SmartNode 5600
Enterprise Session Border Controller

User Manual

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

REGULATORY MODEL NUMBER: 13269D4-001

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

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

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About this guide

This guide describes the SmartNode 5600 Enterprise Session Border Controller (eSBC) 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 13 contains what you need to quickly start using the SmartNode device.
- Chapter 2 on page 16 provides information about eSBC features and capabilities
- Chapter 3 on page 20 contains an overview describing eSBC operation and applications
- Chapter 4 on page 22 provides quick start hardware installation procedures
- Chapter 5 on page 27 provides quick-start procedures for configuring the SmartNode eSBC
- Chapter 6 on page 33 contains information on contacting Patton technical support for assistance
- Appendix A on page 36 contains compliance and regulatory information for the eSBC
- Appendix B on page 38 contains specifications for the eSBC
- Appendix C on page 42 provides cable recommendations
- Appendix D on page 45 describes the eSBC's ports and pin-outs
- Appendix E on page 47 lists the factory configuration settings for SmartNode 5600
- Appendix F on page 49 provides license information that describes acceptable usage of the software provided with the SmartNode 5600

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

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 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 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.

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

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.

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.

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

Deutsch

Warnhinweise:

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 entält 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, Neutralleiter 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.

- 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.
Italicized Helvetica type	Variables for which you supply values are in *italic* 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.

Table 1. General conventions (Continued)

Convention	Meaning
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 Quick Start

Chapter contents

Default IP Settings

ETH 0/0

DHCP Client

ETH 0/1

192.168.1.1 | 255.255.255.0 (DHCP Server)

smartnode.local

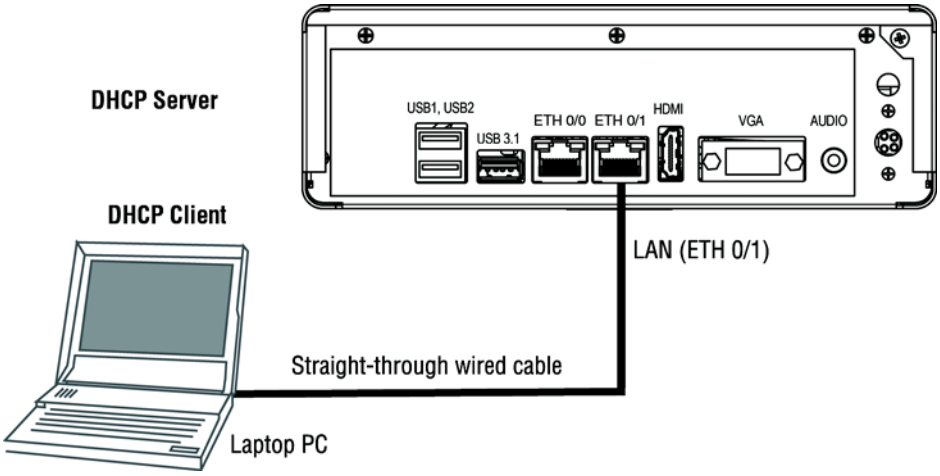


Figure 1. Default IP Settings

Default Login

Username: *admin*

Leave the password empty

Press the *Enter* key after the password prompt.

IMPORTANT

You are responsible for creating a new administrator account to maintain system security. Patton Electronics accepts no responsibility for losses or damage caused by loss or misuse of passwords. Refer to Chapter 4 "Accessing the CLI", section "Selecting a secure password" in the *Trinity Command Line Reference Guide* for more details.

Chapter 2 General Information

Chapter contents

SmartNode 5600 Overview

The SmartNode 5600 Enterprise Session Border Controller (eSBC) (see figure 2) supports up to 1,000 SIP-to-SIP calls. Service demarcation is key for high quality and reliable services, even in All-IP networks. The eSBC comes with built-in security features such as SIP TLS (SRTP coming soon), intelligent ACL, Trust SIP Peer and secure provisioning to protect the LAN networks from fraud strikes out of the Internet. Like all SmartNode eSBC devices, the SN5600 comes with the built in Web Wizard for ease of use, zero touch provisioning features such as Redirect Service using HTTPS, TR-069, TFTP and can be orchestrated from **Patton Cloud**.

