



User's Manual

IP Telephony Gateway

Model No.: SP5002/S, SP5004/S

<http://www.micronet.info>

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About this User's Manual

This user's guide gives hardware specifications and explains web configuration and command line configuration for the VoIP Telephony Gateway.

Online Upgrade

Please refer to <http://www.micronet.info/> for additional support documentation.

General Syntax Conventions

Mouse action sequences are denoted using a comma. For example, click start, Settings, Control Panel, Network means first you click Start, Click or move the mouse pointer over Settings the click or move the mouse pointer over Control Panel and finally click (or double-click) Network.

[Enter] means to type one or more characters.

Predefined choices are in **Bold Arial** Font.

A single keystroke is in Arial font and enclosed in square brackets. **[Enter]** means the Enter.

For brevity's sake, we will use "e.g.," as shorthand for "for instance", and "i.e.," for "that is" or "in other words."

Safety Notes

Use the external power supply that is included in the package. Other power supplies may cause damage to the phone, affect the behavior or induce noise.

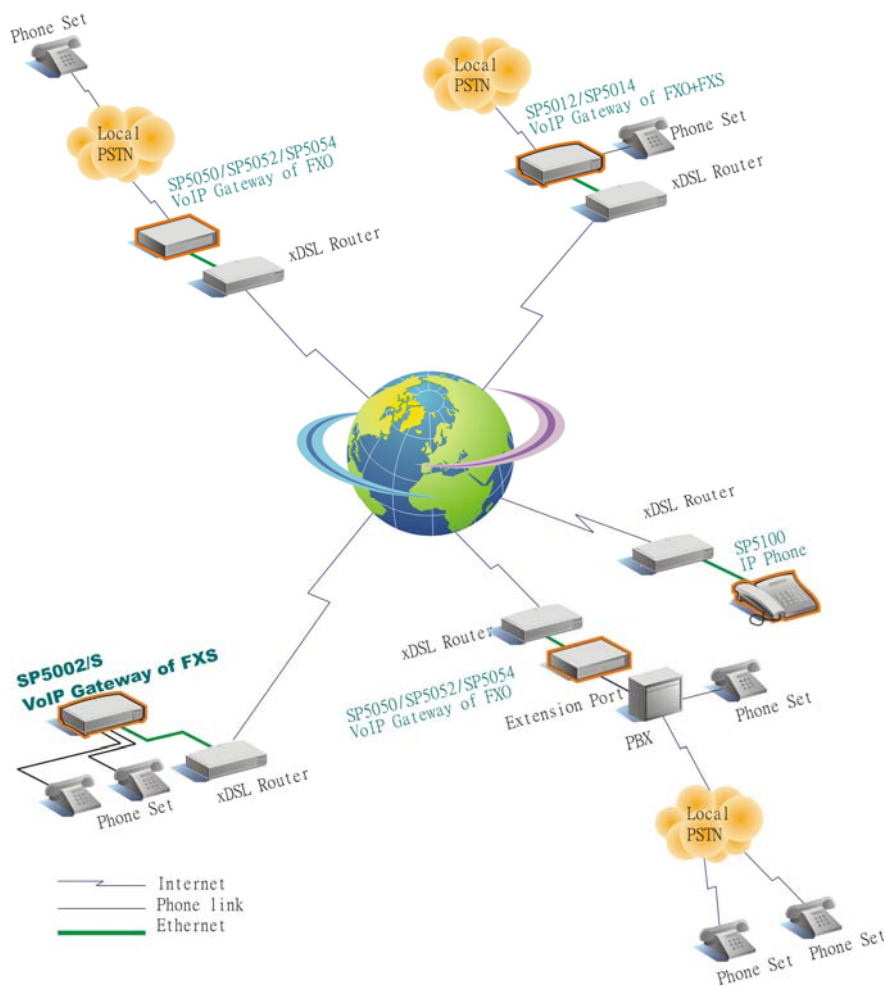
Specifications are subject to change without notice.

1. Introduction

1.1. Overview

Micronet SP5002/S, SP5004/S FXS (Foreign eXchange Station) VoIP Gateway, based on IETF SIP standard, provides voice and fax over IP networks. Their simplified operation and configuration features are the most suitable for residential and SOHO application. Just an IP address and two (or four) phone sets can bring you to Voice over IP world. No more long distance and international telephone fee.

Foreign eXchange Station, or FXS, is a telephone interface which generates battery power and ring signals. FXS interface connects directly to a standard telephone or fax machine, supplies ring, voltage, and dial tone.



1.2. Features

- Compliant with IETF RFC 3261 SIP standards
- Provide 2 or 4 RJ-11 FXS ports for phone set or fax machine
- Provide 2-port 10/100M Ethernet switch
- Provide advanced telephony features, such as call hold, call forward and call transfer
- Support Proxy and Peer-to-Peer Mode
- Support FAX over IP (T.38)
- Support FSK and DTMF Caller ID
- Support Static IP, DHCP and PPPoE connection
- TFTP/FTP firmware upgrade
- QoS : ToS (Type of Service)

Audio feature

- Codec: G.711 a/μ-law, G.723.1 (6.3kbps), G.729A
- VAD (Voice Activity Detection)
- CNG (Comfort Noise Generate)
- G.168/165-compliant adaptive echo cancellation
- Dynamic Jitter Buffer
- Bad Frame Interpolation
- Voice/DTMF Gain Settings

Interface

- One 10/100 Base-T Ethernet RJ45 port for WAN
- One 10/100 Base-T Ethernet RJ45 ports for LAN
- Two RJ11(SP5002/S) / Four RJ11(SP5004/S) FXS Ports
- One RS-232 Serial Port
- DC 12V input.

System Management

WEB Interface, Telnet, Console

Environment

Operating and storage Humidity: 10 to 90 % (Non-condensing)

Operational Temperature: 0 to 40 °C

Storage Temperature: -10 to 50 °C

Dimension & Weight : 230 x 150 x 38 mm, 360g

Certification

CE, FCC

1.3. Default Settings

The following are the settings of the default profile

IP Parameters

WAN IP Address: **10.1.1.3**

Subnet: **255.0.0.0**

Default gateway: **10.1.1.254**

Web, Telnet or Console Login Password

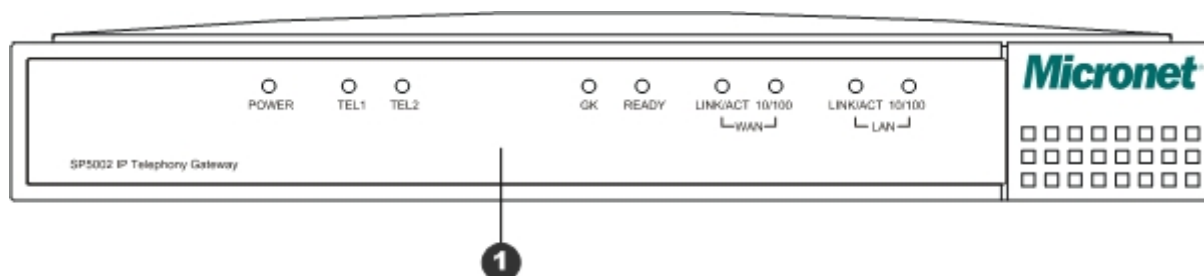
Login = **root**

Password = **Null** (No password)

1.4. Appearance

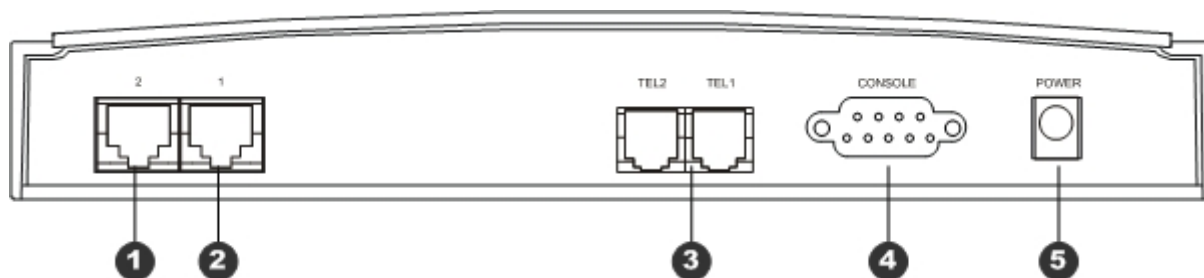
SP5002/S

Front Panel



1. LED Status Display

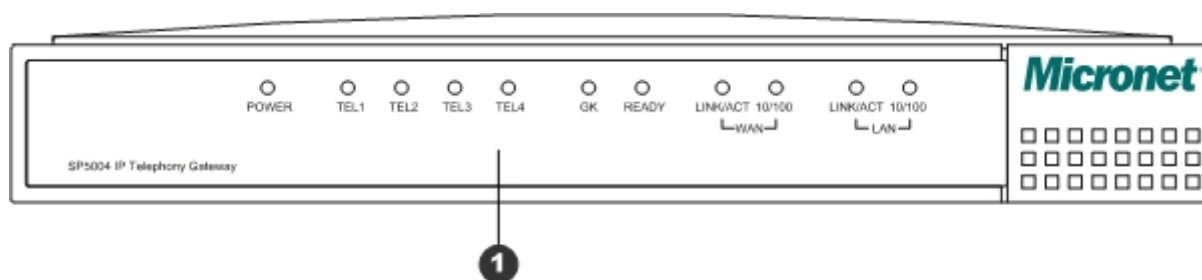
Rear Panel



1. RJ-45 LAN Port
2. RJ-45 WAN Port
3. RJ-11 Ports, FXS Interface
4. Serial Console Port
5. Power Jack 12V DC

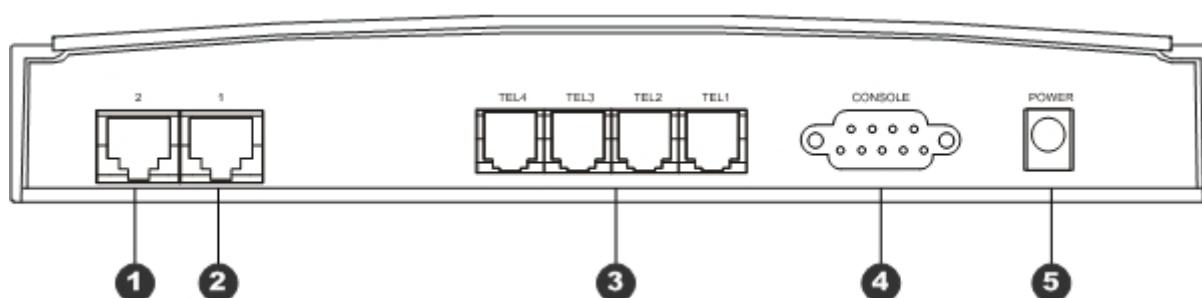
SP5004/S

Front Panel



1. LED Status Display

Rear Panel



1. RJ-45 LAN Port
2. RJ-45 WAN Port
3. RJ-11 Ports, FXS Interface
4. Serial Console Port
5. Power Jack 12V DC

Note:

The LAN and WAN ports here are similar to the switch hub, it has no routing function as NAT router does.

1.5. LED Status

LED	Status	Active	Description
PWR	Green	On	The Power is on
		Off	The Power is off
TEL	Amber	On	The telephone is Off-Hook
		Off	The telephone is On-Hook
		Flash	The gateway has Incoming Call
GK	Green	On	In Proxy mode, the gateway has registered to the SIP server
		Off	Gateway is in Peer-to-Peer Mode
		Flash	In Proxy mode, the gateway failed registration to the SIP server
READY	Green	Flash Slow	Normal operation
		Flash Fast	Gateway is downloading the firmware
WAN			
LINK/ACT	Green	On	WAN connection has established
		Off	No connection
		Flash	Transmitting data
10/100	Green	On	100M Connection
		Off	10M Connection
LAN			
LINK/ACT	Green	On	LAN connection has established
		Off	No connection
		Flash	Transmitting data
10/100	Green	On	100M Connection
		Off	10M Connection

Ethernet Port1: (WAN)

Connect the Ethernet cable to the ADSL or Cable modem Ethernet port.

Ethernet Port2: (LAN)

Connect the Ethernet cable to the Ethernet adapter in your computer.

TEL Port:

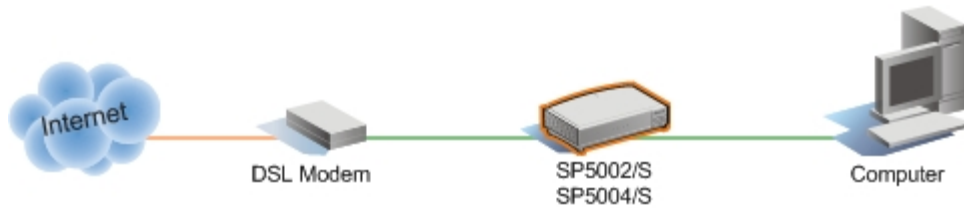
RJ-11 connector, FXS interface. To connect analog phone set or trunk line of PABX.

Power Jack:

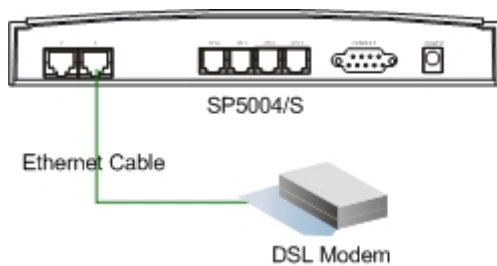
12V DC Power supply.

2. Setting Up the Gateway

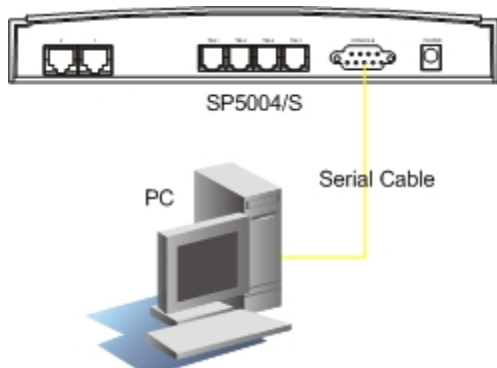
This chapter describes how to setup the connection and configurations. The FXS Gateway can be configured via hyper terminal, telnet or web interface through a computer. The VoIP Gateway requires high speed Internet connection like DSL or Cable modem.



2.1. Connecting the FXS Gateway



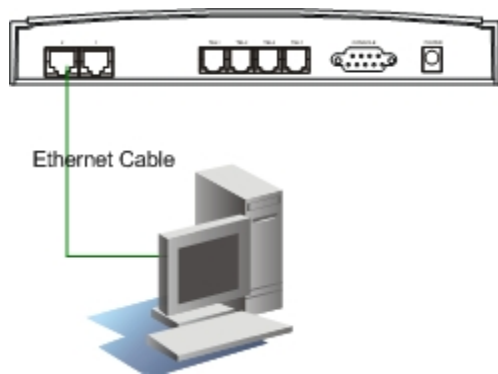
1. Connect the Ethernet cable from WAN port to the DSL modem LAN port.



2. Connect the Serial cable from Console port to the COM port in your computer

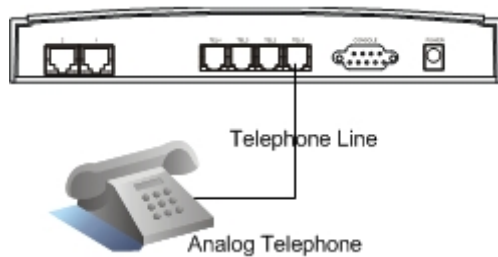
You can skip this connection if your PC or Notebook PC has no serial port, and check the next section for more details

Note: The console connection can use for change configurations or some advanced setup like debug mode, boot mode, etc.

