

SmartNode 5530 Series Enterprise Session Border Controller and Integrated Access Device

User Manual



SmartNode SN5531 eSBC and IAD



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

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Revised: March 12, 2019

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Summary Table of Contents

- 1 General Information 14
- 2 Applications Overview 21
- 3 SmartNode Installation 25
- 4 Initial Configuration 31
- 5 Contacting Patton for Assistance 36
- A Compliance Information 39
- B Specifications 42
- C Cabling 48
- D Port pin-outs 52
- E SmartNode SN5530 Factory Configuration 56
- F Reset Button Functions 58
- G End User License Agreement 63

Table of Contents

About this guide.....	9
Audience.....	9
Structure.....	9
Precautions	10
Safety when working with electricity.....	10
Deutsch	11
General observations	12
Typographical conventions used in this document.....	13
General conventions	13
1 General Information	14
SmartNode SN5530 Overview	15
Model Code Conventions	16
Rear panel ports	17
Front panel LEDs	19
2 Applications Overview	21
Introduction.....	22
Application—Edge Intelligence of Enterprise Communication	22
Application—Multi-service ISDN, Secure VoIP and Data Routing Solution	23
3 SmartNode Installation	25
Planning the Installation.....	26
Site log	26
Network information	26
Network Diagram	26
IP related information	26
Software tools	27
Power source	27
Location and mounting requirements	27
Installing the Patton SmartNode eSBC/IAD	27
Placing the SmartNode device	27
Installing cables	28
4 Initial Configuration	31
Introduction.....	32
Connecting the SmartNode to Your Laptop PC.....	32
Configure the Desired IP Address.....	33
Factory-default IP Settings	33
Login	33
Changing the WAN IP address	33
Connecting the SmartNode to the Network.....	34
Loading the Configuration (optional).....	35

Additional Information	35
5 Contacting Patton for Assistance	36
Introduction	37
Contact information	37
Contacting Patton Technical Services for Free Support	37
Warranty Service and Returned Merchandise Authorizations (RMAs)	37
Warranty coverage	37
RMA numbers	38
A Compliance Information	39
Compliance	40
EMC	40
Safety	40
Radio and TV Interference (FCC Part 15)	40
EC Declaration of Conformity	40
Authorized European Representative	40
ISDN Compliance	41
B Specifications	42
DSP	43
Voice Connectivity	43
Data Connectivity	43
WAN Interface (if applicable)	43
Voice Processing (signalling dependent)	45
Fax and modem support	45
Voice Signalling	45
Voice Routing—Session Controller	46
IP Services	46
Management	47
System	47
Physical	47
Plastic Enclosure	47
Metal Enclosure	47
C Cabling	48
Introduction	49
Serial Console	49
Ethernet	50
ISDN BRI	51
D Port pin-outs	52
Introduction	53
Console port	53
Ethernet	53
VDSL-ADSL Port (/A and /AVA & /AVB models only)	54
G.SHDSL EFM & ATM port (/2G and /4G models)	54

	Fiber Ports (/F models only)	55
	ISDN BRI (NT/Net or TE/User) ports (0/0–0/7).....	55
E	SmartNode SN5530 Factory Configuration	56
	Introduction	57
F	Reset Button Functions	58
	Introduction	59
	Resetting the SmartNode device when it is operating and the Power LED is lit.....	60
	Resetting the SmartNode device when it is initially powered off.....	60
	Very exceptional case - minimal config recovery	61
G	End User License Agreement	63
	End User License Agreement	64
	1. Definitions	64
	2. Title	64
	3. Term	64
	4. Grant of License	64
	5. Warranty	65
	6. Termination	65
	7. Notices	65
	8. Other Licenses	65
	9. Unenforceable Provisions	66
	10. Governing Law	66
	11. Waiver	66

List of Figures

1	SmartNode SN5530 Series eSBC and IAD	15
2	Examples of SN5530 rear panels	17
3	SmartNode SN5530 front panel LEDs	19
4	Edge intelligence of enterprise communication application	22
5	Multi-service ISDN, Secure VoIP and Data Routing Solution	23
6	Power LEDs	30
7	Connecting the SmartNode to your Laptop PC	32
8	Connecting the SmartNode to the network	34
9	Connecting a serial terminal	49
10	Typical Ethernet straight-through cable diagram for 10/100Base-T	50
11	Typical Ethernet straight-through cable diagram for 1000Base-T	50
12	Connecting an ISDN device	51
13	EIA-561 (RJ-45 8-pin) port	53
14	SN5530 Reset button	59
15	Reset button periods (in seconds) for performing actions	60

List of Tables

1	General conventions	13
2	Rear panel ports	18
3	LED Definitions	20
4	Sample site log entries	26
5	Factory Default IP Address and Network Mask Configuration	33
6	WAN Interface Specifications	43
7	10/100 Base-T RJ-45 socket	53
8	1000Base-T RJ-45 Socket	54
9	VDSL-ADSL Port: RJ-45 connector	54
10	EFM Port	54
11	RJ-45 Socket	55
12	Results from pressing the Reset button	60
13	Using the Reset button to switch to a backup image	60
14	Using the Reset button to switch to erase flash memory	61

About this guide

This guide describes the SmartNode SN5530 Enterprise Session Border Controller (eSBC) and Integrated Access Device (IAD) hardware, installation and basic configuration. For detailed software configuration information refer to the [Trinity Software Configuration Guide](#) and the available [Knowledgebase](#), as well as the [Wizard portal](#).

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 eSBC/IAD features and capabilities
- [Chapter 2](#) on page 21 contains an overview describing eSBC/IAD operation and applications
- [Chapter 3](#) on page 25 provides quick start hardware installation procedures
- [Chapter 4](#) on page 31 provides quick-start procedures for configuring the SmartNode eSBC/IAD
- [Chapter 5](#) on page 36 contains information on contacting Patton technical support for assistance
- [Appendix A](#) on page 39 contains compliance and regulatory information for the eSBC/IAD
- [Appendix B](#) on page 42 contains specifications for the eSBC/IAD
- [Appendix C](#) on page 48 provides cable recommendations
- [Appendix D](#) on page 52 describes the eSBC/IAD's ports and pin-outs
- [Appendix E](#) on page 56 lists the factory configuration settings for SmartNode SN5530
- [Appendix F](#) on page 58 describes the *Reset* button functions
- [Appendix G](#) on page 63 provides license information that describes acceptable usage of the software provided with the SmartNode SN5530

For best results, read the contents of this guide *before* you install the eSBC/IAD.

Precautions

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

Note Calls attention to important information.



The alert symbol and IMPORTANT heading 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.



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



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.



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

Safety when working with electricity



The SmartNode device contains no user serviceable parts, and is not to be opened by the user. The equipment shall be returned to Patton Electronics for repairs or repaired by qualified service personnel.



Mains Voltage: In systems without a power switch, line voltages are present in the power supply when the power cord is connected. The mains outlet used to power the SmartNode device shall be within 10 feet (3 meters) of the device, be easily accessible, and protected by a circuit breaker.



For AC powered units, ensure that the power cable used meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet which has earth ground.



WARNING

For units with an external power adapter, the adapter shall be a listed Limited Power Source.



WARNING

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



WARNING

Before handling the device, disconnect the telephone network cables to avoid contact with telephone line voltages. When detaching the cables, detach the end away from the SmartNode device first.



WARNING

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

Deutsch

Warnhinweise:



WARNUNG

Dieses Gerät ist NICHT für den Anschluss an das Telefonnetz (PSTN) bestimmt und auch NICHT dafür zugelassen. Es ist nur für den Anschluss an Endgeräte beim Kunden vorgesehen.



