A Series rear panel

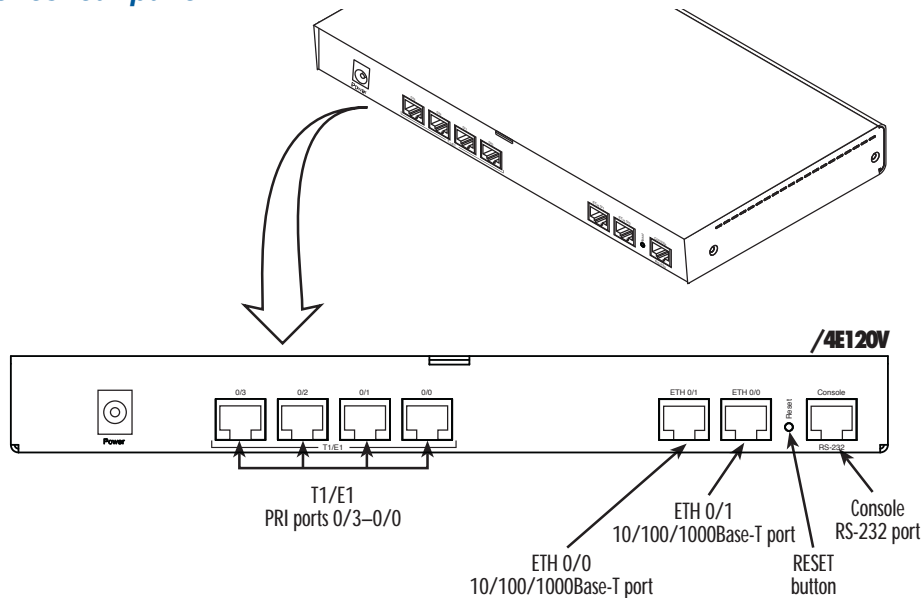


Figure 2. SN4980A/SN4981 Rear Panel

SN4990A Series rear panel

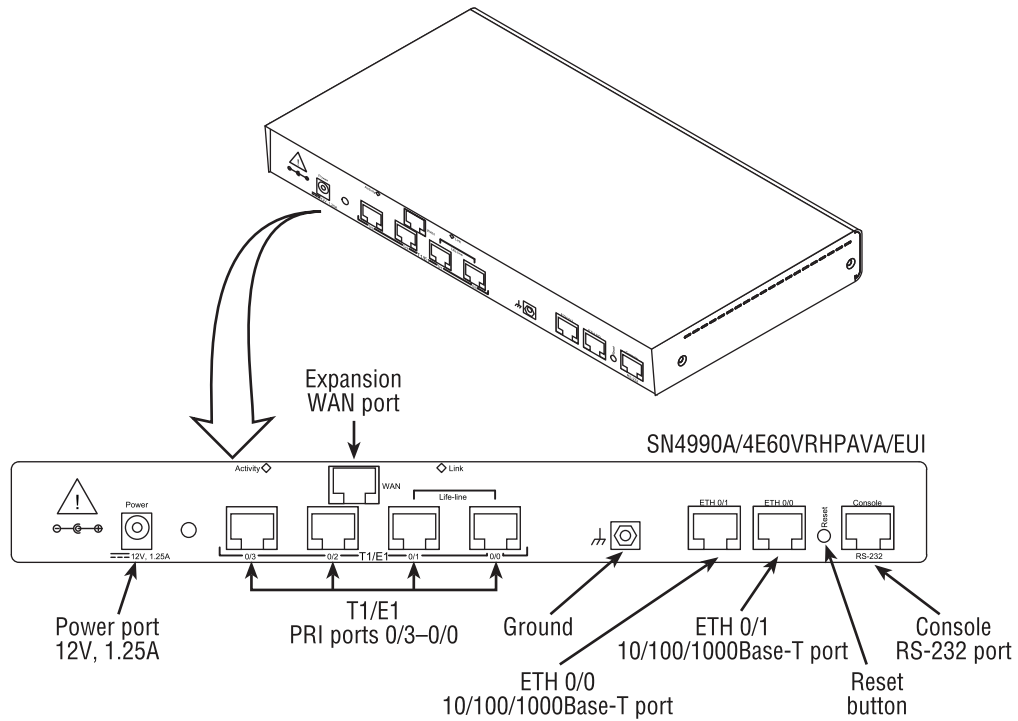


Figure 3. SN4991 Rear Panel

Table 2. Rear panel ports

Port	Description
ETH 0/0-0/1	Auto-MDX Gigabit-Ethernet port, RJ-45 (see Figure 2), connects the unit to an Ethernet Expansion device (for example, a cable modem, DSL modem, or fiber modem) or to (a PC, printer, or wireless bridge). Note: Only full duplex modes are supported.
PRI 0/0-0/3	RJ-45 connector providing E1 (2.048Mbps) or T1(1.533 Mbps) PRI interface, meeting all requirements of ITU-T recommendations for G.703. Use a shielded E1 or T1 interface cable for 120 Ohm balanced connections to connect the SmartNode with an NT or ET, e.g. a PBX or LE.
Expansion Port G.SHDSL, VDSL-ADSL, SFP, RJ45 Ethernet (SN4990A models only)	<p>The G.SHDSL, VDSL-ADSL, SFP or RJ45 Ethernet LEDs are located on either side of the DSL port. ACT (when lit or blinking) shows Activity, and LINK (when lit) shows that the DSL port is connected.</p> <p>Note On VDSL-ADSL models (/AVA and /AVB) <i>only</i>, the Activity LED has no function.</p>
Console	Used for service and maintenance, the Console port (see Figure 2), an RS-232 RJ-45 connector, connects the product to a serial terminal such as a PC or ASCII terminal (also called a dumb terminal).
12V DC, 1.0A	Electricity supply socket. (see Figure 2).
Reset	The reset button has several functions, as described in appendix F, “ Reset Button Functions ” on page 57.

SmartNode 4980A and 4990A Series Front Panel

Figure 4 shows the SmartNode’s front panel LEDs. The LED definitions are listed in Table 3.