Figure 2. SmartNode 5600 eSBC

The SN5600 comes equipped with two Gigabit Ethernet ports and three USB ports.

The SmartNode 5600 eSBC performs the following major functions:

- Up to 1,000 SIP Sessions sessions between IPPBX customer premise equipment and ITSP's SIP Trunks. Protocol conversion between SIP UDP and SIP TCP including SIP-TLS (SRTP coming soon).
- Non transcoded SIP calls: Supports 4 SIP to SIP calls and can be license upgraded to a total of 1,000* (additional cost)
- Secure Enterprise: Enable NAT/NAPT, Access Control Lists with QoS to ensure the most efficient use of your bandwidth
- IP Routing: Policy based routing, Packet filtering, protocol based routing, packet length routing
- SIP registrar
- Patton Cloud Orchestration support includes Secure Zero Touch Provisioning
- 2x USB 2.0 and 1x USB 3.1 host ports 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.

SmartNode 5600 Rear Panel

The SmartNode 5600 is a compact Enterprise Session Border Controller that supports up to 1,000 VoIP or Fax calls, by using either G.711, G.722, T.38 or any other codec as indicated under section "Voice Signaling" on page 39. The SmartNode 5600 rear panel ports are described in table 2.

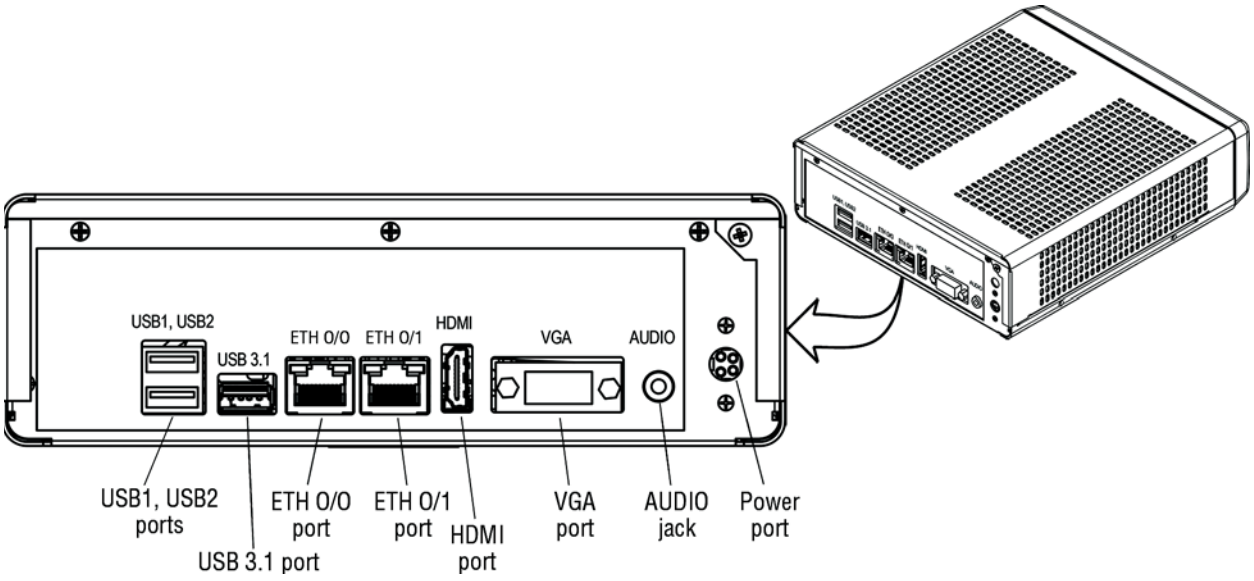


Figure 3. SN5600 rear panel

Ports descriptions

The SmartNode 5600 rear panel ports and LED are described in table 2.

