



**DVG-5004S/5008S
VoIP Gateway**

User's Manual

Version 1.3
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FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Warnung!

Dies ist ein Produkt der Klasse B. Im Wohnbereich kann dieses Produkt Funkstörungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaución!

Este es un producto de Clase B. En un entorno doméstico, puede causar interferencias de radio, en cuyo caso, puede requerirse al usuario para que adopte las medidas adecuadas.

Attention!

Ceci est un produit de classe B. Dans un environnement domestique, ce produit pourrait causer des interférences radio, auquel cas l'utilisateur devrait prendre les mesures adéquates.

Attenzione!

Il presente prodotto appartiene alla classe B. Se utilizzato in ambiente domestico il prodotto può causare interferenze radio, nel cui caso è possibile che l'utente debba assumere provvedimenti adeguati.

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1. Introduction

1-1 Product Overview

The DVG-5004S/5008S VoIP Gateway carries both voice and facsimile over the IP network. It uses the industry standard SIP call control protocol so as to be compatible with free registration services or VoIP service providers' systems. As a standard user agent, it is compatible with all common Soft Switches and SIP proxy servers. While running optional server software, the gateway can be configured to establish a private VoIP network over the Internet without a third-party SIP Proxy Server.

The gateway can be seamlessly integrated into an existing network by connecting to a phone set and fax machine. With only a broadband connection such as an ADSL bridge/router, a Cable Modem or a leased-line router, the gateway allows you to use voice and fax services over IP in order to reduce the cost of all long distance calls.

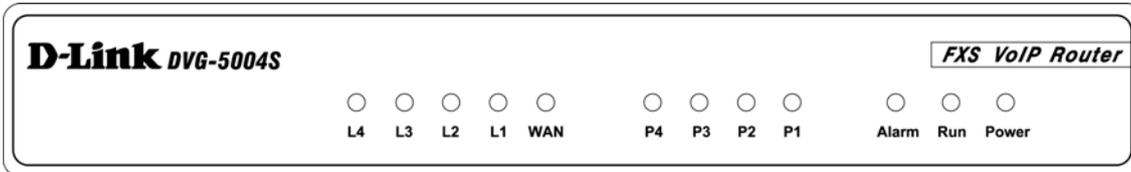
DDNS support makes the gateway reachable via its domain name where an ISP dynamically assigns an IP address. By enabling the CDR function, administrators are allowed to log-in and view all call records, for example call duration, time and date of calls, and latency.

The gateway can be assigned a fixed IP address or it can have one dynamically assigned by DHCP over PPPoE. It adopts either the G.711, G.726, G.729A or G.723.1 voice compression format to save network bandwidth while providing real-time, toll quality voice transmission and reception.

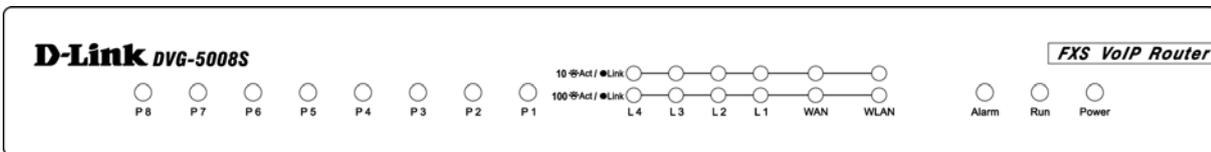
1-2 Hardware Description

Front Panel

DVG-5004S



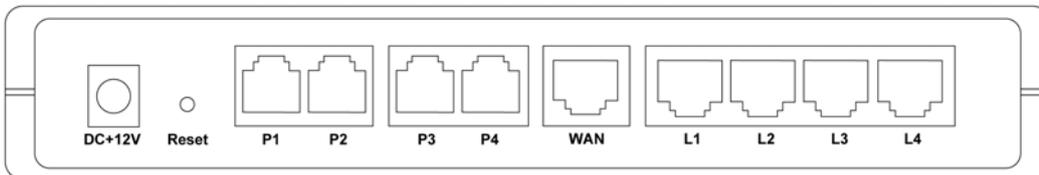
DVG-5008S



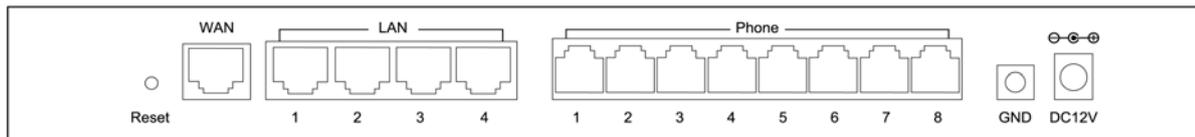
- **Power Indicator:** green light indicates a normal power supply.
 - **Run Indicator:** blinking green light indicates normal operation.
 - **Alarm Indicator:** when the system starts up, the red light will blink. This indicator will also light to indicate any abnormal gateway behavior.
 - **P1 – P4/P1 – P8 Indicators:** indicate connection and activity on Port 1 – 4/1 – 8 (phone 1 – 4/1 – 8).
 - **WAN Indicators:** indicate connection and activity on the WAN Ports.
 - **L1 – L4 Indicators:** indicate connection and activity on LAN Port 1 – 4.
- ✓ **When starting up the system, the Alarm, Run, and Power indicators will light up. After about 40 seconds, the Alarm indicator will go off, the Run indicator will blink green, and the Power indicator will stay green (under normal operating conditions). If the Alarm indicator continues to blink, then the system is attempting to connect with your ISP and has yet to obtain an IP address.**
 - ✓ **Once the WAN is connected, the WAN indicator will light up green and, if data is being transmitted over the Internet, the indicator blinks green and orange.**

Rear Panel

DVG-5004S



DVG-5008S



WARNING: DO NOT (1) connect the phone ports to each other (FXS to FXS) or (2) connect any phone port directly to a PSTN line (FXS to PSTN) or to an internal PBX line (FXS to PBX extension). Doing so may damage your VoIP gateway.

To restore factory default settings (IP address, User's Name, Password):

- (1) Disconnect the power plug.
- (2) Press and hold the reset button for 6 seconds.
- (3) Reconnect the power plug while pressing down on the reset button.
- (4) Release the reset button after 6 seconds. Factory settings will be restored.

2. Installation and Applications

2-1 Network Interface

The network interface is divided into three basic modes as described below:

- Gateway can be assigned a Public IP Address
- Gateway can be built under the existing NAT
- Gateway can be assigned a Public IP address and serve as an IP-sharing router.



NOTE: The Network Interface function mode setup is accessed through a web UI.

Gateway Assigned a Public IP Address

The gateway will have a public IP address for Internet connection regardless of whether the IP is a static IP address, DHCP (using a Cable Modem), or PPPoE (Dial-up / ADSL).

Gateway IP Settings	Need to be set up as static IP, DHCP, or PPPoE	
NAT/STUN Settings	Unnecessary (Disabled)	
DDNS Settings	Unnecessary (Disabled)	

Gateway in a NAT Network

Under this mode, the gateway uses a virtual IP address and the IP sharing function of other systems to connect to the Internet.

LAN IP address for IP sharing	Please avoid IP addresses in the following range: 192.168.8.1-192.168.8.254 (You may need to change the settings of IP sharing or change SIP series gateway LAN Port IP addressing)	
Gateway IP Settings	Set as static IP address, and assign the LAN IP address of the IP sharing to the Default Gateway.	
NAT /STUN Settings (Please refer to page 14 for information on using NAT.)	Enable	If the WAN of the IP sharing device has a static IP address, then the NAT IP address is set as the Public IP address for IP sharing.
		If the WAN of the IP sharing device uses a dynamic IP address, then the gateway has to comply with the DDNS settings. When using NAT, you must enter the URL (Uniform Resource Locator) that is registered to the DDNS server.
DDNS Settings (Please refer to page 14 for information on DDNS settings.)	The WAN of the IP sharing device has a static IP address.	Disabled
	The WAN of the IP sharing device has a dynamic IP address.	Enabled: enter the registered URL (Uniform Resource Locator) into the network settings under NAT

Gateway assigned a Public IP Address and serving as an IP sharing device

The gateway will have a public IP address regardless of whether it is a static IP application, DHCP (using a Cable Modem), or PPPoE (to connect to your ADSL account), which can then use the functions of built-in IP sharing to allow other PCs to be on-line at the same time.

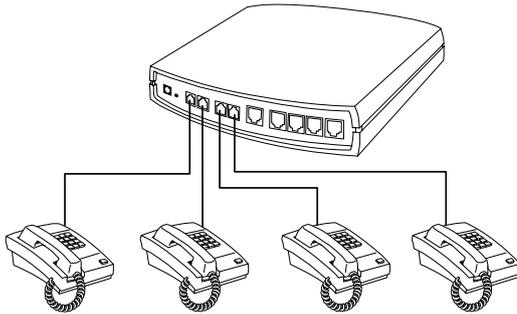
Gateway IP Settings	Need to be set up as static IP, DHCP, or PPPoE	
NAT/STUN Settings	Unnecessary (Disabled)	
DDNS Settings	Unnecessary (Disabled)	
PC IP Address Settings <i>(for IP sharing through the gateway)</i>	PCs should use a static IP address in the following range : 192.168.8.1-192.168.8.253 Subnet Mask : 255.255.255.0 Default Gateway : 192.168.8.254	

2-2 Telephone Interface Description

Example for DVG-5004S/5008S:

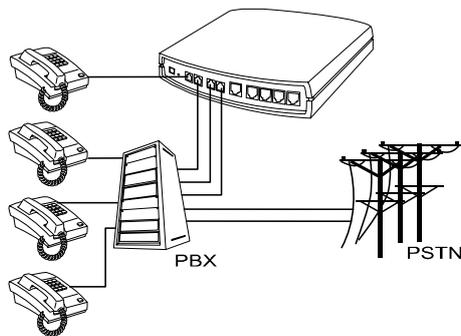
DVG-5004S/5008S connecting directly to phone sets

After connecting telephone sets to P1-P4/P1-P8, users can make direct calls. P1-P4/P1-P8 are FXS interfaces. Each telephone acts as an independent extension line.



Integrating the DVG-5004S/5008S with a PBX

P1-P4/P1-P8 are FXS interfaces, and some of them can be connected to telephone sets for direct calls. Others can be connected to the external side of the PBX so that other extension lines can make VoIP calls.



3. Gateway Configuration – Use Web Browser

The VoIP gateway allows users to configure its settings using a web interface (Web UI). You can access the Configuration Menu by opening a web-browser (e.g., Internet Explorer or Netscape Navigator) and entering the factory default LAN IP address: 192.168.8.254. The IP address of the Web UI is same as the default LAN IP noted elsewhere in this user's manual.

You can also use an ordinary telephone, connect it to the gateway, and dial "101" to inquire about the current WAN Port IP address and then use the WAN port to log-in.

Instructions

- Open a Web-Browser (e.g., Explorer, Navigator, Opera, Firefox).
- Enter the LAN port IP address. The default LAN port IP address is: 192.168.8.254.
- The log-in screen below will appear after you connect. (The factory default settings for **Login ID** and **Password** are blank (i.e., no login ID, no password).)



The gateway does not allow multiple people to configure the gateway simultaneously. Please remember to logout or restart the system if you are not using the web configuration function.

3-1 Network Settings (WAN)

The network settings are used to set the gateway's communication ports, IP configurations, and Phone Book Manager IP settings.

Network Settings (WAN)

Current WAN IP Address: 192.168.1.2
 Listen Port UDP [1 - 65535]: 5060
 RTP Starting Port UDP [1 - 65500]: 9000

DHCP

IP address: 192.168.1.2
 Static IP Subnet mask: 255.255.255.0
 Default Gateway IP: 192.168.1.254
 PPPoE Account: _____

PPPoE

PPPoE Password: _____
 Confirm Password: _____
 IP address: _____
 Subnet mask: _____

PPTP

PPTP Server: _____
 PPTP ID: _____
 PPTP Password: _____
 Confirm Password: _____
 User Name: _____

BigPond Cable

BigPond Cable Password: _____
 Confirm Password: _____
 Login Server: _____

Domain Name Server Assignment: Auto Manual
 Domain Name Server (Primary) IP: 169.95.1.1
 Domain Name Server (Secondary) IP: _____
 WAN Link Speed: Auto

Factory Default MAC Address: 000C2A05F914
 Your MAC Address: 000C2E6F1305
 Current MAC Address: _____

Enable Phone Book Manager Server:
 Share Phone Book to Clients:
 TTL (Expire time, mins) [0 - 60]: 1
 Register to Phone Book Manager:
 VoIP failure announcement:
 Gateway Name for Phone Book Manager: _____
 Phone Book Manager Login Password: _____
 Confirm Password: _____
 Phone Book Manager IP/Domain: 192.168.1.1
 Phone Book Manager Server Listen Port [1 - 65535]: 1630

LAN Interface mode

Router Bridge

Network Settings (LAN)

LAN IP / LAN default Gateway: 192.168.8.254
 Subnet mask: 255.255.255.0

DHCP Server

Enable DHCP Server:
 IP Pool Starting Address: 192.168.8.1
 IP Pool Ending Address: 192.168.8.250
 IP Pool Uses Other Default GW:
 IP Pool Default Gateway: 192.168.8.254
 IP Pool Subnet mask: 255.255.255.0
 Lease Time [1 - 9999 hours]: 1
 Domain Name Server Assignment: Auto Manual
 Domain Name Server (Primary) IP: _____
 Domain Name Server (Secondary) IP: _____

Port of Web Access from WAN [0=disable, 1 - 65535]: 00
 Enable Web UI:
 Enable Telnet Service:

- **Current WAN IP Address:** The IP address of the WAN port.
- **Listen Port UDP:** It is not necessary to change the protocol of the communication port used by the gateway, unless it conflicts with ports used by another device in your network.
- **RTP Starting Port UDP:** The initial value of the port number for transmitting voice data among gateway(s). Each line requires 2 ports. It is not necessary to change the setting, unless it conflicts with ports used by another network device.
For example, if the starting port is 9000, then Line 1 is using ports 9000 and 9001, and Line 2 is using ports 9002 and 9003, and so forth.