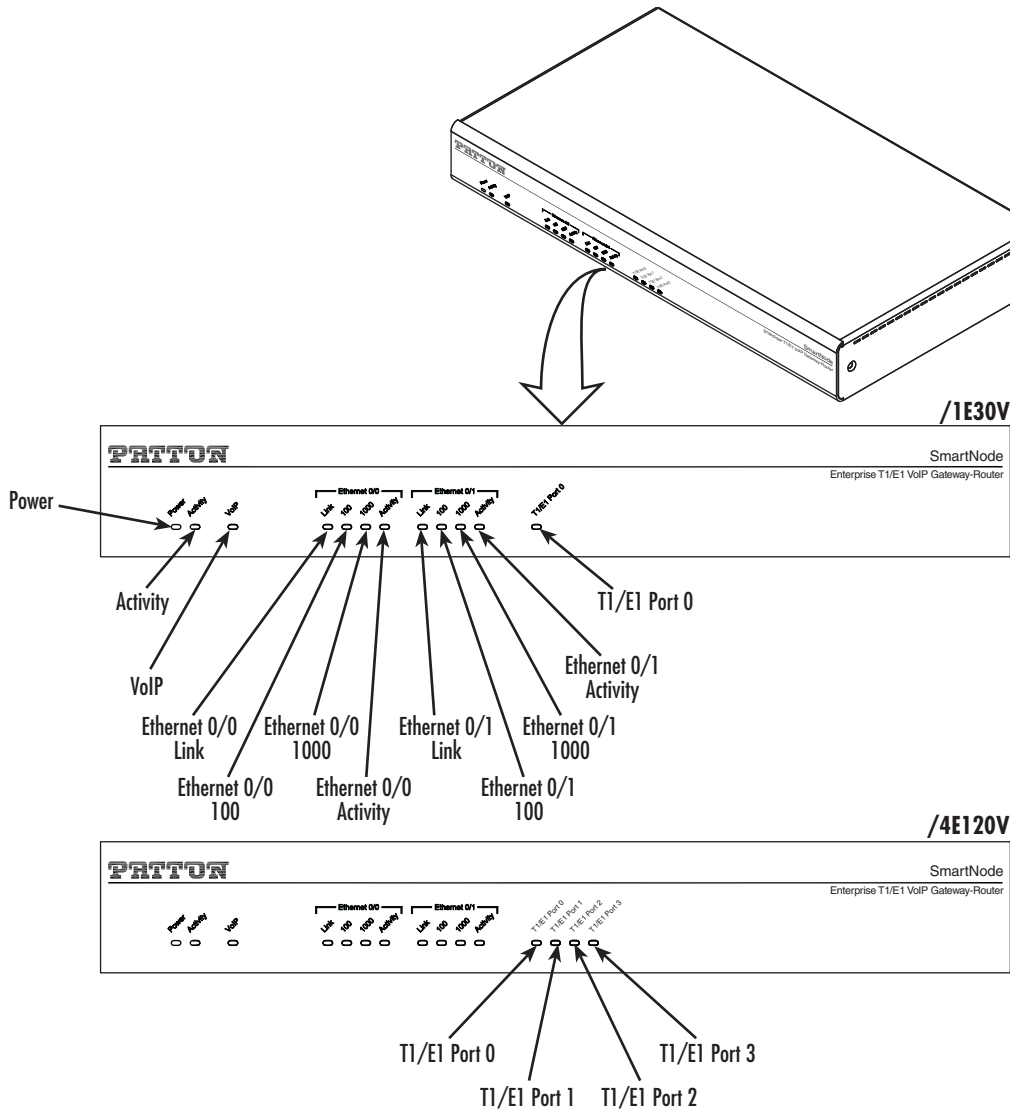


Figure 4. SmartNode 4980A/4990A front panel

Table 3. LED Definitions

LED	Description
Note	If an error occurs, all LEDs will flash once per second.
Power	When lit, indicates power is applied.
Run	When lit, the unit is in normal operation; flashes once per second during boot (startup).

Table 3. LED Definitions (Continued)

LED	Description
VoIP Link	<ul style="list-style-type: none"> • On indicates the gateway is registered to a SIP server, or, in the case of direct routing, has at least one active VoIP connection. • Off indicates the unit is not configured or registered, or has no active direct-routed VoIP connection. • Flashing green indicates that the unit is attempting to register or has failed to register.
Ethernet Link	<ul style="list-style-type: none"> • On when the Ethernet connection on the corresponding port has a link indication.
Ethernet Speed 10/100	<p>When the Ethernet Link LED is on, then:</p> <ul style="list-style-type: none"> • On when the Ethernet is connected to a 100Mb network. • Off when the Ethernet is connected to a 10Mb network.
Ethernet Speed 1000	<ul style="list-style-type: none"> • On when the Ethernet is connected to a 1000Mb network.
Ethernet Activity	<ul style="list-style-type: none"> • Flashes when data is received or transmitted at the corresponding Ethernet port.
PRI Link/Status	<ul style="list-style-type: none"> • On = in frame, no errors • Flash = Error • Fast Flash = Signal detected but no frame synchronization or acquisition is in process • Slow Flash = Framing synchronized, Signaling not established
WAN ACT/Link LEDs (SN4990A models only)	
WAN ACT (Rear panel)	<ul style="list-style-type: none"> • Flashes when data is received or transmitted • Off = No activity <p>Note On VDSL-ADSL models (/AVA and /AVB) <i>only</i>, the Activity LED has no function.</p>
WAN Link (Rear panel)	<ul style="list-style-type: none"> • On when the WAN connection on the corresponding port has a link indication. • Off when there is no WAN connection

Chapter 2 **Applications Overview**

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Typical Application

IP-enable legacy PBX systems with an Enterprise-class SmartNode 4980A VoIP Gateway-Router or SmartNode 4990A Integrated Access Device. The SN4980A and SN4990A support up to 120 concurrent VoIP calls.

The SN4980A with built-in IP Router enables Enterprises to connect existing PBX systems with advanced IP telephony services and the PSTN. With built-in G.SHDSL(ATM&EFM), ADSL, VDSL or Fiber the SN4990 enables Broadband Providers to connect existing PBX systems with advanced IP telephony services and the PSTN.

Combining a VoIP gateway with an IP router, the SmartNode 4980A and 4990A Series adds QoS and VPN security, making it the ideal solution for secure prioritized communications.

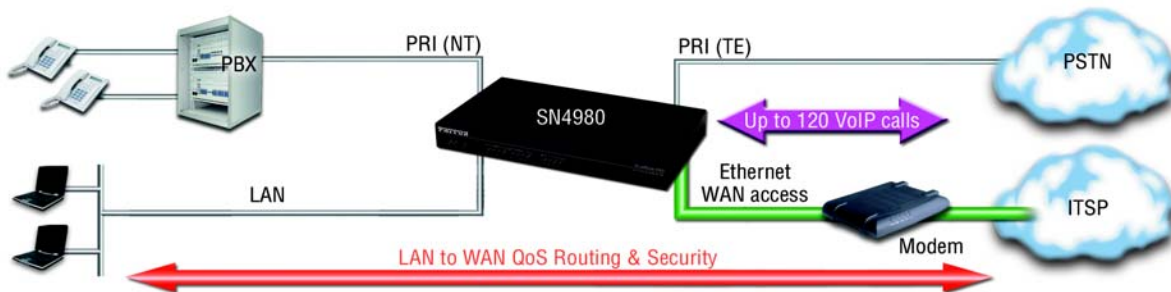


Figure 5. SN4980A application

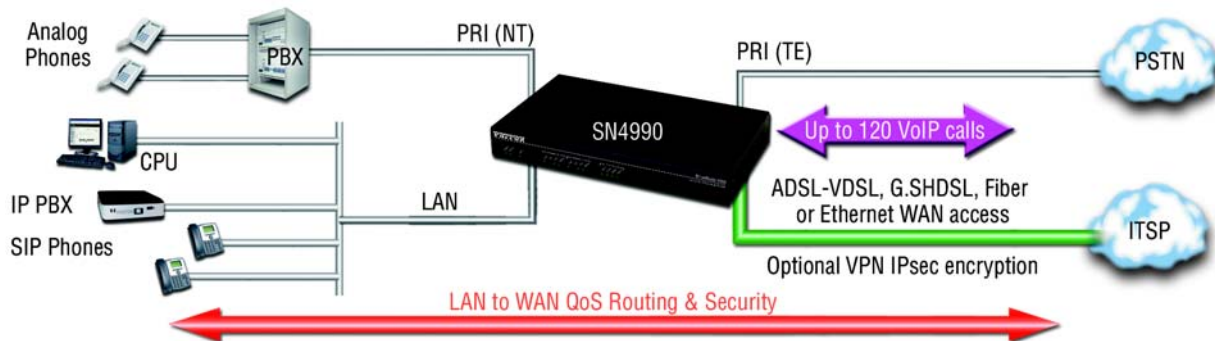


Figure 6. SN4990A application



Figure 7. WAN uplink redundancy

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Planning the Installation

Before installing the SmartNode, 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 25)
- **Verify power source reliability** (see section “[AC Power Mains](#)” on page 25).

After you have finished preparing for installation, go to the section “[Installing the SmartNode](#)” on page 25 to install the device.