Table 2. Rear panel LED and ports

Ports	Description
USB 1 & USB 2	USB 2.0 host ports (see figure 3) 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
USB 3.1	USB 3.1 host port (see figure 3) 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
ETH 0/0 & ETH 0/1	Auto-MDX Gigabit Ethernet port, RJ-45 (see figure 3), connects the unit to an Ethernet WAN device (for example, a cable modem, DSL modem, or fiber modem).
HDMI	High-definition multimedia interface port.
VGA	VGA port supports 640 x 480 resolution color display screens with a refresh rate of 60 Hz.
AUDIO	3.5 mm audio jack (also called a headphone jack)
Power port	Electricity supply socket 4-pin, 12V, 5.5A

SmartNode 5600 Front Panel

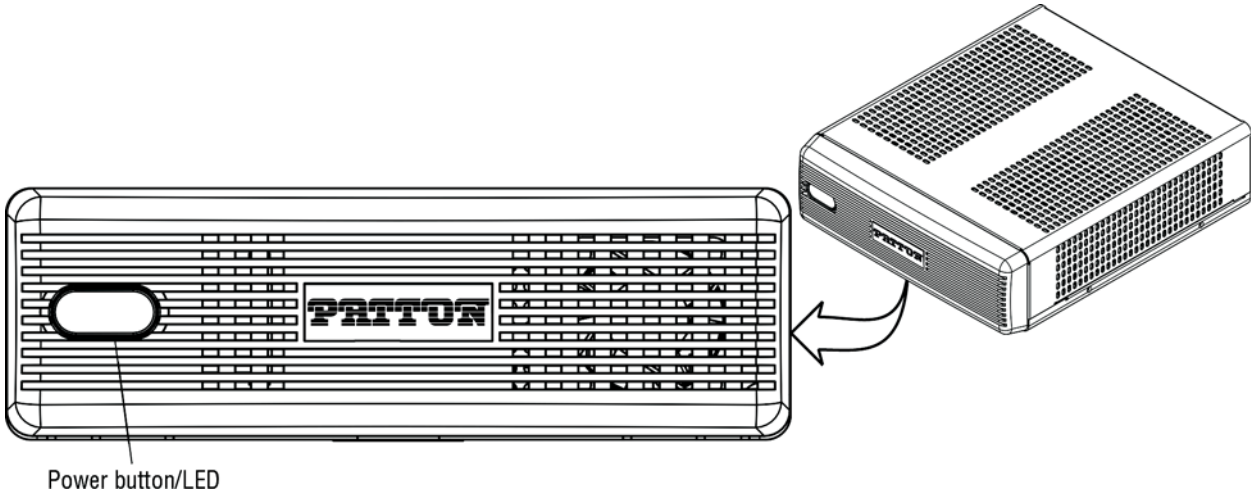


Figure 4. SmartNode 5600 front panel

Figure 4 shows the SmartNode 5600 front panel. Table 3 describes the power button and LED.

Table 3. Front panel power button/LED

Button/LED	Description
Power Button/LED	After pressing the button to boot up the SN5600, the button will glow blue to indicate power to the device. While the device is operating, pressing the button longer than 5 seconds will cause the SN5600 to perform a hard shutdown.

Chapter 3 Applications Overview

Chapter contents

Introduction

Patton's SmartNode eSBC 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/**.

Typical Application

Whether used as an Enterprise Session Border Controller or IP router, the SmartNode 5600 provides excellent VoIP, IP QoS, and security features for seamless network integration (see .

Thanks to the built-in SIP back-to-back user agent, it resolves technology evolution related problems by normalizing SIP traffic from different vendor implementations. In addition, enhanced security is given to the enterprise thanks to various features protecting the LAN infrastructure. Number manipulation and call routing options come standard with every Patton eSBC.

Operated, managed, and administrated through the Patton Cloud, proactive notification of a customer network problem helps reduce service downtime and increase customer satisfaction.

