SmartNode SN-SFP Series

T1/E1/PRI VoIP Gateways

(SN-SFP VoIP SFP Module, T1/E1 Emulation VoIP Gateway)

User Manual

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

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About this guide

This guide describes the SmartNode SN-SFP VoIP Gateway hardware, installation and basic configuration.

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Read this User Manual carefully before you start operating the product.

All connections must be made with the equipment fully powered off!

Do not operate the equipment without proper grounding!

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1. Conventions and Abbreviations

1.1. Designations

This document uses conventional symbols (icons) located on the left side of the page to highlight critical information. The list of the conventional symbols used in this document can be found below:

Indicates a warning that special attention should be paid to a particular section of the document.

Indicates a warning about critical information to which special attention should be paid.

Indicates a note or a piece of explanatory information.

Indicates an example text from the system console, report or other source.

Indicates a tip that saves time and helps the user to work more efficiently.

Indicates a reference to an external document (e.g. specification or other resource) where more detailed information or description can be found.

1.2. Abbreviations

Table 1. Abbreviations

Abbreviation	Description
SIP	The Session Initiation Protocol (SIP) is a communications protocol for signaling, for the purpose of controlling multimedia communication sessions. Internet telephony, business IP telephone systems, service providers and all of the carriers use SIP.
VoIP	Voice over IP is a methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol (IP) networks, such as the Internet.
TDM	Time-division multiplexing (TDM) is a method of transmitting and receiving independent signals over a common signal path by means of synchronized switches at each end of the transmission line so that each signal appears on the line only a fraction of time in an alternating pattern. It is used when the data rate of the transmission medium exceeds that of signal to be transmitted.
E1	Standard of digital transmission of data
D-Channel	D Channel (delta channel) is a telecommunications term which refers to the ISDN channel in which the control and signaling information is carried.
PBX	Private Branch Exchange
SNMP	Simple Network Management Protocol
CDR	Call Detail Record
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
DTMF	Dual-Tone Multi Frequency (tones)
HTTP	HyperText Transfer Protocol. Refer to IETF RFC 1945 and RFC 2068
IP	Internet Protocol. An Internet network-layer protocol
ISDN	Integrated Services Digital Network
IVR	Interactive Voice Response system
MG	Media Gateway. Provides the bearer circuit interfaces to the PSTN and transcodes the media stream.
PCM	Pulse-code Modulation (PCM) is a method used to digitally represent sampled analog signals.
PSTN	Public Switched Telephone Network
RTP	Real-time Transport Protocol. A protocol for encapsulating encoded voice and video streams. Refer to IETF RFC 1889.
RTCP	Real-Time Control Protocol
TCP	Transmission Control Protocol

Abbreviation	Description
UDP	User Datagram Protocol. A connectionless protocol built upon Internet Protocol (IP).

2. Description

This manual will make you familiar with the basics of operating the SN-SFP VoIP Gateway software included with the unit. The contents of this manual cover all the items required to start operating the product immediately.

Read the manual in a cursory manner before you start operating the product and then refer to required sections for help using the Table of Contents.

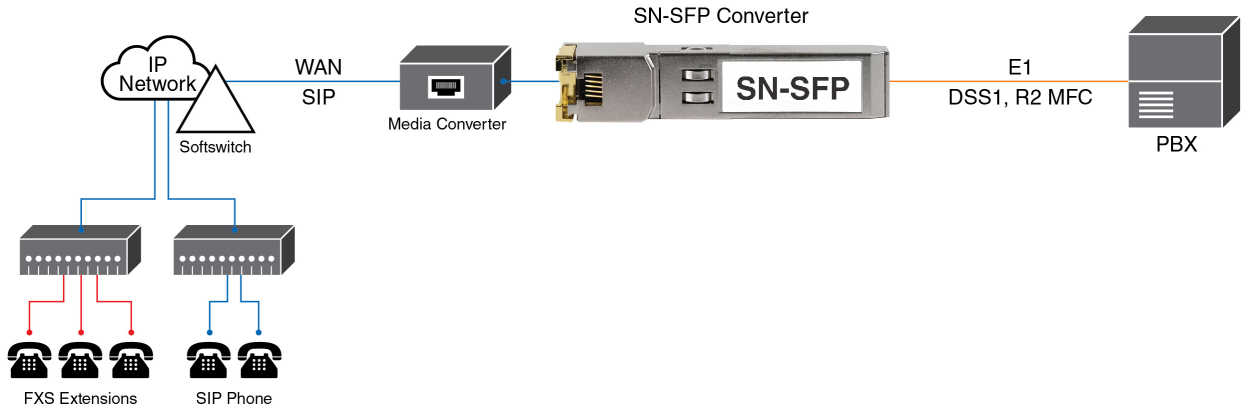
3. System in Brief

The **SN-SFP VoIP Gateway** is a digital VoIP Gateway with one E1 port and connector used to provide connection to the internal board where the Gateway is mounted. The product is designed as a SFP module.

Depending on the application, the device can be used as:

1. **SN-SFP VoIP Gateway (DSS1)** — a low-cost VoIP gateway with a SFP form factor designed to integrate E1 interface with PRI signaling protocols to IP network with SIP.

Figure 1. Scheme of using the SN-SFP module as a VoIP Gateway (DSS1/R2MFC)



2. **SN-SFP VoIP Gateway (R2MFC)** — a low-cost VoIP gateway with a SFP form factor designed to integrate E1 interface with R2MFC signaling protocols to IP networks with SIP.
3. **SN-SFP VoIP Gateway (IP PBX)** — digital telephony module with a SFP form factor designed to integrate and connect IP-ATC, IVR systems, VoIP gateways, and other dedicated FreeSwitch solutions to PBX and PSTN via an E1 interface.

Figure 2. SN-SFP VoIP Gateway digital module for an IP PBX project

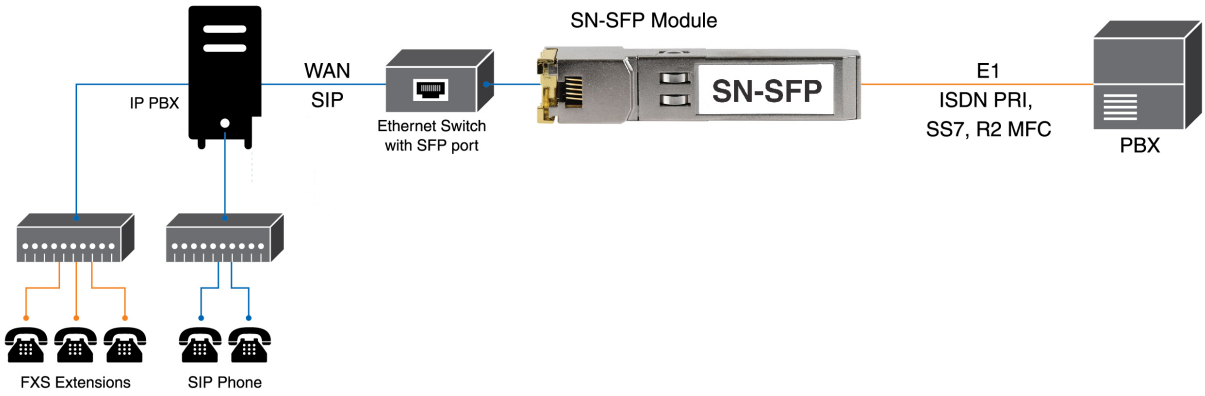


Table 2. Summary

VoIP	SIP 2.0 (RFC 3261)
Network Protocols	IP, TCP, UDP, RTP, RTCP, ARP, NTP, HTTP, Telnet, IEEE 802.1Q, IEEE 802.1P
Signaling Protocols	ISDN PRI (ITU-T Q.931,Q.921), R2MFC
Sound	G.711 u-Law and A-Law, G.711 Appendix 1, G.168, silence suppression, ITU
Network	static IP address
Interfaces	E1 G.703; IEEE 802.3z – 1000Base-X
E1 port impedance	Support for the connection cables with impedances 120Ω.
Security	Filtering by IP addresses, 802.1Q
Control and monitoring	GUI client, Telnet, SNMP v1/v2c Traps, updating software over HTTP, storing/recovering configuration, checking E1 port/signaling status
Power Supply	DC 3.3 V from network equipment
Power Consumption	Up to 1 W
Dimensions	14 x 70 x 14 mm