IP Configuration (Setting WAN Port)

There are five methods of obtaining a WAN port IP address:

1. Static IP
2. DHCP, which means a Dynamic IP (Cable Modem)
3. PPPoE (dial-up ADSL)
4. PPTP
5. BigPond (for Australia only)

Methods for using DHCP and PPPoE for obtaining an IP address may vary. If you are not familiar with creating a network connection, please contact your local ISP.

Setting Dynamic IP (DHCP)

DHCP <input type="radio"/>	Hostname	<input type="text"/>
	Vendor Class ID	<input type="text"/>

Click "DHCP" to obtain a Dynamic IP address, enter the "Hostname" and "Vendor Class ID" if required by your local ISP and then click the "Accept" button at the bottom of the screen.
 Saving the settings: Click System Operation to select "Save Settings", "Restart", and then click the "Accept" button. Wait for about 40 seconds, and the system will obtain the required IP value from the DHCP Server.

NOTE: After the system has obtained a new IP address, if you are using a WAN port to enter the Web Configuration Screen, the new IP address has to be used. The same principle applies to the next two settings.

Setting Static IP

Static IP <input checked="" type="radio"/>	IP address	<input type="text" value="192.168.1.2"/>
	Subnet mask	<input type="text" value="255.255.255.0"/>
	Default Gateway IP	<input type="text" value="192.168.1.254"/>

Select "Static IP" and enter the IP address, Subnet Mask and Default Gateway values. Then click the "Accept" button at the bottom of the screen. Save the settings, and then restart the system. Wait for about 40 seconds for the system to restart.

ADSL PPPoE Settings

PPPoE <input checked="" type="radio"/>	PPPoE Account	<input type="text"/>
	PPPoE Password	<input type="text"/>
	Confirm Password	<input type="text"/>

Select "PPPoE" and enter the Account Number, Password and Reenter Password to confirm. Then click the "Accept" button at the bottom of the screen. Save the settings, and then restart the system. The system will take about 49 seconds to restart.

PPTP

PPTP <input checked="" type="radio"/>	IP address	<input type="text"/>
	Subnet mask	<input type="text"/>
	PPTP Server	<input type="text"/>
	PPTP ID	<input type="text"/>
	PPTP Password	<input type="password"/>
	Confirm Password	<input type="password"/>

Select "PPTP" and enter the IP Address, Subnet mask, PPTP Server, PPTP ID and Password. Then click the "Accept" button at the bottom of the screen.

BigPond (for Australia only)

BigPond Cable <input checked="" type="radio"/>	User Name	<input type="text"/>
	BigPond Cable Password	<input type="password"/>
	Confirm Password	<input type="password"/>
	Login Server	<input type="text"/>

Click "BigPond Cable" and enter the User Name and Password. Then click the "Accept" button at the bottom of the screen.

(DNS) Settings

Domain Name Server Assignment	<input type="radio"/> Auto <input checked="" type="radio"/> Manual
Domain Name Server (Primary) IP	<input type="text" value="168.95.1.1"/>
Domain Name Server (Secondary) IP	<input type="text"/>

Domain Name Server (DNS): While a gateway is accessing another gateway or a computer with a hostname, it will look up the IP address from the DNS provided by your ISP. Normally, the ISP assigns DNS information while negotiating with PPPoE or DHCP. If the DNS is not assigned automatically or the WAN port is assigned a static IP address, the DNS settings must be assigned manually.

Auto: the gateway learns primary and secondary addresses from the ISP's DHCP server or PPPoE server.

Manual: enter the primary and secondary addresses manually. Please be sure that the IP addresses are correct otherwise the gateway will not be able to access hosts using hostnames instead of IPs.

WAN Link Speed

WAN Link Speed	Auto
----------------	------

It is used to choose the WAN Ethernet link speed. The default is Auto. Please choose the same speed with Router/Switch/Hub, if VoIP gateway connected to Router/Switch/Hub has the link problem.

Clone MAC

Factory Default MAC Address	00AABBCCDD00	Restore
Your MAC Address	000C295FC915	Clone
Current MAC Address		

Some Internet Service Providers (ISPs) assign bandwidth via MAC (Media Access Control) addresses. You can click the "Clone" button to type in a MAC address which will be recognized by your ISP. It is only necessary to fill in the field if it is required by your ISP.

The "Your MAC Address" field will be blank as you log-in via the WAN port.

Using Phone Book Manager

Enable Phone Book Manager Server	<input type="checkbox"/>	Clients List
Share Phone Book to Clients	<input type="checkbox"/>	
TTL (Expire time: mins) [1 - 60]	1	
Register to Phone Book Manager	<input type="checkbox"/>	
Gateway Name for Phone Book Manager		
Phone Book Manager Login Password		
Confirm Password		
Phone Book Manager IP/Domain	192.168.1.1	
Phone Book Manager Server Listen Port [1 - 65535]	1690	

- **Enable Phone Book Manager Server:** this allows other gateway users to register the IP address and telephone number in this Phone Book manager. It is recommended that the unit appointed as the Phone Book Manager use static IP.
- **Share Phone Book to Clients:** While this option is enabled and the gateway is performing as a Phone Book Manager, this gateway will append its Phone Book entries to the Manager for other clients to lookup.
- **TTL (Time to Live):** If a gateway system that is controlled by the Phone Book Manager does not report back within the deadline set by TTL, the system will be excluded from the user's list. Each gateway should report to the Phone Book Manager once every 30 seconds.
- **Register to Phone Book Manager:** To register to the Phone Book Manager.
- **Gateway Name for Phone Book Manager:** The alias registered with the Phone Book Manager.
- **Phone Book Manager Login Password:** Enter the registered password. If this system is serving as the Phone Book Manager, the set password is also the password used for registering other gateway systems.

- **Phone Book Manager IP/Domain:** Enter the IP address for the Phone Book Manager. (This variable also supports URL (Uniform Resource Locator).)
- **Phone Book Manager Server Listen Port [1 - 665535]:** The protocol communication port for transmitting signals between the Phone Book Manager and other gateway systems. Please confirm whether or not the setting is the same as that of the **Phone Book Manager**.

3-2 Network Settings (LAN)

LAN interface mode	
<input checked="" type="radio"/> Router <input type="radio"/> Bridge	
Network Settings (LAN)	
LAN IP / LAN default Gateway	<input type="text" value="192.168.8.254"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
DHCP Server	
Enable DHCP Server	<input checked="" type="checkbox"/>
IP Pool Starting Address	<input type="text" value="192.168.8.1"/>
IP Pool Ending Address	<input type="text" value="192.168.8.250"/>
Lease Time [1 - 9999 hours]	<input type="text" value="1"/>
Domain Name Server Assignment	<input checked="" type="radio"/> Auto <input type="radio"/> Manual
Domain Name Server (Primary) IP	<input type="text"/>
Domain Name Server (Secondary) IP	<input type="text"/>
Port of Web Access from WAN [0=disable, 1 - 65535]	<input type="text" value="80"/>
Enable Web UI	<input checked="" type="checkbox"/>
Enable Telnet Service	<input checked="" type="checkbox"/>

LAN interface mode
<input checked="" type="radio"/> Router <input type="radio"/> Bridge

- **Router:** The system serves as a **Router** with NAT.
- **Bridge:** The system serves as a **Bridge** between WAN port and LAN port without NAT. (LAN default gateway will still be accessible for configuration).

Network Settings (LAN)	
LAN IP / LAN default Gateway	<input type="text" value="192.168.8.254"/>
Subnet mask	<input type="text" value="255.255.255.0"/>

Gateway LAN Port IP address and subnet mask settings.

DHCP Server	
Enable DHCP Server	<input checked="" type="checkbox"/>
IP Pool Starting Address	<input type="text" value="192.168.8.1"/>
IP Pool Ending Address	<input type="text" value="192.168.8.250"/>
IP Pool Uses Other Default Gw	<input type="checkbox"/>
IP Pool Default Gateway	<input type="text" value="192.168.8.254"/>
IP Pool Subnet mask	<input type="text" value="255.255.255.0"/>
Lease Time [1 - 9999 hours]	<input type="text" value="1"/>
Domain Name Server Assignment	<input checked="" type="radio"/> Auto <input type="radio"/> Manual
Domain Name Server (Primary) IP	<input type="text"/>
Domain Name Server (Secondary) IP	<input type="text"/>

- **Enable DHCP Server:** Enable or Disable DHCP server service of the gateway.
- **IP Pool Starting Address:** The first IP address to be assigned to DHCP clients.
- **IP Pool Ending Address:** The last IP address to be assigned to DHCP clients.
- **IP Pool Uses Other Default Gw:** Tick the check box to give DHCP client the other default gateway.
- **IP Pool Default Gateway:** Assign the default gateway and subnet mask to DHCP client.
- **IP Pool Subnet mask:** Assign the default gateway and subnet mask to DHCP client.
- **Lease Time:** The valid period of an assigned IP address.
- **Domain Name Server Assignment:** The DNS information to be assigned to DHCP clients.
Auto: the gateway learns primary and secondary addresses from the ISP's DHCP server or PPPoE server.
Manual: enter the primary and secondary addresses manually. Please be sure that the IP addresses are correct otherwise the gateway will not be able to access hosts using hostnames instead of IPs.

Port of Web Access from WAN [0=disable, 1 - 65535]	<input type="text" value="80"/>
Enable Web UI	<input checked="" type="checkbox"/>
Enable Telnet Service	<input checked="" type="checkbox"/>

- **Port of Web Access from WAN:** HTTP port for WAN. To change this setting, web configuration must be accessed via the gateway's LAN port. The gateway always uses port 80 for HTTP connection via the LAN port.
-  **NOTE:** Due to network security concerns, Web Access for WAN port is disabled by default (port number "0" in this option means disable web access). To enable it, simply enter a valid port number in this field.
- **Enable Web UI:** When "Enable Web UI" is un-ticked, you cannot access from Web.
- **Enable Telnet Service:** It is to activate Telnet access from WAN or LAN when ticked. You can configure all settings on web user interface through telnet, such as IP configuration, SIP settings, Provision settings, reset to a default stat, etc.

3-3 QoS Settings

WAN QoS

WAN QoS		
<input type="checkbox"/> QoS	Downstream Bandwidth	Full
	Upstream Bandwidth	Full
ToS / DiffServ Settings		
ToS IP Precedence <input checked="" type="radio"/>	Signaling	3 (Flash)
	Voice Data	5 (CRITIC / ECP)
DiffServ (DSCP) <input type="radio"/>	Signaling Value	26 (Assured Forwarding Class 3 - Low Drop Precedence, AF31)
	Voice Data Value	46 (Expedited Forwarding, EF)

- **QoS** (Quality of Service): Sets true bandwidth of your Internet connection to ensure sound quality during transmission. (When this function is enabled, voice packets have the highest priority to ensure telecommunication quality while less bandwidth is assigned for data transmission.) Some models of the VoIP gateway without this function will adjust bandwidth automatically.
- **ToS/DiffServ** (Type of Service/DSCP): Voice packets have the highest priority to ensure telecommunication quality; the larger the value you set, the higher the priority.



NOTE: Please contact your ISP when you configure these values.

LAN QoS

LAN QoS				
Enable LAN QoS <input type="checkbox"/>				
Port	Priority	Flow Control	Incoming Rate Limit	Outgoing Rate Limit
LAN Port 1	Low	<input type="checkbox"/>	Full	Full
LAN Port 2	Low	<input type="checkbox"/>	Full	Full
LAN Port 3	Low	<input type="checkbox"/>	Full	Full
LAN Port 4	Low	<input type="checkbox"/>	Full	Full

- **Priority:** The gateway can prioritize LAN ports. Data from HIGH priority port are delivered prior to those from LOW priority port while they arrive at the same time.
- **Flow Control:** Enable or Disable Flow control.
- **Incoming Rate Limit:** Set the incoming (from WAN to LAN) rate limit of a specific LAN port (can not exceed the real downstream bandwidth).
- **Outgoing Rate Limit:** Set the outgoing (from LAN to WAN) rate limit of a specific LAN port (can not exceed the real upstream bandwidth).

