D-Link®

# DVG-N5402FF
# VoIP Wireless Router

# User's Manual

Version 1.0

(July 2011)

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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 Funkstoerungen 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 case, 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-N5402FF is designed to carry both voice and facsimile over the IP network and wirelessly share Internet access. 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 VoIP Router can be configured to establish a private VoIP network over the Internet without a third-party SIP Proxy Server.

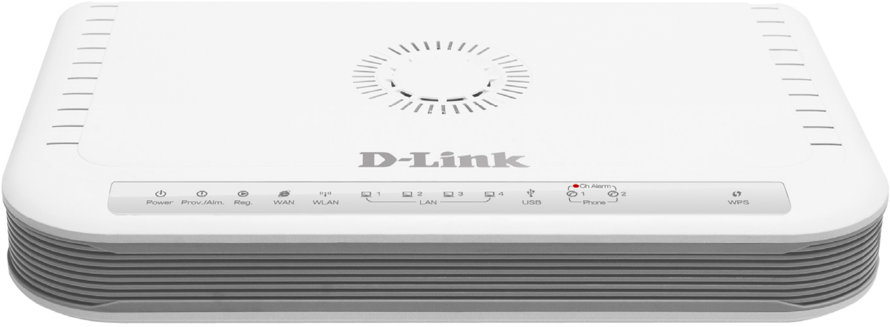
The DVG-N5402FF can be seamlessly integrated into an existing network by connecting to a phone set and fax machine. With only a broadband connection such as an ADSL bridge/router, a Cable Modem or a leased-line router, the VoIP Router allows you to use voice and fax services over IP in order to reduce the cost of all long distance calls.

The DVG-N5402FF is also an 802.11b/g/n wireless access point. Allow wireless clients to connect to it and share your broadband Internet connection. A built-in 4-port switch makes it possible to connect up to 4 Ethernet-enabled computers or devices to also share your Internet connection.

The DVG-N5402FF can be configured a fixed IP address or it can have one dynamically assigned by DHCP or PPPoE. It adopts either the G.711, G.726, G.729A, G.723.1 or iLBC voice compression format to save network bandwidth while providing real-time, toll quality voice transmission and reception.

# 1-2 Hardware Description

## Front Panel



**Power:** Power LED. A steady light indicates a proper connection to a power source.

**Prov./Alm.:** A blinking light indicates the DVG-N5402FF can not register with SIP Server or can not get the IP address. A blinking light also indicates the DVG-N5402FF is attempting to connect with the Provisioning server. Once the service connects, the LED will turn off. The LED will light solid red if the self-test or boot-up fails.

**Reg.:** The Register LED will turn on and continuously working when DVG-N5402FF is connected to a VoIP service provider. The LED will flash if not connected to a service provider.

**WAN:** When a connection is established the LED will light up solid. The LED will blink to indicate activity. If the LED does not light up when a cable is connected, verify the cable connections and make sure your devices are powered on.

**WLAN:** A steady light indicates a wireless connection. A blinking light indicates that the VoIP Router is receiving/transmitting from/to the wireless network.

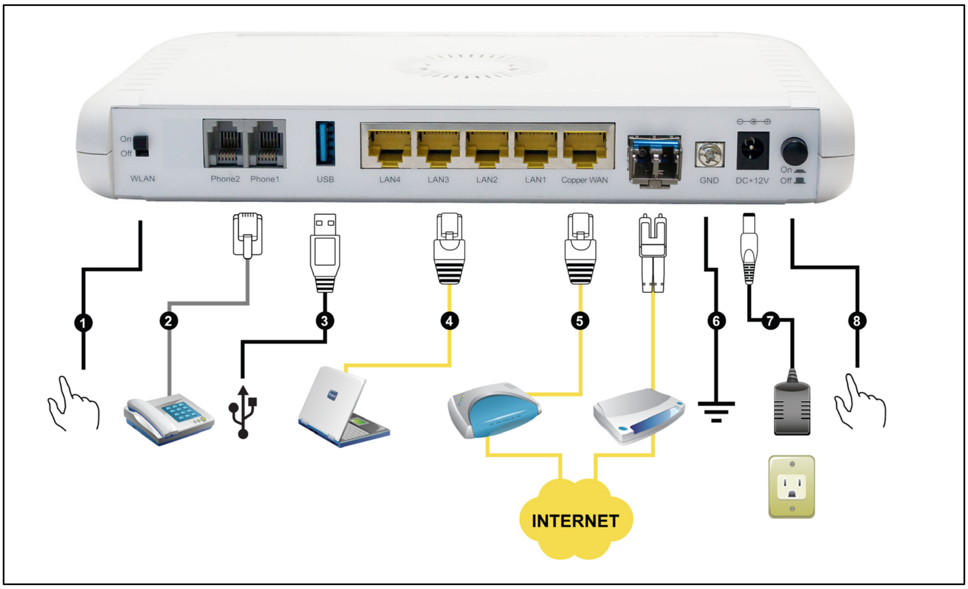
**LAN:** When a connection is established the LED (bottom) will light up solid on the appropriate port. The LEDs will blink to indicate activity. If the LED does not light up when a cable is connected, verify the cable connections and make sure your devices are powered on.

**USB:** This indicates that DVG-N5402FF detects a supported 3G modem dungle or a USB device.(This function Is optional)

**Phone:** This LED displays the VoIP status and Hook/Ringing activity on the phone port that is used to connect your normal telephone(s). If a phone connected to a phone port is off the hook or in use, this LED will light solid. When a phone is ringing, the indicator will blink.

**WPS:** Flashing in blue as DVG-N5402FF processing WPS-PBC wireless connecting progress.

## Rear Panel



1. **WiFi Switch:** trn on/off wireless LAN.

2. **Phone Port (1-2):** Connect to your phones using standard phone cabling (RJ-11).

3. **USB:** Connect to a 3G USB dungle or a printer. (This function Is optional)

4. **LAN:** Connect to your Ethernet enabled computers using Ethernet cabling.

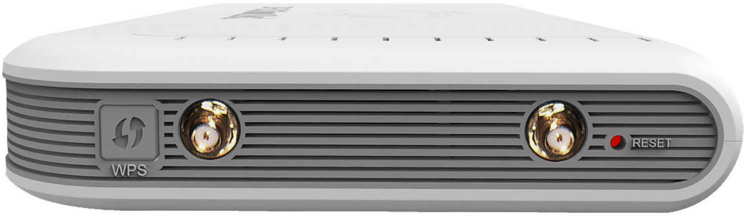
5. **WAN:** Connect to your broadband modem using an Ethernet cable.

6. **Ground:** A conducting connection with the earth. Connect with the ground so as to make the earth a part of an electrical circuit using metal wire.

7. **Power Receptor:** Receptor for the provided power adapter.

8. **Power Switch:** Press down to turn-on DVG-N5402FF.

**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). (3) Stacking is forbidden. Doing so may damage your VoIP Router.**



**WPS:** WPS button for wireless WPS-PBC setup method.

**Antenna:** Connect to a wireless network.

**Reset button:** Use to restore factory default settings.

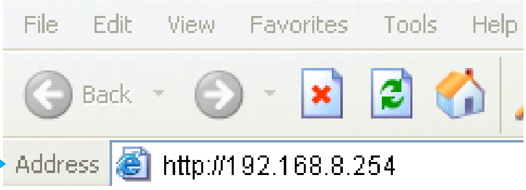
**Use Reset Button to restore factory default settings:**

1. **Press and hold the reset button for 5 seconds.**
2. **As Alarm indicator is blinking, please release the reset button. Factory settings will be restored.**

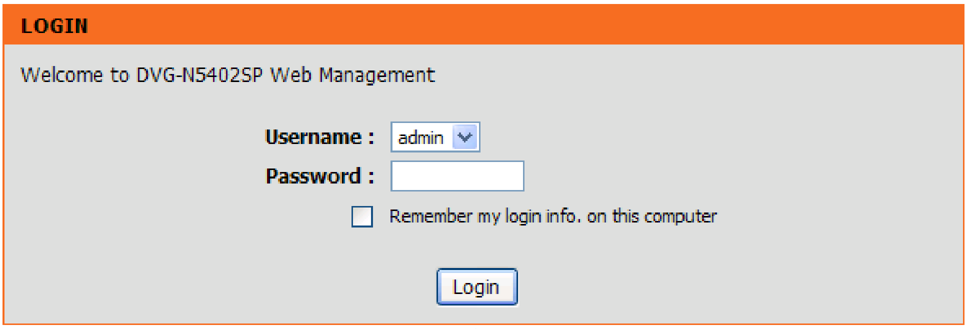
# 2. Getting Started

To access the web-based configuration utility, open a web browser such as Internet Explorer and enter the IP address of the DVG-N5402FF from WAN port.

Open your Web browser and type **http://192.168.8.254** into the URL address box. Press the Enter or Return Key.



http://192.168.8.254



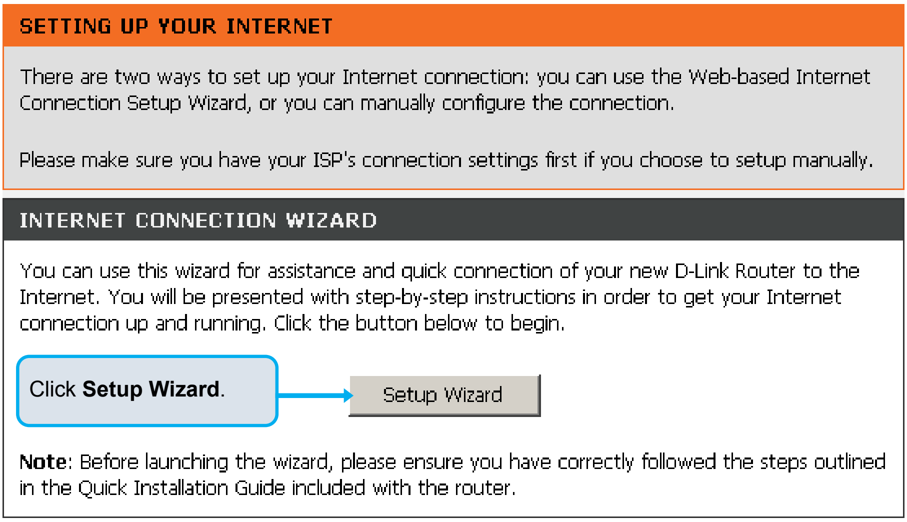
Welcome to DVG-N5402SP Web Management

Username : admin

Password :

□ Remember my login info. on this computer

Click **Login** to enter Web Site.



**SETTING UP YOUR INTERNET**

There are two ways to set up your Internet connection: you can use the Web-based Internet Connection Setup Wizard, or you can manually configure the connection.

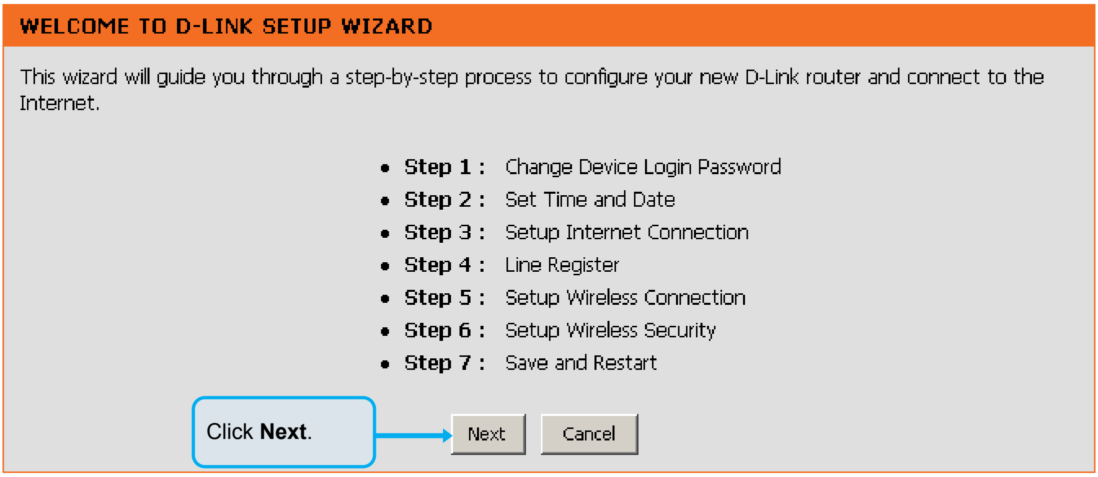
Please make sure you have your ISP's connection settings first if you choose to setup manually.

**INTERNET CONNECTION WIZARD**

You can use this wizard for assistance and quick connection of your new D-Link Router to the Internet. You will be presented with step-by-step instructions in order to get your Internet connection up and running. Click the button below to begin.

Click **Setup Wizard**.

**Note**: Before launching the wizard, please ensure you have correctly followed the steps outlined in the Quick Installation Guide included with the router.

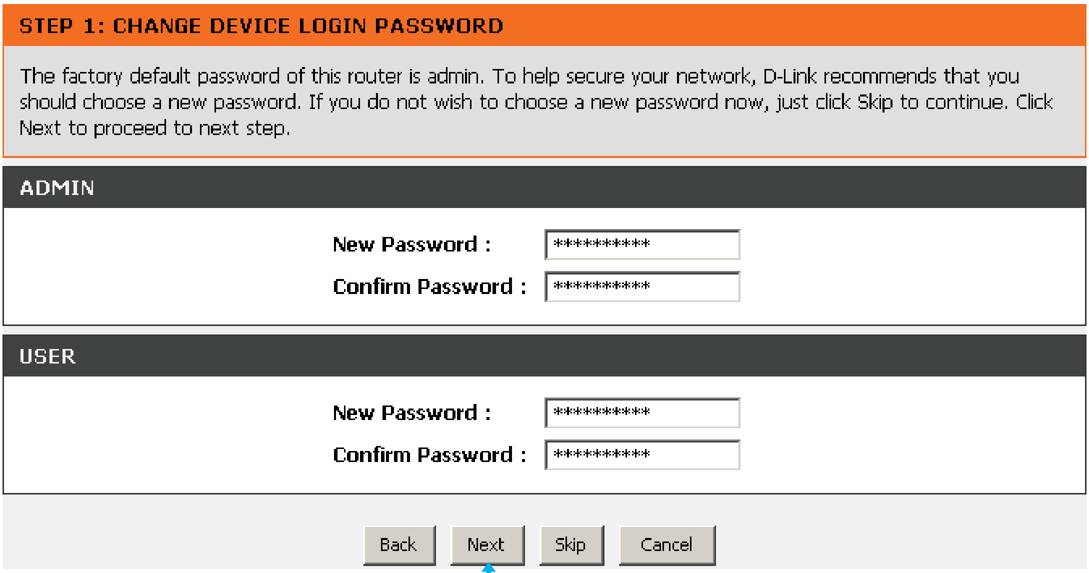


**WELCOME TO D-LINK SETUP WIZARD**

This wizard will guide you through a step-by-step process to configure your new D-Link router and connect to the Internet.

- **Step 1 :** Change Device Login Password
- **Step 2 :** Set Time and Date
- **Step 3 :** Setup Internet Connection
- **Step 4 :** Line Register
- **Step 5 :** Setup Wireless Connection
- **Step 6 :** Setup Wireless Security
- **Step 7 :** Save and Restart

Click **Next**.



STEP 1: CHANGE DEVICE LOGIN PASSWORD

The factory default password of this router is admin. To help secure your network, D-Link recommends that you should choose a new password. If you do not wish to choose a new password now, just click Skip to continue. Click Next to proceed to next step.

ADMIN

New Password : ***********

Confirm Password : ***********

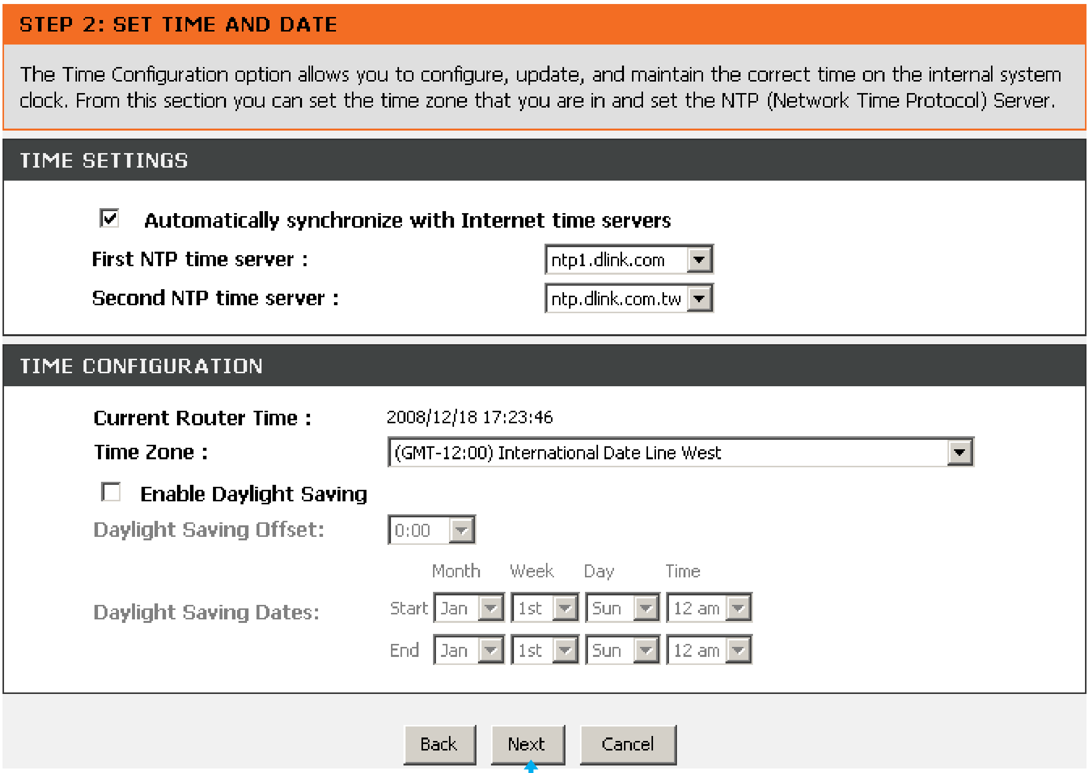
USER

New Password : ***********

Confirm Password : ***********

The username of **ADMIN** and **USER** have been defined and locked by default. It is highly recommended to create a login password to keep your VoIP Router secure.

Click **Next**.



STEP 2: SET TIME AND DATE

The Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in and set the NTP (Network Time Protocol) Server.