3.1 Device Specifications

- 1x E1 interface.
- Signaling and control protocols:
  - IP – SIP, RTP, RTCP, TCP, UDP
  - PSTN — ISDN PRI (DSS1, QSIG, Q.931), R2 MFC
- The following services are provided in 30 channels that are simultaneously busy:
  - G.711 compression
  - Fax – fax over G.711, T.38 fax relay
  - DTMF – RFC2833, SIP INFO, RFC 2976
  - Comfort Noise Generation (CNG)
- Power Supply:
  - From an Ethernet internal board where the Gateway is mounted in compliance with the SFF-8074i standard (3.3V rated voltage DC)
  - Power consumption: up to 1W
- Design Specifications:
  - SFP housing
  - Weight: 0.03 kg
- DSS1, R2MFC Signaling and SIP protocols

3.2. Operating Conditions

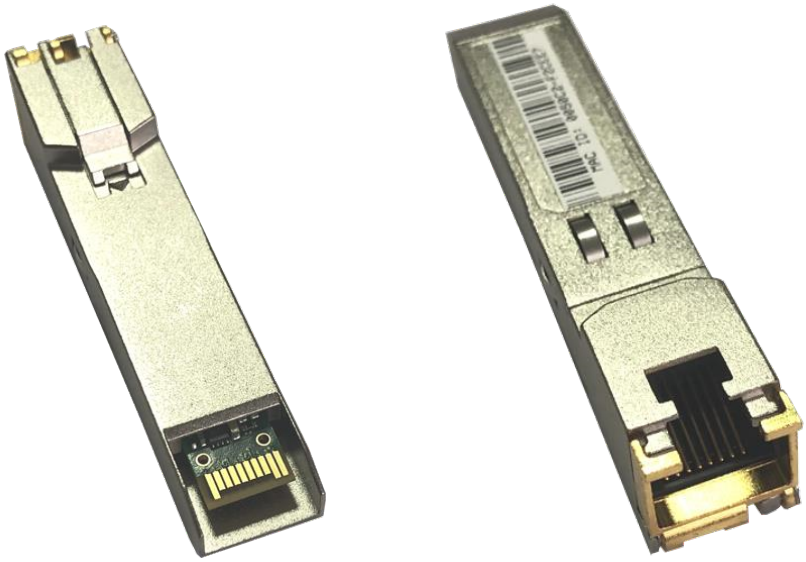
- Ambient temperature: **from 0 to +50°C**
- Relative humidity: **from 5 to 80%**
- Operating regime: **24/7**
- Mean time between failures: **50,000 hours**

3.3. General View

The SN-SFP VoIP Gateway is a Small Form-factor Pluggable (SFP) module that supports a physical Ethernet connection and an E1 (G.703) interface.

The module is inserted from one side into a SFP slot of a main unit (switch, router or similar unit). The other side of the module features the connector designed specifically to connect to an E1 - RJ45 interface.

Figure 3. Appearance of the SFP VoIP Gateway



4. Installing and Removing the Device

The SN-SFP VoIP Gateway can be installed when the main unit is either turned off or turned on.

1. Insert the SFP module with the latch locked into the SFP slot of the main unit as shown in the figure below (Figure 4).

Figure 4. Installation of SFP VoIP Gateway

2. Apply some pressure on the module. When it is properly inserted (Figure 5) you'll hear a distinctive sound.

Figure 5. Installed SFP VoIP Gateway

To remove the module:

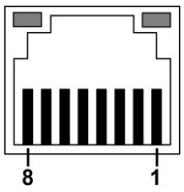
1. Unlock the module latch (Figure 6).

Figure 6. Installed SFP VoIP Gateway module with open latch

2. Remove the module from the slot of the main unit (Figure 7).

Figure 7. Extract SFP VoIP Gateway

5. Pin-out of E1 Port Contacts



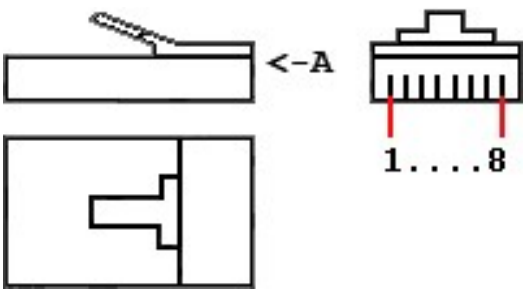
Type: RJ-45, socket, 8 pins (Short for Registered Jack-45) for connecting E1 channel.

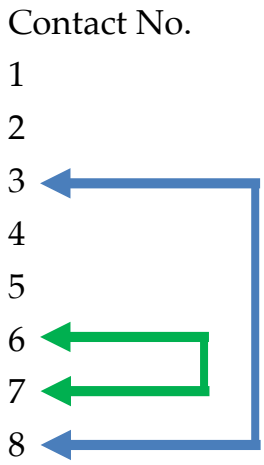
Table 3. E1 flow connector (RJ-45)

Contact number	Description
1	Output PCM
2	Output PCM
3	Not connected
4	Input PCM
5	Input PCM
6	Not connected
7	Not connected
8	Not connected

6. Reset to Factory Settings

To reset the product to factory settings the dedicated RJ45 loop stub is used. The crimping scheme is shown below.





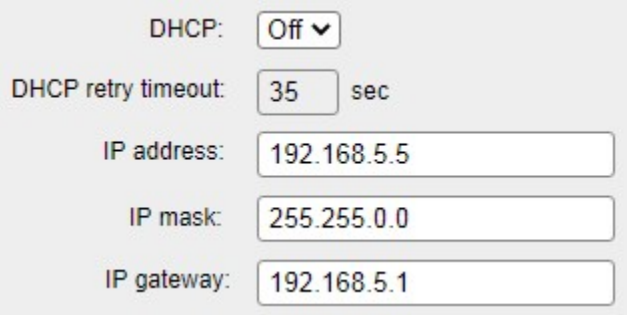
To reset the product, insert this stub into the product slot for 2-3 seconds. After 10 seconds the product will reload with factory settings.

7. Management via the WEB Interface

Control via a Web GUI interface is available for the **SN-SFP VoIP Gateway**.

When the product is connected for the first time it launches with factory network settings (Figure 8).

Figure 8. Factory Network Settings



If DHCP protocol is not available then the factory network settings are applied.

The settings of the product can be controlled using the Web interface. To access the Web interface, specify the IP address of the product in the browser's address bar (e.g. Internet Explorer, Mozilla, Chrome, Opera).

The product Web interface contains the main menu. To access any menu item, click on that item. The current menu item will be highlighted.

To exit a menu item, simply go to another menu item using the main menu bar (which is always available).

7.1. WEB Interface SFP VoIP Gateway (DSS1/R2MFC)

7.1.1. Network

The **Network** subsection is designed to set up the product to work under your operating conditions. The **Save** and **Reboot** buttons are used to save applied changes. After the applied changes are saved the module will reload.

Save button - saves your changes.

Reboot button - saves your changes and reboots the device to apply the saved changes.

Note! If you change the network settings then you will need to re-enter the Web interface using the new address.

The table below lists the settings that can be configured. It contains 2 sections: GENERAL and SIP (Figure 9).