- Das Gerät enthält keine austauschbaren Komponenten und ist vom Benutzer nicht zu öffnen. Bei Systemen ohne Netzschalter und ohne externes Netzteil liegt Netzspannung im Gerät an, wenn das Netzkabel angeschlossen ist.
- Bei Geräten mit externem Netzteil muss das Netzteil die Anforderungen an eine zugelassene Stromquelle mit begrenzter Leistung erfüllen. Die Steckdose, die für die Stromversorgung des Gerätes verwendet wird, sollte höchstens 3 Meter vom Gerät entfernt und leicht zugänglich sein sowie durch einen den örtlichen regulatorischen Anforderungen entsprechenden Schutzschalter abgesichert sein.
- Für mit Wechselstrom betriebene Geräte muss sichergestellt sein, dass das verwendete Netzkabel alle gültigen Normen des Landes erfüllt, in dem es eingesetzt werden soll.
- Für mit Wechselstrom betriebene Geräte, die 3-polige Netzstecker haben (L1, L2 u. GND oder Phase, Neutraleiter u. Schutzleiter), muss die Steckdose geerdet sein.
- Für mit Gleichstrom betriebene Geräte muss sichergestellt sein, dass die Verbindungskabel für Spannung, Strom, erwartete Temperatur, Entflammbarkeit und mechanische Wartbarkeit geeignet sind.
- WAN-, LAN- u. PSTN-Ports (Anschlüsse) können unter gefährlicher Spannung stehen, unabhängig davon, ob das Gerät ein- oder ausgeschaltet ist. PSTN bezieht sich auf Schnittstellen wie Telefon, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, usw. Diese sind als „gefährliche Netzwerkspannungen“ bekannt. Um einen elektrischen Schlag zu vermeiden, muss in der Nähe dieser Anschlüsse mit Vorsicht gearbeitet werden. Werden Kabel von diesen Anschlüssen getrennt, zuerst das Kabel am anderen Ende herausziehen.
- Während eines Gewitters darf nicht am Gerät gearbeitet werden und es dürfen keine Kabel angeschlossen oder vom Netz getrennt werden.



In Übereinstimmung mit den Anforderungen der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte (WEEE) muss sichergestellt sein, dass Altgeräte von anderem Abfall und Schrott getrennt werden und dem Sammel- und Verwertungssystem für Elektro- und Elektronik-Altgeräte in Ihrem Land zum Recycling zugeführt werden.

General observations



Do not stack multiple SmartNode devices directly on top of one another, and do not place items on top of the device. If you will be installing equipment above the SmartNode device, leave at least 2 inches (5 cm) of clearance between the devices.

Furthermore, leave at least 2 inches (5 cm) to the left, right, front, and rear of the SmartNode device for proper ventilation.



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.

- Clean the case with a soft slightly moist anti-static cloth
- Place the unit on a flat surface and ensure free air circulation

- Avoid exposing the unit to direct sunlight and other heat sources
- Protect the unit from moisture, vapors, and aggressive liquids


Typographical conventions used in this document

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

General conventions

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

Table 1. General conventions

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

Chapter 1 **General Information**

Chapter contents

- SmartNode SN5530 Overview15
- Model Code Conventions16
- Rear panel ports17
- Front panel LEDs19

SmartNode SN5530 Overview

The SmartNode SN5530 Series Enterprise Session Border Controller (eSBC) and Integrated Access Device (IAD) (see [figure 1](#)) comes with built-in security features such as SIP TLS, SRTP, stateful firewall, and secure provisioning to protect the LAN networks from fraud strikes out of the Internet. For survivability use cases the BRI ports can be used for local PSTN breakout. The BRI ports can be used to connect legacy equipment to any VOIP network as well. Like all Trinity devices, the SN5530 comes with the built in WEB Wizard for ease of use.



Figure 1. SmartNode SN5530 Series eSBC and IAD

The SmartNode SN5530 consists of several models: see the complete SKU list on the corresponding product page on www.patton.com.

All the SN5530 models come equipped with two 10/100/1000 Base-T Ethernet ports and with 2 up to 8 BRI T0/S0 ports.

The SmartNode SN5530 eSBC/IAD performs the following major functions:

- Four up to 16 channels of Voice over IP and local voice switching via 2, 4 or 8 ISDN BRI S0/T0 ports. Each port can be switched between NT and TE per software.
- For each ISDN port in NT mode a Phantom power supply can be switched on. The total delivered power is 4W.
- Depending on the model, a fallback cut-through relay between ISDN BRI ports 0/0 and 0/1 (0/2 and 0/3; 0/4 and 0/5; 0/6 and 0/7) electrically connects the NT and TE port in case of power failure and enables life-line calls to the public ISDN network (PSTN-supplied ISDN line must be used).
- Standard compliant VoIP in accordance with SIPv2 protocol.
- Supports 4 SIP-to-SIP calls and can be license upgraded to a total of 200* (additional cost)
- Internet access and IP Routing with IP Quality of Service (QoS) support for mixed voice and data traffic.
- SIP registrar, SIP TLS, and SRTP are available on all SN5530 models.
- USB 2.0 host port for 3G/4G modem support, which can be used for Survivability applications as a data backup link.

Note A list of supported USB Models can be found in the release notes and in the Software Configuration Guide.

*Supported under ideal conditions. Transcoding, debugging, and/or IP routing reduce processing capacity.

In addition, the IAD supports WAN access termination (VDSL2, ADSL2/2+, SHDSL, Fiber SFP). Section “[Model Code Conventions](#)” on page 16 provides more information on the device.

Model Code Conventions

The SmartNode SN5530 is a compact Enterprise Session Border Controller that supports eight VoIP or Fax calls, by using either G.711, G.722, T.38 or any other codec as indicated under Voice Processing in Appendix B, “[Specifications](#)” on page 42. Additional calls can be enabled by loading SNSW-1B licenses (additional charge). Some IAD versions also have WAN uplink termination included, such as Fiber-SFP, ADSL/VDSL or G.SHDSL (EFM/ATM).

On the product the following model code conventions apply:

- *V* stands for number of Voice Channels
- *BIS* stands for BRI ports (NT or TE)
- *HP* stands for High Precision Clock (less than 5 ppm)
- *AVA* stands for VDSL / ADSL (Annex A,L,M)
- *AVB* stands for VDSL/ADSL (Annex B,J)
- *2G* stands for 2-pair G.SHDSL.bis
- *4G* stands for 4-pair G.SHDSL.bis
- *F* stands for SFP slot being used for Fiber link termination
- *EUI* stands for external universal input power supply

Note For a complete listing of available models, refer to the SmartNode VoIP page at <https://www.patton.com/products/voip-comparison.asp>

Section “[Rear panel ports](#)” on page 17 includes examples of SN5530 rear panels and descriptions of the ports.

Rear panel ports

Figure 2 shows examples of SN5530 rear panels. The ports are described in table 2 on page 18.