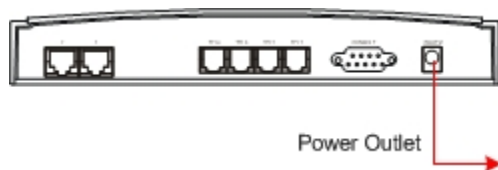


3. Connect the Ethernet cable from LAN port to the Ethernet adapter in your computer

Note: If both VoIP gateway and Computer's network has connected to the NAT router or switch hub already, you can skip this step



4. Connect the telephone handset to the TEL port (FXS port)



5. Connect the power adapter to the gateway and plug it in to a power outlet. It takes about 40 seconds to boot up completely

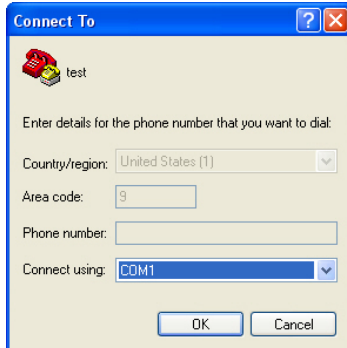
2.2. Configuring the Network

VoIP Gateway can be configured by Terminal program through the serial cable connection (called Console Mode) or by Internet browser through the Ethernet connection, e.g., Internet Explorer or Netscape Navigator.

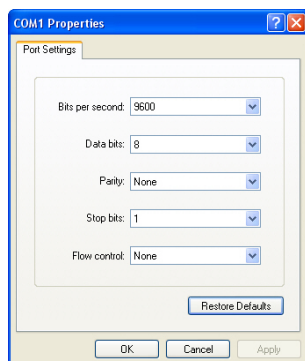
by Console



1. Run Hyper Terminal from you PC by choose **Start → All Programs → Accessories → Communication → Hyper Terminal** (Windows XP)



2. Choose the COM port correspond to your PC COM port connects with serial cable connected



3. Setup the COM Properties as:

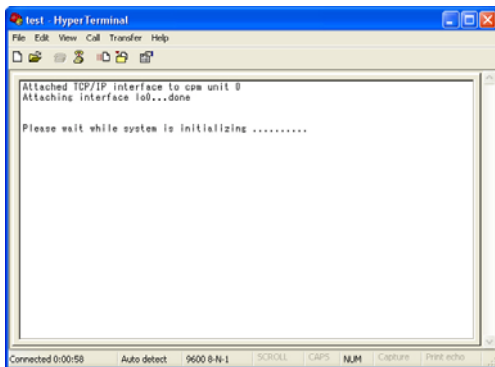
Bits/s : 9600

Data bits: 8

Parity: None

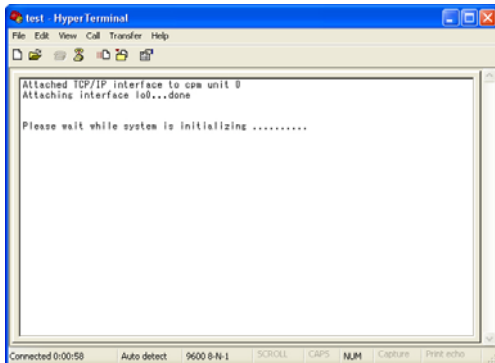
Stop bits: 1

Flow Control: None



4. Power on the Gateway, wait for about 40 seconds to boot up completely

Note: If you applied the power to the Gateway already, you don't get the boot up message, type the **root** and press [Enter]



5. When **Login:** shows, enter **root** as user name and no password as default, press **[Enter]** to proceed

In the console mode, we use the Static IP address for the example, shows how to change the Gateway network by **[ifaddr]** command.

```
usr/config$ ifaddr -ip 61.219.198.204 -mask 255.255.255.248 -gate 61.219.198.201
```

```
usr/config$ commit (to save the data changed)
```

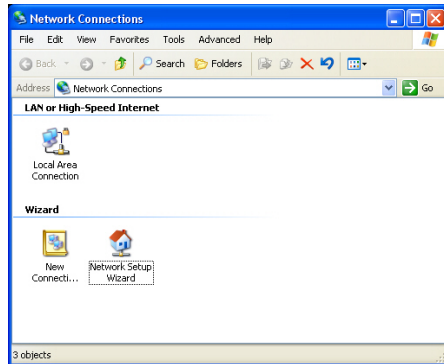
```
usr/config$ reboot (restart the gateway to take changes effect)
```

After the Gateway restarted, you can use the **ping** command to verify the Internet connection. For example: **ping 168.95.1.1** or **ping www.micronet.info**

Note: In console mode, you can type **[?]**, or **[help]** any time to check the all the available commands. Refer to **Chapter 6** for more details.

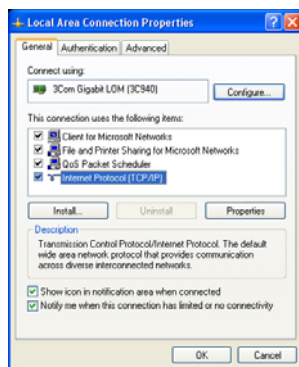
by Web Interface

If the PC or Notebook PC doesn't come with serial port, you can use the web browser by the Ethernet connection to configure. The default Gateway's IP address is **10.1.1.3**. You need to change the PC's network setting first to be able to communicate with the FXS Gateway. Here we are using Windows XP as the example:

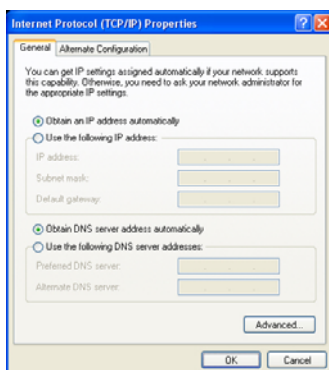


1. Choose **Start** → **All Programs** → **Accessories** → **Communication** → **Network Connections**

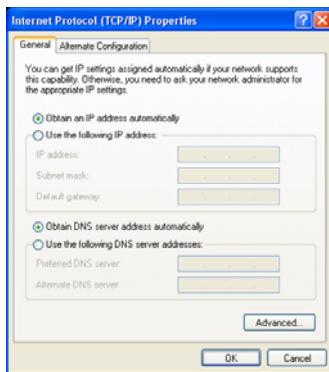
2. Right-click the Local Area Connection icon; from the shortcut menu, choose **Properties**



3. In this dialog box, double-click the Internet Protocol (TCP/IP) item that corresponds to your Ethernet card



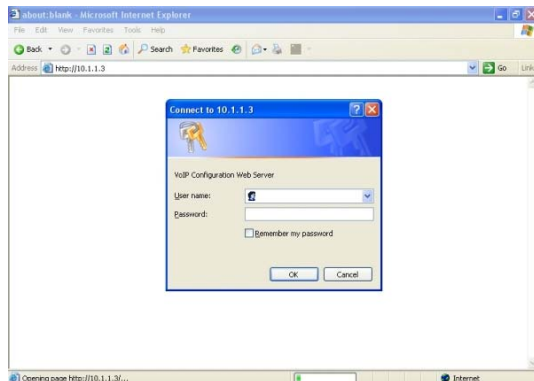
4. Most of the time, "Obtain an IP address automatically" and "Obtain DNS server address automatically" has selected.



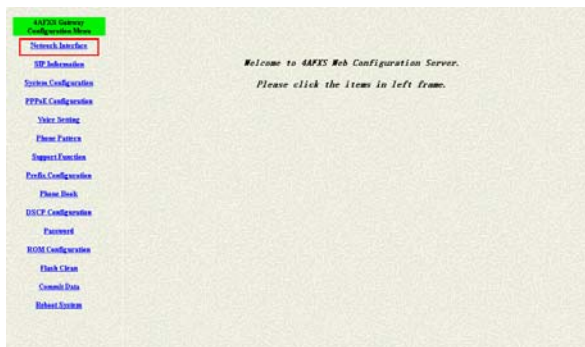
5. Turn on "Use the following IP address" and type in the appropriate numbers. For example, 10.1.1.8 in IP address, 255.255.255.0 in Subnet.

Click **OK**

Note: As a courtesy, Windows XP doesn't make you restart the computer in order for your new network settings to take effect.



6. To access the Web-based configuration of the Gateway, launch Internet Explorer or Netscape Navigator, and enter the Gateway's default IP address **10.1.1.3** in the Address field, and press the **Enter** key. A login screen will appear asking **User name** and **Password**



7. Enter **root** in the Login name field and leave the Password field blank

8. Click the **[Network Interface]** from the right-hand side menu

Network Interface

IP Address: 10 . 1 . 1 . 3

Subnet Mask: 255 . 0 . 0 . 0

Default routing gateway: 10 . 1 . 1 . 254

DHCP: ☐ enable ☒ disable

Sntp: ☒ enable ☐ disable

Sntp Server Address: 168 . 95 . 195 . 12

GMT: 8

IP Sharing: ☐ enable ☒ disable

IP Sharing Server Address: 210 . 99 . 163 . 198

Primary DNS Server: 168 . 95 . 192 . 1

Secondary DNS Server: 168 . 95 . 1 . 1

OK

9. Type in the appropriate numbers to change Gateway's network settings.

Commit Data

It will take few seconds...

COMMIT

10. Click the **[Commit Data]** from right-hand side menu, then click **COMMIT** button to save the data.

Reboot AFXS System

It will take 40 seconds to reboot.
(remember to COMMIT data before reboot)

REBOOT

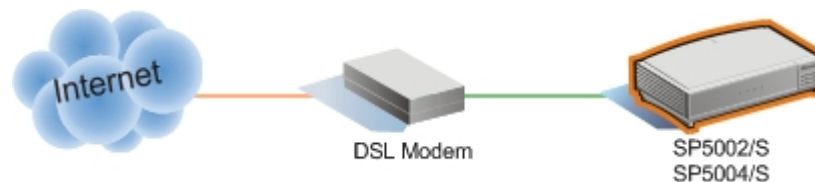
11. Click the **[Reboot System]** from right-hand side menu, then click **REBOOT** button to restart the Gateway.

2.3. Internet Connection Setup

This section shows the basic setup to enter the Internet connection settings provided by your ISP. Before proceeding with the Internet connection setup, you need to know the setup information for your specific type of Internet connection, for example, DSL connection or Cable connection, login name / e-mail and password, then you can configure the gateway.

A. PPPoE Connection Setup

For DSL users, many ISPs may require you to log on with a user name (or e-mail address) and password to gain access to the Internet. This connection type is called Point to Point Protocol over Ethernet (PPPoE). PPPoE (Point-to-Point Protocol over Ethernet) is a specification for connecting multiple computer users on an Ethernet local area network to a remote site through common customer premises equipment, which is the telephone company's term for a modem and similar devices, commonly used in dialup connections, users share a Digital Subscriber Line (DSL), cable modem, or wireless connection to the Internet. Most of the PPPoE connection is temporarily assigning an IP address to a requesting Dynamic Host Configuration Protocol (DHCP) NAT router or computer from a pool of IP addresses. The temporary IP address is called a **dynamic IP address**.



1. Select the [PPPoE Configuration]

PPPoE Device Configuration	
Device:	☐ On ☒ Off
User Name:	pppoe
Password:	*****
IP Address:	
Destination:	
DNS primary:	
Reboot After Remote Host Disconnection:	☒ On ☐ Off
OK	

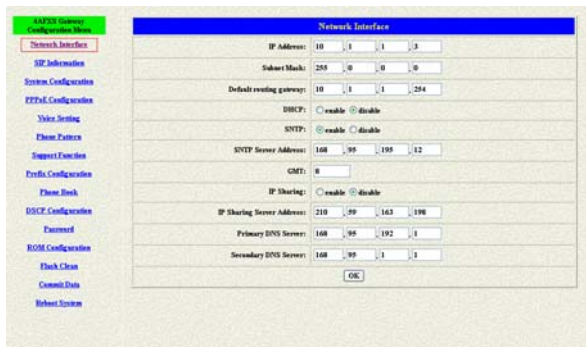
2. Select **[On]** to enable the PPPoE Device
3. Enter your DSL login name into User Name field
4. Enter your DSL password into Password field
5. Click **OK** button
6. Select **[Commit Data]** and click **COMMIT** button.
7. Select **[Reboot System]** and click **REBOOT** button.

Wait for the gateway to reboot, check the DSL connection status by select the **[PPPoE Configuration]**

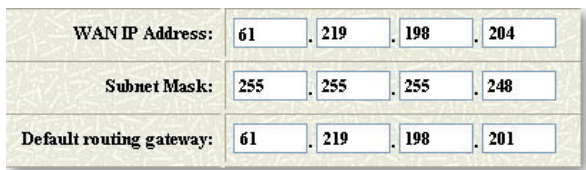
PPPoE Device Configuration	
Device:	☒ On ☐ Off
User Name:	85238998@hinet.net
Password:	••••••••
IP Address:	61.229.31.3
Destination:	61.229.24.254
DNS primary:	168.95.1.1
Reboot After Remote Host Disconnection:	☒ On ☐ Off
OK	

B. Static DSL Connection Setup

A static IP address is a number (in the form of a dotted quad) that is assigned by an Internet service provider (ISP) to be its permanent address on the Internet. VoIP gateways use IP addresses to locate and talk to each other on the Internet, much the same way people use phone numbers to locate and talk to one another on the telephone.



1. Select the [Network Interface]



2. Enter the IP address, Subnet and Default Gateway

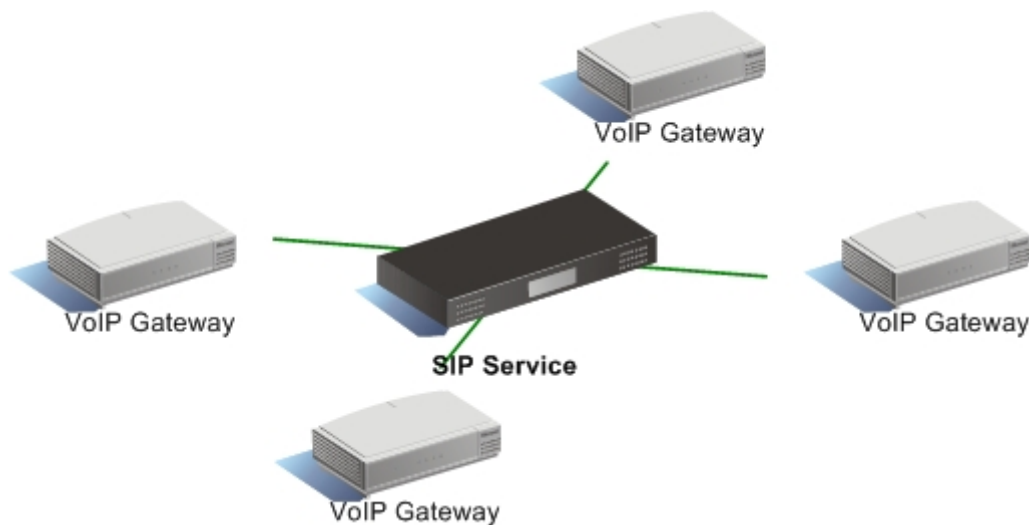
3. Click **OK** button

4. Select [Commit Data] and click **COMMIT** button.

5. Select [Reboot System] and click **REBOOT** button.

2.4. Proxy Mode Setup

You can choose either Proxy mode or Peer-to-Peer mode for communication. Proxy mode requires account information to access to the service; it's assigned by the SIP service provider. SIP Serve rendezvous point at which callees are globally reachable, and perform registration, call routing function. The VoIP gateway (or IP phone) of the users in the domain register their IP addresses with the server so that the other users can reach them. Proxy Mode also suit for the gateway has dynamic IP address connection.