Table 4. Network

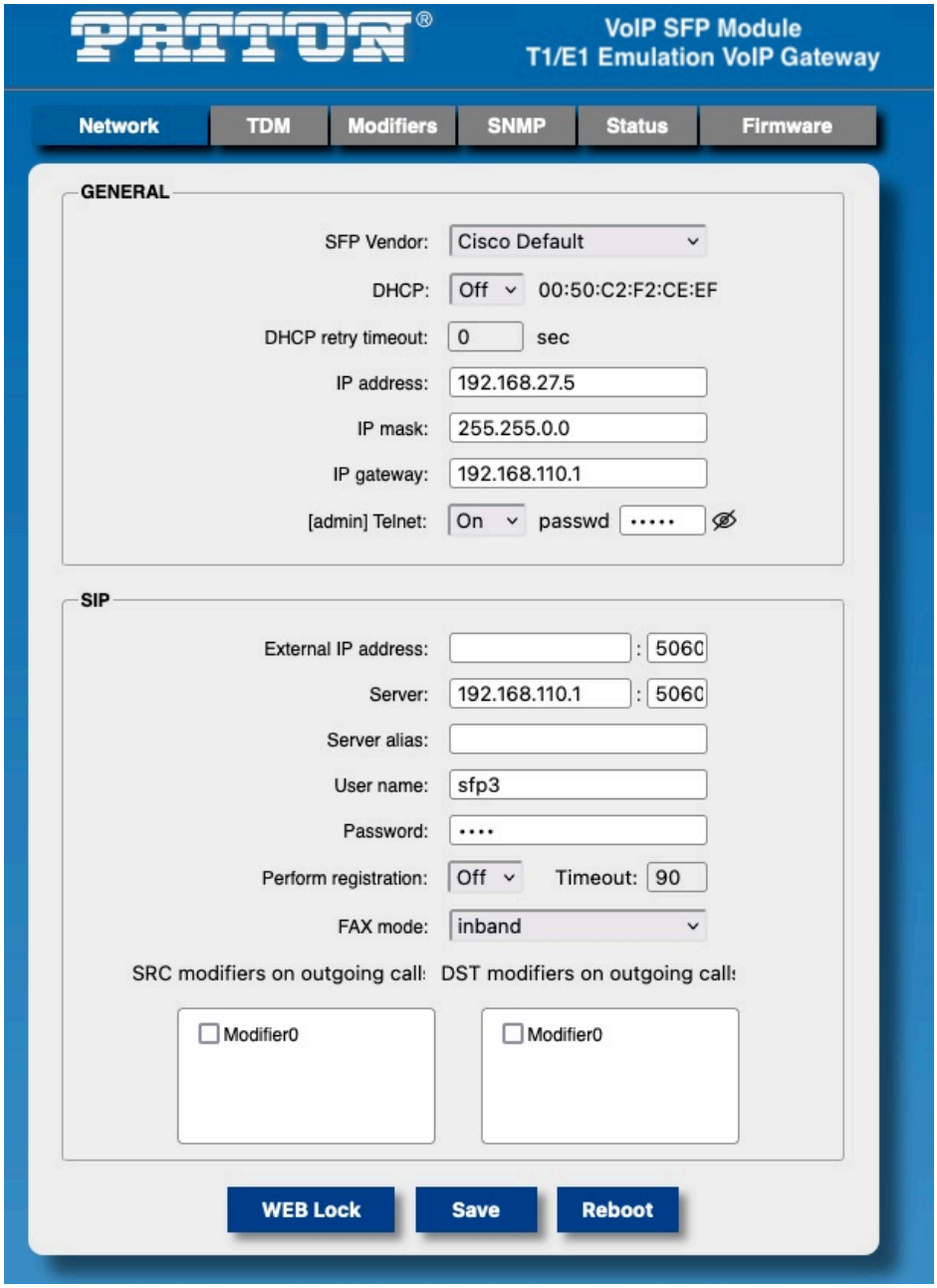
Parameter	Description	Value
[GENERAL]		
SFP Vendor	Choosing I2C Vendor EEPROM	Cisco Default Juniper Extreme Cisco 1 - Cisco 24 * See note after the table.
DHCP	Dynamic Host Configuration Protocol	On – configuration over DHCP Off – manual network configuration
DHCP reply timeout	The delay in obtaining a DHCP address on	For equipment where port service is delayed, you need to set the parameter value in accordance with the requirements of the equipment used
IP address	Product address	
IP mask	Network mask	
IP gateway	Default gateway	
[admin] Telnet	Allow Telnet to be used. User [admin]	On –Yes Off –No (default)
passwd	Telnet access password. User [admin]	The password should be more than 5 characters on "Latin", may contain large and small letters, numbers 0...9 "admin" - default
[SIP]		
External IP address:	External SIP IP address and port	If no port is specified, the port value of the SIP server is used
Server	SIP server address and port	
Server alias	SIP server alias	

User Name	User name to be registered with SIP server	
Password	User password to be registered with SIP server	
Perform registration	Registration with SIP server	On – Yes Off – No
		Status of the registration process:  - OK  Fail (not found, forbidden, timeout and other)
Reg. timeout	Period of user re-registration on the SIP server	1500 sec. - default
FAX mode	Fax transfer mode	T.38 inband
SRC modifiers on outgoing calls	SRC modifiers on outgoing calls	
DST modifiers on outgoing calls	DST modifiers on outgoing calls	

When using more than one SN-SFP VoIP Gateway for Cisco equipment, this parameter must be different for each connected device.

Otherwise, the switch will disable all SN-SFP VoIP Gateways with the same SFP Vendor parameter values.

Figure 9. SFP VoIP Gateway - Network



Note! The WEB Lock button allows you to disable the product Web interface. The changes will be applied after you press Save and Reboot buttons. After rebooting the Web interface cannot be accessed!!!

To restore access to the Web interface it is required to physically remove the product from SFP slot. After cold restart the Web interface can be used for 2 minutes. To unlock the Web interface and use it beyond the 2 minutes, select WEB Unlock button.

Note! To use the product on the global Internet with the actual IP address it is recommended that you block access to the product Web interface.

Note! When Telnet access is enabled, be sure to replace the default "admin" password!!!

7.1.2. TDM

The **TDM** subsection it is used to configure the port E1 and signaling, DSS1 or R2 MFC. The **Save** and **Reboot** buttons are used to save applied changes. After the applied changes are saved the module will reload.

Save button - saves your changes.

Reboot button - saves your changes and reboots the device to apply the saved changes.

The table below lists the settings that can be configured. It contains 2 sections: E1 PORT and DSS1 or R2MFC (Figure 10, Figure 11).

Table 5. TDM

Parameter	Description	Value
[E1 PORT]		
CRC-4	Checksum in E1 channel	On – enabled Off – disabled
Line coding	E1 coding type	HDB3 AMI
Synchronization	E1 channel synchronization	Slave – receive from E1 Master – the product is E1 synchronization source
Jitter buffer	Quantity of 20 msec buffers	4, 8, 12
Signaling type	Signaling type	DSS1 R2MFC
[DSS1]		
PRI side	PRI side	NT — emulates exchange operation TE — emulates ISDN phone operation
Channel choice direction	Channel selection sequence	forward backward

Channel choice algorithm	Channel selection algorithm	cyclic start from first cyclic (even priority) cyclic (odd priority)
Number send mode	Controlling the mode of "complete/ incomplete address information".	en-bloc overlap
Dialplan	List of templates for the current dial plan	Each new template for the current dial plan is assigned in a new line. The following symbols can be used to assign the template: 1234567890*#|[] .,xSL- 1) Digits from 1 to 9. 2) The asterisk (*) and hash (#) characters are used to control additional services. 3) The sequence of digits within square brackets [ ]. It means that any digit displayed within the square brackets can be used. For example the [13579] sequence means that digits 1, 3, 5, 7 and 9 can be used. 4) x. It means any digit. For example the xxxx sequence means that any 4-digit number can be used. 5) Intervals. For example the 1-9 sequence means that any digit from 1 to 9 can be used. The

		interval of values is used within square brackets, i.e. [1-9]. 6) The comma (,) character. It is used to apply the dial tone in the line. For example the 2,3 sequence means that when 2 is dialed the dial tone is applied in the line till 3 is dialed. 7) The period (.) character. If the period is placed following the certain digit this means that it can be included in the number any number of times. For example the 8x. sequence means that a number can be dialed that starts with 8 and has unlimited length and contains any digits. 8) S - it allows to change the value of the "T-shot Timeout" parameter for the current template that is predefined above. 9) L - it allows to change the value of the "T-long Timeout" parameter for the current template that is predefined above. Example: 012345679]x.# 8,[346789]xxxxxxxxx 8,10xxxxxxx 8,1[123] 8,1[489]x 8,[25][1-5]xxxxxxxxx 8,80xxxxxxxx 8,5[6789]xxxxxxxxxxx 8,9998[068]1 [012345679]x.# 8,15xxx
T-long timer	Maximum time (in seconds) that is allowed between dialed digits when no template matches the dialed number to the full extent	
T-short timer	Maximum time (in seconds) that is allowed between dialed digits when at least one template matches the dialed number	

SRC modifiers on outgoing calls	SRC modifiers on outgoing calls	
DST modifiers on outgoing calls	DST modifiers on outgoing calls	
[R2MFC]		
MFS set for register exchange	This parameter is designed to assign the individual option of exchanging dualtone pulses and it is used with signaling where shuttle transfer of address information is applied	
CAS bits inversion		On Off
Outgoing TS range	The range of channels that will be used for outgoing calls	1 … 31
Channel choice direction	Channel selection sequence	forward backward
Channel choice algorithm	Channel selection algorithm	cyclic start from first
		cyclic (even priority) cyclic (odd priority)
SRC modifiers on outgoing calls	SRC modifiers on outgoing calls	
DST modifiers on outgoing calls	DST modifiers on outgoing calls	

Figure 10. SFP VoIP Gateway – TDM (E1 PORT, DSS1)