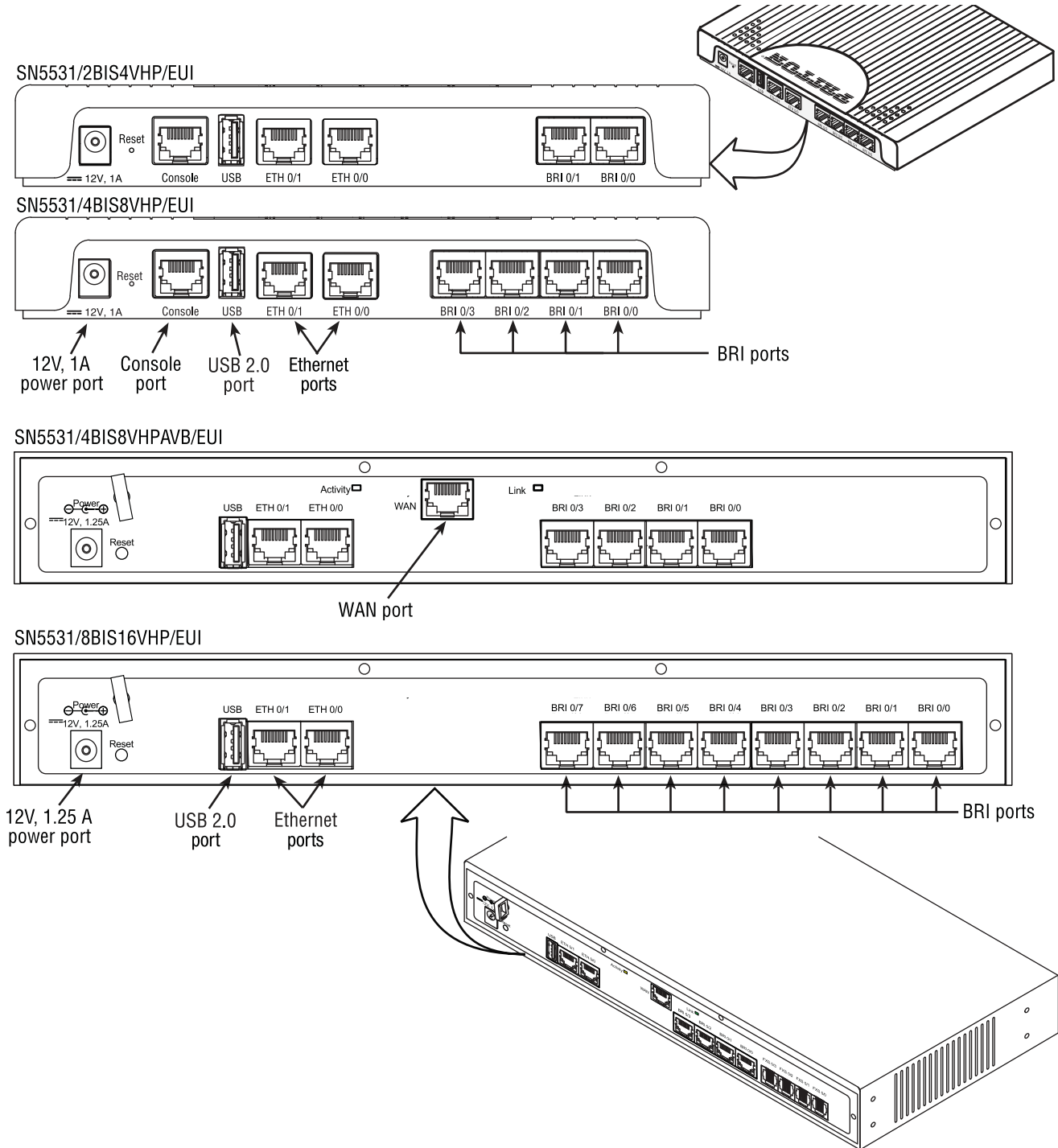


Figure 2. Examples of SN5530 rear panels

Table 2. Rear panel ports

Port	Description
ETH 0/0 & ETH 0/1	Auto-MDX Fast-/Gigabit-Ethernet port, RJ-45 (see figure 2), connects the unit to an Ethernet WAN device (for example, a cable modem, DSL modem, or fiber modem).
USB 2.0	USB 2.0 host port (see figure 2) to connect a USB 3G/4G Cellular Modem. A list of supported USB Models can be found in the release notes and in the Software Configuration Guide
BRI 0/0 - BRI 0/7	ISDN BRI TE/NT port, RJ-45 socket S0/T0 interface (see figure 2), connects the SmartNode with an ISDN device over an S/T bus, e.g. a PBX or an NT. The port can be switched between TE and NT mode. The interface is internally terminated with 100 Ohm. Point-to-point or point-to-multipoint configurable. If the port is in NT mode, a Phantom power supply can be switched on to supply connected phones with power.
Console	Used for service and maintenance, the console port (see figure 2 on page 17) 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). Configuration settings: <ul style="list-style-type: none"> • 19200 bps • 8 bits, no parity • 1 stop bit • flow control off
12V DC, 1A	Electricity supply socket. (see figure 2 on page 17)
Reset	The reset button has several functions, as described in appendix F, “ Reset Button Functions ” on page 58.
Expansion Port G.SHDSL,VDSL-ADSL, SFP	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. Note On VDSL-ADSL models (/AVA and /AVB) only, the Activity LED has no function.

Section “[Front panel LEDs](#)” on page 19 shows SN5530 front panel LEDs, and includes descriptions of the LEDs.

Front panel LEDs

Figure 3 shows SmartNode SN5530 front panel LEDs. LED definitions are listed in table 3 on page 20.

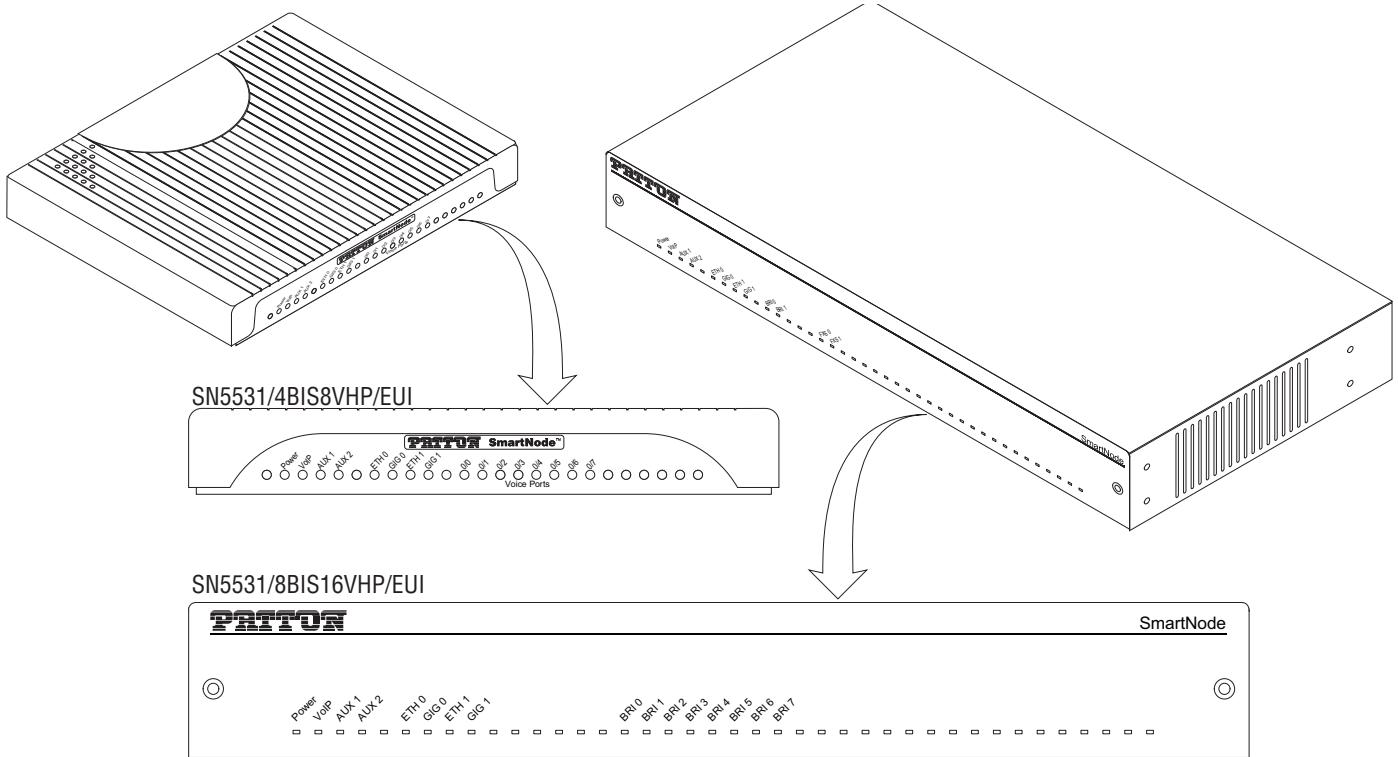


Figure 3. SmartNode SN5530 front panel LEDs

Table 3. LED Definitions

LED	Description
	Note If an error occurs, all LEDs will flash solid for MORE than 5 seconds before the device reboots
Power	When lit, indicates power is applied. Blinks fast during bootloader phase and blinks slow during boot process of Trinity Software. Becomes solid when the system is up and running.
VoIP Link	<ul style="list-style-type: none"> • On indicates the gateway is registered to a SIP server, or, a SIP device has registered to the SN5530. • Off indicates the unit is not configured or registered, or has no active direct routed VoIP connection.
BRI 0 – BRI 7	<ul style="list-style-type: none"> • On when L1 and L2 are active. Flashes when there are ongoing calls. • Off when no line or phone is connected or the port is shutdown.
ETH 0 – ETH1	<ul style="list-style-type: none"> • On when the Ethernet connection on the corresponding port has a link indication. • Flashes when data is received or transmitted at the corresponding Ethernet port.
GIG 0 – GIG 1	<ul style="list-style-type: none"> • On when the Ethernet is connected to a 1000Mb network. • Off when the Ethernet is connected to a 10Mb or 100Mb network or not connected
AUX 1	On when connected to Patton Cloud
AUX 2–AUX 4	Auxiliary LEDs for future use.

Chapter 2 **Applications Overview**

Chapter contents

Introduction	22
Application—Edge Intelligence of Enterprise Communication	22
How it works	23
Application—Multi-service ISDN, Secure VoIP and Data Routing Solution	23

Introduction

Patton's SmartNode eSBC/IAD deliver the features you need for advanced multiservice voice and data network applications. They combine high quality voice-over-IP with powerful *quality* of service routing functions to build professional, secure and reliable VoIP and data networks. This chapter describes typical applications for which this SmartNode is uniquely suited.