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 Trinity 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, 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 and/or URL of SIP servers or Internet telephony services (if used)
- Login and password for PPPoE Access
- Login and password for SIP-based telephony services
- IP addresses of central TFTP server used for configuration upload and download (optional)

Software tools

You will need a PC (or equivalent) with Windows Telnet or a program such as *Tera Term Pro Web* to configure the software on your SmartNode.

AC Power Mains

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. Patton recommends that you include an uninterruptible power supply (UPS) in the installation to ensure that VoIP service is not impaired if the power fails. Refer to “Connecting the SmartNode to the power supply” on page 28.

Location and mounting requirements

The SmartNode 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.

Note Under the rack mount option, the chassis can be equipped with rack mount ears that allow for use in a 19” rack.

Installing the SmartNode

SmartNode hardware installation consists of the following:

- Placing the device at the desired installation location (see section “Placing the SmartNode” on page 25)
- Connecting the interface and power cables (see section “Installing cables”)

When you finish installing the SmartNode, go to chapter 4, “Initial Configuration” on page 29.

Placing the SmartNode

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

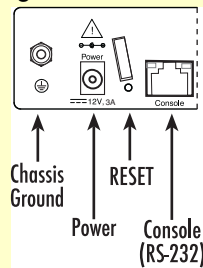
Note For proper ventilation, leave at least 2 inches (5 cm) to the left, right, front, and rear of the unit.

Ground Connection



IMPORTANT

To be compliant with safety regulations (EN60950-1, UL60950-1 and CAN/CSA-C22.2 No 60950), the ground terminal must be connected to a reliable ground.



Installing cables



WARNING

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

Connect the cables in the following order:



CAUTION

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.

1. Connect the T1/E1 cables to the PRI T1/E1 ports (see [Appendix C on page 46](#) and [Appendix D on page 51](#)).
2. Connect the 10/100/1000Base-T Ethernet LAN and WAN (see section “[Connecting the 10/100/1000Base-T Ethernet LAN and WAN cables](#)” on page 27)
3. Connect the power mains cable (see section “[Connecting the SmartNode to the power supply](#)” on page 28)

Connecting the PRI

The SmartNode comes with one or four PRI ports. These ports are usually connected to a PBX or switch (local exchange (LE)). Each PRI T1/E1 port is a RJ-48C receptacle. In most cases, a straight-through RJ-45 can be used to connect the PRI. Each port can be configured as NT (clock master) or TE (clock slave).

For details on the PRI port pin-out and ISDN cables, refer to Appendix C, “Cabling” on page 43 and Appendix D, “port pin-outs” on page 47.



CAUTION

For the ISDN connection to a carrier Network, it shall be connected to a Network Termination Device and not connected directly to an outside POTS line.

Connecting the 10/100/1000Base-T Ethernet LAN and WAN cables

The SmartNode has automatic MDX (auto-crossover) detection and configuration on all Ethernet ports. Any of the ports can be connected to a host or switch with a straight-through or cross-over wired cable.

1. Connect to the subscriber port of the broadband access modem (DSL, cable, WLL) to *ETH 0/0*.

Note The SmartNode Ethernet ports operate in Full Duplex mode only. Do not connect to Half Duplex ports. For best results, use auto-negotiation. Auto negotiation is mandatory when using 1000BaseT (Gigabit) Ethernet.

2. Connect port ETH 0/1 to your LAN.

For details on the Ethernet port pinout and cables, refer to [Appendix C, “Cabling”](#) on page 46 and [Appendix D, “Port Pin-outs”](#) on page 51.

Installation cable requirements for the DSL WAN cable (SN4990A /2G /4G /A /AVA /AVB Models)

The SmartNode Model 4991 comes with an option for a G.SHDSL, VDSL-ADSL or ADSL WAN interface. Use a straight-through RJ-45 cable to connect the DSL port.

For details on the G.SHDSL port pinout, refer to section “[G.SHDSL EFM & ATM port \(/2G and /4G models\)](#)” on page 53.

For details on the VDSL and ADSL port pinout, refer to section “[ADSL & VDSL-ADSL Port \(/A and /AVA & /AVB models only\)](#)” on page 53.

Installation cable requirements for the SFP for Fiber WAN module (SN4991)

The SmartNode Model 4991 comes with an option for an SFP for Fiber WAN module. For details about the tested and compatible SFP modules see <http://www.patton.com/products/sfpmodules.asp>.

Installation cable requirements for the Ethernet 10/100 WAN interface (SN4991 /I Models)

The SmartNode Model 4991 comes with an option for a 3rd Ethernet 10/100 port to be used as a WAN interface for instance. Use a straight through RJ-45 cable to connect the Ethernet WAN port.

For details on the Ethernet port pinout, refer to [Appendix D on page 51](#).

Connecting the SmartNode to the IP network

The SmartNode comes with two 10/100/100 Base-Tx Ethernet ports (Gigabit) for connection to an IP network. (Some models come with 3 Ethernet ports, see /I Models). The Ethernet WAN interface is factory-configured as a DHCP client, so you must connect the SmartNode to an IP network that provides a DHCP server.

The Ethernet port (ETH) includes an automatic MDX (auto-crossover) feature that automatically detects the cable configuration and adjusts accordingly. The feature allow you to use a straight-through Ethernet cable to connect to an Ethernet switch. Typically the switch will connect to a router that provides the the local-residential IP network with broadband Internet access.

Using the included black Ethernet cable, connect the RJ-45 Ethernet WAN port on your SmartNode (labeled ETH), to an Ethernet switch on the same network as your PC.

For details on the Ethernet port pinout and cables, refer to [Appendix C on page 46](#) and [Appendix D on page 51](#).

Connecting the SmartNode to the power supply



- Do not connect power to the AC Mains at this time.
- The external power adapter shall be a listed Limited Power Source.
- The 4980A external 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.



- The external 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.

1. Insert the barrel type connector end of the AC power cord into the *12V DC, 1.0A* port (see [Figure 8](#)).
2. Insert the female end of the power cord into the internal power supply connector.

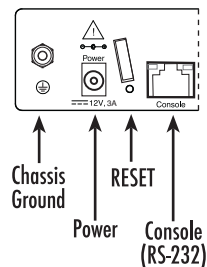


Figure 8. Power connector location on rear panel

3. Verify that the AC power cord included with your SmartNode is compatible with local standards. If it is not, refer to chapter 5, “[Contacting Patton for Assistance](#)” on page 34 to find out how to replace it with a compatible power cord.
4. Connect the male end of the power cord to an appropriate power outlet.
5. Verify that the green *Power* LED is lit (see [Figure 8](#)).

Chapter 4 Initial Configuration

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- 2. Configuring the Desired IP Address 31
 - Factory-default IP settings 31
 - Login 31
 - Changing the WAN IP address 31
- 3. Connecting the SmartNode to the Network 32
- Loading the Configuration (optional) 33
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Introduction

This chapter leads you through the basic steps to set up a new SmartNode and to download a configuration. Setting up a new SmartNode consists of the following main steps:

Note If you haven't already installed the SmartNode, refer to chapter 3, "SmartNode Installation" on page 23.

- Connecting the SmartNode to your laptop PC
- Configuring the desired IP address
- Connecting the SmartNode to the network
- Loading the configuration (optional)

1. Connecting the SmartNode to your Laptop PC

First the SmartNode must be connected to the mains power supply with the power cable. Wait until the *Power* LED stops blinking and stays lit constantly. Now the SmartNode is ready.



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.

The SmartNode 4980A and 4990A Series is equipped with Auto-MDX Ethernet ports, so you can use straight-through cables for host or switch connections (see [Figure 9](#)).