TIME SETTINGS

☑ Automatically synchronize with Internet time servers

First NTP time server : ntp1.dlink.com

Second NTP time server : ntp.dlink.com.tw

TIME CONFIGURATION

Current Router Time : 2008/12/18 17:23:46

Time Zone : (GMT-12:00) International Date Line West

☐ Enable Daylight Saving

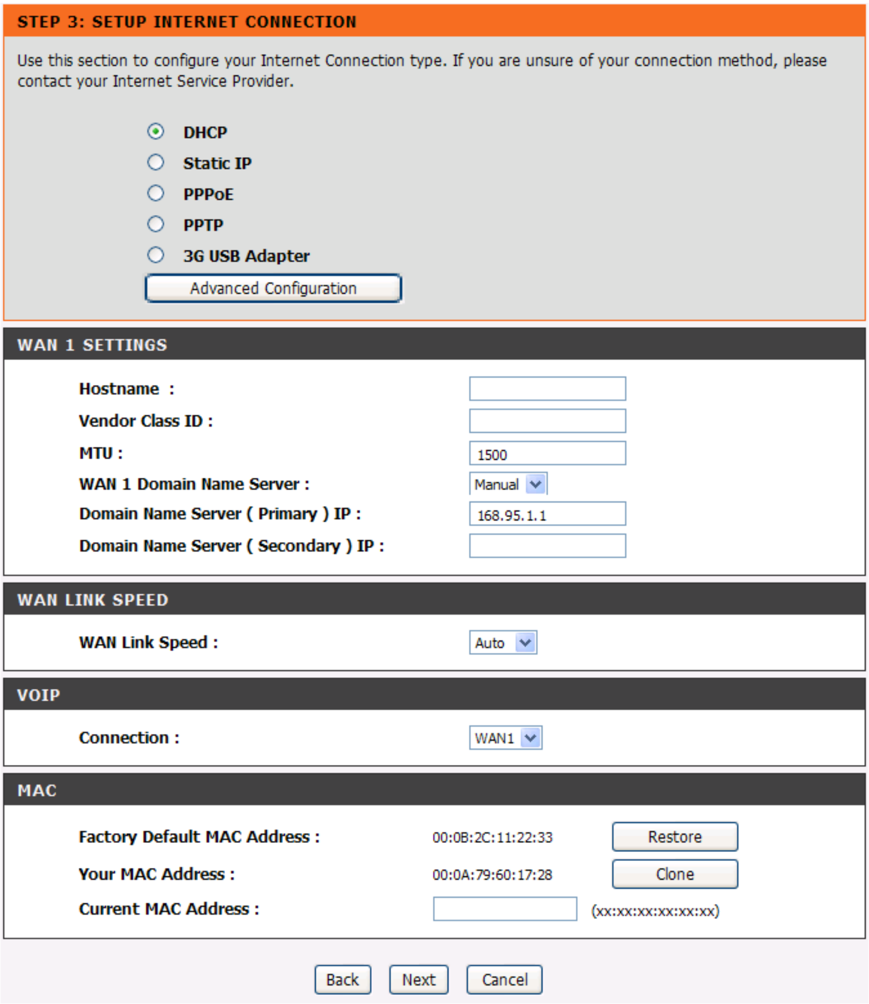
Daylight Saving Offset: 0:00

Daylight Saving Dates:

| | Month | Week | Day | Time |
|---|---|---|---|---|
| Start | Jan | 1st | Sun | 12 am |
| End | Jan | 1st | Sun | 12 am |

Enter a NTP server or use the default server. Select your time zone from the drop-down menu. Enable Daylight Saving for your local time if required.

Click **Next**.



**STEP 3: SETUP INTERNET CONNECTION**

Use this section to configure your Internet Connection type. If you are unsure of your connection method, please contact your Internet Service Provider.

- ● DHCP
- ○ Static IP
- ○ PPPoE
- ○ PPTP
- ○ 3G USB Adapter

**WAN 1 SETTINGS**

| | |
|---|---|
| Hostname : | |
| Vendor Class ID : | |
| MTU : | 1500 |
| WAN 1 Domain Name Server : | Manual |
| Domain Name Server ( Primary ) IP : | 168.95.1.1 |
| Domain Name Server ( Secondary ) IP : | |

**WAN LINK SPEED**

WAN Link Speed : Auto

**VOIP**

Connection : WAN1

**MAC**

| | | |
|---|---|---|
| Factory Default MAC Address : | 00:0B:2C:11:22:33 | Restore |
| Your MAC Address : | 00:0A:79:60:17:28 | Clone |
| Current MAC Address : | | (xx:xx:xx:xx:xx:xx) |

Select your Internet connection type:

**DHCP** – Most Cable ISPs or if you are connecting the DVG-N5402FF behind a router.

**Static IP** – Select if your ISP supplied you with your IP settings.

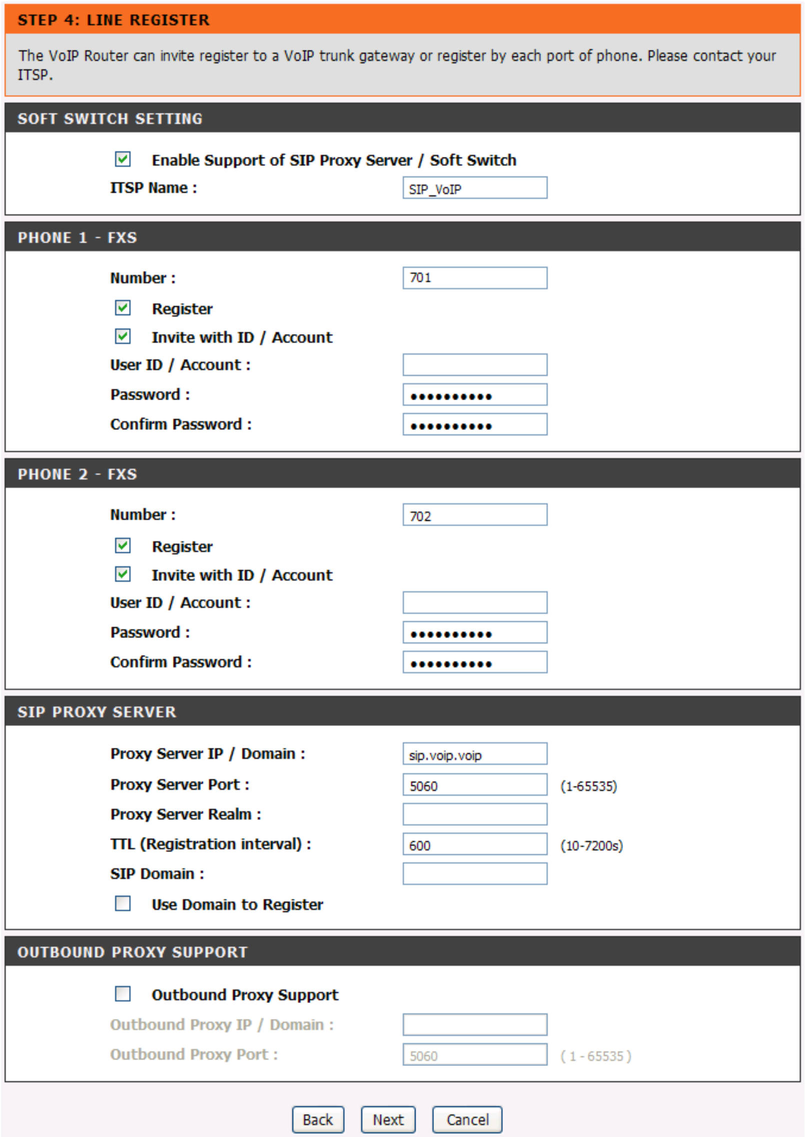
**PPPoE** – Most DSL ISPs.

**PPTP** – Select if required by your ISP.

**3G USB Adapter** – Select it for 3G WISP.

**WAN1 Domain Name Server** – Select **Manual** to manually enter IP address of DNS or select **Auto** if DNS is assigned by ISP.

Click **Next**.



**STEP 4: LINE REGISTER**

The VoIP Router can invite register to a VoIP trunk gateway or register by each port of phone. Please contact your ITSP.

**SOFT SWITCH SETTING**

☑ Enable Support of SIP Proxy Server / Soft Switch

| | | |
|---|---|---|
| ITSP Name : | SIP_VoIP | |

**PHONE 1 - FXS**

| | | |
|---|---|---|
| Number : | 701 | |
| ☑ Register | | |
| ☑ Invite with ID / Account | | |
| User ID / Account : | | |
| Password : | •••••••••• | |
| Confirm Password : | •••••••••• | |

**PHONE 2 - FXS**

| | | |
|---|---|---|
| Number : | 702 | |
| ☑ Register | | |
| ☑ Invite with ID / Account | | |
| User ID / Account : | | |
| Password : | •••••••••• | |
| Confirm Password : | •••••••••• | |

**SIP PROXY SERVER**

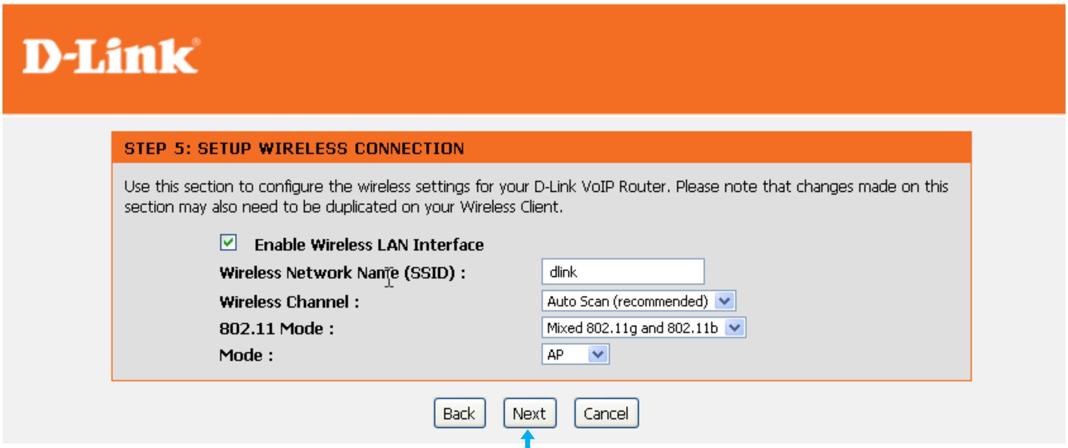
| | | |
|---|---|---|
| Proxy Server IP / Domain : | sip.voip.voip | |
| Proxy Server Port : | 5060 | (1-65535) |
| Proxy Server Realm : | | |
| TTL (Registration interval) : | 600 | (10-7200s) |
| SIP Domain : | | |
| □ Use Domain to Register | | |

**OUTBOUND PROXY SUPPORT**

| | | |
|---|---|---|
| □ Outbound Proxy Support | | |
| Outbound Proxy IP / Domain : | | |
| Outbound Proxy Port : | 5060 | ( 1 - 65535 ) |

Register to the SIP Proxy Server by clicking **Enable support of SIP Proxy Server**. Enter **Proxy Server IP/Domain** and **Port**.
**Outbound Proxy Support** is optional. To register, please click on the **Outbound Proxy Support** box and enter **Outbound Proxy IP/Domain** and **Port** in it.
Registration by phone line: Enter **Number, User ID/Account** and **Password** supplied by your ITSP. Check on the **Register** box to register to Proxy Server.

Click **Next**.



STEP 5: SETUP WIRELESS CONNECTION

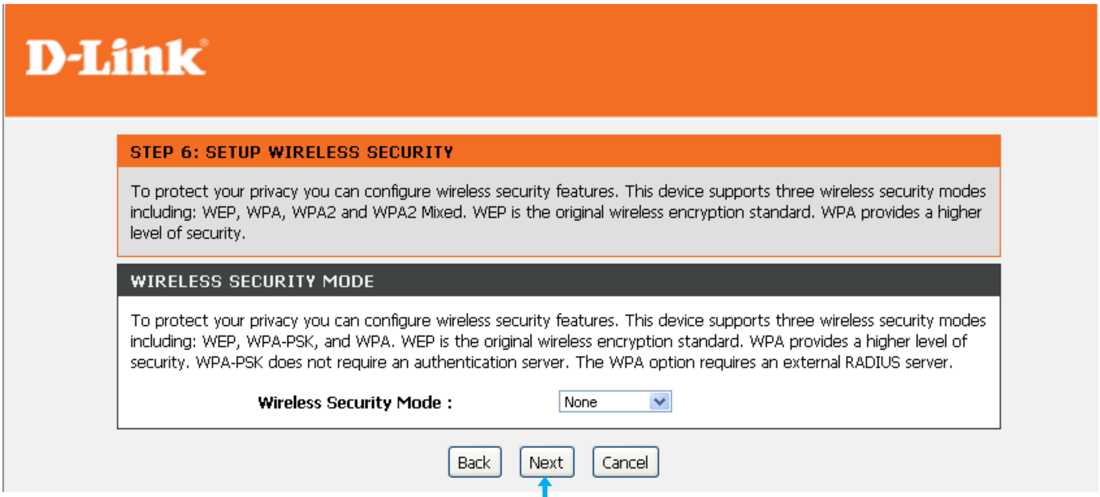
Use this section to configure the wireless settings for your D-Link VoIP Router. Please note that changes made on this section may also need to be duplicated on your Wireless Client.

☑ Enable Wireless LAN Interface

| | |
|---|---|
| Wireless Network Name (SSID) : | dlink |
| Wireless Channel : | Auto Scan (recommended) |
| 802.11 Mode : | Mixed 802.11g and 802.11b |
| Mode : | AP |

Click on the **Enable wireless LAN interface** check box to build a wireless network. Enter the SSID to name your wireless network. All devices must have the same SSID to communicate on the wireless network. Select a clear wireless channel. Select the 802.11 Mode of your network which can work in different speed of wireless connection.

Click **Next**.



STEP 6: SETUP WIRELESS SECURITY

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA, WPA2 and WPA2 Mixed. WEP is the original wireless encryption standard. WPA provides a higher level of security.

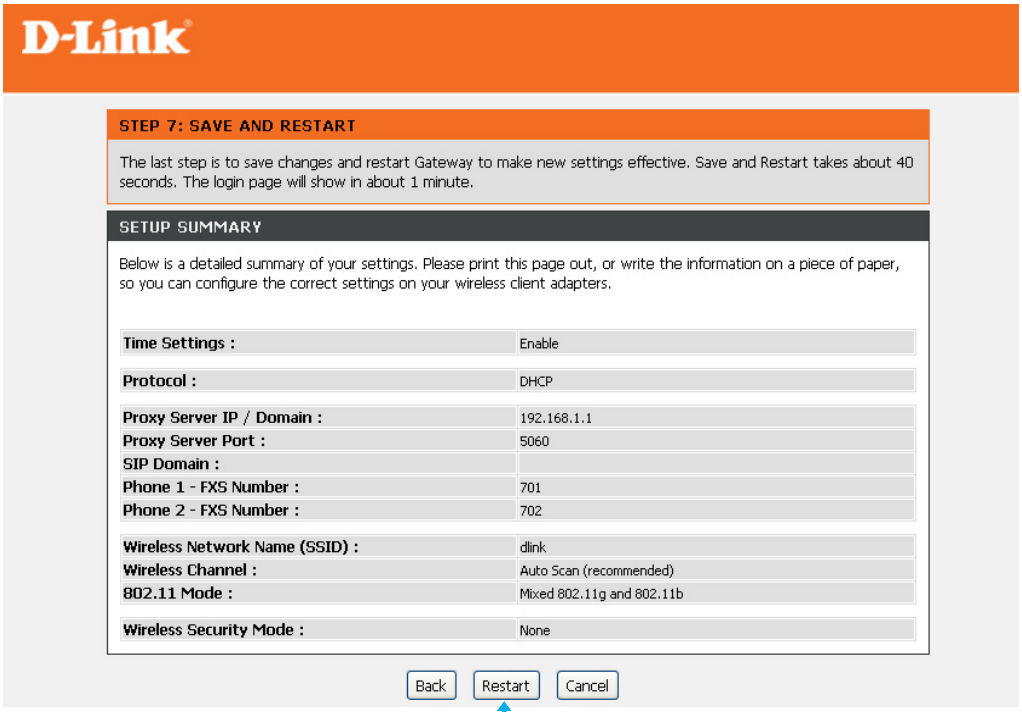
WIRELESS SECURITY MODE

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA-PSK, and WPA. WEP is the original wireless encryption standard. WPA provides a higher level of security. WPA-PSK does not require an authentication server. The WPA option requires an external RADIUS server.

Wireless Security Mode : None

Select **Security Mode** for your wireless network.

Click **Next**.



STEP 7: SAVE AND RESTART

The last step is to save changes and restart Gateway to make new settings effective. Save and Restart takes about 40 seconds. The login page will show in about 1 minute.

SETUP SUMMARY

Below is a detailed summary of your settings. Please print this page out, or write the information on a piece of paper, so you can configure the correct settings on your wireless client adapters.

| | |
|---|---|
| Time Settings : | Enable |
| Protocol : | DHCP |
| Proxy Server IP / Domain : | 192.168.1.1 |
| Proxy Server Port : | 5060 |
| SIP Domain : | |
| Phone 1 - FXS Number : | 701 |
| Phone 2 - FXS Number : | 702 |
| Wireless Network Name (SSID) : | dlink |
| Wireless Channel : | Auto Scan (recommended) |
| 802.11 Mode : | Mixed 802.11g and 802.11b |
| Wireless Security Mode : | None |

Setup is finished. Check the summary of your settings. To make new settings effective, you must click on the **Restart** button to reboot the DVG-N5402FF.

Click **Restart**.

# 3. VoIP Router Web Configuration

## 3-1 SETUP

### 3-1-1 Internet Setup

WAN (Wide Area Network) Settings are used to connect to your ISP (Internet Service Provider). The WAN settings are provided to you by your ISP and oftentimes referred to as "public settings". Please select the appropriate option for your specific ISP.

#### IP Configuration (Setting WAN Port)

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

1. DHCP, which means a Dynamic IP (Cable Modem)
2. Static IP
3. PPPoE (dial-up ADSL)
4. PPTP
5. 3G USB Adapter

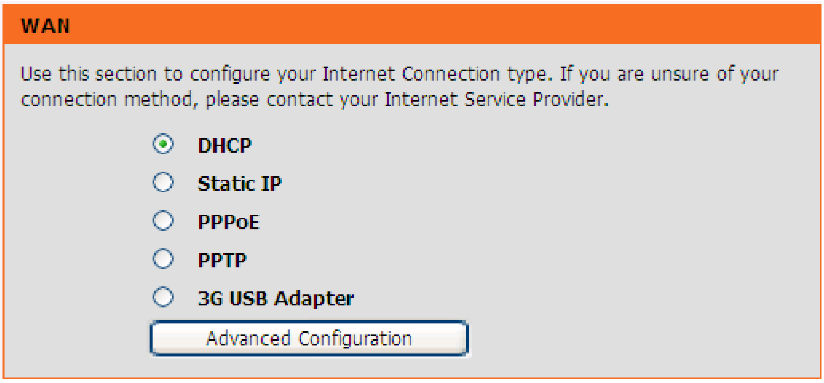
Methods for using DHCP and PPPoE for obtaining an IP address may vary. If you are not familiar with creating a network connection, please contact your local ISP.