Note Detailed configuration information for SmartNode applications can be found online at: <http://www.patton.com/session-border-controller/>.

Application—Edge Intelligence of Enterprise Communication

Enterprises are excited about voice over IP and convergence for the following reasons:

- Bypassing the PSTN. Using Internet telephony service providers (ITSPs) instead of incumbent carriers dramatically reduces telephony costs
- IP PBXs, with their full suite of features and ease of integration into existing IT environments are very appealing
- Convergence lowers technology ownership costs and enables enterprises to deploy new integrated applications

However, there are several concerns about migrating the whole telephony infrastructure to VoIP:

- Loss of voice quality
- Unknown reliability
- Lack of experience/expertise in voice over IP
- VoIP Security concerns

Patton's SmartNode series of VoIP gateways address these concerns enabling enterprises to safely migrate to VoIP. SmartNodes enable system administrators to gradually introduce VoIP, using it as the edge communication device for all worlds, connecting PSTN, legacy PBX, ITSPs and an IP PBX.

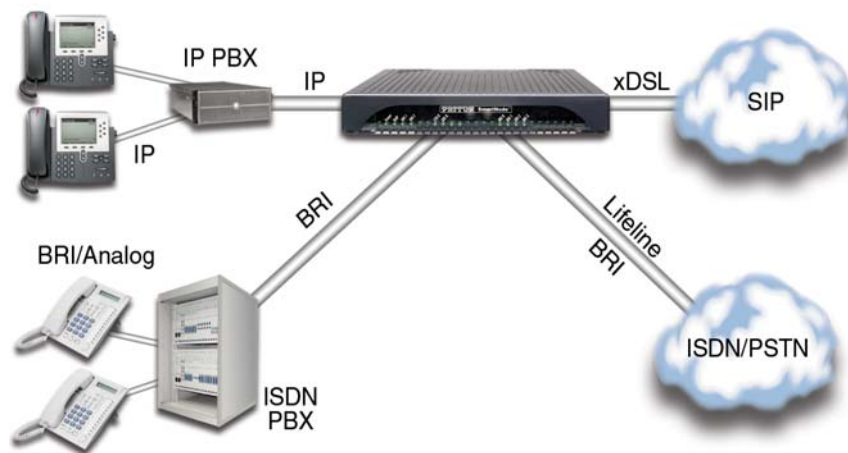


Figure 4. Edge intelligence of enterprise communication application

How it works

1. Connect the SmartNode to the PSTN and legacy PBX, and configure the call router to pass all calls from the PBX to the PSTN and vice versa. This first step will not affect any uses in the enterprise
2. Choose your ITSPs, and configure as many on the SmartNode as you need. Use the intelligent call router in the SmartNode to decide which call is forwarded to which ITSP, and which calls should go to the PSTN. This may be based upon least-cost routing criteria, or for example, on calling party number. The latter is ideal if you want to test calls to an ITSP before enabling it for all users within the enterprise. As far as supported by the ITSP, the SIP signaling but also the Media can be sent and received encrypted using SIP TLS and SRTP.
3. Voice over IP can be switched off instantly on one single box (the SmartNode) to revert the system back to as it was before.
4. Build up an IP PBX system that uses the SmartNode as PSTN gateway. For all calls from this IP PBX, you can direct them to the PSTN or to ITSPs. Numbering plan adaptations are handled through regular expression matching by the SmartNode. No need to change anything on the PBXs.
5. Once the IP PBX is ready, you can choose on incoming calls from the PSTN, for each extension whether this extension is to be directed to the IP PBX or on the legacy PBX.

Application—Multi-service ISDN, Secure VoIP and Data Routing Solution

The SmartNode SN5530 can be used to make and receive calls to and from the public ISDN network and internet Telephony services on any ISDN Terminal (Phone or PBX) (see figure 5). Using individually configurable routing tables, an outbound call can be directed to the local PSTN connection or to an Internet telephony service provider (ISTP). Inbound calls from the Internet and the PSTN can ring the same phone.

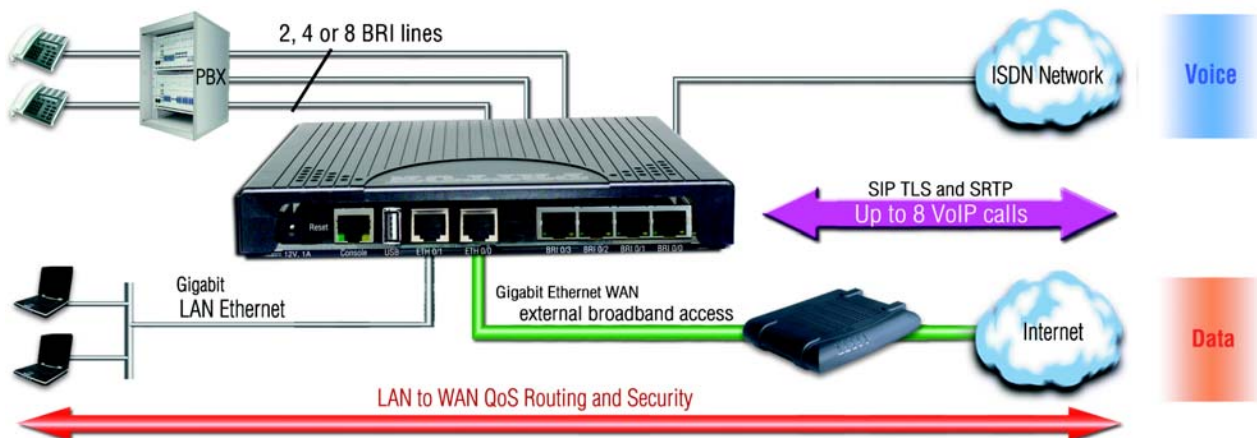


Figure 5. Multi-service ISDN, Secure VoIP and Data Routing Solution

Broadband network connectivity integrates with any fixed IP, DHCP or PPPoE service. An integrated 10/100/1000 Ethernet LAN port, with advanced routing features such as NAT, Stateful-Firewall/ACL, DynDNS, Packet based routing, etc, fulfills the requirements of demanding network users.

Quality of Service (QoS) features complete the offering with advanced voice prioritization and traffic management. Patton's patent-pending DownStreamQoS™ ensures voice without interruptions even over best-effort Internet connections.

Chapter 3 SmartNode Installation

Chapter contents

- Planning the Installation.....26
 - Site log26
 - Network information26
 - Network Diagram26
 - IP related information26
 - Software tools27
 - Power source27
 - Location and mounting requirements27
- Installing the Patton SmartNode eSBC/IAD27
 - Placing the SmartNode device27
 - Installing cables28
 - Connecting ISDN terminals and NT to the SmartNode’s ISDN BRI ports28
 - Connecting the 10/100/1000Base-T Ethernet LAN and WAN cables28
 - Installation cable requirements for the DSL WAN cable (SN5530/2G, /4G, /AVA, /AVB Models)29
 - Installation cable requirements for the SFP for Fiber WAN module (SN5530/F)29
 - Connecting the Power Supply29
 - Internal S-Bus power supply30

Planning the Installation

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

- **Create a network diagram** (see section “[Network information](#)” on page 26)
- **Gather IP related information** (see section “[IP related information](#)” on page 26 for more information)
- **Install the hardware and software needed to configure the SmartNode.** (See section “[Software tools](#)” on page 27)
- **Verify power source reliability** (see section “[Power source](#)” on page 27).

When you finish preparing for SmartNode installation, go to section “[Installing the Patton SmartNode eSBC/IAD](#)” on page 27 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 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 SN5530 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 or Putty to configure the software on your SmartNode eSBC.

Also you may use your WEB browser to configure the unit. The Web wizard in this case reduces time to get your unit up and running. See more details on the [Knowledgebase](#).

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. 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.

Location and mounting requirements

The SmartNode eSBC/IAD 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 Patton SmartNode eSBC/IAD

Install the SmartNode device as follows:

- Placing the device at the desired installation location (see section “[Placing the SmartNode device](#)”)
- Installing the interface and power cables (see section “[Installing cables](#)” on page 28)

When you finish installing the SmartNode, go to Chapter 4, “[Initial Configuration](#)” on page 31.

Placing the SmartNode device

Place the SmartNode device on a desktop or similar sturdy, flat surface. 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.



To prevent overheating and damaging the unit, proper ventilation is required when placing the device; leave at least 2 inches (5 cm) to the left, right, front, and rear of the SmartNode device.