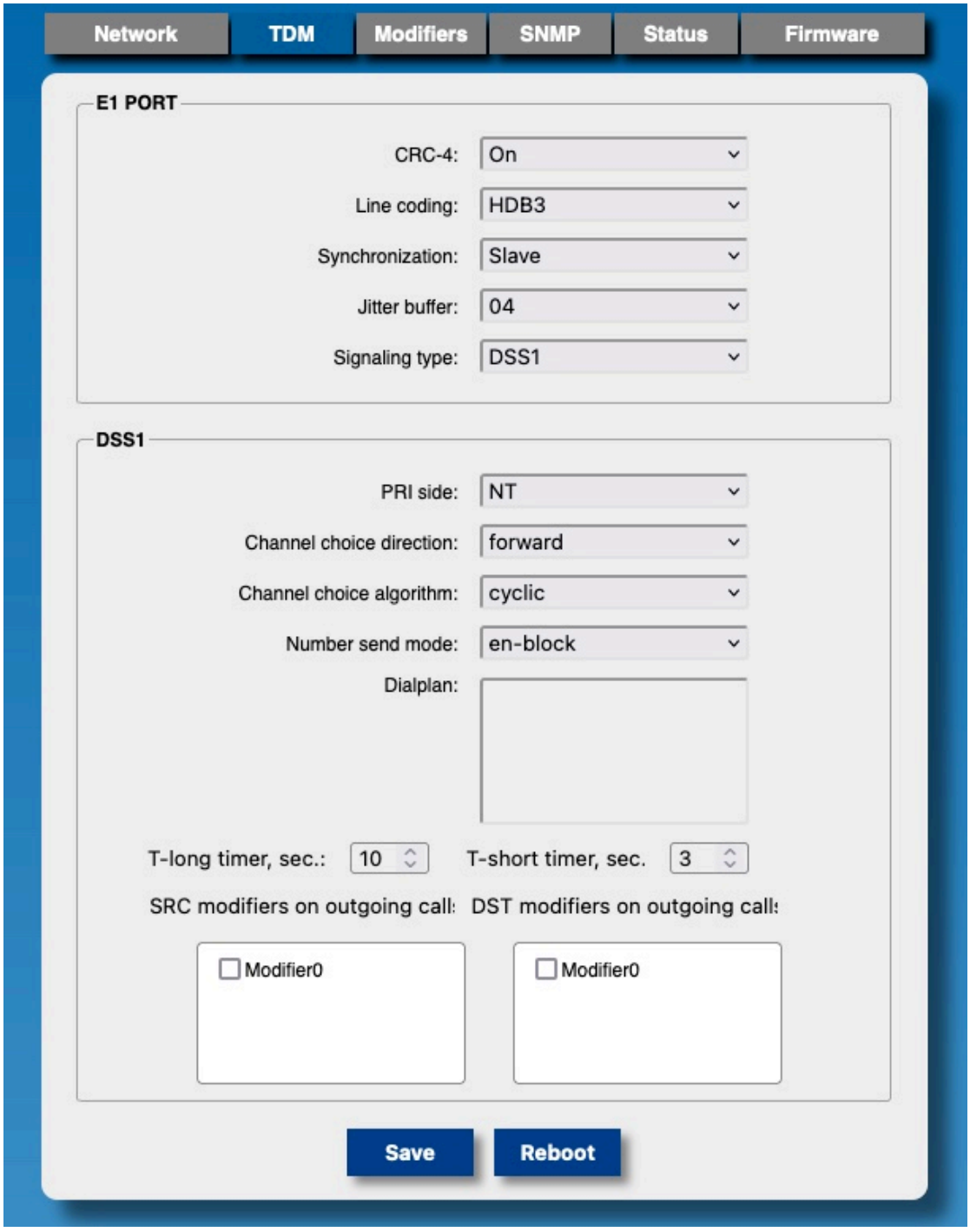
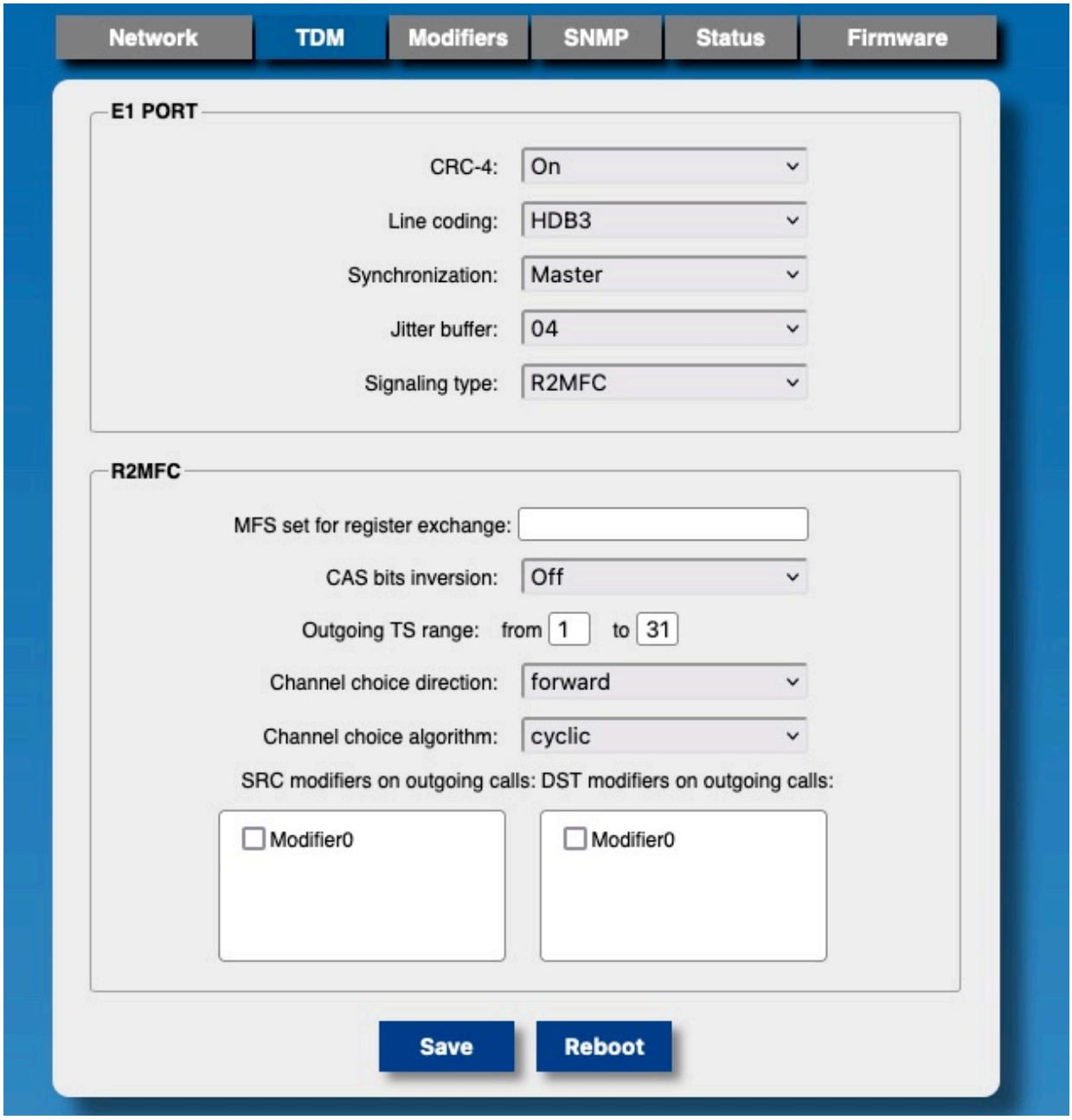


Figure 11. SFP VoIP Gateway – TDM (E1 PORT, R2MFC)



7.1.3. Modifiers

A **modifier** is a block of parameters that contain data required to change the subscriber's number. The **Modifiers** subsection is used to manage rules for number changing.

The **+Add** button is used to add a new modifier. Description modifier block parameters are shown in the table below (Table 6).

To save changes, use the **Save** button. To delete the selected modifier, use the **Delete** button.

The added modifier becomes available for use in other subsections of the device configuration, but the changes will take effect only after rebooting the device.