After selecting the suitable option, click **Accept** at the bottom of the screen to save the settings.

You need to save the changes and restart the VoIP Router to make the changes active. Saving the settings: Click **MAINTENANCE** and select **Save/Restart** in **Backup and Restore** from the left menu. Tick **Save Settings** and **Restart**, and then click **Accept**. Wait for about 40 seconds before the VoIP Router obtaining an IP address by the method you selected.

**Note:** When the system has obtained a new IP address, and you are using a WAN port to enter the Web Configuration Screen, the new IP address has to be used before you can get connected to the VoIP Router. The same principle applies to the next two settings.

SETUP → Internet Setup

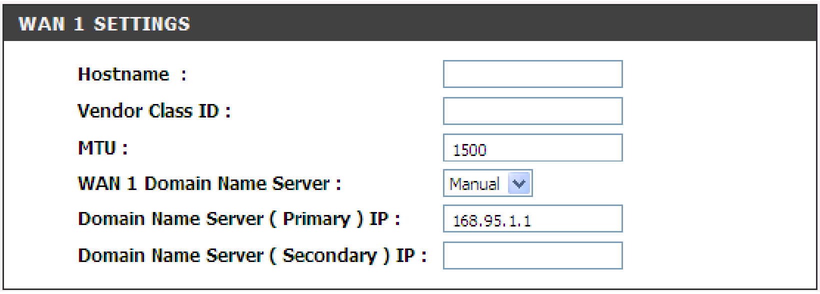


**WAN**

Use this section to configure your Internet Connection type. If you are unsure of your connection method, please contact your Internet Service Provider.

- ● DHCP
- ○ Static IP
- ○ PPPoE
- ○ PPTP
- ○ 3G USB Adapter

SETUP → Internet Setup

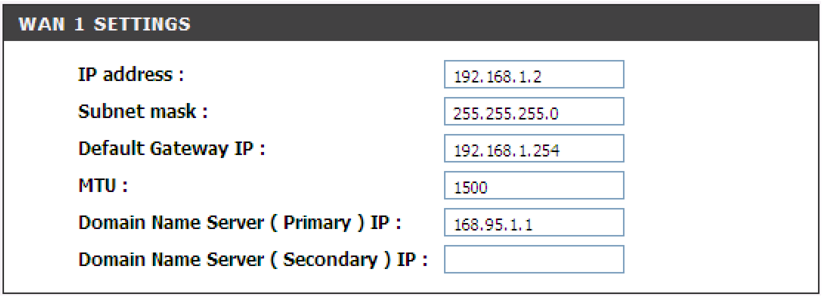


**WAN 1 SETTINGS**

| | |
|---|---|
| Hostname : | |
| Vendor Class ID : | |
| MTU : | 1500 |
| WAN 1 Domain Name Server : | Manual |
| Domain Name Server ( Primary ) IP : | 168.95.1.1 |
| Domain Name Server ( Secondary ) IP : | |

**DHCP:** Select this option if your ISP (Internet Service Provider) provides you an IP address automatically. Cable modem providers typically use dynamic assignment of IP Address. The Host Name field is optional but may be required by some Internet Service Providers.

SETUP → Internet Setup

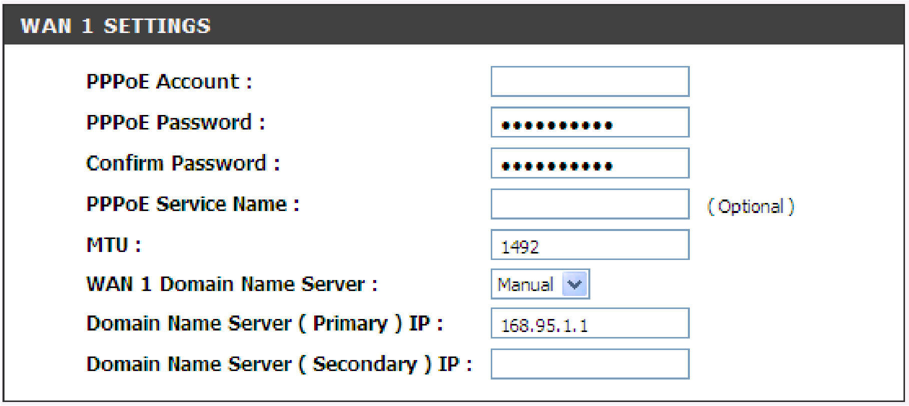


**WAN 1 SETTINGS**

| | |
|---|---|
| IP address : | 192.168.1.2 |
| Subnet mask : | 255.255.255.0 |
| Default Gateway IP : | 192.168.1.254 |
| MTU : | 1500 |
| Domain Name Server ( Primary ) IP : | 168.95.1.1 |
| Domain Name Server ( Secondary ) IP : | |

**Static IP:** Select this option if your ISP (Internet Service Provider) provides you a Static IP address. Enter the **IP address**, **Subnet Mask** and **Default Gateway IP**.

SETUP → Internet Setup

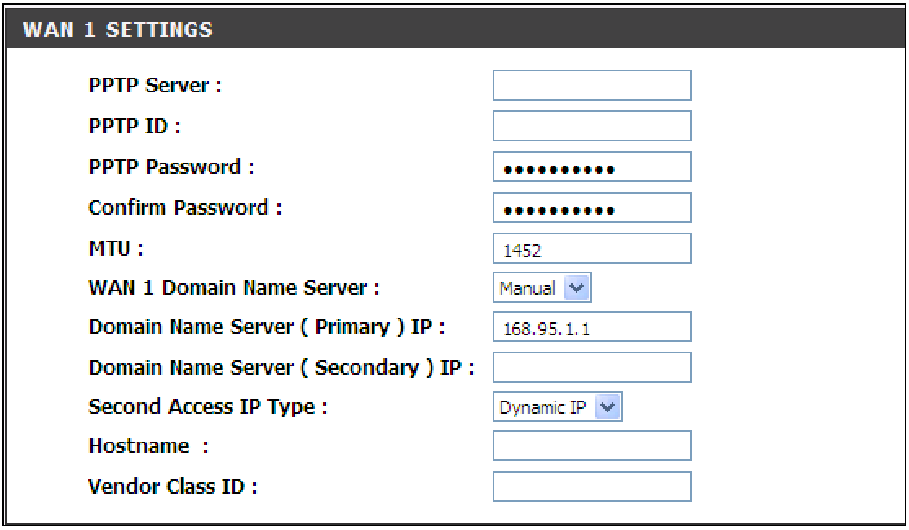


WAN 1 SETTINGS

| | | |
|---|---|---|
| PPPoE Account : | | |
| PPPoE Password : | •••••••••• | |
| Confirm Password : | •••••••••• | |
| PPPoE Service Name : | | ( Optional ) |
| MTU : | 1492 | |
| WAN 1 Domain Name Server : | Manual | |
| Domain Name Server ( Primary ) IP : | 168.95.1.1 | |
| Domain Name Server ( Secondary ) IP : | | |

**PPPoE:** Select this option if your ISP requires you to use a PPPoE (Point-to-Point Protocol over Ethernet) connection. Enter the **PPPoE Account**, **PPPoE Password** and re-enter Password to confirm.

SETUP → Internet Setup

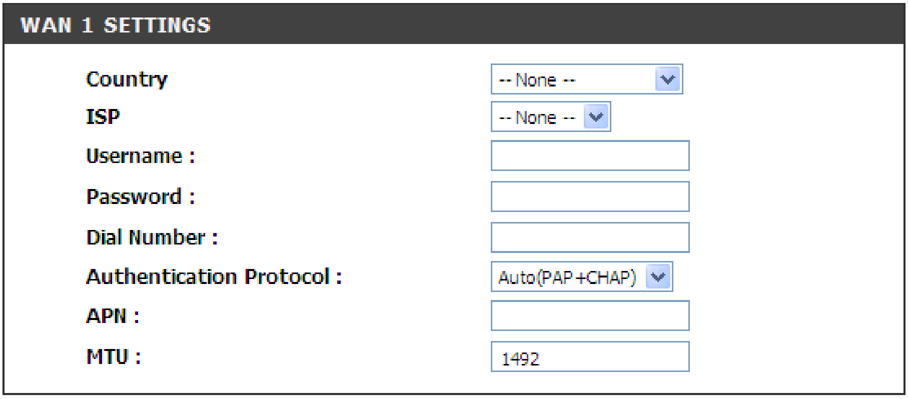


WAN 1 SETTINGS

| | |
|---|---|
| PPTP Server : | |
| PPTP ID : | |
| PPTP Password : | •••••••••• |
| Confirm Password : | •••••••••• |
| MTU : | 1452 |
| WAN 1 Domain Name Server : | Manual |
| Domain Name Server ( Primary ) IP : | 168.95.1.1 |
| Domain Name Server ( Secondary ) IP : | |
| Second Access IP Type : | Dynamic IP |
| Hostname : | |
| Vendor Class ID : | |

**PPTP:** Point-to-Point Tunneling Protocol (PPTP) is a WAN connection. Enter the **IP Address**, **Subnet mask**, **PPTP Server**, **PPTP ID** and **Password**.

SETUP → Internet Setup

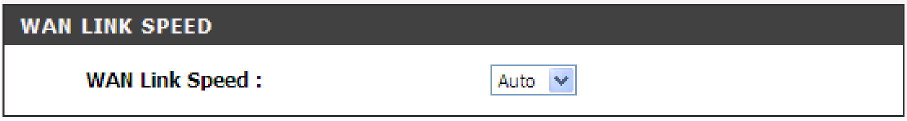


WAN 1 SETTINGS

| | |
|---|---|
| Country | -- None -- |
| ISP | -- None -- |
| Username : | |
| Password : | |
| Dial Number : | |
| Authentication Protocol : | Auto(PAP+CHAP) |
| APN : | |
| MTU : | 1492 |

**3G USB Adapter:** 3G/3.5G WISP. Enter Username, Password, Dial Number and APN to connect to Internet via 3G/3.5G WISP. Users could also select a configured WISP from the list and DVG-N5402FF will fill necessary parameter automatically.

SETUP → Internet Setup

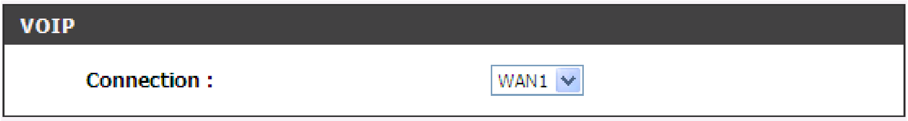


WAN LINK SPEED

WAN Link Speed : Auto

**WAN Link Speed:** Select WAN port link speed.

SETUP → Internet Setup

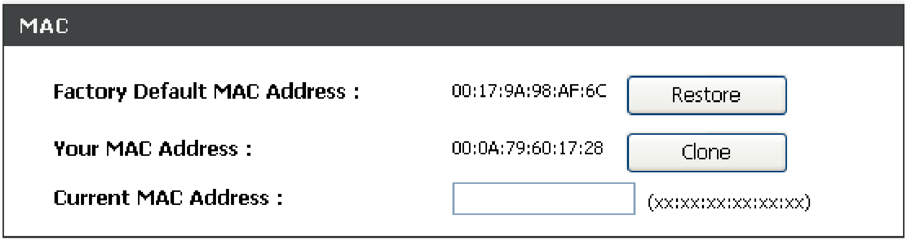


VOIP

Connection : WAN1

**VoIP Connection Interface:** Select a WAN interface for DVG-N5402FF VoIP traffic.

SETUP → Internet Setup



MAC

| | | |
|---|---|---|
| Factory Default MAC Address : | 00:17:9A:98:AF:6C | Restore |
| Your MAC Address : | 00:0A:79:60:17:28 | Clone |
| Current MAC Address : | | (xx:xx:xx:xx:xx:xx) |

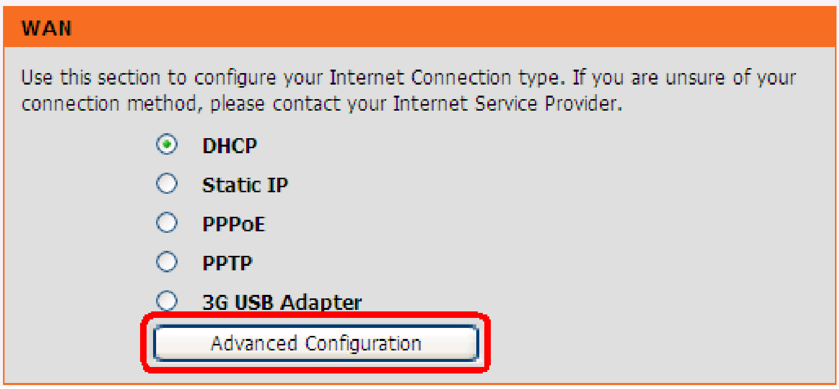
**Factory Default MAC Address:** The original MAC address of the VoIP Router.

**Your MAC Address:** It is left blank as you log-in via the WAN port.

**Current MAC Address:** It shows the current MAC Address if you ever used the different MAC address from Factory Default MAC Address. You can click **Clone** to automatically copy the MAC address of the Ethernet Card installed in the computer used to configure the device.

**Note:** This is only necessary to fill the field if required by your ISP.

SETUP → Internet Setup

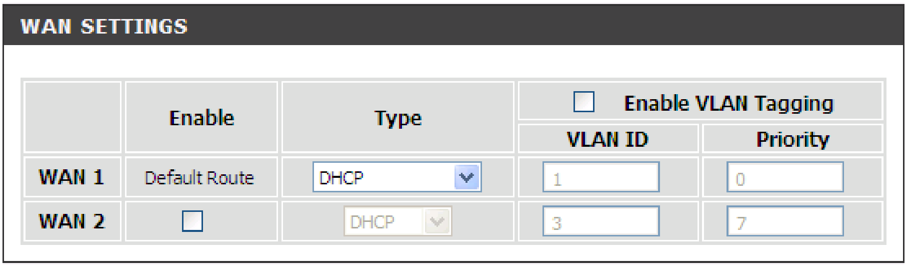


WAN

Use this section to configure your Internet Connection type. If you are unsure of your connection method, please contact your Internet Service Provider.

- ● DHCP
- ○ Static IP
- ○ PPPoE
- ○ PPTP
- ○ 3G USB Adapter

Click "Advanced Configuration" for 802.11q/p VLAN tag or dual WAN access configuration.



WAN SETTINGS

| | Enable | Type | ☐ Enable VLAN Tagging | |
|---|---|---|---|---|
| | | | VLAN ID | Priority |
| WAN 1 | Default Route | DHCP | 1 | 0 |
| WAN 2 | ☐ | DHCP | 3 | 7 |

VLAN is optional. It works with the Router or Switch that supports VLAN tag. By adding VLAN tag in packets may improve efficiency of voice traffic 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.

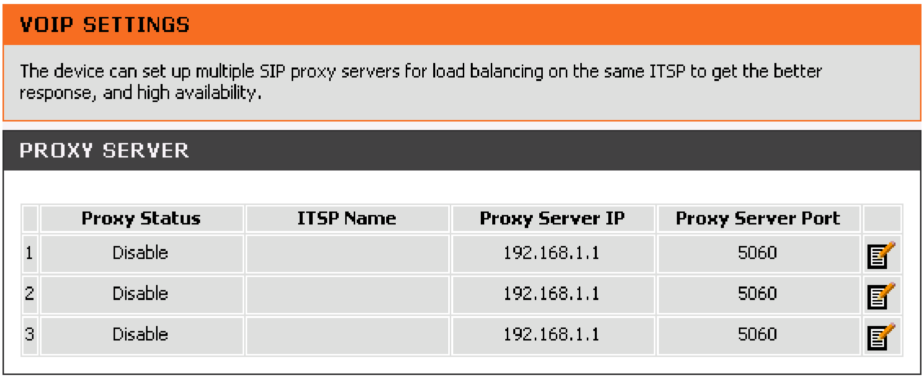
**Note: Please do not change anything here unless requested by your ISP.**

## 3-1-2 VoIP Setup

In this section, it supports registration to multiple Proxy Servers which is allowed to choose ITSP by user manually. If any registration problem occurs, please consult your VoIP Service Provider.

SETUP → VoIP Setup

Clink Edit icon to modify the settings.
The same configurations and applications apply to three Proxy Servers. Select one of three Proxy Servers for SIP configuration.



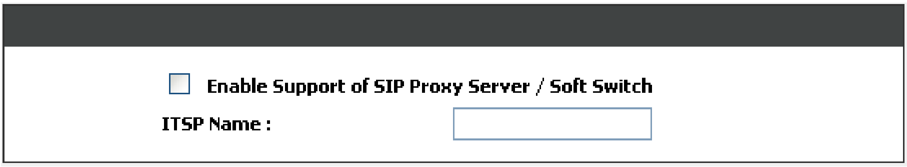
VOIP SETTINGS

The device can set up multiple SIP proxy servers for load balancing on the same ITSP to get the better response, and high availability.

PROXY SERVER

| | Proxy Status | ITSP Name | Proxy Server IP | Proxy Server Port | |
|---|---|---|---|---|---|
| 1 | Disable | | 192.168.1.1 | 5060 | ✎ |
| 2 | Disable | | 192.168.1.1 | 5060 | ✎ |
| 3 | Disable | | 192.168.1.1 | 5060 | ✎ |

SETUP → VoIP Setup



□ Enable Support of SIP Proxy Server / Soft Switch

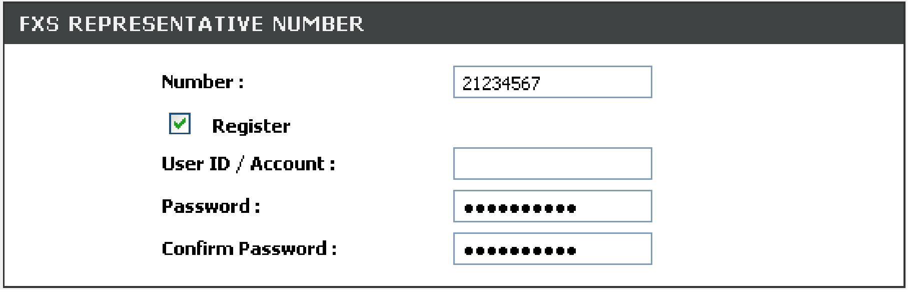
ITSP Name :

**Enable Support of SIP Proxy Server / Soft Switch:** Check the box to register the VoIP Router with SIP proxy server or soft switch.