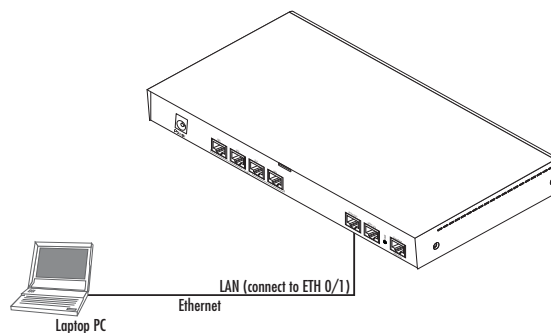


Figure 9. Connecting the SmartNode to your laptop PC

The SmartNode comes with a built-in DHCP server to simplify configuration. Therefore, to automatically configure the PC for IP connectivity to the SmartNode, the laptop PC must be configured for DHCP. The SmartNode will provide the PC with an IP address. You can check the connection to the SmartNode by executing the ping command from the PC command window as follows:

```
ping 192.168.1.1
```

2. Configuring the Desired IP Address

Factory-default IP settings

The factory default configuration for the Ethernet interface IP addresses and network masks are listed in Table 5. Both Ethernet interfaces are activated upon power-up. LAN interface *ETH 0/1 (LAN)* provides a default DHCP server, the WAN interface uses DHCP client to automatically assign the IP address and network mask.

Table 5. Factory default IP address and network mask configuration

	IP Address	Network Mask
WAN interface Ethernet 0 (ETH 0/0)	DHCP	DHCP
LAN interface Ethernet 1 (ETH 0/1)	192.168.1.1	255.255.255.0
WAN interface Ethernet 2 (ETH 0/2)	DHCP	DHCP
DHCP address range	192.168.1.10–192.168.1.99	255.255.255.0

If these addresses match with those of your network, go to section “3. Connecting the SmartNode to the Network” on page 32. Otherwise, refer to the following sections to change the addresses and network masks.

Note For configuring the IP address of the integrated WAN interface (G.SHDSL), please refer to Chapter 5, “G.SHDSL Basic Configuration” on page 36.

Login

To access the SmartNode, start the Telnet application. Type the default IP address for the SmartNode into the address field: **192.168.1.1**. Accessing your SmartNode via a Telnet session displays the login screen. Type the factory default login: *administrator* and leave the password empty. Press the *Enter* key after the password prompt.

```
login:administrator
password: <Enter>
192.168.1.1>
```

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.

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

Changing the WAN IP address

Select the context IP mode to configure an IP interface.

```
192.168.1.1(cfg)#context ip router
192.168.1.1(ctx-ip)[router]#
```

Now you can set your IP address and network mask for the interface *ETH 0/0 (WAN)*. Within this example a network 172.16.1.0/24 address is assumed. The IP address in this example is set to 172.16.1.99 (you should set this the IP address given to you by your network provider).

```
192.168.1.1(ctx-ip)[router]#interface WAN
192.168.1.1(if-ip)[WAN]#ipaddress 172.16.1.99 255.255.255.0
2002-10-29T00:09:40 : LOGINFO      : Link down on interface WAN.
2002-10-29T00:09:40 : LOGINFO      : Link up on interface WAN.
172.16.1.99(if-ip)[WAN]#
```

Copy this modified configuration to your new start-up configuration. This will store your changes in non-volatile memory. Upon the next start-up the system will initialize itself using the modified configuration.

```
172.16.1.99(if-ip)[WAN]#copy running-config startup-config
172.16.1.99(if-ip)[WAN]#
```

The SmartNode can now be connected to your network.

3. Connecting the SmartNode to the Network

In general, the SmartNode will connect to the network via the *WAN (ETH 0/0)* port. This enables the SmartNode to offer routing services to the PC hosts on *LAN (ETH 0/1)* port. The SmartNode 4980A and 4990A Series is equipped with Auto-MDX Ethernet ports, so you can use straight-through or crossover cables for host or switch connections (see [Figure 10](#)).



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.

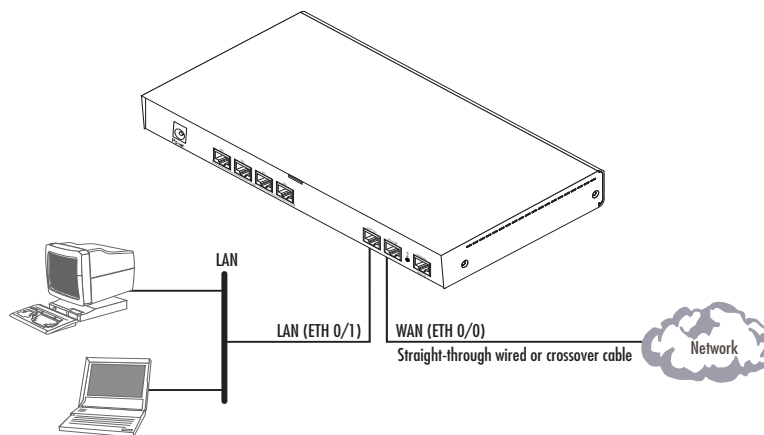


Figure 10. Connecting the SmartNode to the network

You can check the connection with the ping command from the SmartNode to another host on the network.

```
172.16.1.99(if-ip)[WAN]#ping <IP Address of the host>
```

Note If the WAN address is **not** set to DHCP, to ping a device outside your local LAN you must first configure the default gateway. (For information on configuring the default gateway, refer to section “Set IP addresses” in Appendix C, “Command Summary” of the *Trinity Software Configuration Guide*.)

Loading the Configuration (optional)

The [WebWizard Community](#) provides a collection of Wizards that help to reduce the setup time of a Patton device.

Simply download the appropriate Wizard to your device, execute it locally, and you are ready to do phone calls after the SmartNode has rebooted.

Optionally, you may execute the Wizard that matches your application online, and import the generated .cfg config into the SmartNode device.

In addition to that the [Knowledgebase](#) provides configuration file templates that may fit your application.

Note If your application is unique and not covered by any of Patton’s configuration templates, you can manually configure the SmartNode instead of loading a configuration file template. In that case, refer to the *Trinity Command Line Reference Guide* for information on configuring the Trinity device.

In this example we assume the TFTP server on the host with the IP address 172.16.1.11 and the configuration named *SN.cfg* in the root directory of the TFTP server.

```
172.16.1.99(if-ip)[WAN]#copy tftp://172.16.1.11/sn.cfg startup-config
172.16.1.99(if-ip)[WAN]#
```

After the SmartNode device has been rebooted the new startup configuration will be activated.

```
172.16.1.99(if-ip)[WAN]#reload
Press 'yes' to restart, 'no' to cancel :yes
The system is going down NOW
```

Additional Information

For detailed information about configuring and operating guidance, set-up procedures, and troubleshooting, refer to the *Trinity Command Line Reference Guide* available online at www.patton.com/manuals.

Chapter 5 **Contacting Patton for Assistance**

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 - Out-of-warranty service36
 - Returns for credit36
 - Return for credit policy36
 - RMA numbers36
 - Shipping instructions36

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 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.