The device should be installed in a dry environment with sufficient space to allow air circulation for cooling. Do not stack multiple SmartNode devices directly on top of one another, and do not place items on top of the device. If you will be installing equipment above the SmartNode device, leave at least 2 inches (5 cm) of clearance between the devices.

Installing 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.

Connect the cables in the following order:

1. Connect the ISDN terminals and NT to the BRI ports (see section “[Connecting ISDN terminals and NT to the SmartNode’s ISDN BRI ports](#)”)
2. Connect the 10/100/1000Base-T Ethernet LAN and WAN (see section “[Connecting the 10/100/1000Base-T Ethernet LAN and WAN cables](#)”)
3. Connect the power mains cable (see section “[Connecting the Power Supply](#)” on page 29)

Connecting ISDN terminals and NT to the SmartNode’s ISDN BRI ports

The SmartNode comes with four ISDN BRI ports located on the rear panel (see [figure 2](#) on page 17). All ports can be connected to the PSTN (ISDN NT) or terminals.



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.

Note On Lifeline Relay models (/R option) the PSTN line should be connected to BRI 0/0 and a terminal to BRI 0/1 to benefit from the lifeline function. (See the full list of models on www.patton.com).

For details on the BRI port pinout and ISDN cables, refer to [Appendix C, “Cabling”](#) on page 48 and [Appendix D, “Port pin-outs”](#) on page 52.

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

The SmartNode SN5530 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.

1. Connect to the subscriber port of the broadband access modem (DSL, cable, WLL) to ETH 0/0.
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 48 and [Appendix D, “Port pin-outs”](#) on page 52.

Installation cable requirements for the DSL WAN cable (SN5530/2G, /4G, /AVA, /AVB Models)

The SmartNode Model SN5530 comes with an optional G.SHDSL(EFM-ATM) or VDSL-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 54.

For details on the VDSL and ADSL port pinout, refer to section “VDSL-ADSL Port (/A and /AVA & /AVB models only)” on page 54.

Installation cable requirements for the SFP for Fiber WAN module (SN5530/F)

For SmartNode models that come with an option for an SFP for Fiber WAN module, see details about the tested and compatible SFP modules on <http://www.patton.com/products/sfpmodules.asp>.

Connecting the Power Supply

Do the following to connect the main power to the Model SN5530:

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

1. Insert the female end of the AC power supply cable to the mains port (see [figure 2](#) on page 17).



There are no user-serviceable parts in the power supply section of the model SN5530. Contact Patton Electronics Technical Support at support@patton.com for more information

2. Verify that the AC power cord included with your device is compatible with local standards. If it is not, refer to “[Contacting Patton for Assistance](#)” on page 36 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.

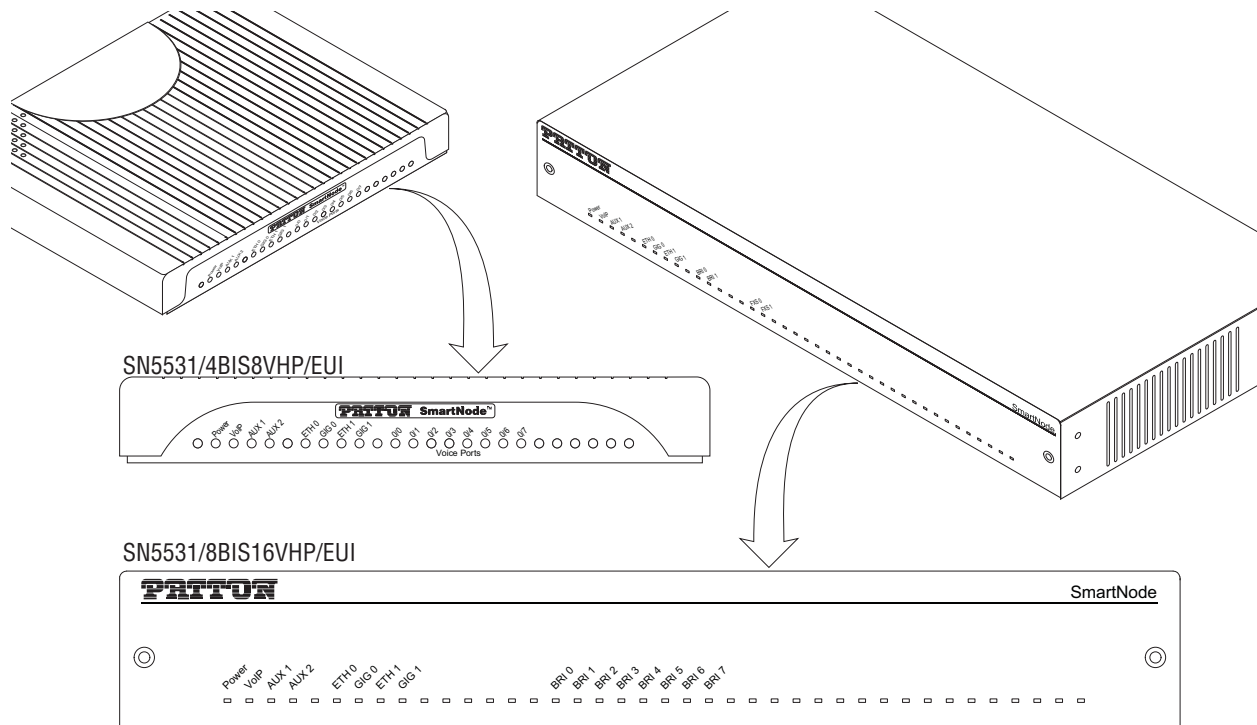


Figure 6. Power LEDs

4. Verify that the green *Power* LED is lit (see [figure 6](#)). Blinks fast during bootloader phase and blinks slow during boot process of Trinity Software. Becomes solid when the system is up and running.

Internal S-Bus power supply

The Model SN5530 supplies S-Bus line power on the BRI ports that can be activated individually for each port. If a port is switched to TE mode, line power is switched off. A total of 4W are available.

Congratulations, you have finished installing the SmartNode Enterprise Session Border Controller! Now go to Chapter 4, “[Initial Configuration](#)” on page 31.

Chapter 4 Initial Configuration

Chapter contents

- Introduction 32
- Connecting the SmartNode to Your Laptop PC..... 32
- Configure the Desired IP Address..... 33
 - Factory-default IP Settings 33
 - Login 33
 - Changing the WAN IP address 33
- Connecting the SmartNode to the Network..... 34
- Loading the Configuration (optional)..... 35
- Additional Information 35

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 25.

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

Connecting the SmartNode to Your Laptop PC

First, the SmartNode must be connected to the main 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.



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.

The SmartNode SN5530 is equipped with Auto-MDX Ethernet ports, so you can use straight-through cables for host or hub/switch connections (see figure 7).

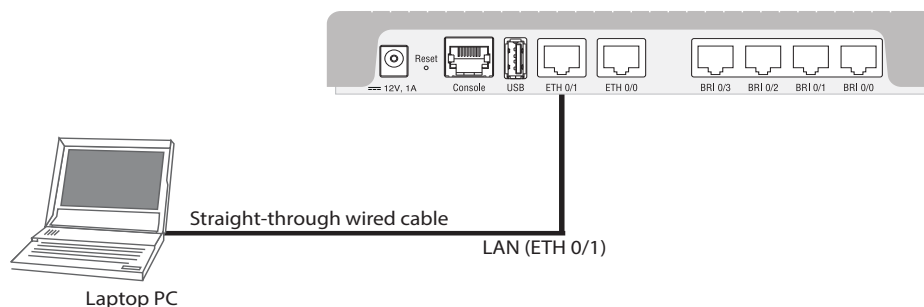


Figure 7. Connecting the SmartNode to your Laptop PC

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
```


Configure 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
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 “[Connecting the SmartNode to the Network](#)” on page 34. Otherwise, refer to the following sections to change the addresses and network masks.

Login

To access the SmartNode, start the Telnet application. Type either the host name **smartnode.local**

or the default IP address into the address field of the Telnet application:

192.168.1.1

Accessing your SmartNode via a Telnet session displays the login screen. Type the factory default login: *admin* and leave the password empty. Press the Enter key after the password prompt.

```
login:admin
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 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]#no ipaddress DHCP
192.168.1.1(if-ip)[WAN]#ipaddress WAN 172.16.1.99/24
2002-10-28T00:09:40 : 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.