Figure 12. SFP VoIP Gateway – Modifiers

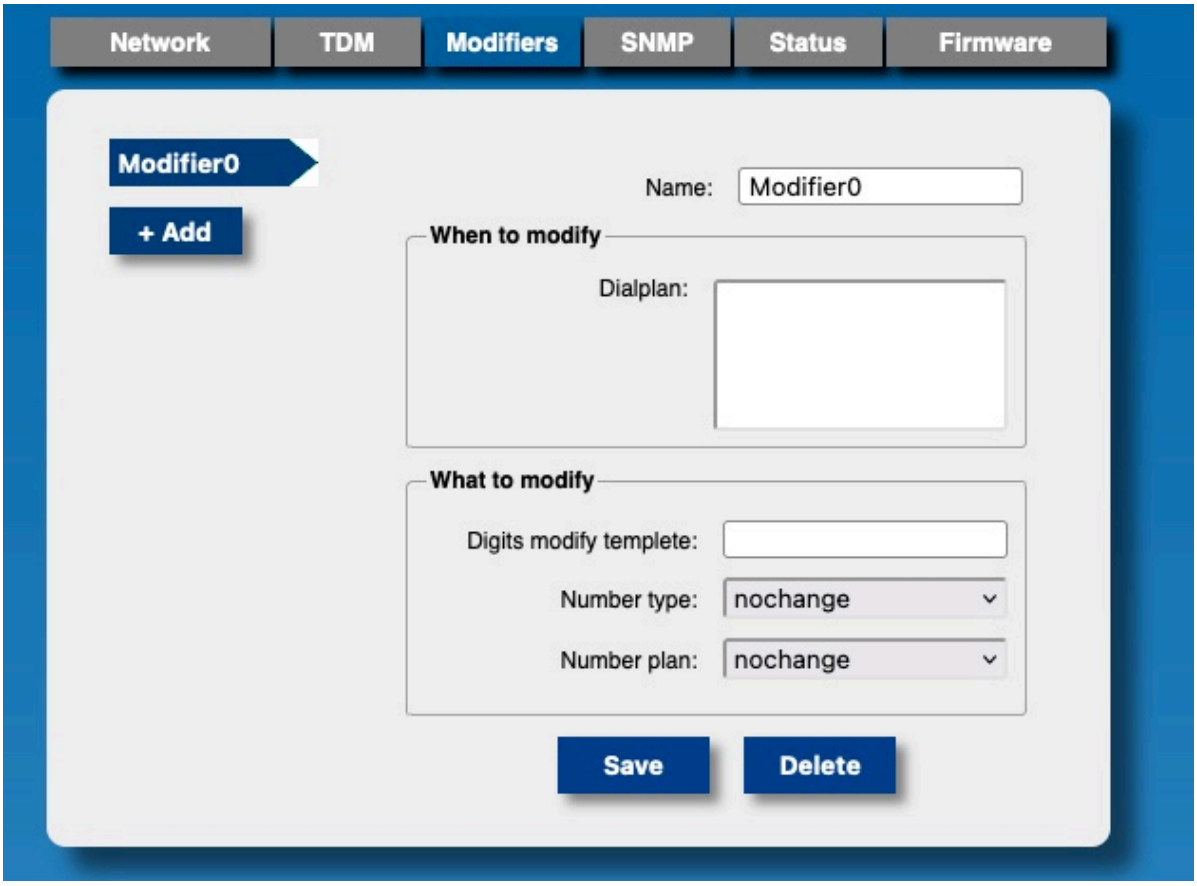


Table 6. Modifiers

Parameter	Description	Value
Name	Name of the rule for changing the number	
[When to modify]		
Dialplan	List templates numbers to determine whether to perform modification of subscriber numbers	Each new template for the current dial plan is assigned in a new line. The following symbols can be used to assign the template: **1234567890*#|[] .,xSL-** 1) Digits from 1 to 9. 2) The asterisk (*) and hash (#) characters are used to control additional services. 3) The sequence of digits within square brackets [ ]. It means that any digit displayed within the square brackets can be used. For example the [13579] sequence means that digits 1, 3, 5, 7 and 9 can be used. 4) x. It means any digit. For example the xxxx sequence means that any 4-digit number can be used. 5) Intervals. For example the 1-9 sequence means that any digit from 1 to 9 can be used. The interval of values is used within square brackets, i.e. [1-9]. 6) The comma (,) character. It is used to apply the dial tone in the line. For example the 2,3 sequence means that when 2 is dialed the dial tone is applied in the line till 3 is dialed. 7) The period (.) character. If the period is placed following the certain digit this means that it can be included in the number any number of times. For example the 8x. sequence means that a number can be dialed that starts with 8 and has unlimited length and contains any digits. 8) S - it allows to change the value of the "T-shot Timeout" parameter for the current template that is predefined above.

		9) L - it allows to change the value of the "T-long Timeout" parameter for the current template that is predefined above. Example: 012345679]x.# 8,[346789]xxxxxxxxx 8,10xxxxxxx 8,1[123] 8,1[489]x 8,[25][1-5]xxxxxxxxx 8,80xxxxxxxx 8,5[6789]xxxxxxxxxxx 8,9998[068]1 [012345679]x.# 8,15xxx
[What to modify]		
Number type	The new value of the subscriber number	
Number plan	The new value of the subscriber number	
Digits modify template	Digits modification template of the verified subscriber number	The template for modifying digits of the number to be checked. The template for modifying the number allows the following symbols: "x" - omit one digit of the number "." - delete one digit of the number "+" - start adding digits to the number "0..9" - digits of the number Let us consider a specific example of using mask symbols. Assume that the received number of the calling subscriber should be changed as follows: add digits 28 to the front of the number and replace the second received digit with digit 7. The mask will look as follows in this case: "+28x.+7".

7.1.4. SNMP

The **SN-SFP VoIP Gateway** (DSS1/R2MFC) provides an embedded SNMP agent (SNMP v1/v2c). The SNMP agent sends alarm messages to the controlling SNMP manager in real time. In addition, the SNMP agent supports monitoring of the product conditions upon a request from the SNMP manager.

Figure 13. SFP VoIP Gateway - SNMP

Table 7. SNMP

Parameter	Description	Value
SNMP		On — enable SNMP support Off — disable SNMP support
Read Community	Community line for reading	
Trap Community	Community line for traps	
Server addresses for SNMP traps	Server addresses for SNMP traps	Each server is listed in a new line. The maximum number of servers is 8.

To configure the product to be able to use SNMP, the **Save** and **Reboot** buttons are used to save applied changes. After the applied changes are saved, the module will reload.

Save button - saves your changes.

Reboot button - saves your changes and reboots the device to apply the saved changes.

7.1.5. Status

The **Status** subsection is designed to monitor in real time PCM and SIP channels, call statistics and the system state of the module. The displayed settings of the **Status** subsection are listed in the table below (Table 8).