* **VLAN** – This feature is only supported for the special hardware.

VLAN		
Enable VLAN Tagging	<input type="checkbox"/>	
	VLAN ID [1 - 4094]	Priority [0 - 7]
Voice Traffic	<input type="text" value="3"/>	<input type="text" value="7"/>
LAN Traffic	<input type="text" value="1"/>	<input type="text" value="0"/>

VLAN is optional. It works with the Router or Switch that supports VLAN. There are 2 VLAN groups: Voice and data (LAN). This improves efficiency of network performance and security.

- **Enable VLAN Tagging:** It is to tag the packets for VLAN Router or Switch identifying.
- **VLAN ID:** It is to assign uniquely a user-defined ID to each packet.
- **Priority:** It is the proprietary to VLAN Router or Switch.

 **Note:** Please do not change anything here unless requested by your ISP.

3-4 NAT/DDNS

NAT Traversal

NAT Traversal		
NAT Public IP <input type="checkbox"/>	NAT IP/Domain	<input type="text"/>
Enable STUN Client <input type="checkbox"/>	STUN Server IP / Domain	<input type="text"/>
	STUN Server Port[1 ~ 65535]	<input type="text" value="3478"/>
Enable UPnP Control Point <input type="checkbox"/>		

If your gateway is set up behind an Internet sharing device, you can select either the NAT or STUN protocol.

- **NAT Public IP:** The IP address used by the gateway should be a private address. Furthermore, users must set Virtual Server Mapping in the Internet sharing device. (For example, a virtual server is usually defined as a Service Port, and all requests to this port will be redirected to this specified server's private IP address).

The default ports of the gateway are listed below:

Listen Port (UDP): 5060

RTP Starting Port (UDP): Listen Port used for telephone communication.

Port of Web Access from WAN (TCP): the number you set in this option on the Network Settings page.

DVG-5004: 9000~9023

DVG-5008: 9000~9047

- **NAT IP/Domain:** Enter the NAT Server IP address (real public IP address of the Internet sharing device); or enter a true URL (Uniform Resource Locator) when DDNS is used. Please refer to the DDNS settings.



NOTE: If you are setting a public IP in this field, it has to be a static public IP, otherwise VoIP communication may not be established properly. Please contact your ISP to check whether your Internet connection has static public IP addresses.

- **Enable STUN Client:** Using the STUN protocol prevents problems with setting the IP sharing function, but some NATs do not support this protocol.



NOTE: You can use the "Status → STUN Inquiry" page to detect the NAT type of your Internet sharing device. If the NAT type is "Symmetric NAT," then the gateway is not able to traverse the NAT. It is not a flaw of the gateway design, but rather a limitation of the STUN protocol.

- **STUN Server IP/Domain and Port:** Enter the STUN server IP address and Listen Port number. You can set two STUN server IPs separated by a semicolon.
- **Enable UPnP Control Point:** This variable will enable the gateway's IP traffic to pass through an Internet sharing device. This function only works when the Internet sharing device supports UPnP and has it enabled.



NOTE: The "Status → Current Status" page will show the status of UPnP.

DDNS

<input type="checkbox"/> Register to DDNS	
<hr/>	
<input type="radio"/> DynDNS DDNS Server	<input type="button" value="Default"/>
Server Address	<input type="text" value="members.dyndns.org"/>
Hostname	<input type="text" value="dyndns.org"/>
Login ID	<input type="text"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
Behind NAT	<input type="checkbox"/> Yes
Custom	<input type="checkbox"/>
<hr/>	
<input type="radio"/> TZO DDNS Server	<input type="button" value="Default"/>
Server Address	<input type="text" value="rh.tzo.com"/>
Hostname	<input type="text" value="tzo.com"/>
E-Mail Address	<input type="text"/>
Key	<input type="text"/>
Behind NAT	<input type="checkbox"/> Yes
<hr/>	
<input type="radio"/> 3322 DDNS Server	<input type="button" value="Default"/>
Server Address	<input type="text" value="members.3322.org"/>
Hostname	<input type="text" value="3322.org"/>
Login ID	<input type="text"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
Behind NAT	<input type="checkbox"/> Yes
<hr/>	
<input type="radio"/> PeanutHull DDNS Server	<input type="button" value="Default"/>
Server Address	<input type="text" value="hph008.oray.net"/>
Hostname	<input type="text" value="vicp.net"/>
Login ID	<input type="text"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
<hr/>	
<input checked="" type="radio"/> DDNS Server	<input type="button" value="Default"/>
Server Address	<input type="text"/>
Hostname	<input type="text"/>
Login ID	<input type="text"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
Behind NAT	<input type="checkbox"/> Yes

These settings are only necessary when the gateway is set up behind an Internet sharing device that uses a dynamic IP address and does not support DDNS.

Choose a DDNS Server: The current system allows users to choose either DynDNS · TZO · 3322.org · PeanutHull or a private server. You will need to apply for an account with DynDNS · TZO · 3322.org · PeanutHull or a private server before you type in the following information.

- **Server address:** the IP address or URL (Uniform Resource Locator) of the DDNS Server.
- **Hostname:** the URL of the system (or NAT) – applied from domain name registration providers (e.g. www.dyndns.org).
- **Login ID and Password:** The ID and password used to log-in to the DDNS server.
- **Behind NAT:** Select this only when the system is set up behind a NAT device.

 **NOTE:** If the gateway is set up under NAT, then enter the hostname in the NAT IP/Domain that is the same as the Hostname of the DDNS.

Example:

NAT

NAT Traversal	
NAT Public IP <input checked="" type="checkbox"/>	NAT IP/Domain <input type="text" value="hostname.ddnsserv.com"/>

DDNS

<input checked="" type="checkbox"/> Register to DDNS	
DynDNS DDNS Server Default	
Hostname	<input type="text" value="hostname.ddnsserv.com"/>

3-5 Caller ID

FXS Caller ID Generation	<input checked="" type="radio"/> Disable <input type="radio"/> DTMF <input type="radio"/> FSK
Send Caller ID After The First Ring	<input checked="" type="checkbox"/>
FSK Caller ID Type	<input checked="" type="radio"/> Bellcore <input type="radio"/> ETSI
Anonymous Caller ID (CLIR)	<input type="checkbox"/>

- **FXS Caller ID Generation:** Select this option to enable the caller ID display function on FXS ports. When enabled, the caller's phone number will be displayed on your phone set when the call comes through. FSK is preferred in some countries.
- **Send Caller ID After The First Ring:** When enabled, the caller's phone number will be sent to your phone set after the first ring-on. When disabled, caller id will be sent before the First ring-on.
- **FSK Caller ID Type:** Bellcore is used in North America and ETSI is used in EU.
- **Anonymous Caller ID (CLIR):** When enabled, anyone receiving a call from you will not display your number if they have caller ID.



NOTE: If you register the gateway to a Proxy and you check this option, you may be unable to make a call. This is due to the fact that the VoIP gateway doesn't send the number for authorization.

3-6 Telephony Settings

Line	Enable	Type	Hot Line	Hot Line No.	Warm Line (Hot Line Delay) [0 - 60 s]	Dial-Out Prefix	FXO Line Default Dial-Out	FXS Group	Fax / Modem
1	<input checked="" type="checkbox"/>	FXS	<input type="checkbox"/>	<input type="text"/>	<input type="text" value="0"/>			<input checked="" type="checkbox"/>	T.38 Fax ▼
2	<input checked="" type="checkbox"/>	FXS	<input type="checkbox"/>	<input type="text"/>	<input type="text" value="0"/>			<input checked="" type="checkbox"/>	T.38 Fax ▼

- **Enable:** Enable a line; if some lines are not used, disable them (Pause Function) to avoid unnecessary waiting when an incoming call is diverting to this line.

Hotline Functions

- **FXS port:** When the user picks up the phone, the gateway automatically dials your assigned hotline number. When in hotline mode, other phone numbers cannot be dialed.
- **Hot Line No.:** Enter the hot line number for an automatic dialing function.
- **Warm Line:** When the Warm Line function is in use, user can dial a number. Otherwise the system will divert incoming calls from an outside line to the Hot Line Number after a set wait time.

Example:

Assume that the assigned hotline for DVG-5004S/5008S line 1 is 701 and the Warm Line (Hot Line Delay) is five seconds. If no extension number is dialed within five seconds, the call will be automatically diverted to the assigned hotline (ext. 701). The system allows users to record a voice prompt (e.g. "please enter an extension number or wait for the operator to connect you") to use in this situation.

Assume that the assigned hotline for DVG-5004S/5008S line 2 is 702 and the wait time is 0 seconds. When Port 2 receives a call from an outside line, it will be automatically diverted to extension 702.

- **FXS Group:** Select group hunting when there is an incoming call and the gateway will automatically assign an unassigned call according to the Hunting Priority. If Line 2 does not want to be set as an assigned line to receive any inbound calls, the function can be disabled. Users can also use the Up or Down key to adjust hunting priority.

- **FAX / Modem:** Select the mode to detect if there is a fax tone and transfer the call to a fax line.

Function	Fax Detection	Content of SDP of re-INVITE	Receive re-INVITE with T.38
Disable	No	N/A	Accept and change RTP to T.38
T.38 Fax	Yes	re-INVITE with T.38 and T.30	Accept and change RTP to T.38
T.30 Fax	Yes	re-INVITE with T.30	Accept and change RTP to T.38
T.30 Fax/Modem	Detect CED only	re-INVITE with T.30	Accept and change RTP to T.38
T.30 Only	No	N/A(All the calls use T.30 codec of RTP stream, not need to change codec.)	Accept and change RTP to T.38
T.38 Native	Yes	re-INVITE with T.38	Accept and change RTP to T.38

NOTE: When a fax tone is detected from the call, the gateway will automatically switch from voice mode to fax mode. Hence, the fax settings will be temporarily applied to a specific port which detects the fax tones, instead of its default voice settings.

Ring (Early Media) Time Limit [10 - 600 s]	<input type="text" value="90"/>
Enable End of Digit Tone	<input type="checkbox"/>
VoIP Call Out Notification	<input type="checkbox"/>
Enable Built-in Call Hold Music	<input checked="" type="checkbox"/>
Early Media Treatment	<input checked="" type="checkbox"/>
Loop Current Drop Trigger Time [0=disable, 3 - 30 s]	<input type="text" value="0"/>
Loop Current Drop Duration [1 - 5 s]	<input type="text" value="2"/>
Enable ROH	<input type="checkbox"/>
FXS Ring Voltage [0=disable, 45 - 80]	<input type="text" value="0"/>
Max. External Call	<input type="text" value="999"/>
VoIP Centrex Extension Digit Count [0=disable, 1 - 30]	<input type="text" value="0"/>
VoIP Centrex Digit	<input type="checkbox"/>

- **Ring (Early Media) Time Limit[10 - 600secs]** : The timeout to cancel a call when no one answers.
- **Enable End of Digit Tone** : The gateway will play a “Beep-Beep” tone to notify that the call is in progress.
- **VoIP Calling Notification:** The gateway will play a tone to notify that the call is via VoIP.
- **Enable Built-in Call Hold Music:** The default setting is that when receiving a call hold request, the gateway will play music on hold. Untick the check box to disable this function while necessary.

- **Early Media Treatment:** If this variable is disabled, the system will send RTP immediately after a connection with a proxy is set up. The default setting is enabled. If communicating with other gateways encounters problems, please disable this function.
- **Loop Current Drop Trigger Time:** It is to set the trigger time for dropping loop current by FXS port. A setting of zero is to disable this function. It is used to avoid the line engaged if FXS port is connected to PBX.
- **Loop Current Drop Duration:** It is to set the drop duration.
- **Enable ROH:** The system will play Receiver Off-Hook tone to notify user of hanging up the phone set.
- **FXS Ring Voltage:** FXS ringing voltage, the unit is VRMS.
- **Max. Eternal Call:** Defines the maximum concurrent Internet call is allowed by the gateway.
- **VoIP Centrex Extension Digit Count:** This feature is to enable and set the digit count of VoIP Centrex. The setting "0" zero is to disable this function.
- **VoIP Centrex Digit:** Enter the digit for VoIP call. If you dial VoIP Centrex Digit first, the dialing plan is according to the Digit Map; otherwise the VoIP gateway will send the number which digit count is the same as VoIP Centrex Extension Digit Count.

FXS Group Hunting / Ring Priority		
Hunting / Ring	Hunting <input type="button" value="v"/>	
Sequential Ring Time [1 - 100 s]	<input type="text" value="6"/>	
1	<input type="text" value="Line 1"/>	<input type="button" value="v"/>
2	<input type="text" value="Line 2"/>	<input type="button" value="^"/> <input type="button" value="v"/>
3	<input type="text" value="Line 3"/>	<input type="button" value="^"/> <input type="button" value="v"/>
4	<input type="text" value="Line 4"/>	<input type="button" value="^"/>

- **Hunting/Ring:** This variable is able to set FXS group hunting using simultaneous ring or sequential ring.
- **Sequential Ring Time:** Sets the ring time of each port, when sequential ring is chosen.
- **Hunting Priority:** This variable can be adjusted using the Up and Down arrows.