Note The modified configuration is applied immediately. It is not necessary to reboot the device when changing any configuration parameter.

```

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.

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 SN5530 is equipped with Auto-MDX Ethernet ports, so you can use straight through or crossover cables for host or hub/switch connections. (see [figure 8](#)).



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.



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.

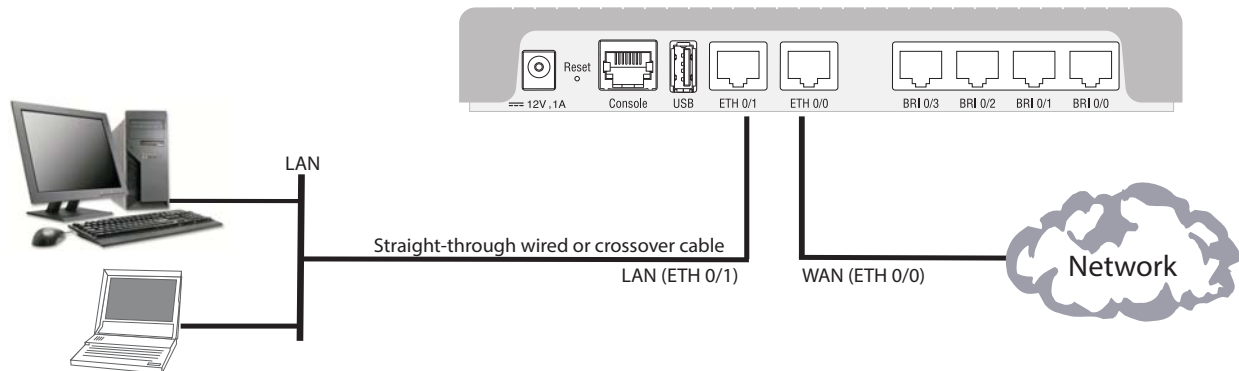


Figure 8. Connecting the SmartNode to the network

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 the Trinity Software Configuration Guide.)

Note Connecting both ethernet ports to the same switch will only work if the switch has separate ARP tables for each connection.

Loading the Configuration (optional)

Patton provides a collection of configuration templates on the support page at:

<http://www.patton.com/support/kb.asp> —one of which may be similar enough to your application that you can use it to speed up configuring the SmartNode. Simply download the configuration note that matches your application to your PC. Adapt the configuration as described in the configuration note to your network (remember to modify the IP address) and copy the modified configuration to a TFTP server. The SmartNode can now load its configuration from this server.

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 SmartNode Series Trinity Configuration Guide for information on configuring the SmartNode 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 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 Software Configuration Guide available online at www.patton.com/manuals.

Chapter 5 **Contacting Patton for Assistance**

Chapter contents

- Introduction37
- Contact information37
 - Contacting Patton Technical Services for Free Support37
- Warranty Service and Returned Merchandise Authorizations (RMAs)37
 - Warranty coverage37
 - Out-of-warranty service38
 - Returns for credit38
 - Return for credit policy38
 - RMA numbers38
 - Shipping instructions38

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.

Contacting Patton Technical Services for Free Support

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**

Chapter contents

- Compliance40
 - EMC40
 - Safety40
- Radio and TV Interference (FCC Part 15)40
- EC Declaration of Conformity40
- Authorized European Representative40
- ISDN Compliance41

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

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).

EC 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

ISDN Compliance

The device is approved for connection to the public ISDN telecommunication network.



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.

Appendix B Specifications

Chapter contents

DSP.....	43
Voice Connectivity.....	43
Data Connectivity.....	43
WAN Interface (if applicable).....	43
Voice Processing (signalling dependent).....	45
Fax and modem support.....	45
Voice Signalling.....	45
Voice Routing—Session Controller.....	46
IP Services.....	46
Management.....	47
System.....	47
Physical.....	47
Plastic Enclosure.....	47
Metal Enclosure.....	47

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

DSP

One 4, 8 or 16-channel DSP (depending on model)

Voice Connectivity

2, 4 or 8 ISDN BRI S0/T0 (S/T), 4-wire

RJ-45 ports NT/TE configurable per port

Point-to-point, point-to-multipoint configurable

Life-line bypass relay between port pairs BRI 0/0 & BRI 0/1, BRI 0/2 & BRI 0/3, etc. (Depends on model; /R option)

ISDN line power can be switched on per software per port

Data Connectivity

Two 10/100/1000Base-TX Ethernet ports

All ports full duplex, autosensing, auto-MDX

WAN Interface (if applicable)

Note For information on configuring the WAN interface, see Chapter 4, “Initial Configuration” on page 31.

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

Table 6. WAN Interface Specifications

Factor	Specs
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
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, refer to http://www.patton.com/products/sfpmodules.asp)

Voice Processing (signalling dependent)

Four, eight, or 16 full-duplex channels with voice CODECS:

- G.711 A-Law/-Law (64 kbps)
- G.722 (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
- AMR-NB (4.75, 5.15, 5.9, 6.7, 7.4, 7.95, 10.2, 12.2 kbps)
- iLBC at 13.33 & 15.2 kbps

G.168 echo cancellation (128 ms)

Four, eight, or 16 simultaneous low-bandwidth 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, etc.)

Configurable transmit packet length

RTP/RTCP (RFC 1889)

SRTP (RFC 3711)

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

SIPv2 over IPv6

SIPv2 over TLS

SIP call transfer, redirect

Overlap or en-bloc dialing

DTMF in-band, out-of-band

Configurable progress tones

Voice Routing—Session Controller

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

TR-069 for configuration & firmware provisioning through auto-configuration server (ACS)

Radius, TACACS+

HTTP web management and firmware loading

TFTP configuration & firmware loading

HTTPS configuration & firmware provisioning

SNMP v1 agent (MIB II and private MIB)

Built-in diagnostic tools (trace, debug)

Secure Auto-provisioning

System

Dual Core CPU Broadcom BCM53012 operating at 1GHz

Memory:

- 256 Mbytes DRAM
- 128 Mbytes Flash

Physical

Plastic Enclosure

Dimensions: 8.2 x 1.3H x 6.5D inch (20.8W X 3.4H x 16.5D cm)

Weight: <15.9 oz. (<450 g)

Power Consumption: <10W

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