Figure 14. SFP VoIP Gateway - Status

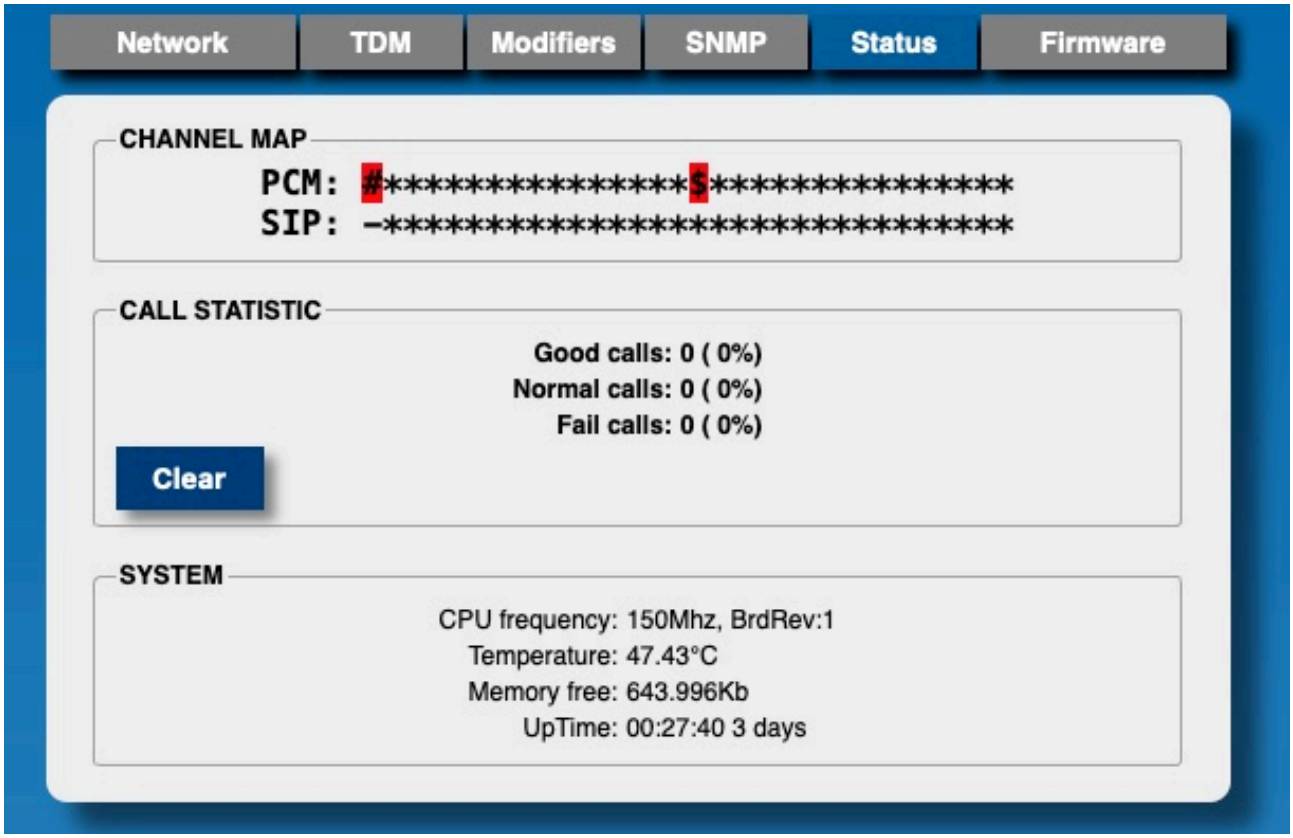


Table 8. Status

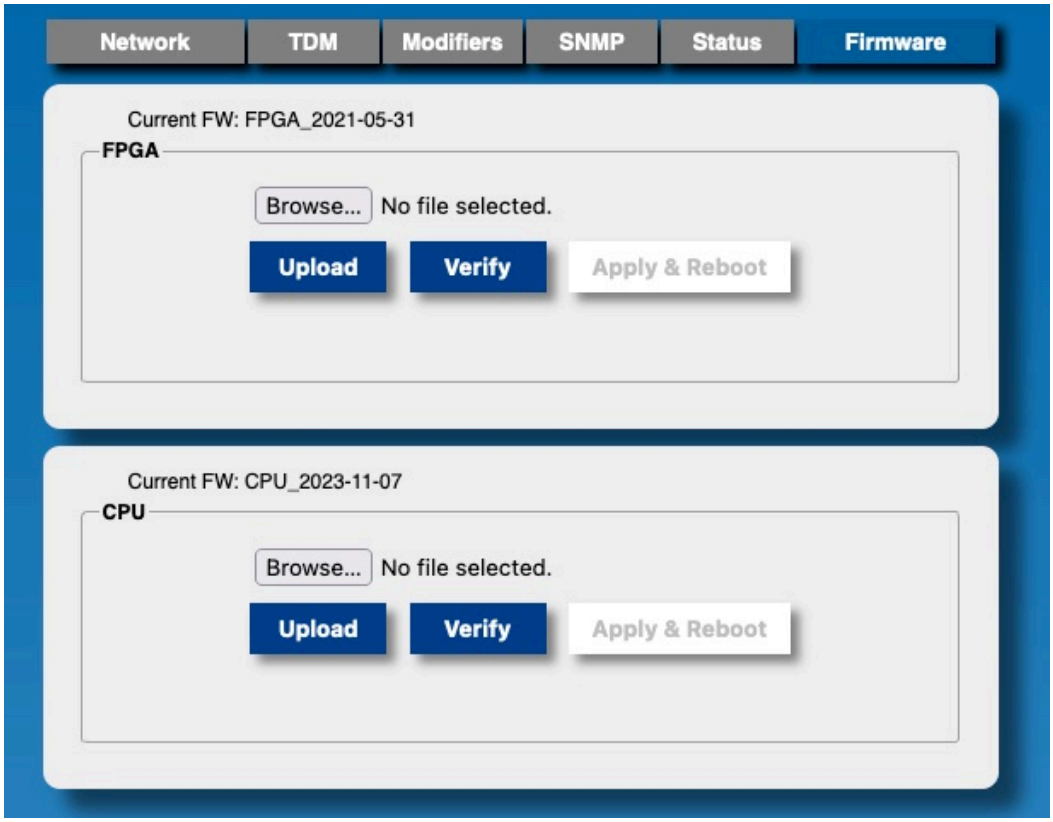
Parameter	Description	Value
[CHANNEL MAP]		
PCM	E1 port channels	# -synchro timeslot
SIP	SIP channels	$ -signalling timeslot

		L -LTEST board timeslot E -EAL board timeslot . -unconfigured channel < -incoming direction > -outgoing direction * - double direction x - free channel x - busy channel x - blocked channel x - active channel (g711) x - active channel (g729/gsm)
[CALL STATISTICS]		
Good calls	Completed calls with conversations	
Normal calls	Successful calls without conversations	
Fail calls	Calls that could not be completed for the following reasons: channel error, frequency exchange error, decade dialing error, overfilling or insufficient memory	
[SYSTEM]		
CPU frequency	CPU frequency	
Temperature	Module temperature	
Memory free	Free memory	
UpTime	Uptime since last reboot	

7.1.6. Firmware

The **Firmware** subsection is designed to update and check the product firmware. The subsection consists of two parts - "FPGA" and "CPU". Both parts are of the same type and working with them is the same.

Figure 15. SFP VoIP Gateway – Firmware



To update the firmware, select the firmware file using the Browse/Select file button.

The firmware update package contains 2 files:

- FPGA firmware file such as FPGA_YYYY-MM-DD.bin
- CPU firmware file such as DSS_H7_CPU_YYYY-MM-DD.bin

After the file is selected, use the **Upload** button to upload the firmware to the product. The upload progress can be monitored using the progress bar that accompanies this process. After the file is uploaded you will see a notification.

Wait until the notification about completion of uploading or checking the firmware is displayed.

The same actions are performed to check whether the current product firmware version matches the firmware file. Select the firmware file using the **Browse/Select** file button. To check the firmware, use the **Verify** button in the selected part of the subsection.