1. Click the **[SIP Information]** at the Configuration Menu section
2. Select the **Proxy**
3. Enter the Proxy Server's IP address or URL. For example, **220.130.173.70** or **sip.micronet.info**

SIP Information	
Run Mode:	☐ Peer-2-Peer ☒ Proxy ☐ Gateway
Primary Proxy IP Address:	220.130.173.70
Secondary Proxy IP Address:	null
Outbound Proxy:	null
Proxy port:	5060
Prefix String:	null
Line1 Number:	1001

4. Enter the Line Number

5. Enter the Account. It can be same as the Line number, the user name or the e-mail account. Check with your VoIP service support for the details.

6. Enter the Password

Line1 Number:	2218001
Line1 Account:	2218001
Line1 Password:	*****
Line2 Number:	2218002
Line2 Account:	22218002
Line2 Password:	*****
Line3 Number:	x
Line3 Account:	
Line3 Password:	

Note: You can use x to disable the lines

7. Click button

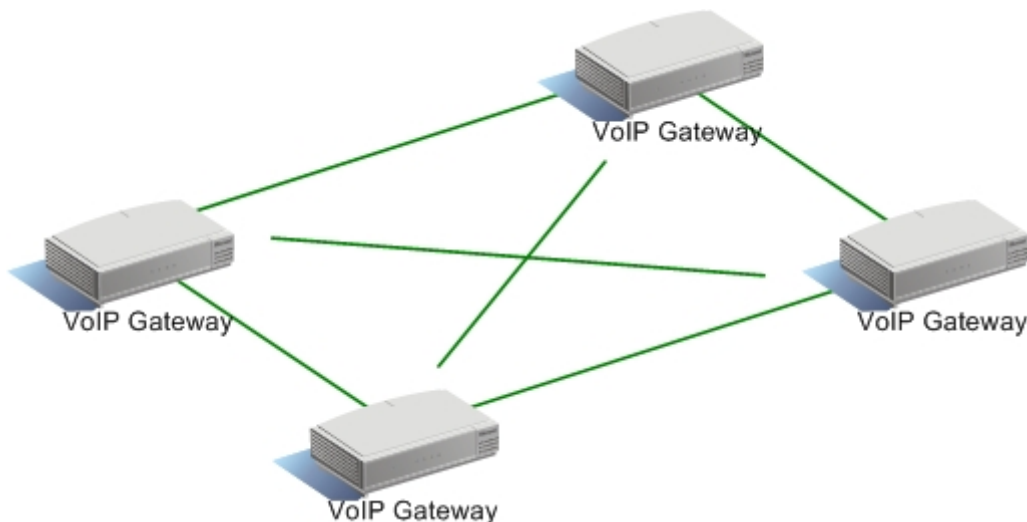
8. Select **[Commit Data]** and click button.

9. Select **[Reboot System]** and click button.

After reboot the FXS GATEWAY, check the **Status** LED, it shows the gateway has registered to the SIP server successfully when the LED stays on. If not, the **Status** LED is blinking, check the Internet connection and SIP Configuration settings again.

2.5. Peer-to-Peer Mode Setup

P2P Mode doesn't require any centralized control units like Proxy Mode does, it makes communication between two end-points directly, **[Phone Book]** needs to configure to work with in P2P Mode. It requires direct public IP access, it can also perform the job behind the NAT device with static public IP connection, but it can not work behind the NAT device with the dynamic IP connection.



SIP Information	
Run Mode:	☒ Peer-2-Peer ☐ Proxy ☐ Gateway
Primary Proxy IP Address:	10.1.1.2
Secondary Proxy IP Address:	null
Outbound Proxy:	null
Proxy port:	5060
Prefix String:	null

1. Click the **[SIP Information]** at the Configuration Menu section, select the **Peer-2-Peer** Mode

Line1 Number:	31
Line1 Account:	
Line1 Password:	
Line2 Number:	32
Line2 Account:	
Line2 Password:	
Line3 Number:	33
Line3 Account:	
Line3 Password:	
Line4 Number:	34

2. Enter the LineX Numbers then click **OK** button

The Line Number is similar to the extension number of PABX system. You can create your own numbering plan for your VoIP system.

Phone Book				
Index	Name	IP Address	E164	Port

New Record				
Index	Name	IP Address	E164 No.	Port No.

3. Select the **[Phone Book]** at the Configuration Menu section

New Record				
Index	Name	IP Address	E164 No.	Port No.
1	Branch	203.69.28.242	71	

4. Enter the destination information into **New Record** field

The E164 number is the other gateway's line number you want to call

5. Select **[Commit Data]** and click button.

6. Select **[Reboot System]** and click button.

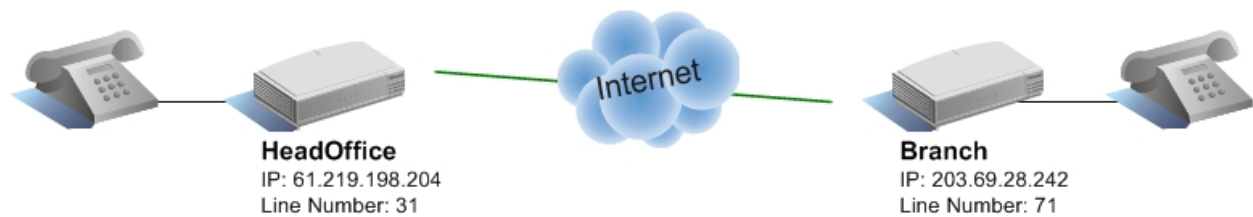
Follow the same steps to configure the remote side gateway. The next section shows the Peer-to-Peer configuration example.

Note:

Remember, the P2P Mode can not work behind the NAT device with the dynamic IP connection.

2.6. P2P Connection Example

The following example shows the gateway's settings of each location in P2P Mode



Head office dials **71#** to reach branch office gateway

Branch office dials **31#** to reach head office gateway

Head Office					Branch						
Network											
Network Interface					Network Interface						
IP Address:		61	219	198	204	IP Address:		203	69	28	242
Subnet Mask:		255	255	255	248	Subnet Mask:		203	69	28	255
Default routing gateway:		61	219	198	201	Default routing gateway:		203	69	28	190
Line Number											
SIP Information					SIP Information						
Run Mode: ☒ Peer-2-Peer ☐ Proxy ☐ Gateway					Run Mode: ☒ Peer-2-Peer ☐ Proxy ☐ Gateway						
Primary Proxy IP Address:		10.1.1.2			Primary Proxy IP Address:		10.1.1.2				
Secondary Proxy IP Address:		null			Secondary Proxy IP Address:		null				
Outbound Proxy:		null			Outbound Proxy:		null				
Proxy port:		5060			Proxy port:		5060				
Prefix String:		null			Prefix String:		null				
Line1 Number:		31			Line1 Number:		71				
Line1 Account:					Line1 Account:						
Line1 Password:					Line1 Password:						
Line2 Number:		32			Line2 Number:		72				
Phone Book											
New Record					New Record						
Index	Name	IP Address	E164 No.	Port No.	Index	Name	IP Address	E164 No.	Port No.		
1	Branch	203.69.28.242	71		1	HQ	61.219.198.204	31			
Add Data Delete Data					Add Data Delete Data						

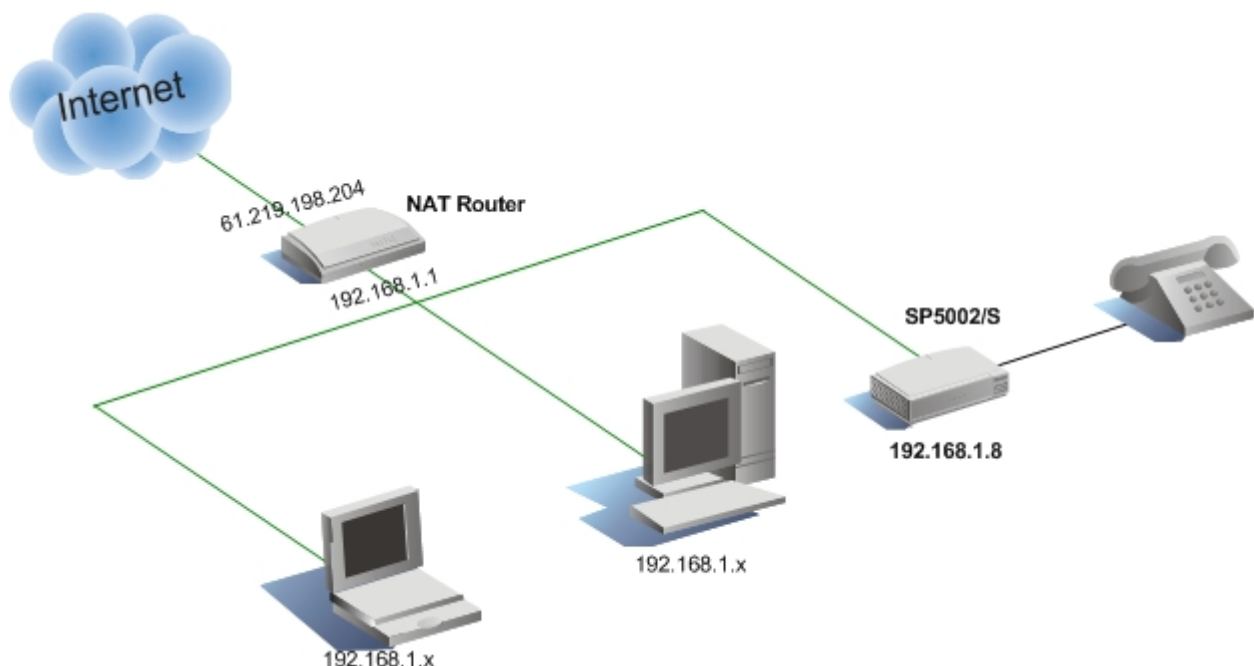
3. Advanced Setup

It would be simple if every VoIP gateway, or computer that connects to the Internet could have its own static IP number, but when the Internet was first conceived, the architects didn't foresee the need for an unlimited number of IP addresses.

Consequently, there are not enough IP numbers to go around and we use the NAT device or router connects our local area network (LAN), or the group of PCs in your home or office, to the Internet. In this section, we will show you how to configure your FXS Gateway behind the NAT device if the FXS Gateway acts standalone device in your network.

3.1. Behinds the NAT Router (P2P Mode)

When you place the FXS GATEWAY behinds the NAT router in P2P Mode, a few more settings need to configure on the FXS GATEWAY and router.



Setup the FXS Gateway:

1. Open the web browser to connect the gateway and select the **[Network Interface]**

Network Interface	
IP Address:	192 . 168 . 1 . 8
Subnet Mask:	255 . 255 . 255 . 0
Default routing gateway:	192 . 168 . 1 . 1
DHCP:	☐ enable ☒ disable
SNTP:	☒ enable ☐ disable
SNTP Server Address:	168 . 95 . 195 . 12
GMT:	8
IP Sharing:	☒ enable ☐ disable
IP Sharing Server Address:	61 . 219 . 198 . 204
Primary DNS Server:	168 . 95 . 192 . 1
Secondary DNS Server:	168 . 95 . 1 . 1
OK	

2. Change the IP Address, assign the IP address depends on your NAT router settings. If the NAT Router LAN IP is **192.168.1.1**, then the Gateway's IP must be set as **192.168.1.x** , then enter the Subnet Mask as **255.255.255.0**

Note: The static IP must configured on the Gateway in this application

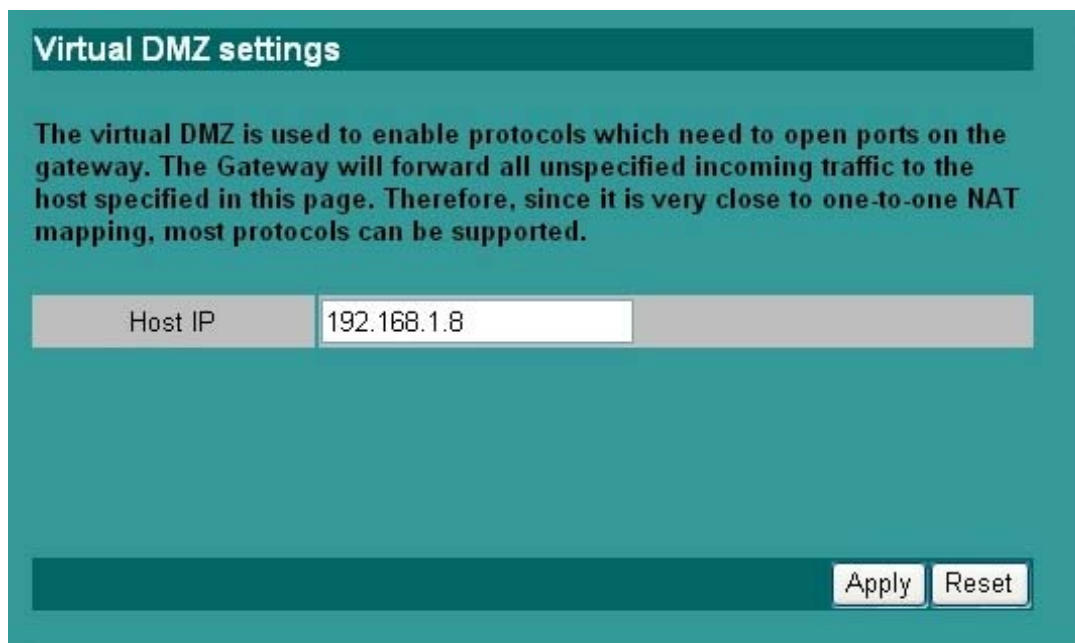
3. Change the Default routing gateway IP Address. Here means your router's LAN IP address, for example: **192.168.1.1**
4. Enable the **[IP Sharing]**, enter the **IP Sharing Server Address**, here means the router's WAN IP address, for example: **61.219.198.204**, then Click the button
5. Select **[Commit Data]** and click button.
6. Select **[Reboot System]** and click button.

Setup the NAT router:

When the VoIP gateway or computer behind the NAT router, normal web surfing and email will not know the difference, but some communication services using ports other than the normal web ports (ports are like door ways to your computer and for security the communication has the abnormal ones closed and locked but the normal ones open like the web surfing port 80). It must enable the **DMZ** (Demilitarized Zone) function or setup the **Port Forwarding**(or called Virtual Server), let the communication traffic can pass through the router.

A. DMZ Setup

1. Enter the NAT router configuration by web browser or software utility.
2. Locate the DMZ function and enable it



Virtual DMZ settings

The virtual DMZ is used to enable protocols which need to open ports on the gateway. The Gateway will forward all unspecified incoming traffic to the host specified in this page. Therefore, since it is very close to one-to-one NAT mapping, most protocols can be supported.

Host IP 192.168.1.8

Apply Reset

SP888B Broadband Router Screen Shot

DMZ

In computer networks, a DMZ (demilitarized zone) is a computer host or small network inserted as a "neutral zone" between a company's private network and the outside public network. It prevents outside users from getting direct access to a server that has company data. (The term comes from the geographic buffer zone that was set up between North Korea and South Korea following the UN "police action" in the early 1950s.)