3-7 SIP

FXS Representative Number registers to Proxy:

Line	Type	Number	Register	Invite with ID / Account	User ID / Account	Password	Confirm Password
	FXS Representative Number	198	<input checked="" type="checkbox"/>		198	.....	.....

Assuming that your registered ID and password are individual, the settings should be as above.

- **FXS Representative Number:** Register all FXS ports as a hunting group.
- **Register:** Register to proxy if selected.
- **Invite with ID / Account:** The DVG-5004S/5008S can invite to a VoIP trunk gateway without registering to a proxy. Please contact your VoIP service provider.

NOTE: Please contact your VoIP provider about whether they can provide representative numbers to allow you to use them for more than one FXS ports. FXS representative numbers should be different.

Each line registers to Proxy independently:

Line	Type	Number	Register	Invite with ID / Account	User ID / Account	Password	Confirm Password
1	FXS	701 <input type="button" value="Auto"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	701	.....	.....
2	FXS	702	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	702	.....	.....
3	FXS	703	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	703	.....	.....
4	FXS	704	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	704	.....	.....

- **Number:** VoIP phone number
- **User ID/Account:** VoIP account Authentication ID or account name
- **Password:** password for VoIP account authentication
- **Invite with ID / Account:** can invite to a VoIP trunk gateway without registering to a proxy. Please contact your VoIP service provider.

As there are various Proxy Server providers, the gateway has been designed to be compatible with as many SIP VoIP networks as possible using RFC standards. If any kind of registration problem occurs, please consult your VoIP service provider.

NOTE: When you register with a Proxy Server, dialing principles may vary with different Proxy Servers. Please consult your VoIP service provider for details.

DNS SRV Settings

Use DNS SRV	<input type="checkbox"/>
DNS SRV Auto Prefix	<input checked="" type="checkbox"/>
Proxy Fallback Interval [0 - 10800 s]	1800

- **Use DNS SRV:** The gateway asks for the related IP address of SIP Server from the records of DNS SRV. DNS SRV uses several servers for a single domain for SIP proxy, to move services from host to host and design some hosts as primary servers (the highest priority) for a service and others as backups. If the primary server is not reachable, the gateway will go for backup server, and so forth...
- **DNS SRV Auto Prefix:** This option tells the gateway to send packet with service type when using DNS SRV.
- **Proxy Fallback Interval:** Set the preferred Proxy Fallback Interval. After the time expires, the gateway gets back for registration with the primary server.

Enable Support of SIP Proxy Server / Soft Switch

<input type="checkbox"/> Enable Support of SIP Proxy Server / Soft Switch	
<input checked="" type="checkbox"/> Enable SIP Proxy 1	
Proxy Server IP / Domain	192.168.1.1
Proxy Server Port [1 - 65535]	5060
Proxy Server Realm	
TTL (Registration interval) [10 - 7200 s]	600
SIP Domain	
Use Domain to Register	<input type="checkbox"/>
<input type="checkbox"/> Enable SIP Proxy 2	
Proxy Server IP / Domain	192.168.1.1
Proxy Server Port [1 - 65535]	5060
Proxy Server Realm	
TTL (Registration interval) [10 - 7200 s]	600
SIP Domain	
Use Domain to Register	<input type="checkbox"/>
VoIP failure announcement	<input type="checkbox"/>
Bind Proxy Interval for NAT [0 - 180 s]	0
Initial Unregister	<input type="checkbox"/>
Support Message Waiting Indication (MWI)	<input type="checkbox"/>
MWI Subscribe Interval [0=disable, 60 - 86400 s]	7200

- **Enable Support of SIP Proxy Server / Soft Switch:** Enable the functions to inter-work with Proxy Server / Soft Switch. When SIP Proxy 1 and 2 are enabled, the system will register to SIP Proxy 2 after all lines have failed to register to SIP Proxy 1. SIP Proxy 2 is a backup system.

- **Proxy Server IP/Domain:** Enter the Proxy Server IP address or URL (Uniform Resource Locator).
- **Proxy Server Port:** Enter the Proxy Server **listen** port number. (The default value is 5060)
- **Proxy Server Realm:** This variable is used for gateway SIP account authentication in a SIP server. In most cases, the gateway can automatically detect your SIP server realm. So you can leave this option blank. However, if your SIP server requires you to use a specific realm you can manually enter it here. **If you fail to make a call, please contact your VoIP service provider.**
- **TTL (Registration interval) [10-7200 s]:** Enter the desired time interval at which the gateway will report to your Proxy Server.
- **SIP Domain/Use Domain to Register:** Enter the correct SIP domain to avoid registration failure (it is not necessary to set this with some Proxy Servers). If you enable "Uses Domain to Register" the VoIP gateway will register to the proxy with the domain name you filed. Otherwise the VoIP Gateway will register to a Proxy with the IP it resolves. **If you fail to make a call, please contact your VoIP service provider.**
- **VoIP failure announcement:** As soon as the registration to proxy server is failed, the gateway will drive IVR system to play out failure announcements for the caller.
- **Bind Proxy Interval for NAT:** This function is able to keep the binding that exists when the VoIP gateway is behind a NAT and SIP Proxy is not able to keep the binding.
- **Initial Unregister:** After rebooting, the gateway is initially unregistered and then it will perform a general register process.
- **Support Message Waiting Indication:** The system will play a tone to remind users that there are messages in the SIP Server.
- **MWI Subscribe Interval:** The subscribe interval is for the gateway check of the voice mail.

Outbound Proxy Support	<input type="checkbox"/>
Outbound Proxy IP / Domain	<input type="text"/>
Outbound Proxy Port [1 - 65535]	<input type="text" value="5060"/>

- **Outbound Proxy Support :** An outbound proxy server handles SIP call signaling as a standard SIP proxy server would. Further, it receives and transmits phone conversation traffic (media) between two communication parties. This option tells the gateway to send and receive all SIP packets to the destined outbound proxy server rather than the remote gateway. This helps VoIP calls to pass through any NAT protected network without additional settings or techniques. Please make sure your VoIP service provider supports outbound proxy services before you enable it.

Session Expiration [0=disable, 10 - 1800]	<input type="text" value="0"/>
Session Refresh Request	<input checked="" type="radio"/> UPDATE <input type="radio"/> re-INVITE
Session Refresher	<input checked="" type="radio"/> UAS <input type="radio"/> UAC

- **Session Expiration:** This variable is used to avoid billing for abnormally dropped calls due to Internet problems. The default is disabled.
- **Session Refresh Request:** Used to resend UPDATE or re-INVITE requests to the Server.
- **Session Refresher:** Selects which user agent is the session refresher. UAS (User Agent Server) is an originator, and UAC (User Agent Client) is a replier.

Enable P-Assert	<input type="checkbox"/>
Privacy Type	id

- **Enable P-Assert:** This variable is for caller ID protection.
- **Privacy Type:** Privacy type is used to disguise the caller ID when queried via an ITSP/Third-Party Assertion.

SIP Message Resend Timer Base [s]	0.5
Max. Response Time for Invite [1 - 32]	8
Invite URL need 'user=phone'	<input checked="" type="checkbox"/>
Reliability of Provisional Responses	<input type="checkbox"/>
Compact Form	<input type="checkbox"/>
SIP Caller ID Obtaining	Remote-Party-Id Display Name
Put Caller ID In URI	<input type="checkbox"/>
INVITE With Remote-Party-ID Header	<input type="checkbox"/>
Retry-After Value for Temporarily Unavailable	0
Support URI Percent-Encoding (RFC 3986)	<input type="checkbox"/>
Enable SIP 'Allow' Header	<input checked="" type="checkbox"/>
Call Hold Compatible With RFC 2543	<input type="checkbox"/>

- **SIP Message Resend Timer Base:** SIP packet will resend if response did not arrive in the base time set in this column. It will send again at "base time" * 2, and send again at "base time" * 2 * 2. The maximum resend time is four seconds. Resend will stop and restart when the total resend time has reached 20 seconds.
- **Max. Response Time for Invite:** If the destination does not reply in the set time, the call is failed.
- **Invite URL need 'user=phone':** There is 'user=phone' in invite packet.
- **Reliability of Provisional Responses:** Provide information on the progress of the request processing if selected.
- **Compact Form:** It decreases the size of SIP header if selected.
- **SIP Caller ID Obtaining:** Select the part of the SIP packet from the VoIP gateway to obtain Caller ID. There are several places where the Caller ID is located.
Remote-Party-Id Display Name - It is located at SIP → Remote-Party-ID → Before [<sip:]
Remote-Party-Id User Name - It is located at SIP → Remote-Party-ID → After [<sip:], Before [@]
From-Header Display Name - The standard way is in SIP → Message Header → From → SIP Display info.
From-Header User Name - It is locate at SIP -> Message Header -> From -> SIP from address before [@].

- **Put Caller ID In URI:** This feature is to put Caller ID in URL. The Caller ID is located in SIP → Message Header → After [From:], Before [<sip:] by default settings. It will be located in SIP → Message Header → After [<sip:], Before [@] if ticked.
- **INVITE With Remote-Party-ID Header:** Check the box to comprise the information of Remote-Party-ID in the message header of INVITE. Different format of INVITE header might cause the call not to be connected. Please consult with your VoIP Service Provider before enabling it.
- **Retry-After Value for Temporarily Unavailable:** To set the time interval. When ISDN PRI Gateway is full loading, ISDN PRI Gateway will inform VSP to stop sending INVITE packets and start to send INVITE packets after Retry-After Value.
- **Support URI Percent-Encoding(RFC 3986):** It follows RFC 3986 to encode/decode the letters of the basic Latin alphabet, digits, and a few special characters.
- **Enable SIP 'Allow' Header:** Check the box to comprise the information of "Allow" in the message header of INVITE. Disable it if the call can't be connected.
- **Call Hold Compatible With RFC 2543:** Check the box to comprise c=0.0.0.0 in SDP message to be compatible with RFC2543.

E.164

International Call Prefix Digit	<input type="text"/>
Country Code	(Other) <input type="text"/> <input type="button" value="v"/>
Long Distance Call Prefix Digit	<input type="text"/>
Area Code	<input type="text"/>
E.164 Numbering	To Invite Proxy <input type="checkbox"/>
	Transform to Transit Out <input type="checkbox"/>
ENUM Header Exception	<input type="text" value="070"/>

- **International Call Prefix Digit:** Enter the International call prefix.
- **Country Code:** Users please select the desired country code.
- **Long Distance Call Prefix Digit:** The long-distance prefix digit for making a long-distance call.
- **Area Code:** Please enter the area code.
- **E.164 Numbering:** This variable invites the proxy to follow the E.164 rule, but it depends on the proxy. If you fail to make a call, please contact your ITSP.



NOTE: All settings in this section are specific to your VoIP network. Please ask your VoIP service provider whether or not they require these settings.

3-8 Calling Features

Line	Type	Do Not Disturb	Unconditional Forward	Busy Forward	No Answer Forward	Call Hold	Call Transfer	Call Waiting	Three-Way Calling / Service ID
FXS Representative Number		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1	FXS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> After[10 - 60] 20 s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	FXS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> After[10 - 60] 20 s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	FXS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> After[10 - 60] 20 s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	FXS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> After[10 - 60] 20 s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NOTE: Following features also depends on your VoIP network. Please also check with your service provider on these services.

- **Do Not Disturb:** The particular line will only be able to call out when this variable is enabled. All incoming calls will be rejected.
- **Unconditional Forward:** All incoming calls will be forwarded to the “Forwarding Number” automatically.
- **Busy Forward:** Forward incoming calls to the “Forwarding Number” when the port is busy.
- **No Answer Forward:** Forward incoming calls to the “Forwarding Number” after ring timeout expires without answer.
- **Call Hold:** Enable the call hold feature on the specific FXS port.

NOTE: Call Hold must be checked for Call Transfer or Call Waiting to be active.

- **Call Transfer:** Enable the call transfer feature of the specific FXS port.
- **Call Waiting:** Enable the call waiting feature of the specific FXS port.