Operating humidity: up to 90%, non condensing

Metal Enclosure

Dimensions: 12.11W x 1.77H x 6.09D inch (30.75W X 4.49H x 15.46D cm)

Weight: 25.6 oz (725 g)

Power Consumption: <10W

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

Operating humidity: up to 90%, non condensing

Appendix C **Cabling**

Chapter contents

Introduction.....	49
Serial Console.....	49
Ethernet	50
ISDN BRI.....	51

Introduction

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

Serial Console

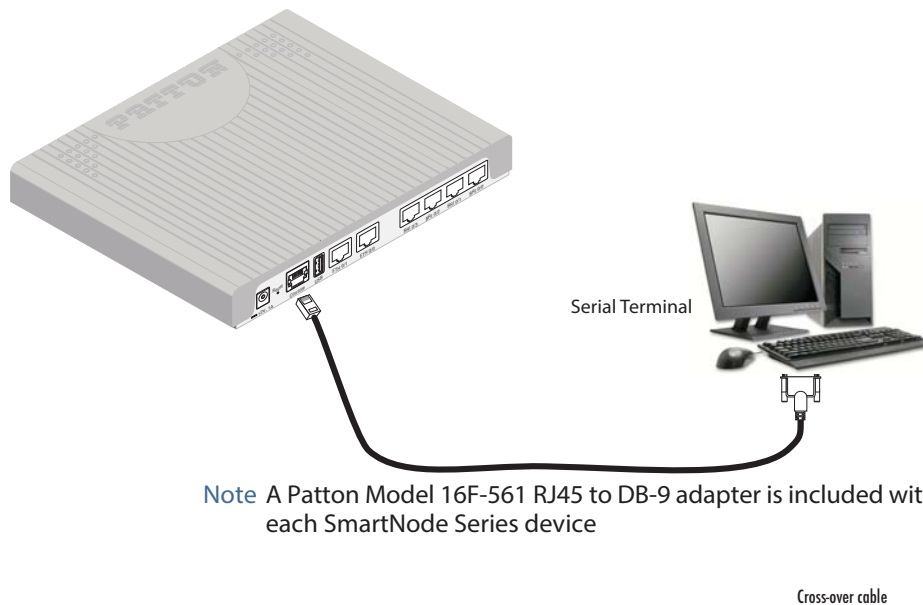
The SmartNode can be connected to a serial terminal over its serial console port, as depicted in [figure 9](#).



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.



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.



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

Figure 9. Connecting a serial terminal

Console Connection settings:

- 19200 Bps
- 8bits, no parity
- 1stop bit
- flow control off

Note See section “[Console port](#)” on page 53 for console port pin-outs.

Ethernet

Ethernet devices (10/100/1000 Base-T) are connected to the SmartNode over a cable with RJ-45 plugs. All Ethernet ports on the SN5530 are Auto-MDX. Use any straight or crossover cable to a host, hubs, switches, PCs or other devices.



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.



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.

Note Connecting both Ethernet ports to the same switch will only work if the switch has separate ARP table for each connection.

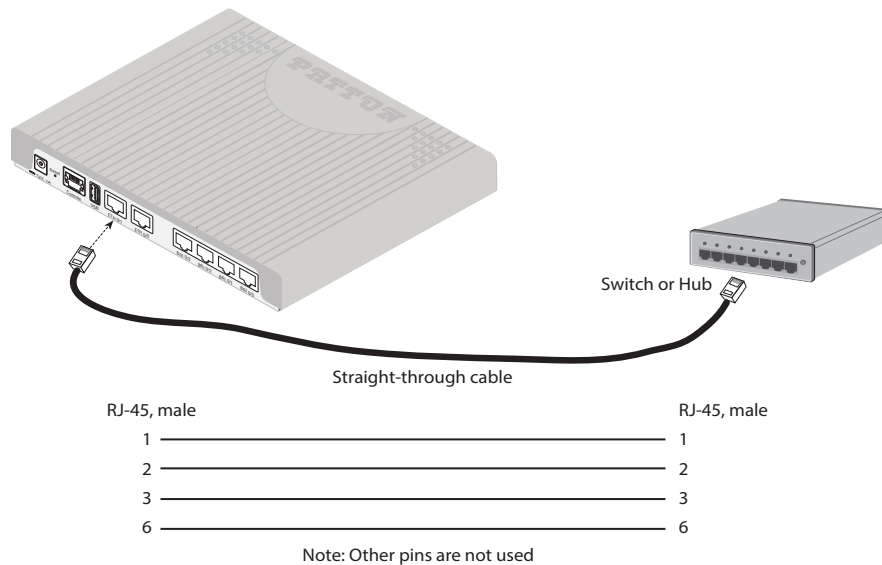


Figure 10. Typical Ethernet straight-through cable diagram for 10/100Base-T

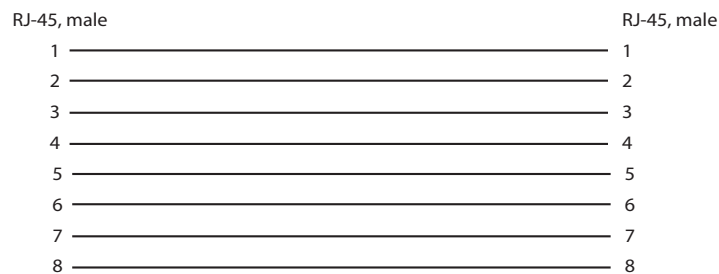


Figure 11. Typical Ethernet straight-through cable diagram for 1000Base-T

ISDN BRI

The ISDN ports are connected to ISDN terminals (Phones, PBXs) or an ISDN NT using cables terminated with RJ-45 connectors. Use straight-through cables to connect to the S/T port of your NT or phones/PBX.



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.



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.

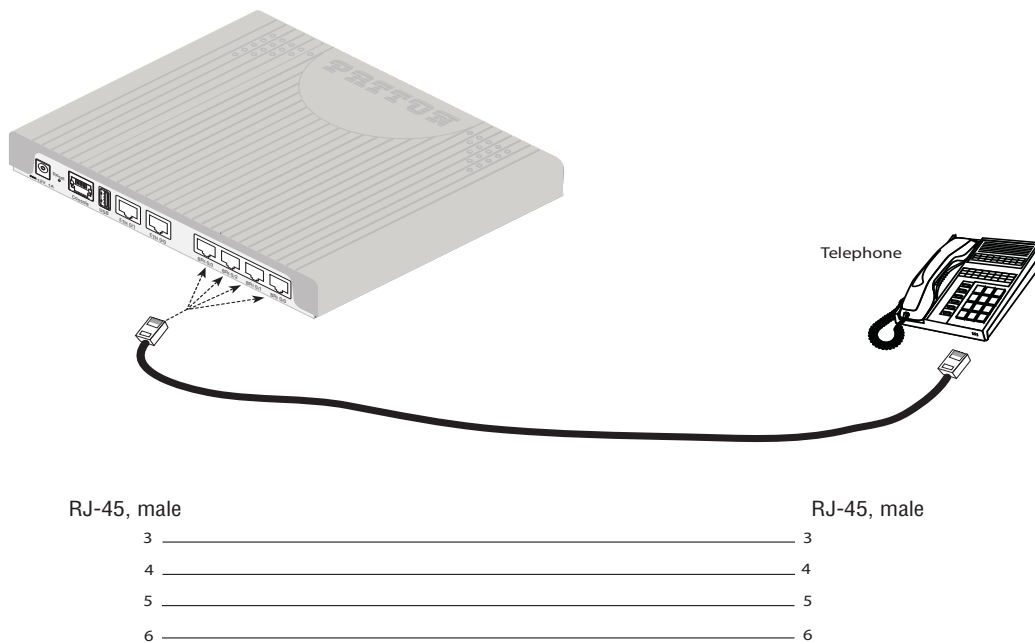


Figure 12. Connecting an ISDN device

Appendix D **Port pin-outs**

Chapter contents

Introduction.....	53
Console port.....	53
Ethernet	53
VDSL-ADSL Port (/A and /AVA & /AVB models only).....	54
G.SHDSL EFM & ATM port (/2G and /4G models).....	54
Fiber Ports (/F models only).....	55
ISDN BRI (NT/Net or TE/User) ports (0/0–0/7).....	55

Introduction

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

Console port

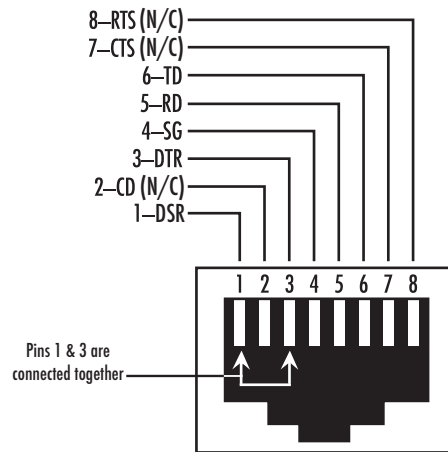


Figure 13. EIA-561 (RJ-45 8-pin) port

Note N/C means no internal electrical connection.

Console Connection Settings:

- 19200bps
- 8 bits, no parity
- 1 stop bit
- flow control off

Ethernet

Table 7. 10/100 Base-T RJ-45 socket

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

Note Pins not listed are not used.

Table 8. 1000Base-T RJ-45 Socket

Pin	Signal
1	TRD0+
2	TRD0-
3	TRD1+
4	TRD1-
5	TRD2+
6	TRD2-
7	TRD3+
8	TRD3-

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

Table 9. VDSL-ADSL Port: RJ-45 connector

Pin	Signal
4	Tip
5	Ring

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



CAUTION

RJ11 connectors **ARE NOT** to be inserted in to RJ45 sockets. An RJ11 connector can cause permanent damage to RJ45 socket pins and cause data connections to fail. An RJ11 to RJ45 adapter should be used if necessary.

Fiber Ports (/F models only)

For tested and approved modules, please refer to the list of SFPs that Patton has tested at:

<http://www.patton.com/products/sfpmodules.asp>

ISDN BRI (NT/Net or TE/User) ports (0/0–0/7)

The BRI phone port uses an 8-pin RJ-45 connector (the pinout shown in [table 11](#))

Table 11. RJ-45 Socket

Pin	Signal
3	Rx+
4	Tx+
5	Tx-
6	Rx+

Note Pins not listed are not used

Note All pins between the even and odd BRI port pair (BRI 0/0&BRI0/1; BRI0/2&BRI0/3, etc) are connected during power failure. Fallback relay operation (depending on model. Only for Models with /R in Product code:

- When the unit is not powered, the fallback relay connects pins 3, 4, 5, and 6 of the net and the user ports (fallback) together. This enables you to place calls to the PSTN even if the unit is powered down.
- Line power applied to the Line port is fed through to the Phone port at all times and independent of the fallback relay's status.

Note On each ISDN BRI port in TE mode, it is possible to switch on ISDN line power per software. The total amount of power is 4W. If a ISDN BRI port is switched to NT mode, the ISDN line power is turned off.

Appendix E **SmartNode SN5530 Factory Configuration**

Chapter contents

Introduction.....	57
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Introduction

The factory configuration settings for SmartNode SN5530 can be obtained with the following command through the CLI;

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

Refer to Chapter 4, "[Initial Configuration](#)" on page 31 for more details about IP address settings for initial configuration.

Appendix F **Reset Button Functions**

Chapter contents

- Introduction 59
- Resetting the SmartNode device when it is operating and the Power LED is lit 60
- Resetting the SmartNode device when it is initially powered off 60
 - Very exceptional case - minimal config recovery 61

Introduction

The *Reset* button (see figure 14) 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 60)
- 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 60)
- 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 60)