B. Port Forwarding (Virtual Server)

If you can not find the DMZ function on your router or firewall, then the Port Forwarding is another way to allow the communication traffic pass through. A broadband router creates a firewall between your internal network and the internet. A firewall keeps unwanted traffic from the internet away from your LAN computers. A 'tunnel' can be created through your firewall so that the computers on the Internet can communicate to one of the computers on your LAN on a single port. This is handy for running web servers, game servers, ftp servers, VoIP applications or even video conferencing. This is called port forwarding. Port 5060 and Port 16384 ~ are commonly used in SIP from Micronet VoIP products

1. Enter the NAT router configuration by web browser or software utility.
2. Locate the Port Forwarding function and enable it

Virtual Server

Please complete the following information to create a rule. To delete a rule, empty Name field or click "del" button to clear relative text entries. You have to click "Apply" to take all changes effect. A maximum number of rules supported in this version is 20.

Name	Port Range	IP Address	Enable	
SIP	5060	5060 TCP	192.168.1.8	☒ del
RTP	16384	16394 UDP	192.168.1.8	☒ del

Apply Reset

SP888B Broadband Router Screen Shot

Port

Applications running on TCP/IP open connections to other computers using something called ports. Ports allow multiple applications to reside on a single computer - all talking TCP/IP. Ports are another set of numbers AFTER the standard IP address. Applications often hide these port numbers to reduce the complexity of TCP/IP. Example: web services (HTTP) reside on port 80 by default, port 5060 is for the SIP signaling by default, port 16384 ~ is for the RTP by default, etc.

3.2. Codec Selection

Codec (Coder / Decoder)

Codecs are used to convert analog signals to a digital bit stream, and another identical codec at the far end of the communication converts digital bit stream back into an analog signal. Codecs vary in the sound quality, the bandwidth required, the computational requirements, etc. Codecs generally provide a compression capability to save network bandwidth. Some codecs also support silence suppression, where silence is not encoded or transmitted. In the VoIP world, codec's are used to encode voice for transmission across IP networks.

Micronet VoIP gateway supports several different codecs, G.711A/ μ law, G723.1, G729, and when talking to each other, negotiate which codec they will use.

Codec	Description	Bit Rate (Kb/s)	Remark
G.723.1	G.723.1 is an ITU-T standard codec. Its reasonably low bit rate (6.3Kbps or 5.3Kbps). Use of this codec in a product requires licensing by Sipro Lab Telecom	5.6 / 6.3	It encodes speech or other audio signals in frames using linear predictive analysis-by-synthesis coding.
G.729	Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP)	8	Low delay (15 ms)
G.711	G.711 is the international standard for encoding telephone audio on an 64 kbps channel. It is a pulse code modulation (PCM). This is most	64	μ -law (US, Japan) and A-law (Europe) companding

All VoIP packets are made up of two components: **voice samples** and **IP/UDP/RTP headers**. Although the voice samples are compressed by the Digital Signal Processor (DSP) and may vary in size based on the codec used, these headers are a constant 40 bytes in length. This table shows the nominal Ethernet bandwidth consumption.

Codec	Bit Rate (Kb/s)	Nominal Ethernet Bandwidth
G.723.1	5.3 / 6.4	20.8 kbps (for 5.3 frame bit rate) 21.9 kbps (for 6.4 frame bit rate)
G.729	8	31.2 kbps
G.711	64	87.2 kbps

4. Firmware Upgrade

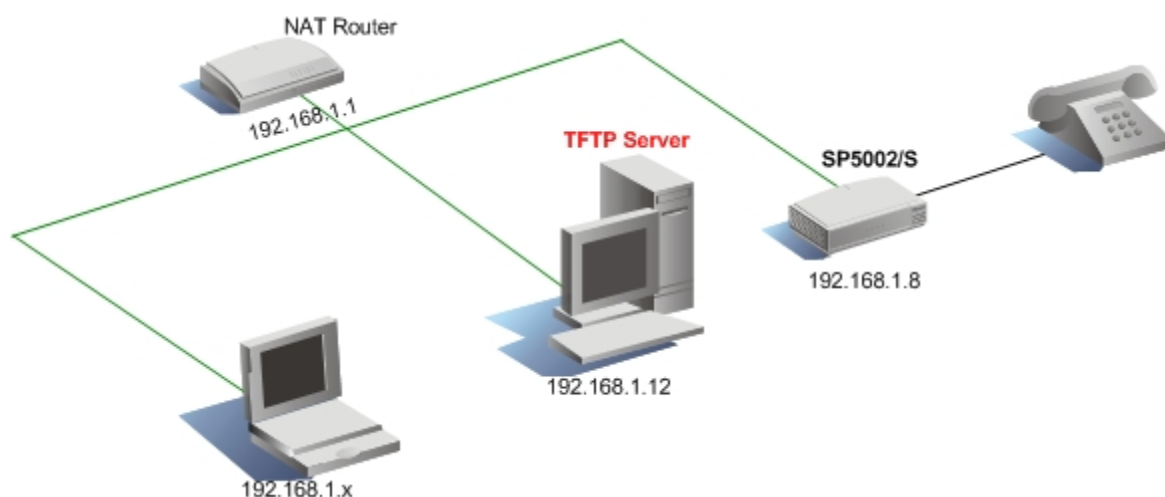
Firmware is a combination of software and hardware. Computer chips that have data or programs recorded on them are firmware. These chips commonly include the following: **ROMs** (read-only memory), **PROMs** (programmable read-only memory), **EPROMs** (erasable programmable read-only memory), it's same as software, except it is executed from ROM, and does not disappear when the power is turned off.

Firmware in PROM or EPROM is designed to be updated if necessary through a software update. You can download firmware updates for Micronet VoIP products from Micronet web site at Download Center.

You must have a TFTP or FTP server configured and running to perform the download operation, you can download the TFTP program from Micronet web site.

Note:

Firmware should be upgraded **ONLY** if you experience problems with the Gateway



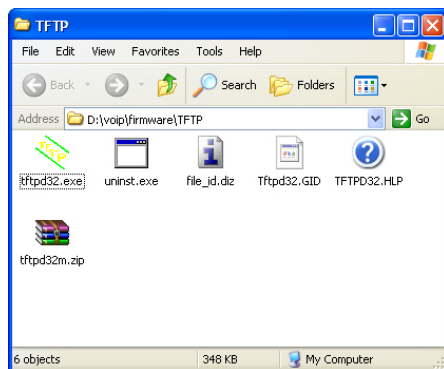
4.1. TFTP Server Setup

1. Click the link to download the TFTP program. The file downloads as a compressed file called a zip (.zip) file.

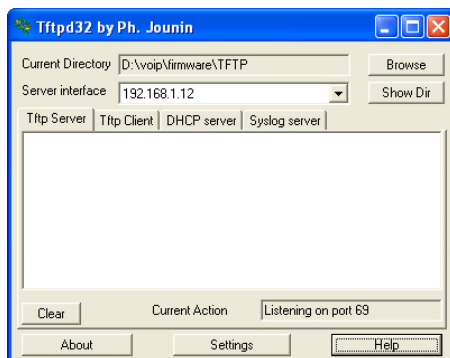
<http://www.micronet.info/Download/Driver/VoIP/utility/tftpd32m.zip>

Note:

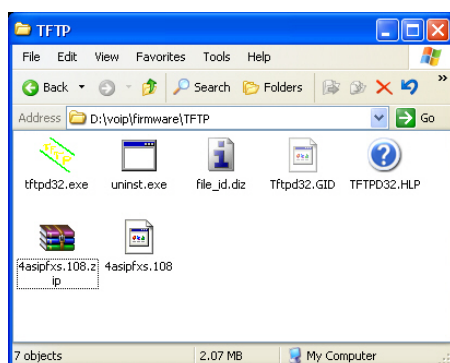
The file opens in WinZip® or another decompression program, use the program to extract the zip from the compressed file.



2. Select the folder where you want to save the compressed file, and then click Save



3. After extracting the file, you can double-click the **tftpd32.exe** to start the program.

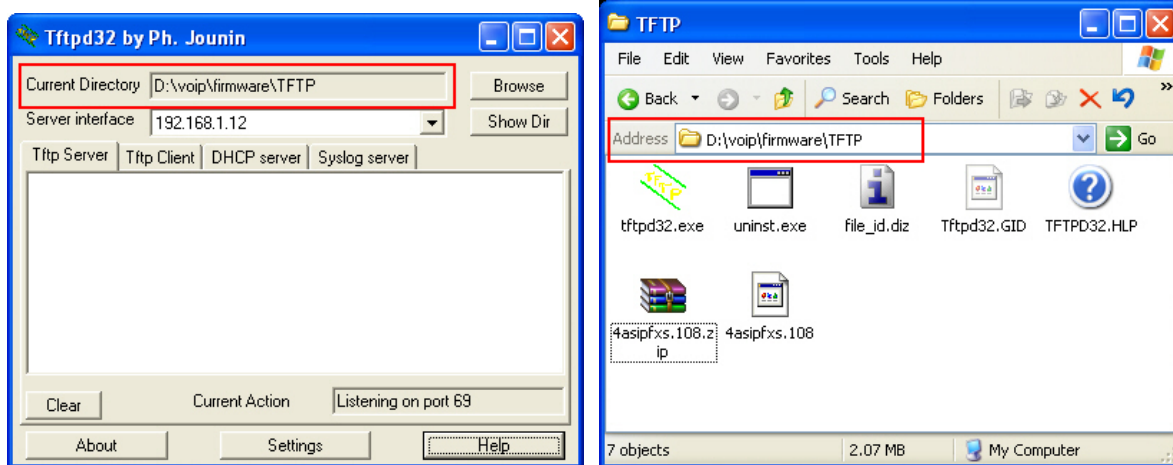


4. Download the firmware, save and decompress the file into same folder where the TFTP program located

5. Now, you have the TFTP server and latest Application firmware ready. Go to next section for upload the firmware into the FXS GATEWAY

Note:

Make sure the **Current Directory** has located the same folder as where the firmware file saved.



If you saved the ROM file other than where the TFTP program located, please select the correct folder by click **Browse**

TFTP

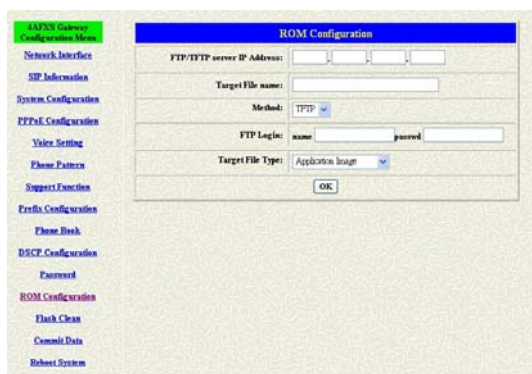
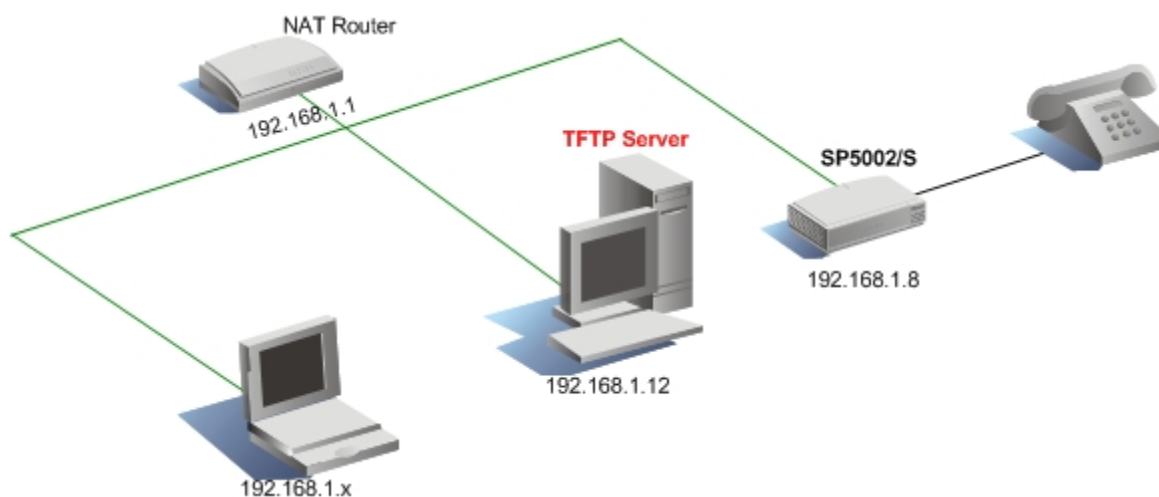
Trivial File Transfer Protocol (TFTP) is a very simple file transfer protocol akin to a basic version of FTP. TFTP is often used to transfer small files between hosts on a network, such as when a remote X Window System terminal or any other thin client boots from a network host or server.

Some details of TFTP:

- Uses UDP (port 69) as its transport protocol (unlike FTP which uses TCP port 21).
- It cannot list directory contents
- No authentication or encryption mechanisms
- Used to read files from/write files to a remote server

4.2. Upgrade by WEB Interface

The FXS GATEWAY has configured static IP address (**192.168.1.8**) and the TFTP server (**192.168.1.12**) as the diagram showed.

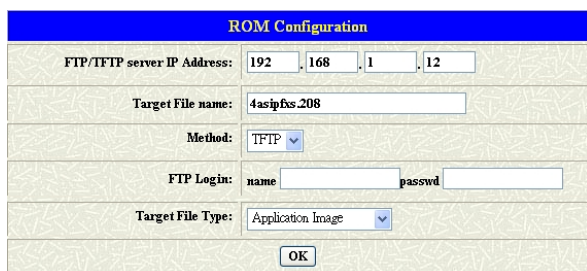


1. Open the web browser to connect the gateway and select the **[ROM Configuration]**

ROM Configuration	
FTP/TFTP server IP Address:	192 . 168 . 1 . 12
Target File name:	4asipfxs.208
Method:	TFTP
FTP Login:	name _____ passwd _____
Target File Type:	Application Image
OK	

2. Enter the TFTP server IP address (192.168.1.12)

3. Enter the firmware file name into Target File name field



ROM Configuration

FTP/TFTP server IP Address: 192 . 168 . 1 . 12

Target File name: 4asipfxs.208

Method: TFTP

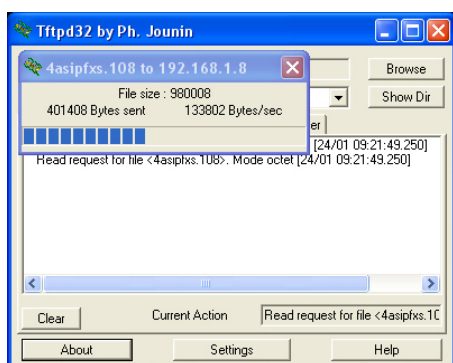
FTP Login: name password

Target File Type: Application Image

OK

4. Select **[TFTP]** method

5. Select **[Application Image]** as Target File Type



6. Click **OK** button to start downloading the firmware

Note: TFTP server is uploading the file to the gateway

Please issue FLASH CLEAN to consist software version.

After file transferred complete, the gateway will write the new firmware into the Flash ROM, wait until see the web browser showed **Please issue FLASH CLEAN to consist software version**



Flash Clean

4AFXS Gateway will be reseted to factory default values.

CLEAN

7. Select [Flash Clean] menu and click the **CLEAN** button

Flash cleaned!!

When the screen showed **Flash cleaned!!** You can now reboot the gateway.

Note:

All the settings will be erased after upgrade the firmware, the gateway needs to re-configure again. You can change Micronet VoIP gateway's protocol from SIP to H.323, or from H.323 to SIP by firmware uploaded as well.