REGION	North America	Western Europe	Central & Eastern Europe	Middle East North Africa
Location	Maryland, USA	Bern, Switzerland	Budapest, Hungary	Beirut, Lebanon
Time Zone	EST/EDT UTC/GMT - 4/5 hours	CET/CEDT UTC/GMT + 1/2 hours	CET/CEDT UTC/GMT + 1/2 hours	EET/EEDT UTC/GMT + 2/3 hours
Business Hours	Monday-Friday 8:00am to 5:00pm	Monday-Friday 09:00 to 12:00 13:30 to 17:30	Monday-Friday 8:30 to 17:00	Monday-Friday 8:00am to 5pm
Email	support@patton.com	support@patton.com	support@patton.com	support@patton.com
Phone	+ 1 301 975 1007	+41 31 985 25 55	+36 439 3835	+96 1 359 1277
Fax	+1 301 869 9293	+41 31 985 2526		

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**

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Compliance

EMC

- FCC Part 15, Class A
- EN55032, Class A
- EN55024

Safety

- UL 62368-1/CSA C22.2 N0. 62368-1
- IEC/62368-1
- AS/NZS 62368-1

PSTN Regulatory

- FCC Part 68
- CS-03
- TBR 4
- TBR 12 & 13
- AS/ACIF S016
- AS/ACIF S038
- AS/ACIF S043 (G.SHDSL card)
- NZ ISDN Layer 3 Supplement



For the ISDN connection to a carrier network, it shall be connected to a network termination device and not connected directly to an outside POTS line.

Radio and TV Interference (FCC Part 15)

This equipment 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. This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the 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 equipment causes interference to radio or television reception, which can be determined by disconnecting the cables, 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

We certify that the apparatus identified above conforms to the requirements of Council Directive 2014/30/EU on the approximation of the laws of the member states relating to electromagnetic compatibility; Council Directive 2014/35/EU on the approximation of the laws of the member states relating to electrical equipment designed for use within certain voltage limits; Council Directive 2011/65/EU as modified by Council Directive 2015/863/EU on the approximation of the laws of the member states relating to RoHS and REACH compliance; and Council Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products.

Authorized European Representative

Martin Green
European Compliance Services Limited
Milestone house
Longcot Road
Shrivenham
SN6 8AL, UK

Appendix B **Specifications**

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Note Refer to the [software feature matrix](#) for the most up-to-date specifications.

Voice Connectivity

1 or 4 PRI T1/E1 ports on RJ48C connectors

Net/User configurable per port

Each port can be slave or master clock

Each port can be used to synchronize to an external clock master

Failover relay between ports 0/0 - 0/1 and 0/2 - 0/3 for specific models (/R in SKU code)

Data Connectivity

Two 10/100/1000Base-Tx Gigabit Ethernet ports

All ports full duplex, autosensing, auto-MDX

Voice Processing (signaling dependent)

Up to 120 full-duplex channels with Voice CODECS:

- G.711 A-Law/ μ -Law (64 kbps)
- G.726 (ADPCM 16, 24, 32, 40 kbps)
- G.723.1 (5.3 or 6.3 kbps)
- G.729ab (8 kbps)
- Transparent ISDN data

G.168 echo cancellation (128 ms)

Up to 120 simultaneous voice or T.38 fax calls

DTMF detection and generation

Carrier tone detection and generation

Silence suppression and comfort noise

Adaptive and configurable dejitter buffer

Configurable tones (dial, ringing, busy)

Configurable transmit packet length

RTP/RTCP (RFC 1889)

Fax and Modem Support

Automatic fax and modem detection

Codec fallback for modem-bypass

T.38 Fax-Relay (Gr. 3 Fax, 9.6 k, 14.4 k)

G.711 Fax-Bypass

Voice Signalling

SIPv2

SIP call transfer, redirect

SIPv2, SIPv2 over IPv6, SIPv2 over TLS

Overlap or en-bloc dialing

DTMF in-band, out-of-band

Configurable progress tones

Voice Routing—session router

Local switching (hairpinning)

Least cost routing

Interface huntgroups

Call-Distribution groups

Number blocking

Call Routing Criteria:

- Interface
- Calling/called party number
- Time of day, day of week, date
- ISDN bearer capability
- Various other information elements (IEs) of the ISDN setup
- Wildcard and regular expression matching

Regular expression number manipulation functions:

- Replace numbers
- Add/remove digits
- Pattern matching and replacement

IP Services

IPv4 & IPv6 router (Dual Stack)

Routing functionalities:

- Programmable static routes and policy-routing
- BGP
- GRE

- RIP
 - VRRP
- OpenVPN, L2TP, IPSec (License at additional charge)
- ICMP redirect (RFC 792); Packet fragmentation
- DiffServe/ToS set or queue per header bits
- Packet Policing discards excess traffic
- DHCP client and server (IPv4 and IPv6—Dual Stack)
- DNS client and relay-server, DynDNS

Management

Patton Cloud Management

Web-based GUI; Trinity WEB Wizard

Industry standard CLI with remote Telnet and SSH access, fully documented

HTTP web management and firmware loading

TFTP configuration & firmware loading

HTTPS configuration & firmware provisioning

SNMP v1, v2, v3 agent (MIB II and private MIB)

Built-in diagnostic tools (trace, debug)

Secure Auto-provisioning

TR-069 config file and software image provisioning

System

CPU Motorola MPC8360 series operating at 400 MHz

Memory:

- 256 Mbytes RAM (DDR,400MHz)
- 64 Mbytes Flash

Physical

Dimensions: 11.9W x 1.71H x 7.16D inch (302W x 44H x 182mm)

Weight: <21 oz. (<600g)

Power Consumption: < 16W

Operating temperature: 32–104°F (0–40°C)

Operating humidity: up to 90%, non condensing

WAN Interface (if applicable)

Note For information on configuring the WAN interface, see Chapter 4, “Initial Configuration” on page 29.

Table 6. WAN Interface Specifications

Factor	Specs
VDSL-ADSL (/AVA and /AVB models)	<ul style="list-style-type: none"> • ANSI T1.413 Issue 2 • G.992.1 (G.dmt) • G.992.2 (G.lite) • G.992.3 (ADSL2, G.dmt.bit) • G.992.4 (ADSL2, G.lite.bis) • G.992.5 (ADSL2+) • G.993.1 (VDSL) • G.993.2 (VDSL2) • G.994.1 (G.hs) • G.Vectoring • Annex A, M and L • Annex B and J • VDSL Profile up to 30a supported
G.SHDSL-EFM (/2G and /4G models)	<ul style="list-style-type: none"> • Support ITU-T G991.2/G.994.1 standards • Support ITU-T G.998.1 (G.bond) • TC-PAM line modulation 16,32,64 & 128 • CO or CPE Mode • IEEE 802.3 2Base-TL (aka 802.3ah) compliant • Rate negotiating/manually rate adaptation configuration • 2–8 wire mode auto detect • Data rate selections: Up to Nx239 (5.7 Mbps) per pair • Support bonding based on EFM • Line interface: up to 4 pairs on a single RJ45 connector
G.SHDSL-ATM (/2G and /4G models)	<ul style="list-style-type: none"> • Classical IPoA (RFC 1577/2225) • PPPoE Client (over ATM) (RFC 2516) • IPoA (RFC 2684/1483) • ATM AAL5 encapsulation • Max. 8 PVCs • User selectable VC MUX and LLC MUX (default) • Configurable auto-connection • ATM QoS: UBR (default), CBR, and VBR-rt, VBR-nrt, UBR: per VC queuing • Auto-configuration: TR-037 & ILMI 4.0

Table 6. WAN Interface Specifications

Factor	Specs
Interworking/Interoperability	<ul style="list-style-type: none"> • G.SHDSL Interoperability: <ul style="list-style-type: none"> - Alcatel - NEC - Lucent Anymedia - Lucent Stinger • BRAS Interoperability: <ul style="list-style-type: none"> - Cisco - Redback - Alcatel-Lucent EVLT-K - Calix E5-120 - Ericsson Telecom AB EDN612nm - Adtran, Inc. IU VDSL48J3:ME - Adtran, Inc. Adtran TA1248V - Alcatel-Lucent ABLT-D
Fiber (/F models)	<ul style="list-style-type: none"> • 100Mbps and 1000Mbps Fiber SFP. (For a list of tested SFP modules, please refer to http://www.patton.com/products/sfpmodules.asp)
Ethernet (ETH 0/2) (/I models)	<ul style="list-style-type: none"> • 10/100Mbps Fast Ethernet R45

Appendix C **Cabling**

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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.