Call Feature Code		
Enable Call Feature Code	<input checked="" type="checkbox"/>	
	Enable	Disable
Unconditional Forward (FXS Representative Number)	<input type="text" value="*78"/>	<input type="text" value="#78"/>
Do Not Disturb	<input type="text" value="*74"/>	<input type="text" value="#74"/>
Unconditional Forward	<input type="text" value="*77"/>	<input type="text" value="#77"/>
Busy Forward	<input type="text" value="*76"/>	<input type="text" value="#76"/>
No Answer Forward	<input type="text" value="*75"/>	<input type="text" value="#75"/>
Call Hold	<input type="text" value="*70"/>	<input type="text" value="#70"/>
Call Transfer	<input type="text" value="*71"/>	<input type="text" value="#71"/>
Call Waiting	<input type="text" value="*72"/>	<input type="text" value="#72"/>
Blind Transfer	<input type="text" value="*50"/>	

- **Enable Call Feature Code:** User could enable/disable some call features with a phone set.
- ◆ **NOTE:** In most VoIP provider, please disable this function to use call features provided by SoftSwitch.
 1. If you would like enable **DND** function of FXS #2. Please pickup FXS #2 and dial “*74#”
 2. If you would like **enable Unconditional Forward** of FXS #3 and assign the number. Please pickup FXS #3 and dial “*77 0912345678#”. 0912345678 is the number you would like forward to.
 3. If you would **stop Unconditional Forward** of FXS #3. Please pickup FXS #3 and dial “#77#”
 4. If you would like to **enable Unconditional Forward again**, but the number is the same. Please pickup FXS #3 and dial “*77#”.

Calling Feature Instructions:

- **Call Hold:** The call will be put on hold after the FLASH button is pressed on the phone set. The gateway will play hold music (provided by your VoIP network) to the remote end.
- **Call Transfer:** The call will be put on hold after the FLASH button is pressed on the phone set (the gateway plays hold music to the remote end). Once the call is on hold, the local user can dial out to another number after a dial tone is received. After the handset is replaced on the hook, the call on hold will then be transferred to the new number regardless of the status of the new call. If the wrong number is dialed for the new call, just press the FLASH button to get the on hold call back. Please notice that the PBX between the phone sets and the gateway must support FLASH features in order to use this function. If a phone set is connected directly to the FXS port of the gateway and FLASH functions are not working, please adjust the settings in “Flash Time” on “Line Settings”.
- ◆ **NOTE:** The availability of the above features also depends on your VoIP network. Please also check with your service provider on these services.

Examples of establishing a Three-Way call:

1. Phone1 dials to Phone2, Phone2 answers the call.
 2. Phone1 presses Flash then calls Phone3 (Phone2 is on hold) and Phone3 answers the call.
 3. Phone1 dials *61 and then presses Flash to start the conference call.
- Or**
4. Phone1 dials to Phone2, Phone2 answers the call.
 5. Phone3 dials to Phone1 (Call Waiting), Phone1 presses Flash to pick up the second call and talk to Phone3.
 6. Phone1 dials *61 and then presses Flash to start the conference call.

3-9 Advanced Options

Administrator's Name	<input type="text"/>
Administrator's Password	<input type="password"/>
Confirm Password	<input type="password"/>
Web UI Login ID	<input type="text"/>
Web UI / IVR Password	<input type="password"/>
Confirm Password	<input type="password"/>
Web UI auto logout [30 - 300 s]	<input type="text" value="60"/>



NOTE: There are two operating levels when entering the Web UI. Logging-in as the Administrator allows you to change all settings. A Web UI user only has access to some settings.

- **Administrator's Name and Password:** Enter the administrator name and password, which has the highest level of control of the gateway.
- **Web UI Login ID and Web UI/IVR Password:** Enter log-in ID and password when you log-in to the Web interface/IVR of the gateway as a normal user.
- **Web UI auto logout:** If a user does not act within the effective time range when logging into the web interface, the user will be disconnected from the web page to allow others to log-in.

Dial Wait Timeout [1 - 60 s]	<input type="text" value="10"/>
Inter Digits Timeout [1 - 60 s]	<input type="text" value="4"/>
Minimum DTMF ON Length [40 - 500 ms]	<input type="text" value="80"/>
Minimum DTMF OFF Length [40 - 500 ms]	<input type="text" value="80"/>
DTMF Detection Sensitivity	(less) <input type="radio"/> 1 <input type="radio"/> 2 <input checked="" type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 (more)

- **Dial Wait Timeout:** Use this variable to set the wait time for the user's first key pressing when dialing a number. The user will hear a busy tone if he or she does not press the first key within the set time frame.
- **Inter Digits Timeout:** Set the waiting time between each key press. The numbers input up to that point will be dialed after the timeout.
- **Minimum DTMF ON Length (Dial on)/ Minimum DTMF OFF Length (Dial off - between tones):** Used to set the dial tone when a call is being diverted to another extension.
- **DTMF Detection Sensitivity:** Used to adjust the sensitivity of the telephone keys.

FXS Impedance	<input type="text" value="Taiwan 600 Ohm"/>
---------------	---

- **FXS Impedance:** Choose the correct impedance in your country or area.

Enable Out-of-Band DTMF <input type="checkbox"/>	<input checked="" type="radio"/> RFC 2833 Payload Type 101 Volume 0 dB
Enable Hook Flash Event	<input type="radio"/> SIP_INFO Disable
Use Second CPT after SIP registered	<input type="checkbox"/>
Enable Non-SIP Inbox Call	<input checked="" type="checkbox"/>

- **Enable Out-of-Band DTMF:** To send DTMF keys (0~9, *, #,) follow the RFC2833 rules or via SIP Info.
-  **NOTE:** Out-of-Band DTMF transport method may vary with different VoIP networks, please contact your VoIP provider for their preferred method.
- **Payload Type:** payload type of RFC2833.
- **Volume:** Defines the volume of RFC2833.
- **Uses Second CPT for VoIP Call:** This function is usually applied when the user selects VoIP as the primary path for outgoing calls and PSTN as the backup. By enabling this function, the gateway will generate a different set of tones to inform the user that VoIP is in service. Should VoIP fail and fallback to PSTN, the user will hear PSTN tones instead of the second set CPT. (for CPT related settings, please refer to Trunk Management -> CPT/Cadence Settings).
- **Enable Non-SIP Inbox Call:** Untick on the check box to disable Non-SIP inbox call if all calls need to go through ITSP.

Line Settings

Line	Type	Listening Volume	Speaking Volume	Tone Volume	Min. FXS Hook Flash Time [50-950 ms]	Flash Time FXS [50-950 ms]	Enable Polarity Reversal	FXS Chip Option 1
1	FXS	0 <input type="button" value="All"/>	0 <input type="button" value="All"/>	5 <input type="button" value="All"/>	90 <input type="button" value="All"/>	600 <input type="button" value="All"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	FXS	0	0	5	90	600	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	FXS	0	0	5	90	600	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	FXS	0	0	5	90	600	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- **Listening Volume:** Adjusts the earpiece or speaker volume.
- **Speaking Volume:** Adjusts the microphone volume.
- **Tone Volume:** Adds a new option to make tone volume adjustable. This setting will be applied to all tones generated by the gateway including dial tone and busy tone.
- **Min. FXS Hook Flash Time:** It is to set the minimum flash time for FXS detecting.
- **Flash Time:** Used to adjust the detection period for flash signals from a phone set connected to an FXS port. For example, if pressing the HOLD key sometimes disconnects a call, increasing the “Flash Detect Time” should fix this issue.
- **Enable Polarity Reversal:** As a remote site answers calls from this extension the FXS port will reverse polarity.
- **FXS Chip Option 1:** It is to avoid mis-detecting the loop state of a subscriber line or PBX user loop by FXS interface. In some places, the voltage of off-hook makes it mis-detect the idle state and the active state by FXS interface. Untick this variable if it mis-detects the state by FXS interface in your place.

Codec Settings

Preferred Codec Type	G.723.1				
Jitter Buffer [60 - 1200 ms]	120				
Silence Detection / Suppression	<input type="checkbox"/>				
Echo Cancellation	<input checked="" type="checkbox"/>				
Codec	<input checked="" type="checkbox"/> G.711 u-law	<input checked="" type="checkbox"/> G.723.1 G.723.1 6.3k	<input checked="" type="checkbox"/> G.726	<input checked="" type="checkbox"/> G.729	<input checked="" type="checkbox"/> G.711 a-law
Packet Interval (ms)	20	30	20	20	20
Approximate Bandwidth Required (kbps)	85.6	20.8	53.6	29.6	85.6

- **Preferred Codec Type:** Since different voice codecs have different compression ratios, the sound quality and occupied bandwidths are also different. It is recommended that you use the default provided (G.723.1) because it occupies less bandwidth and will provide better sound quality.
- **Jitter Buffer:** Adjusts the jitter for receiving packets. If the jitter range is too wide, it will delay voice transmission.
- **Silence Suppression:** If one side of a connection is not speaking, the system will stop sending voice data (packets) to decrease bandwidth usage.
- **Echo Canceling:** Prevents poor telecommunication quality caused by echo interference.
- **Codec:** Choose the codec that you need.
- **Packet Time:** Defines how long the gateway sends a RTP packet or voice packet to the receiving side. The smaller the value, the greater the bandwidth usage, but larger values increase voice delay.
- **Approximate Bandwidth Required:** The bandwidth required varies with codec format and packet time.

Fax Settings

T.38	<input checked="" type="checkbox"/> Enable High Quality
T.30	FAX Codec: G.711 u-law 64kbps
T.30	FAX Jitter Buffer [60 - 1200 ms]: 200

- ❗ **NOTE:** When a fax tone is detected in a call, the gateway will automatically switch from voice mode to fax mode. So fax settings will be temporarily applied to a specific port which detects fax tones, instead of its default voice settings.
- **Enable High Quality:** The system sends the same fax frame twice to get a high quality fax transmission. Enabling this variable increases bandwidth requirements.
- **T.30:** The system uses T.30 as the protocol for fax transmission. The parameter settings are the same as for voice transmission. However, enabling the T.30 protocol will consume more network resources and will affect transmission quality.
- ❗ **NOTE:** When you send fax over an IP network it needs your network to support fax over IP functionality (either T.38 or T.30). Please consult your VoIP service provider for this setting.

Drop Inactive Call

Silence Detection Threshold [0=disable, 1 - 60 dB]	<input type="text" value="0"/>
Drop Silent Call Timeout [0=disable, 1 - 3600 s]	<input type="text" value="120"/>

This is used as a standard to determine whether or not to hang up the phone. The system will hang up the phone automatically to avoid keeping the line engaged if the detected volume is below the Silence Detection Threshold and the time exceeds the Drop Silent Call Timeout.

- **Silence Detection Threshold:** The volume below the threshold is used as a standard to determine whether or not to hang up the phone.
- **Drop Silent Call Timeout:** If the detected volume is below the threshold and the time exceeds the silence detection interval, the system will hang up the phone automatically to avoid keeping the line engaged.

 **NOTE:** Please be careful with these settings. Improper values might cause unexpected automatic disconnection of a call. Default values are recommended.

Voice Menu Options

Voice Menu Options	
Enable	<input checked="" type="checkbox"/>

Enable: To enable or disable IVR function.

3-10 Digit Map

Digit Map now is combined the original feature of Digit Map and Speed Dial. You can use “?” or “%” in the column of Scan Code, VoIP Dial-out and PSTN Dial-out. “?” is a single digit, and “%” is wildcard. It provides a mapping between the number received from user and the replaced or modified number for real dial out. With this function, user can easily add certain leading digits to replace full number. There are 50 sets of leading digit entries to choose voice routing interface.

Enable Pound Key '#' Function	<input checked="" type="checkbox"/>
Default Call Route	Auto (VoIP first) ▼

- **Enable Pound Key '#' Function:** It is to speed up the connection of a call by entering '#' after a complete phone number is dialed.
- **Default Call Route:** The default call route can be Auto, VoIP or Deny.
Auto (VoIP first): The call route is VoIP first, and the next is Deny.
Deny: The call will be denied.

Digit Map Testing

Digit Map Testing	
Test Dial No.	<input type="text"/> <input type="button" value="Run"/>
Result	<input type="text"/>

- **Test Dial No.:** You have to set some rules in Digit Map Setting first and enter the number for test.
- **Result:** The gateway will show the number for VoIP Dial-out and PSTN Dial-out according to the Digit Map Setting as below.

Digit Map Rule

#	Enable	Scan Code	VoIP Dial-out	User Dial Length [0=disable, 1 - 25]	Route
1	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10	Auto (VoIP first) ▼
2	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10	Auto (VoIP first) ▼
3	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10	Auto (VoIP first) ▼
4	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10	Auto (VoIP first) ▼
5	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10	Auto (VoIP first) ▼

- **Enable:** Enable detection of this entry.
- **Scan Code:** Defines the digits for the gateway to scan while user is dialing.
- **VoIP Dial-out:** Defines the dialed number rule for the gateway to call through Internet.
- **User Dial Length:** Defines total number of digits that user dialed. A setting of zero tells the gateway scans digits only and disregards the total digit count.
- **Route:** Determine the interface calls should go through if above conditions satisfied.

Methods of Digit Map:

Method 1- Single mapping: Fill a short code into the Scan Code column, and enter the desired phone number into the VoIP Dial-out or PSTN Dial-out column.

For example,

Scan Code: 55

VoIP Dial-out: 07021234567

User Dial Length: 2

Route: Auto

#	Enable	Scan Code	VoIP Dial-out	User Dial Length [0=disable, 1 - 25]	Route
1	<input checked="" type="checkbox"/>	55	07021234567	2	Auto (VoIP first) ▾
2	<input type="checkbox"/>			10	Auto (VoIP first) ▾
3	<input type="checkbox"/>			10	Auto (VoIP first) ▾

Pick up the handset and dial 55 and the system will dial 07021234567. You also can use Digit Map Testing to know that the system will dial 07021234567 and go through Internet.