**ITSP Name:** Enter the name of ITSP.

SETUP → VoIP Setup

**FXS Representative Number registers to Proxy:**



FXS REPRESENTATIVE NUMBER

Number : 21234567

☑ Register

User ID / Account :

Password : ●●●●●●●●●●●

Confirm Password : ●●●●●●●●●●●

**Number:** Enter the representative number for Line 1 and Line 2. If the VoIP Router is configured to register with SIP proxy server, Line 1 and Line 2 are using this number to call through SIP proxy server. It is the Caller ID for the called party when you make a VoIP call. If you register the VoIP Router to a SIP proxy server, then it should be the number that provided by SIP proxy server.

**Register:** Check the box to register with SIP proxy server.

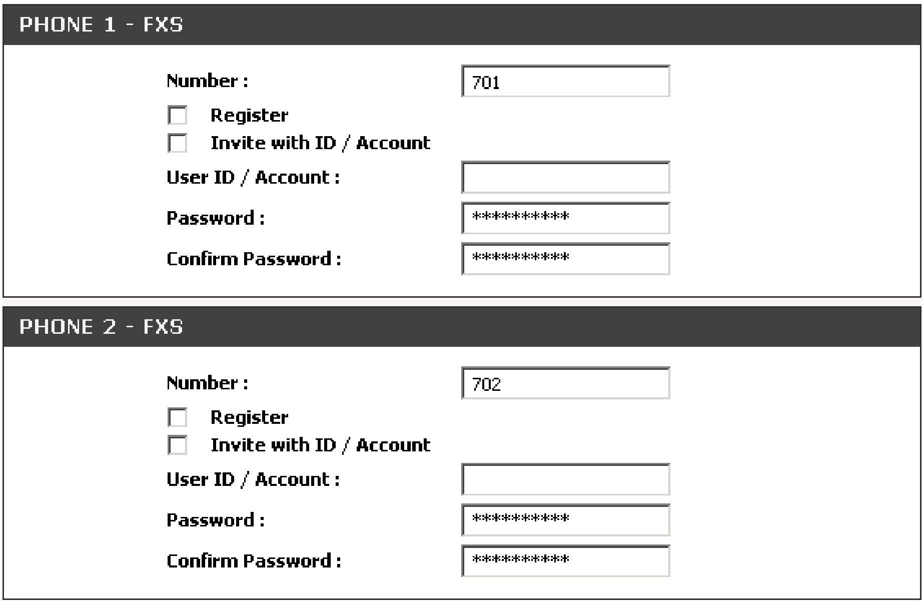
**User ID/Account**: User ID/Account are usually the same as Number from most SIP proxy severs.

**Password:** Enter password and re-enter to confirm.

**Note:** Please ensure if your VoIP Service Provider allows one account for multi-port using.

SETUP → VoIP Setup

**Each line registers to Proxy independently:**



PHONE 1 - FXS

| | |
|---|---|
| Number : | 701 |
| □ Register | |
| □ Invite with ID / Account | |
| User ID / Account : | |
| Password : | ********** |
| Confirm Password : | ********** |

PHONE 2 - FXS

| | |
|---|---|
| Number : | 702 |
| □ Register | |
| □ Invite with ID / Account | |
| User ID / Account : | |
| Password : | ********** |
| Confirm Password : | ********** |

**Number:** Enter the number, text or number and text in this field. It is the Caller ID for the called party when you make a VoIP call. If you register the VoIP Router to a SIP proxy server, then it should be the number that provided by SIP proxy server. Number and User ID/Account are usually the same from most SIP proxy severs. Each line has a number. And the number of each line is not reiteration.

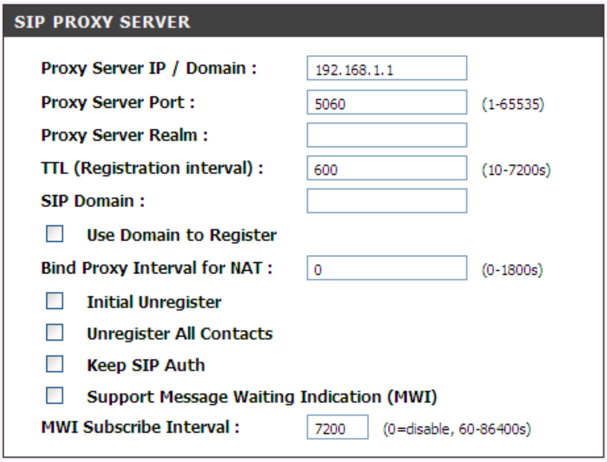
**Register:** Check the box to register with SIP proxy server.

**Invite with ID / Account:** Check the box to call through SIP proxy server without registration. It is always ticked when Register is also ticked. Most VoIP Service Providers will interdict the connection without registration.

**User ID/Account**: User ID/Account are usually the same as Number from most SIP proxy severs.

**Password:** Enter password and re-enter to confirm.

SETUP → VoIP Setup



**SIP PROXY SERVER**

| | | |
|---|---|---|
| Proxy Server IP / Domain : | 192.168.1.1 | |
| Proxy Server Port : | 5060 | (1-65535) |
| Proxy Server Realm : | | |
| TTL (Registration interval) : | 600 | (10-7200s) |
| SIP Domain : | | |
| □ Use Domain to Register | | |
| Bind Proxy Interval for NAT : | 0 | (0-1800s) |
| □ Initial Unregister | | |
| □ Unregister All Contacts | | |
| □ Keep SIP Auth | | |
| □ Support Message Waiting Indication (MWI) | | |
| MWI Subscribe Interval : | 7200 | (0=disable, 60-86400s) |

**Proxy Server IP/Domain:** Enter the IP address or URL (Uniform Resource Locator) of SIP proxy server or soft switch.

**Proxy Server Port:** Enter the SIP proxy server’s listening port for the SIP in this field. Leave this field to the default if your VoIP Service Provider did not give you a server port number for SIP.

**Proxy Server Realm:** Enter the realm for SIP proxy server. It is used for authentication in a SIP server. In most cases, the VoIP Router 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 in.

**TTL (Registration interval) [10-7200 s]:** Enter the desired time interval at which the VoIP Router will report to your SIP proxy server.

**SIP Domain:** Enter the SIP domain provided by your VoIP Service Provider. (Note some SIP proxy servers might not require this.) If you enable “Uses Domain to Register”, the VoIP Router will register to the SIP proxy server with the domain name you filled in. Otherwise, the VoIP Router will register to a SIP proxy server with the IP it resolves.

**Use Domain to Register:** Check the box to use Domain to register with SIP proxy server. The VoIP Router is registered to the SIP proxy server with IP address if un-ticked.

> **Note: Proxy Server Realm**, **SIP Domain** and **Use Domain to Register** are the parameters provided by VoIP Service Provider. If you fail to make a call, please contact your VoIP Service Provider.

**Bind Proxy Interval for NAT:** Check the box to keep the binding exist by sending packets when the VoIP Router is behind a NAT and SIP proxy server is not able to keep the binding.

**Initial Unregister:** Check the box to send an unregistered message initially by the VoIP Router and then it will perform a general register process.

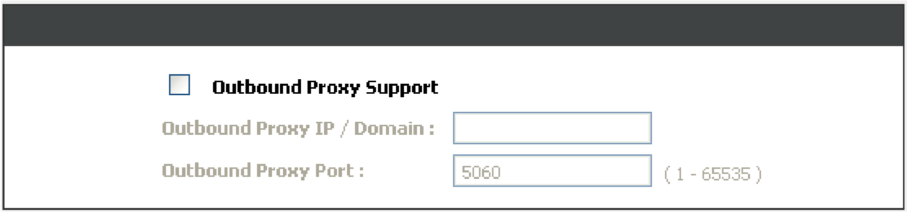
**Unregister All Contacts:** DVG-N5402FF will fill “*”(a star) in Contact field in un-register request to release all registered accounts in this DVG-N5402FF.

**Keep SIP Auth:** DVG-N5402FF keeps the last register SIP MD5 authentication information and re-use it for next register request.

**Support Message Waiting Indication (MWI):** It is used to enable/disable Message Waiting Indication. It is available only when Voice Mail Service is available from the VoIP Service Provider.

**MWI Subscribe Interval:** It is used to set the subscribe time for the VoIP Router to check the voice mail.

SETUP → VoIP Setup



□ Outbound Proxy Support

Outbound Proxy IP / Domain :

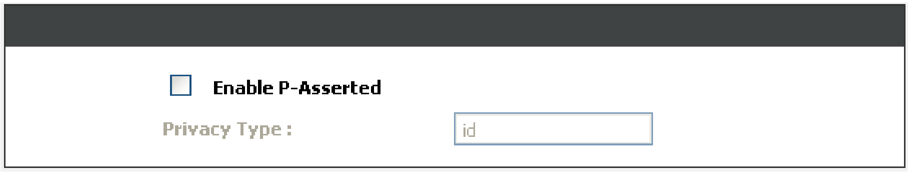
Outbound Proxy Port : 5060 ( 1 - 65535 )

**Outbound Proxy Support:** Check the box to send all SIP packets to the destined outbound proxy server. An outbound proxy server handles SIP call signaling as a standard SIP proxy server would do. Further, it receives and transmits phone conversation traffic (media) between two communication parties. This option tells the VoIP Router to send and receive all SIP packets to the destined outbound proxy server rather than the remote VoIP device. 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.

**Outbound Proxy IP/Domain:** Enter the outbound proxy's IP address or URL.

**Outbound Proxy Port:** Enter the outbound proxy's listening port.

SETUP → VoIP Setup



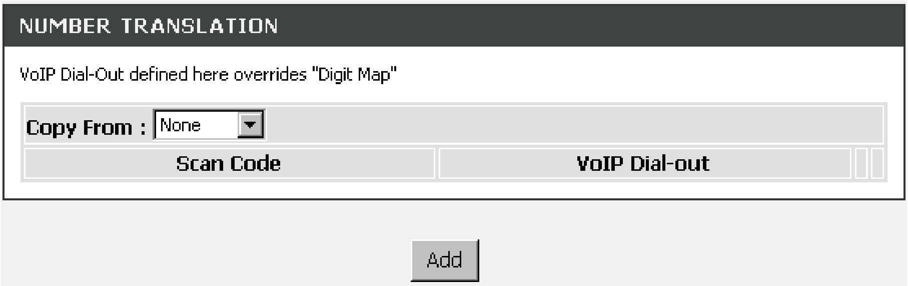
□ Enable P-Asserted

Privacy Type : id

**Enable P-Assert:** Check the box to enable the caller ID protection.

**Privacy Type:** It is used to disguise the caller ID when queried via an ITSP/Third-Party Assertion. The Privacy Type includes 'user', 'header', 'session', 'none', 'critical', 'id' and 'history'.

SETUP → VoIP Setup



NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

| Scan Code | VoIP Dial-out |
|---|---|

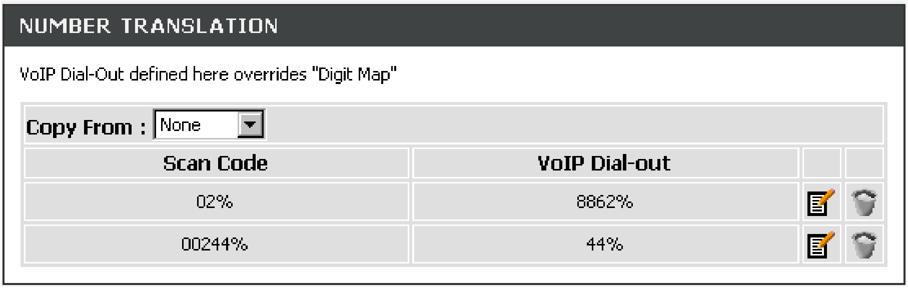
The rule of dialing of inviting to VoIP Service Providers may vary. That is, you have to configure different Digit Map for different VoIP Service Providers. In this filed, you can configure individual dialing plan for each VoIP Service Provider. The following examples introduce some cases. For general configuration, refer to **Digit Map** page. **Note: Press "Add" to add an entry. Don't forget to press "Apply" which in the above of Number Translation.**

**For example** (Example in Taiwan)**,**

If Server 1 is local VoIP Service Provider you can refer to **Digit Map** page for general settings.

If Server 2 is global VoIP Service Provider (VoIP STUN, free to dial to some cities free charge) you can set individual dialing plan for VoIP STUN in **Number Translation** field. **Scan Code** can be your dialing custom, and **VoIP Dial-out** is the number on the basis of the dialing rule needed by VoIP STUN. Its dialing rule is Country code + Area Code + phone number. When you make calls to Taipei through VoIP STUN, you don't change the dialing custom, just dial 02xxxxxxxx, and the system will change the number from 02xxxxxxx to 8862xxxxxxxx. The same rule is for #2. When you make calls to UK via VoIP STUN, you'll dial 00244xxxxxx, and the system will change it to 44xxxxxx.

The settings for Server 2 appear like:



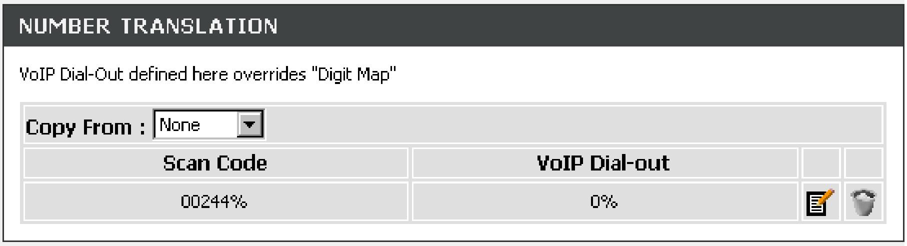
NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

| Scan Code | VoIP Dial-out | | |
|---|---|---|---|
| 02% | 8862% | | |
| 00244% | 44% | | |

If Server 3 is a VoIP Service Provider in UK, you can set individual dialing plan in **Number Translation** field. As you make calls to UK through this VoIP Service Provider, "Country code" should be removed and plus "0" by the system. The settings for Server 3 appear like:



NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

| Scan Code | VoIP Dial-out | | |
|---|---|---|---|
| 00244% | 0% | | |

## 3-1-3 Wireless Setup

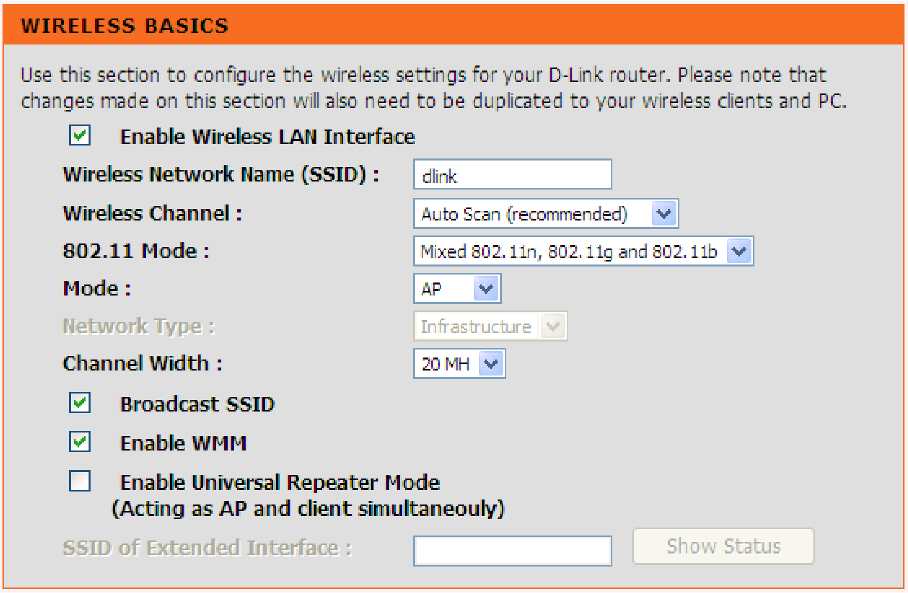
This section instructs you how to setup your wireless network on the VoIP Router device.

Setup Hint:

1. Every device in the same wireless network must use the same SSID.
2. To avoid wireless network overlap, a specific and different channel is needed.
3. Make sure security used by every device in the same wireless network is compatible with the wireless AP.

### 3-1-3-1 Wireless Basic

SETUP ->Wireless Setup -> Wireless Basic



WIRELESS BASICS

Use this section to configure the wireless settings for your D-Link router. Please note that changes made on this section will also need to be duplicated to your wireless clients and PC.

☑ Enable Wireless LAN Interface

| | |
|---|---|
| Wireless Network Name (SSID) : | dlink |
| Wireless Channel : | Auto Scan (recommended) |
| 802.11 Mode : | Mixed 802.11n, 802.11g and 802.11b |
| Mode : | AP |
| Network Type : | Infrastructure |
| Channel Width : | 20 MH |

☑ Broadcast SSID

☑ Enable WMM

□ Enable Universal Repeater Mode (Acting as AP and client simultaneouly)

SSID of Extended Interface :

**Enable Wireless LAN Interface:** Enable wireless basic settings on LAN interface.

**Wireless Network Name (SSID):** SSID is the name of your wireless network. All wireless-equipped devices share the same SSID to communicate with each other. It must be unique to identify separated wireless network. For security, you should change the default SSID to a special ID.

**Wireless Channel:** Select a clear and appropriate channel for your wireless network. A device on your wireless network must use a specific channel to transmit and receive data. If wireless network has overlap, change a different channel number.

**802.11 Mode:** The VoIP Router can operate in 2.4GHz ISM band with different speed of wireless connection, Select the wireless band of your network.

**802.11b only -** Allow all 802.11b compliant wireless devices to associate with the wireless AP.

**802.11g only -** Allow all 802.11g compliant wireless devices to associate with the wireless AP.

**802.11n only -** Allow all 802.11n compliant wireless devices to associate with the wireless AP.

**Mixed 802.11g and 802.11b -** Allow a mix of both IEEE802.11g and 802.11b compliant wireless devices to associate with the wireless AP.

**Mixed 802.11n and 802.11g -** Allow a mix of both IEEE802.11n and 802.11g compliant wireless devices to associate with the wireless AP.

**Mixed 802.11n, 802.11g and 802.11b -** Allow a mix of both IEEE802.11n, 802.11g and 802.11b compliant wireless devices to associate with the wireless AP.

**Access Mode:** DVG-N5402FF has ability to serve as two operating modes in wireless network separately.

**AP:** As a wireless AP that allows wireless-equipped stations to communicate with a wired network and the other wireless network for Internet access and resources sharing.