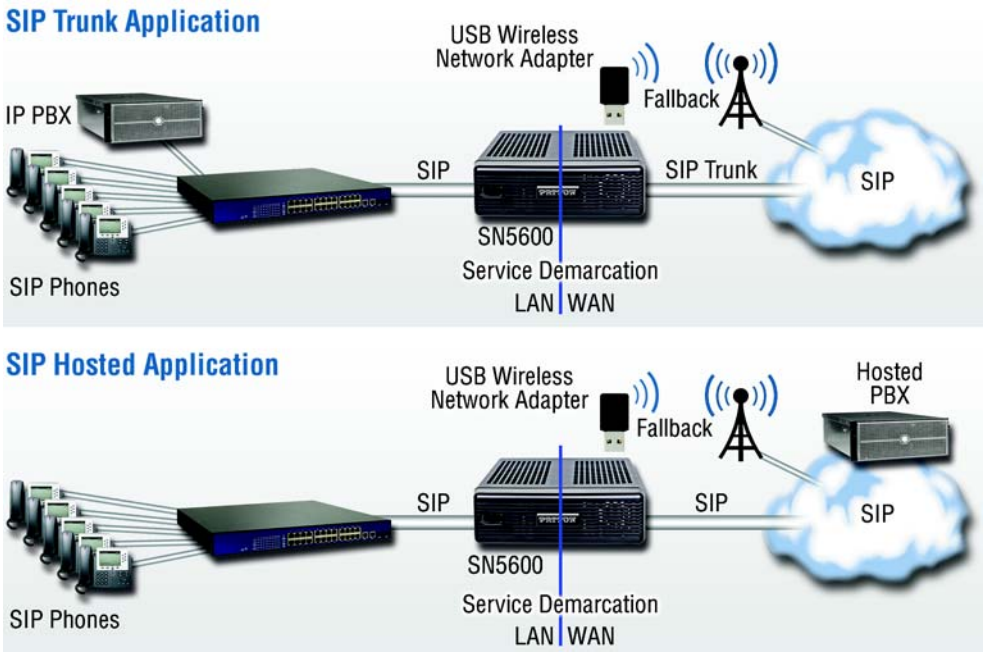


Figure 5. SmartNode 5600 network integration application

Chapter 4 SmartNode Installation

Chapter contents

Planning the Installation

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

- **Create a network diagram** (see section "Network information" on page 23)
- **Gather IP related information** (see section "IP related information" on page 23 for more information)
- **Install the hardware and software needed to configure the SmartNode**. (See section "Software tools" on page 24)
- **Verify power source reliability** (see section "Power source" on page 24).

When you finish preparing for SmartNode installation, go to section "Installing the Patton SmartNode eSBC" on page 24 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 5600 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

The simplest way configuring the SN5600 is through **Patton Cloud**.

Alternatively you may use the Web interface in combination with a Web wizard to get your unit up and running. For more details, see the **Wizard Portal**.

The Command Line Interface is also supported for configuration, and can be accessed through Telnet /SSH. Also see the **Knowledgebase** for config snippets when configuring your device through CLI.

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 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

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 25)

When you finish installing the SmartNode, go to Chapter 5, "Initial Configuration" on page 27.

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 10/100/1000Base-T Ethernet LAN and WAN (see section "Connecting the 10/100/1000Base-T Gigabit Ethernet LAN and WAN cables")
2. Connect the power mains cable (see section"Connecting the Power Supply" on page 25)

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

The SmartNode 5600 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 42 and Appendix D, "Port pin-outs" on page 45.

Connecting the Power Supply

Do the following to connect the main power to the Model SN5600:

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 3 on page 18).

There are no user-serviceable parts in the power supply section of the model SN5600. 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 33 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.
4. Verify that the green power LED on the rear panel is lit.

Congratulations, you have finished installing the SmartNode Enterprise Session Border Controller! Now go to Chapter 5, "Initial Configuration" on page 27.

Chapter 5 Initial Configuration

Chapter contents

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 4, "SmartNode Installation" on page 22.