Digit Map Testing	
Test Dial No.	55 <input type="button" value="Run"/>
Result	#1, Seq: VoIP=07021234567

Method 2- Multi mapping: Fill the prefix code into the Scan Code column and the format to transfer into the VoIP Dial-out or PSTN Dial-out column.

For example,

Scan Code: 2???

PSTN Dial-out: 35106???

User Dial Length: 4

Route: Auto

#	Enable	Scan Code	VoIP Dial-out	User Dial Length [0=disable, 1 - 25]	Route
1	<input checked="" type="checkbox"/>	55	07021234567	2	Auto (VoIP first) ▾
2	<input checked="" type="checkbox"/>	2???		4	Auto (VoIP first) ▾
3	<input type="checkbox"/>			10	Auto (VoIP first) ▾

Pick up the handset and dial 2301. The system will dial 351006301 and go through Internet

Digit Map Testing	
Test Dial No.	2301 <input type="button" value="Run"/>
Result	#2, Seq: VoIP=35106301

For example,
 Scan Code: 0%
 PSTN Dial-out: 1805%
 User Dial Length: 0
 Route: Auto

#	Enable	Scan Code	VoIP Dial-out	User Dial Length [0=disable, 1 - 25]	Route
1	<input checked="" type="checkbox"/>	55	07021234567	2	Auto (VoIP first) ▼
2	<input checked="" type="checkbox"/>	2???		4	Auto (VoIP first) ▼
3	<input checked="" type="checkbox"/>	0%	1805%	0	Auto (VoIP first) ▼

Pick up the handset and dial 0423456789. The system will dial 1805423456789 and go through Internet first. If the call is fail to Internet, the system will play busy tone.

Digit Map Testing	
Test Dial No.	0423456789 <input type="button" value="Run"/>
Result	#3, Seq: VoIP=1805423456789

Method 3- Substitution: It helps you dial to destination that you can not dial by phone. Destination like: test@1.1.1.1. Fill the number into the **Scan Code** column and enter the desired name into the **VoIP Dial-out** column.

For example,
 Scan Code: 11
 VoIP Dial-out: test
 User Dial Length: 2
 Route: Auto

#	Enable	Scan Code	VoIP Dial-out	User Dial Length [0=disable, 1 - 25]	Route
1	<input checked="" type="checkbox"/>	11	test	2	Auto (VoIP first) ▼
2	<input type="checkbox"/>			10	Auto (VoIP first) ▼
3	<input type="checkbox"/>			10	Auto (VoIP first) ▼

Pick up the handset and dial 11. The system will dial “test” and go through Internet. You also can use Digit Map Testing to know the dialing result.

Digit Map Testing	
Test Dial No.	11 <input type="button" value="Run"/>
Result	#1, Seq: VoIP=test

3-11 Phone Book

This system can set up and store 100 phone numbers into a phone book and provides an IP address query when calling to other gateway(s). If no Phone Book manager is set within a gateway group, then all gateway systems have to set up phone data to allow each gateway to communicate with the others.

#	Gateway Name	Gateway Number	IP / Domain Name	Port
1				5060
2				5060
3				5060
4				5060
5				5060

- **Gateway Name:** Enter another gateway's code or an easy-to-remember name.
- **Gateway Number:** Enter the desired number of another gateway.
- **IP / Domain Name:** Enter the IP address or URL (Uniform Resource Locator) of another gateway.
- **Port:** Enter another gateway's listen port setting.

3-12 Caller Filter

This function is used to allow or deny SIP invitations from the proxy list ONLY.

<input checked="" type="radio"/> Allow <input type="radio"/> Deny		
Enable	Filter IP address	Subnet mask
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>

- **Filter IP Address:** Enter the start IP you would like to allow or deny.
- **Subnet mask:** Enter the subnet mask you would like to allow or deny.

3-13 CDR Settings

The user can set up a CDR Server to record call details for every phone call. CDR provides call detail recording in a text file and which can be imported to prepare an analysis report.

CDR Settings	
<input type="checkbox"/> Send record to CDR Server	
CDR Server IP / Domain	<input type="text"/>
Port [1 - 65535]	<input type="text" value="1812"/>
Support RADIUS	<input type="checkbox"/>
RADIUS Accounting Port [1 - 65535]	<input type="text" value="1813"/>
RADIUS Server Secret	<input type="password" value="....."/>
RADIUS User ID	<input type="text"/>
RADIUS Password	<input type="password" value="....."/>

- **Send record to CDR Server:** Enables call detail recording.
- **CDR Server IP:** Enter the IP address of the CDR server.
- **Port:** Enter the listen port of the CDR server.
- **Support RADIUS:** Enable RADIUS for CDR database.
- **RADIUS Server Secret:** Enter the secret.
- **RADIUS User ID/Password:** Enter the User ID and password.

3-14 Language

The system provides English, Traditional Chinese, and Simplified Chinese for displaying text on web pages. Changing the language setting also changes the language for IVR (Interactive Voice Response).

Web UI / IVR Language 

3-15 CPT/Cadence Settings

Please adjust the CPT based on the local PSTN or PBX settings and requirements.

# 1 Enable		Setting 1					Default
Tone Type	Low Frequency	High Frequency	T_ON_1	T_OFF_1	T_ON_2	T_OFF_2	
Dial Tone	350	440	3000	0	0	0	
Congestion Tone	480	620	250	250	0	0	
Busy Tone	480	620	500	500	0	0	
Ring-Back Tone	440	480	1000	2000	0	0	

FXS Ring Cadence Settings

[FXS Ring Cadence Settings](#)

Range	ON_1 [250 - 8000 ms]	OFF_1 [250 - 8000 ms]	ON_2 [0, 250 - 8000 ms]	OFF_2 [0, 250 - 8000 ms]	ON_3 [0, 250 - 8000 ms]	OFF_3 [0, 250 - 8000 ms]
1	1000	2000	0	0	0	0
2	500	500	500	1500	0	0
3	500	500	500	1500	0	0

FXS Ring Cadence Settings: Specify the ring cadence for the FXS port. In this field, you specify the on and off pulses for the ring. The ring cadence should be configured differs depending on local PSTN or PBX settings and requirements.

3-16 Current Status

- Port Status:** it includes if each port registers to Proxy successfully, the last dialed number, how many calls each port has made since the Gateway is start, etc.

Port Status							
No	Type	Extension Number	Line Status	Calls	Dialed Number	Proxy Register	UPnP on RTP
1	FXS	701	Idle	0		Disabled (01:46:31)	
2	FXS	702	Idle	0		Disabled (01:46:31)	
3	FXS	703	Idle	0		Disabled (01:46:31)	
4	FXS	704	Idle	0		Disabled (01:46:31)	
SIP Proxy Hunting Number Registration				FXS Disabled (01:48:27)			

- Server Registration Status:** It shows the registration status of DDNS, Phone Book Manager, STUN and UPnP.

Server Registration Status	
DDNS Registration	Disabled (01:47:32)
Phone Book Manager Registration	Disabled (01:47:32)
STUN Registration	Disabled (01:47:32)
UPnP Negotiation	Disabled (01:47:32)

3-17 RTP Packet Summary

Display the information of the last completed call. This report contains peer IP, peer port, packets sent, packet received, and packet loss information. Press the **Refresh** button to get the latest RTP Packet Summary.

RTP Packet Summary				
Line 1	G.723.1 6.3kbps	Packet Sent 61	Packet Received 43	Packet Lost N/A
	The last packet's source IP 192.168.100.199		The last packet's source Port 9000	
Line 2	G.729A 8kbps	Packet Sent 6	Packet Received 155	Packet Lost N/A
	The last packet's source IP 192.168.100.181		The last packet's source Port 9008	
Line 3	G.729A 8kbps	Packet Sent 12	Packet Received 168	Packet Lost N/A
	The last packet's source IP 192.168.100.181		The last packet's source Port 9004	
Line 4	G.729A 8kbps	Packet Sent 5	Packet Received 153	Packet Lost N/A
	The last packet's source IP 192.168.100.181		The last packet's source Port 9006	

3-18 System Information

These two pages show the status of the VoIP gateway. The categories are WAN Port Information, LAN Port Information and Model Information.

WAN Port Information	
Factory Default MAC Address	00195B123456
Net Link	Connected
IP Address	61.221.24.23
Subnet Mask	255.255.255.224
Default Gateway	61.221.24.1
DNS	168.95.1.1
LAN Port Information	
MAC Address	00195B123457
IP Address	192.168.8.254
Subnet Mask	255.255.255.0
DHCP Server	
DHCP Server	Enabled
IP Pool Range	192.168.8.1 - 192.168.8.250
Lease Time	1 hour(s)
DNS	168.95.1.1
Model Information	
Hardware Platform	SA7S8
Hardware	4.0.0
Software Version	1.02.38.16-b8527
Driver Version	SA7S8 VP Driver v1.0.0.42 2008/04/22 16:36:22
DSP	482-128K

- **WAN Port Information:** it shows IP address, subnet mask, default gateway and DNS server. If you use PPPoE to obtain IP, you will know if the IP is obtained through this method. If IP address, subnet mask, default gateway is blank, it means that the VoIP Gateway does not obtain IP.
- **LAN Port Information:** It shows LAN port IP, subnet mask, and the status of DHCP server.
Model Information: It shows the hardware platform, software and hardware version.

3-19 Routing Table

The Routing Table stores the information for particular network destination around the VoIP gateway. Press the **Refresh** button to generate the details.

Destination	Netmask	Gateway	Interface
192.168.100.0	255.255.255.0	0.0.0.0	WAN
192.168.8.0	255.255.255.0	0.0.0.0	LAN
default	0.0.0.0	192.168.100.254	WAN

3-20 STUN Inquiry

Use "STUN Inquiry" to detect your IP sharing device's NAT type and communication between a STUN server and client (built-in to the DVG-5004S/5008S gateway).

NAT Type	Unknown
STUN Server IP / Domain	<input type="text"/>
STUN Server Port [1 - 65535]	<input type="text" value="3478"/>

3-21 Ping Test

Use "Ping" to verify if a remote peer is reachable. Enter a remote IP address and click "Test" to ping the remote host.

Ping Destination	<input type="text"/>
Number of Ping [1 - 100]	<input type="text" value="4"/>
Ping Packet Size [56 - 5600 bytes]	<input type="text" value="56"/>
<input type="button" value="Test"/> <input type="button" value="Stop"/>	

3-22 Static Route

Build static routes within an internal network. These routes will not apply to the Internet.

#	Route	Route Mask	Next Hop IP	Interface
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>
3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>
5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>

- **Route:** Enter the IP of the specified network.
- **Route Mask:** Enter the subnet mask to be used for the specified network.
- **Next Hop IP:** Enter the IP address to the specified network.
- **Interface:** Select the interface.

3-23 Port Filtering

Port filtering enables you to control all data that can be transmitted over routers. When the port used at the source end is within the defined scope, it will be filtered without transmission.

Enable Port Filtering		<input type="checkbox"/>
Port Range	TCP / UDP	Remark
0 - 0	Both <input type="button" value="v"/>	
0 - 0	Both <input type="button" value="v"/>	
0 - 0	Both <input type="button" value="v"/>	

- **Enable Port Filtering:** Select to enable this function.
- **Port Range:** Set the range of ports to be filtered. If, for example, the port to be filtered is 80 and the selected protocol is both or TCP, all computers will be unable to use HTTP services (port 80) and will be unable to browse normal webpages.
- **TCP/UDP:** Choose to filter TCP, UDP, or both.
- **Remark:** This field allows you to enter comments.

3-24 IP Filtering

IP Filtering is used to limit internal users from accessing the Internet.

Enable IP Filtering <input type="checkbox"/>		
IP	TCP / UDP	Remark
<input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/>
<input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/>
<input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/>

- **IP:** Input the IP address that you want to filter. The listed IP address will be unable to transmit data to and from the Internet.
- **TCP/UDP:** Choose to filter TCP, UDP, or both.
- **Remark:** This field allows you to enter comments.

3-25 MAC Filtering

MAC (Media Access Control) address filtering allows you to filter the transmission of data by network card physical address.

Enable MAC Filtering	<input type="checkbox"/>
MAC	Remark
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

- **MAC:** Enter a MAC address to prevent the particular device from accessing the Internet.

3-26 Virtual Server

Virtual server allows you to enable users to access the Internet, FTP and other services from behind your NAT. When remote users are accessing web or FTP servers through WAN-end IP addresses, they will be routed to the server at the internal LAN end as appropriate in accordance with externally required services

Enable Virtual Server <input type="checkbox"/>					
WAN Port Range	TCP / UDP	LAN Host IP Address	Server Port Range	Remark	
0 - 0	Both		0 - 0		
0 - 0	Both		0 - 0		
0 - 0	Both		0 - 0		

- **WAN Port Range:** Input the port range for the WAN side.
- **TCP/UDP:** Select the communication protocols used by the server, TCP or UDP.
- **LAN Host IP Address:** Enter the IP address that provides various services.
- **Server Port Range:** Input the port used by the LAN host.