**Client:** As a wireless client, you are allowed to access Internet via an Access Point in infrastructure mode or build a group of wireless network for files and printer sharing in ad-hoc Mode. **Under Wireless Client Mode, Bridge Mode is not available for the VoIP Router**

**Network Type:** Select network type for Access Client Mode.

**Infrastructure:** Connect to another wireless AP or WISP.

**Ad hoc:** Connect to another wireless Ad hoc device. Usually it is used for peer-to-peer connect mode.

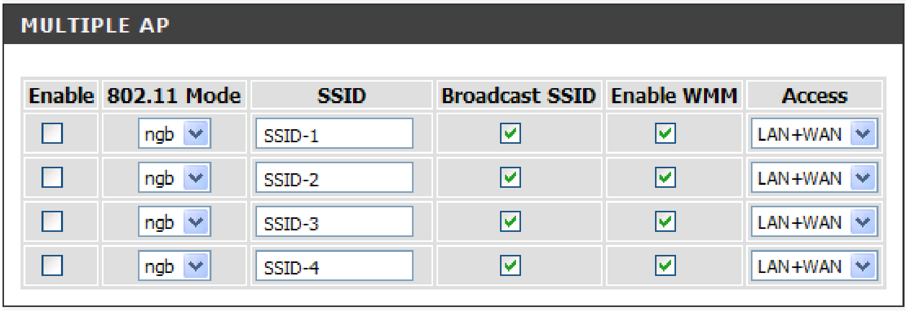
**Channel Width:** Wireless channel width for 802.11n. Select 40 MH for higher speed.

**Broadcast SSID:** Broad AP's SSID for convent usage. To hid SSID for more security.

**Enable WMM:** Wi-Fi Multimedia. It provides higher priority for multimedia stream to get better quality.

**Enable Universal Repeat Mode:** Set DVG-N5402FF to be wireless repeat mode. Please fill the same SSID as the root AP in "SSID of Extended Interface".

SETUP -> Wireless Setup -> Wireless Basic



MULTIPLE AP

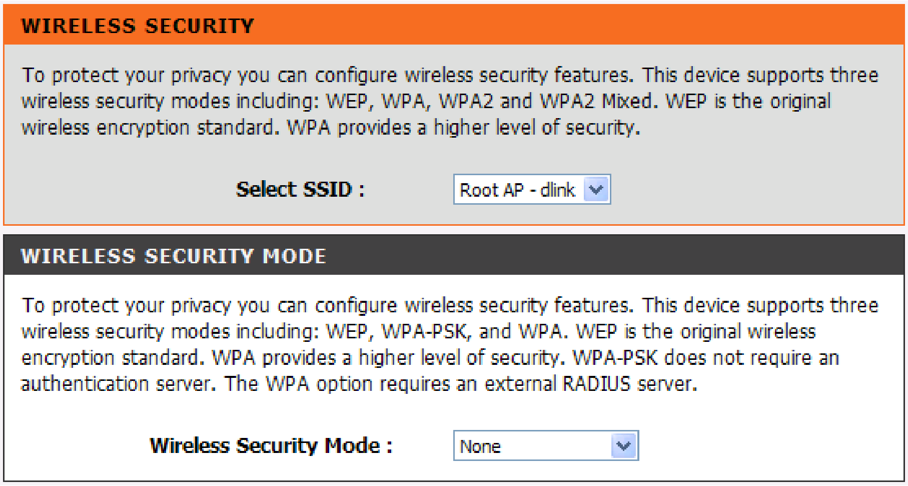
| Enable | 802.11 Mode | SSID | Broadcast SSID | Enable WMM | Access |
|---|---|---|---|---|---|
| □ | ngb | SSID-1 | ☑ | ☑ | LAN+WAN |
| □ | ngb | SSID-2 | ☑ | ☑ | LAN+WAN |
| □ | ngb | SSID-3 | ☑ | ☑ | LAN+WAN |
| □ | ngb | SSID-4 | ☑ | ☑ | LAN+WAN |

**Multiple AP:** It is used for different level of clients. Such as different departments or guests. And you could assign different password for each SSID.

### 3-1-3-2 Wireless Security

This section introduces you different ways of wireless security you can setup. It is important to enable secure algorithm to protect your data from eavesdropping by unauthorized wireless users.

SETUP -> Wireless Setup -> Wireless Security



WIRELESS SECURITY

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA, WPA2 and WPA2 Mixed. WEP is the original wireless encryption standard. WPA provides a higher level of security.

Select SSID : Root AP - dlink

WIRELESS SECURITY MODE

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA-PSK, and WPA. WEP is the original wireless encryption standard. WPA provides a higher level of security. WPA-PSK does not require an authentication server. The WPA option requires an external RADIUS server.

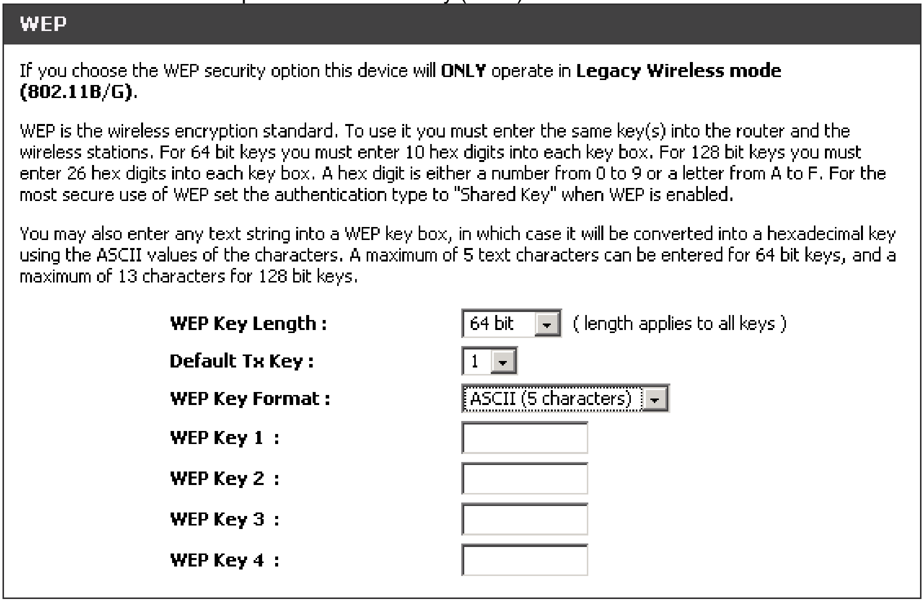
Wireless Security Mode : None

**Select DDID:** Select an SSID to configure wireless security mechanism.

**Security Mode:** Select the encryption/authentication type: None, WPA, WPA2 and WPA2 Mixed.

**WEP Authentication Mode**

SETUP -> Wireless Setup -> Wireless Security (WEP)



WEP

If you choose the WEP security option this device will **ONLY** operate in **Legacy Wireless mode (802.11B/G)**.

WEP is the wireless encryption standard. To use it you must enter the same key(s) into the router and the wireless stations. For 64 bit keys you must enter 10 hex digits into each key box. For 128 bit keys you must enter 26 hex digits into each key box. A hex digit is either a number from 0 to 9 or a letter from A to F. For the most secure use of WEP set the authentication type to "Shared Key" when WEP is enabled.

You may also enter any text string into a WEP key box, in which case it will be converted into a hexadecimal key using the ASCII values of the characters. A maximum of 5 text characters can be entered for 64 bit keys, and a maximum of 13 characters for 128 bit keys.

**WEP Key Length :** 64 bit ( length applies to all keys )

**Default Tx Key :** 1

**WEP Key Format :** ASCII (5 characters)

**WEP Key 1 :**

**WEP Key 2 :**

**WEP Key 3 :**

**WEP Key 4 :**

**WEP Key Length:** Select 64-bit or 128-bit data encryption.

**Default Tx Key:** You can select one of the keys as active key at a time.

**WEP Key Format:** Select the preferred WEP Key Format according to which WEP encryption you choose. When WEP 64bits is enabled, you can select ASCII (5 characters) and Hex (10 characters). When WEP 128bits is enabled, you can select ASCII (13 characters) and Hex (26 characters).

**WEP Key 1 – 4:** You can manually input key value from Key1 to Key4. Type a character sting and apply changes.

For a 64-bit WEP key - Enter 5 characters (ASCII sting) or 10 hexadecimal characters ("0-9", "A-F").

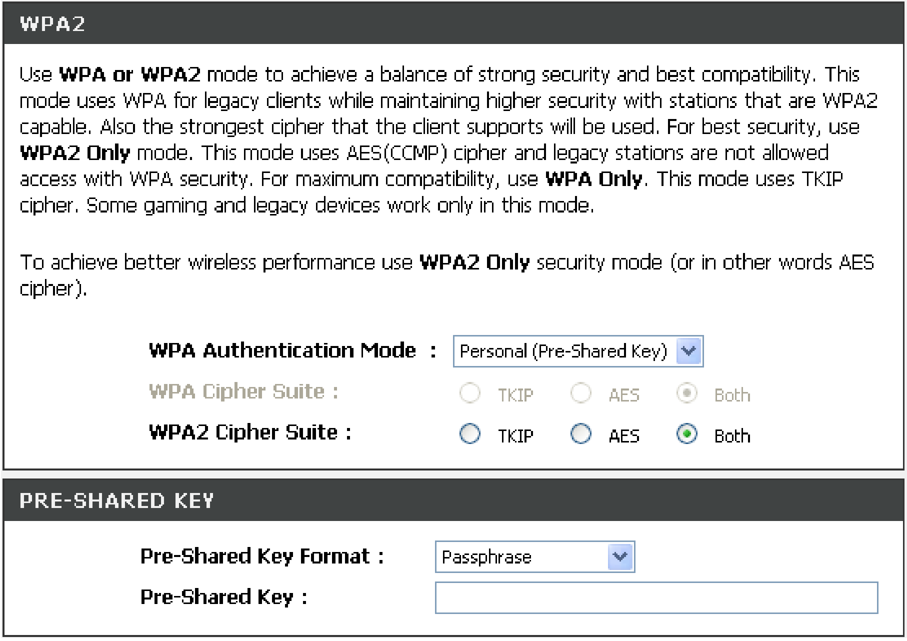
For a 128-bit WEP key - Enter 13 characters (ASCII sting) or 26 hexadecimal characters ("0-9", "A-F").

**Note: WEP authentication is not supported at 802.11n mode. It recommends select WPA or WPA2 for higher secure.**

### WPA Authentication Mode

The wireless network can use WPA Authentication to verify whether a wireless device is allowed to access your Access Point or not. You can choose to use Enterprise (RADIUS) method or Personal (Pre-Shared Key). The encryption mechanism used for RADIUS and WPA-PSK is the same. The difference between the two is that WPA-PSK uses a specific characters sting like password instead of a user-authentication.

SETUP -> Wireless Setup -> Wireless Security (WPA-PSK)



**WPA2**

Use **WPA or WPA2** mode to achieve a balance of strong security and best compatibility. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. Also the strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. This mode uses AES(CCMP) cipher and legacy stations are not allowed access with WPA security. For maximum compatibility, use **WPA Only**. This mode uses TKIP cipher. Some gaming and legacy devices work only in this mode.

To achieve better wireless performance use **WPA2 Only** security mode (or in other words AES cipher).

**WPA Authentication Mode :** Personal (Pre-Shared Key)

WPA Cipher Suite : ○ TKIP ○ AES ● Both

**WPA2 Cipher Suite :** ○ TKIP ○ AES ● Both

**PRE-SHARED KEY**

**Pre-Shared Key Format :** Passphrase

**Pre-Shared Key :**

Select the type of WPA-PSK (WPA-PSK, WPA2-PSK, WPA2 Mixed-PSK), choose the proper security mode according to your wireless network.

**WPA Authentication Mode:** Select **Personal (Pre-Shared Key).**

**WPA Cipher Suite:** WPA Cipher Suite is used for the configuration of WPA or WPA2 Mixed.

> **TKIP -** TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.
>
> **AES -** The most powerful encryption algorithm that is commonly used in WPA.

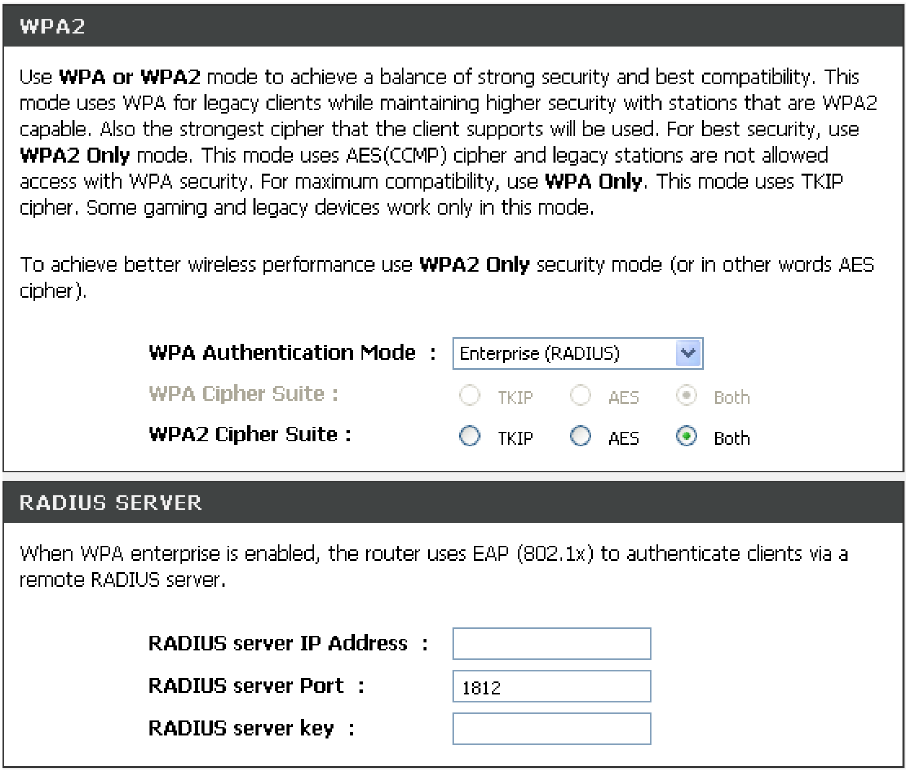
**WPA2 Cipher Suite:** WPA2 Cipher Suite is used for the configuration of WPA2 or WPA2 Mixed.

> **TKIP -** TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.
>
> **AES -** The most powerful encryption algorithm that is commonly used in WPA.

**Pre-Shared Key Format:** Select the Format of Pre-Shared Key. You can select Passphrase or Hex (64 characters) by entering a character string ranging from "A-Z" and "0-9".

**Pre-Shared Key:** Enter a key of 8-64 characters long in the Pre-Shared Key filed. Make sure this key is exactly the same on all other wireless stations.

SETUP -> Wireless Settings -> Wireless Security (WPA)



WPA2

Use **WPA or WPA2** mode to achieve a balance of strong security and best compatibility. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. Also the strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. This mode uses AES(CCMP) cipher and legacy stations are not allowed access with WPA security. For maximum compatibility, use **WPA Only**. This mode uses TKIP cipher. Some gaming and legacy devices work only in this mode.

To achieve better wireless performance use **WPA2 Only** security mode (or in other words AES cipher).

WPA Authentication Mode : Enterprise (RADIUS)

WPA Cipher Suite : ○ TKIP ○ AES ● Both

WPA2 Cipher Suite : ○ TKIP ○ AES ● Both

RADIUS SERVER

When WPA enterprise is enabled, the router uses EAP (802.1x) to authenticate clients via a remote RADIUS server.

RADIUS server IP Address :

RADIUS server Port : 1812

RADIUS server key :

Select the type of WPA (WPA, WPA2, WPA2 Mixed), choose the proper security mode according to your wireless network.

**WPA Authentication Mode:** Select **Enterprise (RADIUS).**

**WPA Cipher Suite:** WPA Cipher Suite is used for the configuration of WPA or WPA2 Mixed.

**TKIP -** TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.

**AES -** The most powerful encryption algorithm that is commonly used in WPA.

**WPA2 Cipher Suite:** WPA2 Cipher Suite is used for the configuration of WPA2 or WPA2 Mixed.

**TKIP -** TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.

**AES -** The most powerful encryption algorithm that is commonly used in WPA.

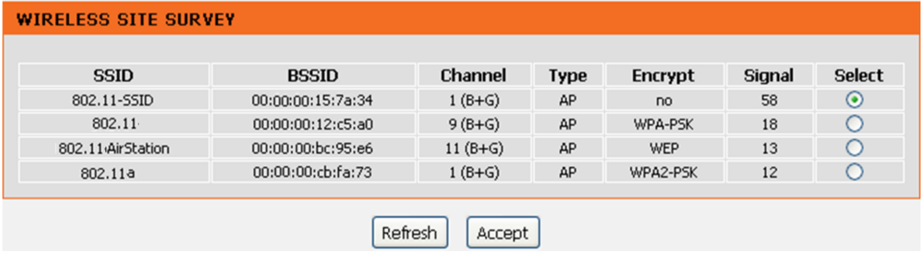
**RADIUS Server:**

**RADIUS server Port -** Enter the port number of the authentication RADIUS server. Keep the default value: 1812 unless the server required change to another number.

**RADIUS server IP Address -** Enter the IP address of the authentication RADIUS server.

**RADIUS server key -** Enter the password such as a security Key.

SETUP -> Wireless Setup -> Site Survey



WIRELESS SITE SURVEY

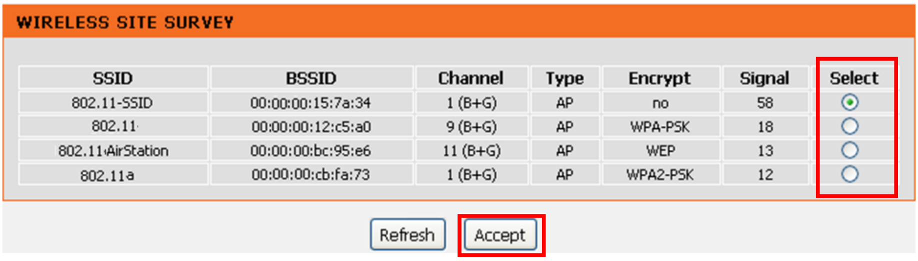
| SSID | BSSID | Channel | Type | Encrypt | Signal | Select |
|---|---|---|---|---|---|---|
| 802.11-SSID | 00:00:00:15:7a:34 | 1 (B+G) | AP | no | 58 | ● |
| 802.11 | 00:00:00:12:c5:a0 | 9 (B+G) | AP | WPA-PSK | 18 | ○ |
| 802.11AirStation | 00:00:00:bc:95:e6 | 11 (B+G) | AP | WEP | 13 | ○ |
| 802.11a | 00:00:00:cb:fa:73 | 1 (B+G) | AP | WPA2-PSK | 12 | ○ |

**Site Survey**

When wireless client mode is enabled, click the Refresh button to display any Access Point on your wireless network so that a wireless client can obtain SSID, BSSID, Channel, Type, Encryption, and Signal through scanning using this Site Survey tools.