- 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, verify that the SmartNode is connected to the main power supply with the power cable.

Press the power button (see figure 4 on page 19) to start the boot-up process.

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 5600 is equipped with Auto-MDX Ethernet ports, so you can use straight-through cables for host or hub/switch connections (see figure 6).

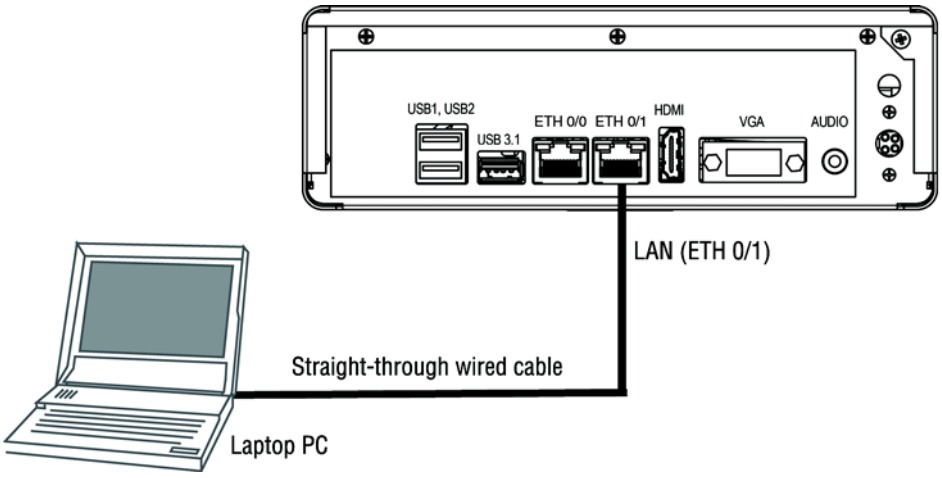


Figure 6. Connecting the SmartNode to your Laptop PC

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
or
smartnode.local
```

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 30. 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)#
```

You are responsible for creating a new administrator account to maintain system security. Patton Electronics accepts no responsibility for losses or damage caused by loss or misuse of passwords. Refer to Chapter 4 "Accessing the CLI", section "Selecting a secure password" in the *Trinity Command Line Reference Guide* for more details.

Changing the WAN IP address (Optional)

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 you 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 5600 is equipped with Auto-MDX Ethernet ports, so you can use straight through or crossover cables for host or hub/switch connections. (See figure 7 on page 31).

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.

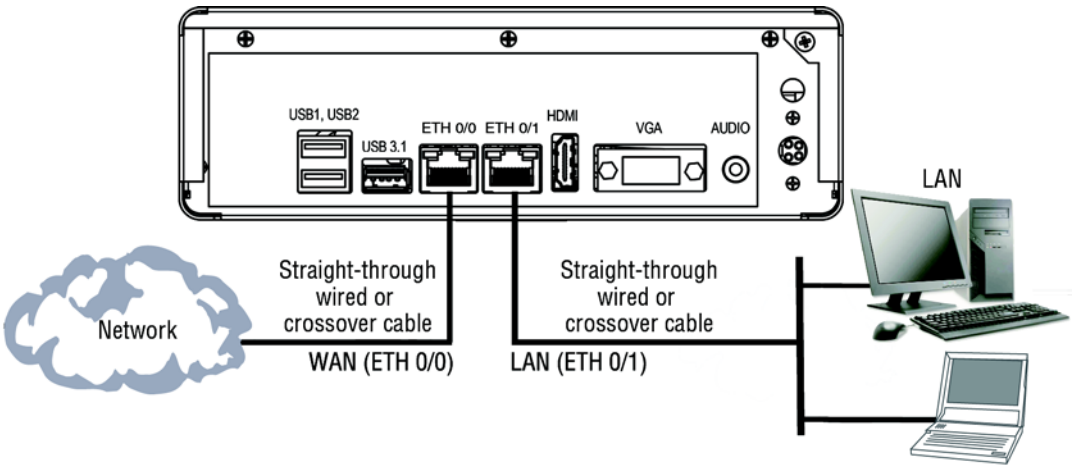


Figure 7. Connecting the SmartNode to the network

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)

The **WebWizard Community** provides a collection of Wizards that help to reduce the setup time of a Patton device. Simply download the 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. In addition to that the **knowledgebase** provides configuration file templates that may fit to 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 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 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 Software Configuration Guide available online at **www.patton.com/manuals**.