Figure 16. SFP VoIP Gateway – Example of success notice

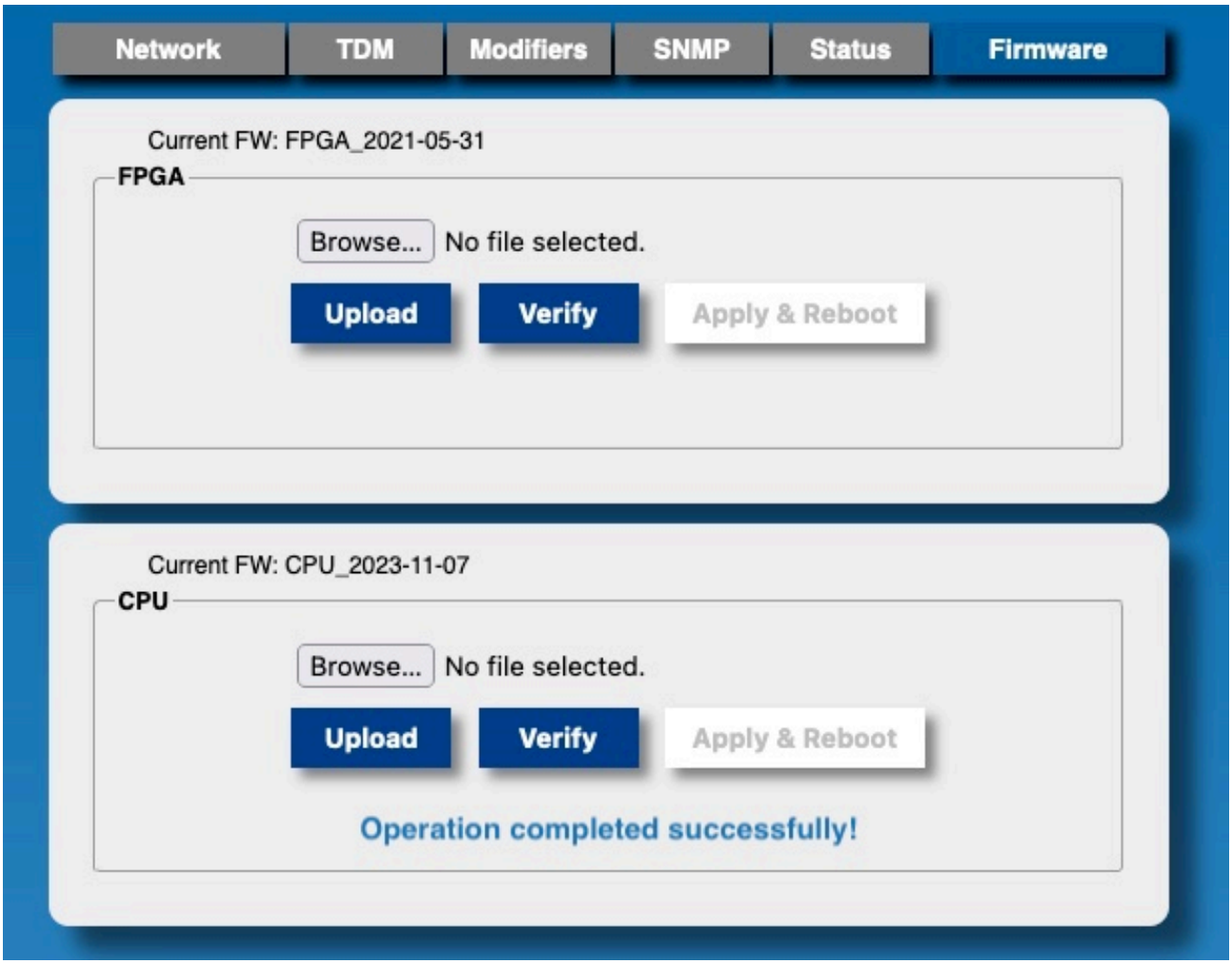


Figure 17. SFP VoIP Gateway – Example of wrong format notice

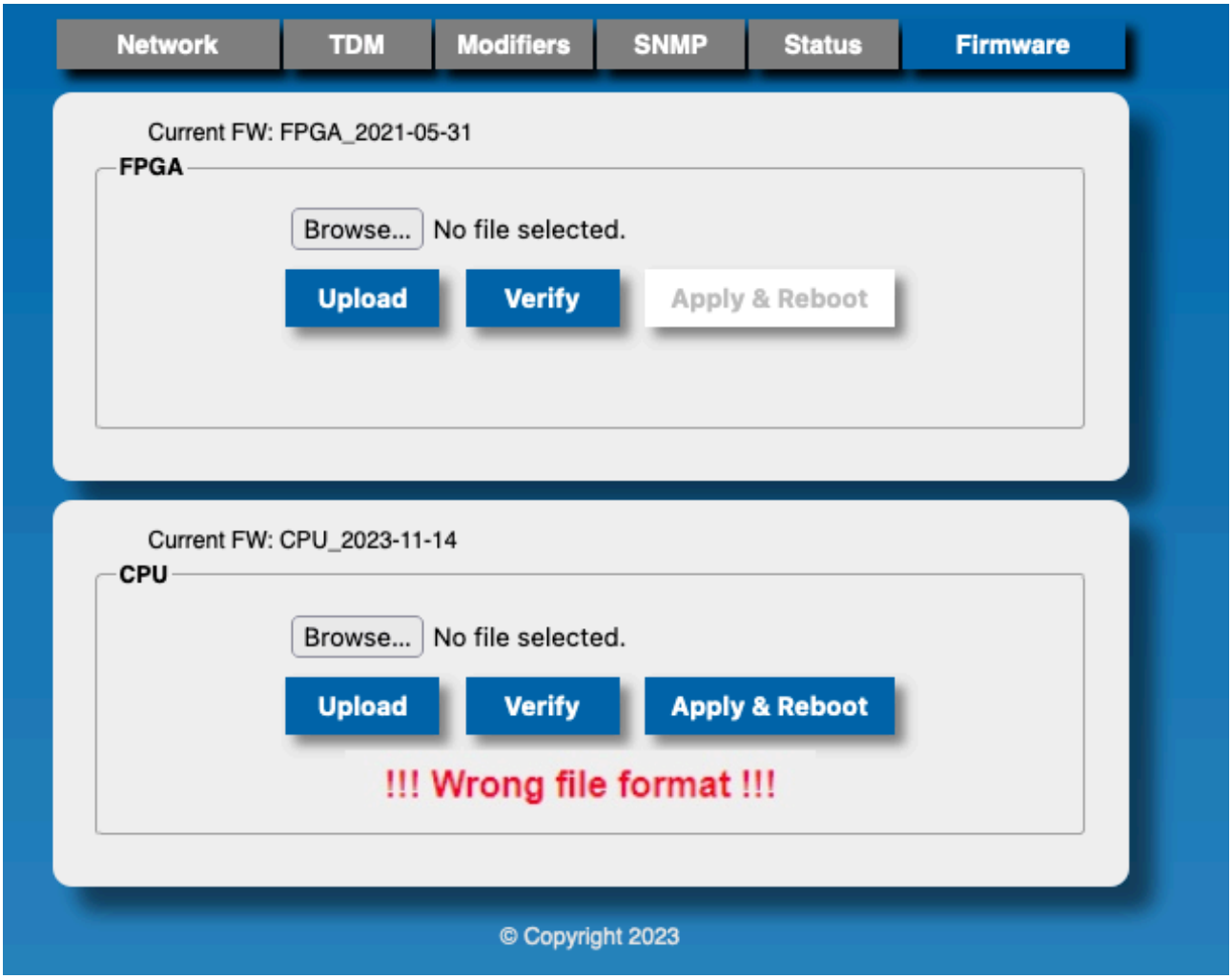


Table 9. Possible notifications

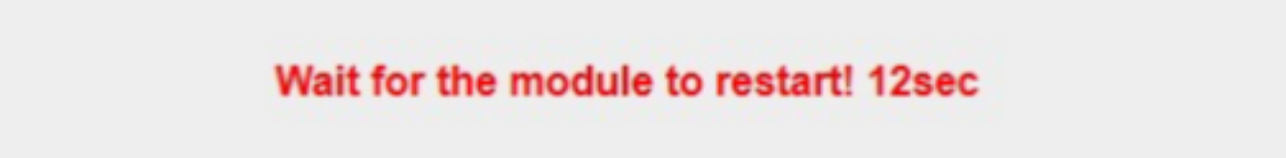
Notification
Wrong file format
Operation completed successfully!
Operation failed
Device busy
Wait for module to restart!
Use the IP address given by the DHCP server

Press the **Apply & Reboot** button to start replacing the firmware. This process takes some time and displays the corresponding notification.

The **Apply & Reboot** button becomes available for use only after the firmware upload to the device using the **Upload** button. Until the firmware is uploaded to the device, the button is not available.

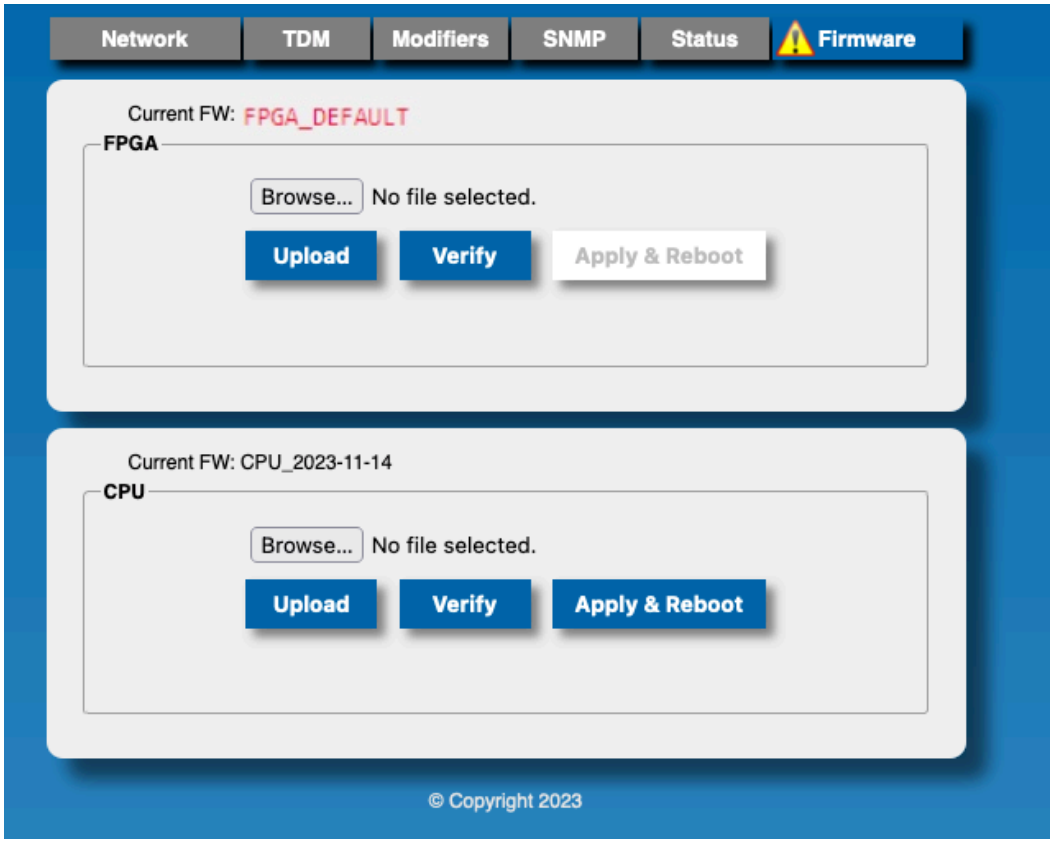
After the firmware is replaced the product will be automatically reloaded.