- Troubleshoot the SmartNode device if it is not booting properly (see section “Resetting the SmartNode device when it is initially powered off” on page 60)

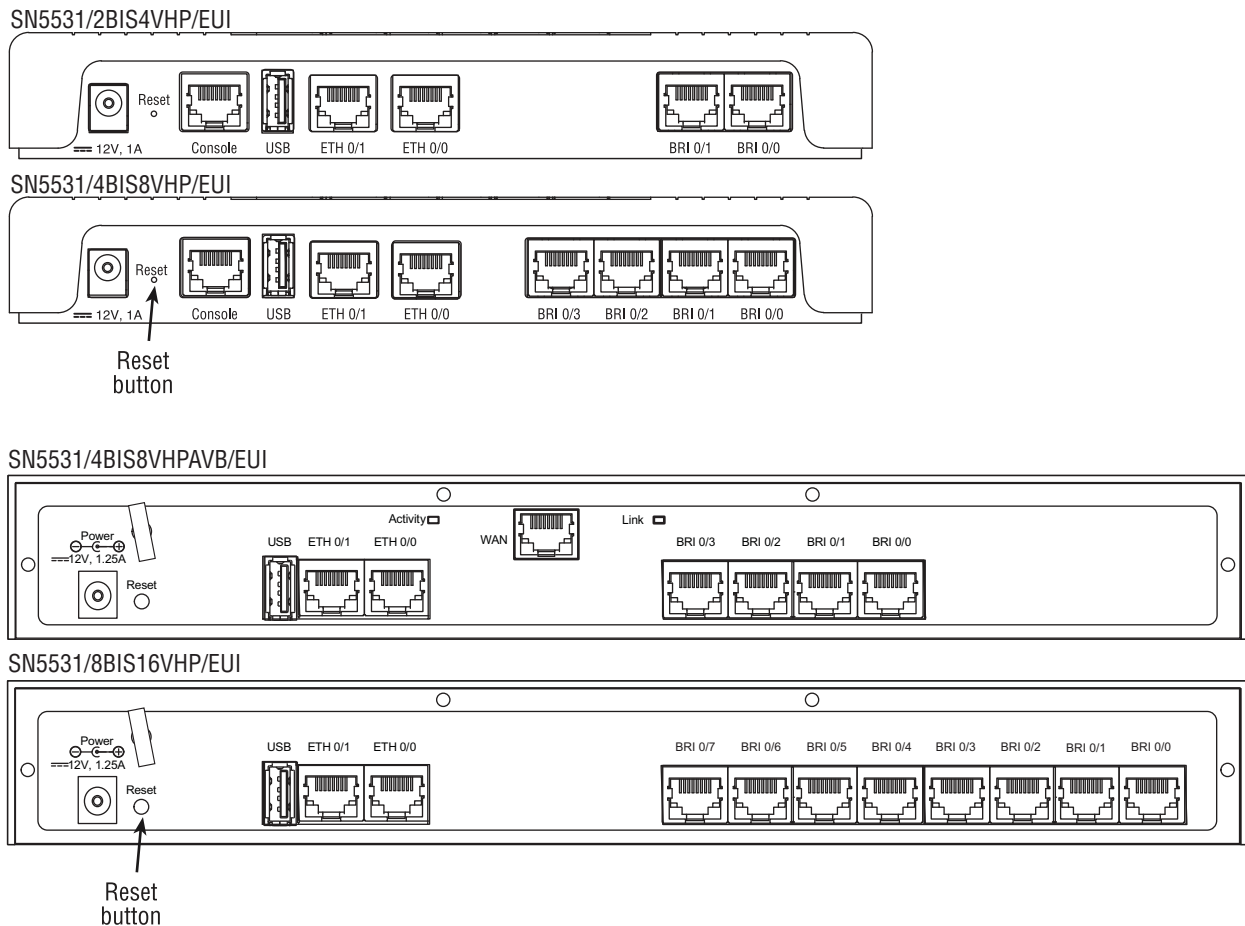


Figure 14. SN5530 Reset button

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 15](#)) the button is pressed (see [table 12](#) for the results from pressing the button).



Figure 15. Reset button periods (in seconds) for performing actions

Table 12. Results from pressing the Reset button

Period	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)

Resetting the SmartNode device when it is initially powered off



This procedure should **only** be performed if the SmartNode device is not booting properly. It should be used by trained SmartNode technicians and Patton Support personnel only.

If the SmartNode device is not booting properly, the *Reset* button may remedy the problem by switching to the backup image.

The following procedure must be performed starting with the SmartNode device in a powered off state:

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 (see [table 13](#)).

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

LED Blink Pattern	Action
1-blink, pause	Boot normally
2-blinks, pause	Switch to backup image, then Boot normally

3. Repeatedly pressing and releasing the *Reset* button will cycle through the blink patterns.
4. When you get to the 2-blink pattern that will switch to backup image, release the *Reset* button. 10 seconds later, the device will switch to the backup image, then boot normally.

If the SmartNode device is still not working properly, see section “[Very exceptional case - minimal config recovery](#)”.

Very exceptional case - minimal config recovery

If, after performing the procedure in section “[Resetting the SmartNode device when it is initially powered off](#)” on page 60, 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 37 for details.



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 initially powered off](#)” on page 60 did not provide a remedy.



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 patterns starting with 1-blink, pause.

Table 14. Using the *Reset* button to switch to erase flash memory

LED Blink Pattern	Action
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 14](#)), 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**

Chapter contents

- End User License Agreement64
 - 1. Definitions64
 - 2. Title64
 - 3. Term64
 - 4. Grant of License64
 - 5. Warranty65
 - 6. Termination65
 - 7. Notices65
 - 8. Other Licenses65
 - 9. Unenforceable Provisions66
 - 10. Governing Law66
 - 11. Waiver66

End User License Agreement

By opening this package, operating the Designated Equipment or downloading the Program(s) electronically, the End User agrees to the following conditions:

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- A) “Effective Date” shall mean the earliest date of purchase or download of a product containing the Patton Electronics Company Program(s) or the Program(s) themselves.
- 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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The term of this Agreement is from the Effective Date until title of the Designated Equipment is transferred by End User or unless the license is terminated earlier as defined in section “6. Termination” on page 65.

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- D) Should End User transfer title of the Designated Equipment to a third party after entering into this license agreement, End User is obligated to inform the third party in writing that a separate End User License Agreement from Patton Electronics Company is required to operate the Designated Equipment.

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- A) The End User may terminate this agreement by returning the Designated Equipment and destroying all copies of the licensed Program(s).
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- 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)

7. Notices

Patton devices may log, collect and report data related to installed software, licenses, feature utilization, product performance, device management, service quality and other parameters which is used for quality control, product improvement, license management, service level management and technical support. Collected data may be reported to Patton or a service provider delivering its services connected to the device.

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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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If any part of these terms and conditions are found to be invalid or unenforceable under applicable law, such part will be ineffective to the extent of such invalid or unenforceable part only, without in any way affecting the remaining parts of these terms and conditions.

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The rights and obligations of the parties pursuant to these terms and conditions are governed by, and shall be construed in accordance with, the laws of the State of Maryland, USA.

User may be subject to other local, provincial or state and national laws. User hereby irrevocably submits to the exclusive jurisdiction of the courts of the State of Maryland, USA for any dispute arising under or relating to this agreement and waives user's right to institute legal proceedings in any other jurisdiction. Patton shall be entitled to institute legal proceedings in connection with any matter arising under this agreement in any jurisdiction where User resides, does business, or has assets.

11. Waiver

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.