Chapter 6 Contacting Patton for Assistance

Chapter contents

Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the 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
Location	**Maryland, USA**	**Bern, Switzerland**	**Budapest, Hungary**
Time Zone	EST/EDT UTC/GMT - 4/5 hours	CET/CEDT UTC/GMT + 1/2 hours	CET/CEDT UTC/GMT + 1/2 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
Email	support@patton.com	support@patton.com	support@patton.com
Phone	+ 1 301 975 1007	+41 31 985 25 55	+36 439 3835
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

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

Appendix B Specifications

Chapter contents

Note Refer to the software feature matrix for the most up-to-date specifications.

Call Capacity

Up to 1,000 SIP to SIP calls*** (license required at additional cost)

Voice Signaling

SIPv2 & SIPv2 over TLS

SIP over IPv4 & IPv6

SIP call transfer, redirect

SIP overlap dialing

DTMF in-band, out-of-band

G.722

G.711m/A-law

G.723.1 (6.4 kbps)

G.729, 729a, 729ab (8 kbps)

G.726 (16 ,24, 32, 40 Kbps)

Transparent Clearchannel (RFC 4040)

iLBC 13.33k

AMR-NB (4.75, 5.15, 5.9, 6.7, 7.4, 7.95, 10.2, 12.2 kbps)

VoIP Security

Network separation

SIP back-to-back UA

SIP TLS & SIP message flood prevention

Open VPN*/IPsec*/L2TP*

DoS detection & prevention

Intelligent ACL

Trusted peer

Quality of Service

Patton Cloud Advanced CDRs and Call Quality Metrics**

Voice priority, DownStreamQoS™

Traffic Management, shaping policing

IEEE 802.1p, IEEE 802.1Q, 4096 VLANs (Tag insertion/deletion), TOS, DiffServ Labeling

Connectivity

2 10/100/1000Base-T Ethernet ports

1 HDMI port

1 VGA port

3 USB ports (2 USB 2.0, 1 USB 3.1)

IP Networking

Routing Protocol support GRE, VRRP, BGP, RIPv1&v2

Policy, Packet and packet length Based Routing

IP Multi-Netting, VLAN, Secondary IP

Network Address and Port translation (NAT/NAPT)

IPv4 & IPv6 DHCP Client & Server

Auto-MDIX

PPPoE Client (multi-session)

IPv4, IPv6 Dual Stack

ICMP

Intelligent ACL, Stateful Firewall

DNS, DynDNS

SNTP Client

Management

Patton Cloud Orchestrated with dynamic resource licensing model (leased/floated)

Web/HTTPs, CLI with Telnet and SSH access

WebWizard

Fully Documented CLI

Telnet and HTTPs access

TR-069, TFTP, HTTP, HTTPS configuration up- and download • TR-069, TFTP, HTTP, HTTPS firmware upgrade

SNMPv1-3 agent

RADIUS, TACACS+

Separate config domain (LAN side config and WAN side config)

MIB II and private MIB

Built-in diagnostic tools

Secure auto-provisioning with built-in root CA

Packaging

Metal chassis

Desktop or wall mountable

Rackmount option: Roadmap

Physical

Dimensions: 7.55W x 2.44H x 8.26D in. (19.2W x 6.2H x 21.0D cm)

Weight: <103.2 oz. (2.92 kg)

Power Consumption: 65 W

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

Operating Humidity: up to 90%, non condensing

Safety & Compliance

EMC compliance: EN55022 and EN55024

Safety compliance: EN 60950

CE compliance

FCC Part 15 Class A

RoHS

Specifications subject to change without notice | * Depending on model | ** Licensed Feature at additional charge | *** Supports up to 1,000 SIP-to-SIP calls under ideal conditions. Transcoding, debugging and/or IP Routing reduce processing capacity.