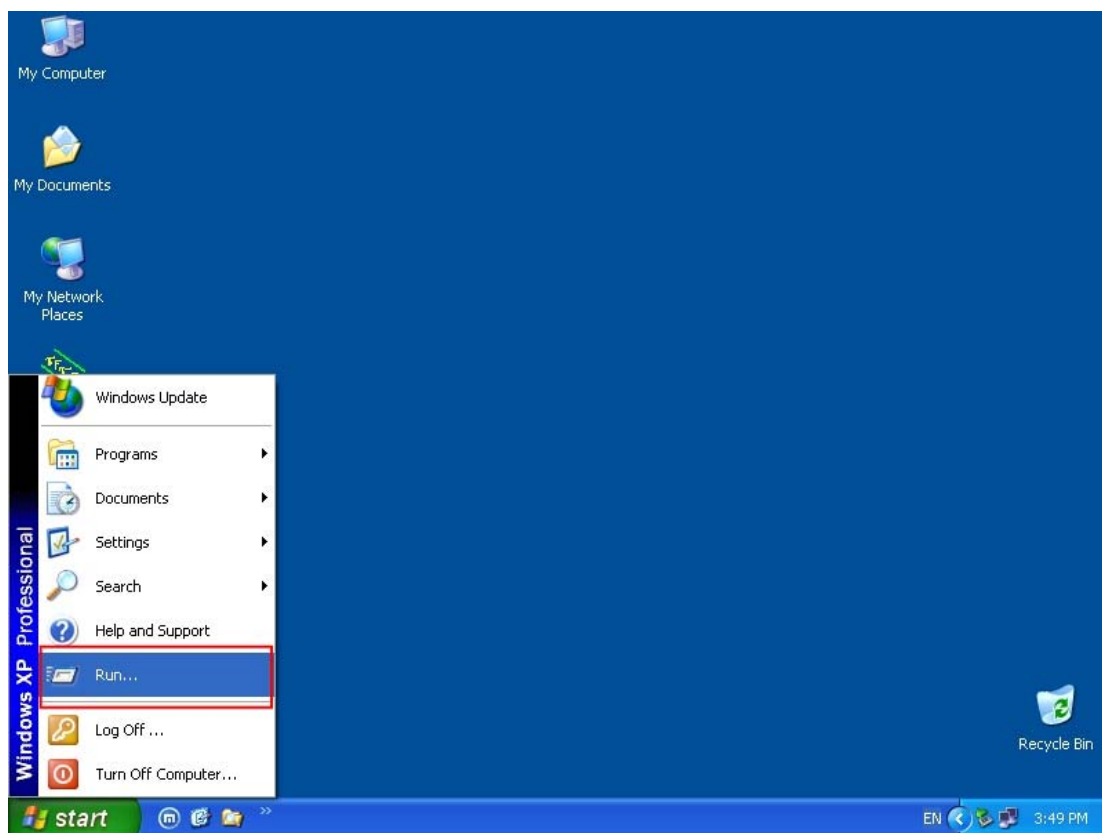
4.3. Upgrade by Telnet Command

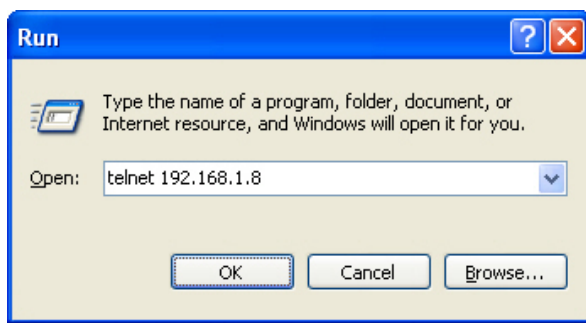
Telnet is another way you can access the gateway, assuming it has given you permission. More technically, Telnet is a user command and an underlying TCP/IP protocol for accessing remote network devices. On the Web, HTTP and FTP protocols allow you to request specific files from remote network devices, but not to actually be logged on as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted to the specific application and data on that device. Telnet is most likely to be used by program developers and anyone who has a need to use specific applications or data located at a particular host.

A Telnet command request looks like this: **telnet 192.168.1.8**

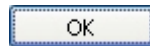
We will show you how to use the telnet command to upgrade the firmware under Windows OS. For the Linux OS users, please check your OS manual or ask the network administrator for the help.

1. Click **Start** and select **Run...**

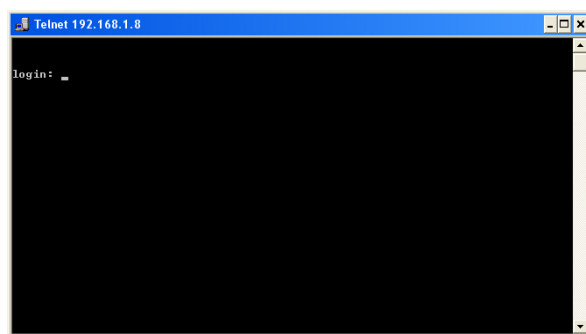




2. Type **telnet 192.168.1.8** and click

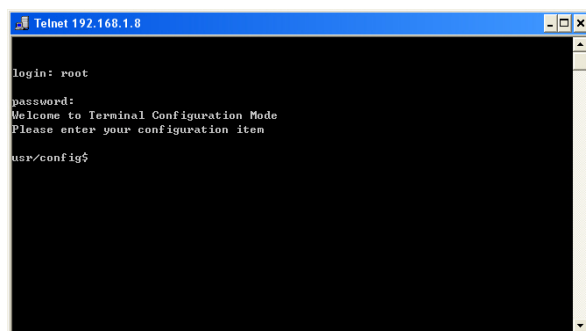


to connect your gateway

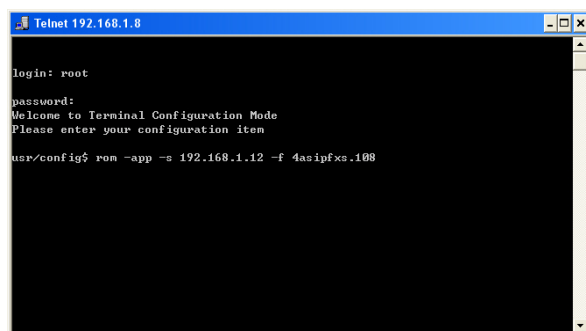


3. Login screen

4.



4. Type **root** as login name, no password, press **[Enter]**



5. Type the following command line to execute the upgrade procedure.

usr/config\$ rom -app -s 192.168.1.12 -f 4asipfxs.108

```

Telnet 192.168.1.8
usr/config$ rom -app -s 192.168.1.12 -f 4asipfxs.108

tftpserver : 192.168.1.12
downloadFile : 4asipfxs.108
address : 80000
112640 byte downloaded
281600 byte downloaded
453120 byte downloaded
621568 byte downloaded
786432 byte downloaded
947200 byte downloaded
Download finish!!!

Tftp transfer OK.

Begin writting flash. Please wait a moment!!!
 6 percent written

```

6. Gateway starts downloading the ROM file

```

Telnet 192.168.1.8
tftpserver : 192.168.1.12
downloadFile : 4asipfxs.108
address : 80000
112640 byte downloaded
281600 byte downloaded
453120 byte downloaded
621568 byte downloaded
786432 byte downloaded
947200 byte downloaded
Download finish!!!

Tftp transfer OK.

Begin writting flash. Please wait a moment!!!
 6 percent written
13 percent written
20 percent written
26 percent written
33 percent written

```

7. After downloaded the file, start writing into Flash ROM

```

Telnet 192.168.1.8
100 percent written

Boot Rom : sdboot.200
Application Rom : 4asipfxs.108
DSP App : 48302cc3.140
DSP Kernel : 48302ck.140
DSP Test Code : 483chit.bin
Hold Tone : holdtone.101

*****
* WARNING!!
* Please issue a "flash -clean" command now for
* software consistency. This command will set the
* device back to factory default settings, please
* record your current settings!
*****

usr/config$

```

8. Always clean the flash memory after upgraded new firmware.

```

Telnet 192.168.1.8
* WARNING!!
* Please issue a "flash -clean" command now for
* software consistency. This command will set the
* device back to factory default settings, please
* record your current settings!
*****

usr/config$ flash -clean

Flash clean start
Flash clean success!!

!! rebooting ...

!! rebooting ...

```

9. After the **rebooting ...** message showed, close the Telnet windows

10. Re-login the gateway and configure it.

Note:

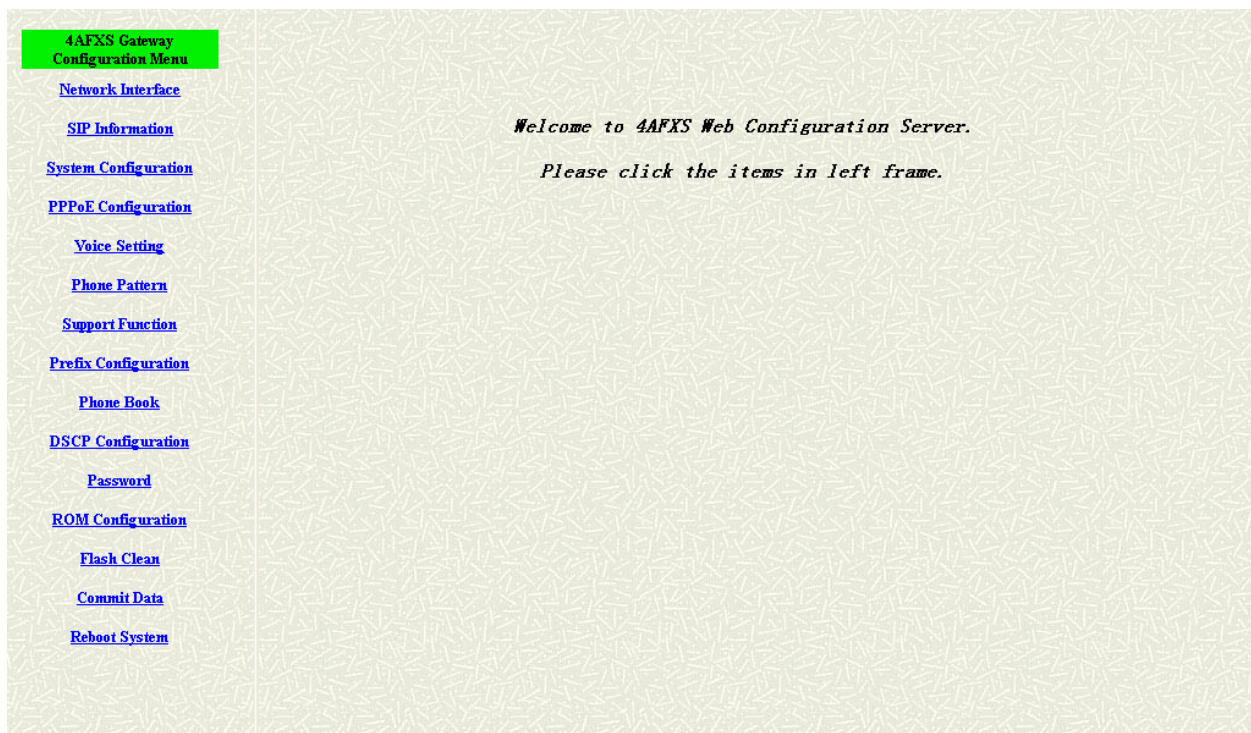
Telnet mode is good for user to monitoring the upgrade procedures

For more details about the Telnet commands, refer to the **Command List** section

5. WEB Configuration Menu

Micronet gateway provides a built-in web server. You can be accessed via Microsoft Internet Explorer or Netscape Navigator through use of a computer connected with an Ethernet cable to the FXS GATEWAY gateway. Configuration and administration can be performed through this convenient web interface. This section shows all of the configure functions.

Main page



5.1. Network Interface

4AFXS Gateway Configuration Menu Network Interface SIP Information System Configuration PPPoE Configuration Voice Setting Phone Pattern Support Function Prefix Configuration Phone Book DSCP Configuration Password ROM Configuration Flash Clean Commit Data Reboot System	Network Interface				
	IP Address:	10	1	1	3
	Subnet Mask:	255	0	0	0
	Default routing gateway:	10	1	1	254
	DHCP:	☐ enable ☒ disable			
	SNTP:	☒ enable ☐ disable			
	SNTP Server Address:	168	95	195	12
	GMT:	8			
	IP Sharing:	☐ enable ☒ disable			
	IP Sharing Server Address:	210	59	163	198
	Primary DNS Server:	168	95	192	1
	Secondary DNS Server:	168	95	1	1
	OK				

IP Address

When your gateway has static IP address or set behind the NAT router, configure the **IP Address**, **Subnet Mask** and **Default routing gateway**

Subnet Mask

A subnet is an identifiably separate part of an organization's network. Typically, a subnet may represent all the machines at one geographic location, in one building, or on the same local area network (LAN). The appropriate subnet mask carried along with the packet would be: **255.255.255.0**

Default routing gateway

The default gateway IP is assigned by the ISP or your NAT router's LAN IP.

DHCP

Enable the DHCP client function if you have the Cable Modem connection to access the Internet

SNTP

Simple Network Time Protocol. It's a simplified version of the NTP protocol, it is an Internet protocol used to synchronize the clocks of gateway to some time reference

SNTP Server Address	Enter the preferred Time server address here You can find the public SNTP server list from the web site, or http://support.microsoft.com/default.aspx?scid=kb;EN-US;q262680
GMT	SNTP uses UTC(Universal Time Coordinated) as reference time, formerly and still widely called Greenwich Mean Time (GMT). Set the correct GMT for your location to get time display correctly.
IP Sharing	Enable this function when you place the gateway behind the NAT router device.
IP Sharing Server Address	Enter the public Internet IP address here, if the gateway behinds the NAT router.
Primary DNS Server	Enter the primary Domain Name Server IP address here. If the gateway connects to the server by URL address, DNS must configure. DNS is the Domain Name System. DNS converts machine names to the IP addresses that all machines on the net have. It translates from name to address and from address to name. For example www.micronet.info
Secondary DNS Server	Enter the secondary Domain Name Server IP address here.

5.2. SIP Information

The screenshot displays the '4AFXS Gateway Configuration Menu' on the left and the 'SIP Information' configuration page on the right. The left menu includes links for Network Interface, SIP Information (highlighted), System Configuration, PPPoE Configuration, Voice Setting, Phone Pattern, Support Function, Prefix Configuration, Phone Book, DSCP Configuration, Password, ROM Configuration, Flash Clean, Commit Data, and Reboot System. The SIP Information page features a 'Run Mode' section with radio buttons for Peer-2-Peer, Proxy (selected), and Gateway. Below this are input fields for Primary Proxy IP Address (10.1.1.2), Secondary Proxy IP Address (null), Outbound Proxy (null), Proxy port (5060), Prefix String (null), and four lines of SIP configuration (Line1 to Line4). Each line includes fields for Number, Account, and Password. At the bottom, there are fields for SIP port (5060), RTP Port (16384), and Expire (60), followed by an OK button.