**Example:**

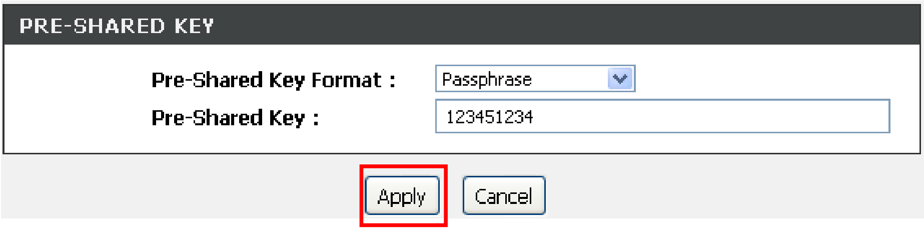
**1. Select the Wireless AP and click Accept bottom.**



WIRELESS SITE SURVEY

| SSID | BSSID | Channel | Type | Encrypt | Signal | Select |
|---|---|---|---|---|---|---|
| 802.11-SSID | 00:00:00:15:7a:34 | 1 (B+G) | AP | no | 58 | ● |
| 802.11 | 00:00:00:12:c5:a0 | 9 (B+G) | AP | WPA-PSK | 18 | ○ |
| 802.11AirStation | 00:00:00:bc:95:e6 | 11 (B+G) | AP | WEP | 13 | ○ |
| 802.11a | 00:00:00:cb:fa:73 | 1 (B+G) | AP | WPA2-PSK | 12 | ○ |

**2. Enter the password of the Wireless AP and click Apply bottom.**

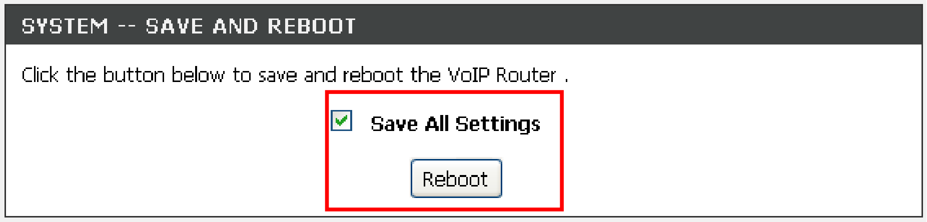


PRE-SHARED KEY

Pre-Shared Key Format : Passphrase

Pre-Shared Key : 123451234

**3. Save the configuration and restart DVG-N5402FF.**



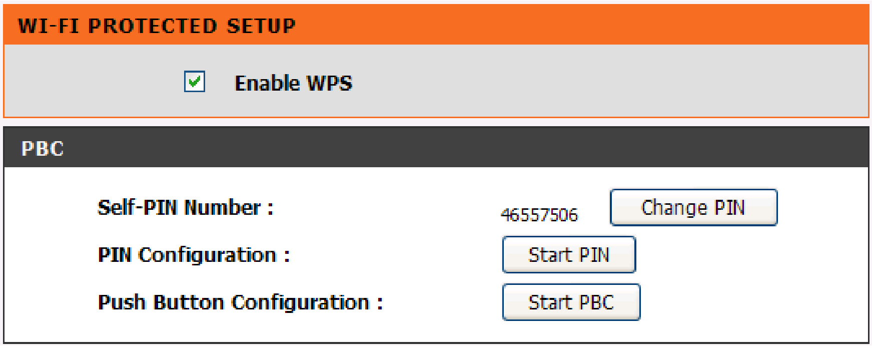
SYSTEM -- SAVE AND REBOOT

Click the button below to save and reboot the VoIP Router .

☑ Save All Settings

### 3-1-3-3 WPS

SETUP -> Wireless Setup -> WPS



WI-FI PROTECTED SETUP

☑ Enable WPS

PBC

Self-PIN Number : 46557506 Change PIN

PIN Configuration : Start PIN

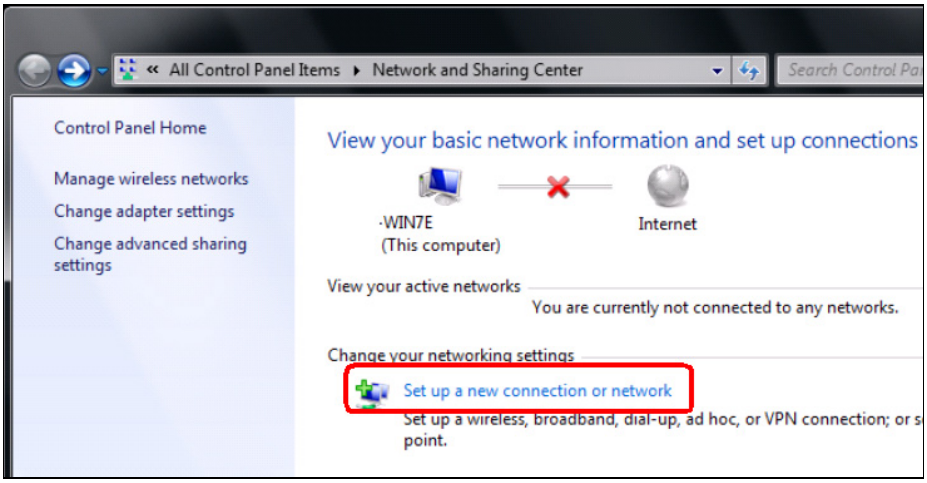
Push Button Configuration : Start PBC

It allows users establish wireless connect between DVG-N5402FF and computers via WPS(Wireless Protect Setup) method.

**Example for setting Wiresess profile via WPS method on Windows 7.**

Enter [Network and Sharing Center]

Click [Set up a new connection or network]



« All Control Panel Items ▸ Network and Sharing Center

Search Control Pa

Control Panel Home

Manage wireless networks

Change adapter settings

Change advanced sharing settings

View your basic network information and set up connections

-WIN7E (This computer)

Internet

View your active networks

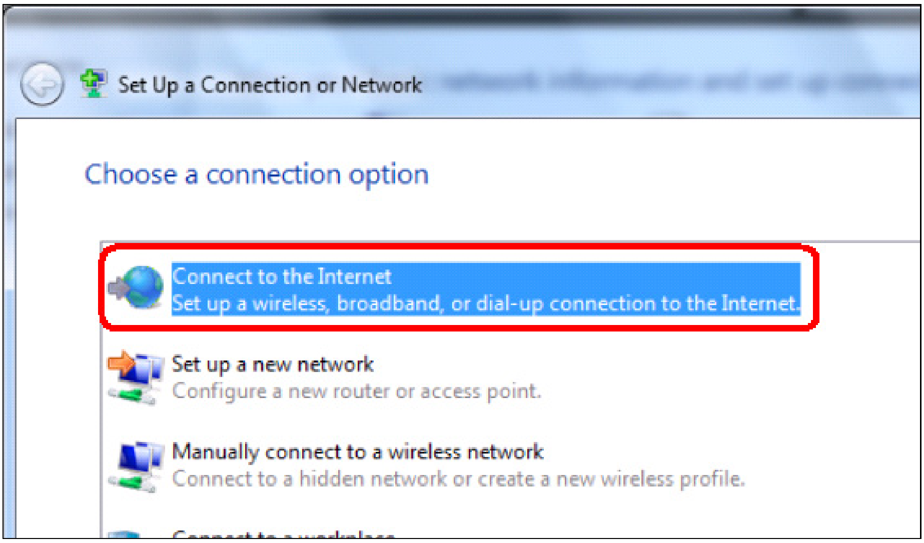
You are currently not connected to any networks.

Change your networking settings

Set up a new connection or network

Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or s point.

Click [Connect to the Internet]



Set Up a Connection or Network

Choose a connection option

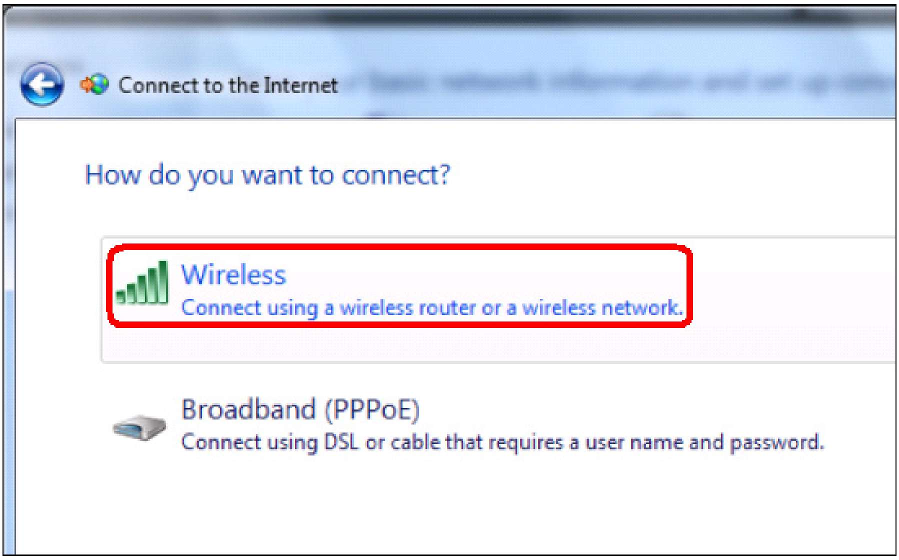
Connect to the Internet
Set up a wireless, broadband, or dial-up connection to the Internet.

Set up a new network
Configure a new router or access point.

Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.

Connect to a workplace

Click [Wireless]



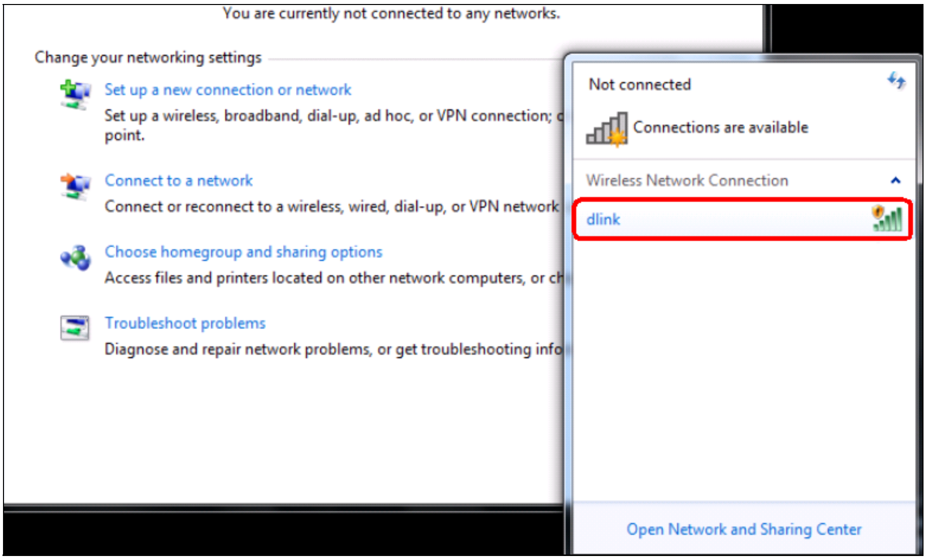
Connect to the Internet

How do you want to connect?

Wireless
Connect using a wireless router or a wireless network.

Broadband (PPPoE)
Connect using DSL or cable that requires a user name and password.

Select a Wireless AP.



You are currently not connected to any networks.

Change your networking settings

Set up a new connection or network

Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; o point.

Connect to a network

Connect or reconnect to a wireless, wired, dial-up, or VPN network

Choose homegroup and sharing options

Access files and printers located on other network computers, or ch

Troubleshoot problems

Diagnose and repair network problems, or get troubleshooting info

Not connected

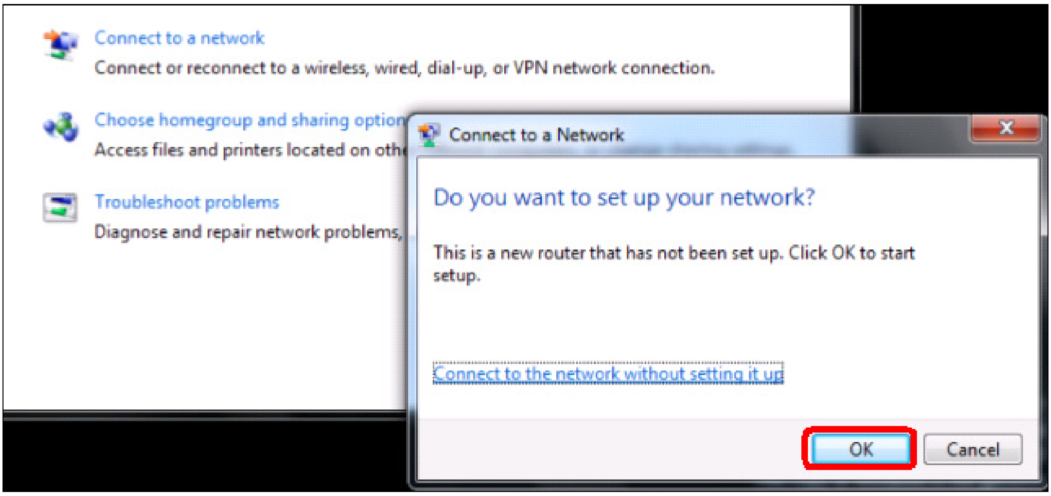
Connections are available

Wireless Network Connection

dlink

Open Network and Sharing Center

Click [OK] to start setup.



Connect to a network

Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

Choose homegroup and sharing option

Access files and printers located on othe

Troubleshoot problems

Diagnose and repair network problems,

Connect to a Network

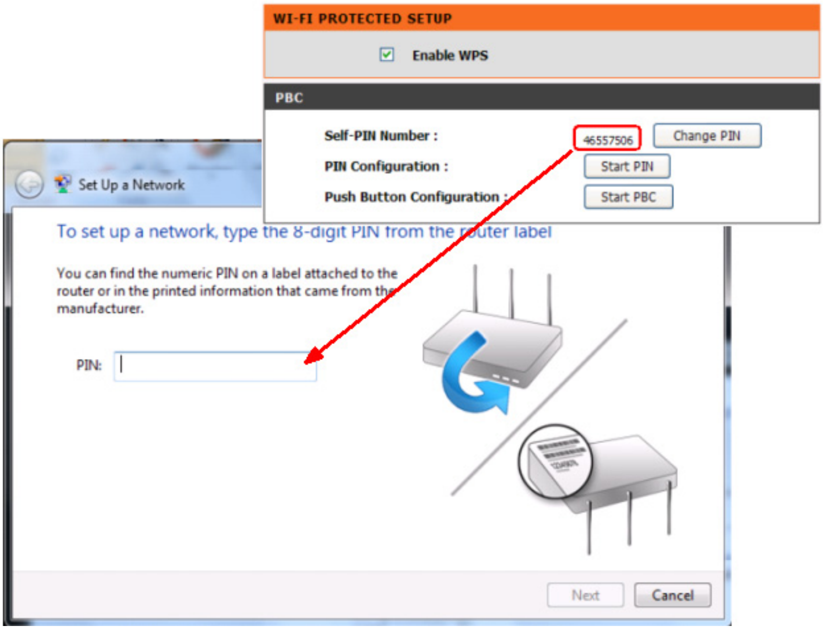
Do you want to set up your network?

This is a new router that has not been set up. Click OK to start setup.

Connect to the network without setting it up

Enter the 8-digit PIN from DVG-N5402FF label then click Next.

**Note: If you have ever click “Change PIN” button on the WEB UI of DVG-N5402FF, please enter the PIN number displaied on WEB GUI.**



WI-FI PROTECTED SETUP

☑ Enable WPS

PBC

Self-PIN Number : 46557506 [Change PIN]

PIN Configuration : [Start PIN]

Push Button Configuration : [Start PBC]

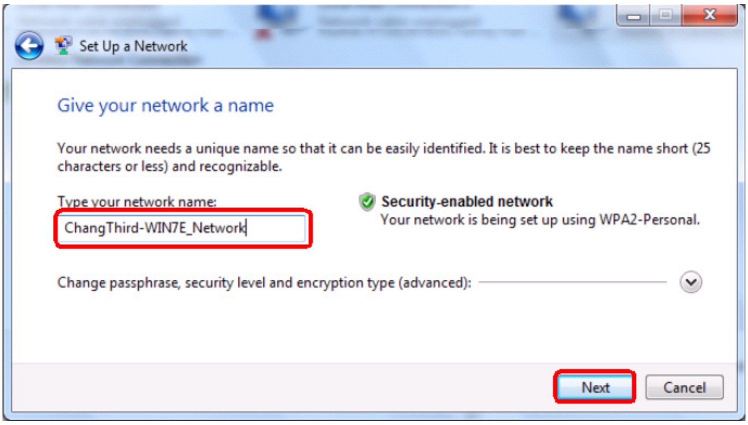
Set Up a Network

To set up a network, type the 8-digit PIN from the router label

You can find the numeric PIN on a label attached to the router or in the printed information that came from the manufacturer.

PIN:

Type network name(SSID) then click Next.



Set Up a Network

Give your network a name

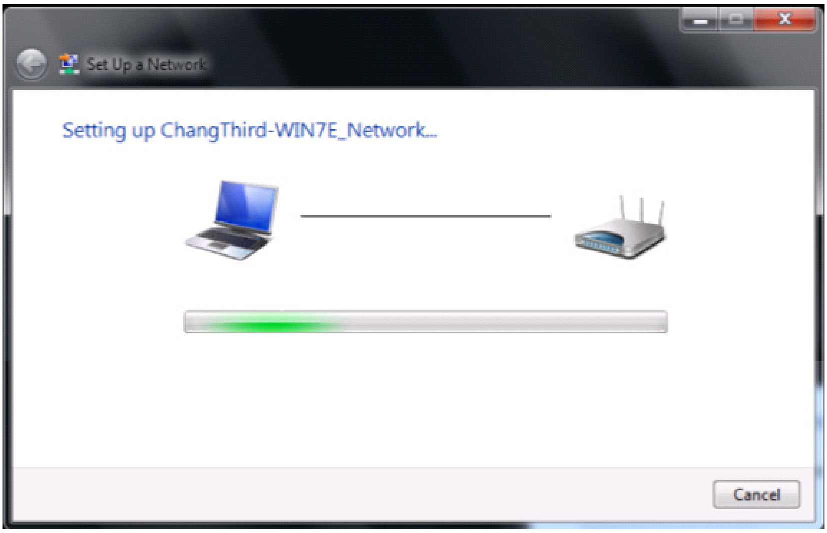
Your network needs a unique name so that it can be easily identified. It is best to keep the name short (25 characters or less) and recognizable.

Type your network name: ChangThird-WIN7E_Network

Security-enabled network
Your network is being set up using WPA2-Personal.