Console

The SmartNode can be connected to a serial terminal over its serial console port, as depicted in [Figure 11](#).

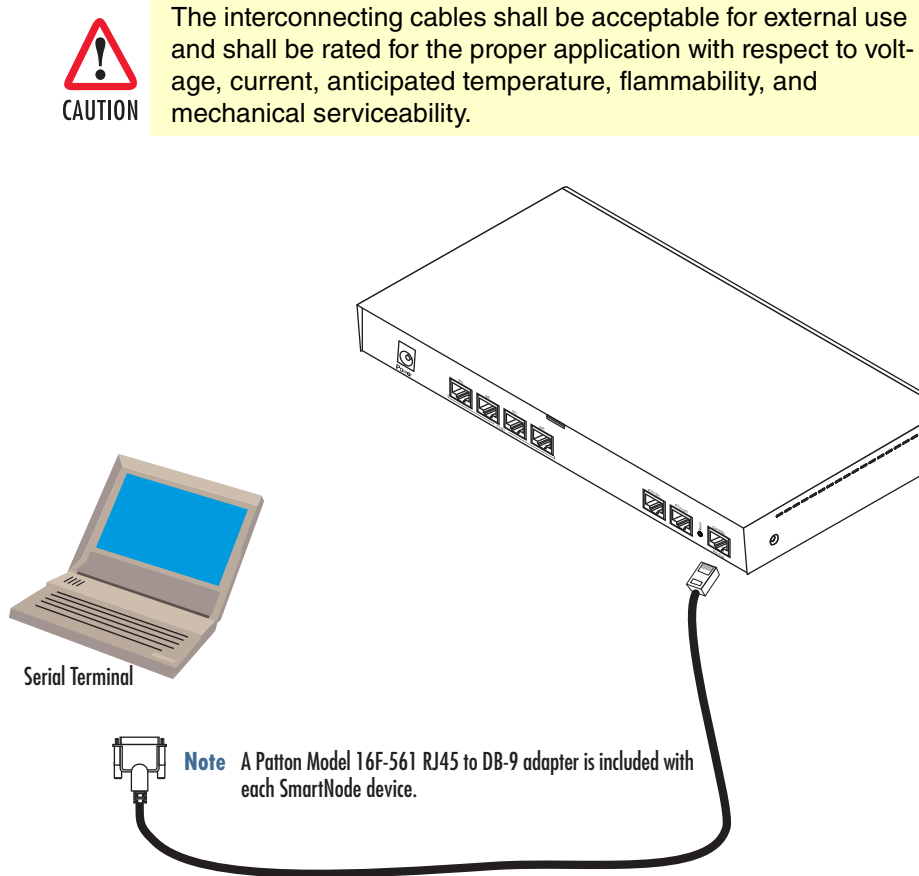


Figure 11. Connecting a serial terminal

Note See section “[Console Port](#)” on page 52 for console port pin-outs.

Ethernet

Ethernet devices (10Base-T/100Base-T/1000Base-T) are connected to the SmartNode over a cable with RJ-45 plugs. All Ethernet ports on the SmartNode are Auto-MDX use any straight or crossover cable to connect to switches, PCs or other devices

Note For SN4990A /I Model: The 3rd Ethernet port (ETH0/2), only figure 12 below applies. There is no 1000Base-T (Gigabit) Ethernet support on (ETH0/2).



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.

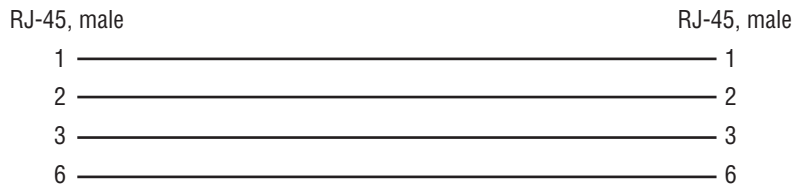
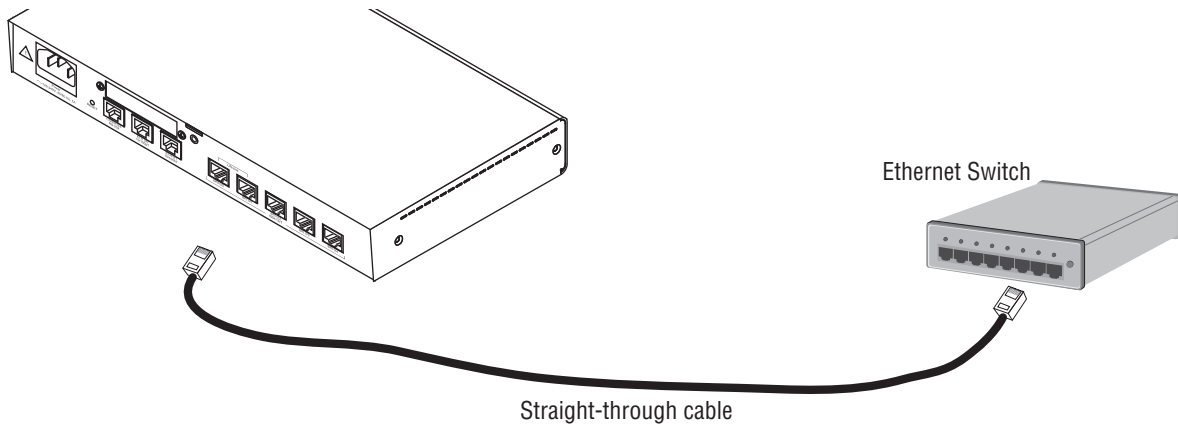


Figure 12. Typical Ethernet straight-through cable diagram for 10/100Base-T

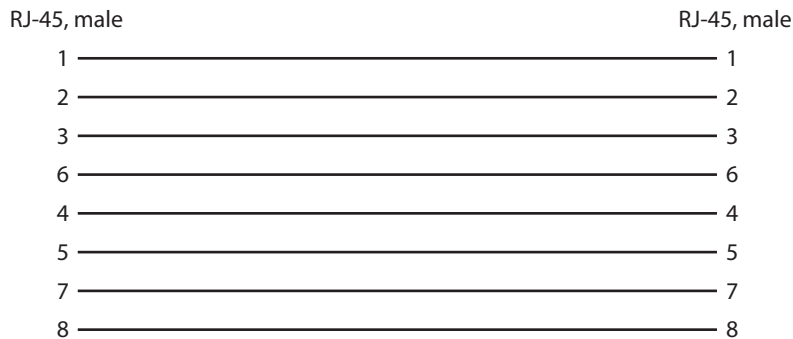


Figure 13. Typical Ethernet straight-through cable diagram for 1000Base-T

E1 PRI

The E1 PRI is usually connected to a PBX or switch—local exchange (LE). Type and pin outs of these devices vary depending on the manufacturer. In most cases, a straight-through RJ-45 to RJ-45 can be used to connect the PRI with a PBX. A cross-over cable is required to connect to an NT device, as illustrated in [figure 14](#).



Hazardous network voltages are present in the PRI cables. If you detach the cable, detach the end away from the SmartNode or interface card first to avoid possible electric shock. Network hazardous voltages may be present on the device in the area of the PRI port, regardless of when power is turned OFF.



To prevent damage to the system, make certain you connect the PRI cable to the PRI port only and not to any other RJ-45 socket.