SIP Information	
Run Mode:	☐ Peer-2-Peer ☒ Proxy ☐ Gateway
Primary Proxy IP Address:	10.1.1.2
Secondary Proxy IP Address:	null
Outbound Proxy:	null
Proxy port:	5060
Prefix String:	null
Line1 Number:	1001
Line1 Account:	1001
Line1 Password:	****
Line2 Number:	1002
Line2 Account:	1002
Line2 Password:	****
Line3 Number:	1003
Line3 Account:	1003
Line3 Password:	****
Line4 Number:	1004
Line4 Account:	1004
Line4 Password:	****
SIP port:	5060
RTP Port:	16384
Expire:	60
OK	

Run Mode Select Peer-to-Peer, Proxy or Gateway mode.
Only Line1 works in Gateway mode

Primary Proxy IP Address Set Proxy IP Address or URL e.g. **220.130.173.70** or **sip.micronet.info**

Secondary Proxy IP Address Set secondary proxy address here if available

Outbound Proxy	The outbound proxy is a normal SIP proxy. You configure your client, the gateway or phone, to use the proxy for all SIP sessions, just like when you configure your Web browser to use a Web proxy for all Web transactions. In some cases, the outbound proxy is placed alongside the firewall and is the only way to let SIP traffic pass from the internal network to the Internet. Enter the Outbound Proxy address here if your SIP service provider supported.
Proxy Port	SIP local UDP port number (5060~5070), default: 5060. Change the Proxy port only when your service provider has different application.
Prefix String	Set specific prefix string, use it when User ID contains alphabets
Line Number	The Line Number is same as the telephone number, people locate you by this number.
Line Account	Account is requires by the SIP server for register, it can be the Line number, user name or e-mail account.
Line Password	Enter the Account password here.
SIP Port	SIP Signaling port. Default is 5060
RTP Port	Real-time Transport Protocol. The Internet protocol for transmitting real-time data such as audio and video. RTP itself does not guarantee real-time delivery of data, but it does provide mechanisms for the sending and receiving applications to support streaming data. Default is 16384
Expire	Set expire time to match the SIP server registration time required. It means, if you set 60, the gateway sends the register request information to the SIP server every 60 seconds.

5.3. System Configuration

System Configuration	
Keypad DTMF Type:	☒ In-Band ☐ RFC2833
RFC2833 Payload Type:	96
FAX Payload Type:	101
Inter Digit Time:	3
CallerID Type:	☒ disable ☐ FSK(BELL CORE) ☐ DTMF
Busy Forward:	☐ ON ☒ OFF
End of Dial Digit:	☐ NONE ☐ * ☒ #
OK	

Keypad DTMF Type Select In-Band, RFC2833 on DTMF replay type

RFC2833 Payload Type RFC2833 Payload Type (range: 96~128 inter-used: 100, 102~105)

FAX Payload Type Set Fax Payload Type (range: 96 or 101, default: 101)

Inter Digit Time Set the DTMF inter digit time (second)

CallerID Type Set CallerID type. If your telephone set has CallerID function, after the first ring at destination site, device will send line number as Caller ID to called site. FSK (Frequency-shift keying) is a method of transmitting digital signals. DTMF (dual tone multi frequency) is the signal to the phone company that you generate when you press an ordinary telephone's touch keys.

Busy Forward Set enable or disable to route the call to preset number when the line has no answer or currently online.

End of Dial Digit Set end of dial key as None, *, #. The End of Dial function is similar to the **Send** button on your mobile phone

5.4. PPPoE Configuration

PPPoE Device Configuration	
Device:	☐ On ☒ Off
User Name:	pppoe
Password:	*****
IP Address:	
Destination:	
DNS primary:	
Reboot After Remote Host Disconnection:	☒ On ☐ Off
OK	

Device	Enable or Disable the PPPoE connection
User Name	Enter your PPPoE account
Password	Enter your PPPoE account password
IP Address	It shows the Internet connection IP address if the gateway PPPoE connection established.
Destination	It shows the Internet connection gateway address if the gateway PPPoE connection established.
DNS primary	It shows the Internet connection Domain Name Server IP address if the gateway PPPoE connection established.
Reboot After Remote Host Disconnection	The gateway will reboot by self when lost the Internet connection and regain the connection

5.5. Voice Configuration

Voice Setting					
Codec Priority	1st G. 723.1	2nd G. 729a	3rd G. 711mu-Law	4th G. 711A-Law	5th G. 729
Frame Size	G.723.1 60ms	G.729a 40ms	G.729 40ms	G.711mu 40ms	G.711A 40ms
G.723 Silence Suppression:	☐ enable ☒ disable				
Volume:	voice 28	input 28	DTMF 23		
Echo Cancelor:	☒ enable ☐ disable				
Jitter Buffer:	Min. Delay 90		Max. Delay 150		
OK					

Codec Priority Set the Codecs priority here. If you set the g723 at first priority, g729a at second priority, then the gateway will use g723 to negotiate the connection first, then shift to second codec if the first didn't match

Frame Size Set Specify sending packet size, G.723: 30/60/90, G.711A, G.711U, G.729: 20/40/60/80ms, G.729A: 20/40/60/80ms. The smaller the packet size, the shorter the delay time. If network is in good condition, smaller sending packet size is recommended

G.723 Silence Suppression Silence Suppression, also called "Voice activation detection" (VAD) is a software application that allows a data network carrying voice traffic over the Internet to detect the absence of audio and conserve bandwidth by preventing the transmission of "silent packets" over the network.

Volume Adjust the volume levels
Voice (Incoming) : 0 ~ 63
Input gain (Outgoing) : 0 ~ 38
DTMF (Keypad tone) : 0 ~ 31

Echo Cancelor

Echo Canceller is designed to cancel acoustic feedback between a loudspeaker and a microphone in loud speaking audio systems.

Jitter Buffer

It's a hardware device or software process that eliminates jitter caused by transmission delays in an Internet telephony (VoIP) network. As the jitter buffer receives voice packets, it adds small amounts of delay to the packets so that all of the packets appear to have been received without delays. Voice signals are sequential by nature (i.e., they must be played back in the order in which they were sent) and the jitter buffer ensures that the received packets are in the correct order. Without a jitter buffer to smooth the transmission, data can be lost, resulting in choppy audio signals.

5.6. Phone Pattern Configuration

For tone simulation, FXS Gateway adopts dual frequencies as traditional telephone does. Default tone value is set according to U.S. tone specification. Users may adjust the values to their own country's tone specification or users-defined tone specification.

Phone Pattern						
Ring Tone:	Frequency 20		On 2000	Off 4000		
Ring Back Tone:	High(freq) 480	Low(freq) 440	High(lev) 155	Low(lev) 155	On 2000	Off 4000
Busy Tone:	High(freq) 620	Low(freq) 480	High(lev) 155	Low(lev) 155	On 500	Off 500
Dial Tone:	High(freq) 440	Low(freq) 350	High(lev) 155	Low(lev) 155	On 8000	Off 0
2nd Dial Tone:	High(freq) 440	Low(freq) 350	High(lev) 19	Low(lev) 19	On 25	Off 25
OK						

Ring Tone

Set Ring frequency, on time, off time. Gateway will give ring to phone set to trigger ring. If user found that phone set cannot ring when having incoming call, please try to increase ring frequency here.

- ringing frequency: 15 ~ 100 (Unit: Hz)
- ringing ring ON/OFF: 0 ~ 8000 (Unit: ms)
- ringing level: 0 ~ 94 (Unit: V)
- tone frequency: 0 ~ 65535 (Unit: Hz)
- tone freqLevel: 0 ~ 65535 (Unit: mVrms)
- tone Tone ON/OFF: 0 ~ 8000 (Unit: ms)

Ring Back Tone

Set ring back tone parameters

Busy Tone

Set busy tone parameters

Dial Tone

Set Dial tone parameters

2nd Dial Tone

To configure the value of the local 2nd dial tone

Audible tones are used in the telephone system to indicate the progress or disposition of a call. Precise dial tone consists of Current day "precise" tones consist of a summation of two low distortion sine waves.

The Dial Tone signal is used in Public Switched Telephone Networks to indicate that the telephone network switching equipment has recognized that a telephone has gone off-hook, and the switching equipment is prepared to receive the dialed digits or DTMF codes.

The Ring-back signal is used in Public Switched Telephone Networks to indicate to the caller that the called number is not busy, and that the line is being "rung" or signaled that an incoming call is present. In most cases, the ring-back signal has the same cadence as the ring generators used in that country, but the ring-back and ring generators are usually not synchronized with one another.

The Busy signal is used in Public Switched Telephone Networks to indicate that the called party is already taking another call. On most switching systems, the busy signal will be emitted until the caller goes on-hook.

5.7. Support Configuration

A screenshot of a configuration window titled "Support Function". The window has a blue header bar with the title. Below the header, there is a section labeled "T.38 FAX:" with two radio buttons: "enable" and "disable". The "disable" radio button is selected. At the bottom of the window, there is an "OK" button.

Support Function	
T.38 FAX:	☐ enable ☒ disable
OK	

T.38 FAX

T.38 is an ITU standard for sending FAX across IP networks in a real-time mode. FAX messages are sent as UDP or TCP/IP packets. Enable the T.38 FAX function, the gateway can send or receive the facsimiles. It must enable on both sides, the caller and called party.

5.8. Prefix Configuration

The Prefix function is using the drop and inserts digits

Prefix Drop/Insert Configuration			
Index	Prefix	Drop	Insert

New Prefix			
Index	Prefix	Drop	Insert
		☐ Enable ☒ Disable	
		Add Data Delete Data	

Index Prefix record index number (Max: 30 prefix records)

Prefix Setting the prefix number of the whole numbers that could be into this VoIP gateway (Max: 20 digits)

Drop Select enable or disable drop prefix function. The function is enabled means to drop prefix number when dialing out. The function is disabled means to keep prefix number.

Insert Setting the digits that you want to insert in this number (Max: 30 digits)

Add Data Enter the **Index**, **Prefix**, **Drop** enable/disable and **Insert** then click the to create the new Prefix record.

Delete Date Enter the Index and click button to erase the Prefix record.

5.9. Phone Book Configuration

Phone Book function allows users to define their own numbers, which mapping to real IP address. It is effective only in peer-to-peer mode.

Phone Book				
Index	Name	IP_Address	e164	Port

New Record				
Index	Name	IP Address	E164 No.	Port No.
Add Data Delete Data				

Add Data You can record 20 sets of phone book. Enter the **Index**, **Name**, **IP Address** and **E.164 No** then click the to create the new phone book record.

Delete Date Enter the Index and click button to erase the phone book record.

Note:

The e164 number defined in phone book will fully carry to destination. It is not just a representative number for destination's IP Address. In other words, user dial this e164 number to reach destination, destination will receive the number and find out if it is matched to its e164, including Line number in some particular device.

5.10. DSCP Configuration

DiffServ Code Point(DSCP) Configuration	
=== Signal Packet ===	
☐ Assured Forwarding(AF) PHB	Delay Priority : Class 1 Drop Precedence : Low
☐ Expedited Forwarding(EF) PHB	
☒ Default	
☐ User Assign Special DSCP Code:	
=== RTP Packet ===	
☐ Assured Forwarding(AF) PHB	Delay Priority : Class 1 Drop Precedence : Low
☐ Expedited Forwarding(EF) PHB	
☒ Default	
☐ User Assign Special DSCP Code:	
OK	

Assured Forwarding (AF) PHB

Assured Forwarding (AF): Has four classes and three drop-precedence within each class (so a total of twelve codepoints). Excess AF traffic is not delivered with as high probability as the traffic "within profile," which means it may be demoted but not necessarily dropped **DiffServ AF**

Expedited Forwarding (EF) PHB

Expedited Forwarding (EF): Has a single codepoint (DiffServ value). EF minimizes delay and jitter and provides the highest level of aggregate quality of service. Any traffic that exceeds the traffic profile (which is defined by local policy) is discarded **DiffServ EF**

Default

Select TOS value as 0.

User Assign Special DSCP Code

User can set other unspecified value here

Differentiated Services (DiffServ, or DS) is a protocol for specifying and controlling network traffic by class so that certain types of traffic get precedence - for example, voice traffic, which requires a relatively uninterrupted flow of data, might get

precedence over other kinds of traffic.

By using DiffServ, traffic is classified based on priority. Then the traffic is forwarded using one of three IETF-defined per-hop behavior (PHB) mechanisms. This approach allows traffic with similar service characteristics to be passed with similar traffic guarantees across multiple networks, even if the multiple networks don't provide the same service the same way. This is an important feature because the Internet is really a network of multiple service provider networks.

DiffServ replaces the first bits in the ToS byte with a differentiated services code point (DSCP). The DSCP is then mapped to the PHB. This technique allows service providers to control how the DSCP codepoints are mapped to PHBs, and each time a packet enters a network domain it may be re-marked.

5.11. Password Configuration

Password		
root	Current Password:	
	New Password:	
	Confirm New Password:	
CHANGEABORT		

Login User Name Select root or administrator

Current Password Enter the existing password here

New Password Enter the new password

Confirm New Password Enter the new password again

There is no password as default setting, it is strongly recommended that you change the factory default password of the gateway. All users who try to access the Gateway's Web-based setup menu will be prompted for the Gateway's Password. The new Password must not exceed 12 characters in length and must not include any spaces. Enter the new Password a second time to confirm it.

5.12. ROM Upgrade

The web configuration provides Update FXS Gateway ROM Version.

ROM Configuration	
FTP/TFTP server IP Address:	. . .
Target File name:	
Method:	TFTP v
FTP Login:	name passwd
Target File Type:	Application Image v
OK	

FTP/TFTP server IP address Enter the FTP or TFTP Server IP Address

Target File Name Enter the new firmware's file name here

Method Select download method as FTP or TFTP

FTP Login Name Enter the FTP Login name (max 14 byte)

FTP Login Password Enter the FTP Login password (max 14 byte)

Target File Type Select download Target File Type on 2M Boot Image, DSP Application Image, DSP Core Image, DSP Test Image different options from the drop-down list box

Note:

To upgrade the firmware version, use the Application ROM only in most cases. 2M ROM includes BOOT and APP images.

5.13. Flash Clean

To reset the gateway settings back to factory default

Flash Clean
<i>4AFXS Gateway will be reseted to factory default values.</i>
CLEAN

Note:

User whose login name is **root** only executes it. All configurations in **[Network Interface]** will be kept.

5.14. Commit Data

To save change after configuring FXS Gateway.

Commit Data
It will take few seconds...
COMMIT

5.15. Reboot System

Reboot the FXS Gateway

Reboot 4AFXS System
It will take 40 seconds to reboot. (remember to COMMIT data before reboot!)
REBOOT

6. Command List

This section introduces the command line interface and lists all of the commands. You can use these commands to configure the gateway by telnet or console.

Command	Description
help	help/man/? [command]
quit	quit/exit/close the telnet connection
debug	Show debug message
reboot	Re-start the gateway
commit	Save the change
ifaddr	Network address manipulation
time	Show current time
ping	Connection test command
pbook	Phonebook information and configuration
pppoe	PPPoE stack manipulation
flash	Clean configuration from flash rom
sysconf	System information manipulation
sip	SIP information manipulation
security	Security information manipulation
voice	Voice information manipulation
support	Special Voice function support manipulation
tos	IP Packet ToS/DSCP values
phone	Setup of call progress tones and ringing (SLIC control)
bureau	Configure the Hotline mode destination
rom	Firmware information and update
passwd	Password setting information and configuration
line	Line information manipulation
prefix	Prefix drop/insert information manipulation

6.1. [help]

Type [help], [man] or [?] to show the command list as the table below.

```
usr/config$ ?

help          help/man/? [command]
quit          quit/exit/close
debug         show debug message
reboot        reboot local machine
commit        commit flash rom data
ifaddr        internet address manipulation
time          show current time
ping          test that a remote host is reachable
pbook         Phonebook information and configuration
pppoe         PPPoE stack manipulation
flash         clean configuration from flash rom
sysconf       System information manipulation
sip           SIP information manipulation
security      Security information manipulation
voice         Voice information manipulation
support       Special Voice function support manipulation
tos           IP Packet ToS/DSCP values
phone         Setup of call progress tones and ringing (SLIC control)
bureau        Bureau line information manipulation
rom           ROM file update
passwd        Password setting information and configuration
line          Line information manipulation
prefix        Prefix drop/insert information manipulation
```

6.2. [quit]

Type [quit], [exit] or [close] will disconnect the Gateway configuration mode.