Appendix C **Cabling**

Chapter contents

Introduction

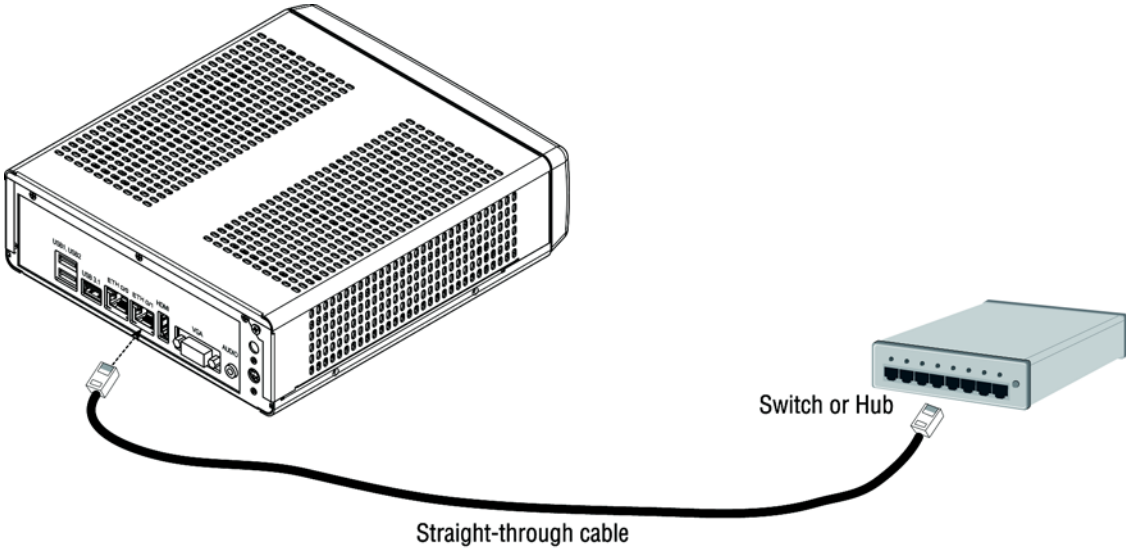
This section provides information on the cables used to connect the SmartNode to the existing network infrastructure and to third party products.

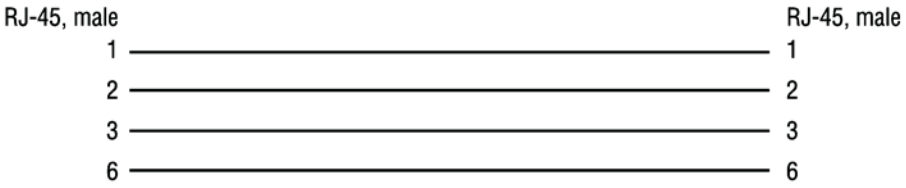
Ethernet

Ethernet devices (10/100/1000 Base-T) are connected to the SmartNode over a cable with RJ-45 plugs. All Ethernet ports on the SN5600 are Auto-MDX. Use any straight or crossover cable to a host, hubs, switches, PCs or other devices.

CAUTION

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





Note Other pins are not used.