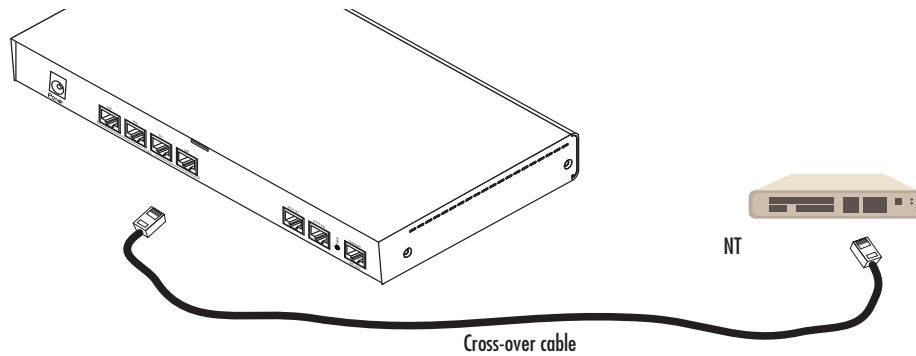


Figure 14. Connecting an E1 PRI port to an NT1

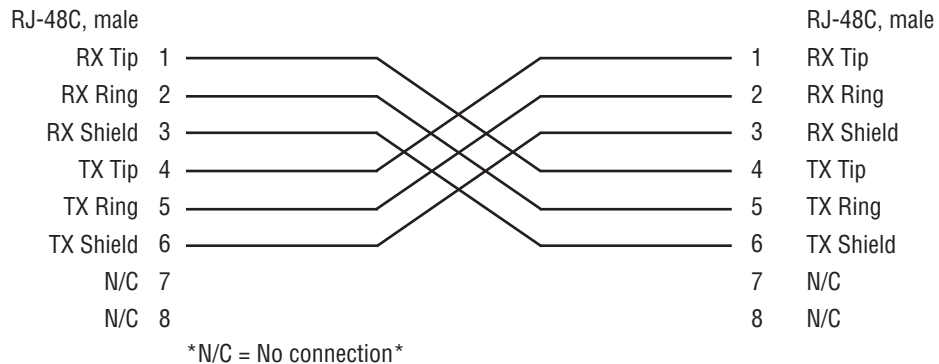


Figure 15. E1 PRI port crossover cable

T1 PRI

The T1 PRI is usually connected to a PBX or switch—local exchange (LE). Type and pin outs of these devices vary depending on the manufacturer. In most cases, a straight-through RJ-45 to RJ-45 can be used to connect the PRI with a PBX. A cross-over cable is required to connect to an NT device, as illustrated in [figure 16](#).



Hazardous network voltages are present in the PRI cables. If you detach the cable, detach the end away from the SmartNode or interface card first to avoid possible electric shock. Network hazardous voltages may be present on the device in the area of the PRI port, regardless of when power is turned OFF.



To prevent damage to the system, make certain you connect the PRI cable to the PRI port only and not to any other RJ-45 socket.

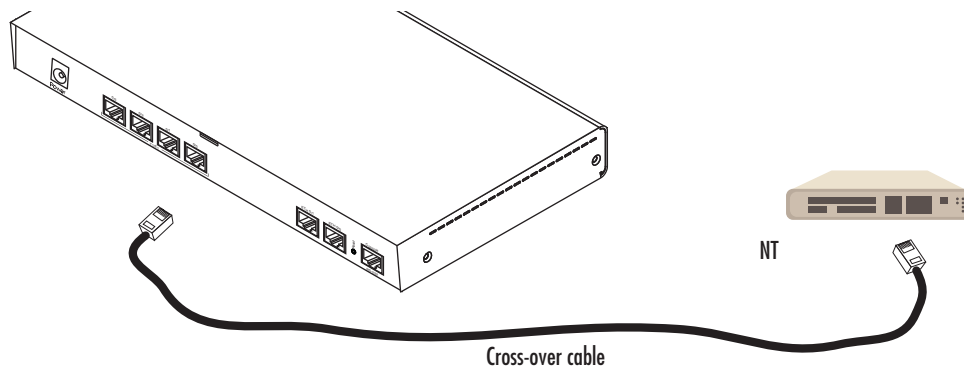


Figure 16. Connecting a T1 PRI port to an NT device

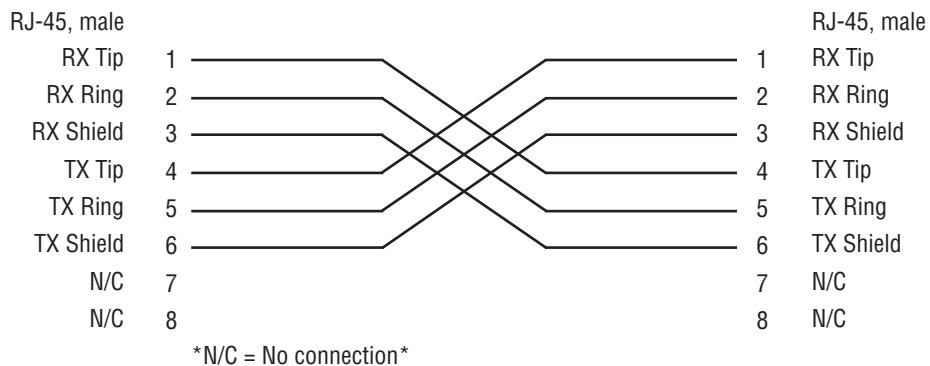


Figure 17. T1 PRI crossover cable

Appendix D **Port Pin-outs**

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Introduction

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

Console Port

Configuration settings: 9600 bps, 8 bits, no parity, 1 stop bit, no flow control

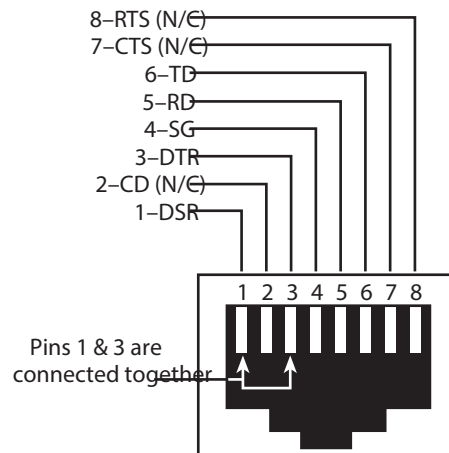


Figure 18. EIA-561 (RJ-45 8-pin) port

Note *N/C* means no internal electrical connection.

Ethernet

Table 7. RJ45 socket 10/100Base-T

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

Note Pins not listed are not used.

Table 8. RJ45 socket 1000Base-T

Pin	Signal
1	TRD0+
2	TRD0-
3	TRD1+
6	TRD1-
4	TRD2+
5	TRD2-

Table 8. RJ45 socket 1000Base-T (Continued)

Pin	Signal
7	TRD3+
8	TRD3-

PRI Port

Table 9. RJ-45 socket

Pin	USR
1	RX Tip
2	RX Ring
3	RX Shield
4	TX Tip
5	TX Ring
6	TX Shield

Note Pins not listed are not used.

G.SHDSL EFM & ATM port (/2G and /4G models)

Table 10. EFM Port

Pin	Signal	Pair
1	Tip	1
2	Ring	1
3	Tip	2
4	Tip	0
5	Ring	0
6	Ring	2
7	Tip	3
8	Ring	3

ADSL & VDSL-ADSL Port (/A and /AVA & /AVB models only)

Table 11. ADSL & VDSL-ADSL Port: RJ-45 connector

Pin	Signal
4	Tip
5	Ring

Note Pins not listed are not used

Fiber Ports (/F models only)

For tested and approved modules, please refer to the list of SFP's Patton has tested at <http://www.patton.com/products/sfpmodules.asp>

10/100 Fast Ethernet Port

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

Note Pins not listed are not used

Appendix E **SmartNode Factory Configuration**

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Introduction

Factory configuration settings for the SmartNode device can be obtained with the following command through the CLI;

```
login: admin
password: <Enter>
192.168.1.1>show config:shipping-config
```

See Chapter 4, "[Initial Configuration](#)" on page 29 for more details about IP address settings for initial configuration.