6.3. [debug]

Debug is a tool to debug and analyze SIP messages traces, it can be more useful to track down the error of the connection. It help identify errors at various development stages.

```
usr/config$ debug

Debug message information and configuration
Usage:
debug [-add type1 [[type2]...]] | -open | -close | -status

    -status    Display the enabled debug flags.
    -add       Add debug flag.
    -delete    Remove specified debug flag.
    -open      Start to show debug messages.
    -close     Stop showing debug messages.

Example:
    debug -add sip msg
    debug -open
```

Parameter Usage:

-status	Display the enabled debug flags.
-add	Add debug flag
-sip	SIP related information
-msg	voice related information
-delete	Remove specified debug flag
-open	Start to show debug messages
-close	Stop showing debug messages

For example, user open debug flags including sip, vp, msg.

```
usr/config$ debug -add sip msg
usr/config$ debug -open
```

```
usr/config$ debug -status

Current debug type enabled :
Debug Mode is open
DEBUG-> SIP      MSG
```

6.4. [reboot]

```
usr/config$ reboot
```

```
◆ Rebooting...It will take 40 seconds....
```

After [commit] command, type [reboot] to re-start the gateway to take new configurations effective

6.5. [commit]

```
usr/config$ commit
```

```
This may take a few seconds, please wait....
```

```
Commit to flash memory ok!
```

Save changes after configuring Gateway.

6.6. [ifaddr]

Configure and display Gateway network information.

```
usr/config$ ifaddr
```

LAN information and configuration

Usage:

```
ifaddr [-print][[-dhcp used]][-sntp mode [server]]
```

```
ifaddr [-ip ipaddress] [-mask subnetmask] [-gate defaultgateway]
```

```
ifaddr [-dns index [dns server address]] [-ipsharing used[ip address]]
```

- print Display LAN information and configuration.
- ip Specify ip address.
- mask Set Internet subnet mask.
- gate Specify default gateway ip address
- dhcp Set DHCP client service flag (On/Off).
- sntp Set SNTP server mode and specify IP address.
- dns specify IP address of DNS Server.
- timezone Set local timezone.
- ipsharing Specify usage of an IP sharing device and specify IP address.

Note:

Range of ip address setting (0.0.0.0 ~ 255.255.255.255).

DHCP client setting value (On=1, Off=0). If DHCP set to 'On',

Obtain a set of Internet configuration from DHCP server assigned.

SNTP mode (0=no update, 1=specify server IP, 2=broadcast mode).

Example:

```
ifaddr -ip 210.59.163.202 -mask 255.255.255.0 -gate 210.59.163.254
```

```
ifaddr -dhcp 1
```

```
ifaddr -sntp 1 210.59.163.254
```

```
ifaddr -ipsharing 1 210.59.163.254
```

```
ifaddr -dns 1 168.95.1.1
```

Parameter Usage:

- | | |
|---------------|---|
| -print | Print current IP setting and status |
| -ip | Assign the VoIP gateway's IP address |
| -mask | Assign the VoIP gateway's Subnet Mask |
| -gate | Assign the VoIP gateway's default gateway |
| -dhcp | Dynamic host configuration (0=Off, 1=On) |

- sntp** Simple Network Time Protocol (0=No update, 1=Specify server IP). When SNTP function is activated, users have to specify a SNTP server as network time source
Example : **ifaddr -sntp 1 168.95.195.12**
- dns** Specify the DNS server's IP address
- timezone** Set local time zone according to GMT
- ipsharing** Enable this function when the VoIP gateway behind the NAT router or IP Sharing devices.
Example : **ifaddr -ipsharing 1 61.219.198.204**

Note : If you don't have static public IP address, then the dedicated IP address is not necessary in the command, for example : **ifaddr -ipsharing 1** However, dynamic IP Address is not working in Peer-to-Peer mode.

Information Example:

```
usr/config$ ifaddr -print

Internet address information
WAN IP address      : 192.168.1.8
Subnet mask         : 255.255.255.0
Default gateway     : 192.168.1.1
DHCP startup        : OFF
SNTP                 : mode=1
                     server 168.95.195.12
                     time zone : GMT+8
                     cycle=1024 mins

IPSharing           : no IPSharing device.

Primary DNS Server  : 168.95.192.1
Secondary DNS Server : 168.95.1.1
```

6.7. [time]

When SNTP function of Gateway is enabled and SNTP server can be found as well, type [time] command to show current network time.

```
usr/config$ time
Current time is MON JAN 10 12:38:38 2005
```

6.8. [ping]

ping is the name of a computer network tool used on TCP/IP networks (such as the Internet). It provides a basic test of whether a particular host is operating properly and is reachable on the network from the testing host. It works by sending ICMP packets to the target host and listening for replies

For example: if 192.168.1.2 is not existing while 192.168.1.1 exists. Users will have the following results:

```
usr/config$ ping 192.168.1.2

PING 192.168.1.2: 56 data bytes
no answer from 192.168.1.2
```

```
usr/config$ ping 192.168.1.1

PING 192.168.1.1: 56 data bytes
64 bytes from 192.168.1.1: icmp_seq=0. time=5. ms
64 bytes from 192.168.1.1: icmp_seq=1. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=2. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=3. time=0. ms
----192.168.123.100 PING Statistics----
4 packets transmitted, 4 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/1/5
```

6.9. [pbook]

Phone Book function allows users to define their own numbers, which mapping to real IP address. It is effective only in **peer-to-peer mode**. When adding a record to Phone Book, users do not have to reboot the machine, and the record will be effective immediately.

```
usr/config$ pbook

Phonebook information and configuration
Usage:
pbook [-print [start_record] [end_record]]
pbook [-add [ip ipaddress] [name Alias] [e164 phonenumber]]
pbook [-search [ip ipaddress] [name Alias] [e164 phonenumber]]
pbook [-insert [index] [ip ipaddress] [name Alias] [e164 phonenumber] [port number]]
pbook [-delete index]
pbook [-modify [index] [ip ipaddress] [name Alias] [e164 phonenumber] [port number]]

    -print      Display phonebook data.
    -add        Add an record to phonebook.
    -search     Search an record in phonebook.
    -delete     Delete an record from phonebook.
    -insert     Insert an record to phonebook in specified position.
    -modify     Modify an exist record.

Note:
    If parameter 'end_record' is omitted, only record 'start_record' will be display.
    If both parameters 'end_record' and 'start_record' are omitted, all records will be display.
    Range of ip address setting (0.0.0.0 ~ 255.255.255.255).
    Range of index setting value (1~100),

Example:
pbook -print 1 10
pbook -print 1
pbook -print
pbook -add name Test ip 210.59.163.202 e164 1001
pbook -insert 3 name Test ip 210.59.163.202 e164 1001
pbook -delete 3
pbook -search ip 192.168.4.99
pbook -modify 3 name Test ip 210.59.163.202 e164 1001
```

Parameter Usage:

-print	Print out current contents of Phone Book. Users can also add index number, from 1 to 50, to the parameter to show specific phone number.
-add	add a new record to phone book. When adding a record, users have to specify name, IP, and e164 number to complete the command.
name	Name to represent caller.
e164	E.164 number for mapping with IP address of caller
ip	IP address of caller
port	Call signal port number of caller
-search	To display record by specify index number
-delete	Delete a specific record. For example : <code>pbook -delete 3</code>
-insert	Insert an record to phonebook in specified position
-modify	modify an existing record. When using this command, users have to specify the record's index number, and then make the change.

PhoneBook Rules:

The e164 number defined in phone book will fully carry to destination. It is not just a representative number for destination's IP Address. In other words, user dial this e164 number to reach destination, destination will receive the number and find out if it is matched to its e164, including Line number in some particular device.

Note:

Index number: means the sequence number in phone book. If users do request a specific index number in phone book, Gateway will give each record a automatic sequence number as index.

6.10. [pppoe]

Display PPPoE related information.

```
usr/config$ pppoe
```

PPPoE device information and configuration

Usage:

```
pppoe [-print][[-open]][[-close]
```

```
pppoe [-dev on/off][[-id username]][-pwd password][[-reboot on/off]
```

```
-print    Display PPPoE device information.
-dev      Enable(=1) or Disable(=0) device.
-open     Open PPPoE connection.
-close    Disconnect PPPoE connection.
-id       Connection user name.
-pwd      Connection password.
-reboot   Reboot after remote host disconnection.
```

Parameter Usage:

-print print PPPoE status.

-dev Enable or Disable PPPoE Dial-up function

-open Open the connection

-close Disconnect the connection

-id The User name ID provided by ISP

-pwd The Login password provided by ISP

-reboot Reboot the gateway after the PPPoE connection disconnected

6.11. [flash]

Restore the gateway's configurations back to default.

```
usr/config$ flash
```

Flash memory information and configuration

Usage:

```
flash -clean
```

Note:

This command will clean the configuration stored in the flash and reboot it.

Parameter Usage:

-clean clean all the user defined value, and reboot Gateway in factory default mode

Note:

It is recommended that use [flash -clean] after application firmware upgraded.

User whose login name is root only executes it. All configurations in command [ifaddr] and [pppoe] will be kept.

6.12. [sysconf]

This command displays system information and configurations.

```
usr/config$ sysconf

System information and configuration
Usage:
  sysconf [-print] [-idtime digit] [-bf digit] [-keypad dtmf]
          [-faxtype type][-2833type type][-lcdrop ON/OFF]
          [-droptime digit][-eod digit] [-callerid type]
          [-service used][-dtmfstart digits] [-dtmfend digits]
  sysconf -print

-print          Display system overall information and configuration.
-idtime         Inter-Digits time.(1~10 sec)
-service        Specify gateway service type. (0: Dial in service,
                1: HotLine service.)
-bf             BusyForward.(ON:1 / OFF:0)
-keypad         Select DTMF type: 0=In-band,
                1=RFC2833.
-faxtype        FAX Payload Type      (range:96~128 inter-used:100,102~105)
-2833type       RFC2833 Payload Type (range:96~128 inter-used:100,102~105)
-lcdrop         Disconnect Supervision(Loop Current Drop) (ON:1 / OFF:0)
-droptime       Period of Loop Current Drop (ms)
-eod            End of Dial Digit setting(0: none, 1: *, 2: #)
-callerid       Caller ID Type setting, 0: Disable,
                1: FSK(BELLCORE),
                2: DTMF.
-dtmfstart      DTMF CallerID Start Symbol.
-dtmfend        DTMF CallerID End Symbol.
-ivr           IVR Auto Hang up (0:Disable /1:Tone /2:reverse )
Example:
  sysconf -keypad 0 -eod 2 -callerid 1
```

Parameter Usage:

- print** Show the sysconf current status.

- idtime** Set the duration (in second) of two pressed digits in dial mode as timed out. If after the duration user hasn't pressed next number, it will dial out all number pressed (1-10 seconds).

- service** Specify gateway service type. (0: Dial in service, 1: HotLine service.)

- bf** Busy Forward function

-keypad	DTMF replay type. When value is “1”, FXS Gateway will transfer DTMF signal via RTP payload as defined in RFC2833. When the value is set to “0”, the DTMF type is set as In-band.
-faxtype	FAX Payload Type. Rrange:96~128 inter-used:100,102~105.
-2833type	RFC2833 Payload Type. Range: 96~128 inter-used: 100, 102~105.
-lcdrop	Disconnect Supervision (Loop Current Drop) (ON:1 / OFF:0).
-droptime	Period of Loop Current Drop (ms).
-eod	Select the End of Dial key, “#”, “*” or none
-callerid	Select the Caller ID type, 0 = disable, 1 = FSK(Bell core), 2 = DTMF, 3 = NTT. After the first ring at destination site, device will send line number as caller ID to called site.
-dtmfstart	DTMF Caller ID Start Symbol
-dtmfend	DTMF Caller ID End Symbol

Payload Type, the essential data that is being carried within a packet or other transmission unit. The payload does not include the "overhead" data required to get the packet to its destination. Note that what constitutes the payload may depend on the point-of-view. To a communications layer that needs some of the overhead data to do its job, the payload is sometimes considered to include the part of the overhead data that this layer handles. However, in more general usage, the payload is the bits that get delivered to the end user at the destination.

Note:

The **ivr** command is customized function, for specified server only.

6.13. [sip]

This command is to configure SIP related parameters.

```
usr/config$ sip

SIP stack information and configuration
Usage:
sip [-print] [-mode pxmode] [-outpx IPaddress][-transport type]
sip [-px address] [-px2 address] [-pxport number] [-prefix prefixstring]
    [-line1 number] [-line2 number] [-line3 number] [-line4 number]
    [-expire t1] [-port udpPort] [-rtp rtpPort]
sip -print

    -print      Display SIP stack information and configuration.
    -mode       Configure as Peer-to-Peer mode:0/Proxy mode:1/Gateway mode:2.
    -px         Primary Proxy server address. (IPv4 address or dns name)
    -px2        Secondary Proxy server address. (IPv4 address or dns name)
    -pxport     Proxy server port. (the port of proxy)
    -outpx      OutBound Proxy server address. (IPv4 address or dns name)
    -prefix     Specify prefix string, use it when UserID contains alphabets
                (if UserID uses numerals, specify as null)
    -line1      TEL1 Phone number.
    -line2      TEL2 Phone number.
    -line3      TEL3 Phone number.
    -line4      TEL4 Phone number.
    -pbsearch   Search phone book 0:off/1:on.
    -expire     The relative time after which the message expires(0 ~ (2^31-1))
    -port       SIP local UDP port number (2326~5070), Default: 5060
    -rtp        RTP port number (2326~65534), Default: 16384
Example:
    sip -mode 1
    sip -px 210.59.163.171 -line1 70 -line2 71 -line3 72 -line4 73
```

Parameter Usage:

- | | |
|----------------|--|
| -print | Show the SIP current settings |
| -mode | Select the P2P, Proxy or Gateway mode, 0 = P2P, 1 = Proxy, 2 = Gateway. |
| -px | To specify Proxy address when FXS Gateway is in proxy mode. Proxy address can be IPv4 address or DNS name. |
| -px2 | To specify Secondary Proxy server address. |
| -pxport | To configure proxy server signaling port, default value is 5060, if there is no special request of Proxy server, please don't change this value. |

-outpx	Set IP Address or URL address (Domain Name Server must be configured. Please refer to Network Configure) of outbound Proxy server.
-prefix	when your username contains alphabets, for example sip1123, then specify the prefix string as “sip”.
-line x	Assign gateway’s line number
-pbsearch	enable/disable phone book search function under Proxy Mode. If user enabled this function, the gateway will search dialed number in phone book to see if there is any matched table before send to Proxy server, and if there is a matched data in phone book, the gateway will make call to related IP address.
-expire	This parameter set duration time for sending registration information.
-port	SIP port which used to listen incoming SIP messages Default is 5060
-rtp	Specify the RTP received port number Default is 16384

6.14. [security]

This command is used to configure the account information included username and password obtained from the proxy service provider

```
usr/config$ security

Security information and configuration
Usage:
  security [-line number][-name username] [-pwd password]
  security [-print]

  -print      Display system account information and configuration.
  -line       Specify which line number you want to set the account.
  -name       Specify user name.
  -pwd        Specify password.
Example:
  security -line 1 -name 1001 -pwd 1001
  security -line 2 -name 1002 -pwd 1002
  security -line 3 -name 1003 -pwd 1003
  security -line 4 -name 1004 -pwd 1004
```

Parameter Usage:

- | | |
|---------------|--|
| -print | Shows the current settings |
| -line | Specify the line for the account configuration, here has only one line for this gateway model. |
| -name | Specify the username of your account information. |
| -pwd | Specify the password of your account information. |

6.15. [voice]

The voice command is associated with the audio setting information.

```
usr/config$ voice

Voice codec setting information and configuration
Usage:
voice [-send [G723 ms] [G711U ms] [G711A ms] [G729 ms] ]
      [-volume [voice level] [input level] [dtmf level]]
      [-nscng [G711U used1] [G711A used2] [G723 used3]]
      [-echo used] [-mindelay t1] [-maxdelay t2]
voice -print
voice -priority [G723] [G711U] [G711A] [G729]

    -print      Display voice codec information and configuration.
    -send       Specify sending packet size.
                 G.723  (30/60 ms)
                 G.711U (20/40/60 ms)
                 G.711A (20/40/60 ms)
                 G.729  (20/40/60/80 ms)
    -priority   Priority preference of installed codecs.
                 G.723
                 G.711U
                 G.711A
                 G.729
    -volume     Specify the following levels:
                 voice volume (0~63, default: 25),
                 input gain (0~38, default: 25),
                 dtmf volume (0~31, default: 23),
    -nscng      No sound compression and CNG. (G.723.1 only, On=1, Off=0).
    -echo       Setting of echo canceller. (On=1, Off=0, per port basis).
    -mindelay   Setting of jitter buffer min delay. (0~150, default: 90).
    -maxdelay   Setting of jitter buffer max delay. (0~150, default: 150).

Example:
voice -send g723 60 g711u 60 g711a 60 g729 60
voice -volume voice 20 input 32 dtmf 27
voice -echo 1 1 1 1
```

Parameter Usage:

- print** Shows the current settings
- send** To define packet size for each codec. 20/40/60/80 ms means to send a voice packet per 20/40/60/80 milliseconds. The smaller the packet size, the shorter the delay time. If network is in good condition, smaller sending packet size is recommended. In this parameter, 20/40/60ms is applicable to G.711u/a law, 20/40/60ms is applicable to G.729 codec, while 30/60ms is applicable to G.723.1 codec.