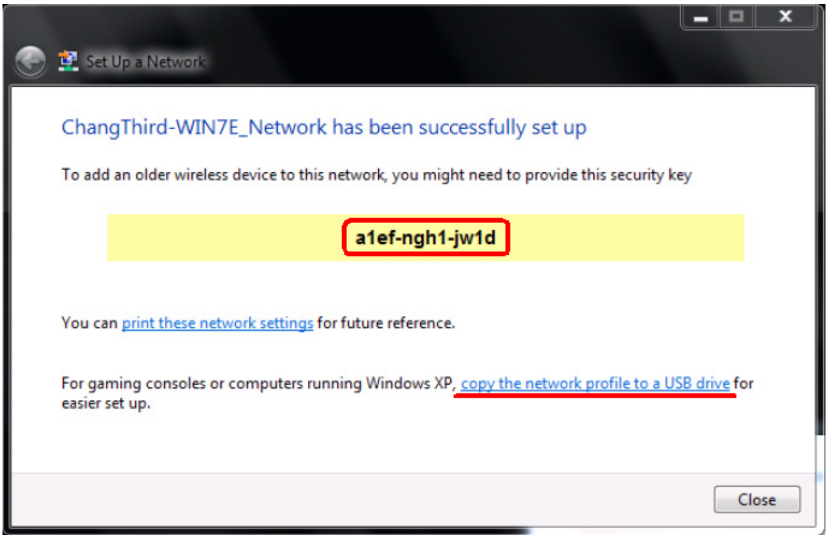
Change passphrase, security level and encryption type (advanced):

Wait for Windows 7 setting up wireless network.



Setting up ChangThird-WIN7E_Network...

Configuration finished, you could connect to DVG-N5402FF at present. You could also print security key of save this profile for another computer to add this wireless network manually.



ChangThird-WIN7E_Network has been successfully set up

To add an older wireless device to this network, you might need to provide this security key

a1ef-ngh1-jw1d

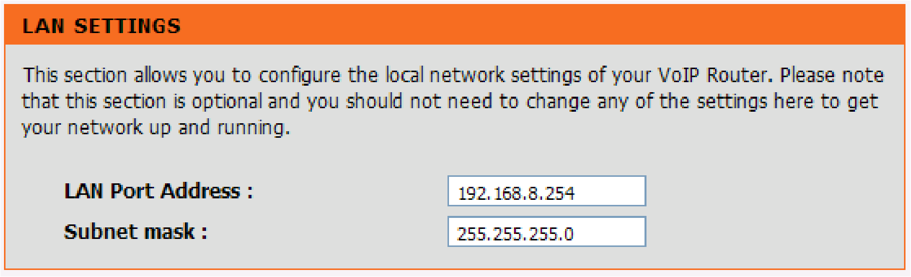
You can print these network settings for future reference.

For gaming consoles or computers running Windows XP, copy the network profile to a USB drive for easier set up.

**Note: DVG-N5402FF supports WPS work with WindowsR Vista and Windows 7 only.**

## 3-1-4 LAN Setup

SETUP → LAN Setup



LAN SETTINGS

This section allows you to configure the local network settings of your VoIP Router. Please note that this section is optional and you should not need to change any of the settings here to get your network up and running.

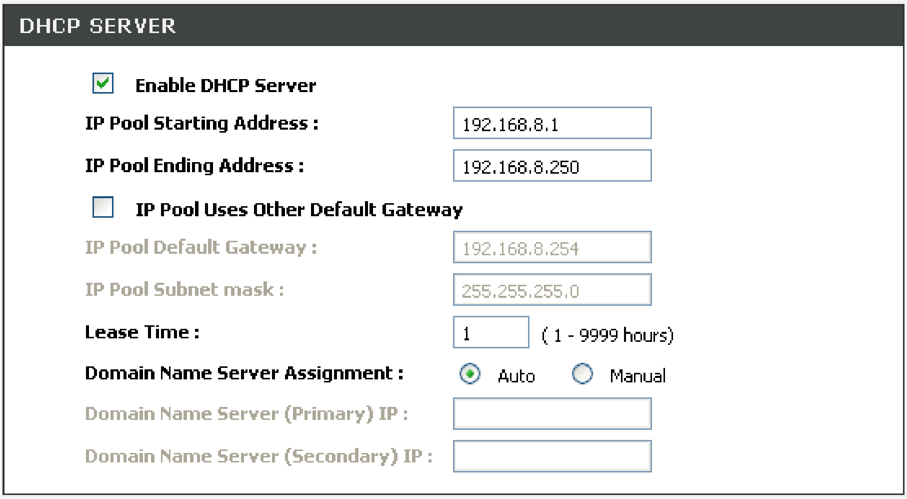
LAN Port Address : 192.168.8.254

Subnet mask : 255.255.255.0

**LAN Port Address:** Enter the LAN IP address of the VoIP Router. It is also the default gateway for DHCP clients.

**Subnet Make:** Enter the subnet mask for DHCP clients.

SETUP → LAN Setup



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 Gateway

| | |
|---|---|
| IP Pool Default Gateway : | 192.168.8.254 |
| IP Pool Subnet mask : | 255.255.255.0 |
| Lease Time : | 1 ( 1 - 9999 hours) |
| Domain Name Server Assignment : | ● Auto ○ Manual |
| Domain Name Server (Primary) IP : | |
| Domain Name Server (Secondary) IP : | |

**Enable DHCP Server:** This variable is to assign the IP address for the devices connected to LAN port of the VoIP Router.

**IP Pool Starting Address:** Enter the starting IP address for the DHCP server's IP assignment.

**IP Pool Ending Address:** Enter the ending IP address for the DHCP server's IP assignment.

**IP Pool Uses Other Default Gw:** Check the box to assign different default gateway for DHCP clients.

**IP Pool Default Gateway:** Enter the new default gateway that is different from LAN IP of the VoIP Router.

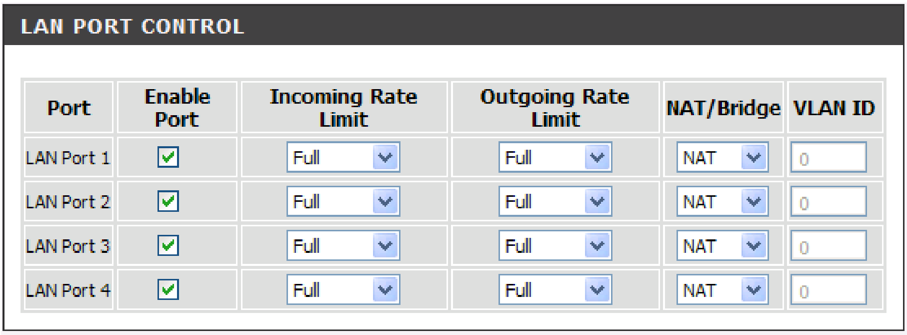
**IP Pool Subnet mask:** Enter the new subnet mask.

**Lease Time:** Enter the length of time for the IP lease.

**Domain Name Server Assignment:** Select **Auto** or **Manual** to get the IP address of Domain Name Server assigned by ISP or manually.

**Domain Name Server IP:** Enter the primary and secondary IP address of Domain Name Server if Domain Name Server Assignment is **Manual**. Otherwise, the VoIP Router will not be able to access hosts using hostnames instead of IPs.

SETUP → LAN Setup



LAN PORT CONTROL

| Port | Enable Port | Incoming Rate Limit | Outgoing Rate Limit | NAT/Bridge | VLAN ID |
|---|---|---|---|---|---|
| LAN Port 1 | ☑ | Full | Full | NAT | 0 |
| LAN Port 2 | ☑ | Full | Full | NAT | 0 |
| LAN Port 3 | ☑ | Full | Full | NAT | 0 |
| LAN Port 4 | ☑ | Full | Full | NAT | 0 |

**Enable Port:** It is to active/des-active LAN port physical connection.

**Incoming Rate Limit:** Set the incoming (from LAN to WAN) rate limit of a specific LAN port (can not exceed the real downstream bandwidth).

**Outgoing Rate Limit:** Set the outgoing (from WAN to LAN) rate limit of a specific LAN port (can not exceed the real upstream bandwidth).

**NAT/Bridge:** Select the VoIP Router serving as a **Router** with NAT or **Bridge** between WAN port and LAN port without NAT.

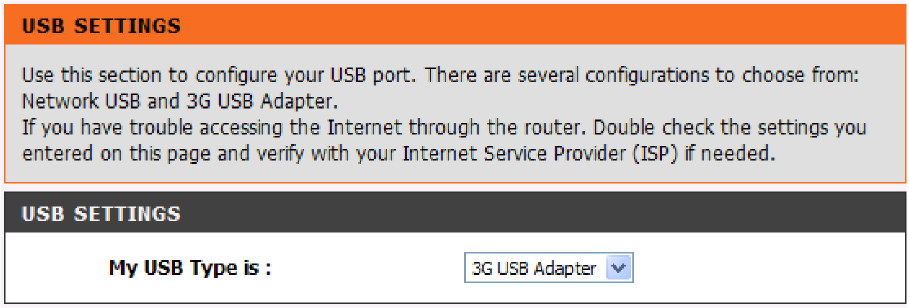
> **Note:** If you set a LAN port to be bridge mode that the LAN port will be bundled with WAN. If you would like to connect to DVG-N5402FF at the bridged LAN port you must enter WAN port IP.

**VLAN ID:** Assign a VLAN ID for DVG-N5402FF to transit traffic through-out at WAN port for WAN-LAN bridge mode. The packets are un-tagged at LAN port and added tag at WAN port.

> **Note:** It is not allowed to change VLAN ID for NAT mode LAN ports. The VLAN ID of NAT LAN ports are bundled with WAN 1 which assigned at Internet Setting page. The packets are un-tagged at LAN port and added tag at WAN port.

## 3-1-5 USB Settings

SETUP → USB Settings



USB SETTINGS

Use this section to configure your USB port. There are several configurations to choose from: Network USB and 3G USB Adapter.
If you have trouble accessing the Internet through the router. Double check the settings you entered on this page and verify with your Internet Service Provider (ISP) if needed.

USB SETTINGS

My USB Type is : 3G USB Adapter

**USB Type:** Select a USB device type.

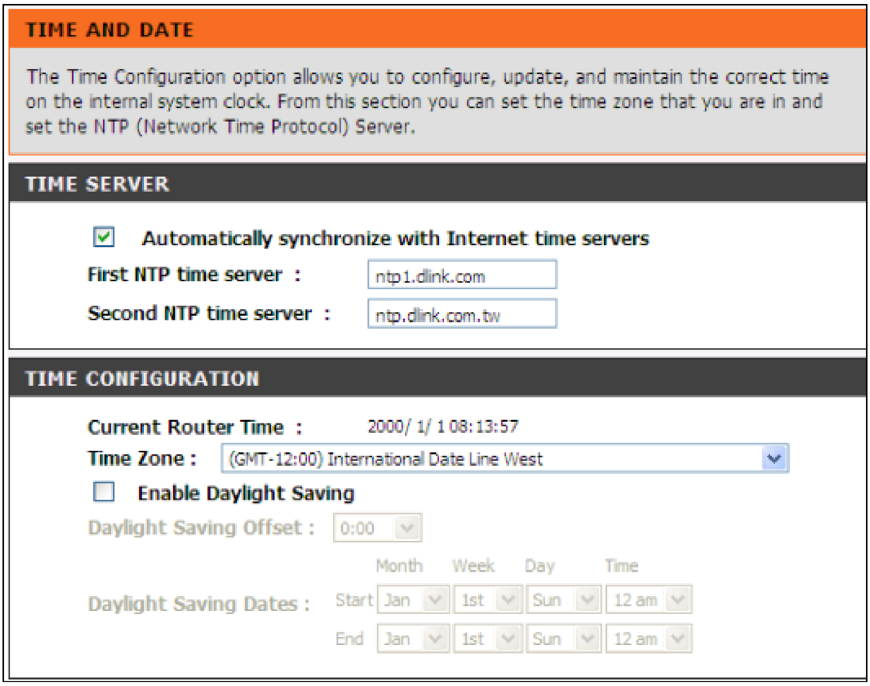
**3G USB Adapter:** It allows you plug in a 3G dungle dial to WISP for Internet access.

**Share Port:** Connect USB device such as a printer, scanner or MFP(Multifunction Printer) to DVG and share it at Local Area Network**.** Please refer to **Share Port User Manua**l for USB Share Port application.

**Note: USB Share port is optional for particular area and users may need to pay additional royalty to get this feature.** .

## 3-1-6 Time and Date

SETUP → Time and Date



TIME AND DATE

The Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in and set the NTP (Network Time Protocol) Server.

TIME SERVER

☑ Automatically synchronize with Internet time servers

First NTP time server : ntp1.dlink.com

Second NTP time server : ntp.dlink.com.tw

TIME CONFIGURATION

Current Router Time : 2000/ 1/ 1 08:13:57

Time Zone : (GMT-12:00) International Date Line West

□ Enable Daylight Saving

Daylight Saving Offset : 0:00

Daylight Saving Dates :

| | Month | Week | Day | Time |
|---|---|---|---|---|
| Start | Jan | 1st | Sun | 12 am |
| End | Jan | 1st | Sun | 12 am |

**Automatically synchronize with Internet time servers:** The VoIP Router should automatically sync up with time servers.

**First NTP time server:** Select the desired domain name of a NTP server as first priority.

**Second NTP time server:** Select the domain name of a NTP server as second priority.

**Current Router Time:** It shows the current time of the VoIP Router.

**Time Zone:** Select your time zone from the drop-down menu.

**Enable Daylight Saving:** To enable/disable daylight saving time.

**Daylight Saving Offset:** Set the current time zone offset for your location.

**Daylight Saving Dates:** Set the start and end dates for daylight saving time.

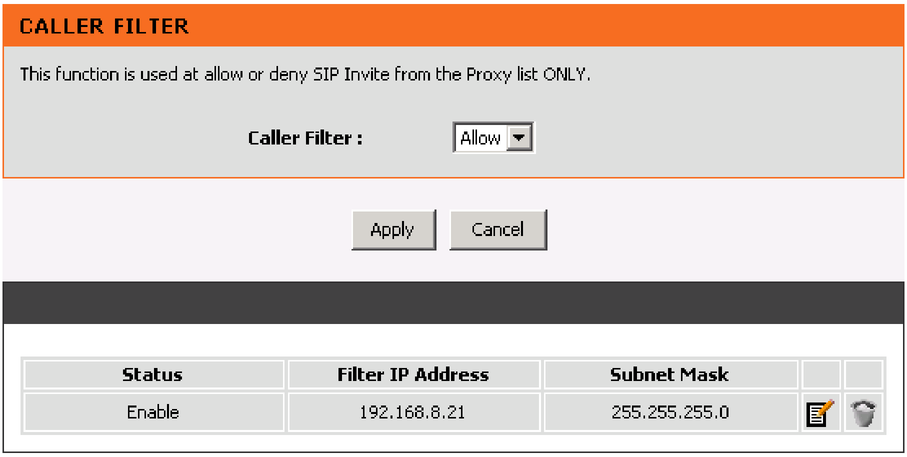
# 3-2 ADVANCED

## 3-2-1 VoIP

### 3-2-1-1 Caller Filter

This function allows you to accept or reject any incoming call from the IP address listed in the filter rule. The call from the IP address of SIP proxy server is always accepted, despite Deny is selected or the IP address of SIP proxy server is not in the filter rule of Allow.

ADVANCED → VoIP → Caller Filter



CALLER FILTER

This function is used at allow or deny SIP Invite from the Proxy list ONLY.

Caller Filter : Allow

| Status | Filter IP Address | Subnet Mask | | |
|---|---|---|---|---|
| Enable | 192.168.8.21 | 255.255.255.0 | | |

**Caller Filter:** It is to allow or deny the filter rule.

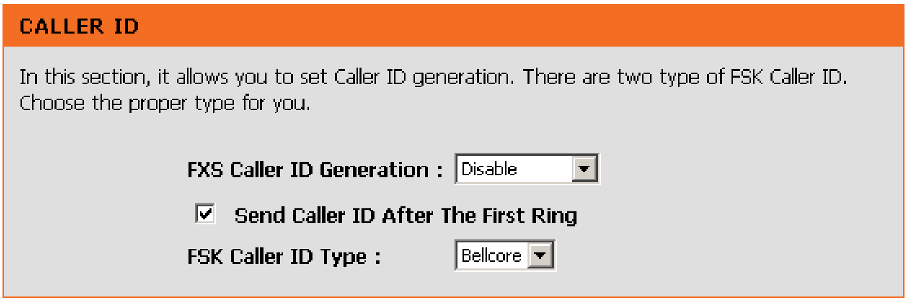
**Status:** It is to show the status of enable or disable.

**Filter IP Address:** Enter the start IP address which you would like to Allow or Deny.

**Subnet mask:** Enter the subnet mask you would like to Allow or Deny.

### 3-2-1-2 Caller ID

ADVANCED → VoIP → Caller ID



CALLER ID

In this section, it allows you to set Caller ID generation. There are two type of FSK Caller ID. Choose the proper type for you.

FXS Caller ID Generation : Disable

☑ Send Caller ID After The First Ring

FSK Caller ID Type : Bellcore

**FXS Caller ID Generation:** Select **DTMF**, **FSK** or **FSK+Type II** Caller ID to enable the caller ID display function on FXS port. When enabled, the caller's phone number will be displayed on your phone set when the call comes through. FSK+Type II Caller ID is used for displaying the caller ID when receiving call waiting calls.

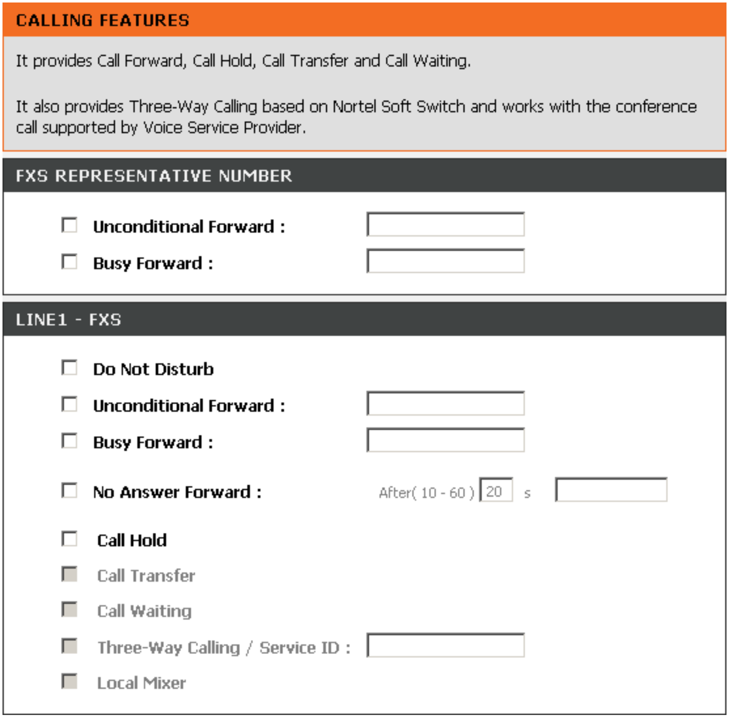
**Note:** Make sure that your phone set supports Type II Caller ID before you select it.

**Send Caller ID After The Firs Ring:** Check the box to send the caller ID after the first ring by FXS port; otherwise, the caller ID is sent before the first ring.