3-27 DMZ

DMZ allows the server on the LAN site to be directly exposed to the Internet for accessing data. Either this function or virtual server can be selected for use in accessing external services.

Enable DMZ	<input type="checkbox"/>
DMZ Host IP Address	<input type="text"/>

3-28 URL Filter

URL filtering is used to deny devices on the LAN from accessing specific web sites. The system will block any URL that contains the strings listed.

Enable	URL string pattern to be blocked	Source IP Range	
<input type="checkbox"/>		0.0.0.0	- 0.0.0.0
<input type="checkbox"/>		0.0.0.0	- 0.0.0.0
<input type="checkbox"/>		0.0.0.0	- 0.0.0.0

3-29 Special Applications

Provide multiple connections for special applications.

Enable	Name	Incoming Type	Incoming Port Range	Trigger Type	Trigger Port Range
<input type="checkbox"/>	MSN Gaming Zone	BOTH	2300-2400,28800-29000	TCP	47624 - 47624
<input type="checkbox"/>	Quick Time	TCP	6970-6999	TCP	554 - 554
<input type="checkbox"/>	ICU II	BOTH	2000-2038,2050-2051,2069,208	TCP	2019 - 2019
<input type="checkbox"/>	PC-to-Phone	TCP	12120,12122,24150-24220	TCP	12053 - 12053
<input type="checkbox"/>		TCP		TCP	0 - 0
<input type="checkbox"/>		TCP		TCP	0 - 0
<input type="checkbox"/>		TCP		TCP	0 - 0
<input type="checkbox"/>		TCP		TCP	0 - 0

- **Name:** The name of the special application.
- **Incoming Type:** The protocol used to trigger the special application.
- **Incoming Port Range:** Port range on the WAN side that will be used to access the application.
- **Trigger Type:** The protocol used to trigger the application.
- **Trigger Port Range:** Port range used to trigger the application.
-

3-30 DoS Prevention Settings

Enable DoS Prevention	<input checked="" type="checkbox"/>
Enable DoS Prevention on LAN	<input checked="" type="checkbox"/>
Whole System Flood	<input checked="" type="checkbox"/> SYN <input type="text" value="50"/> (Packets/Second) [50 - 500]
	<input checked="" type="checkbox"/> FIN <input type="text" value="50"/> (Packets/Second) [50 - 500]
	<input type="checkbox"/> UDP <input type="text" value="68"/> (Packets/Second)
	<input checked="" type="checkbox"/> ICMP <input type="text" value="50"/> (Packets/Second) [50 - 500]
Per-Source IP Flood	<input checked="" type="checkbox"/> SYN <input type="text" value="30"/> (Packets/Second) [30 - 300]
	<input checked="" type="checkbox"/> FIN <input type="text" value="30"/> (Packets/Second) [30 - 300]
	<input type="checkbox"/> UDP <input type="text" value="68"/> (Packets/Second)
	<input checked="" type="checkbox"/> ICMP <input type="text" value="30"/> (Packets/Second) [30 - 300]
TCP / UDP Port Scan	<input type="checkbox"/> TCP / UDP Port Scan Level <input type="text" value="Low"/>
TCP Scan	<input type="checkbox"/>
TCP SYN with Data	<input type="checkbox"/>
TCP Land	<input type="checkbox"/>
UDP Echo Chargen	<input type="checkbox"/>
UDP Bomb	<input type="checkbox"/>
UDP Land	<input type="checkbox"/>
Ping of Death	<input checked="" type="checkbox"/>
ICMP Smurf	<input checked="" type="checkbox"/>
ICMP Land	<input checked="" type="checkbox"/>
IP Spoof	<input type="checkbox"/>
Tear Drop	<input type="checkbox"/>

- **Enable DoS Prevention:** To prevent DoS attacks from WAN.
- **Enable DoS Prevention on LAN:** To prevent DoS attacks from LAN.

Source Blocking	
Enable Source IP Blocking	<input type="checkbox"/>
Blocking Time [2 - 600 s]	<input type="text" value="120"/>

- **Enable Source IP Blocking:** Block a particular IP.
- **Blocking Time:** The time to block the IP.

3-31 NTP (Network Time Protocol)

	Year	Month	Day	Hour	Minute	Second
Gateway Time	2000	1	1	8	1	5
Time Zone	+ 8 : 00					
#	Time Server					
1	ntp1.dlink.com					
2	ntp.dlink.com.tw					
3						

- **Time Zone:** Set the Time Zone where the gateway resides.
- **Time Server #1~#3:** Set the Time Server where the gateway should sync up during start up.

3-32 SNMP

Enable SNMP Agent	<input type="checkbox"/>
Get Community	<input type="text"/>
Set Community	<input type="text"/>
Trap Community	<input type="text"/>
Trap Host	<input type="text"/>

- **Enable SNMP Agent:** Enable SNMP if selected.
- **Get/Set/Trap Community:** Enter Community name to Read, Write and Trap.
- **Trap Host:** Enter the IP of the Trap Host.

3-33 Backup/Restore

You can backup settings to a file and restore settings from that file. You also can restore all settings back to default by selecting **Restore Default Configurations** and click **Restore**.

 **NOTE:** the gateway needs for you to Save Settings and Restart so that all settings will be backed up.

Backup Configurations	
Configuration File	<input type="button" value="Backup"/>
Configuration Template File	<input type="button" value="Backup"/>

- **Configuration File:** Backup all settings.
- **Configuration Template File:** Backup the settings as a template file for editing.

Restore Configurations	
<input checked="" type="radio"/> Upload Configuration File	<input type="text"/> <input type="button" value="Browse..."/>
<input type="radio"/> Restore Default Configurations	
<input type="button" value="Restore"/>	

- **Upload Configuration File:** Upload the configuration file from somewhere to the device.
- **Restore Default Configurations:** Reset the device back to the factory default settings.

3-34 System Log

It will send all logs to the server. Please contact with your provider.

Enable	<input type="checkbox"/>
Server Address	<input type="text"/>
Port [1 - 65535]	<input type="text" value="514"/>

3-35 Provision Settings

Options in this section are only required for VoIP networks in which a provisioning system has been implemented. Fill in the parameters needed by the Provision Server from your service provider.

Enable Auto Provisioning	<input type="checkbox"/>
Provision Server Address	<input type="text"/>
Port [1 - 65535]	<input type="text" value="10101"/>
Packet Format	Proprietary <input type="button" value="v"/> <input checked="" type="checkbox"/> Verify Servers Certificate
Connect Provision Server During Start Up	<input checked="" type="checkbox"/>
Connect Provision Server Periodically	<input checked="" type="checkbox"/>
Auto Provision Interval [60 - 604800 s]	<input type="text" value="10800"/>
Random Offset [0 - 1800 s]	<input type="text" value="600"/>
Provision Retry Times [0=always, 1 - 99] [0 - 99]	<input type="text" value="10"/>
Retry Interval [30 - 120 s]	<input type="text" value="30"/>
Suspend Call Service	<input type="checkbox"/>
<hr/>	
Binding Server for Trigger	<input type="checkbox"/>
Binding Port [1 - 65535]	<input type="text" value="10104"/>
Binding Interval [1 - 65535 s]	<input type="text" value="10"/>

 **NOTE:** The availability of the above features also depends on your VoIP network. Please check with your service provider about the availability of these services.

3-36 System Operations (Save Settings)

Some settings are effective only after **Restart**. Remember to save all settings using **Save Settings** before you restart.

<input type="checkbox"/> Save Settings	Save all configurations.
Be sure to save all settings before restart.	
<input type="checkbox"/> Restart	Restart the Gateway right away. All calls will be DROPPED when Restart.

- **Save Settings:** Save settings after completing changes. The new settings will take effect after the system is restarted. Please select "Save Settings".
- **Restart:** If it is necessary to restart the system, please select "Restart" and click the "Accept" button.

3-37 Software Upgrade

The gateway provides a software upgrade function from a remote source. Please consult your service provider for information about the following details.

Software Upgrade

To Save Current Settings, [Save Settings](#)

Current Software Version No. [1.02.36.7]

Upgrade Server	<input checked="" type="radio"/> TFTP <input type="radio"/> FTP <input type="radio"/> HTTP
Server IP Address	<input style="width: 100%;" type="text"/>
Server Port [1 - 65535]	<input style="width: 50%;" type="text" value="69"/>
User Name	<input style="width: 80%;" type="text"/>
Password	<input style="width: 80%;" type="password"/>
Directory	<input style="width: 100%;" type="text"/>

All calls will be DROPPED during upgrade.

- **Upgrade Server:** Choose the server type given by your provider.
- **Software Upgrade Server IP:** Enter the software server IP address.
- **Software Upgrade Server Port:** Enter the port that the server uses. TFTP is 69, and FTP is 21.
- **User Name/ Password:** The account information to access an FTP server.
- **Directory:** The directory path of the upgrade files for TFTP or FTP.

3-38 Logout

The gateway only allows one user at a time to log-in, so whenever a change is made, please save the settings and restart the system, or logout to avoid a situation where other users cannot log-in to change settings.

4. Configuring the Gateway through IVR

VoIP transmits voice data (packets) via the Internet. One effect of this is that telecommunications quality is closely related to the condition and status of the network environment. If any of the parties involved in VoIP communications has insufficient bandwidth or frequent packet loss, the telecommunication quality will be poor. Therefore, excellent telecommunication can only happen when the gateway is connected to the Internet and when the network environment is stable.

Preparation

- Install the gateway according to instructions. Connect the power supply, telephone set, telephone cable, and network cable properly as described in Chapter 2.
- If a static IP is used, confirm the correct IP settings of the WAN Port (IP address, Subnet Mask, and Default gateway). Please contact your local Internet Service Provider (ISP) if you have any questions.
- If you are using ADSL (PPPoE) for your network connection, confirm the account number and password.
- If you intend to operate the gateway under a NAT, the Gateway WAN Port IP Address and LAN Port should not use the same range in order to avoid phone failures.

Basic Setup

The gateway provides two setup modes:

1. Telephone IVR Configuration Mode
2. Browser Configuration Mode

IVR configuration provides basic query and setup functions, while browser configuration provides full setup functions.

4-1 IVR (Interactive Voice Response)

The gateway provides convenient IVR functions. Users only need to pick up a handset and enter the function code for query and setup without using a PC.



NOTE: After finishing the setup, make sure the new settings are saved. This will enable the new settings to take effect after the system is restarted.

Instructions

- **FXS Port:** Connected to telephones. To access IVR mode, you should enter “* * password #”. Character to number conversion information is provided in the PPPoE Character Conversion Table. After entering the correct IVR password, you will hear an indication tone after which the system is in IVR setup mode. Enter function codes to check or set the gateway configuration. (Please refer to page 43 for function codes).

Example: If your password is “1234”, enter “***1234#” so that you are now in IVR setup mode. Next enter a function code to check or configure the gateway. If your password is “admin”, enter “****4144534954#”. Please refer to the IVR Functions Table (page 43) for available functions and codes.

- Once the first setting or query has been completed, you will hear a dial tone. Use the same procedure to make a second query or setting. To exit IVR mode, simply hang up the phone.

Example: enter “***#” (you are now in IVR mode) → enter 101 (to query about the current IP address) → the system responds with an IP address → you can continue with more settings or queries: enter 111 (to set a new IP address) → enter 192*168*1*2 (new IP address).

Save Settings

After completing all of your settings, dial 509 (Save Settings). Wait for about three seconds, you should hear a confirmation tone "1." You can now hang up the phone. Please reboot the gateway to enable the new settings.

To inquire about the current gateway WAN Port IP address setting

After completing all your settings, dial 101. The system will repeat the current WAN Port IP address. If the system does not repeat the IP address, this indicates that the gateway is not currently connected to the Internet. Please check to be certain that the cable connection, account number, and password are all correct.

IVR Functions Table:

Function Code	Description	Example / Notes
111/101	WAN Port IP address Set/Query	First, use function code 114 to select 1 for a Static IP connection then setup the IP address.
112/102	WAN Port Subnet Mask Set/Query	
113/103	WAN Port Default Gateway Set/Query	
114/104	Current Network IP Access Set/Query (1: Static IP, 2: DHCP, 3: PPPoE)	
115/105	DNS IP address Set/Query	
116/106	Phone Book manager IP address Set/Query	
117/107	Set/Query whether or not to use a Public Telephone Book (0: Disable 1: Enable)	
199/099	Set/Query whether or not this gateway acts as the Phone Book manager (0: Disable 1: Enable)	
066	Querying the connection to Phone Book manager	
118	Restart	
121	Setup PPPoE Account	Use function code 114 to select 3 for a PPPoE connection.
122	Set PPPoE Password	
123	Set NAT IP address	
124	Uses NAT (0: Disable 1: Enable)	
311/301	LAN Port IP Set/Query	
312/302	LAN Port Subnet Mask Set/Query	
109	Restore factory default IP address configuration	A static IP address for WAN Port IP : 192.168.1.2 Mask : 255.255.255.0 Gateway : 192.168.1.254
409	Restore factory default settings	
509	Save settings	
900	Set the IVR and the language used on the Web GUI (1: English, 2: Traditional Chinese, 3: Simplified Chinese)	
209	Software Upgrade	

4-2 IP Configuration Settings—Set the IP Configuration of the WAN Port

Static IP Settings

NOTE: Complete static IP settings should include a static IP (option 1 under 114), IP address (111), Subnet Mask (112), and Default Gateway (113). Please contact your Internet Service Provider (ISP) if you have any questions.