Figure 18. SFP VoIP Gateway – Example of the Wait notice



If a failure occurs when the firmware is being replaced then the Warning! icon will be displayed in the corresponding Web interface tab after the product is reloaded - ⚠. It warns that the factory firmware version was loaded. In this case you will need to retry uploading the firmware.

Figure 19. SFP VoIP Gateway – informing about unsuccessful device firmware



7.1.7. Telnet & Debug

The device can be accessed through an ASCII terminal. It uses a standard application from Windows - **Telnet**, or similar software from other developers, such as **PuTTY**.

Using Telnet commands, you can enable the output of debugging information for the initial start-up and diagnostics of the SIP (siptrace) and E1 (isdntrace) sides.

For a list of available commands, see the table below (Table 10).

Figure 20. Telnet – command list

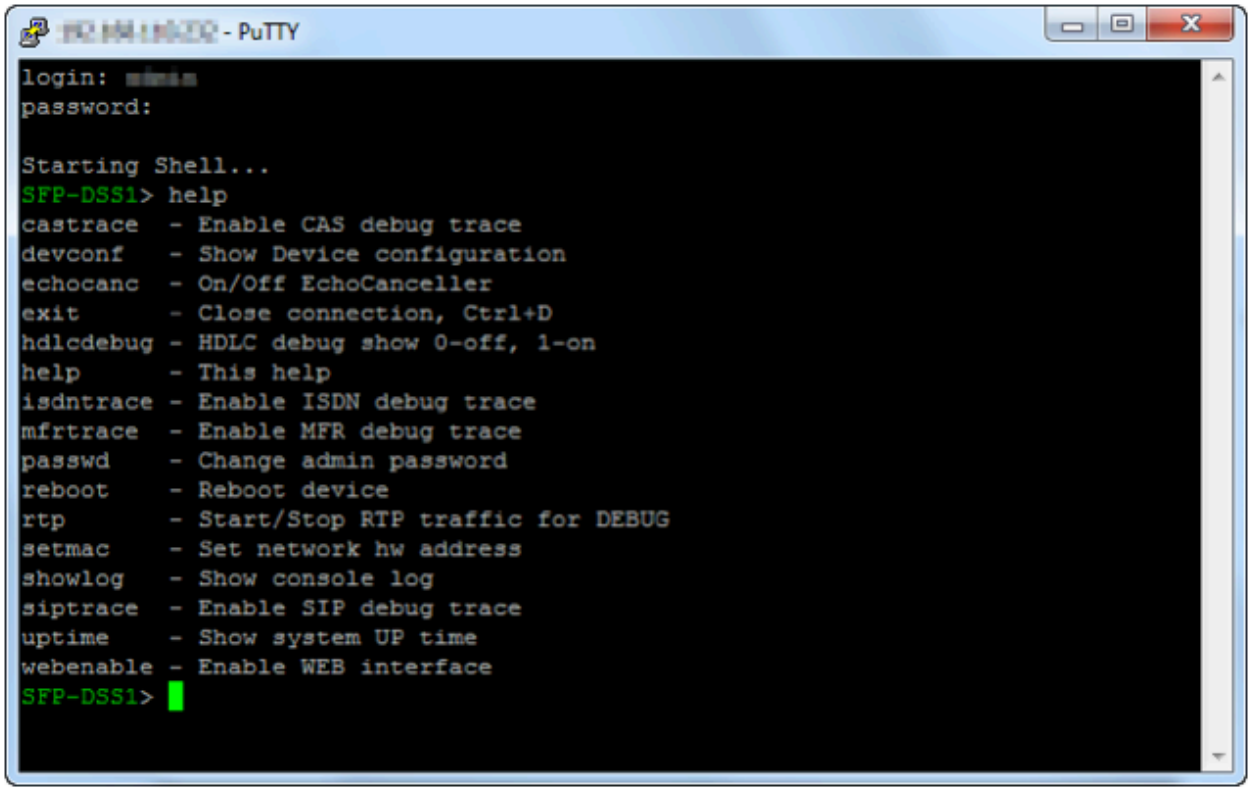


Table 10. Telnet command list

Command	Description	Value
castrace *	Enables Linear Alarm Tracing (CAS) with a specified level. 4-bit field (hex) *** - not available for modification of DSS1**	0 - off (show only errors) 0x0 ... .0xF - trace level **Note: to use set showlog = 1**
devconf	Display device configuration settings	
echocanc	On/off echo suppression. Once settings, it is stored in the device's configuration	1. – off (default) 2. - on
exit	Close Telnet Connection	
hdlcdebug *	On/Off the output of incoming/outgoing messages to hdlc	0 - off (show only errors) 0x0 ... .0xF - trace level **Note: to use set showlog = 1**
help	Telnet command list	
isdntrace *	Enable ISDN tracing with a specified level. 4-bit field (hex)	0 - off (show only errors) 0x0 ... .0xF - trace level **Note: to use set showlog = 1**
mfrtrace *	Enabling Register Signaling Tracing (MFR) with a specified level. 4-bit field (hex) *** - not available for modification of DSS1**	0 - off (show only errors) 0x0 ... .0xF - trace level **Note: to use set showlog = 1**
passwd	Change password. User [admin]	
reboot	Rebooting the device	
rtp	Starts traffic to SIP server address	For internal use
setmac	Setting a network MAC address	XX:XX:XX:XX:XX:XX
showlog	Enable redirecting a standard output to Telnet Terminal	1. – off (default) 2. - on
siptrace	Enable SIP tracing with the specified level. 4 bit field	0 - off (show only errors) 0x0 ... .0xF - trace level
Command	**Description**	**Value**
		Note: to use set showlog = 1
uptime	Device time	
webenable	Enable access to your device via WEB interface	Enable only

Note on the **webenable** command: For easy use, it is possible to temporarily enable access to the device through the WEB interface without the need to physically remove the device from the SFP connector.

Once the work is complete, the device needs to be rebooted through the WEB interface.

Note! The number of Telnet commands may differ from the commands shown in the table above. Do not use unknown commands without first contacting the developer.

8. Contacting Patton for Assistance

8.1 Contact Information

Patton, LLC 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.

8.1.1 Contacting Patton Technical Services for Free Support

Table 11. Contacting Patton Technical Services

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	

8.2 Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton, LLC 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, LLC 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.

8.2.1 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.

8.2.2 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.

8.2.3 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.

8.2.4 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.

8.3 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.

8.3.1 Shipping instructions

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

Patton, LLC

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.

9. 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:

9.1 Definitions

A) "Effective Date" shall mean the earliest date of purchase or download of a product containing the Patton LLC 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.

9.2 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 LLC 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.

9.3 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 "9.6. Termination".

9.4 Grant of License

A) During the term of this Agreement, Patton LLC 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 LLC is required to operate the Designated Equipment.

9.5 Warranty

The Program(s) are provided "as is" without warranty of any kind. Patton, LLC 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, LLC 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, LLC 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.

9.6 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, LLC may terminate this Agreement should End User violate any of the provisions of section "9.4. Grant of License" on page 44.

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).

9.7 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.

9.8 Other Licenses

The Program may be subject to licenses extended by third parties. Accordingly, Patton, LLC 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**).

9.9 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.

9.10 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.

9.11 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.

10. Specifications

Physical Interfaces	T1 and E1 (G.703) 120Ω impedance and IEEE 802.3z 1000Base-X
VoIP and Network Protocols	SIP 2.0 (RFC 3261), IP (static IP address), TCP, UDP, RTP, RTCP, ARP, NTP, HTTP, Telnet, IEEE 802.1Q, IEEE 802.1P
Signaling Protocols	ISDN PRI (ITU-T Q.931,Q.921), MFC R2 (CAS)
Voice Processing	G.711 u-Law and A-Law, G.711 Appendix 1, G.168, silence suppression, ITU v.152
Security	Filtering by IP addresses, 802.1Q
Management	GUI client, Telnet, SNMP v1/v2c Traps, updating software over HTTP, storing/recovering configuration, checking E1 port/signaling status
Power Supply	DC 3.3 V from network equipment. Consumption up to 1W
Dimensions	14 x 70 x 14 mm