Appendix F **Reset Button Functions**

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Introduction

The *Reset* button (see [figure 19](#)) is used to do the following:

- Reboot the SmartNode device (see section “[Resetting the SmartNode device when it is operating and the Power LED is lit](#)” on page 59)
- Erase the *startup-config* settings, which is followed by a SmartNode device reboot as indicated by the slow blinking of all LEDs (see section “[Resetting the SmartNode device when it is operating and the Power LED is lit](#)” on page 59)
- Factory reset, which is followed by a device reboot as indicated by the fast blinking of all LEDs (see section “[Resetting the SmartNode device when it is operating and the Power LED is lit](#)” on page 59)

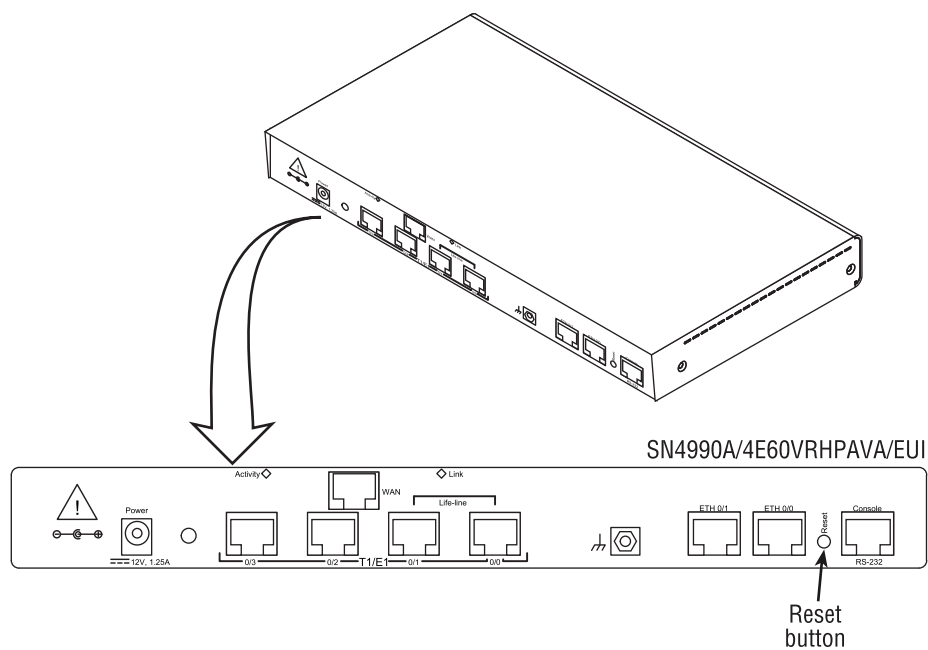


Figure 19. SN4990A *Reset* button

Resetting the SmartNode device when it is operating and the Power LED is lit

The *Reset* button has the following behaviors depending on how many seconds (see [figure 20](#)) the button is pressed (see [table 12](#) for the results from pressing the button).



Figure 20. Reset button periods (in seconds) for performing actions

Table 12. Results from pressing the *Reset* button

LED Blink Pattern	Action
A (less than 1 second)	Reboot device
B (1 to 4 seconds)	No action
C (5 to 14 seconds)	<ul style="list-style-type: none"> • Erase <i>startup-config</i> • Reboot (indicated by the slow blinking of all LEDs)
D (15 to 20 seconds)	<ul style="list-style-type: none"> • Factory reset which erases entire flash memory except for <i>shipping-config</i>, shipping wizards, default root CAs, and software licenses • Reboot (indicated by fast blinking of all LEDs)

Very exceptional case—minimal config recovery

If, after performing the procedure in section “[Resetting the SmartNode device when it is operating and the Power LED is lit](#)” on page 59, the SmartNode device is still not operational, the following may remedy the problem by erasing the entire contents of flash memory (no exceptions).

However it is recommended that in such a case the device be sent to Patton for analysis and repair. See section “[Warranty Service and Returned Merchandise Authorizations \(RMAs\)](#)” on page 35 for details.



IMPORTANT

The following procedure is NOT standard and is NOT to be used to perform a factory reset. It should ONLY be used as a last resort for a minimal recovery of the device when it is in an undefined state, and if the instructions in section “[Resetting the SmartNode device when it is operating and the Power LED is lit](#)” on page 59 did not provide a remedy.



CAUTION

Performing the following procedure will result in loss of all data, including the *shipping-config*, software licenses, Wizards, *backup-configs*, etc. The device will have to be manually set up afterward.

Do the following:

1. While pressing and holding the *Reset* button, apply power to the SmartNode device. The *Power* LED flashes quickly for 2 seconds, during which time the *Reset* button must remain pressed.
2. The *Power* LED will begin a series of blink pattern starting with 1-blink, pause.

Table 13. Using the *Reset* button to switch to a backup image

LED Blink Pattern	Action
1-blink, pause	Boot normally
2-blinks, pause	Boot normally (device only has a single image)
3-blinks, pause	Erase entire contents of flash memory (no exceptions), then boot. Note Erasing flash memory also deletes previously purchased and loaded software license keys.

3. Repeatedly pressing and releasing the *Reset* button will cycle through the blink patterns.
4. When you get to the 3-blink pattern that will erase the entire flash memory (see [table 13](#)), release the *Reset* button. 10 seconds later, flash memory will be erased, then the device will boot.
5. Once booted up, the device will run using the “minimal-config”:

```
#-----#
#                                             #
# Minimal configuration file                 #
#                                             #
#-----#

cli version 4.00

telnet-server
  shutdown

ssh-server
  no shutdown

web-server http
  shutdown

web-server https
  shutdown

context ip ROUTER

  interface LAN
    ipaddress LAN 192.168.200.10/24
    ipaddress DHCP dhcp

port ethernet 0 0
  bind interface ROUTER LAN
  no shutdown
```

Appendix G **End User License Agreement**

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End User License Agreement

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- B) “Program(s)” shall mean all software, software documentation, source code, object code, or executable code.
- C) “End User” shall mean the person or organization which has valid title to the Designated Equipment.
- D) “Designated Equipment” shall mean the hardware on which the Program(s) have been designed and provided to operate by the End User.

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6. Termination

- A) The End User may terminate this agreement by returning the Designated Equipment and destroying all copies of the licensed Program(s).
- B) Patton Electronics Company may terminate this Agreement should End User violate any of the provisions of section “4. Grant of License” on page 62.
- C) Upon termination for A or B above or the end of the Term, End User is required to destroy all copies of the licensed Program(s)

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- RedBoot (Red Hat Embedded Debug and Bootstrap) embedded system debug/bootstrap environment from Red Hat distributed to you pursuant to the eCos license terms (ecos.sourceware.org/license-overview.html) and GNU General Public License (GPL) terms (www.gnu.org/copyleft/gpl.html). Source code is available upon request.

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No waiver of any of the provisions of these terms and conditions will be deemed to constitute a waiver of any other provision nor shall such a waiver constitute a continuing waiver unless otherwise expressly provided in writing duly executed by the party to be bound thereby. Any other terms and conditions of sale, to the extent not inconsistent herein, regarding a Patton device, program, license or service remain in full force and effect.