Function	Command
Select a Static IP	<ul style="list-style-type: none"> After entering IVR mode, dial 114. After hearing "Enter value", dial 1 (to select static IP)
IP address Settings	<ul style="list-style-type: none"> After entering IVR mode, dial 111. After hearing "Enter value", enter your IP address followed by "#". <p>Example: If the IP address is 192.168.1.200, dial 192*168*1*200#.</p>
Subnet Mask Settings	<ul style="list-style-type: none"> After entering IVR mode, dial 112. After hearing "Enter value", enter your subnet mask followed by "#". <p>Example: If the subnet mask value is 255.255.255.0, dial 255*255*255*0#.</p>
Default Gateway Settings	<ul style="list-style-type: none"> After entering IVR mode, dial 113. After hearing "Enter value", enter your default gateway's IP address followed by "#". <p>Example: If the default gateway is 192.168.1.254, dial 192*168*1*254#.</p>
Save Settings and Restart	<ul style="list-style-type: none"> To save settings, dial <u>509</u> (Save Settings). The system will save the current settings. Please restart the system. Wait for about 40 seconds for the system to restart, and then enter <u>101</u> to check whether or not the IP address was retained. If the IP address is not repeated, this indicates that the gateway is not properly connected. Please check to be certain that the cable connection, account, and password are all correct.

Dynamic IP (DHCP) Settings

After entering IVR mode, dial 114.

After hearing "Enter value", dial 2 (to select DHCP).

Saving settings –press 509 (Save Settings). Please restart the system. After the system is restarted, press 101 to check whether or not the IP address was retained.

NOTE: If the system does not repeat the IP address, this indicates that the gateway failed to communicate with a DHCP server. Please check your DHCP server or ISP.

ADSL PPPoE Settings

NOTE: Complete PPPoE settings should include: Select PPPoE (option 3 of 114), PPPoE account (121) and PPPoE password (122).

Please contact your local Internet Service Provider (ISP) if you have any questions.

Select a PPPoE

- After entering IVR mode, dial 114.
- After hearing "Enter value," dial 3 (to select PPPoE).

PPPoE Account Settings

- After entering IVR mode, dial 121.
- After hearing "Enter value", enter the account number followed by "#".
Example: If the account is "84943122@hinet.net," please enter 080409040301020271484954456072544560#.



NOTE: it is necessary to enter two digits for each character/number; for example, you must enter "01" for "1" and "11" for "A". It is recommended that you use the web Interface to configure your PPPoE account details. Refer to the PPPoE Character Conversion Table on the next page for key mappings if you choose to use IVR setup.

PPPoE Password Setting

- After entering IVR mode, dial 122.
- After hearing "Enter value," enter the new password followed by "#".

Example: If the password is "3ttixike", please enter "03 60 60 49 64 49 51 45#".

Save Settings and Restart

To save settings, dial 509 (Save Settings). The system will save the settings. Please restart the system. Wait for about 40 seconds for the system to restart, then enter 101 to check whether or not the IP address was retained. If the IP address is not repeated, this indicates that the gateway is not properly connected. Please check to be certain that the cable connection, account, and password are all correct.

PPPoE Character Conversion Table:

The table below provides a list of PPPoE conversion codes. The first column in each pair of columns lists the number, letter or symbol that you want to enter. The second column in each pair ("Input Key") tells you what code to enter for the corresponding number, letter or symbol. For example, to enter "D-Link" using the codes below, enter: 148322495451

Numbers	Input Key	Upper Case Letters	Input Key	Lower Case Letters	Input Key	Symbols	Input Key
0	00	A	11	a	41	@	71
1	01	B	12	b	42	•	72
2	02	C	13	c	43	!	73
3	03	D	14	d	44	"	74
4	04	E	15	e	45	\$	75
5	05	F	16	f	46	%	76
6	06	G	17	g	47	&	77
7	07	H	18	h	48	'	78
8	08	I	19	i	49	(	79
9	09	J	20	j	50	)	80
		K	21	k	51	+	81
		L	22	l	52	,	82
		M	23	m	53	-	83
		N	24	n	54	/	84
		O	25	o	55	:	85
		P	26	p	56	;	86
		Q	27	q	57	<	87
		R	28	r	58	=	88
		S	29	s	59	>	89
		T	30	t	60	?	90
		U	31	u	61	[	91
		V	32	v	62	\	92
		W	33	w	63	]	93
		X	34	x	64	^	94
		Y	35	y	65	_	95
		Z	36	z	66	{	96
						|	97
						}	98

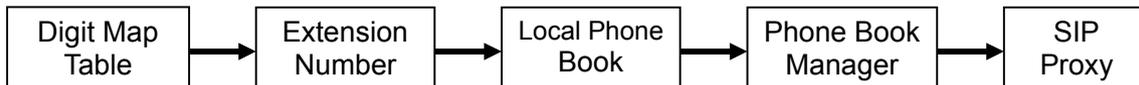
5. Dialing Principles

5-1 Dialing Options

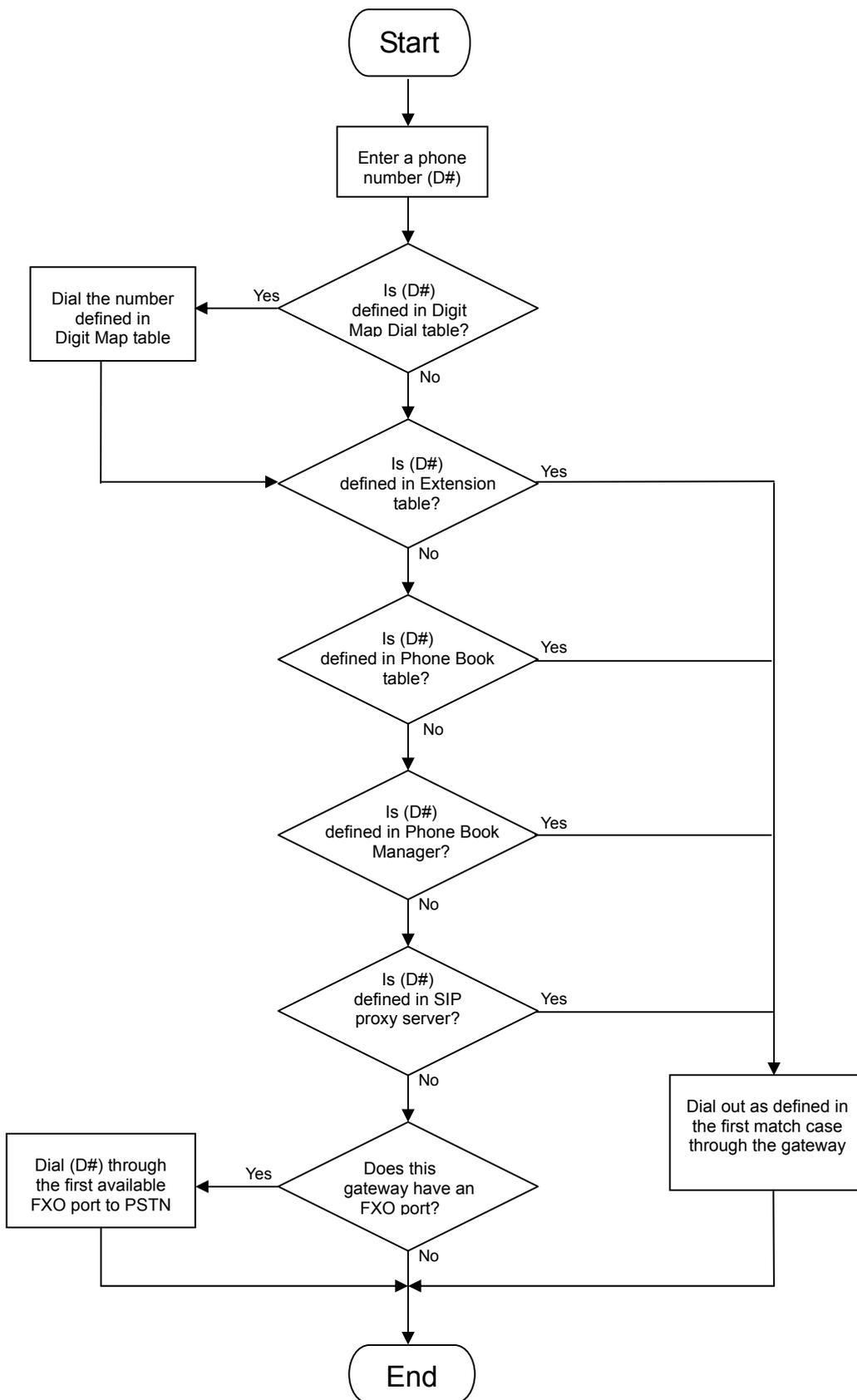
1. Dial the phone number which you want to call and press # to call out immediately, or wait until the "Inter Digits Timeout" expires (defined in "Advanced Options", default=4 seconds, see page 23).
2. If the phone number fits the setting of the Digit Map, the gateway dials out the phone number through the assigned interface automatically.
3. The phone number should have at least 2 digits (not including * and #).

5-2 Dialed Number Processing Flow

To maintain maximum flexibility, the number dialed will be looked up in several tables defined by the gateway. If no match is found, it will look up the number from the registered SIP Proxy Server. The number look up flow is shown below:



A complete flow chart is shown on the next page.



Appendix

Product Features List

WAN

- One 10/100Mbps auto-negotiation, auto-MDI/MDIX RJ-45 Ethernet port
- Support static IP, PPPoE, BigPond Cable and DHCP address assignment and dynamic DNS (DDNS)
- QoS: IP TOS (Type of Services) and DiffServ (Differentiated Services) for both SIP signaling and RTP
- NAT Traversal : Port Forwarding, STUN, UPnP and Outbound Proxy
- NTP: (Network Time Protocol RFC 1305), Accepts up to 3 Time Server
- Time Zone Support
- MAC Address Clone
- RTP Packet Summary : packet sent, packet received, packet loss for voice quality analysis

LAN

- Four 10/100Mbps auto-negotiation, auto-MDI/MDIX RJ 45 Ethernet ports
- DHCP server

Advance Firewall and DoS Protection

- NAT (Network Address Translation) and PAT (Port Address Translation)
- DMZ, Virtual Server
- Traffic Filtering based on MAC address, IP address, TCP/UDP Port number and URL string pattern
- Prevents attacks based on TCP, UDP, IP and ICMP protocols
- Prevents attacks such as SYN Flood, IP Spoofing, Ping of Death, Tear Drop, etc.

Voice Features

- 4/8 FXS (Foreign eXchange Station) ports
- SIP (RFC3261) compatible
- Voice codecs : G.711 a/ulaw, G.726, G.729A, G.723.1
- CNG (Comfort Noise Generation)
- VAD (Voice Activity Detection)
- G.165/G.168 echo cancellation
- Adjustable Jitter Buffer and programmable Gain Control
- In-Band DTMF, Out-Of-Band DTMF relay (RFC2833, SIP INFO)
- Multiple SIP Proxy server entries with failover mechanism
- Polarity reversal generation (FXS)
- T.30 (G.111) / Real time T.38 / Secured T.38 FAX relay
- DTMF, FSK (Bellcore and ETSI) Caller ID detection and generation.
- Support for Caller ID Restriction (CLIR)
- Digit Map for dial plan
- Local phone book for peer-to-peer calling
- E.164 Numbering and ENUM support
- Hot-Line, Warm-Line support
- Single Number / Account (representative number) for multiple ports

- Call features:
 - Call Hold, Call Waiting, Call Pickup
 - Call Forward - Unconditional, Busy, No Answer
 - Call Transfer - Unattended, Attended
 - Three Way Calling (Media Server required)
- Analogue interface
 - Connector : RJ-11
 - Signaling protocol : Loop Start

Configuration and Maintenance

- Configuration methods:
 - Web
 - IVR
 - Telnet
- Status reports:
 - Port status
 - Registration status
 - Ping tests
 - STUN/UPnP status
 - Hardware / software information
- Firmware Upgrade through TFTP, FTP and HTTP server
- Configuration Backup/Restore
- Reset button (with restore factory default function)
- Front Panel LED: voice ports, WAN, LAN1~4, Run, Power, Alarm
- Optional Auto Provisioning Server (APS) for mass deployment