-priority	Codec priority while negotiating with other SIP device. The codec listed in left side has the highest priority when both parties determining final codec. For example : usr/config\$ voice -priority g729 g723 g711u g711a (Selected four Codecs, G.729 is the first choice)
-volume	To adjust the voice, input and dtmf levels
voice	which can be heard from Gateway side(range 0~63, default: 25).
input	which the opposite party hears (range 0~38, default: 25).
dtmf	which sends to its own Line (range 0~31, default: 23).
-nscng	Silence suppression and comfort noise generation setting (1 = ON; 0 = OFF). It is applicable to G.723 codec only.
-echo	Enable or Disable the echo cancellation
-mindelay	The minimum jitter buffer size (Default value= 90 ms).
-maxdelay	The minimum jitter buffer size (Default value= 150 ms).

Note:

Be sure to know well the application before you change voice parameters because this might cause incompatibility.

6.16. [support]

This command provides some extra functions that might be needed by users.

```
usr/config$ support

Special Voice function support manipulation
Usage:
support [-t38 enable]
        [-busy line [number]] [-noanswer line [number]] [-uncon line [number]]
support -print
    -t38      T.38(FAX) enabled/disabled.
    -busy     Busy Forward number.(if empty, please fill "null")
    -noanswer No Answer Forward number.(if empty, please fill "null")
    -uncon    Unconditional Forward number.(if empty, please fill "null")
Example:
support -t38 1
support -busy 1 1001
support -uncon 2 null
```

Parameter Usage:

- | | |
|------------------|---|
| -print | Shows the current settings |
| -t38 | Enable or disable FAX ability. The function is will automatically defer codec (G.723 or G.729a) to T.38 when FAX signal is detected. |
| -busy | Provide setting busy forward to other number, when your gateway is setting this function, it will forward to setting phone number if the channel is busy, |
| -noanswer | Provide setting noanswer forward to other number, when you set this function, it will forward to setting phone number if no one answer the call. |
| -uncon | Provide setting Unconditional forward to other number, when you set this function, all the calls to your number will forward to setting phone number. |

6.17. [tos]

IP Packet ToS (Type of Service)/ Differentiated Service configuration.

```
usr/config$ tos
```

IP Packet ToS(type of Service)/Differentiated Service configuration

Usage:

```
tos [-rtptype dscp]
tos [-sigtype dscp]
tos -print
    [-rtpreliab mode]
tos -print
```

Example:

```
tos -rtptype 7 -sigtype 0
```

-rtptype the packages of voice (0~63)

-sigtype the package of call signal (0~63)

IPv4 Head Format

+	0 - 3	4 - 7	8 - 15	16 - 18	19 - 31
0	Version	Header length	Type of Service (now DiffServ and ECN)	Total Length	
32	Identification			Flags	Fragment Offset
64	Time to Live		Protocol	Header Checksum	
96	Source Address				
128	Destination Address				
160	Options				
192	Data				

In RFC 791, the following 8 bits were allocated to a Type of Service (ToS) field - now DiffServ and ECN. For instance, one host could set its IPv4 datagrams' ToS field value to prefer low delay, while another might prefer high reliability. In practice, the ToS field has not been widely implemented. However, a great deal of experimental, research and deployment work has focused on how to make use of these eight bits. These bits have been redefined and most recently through DiffServ working group in the IETF and the Explicit Congestion Notification codepoints

Note:

The value of rtptype and sigtype is from 0 to 63. ToS only works if it has related network devices supported.

6.18. [phone]

Gateway progress tone is configurable. Default tone value is set according to U.S. tone specification. Users may adjust the values according to their own country's tone specification or users-defined tone specification.

```
usr/config$ phone
```

Phone ringing , ringback tone , busy tone , dial tone setting and notes
Usage:

```
phone [-ring [freq ] [ringON ] [ringOFF ] [ringLevel]]
      [-rbt [freqHi ] [freqLo ] [freqHiLev] [freqLoLev]
          [Tone1ON] [Tone1OFF] [Tone2ON ] [Tone2OFF ]]
      [-bt  [freqHi ] [freqLo ] [freqHiLev] [freqLoLev]
          [Tone1ON] [Tone1OFF] [Tone2ON ] [Tone2OFF ]]
      [-dt  [freqHi ] [freqLo ] [freqHiLev] [freqLoLev]
          [Tone1ON] [Tone1OFF] [Tone2ON ] [Tone2OFF ]]
      [-ht  [freqHi ] [freqLo ] [freqHiLev] [freqLoLev]
          [Tone1ON] [Tone1OFF] [Tone2ON ] [Tone2OFF ]]
      [-flash [freqLo ] [freqHi ]]
      [-level [loopCurrentLevel] [onhookLineVoltageLevel ]]
phone [-print [ring]|[rbt]|[bt]|[dt]|[flash]]

    -print Display phone ringing/tone configuration.
           ring : ringing
           rbt  : ringback tone
           bt   : busy tone
           dt   : dial tone
           ht   : hang up tone
           flash: flash tone
    -ring ringing configuration set .
    -rbt ringback tone configuration set .
    -bt busy tone configuration set .
    -dt dial tone configuration set .
    -ht hang up tone configuration set .
    -flash flash configuration set .
    -level Loop Current and On-Hook Line Voltage level set .
```

Note:

```
ringing frequency : 15 ~ 100 (Unit : Hz)
ringing ring ON/OFF : 0 ~ 8000 (Unit : ms)
ringing level      : 0 ~ 94 (Unit : V)
tone frequency     : 0 ~ 65535 (Unit : Hz)
tone freqLevel     : 0 ~ 65535 (Unit : mVrms)
tone Tone ON/OFF   : 0 ~ 8000 (Unit : ms)
level loopCurrent  : 0 ~ 7 (20mA ~ 41mA, Step : 3mA)
level OnHookVol    : 0 ~ 63 ( 0V ~ 94.5V, Step : 1.5V)
```

Example:

```
phone -print rbt
phone -ring 20 2000 4000 94
phone -rbt 480 440 125 105 2000 4000 2000 4000
phone -bt 620 480 125 105 500 500 500 500
phone -dt 440 350 96 96 8000 0 8000 0
phone -ht 440 350 155 155 100 100 100 100
phone -flash 400 800
phone -level 1 32
```

Parameter Usage:

-print	Specify which tone settings you want to display ring : ring tone settings rbt : ring back tone settings bt : busy tone settings dt : dial tone settings ht : hang up tone flash : flash time settings
-ring	To set RING tone value. The played tone type, when Gateway is receiving a call.
-rbt	To set Ring Back Tone value. The played tone type, when Gateway receives a Q.931 Alerting message. In condition that Gateway is the originate side.
-bt	To set Busy Tone value. The played tone type, when destination is busy.
-dt	To set Dial Tone value. The played tone type, when hook off a phone set of workable Gateway.
-ht	To set hang up tone configuration set
-flash	Set the detective flash range in ms, for example, 400-800 ms.
-level	Loop Current and On-Hook Line Voltage level set.

Note:

For tone simulation, Gateway adopts dual frequencies as traditional telephone does. If users want to have their own call progress tone, they can change the value of tones. High and Low frequency/level/cadence can be configured respectively.

6.19. [bureau]

To set Hotline function must be under Peer-to-Peer mode and switch to hotline mode.

```
usr/config$ bureau

Bureau line setting information and configuration
Usage:
bureau [-hotline [Port DestIP TELnum]]
bureau -print

    -print    Display Bureau line information and configuration.
    -hotline  Set Hot line information. (Port range: 1~6)
Note:
    Hotline feature should be used together with:
        $sysconf -service 1 (HotLine service)
        $sip -mode 0 (peer-to-peer mode)
Example:
    bureau -hotline 1 192.168.4.69 628 2 192.168.4.200 999
```

Parameter Usage:

- | | |
|-----------------|---|
| -print | Shows the current settings |
| -hotline | Define Line Hotline table respectively. The table is included [Line number], [destination IP Address] and [destination Port or Number]. |

For example

1. Destination is a FXS device (Branch), 71 is its Line1 number

usr/config\$ bureau -hotline 1 203.69.28.242 71

From HQ, user picks up the telephone handset connects to gateway, and then hears the ringback tone generated from destination (Branch). Of course, the destination line 71 is ringing simultaneously.

2. Destination is a FXO device, Port_1 has connected to PSTN Line.

usr/config\$ bureau -hotline 1 200.168.4.69 82265699

User picks up the Line1, and then hears the ringback tone generated from destination. Simultaneously, 82265699 numbers is the destination, which is dialed from Port_1 (Above FXO example is subject to the FXO configurations, such as 2nd dial ON or OFF.)

6.20. [rom]

ROM file information and firmware upgrade function.

```
usr/config$ rom
```

ROM files updating commands

Usage:

```
rom [-print] [-app] [-boot] [-dsptest] [-dspcore] [-dspapp]
    [-ht] [-method used] [-boot2m]
    -s TFTP/FTP server ip -f filename
```

```
rom -print
```

```
-print    show versions of rom files. (optional)
-app      update main application code(optional)
-boot     update main boot code(optional)
-boot2m   update 2M code(optional)
-ht       update Hold Tone PCM file(optional)
-dsptest  update DSP testing code(optional)
-dspcore  update DSP kernel code(optional)
-dspapp   update DSP application code(optional)
-s        IP address of TFTP/FTP server (mandatory)
-f        file name(mandatory)
-method   download via TFTP/FTP (TFTP: mode=0, FTP: mode=1)
-ftp      specify username and password for FTP
```

Note:

This command can run select one option in 'app', 'boot',
, 'dsptest', 'dspcore', and 'dspapp'.

Example:

```
rom -method 1
rom -ftp vwusr vwusr
rom -app -s 192.168.4.101 -f app.bin
```

Parameter Usage:

-print	Shows the current settings
-app	update application program code
-boot	update boot code
-boot2m	Includes APP and Boot code
-ht	update Hold Tone PCM file(optional)
-dsptest	update DSP testing code(optional)
-dspcore	update DSP kernel code(optional)

-dspapp	update DSP application code(optional)
-s	To specify TFTP / FTP server IP address for upgrading
-f	To specify the target file name, this will replace the old one.
-method	To decide using TFTP or FTP as file transfer server. TFTP = 0 , FTP = 1
-ftp	If users choose FTP in above item, it is necessary to specify pre-defined username and password when upgrading files.

In computing, **firmware** is software that is embedded in a hardware device, that allows reading and executing the software, but does not allow modification, e.g., writing or deleting data by an end user. **Flash memory** is non-volatile, which means that it stores information on a silicon chip in a way that does not need power to maintain the information in the chip. This means that if you turn off the power to the chip, the information is retained without consuming any power.

When we release the new firmware, you can download the file and write it into Gateway's Flash Memory by **rom** command. You can change your Gateway from SIP to H323 by load the H323 ROM file, also you can change it back to SIP by load the SIP ROM file as well.

Note:

Be very careful when you upgrade the new firmware, make sure you downloaded the correct file for your model. Wrong file may cause serious damage.

6.21. [passwd]

For security concern, users have to input the password before entering configuration mode. [passwd] command is for password setting purpose.

```
usr/config$ passwd

Password setting information and configuration
Usage:
  passwd -set Loginname Password
  passwd -clean
Note:
  1. Loginname can be only 'root' or 'administrator'
  2. passwd -clean will clear all passwd stored in flash,
     please use it with care.
Example:
  passwd -set root Your_Passwd_Setting
```

Parameter Usage:

-set Set login name and password, input login name then input new password.

-clean Clear all password setup, and change null.

Note:

Gateway Login name only use **root** or **administrator**. Both accounts have the same authorization, except commands that can be executed by login name **root** only [passwd -set root], [rom -boot], [room -boot2m] and [flash -clean].

6.22. [line]

It shows Gateway Lines status

```
usr/config$ line

Gateway line information and configuration
Usage:
line -print      Gateway line information.
Example:
    line -print
```

Parameter Usage:

-print Display all the lines status

Example

```
usr/config$ line -print

Line information and configuration
Line  Reg. Status
=====
1      No   Ready
2      No   Ready
3      No   Ready
4      No   Ready
```

The Reg. shows the Gateway in Proxy mode, and has registered on the server.

6.23. [prefix]

Prefix drop/insert information manipulation

```
usr/config$ prefix
```

Prefix drop/insert information and configuration

Usage:

```
prefix -add [prefix number][drop number][insert digits]
```

```
prefix -delete index
```

```
prefix -modify index [prefix number][drop number][insert number]
```

```
prefix -print      Prefix drop/insert information.
```

```
    prefix      The prefix of dialed number.
```

```
    drop        Drop prefix(Enable:1/Disable:0).
```

```
    insert      Insert digits.
```

Example:

```
    prefix -add prefix 100 drop 1 insert 2000
```

```
    prefix -add prefix 100 drop 1
```

```
    prefix -add prefix 100 drop 0 insert 200
```

```
    prefix -delete 1
```

```
    prefix -modify 1 prefix 100 drop 0 insert 300
```

Parameter Usage:

-add Add a rule to drop or insert prefix digits of incoming call.

prefix : Set which prefix number to implement prefix rule.

drop : Enable or disable drop function. If this function is enabled,
Gateway will drop prefix number on incoming call.

insert : Set which digit to insert on incoming call.

-modify Modify a rule to drop or insert prefix digits of incoming call.

-delete Delete a rule to drop or insert prefix digits of incoming call.