Figure 8. Typical Ethernet straight-through cable diagram for 10/100Base-T

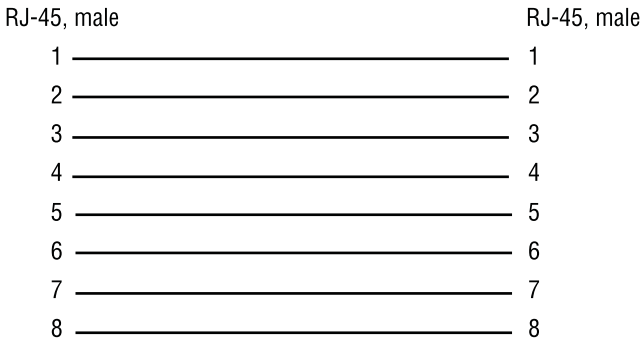


Figure 9. Typical Ethernet straight-through cable diagram for 1000Base-T

Appendix D **Port pin-outs**

Chapter contents

Introduction

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

Ethernet

Table 6. 10/100Base-T RJ-45 socket

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

Note Pins not listed are not used.

Table 7. 1000Base-T RJ-45 Socket

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

Appendix E SmartNode 5600 Factory Configuration

Chapter contents

Introduction

The factory configuration settings for SmartNode 5600 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 5, "Initial Configuration" on page 27 for more details about IP address settings for initial configuration.

Appendix F End User License Agreement

Chapter contents

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:

1. Definitions

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.

2. Title

Title to the Program(s), all copies of the Program(s), all patent rights, copyrights, trade secrets and proprietary information in the Program(s), worldwide, remains with Patton Electronics Company or its licensors.

Patton does not convey any intellectual property title or rights in the Licensed Products to Licensee. All Licensed Products furnished by Patton, and all copies thereof, and compilations, programmatic extension, and all Patches, Updates, Upgrades and Platform Releases, are and shall remain the property of Patton or Patton's licensors, as applicable. Further, the Licensed Products provided under this Agreement are not custom software but are standard commercial software. Except for the license use rights otherwise expressly provided in this Agreement, no right, title or interest in Patton Licensed Products is granted hereunder. Licensee shall not use any proprietary information of Patton to create any computer software program or user documentation, which is substantially similar to the Licensed Products.

3. Term

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 51.

4. Grant of License

A) During the term of this Agreement, Patton Electronics Company grants a personal, non-transferable, non-assignable and non-exclusive license to the End User to use the Program(s) only with the Designated Equipment at a site owned or leased by the End User.

B) The End User may copy licensed Program(s) as necessary for backup purposes only for use with the Designated Equipment that was first purchased or used or its temporary or permanent replacement.

C) The End User is prohibited from disassembling; decompiling, reverse-engineering or otherwise attempting to discover or disclose the Program(s), source code, methods or concepts embodied in the Program(s) or having the same done by another party.

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.

5. Warranty

The Program(s) are provided "as is" without warranty of any kind. Patton Electronics Company and its licensors disclaim all warranties, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose or non-infringement. In no event shall Patton Electronics Company or its licensors be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use of or inability to use the Program(s), even if Patton Electronics Company has been advised of the possibility of such damages. Because some states do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

If the Program(s) are acquired by or on behalf of a unit or agency of the United States Government, the Government agrees that such Program(s) are "commercial computer software" or "computer software documentation" and that, absent a written agreement to the contrary, the Government's rights with respect to such Program(s) are limited by the terms of this Agreement, pursuant to Federal Acquisition Regulations 12.212(a) and/or DEARS 227.7202-1(a) and/or sub-paragraphs (a) through (d) of the "Commercial Computer Software—Restricted Rights" clause at 48 C.F.R. 52.227-19 of the Federal Acquisition Regulations as applicable.

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 50.

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.

Patton may use this information for other business purposes, such as to alerting you to updated products or services, securing access to software updates, and assisting in order processing.

Any and all information collected by Patton or its assigns will be kept strictly confidential and will not be sold, rented, loaned, or otherwise disclosed to any third party except as required by law.

8. Other Licenses

The Program may be subject to licenses extended by third parties. Accordingly, Patton Electronics Company licenses the Programs subject to the terms and conditions dictated by third parties. Third party software identified to the Programs includes:

- The LGPL (Lesser General Public License) open source license distributed to you pursuant to the LGPL license terms (**http://www.gnu.org/licenses/lgpl.html**).
- 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.

9. Unenforceable Provisions

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.

10. Governing Law

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.