**FSK Caller ID Type:** Either Bellcore, ETSI or NTT can be selected.

## 3-2-1-3 Calling Features

ADVANCED → VoIP → Calling Features



CALLING FEATURES

It provides Call Forward, Call Hold, Call Transfer and Call Waiting.

It also provides Three-Way Calling based on Nortel Soft Switch and works with the conference call supported by Voice Service Provider.

FXS REPRESENTATIVE NUMBER

□ Unconditional Forward :

□ Busy Forward :

LINE1 - FXS

□ Do Not Disturb

□ Unconditional Forward :

□ Busy Forward :

□ No Answer Forward : After( 10 - 60 ) 20 s

□ Call Hold

□ Call Transfer

□ Call Waiting

□ Three-Way Calling / Service ID :

□ Local Mixer

**Do Not Disturb:** Check the box to reject (busy tone played) incoming calls.

**Unconditional Forward:** Check the box to forward incoming calls to the assigned "Forwarding Number" automatically.

**Busy Forward:** Check the box to forward incoming calls to the "Forward incoming Number" when the line is busy.

**No Answer Forward:** Check the box to forward incoming calls to the "Forward incoming Number" after ringing timeout (configurable from 10 to 60 seconds) expires.

**Call Hold:** Check the box to hold the call on the specific FXS port.

**Note:** Call Transfer or Call Waiting can only be activated when Call Hold is checked..

**Call Transfer:** Check the box to transfer the call to another destination.

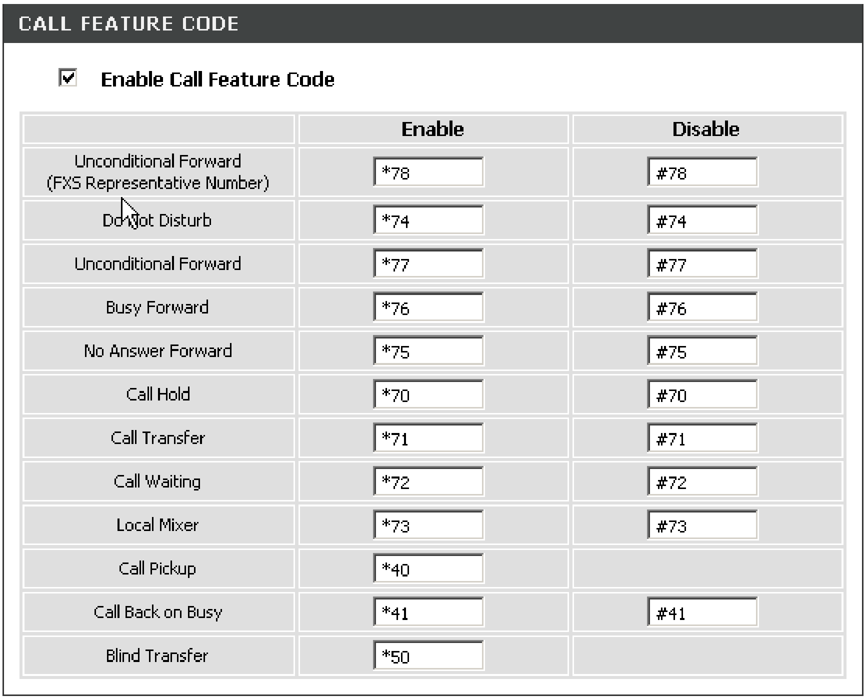
**Call Waiting:** Check the box to accept incoming call while talking.

**Three-Way Calling / Service ID:** It is used for Nortel Style 3-Way conference. Please enter correct service ID assigned on the SoftSwitch or IPPBX.

**Local Mixer:** Enable 3-Way conference mixer on DVG. This option is conflict to "**Three-Way Calling / Service ID"**, don't enable these two options simultaneously.

**Note:** The availability of a Three-Way call also depends on your VoIP network. Please also check with your service provider for these services.

ADVANCED → VoIP → Calling Features



CALL FEATURE CODE

☑ Enable Call Feature Code

| | Enable | Disable |
|---|---|---|
| Unconditional Forward<br>(FXS Representative Number) | *78 | #78 |
| Do Not Disturb | *74 | #74 |
| Unconditional Forward | *77 | #77 |
| Busy Forward | *76 | #76 |
| No Answer Forward | *75 | #75 |
| Call Hold | *70 | #70 |
| Call Transfer | *71 | #71 |
| Call Waiting | *72 | #72 |
| Local Mixer | *73 | #73 |
| Call Pickup | *40 | |
| Call Back on Busy | *41 | #41 |
| Blind Transfer | *50 | |

**Enable Call Feature Code:** Check the box to enable/disable some call feature codes through a phone set.

**Call pickup:** Allow one to pick up someone else's telephone call.

**Call Back on Busy:** Your phone will ring back the last number that called you.

**Blink Transfer:** Blind Transfer involves passing a call without notifying the recipient.

**Call Feature Code Instructions (example):**

1. If you would like to enable **DND** function of FXS, pick up the phone connected to FXS and dial **"*74#"**.
2. If you would like to enable **Unconditional Forward** of FXS and assign the number, pick up the phone and dial **"*77 0912345678#"**. 0912345678 is the number which the incoming call is forwarded to.
3. If you would disable **Unconditional Forward** of FXS, pick up the phone and dial **"#77#"**.

**Calling Feature Instructions:**

**Call Hold:** The call will be held after the FLASH button is pressed on the phone set. The VoIP Router will play a hold music (provided by your ITSP or VSP) to the remote end.

**Call Transfer:** The call will be held after FLASH button is pressed on local phone set (the VoIP Router plays on-hold music to the remote end). Meanwhile, the local user can dial out another number after the dial tone is heard. After the handset is on-hooked, the call originally on hold will then be transferred to the new number regardless the status of the new call. If wrong number is dialed for the new call, press the FLASH button will switch back to the call on hold. Also, if the local user doesn't hang up the phone after the new call is set up, press the FLASH button will switch between the original call and the new call. Please note that the PBX between phone sets and the VoIP Router must support FLASH features in order to use this function. If a phone set is connecting directly to the FXS port of the VoIP Router and the FLASH button does not function, please adjust the settings in "Flash Detect Time" from "Advanced Options" section.

**Note:** The availability of the above features also depends on your VoIP Service Provider. Please also check with your service provider for these services..

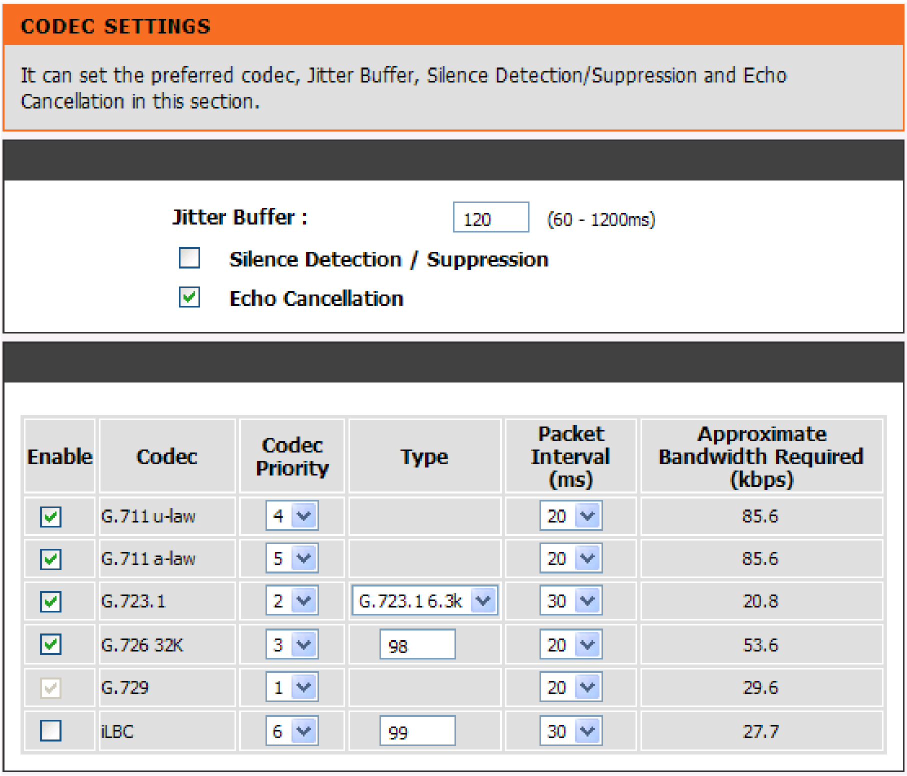
**Examples of establishing a Three-Way call:**

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 presses Flash to start the conference call.
   **Or**
4. Phone1 dials to Phone2, Phone2 answers the call.
5. Phone1 presses Flash then calls Phone3 (Phone2 is on hold) and Phone3 answers the call.
6. Phone1 presses Flash and dial 3 to start the conference call.

**Note:** The availability of a Three-Way call also depends on your VoIP network. Please also check with your service provider for these services.

## 3-2-1-4 Codec

ADVANCED → VoIP → Codec



CODEC SETTINGS

It can set the preferred codec, Jitter Buffer, Silence Detection/Suppression and Echo Cancellation in this section.

Jitter Buffer : 120 (60 - 1200ms)

☐ Silence Detection / Suppression

☑ Echo Cancellation

| Enable | Codec | Codec Priority | Type | Packet Interval (ms) | Approximate Bandwidth Required (kbps) |
|---|---|---|---|---|---|
| ☑ | G.711 u-law | 4 | | 20 | 85.6 |
| ☑ | G.711 a-law | 5 | | 20 | 85.6 |
| ☑ | G.723.1 | 2 | G.723.1 6.3k | 30 | 20.8 |
| ☑ | G.726 32K | 3 | 98 | 20 | 53.6 |
| ☑ | G.729 | 1 | | 20 | 29.6 |
| ☐ | iLBC | 6 | 99 | 30 | 27.7 |

**Jitter Buffer:** Enter the jitter of receiving packets.

**Silence Detection / Suppression:** Check the box to enable the silence packets and send less voice data (package) during the silent period while talking.

**Echo Canceling:** Check the box to remove echo and improve voice quality during conversation.

**RTCP-XR:** Enable RTCP-XR(RFC-3611) to report network quality.

**Codec:** Check the box to codec for the VoIP Gateway to support. All codecs are selected and supported by default. You can un-check the box that is not used.

**Codec Priority:** The priority of code for communication.

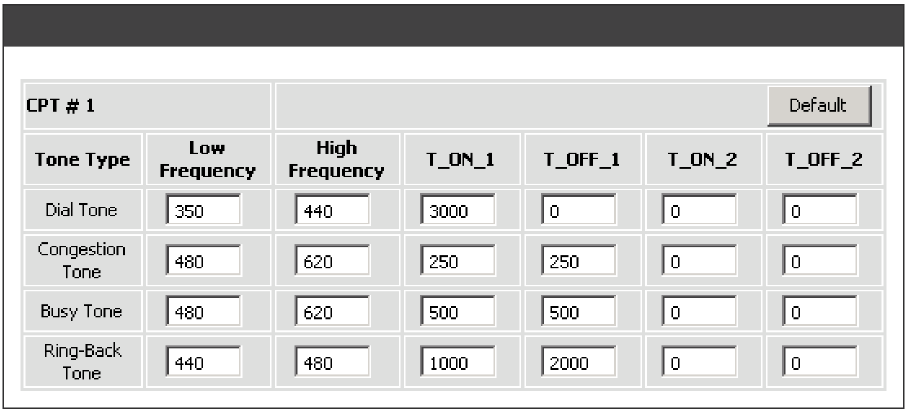
**Type:** To set dynamic payload types of codec.

**Packet Interval:** Select the frame size of voice package from different codec. It defines the time interval for the VoIP Gateway to send a RTP packet or voice packet to the receiving side. The smaller the value, the greater the bandwidth takes, and larger values might cause voice delay.

**Approximate Bandwidth Required:** It shows the bandwidth required from different codec and packet interval.

### 3-2-1-5 CPT/Cadence

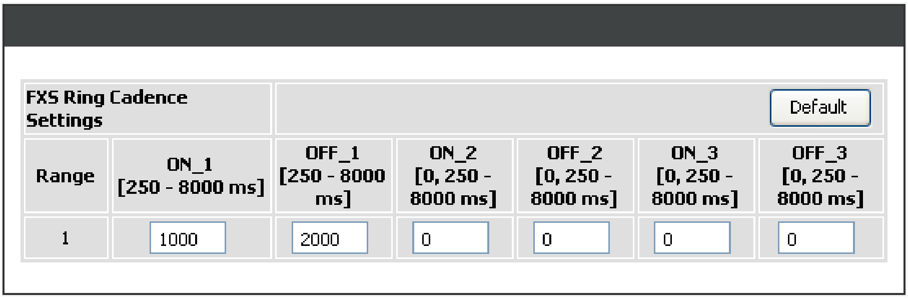
ADVANCED → VoIP → CPT / Cadence



| CPT # 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 |

**CPT # 1 Enable Setting 1:** Define the call process tones for the DVG-N5402FF generates.

ADVANCED → VoIP → CPT / Cadence



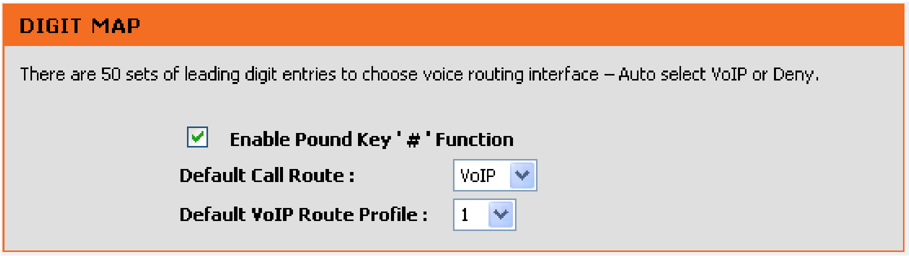
| FXS Ring Cadence Settings | | | | | | Default |
|---|---|---|---|---|---|---|
| Range | ON_1 [250 - 8000 ms] | OFF_1 [250 - 8000 ms] | ON_2 [0, 250 - 8000 ms] | OFF_2 [0, 250 - 8000 ms] | ON_3 [0, 250 - 8000 ms] | OFF_3 [0, 250 - 8000 ms] |
| 1 | 1000 | 2000 | 0 | 0 | 0 | 0 |

**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 that should be configured differs depending on local PSTN or PBX settings and requirements.

### 3-2-1-6 Digit Map

Digit Map supports multiple dial plans which help users to arrange least cost route. Each Proxy Server has individual dial plan which combines the original feature of Digit Map and Speed Dial. You can use "?" or "%" in the column of Scan Code and VoIP Dial-out. "?" represents a single digit, and "%" represents a wildcard. The function of the signs is to mapping the numbers between the number received from user and the replaced or modified number for actual dial out. With this function, users can easily add certain leading digits to replace a full set of numbers. There are 50 sets of leading digit entries to choose voice routing interface.

ADVANCED → VoIP → Digit Map



DIGIT MAP

There are 50 sets of leading digit entries to choose voice routing interface – Auto select VoIP or Deny.

☑ Enable Pound Key ' # ' Function

Default Call Route : VoIP

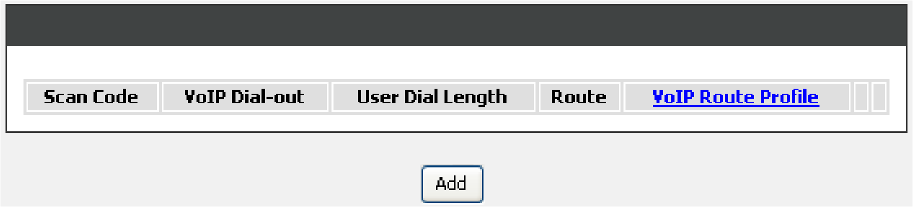
Default VoIP Route Profile : 1

**Enable Pound Key ' # ' Function:** Check the box to treat ' # ' as a digit and send out with other numbers when dialing. If you un-check the box and ' # ' is pressed after dialing, it will speed up the phone number detection of the VoIP Router.

**Default Call Route:** Select **VoIP** or **Deny** as the default call route for the calls.

**Default VoIP Route Profile:** Enter the Profile ID (ranging from 1-10) for the Default VoIP routing.

ADVANCED → VoIP → Digit Map



| Scan Code | VoIP Dial-out | User Dial Length | Route | VoIP Route Profile |
|---|---|---|---|---|

**Scan Code:** Enter the digits for the VoIP Router to scan while user is dialing.

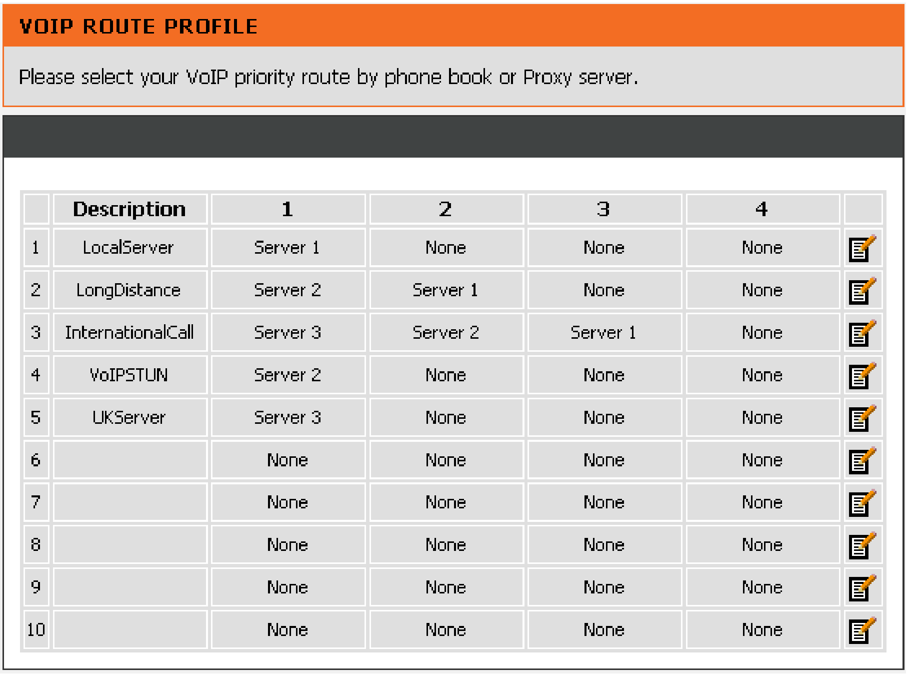
**VoIP Dial-out:** Enter the actual dialing number rule for the VoIP Router to call through the Internet.

**User Dial Length:** Enter the total number of digits that user dialed.

**Route:** Select **VoIP** or **Deny** for this entry.

**VoIP Route Profile:** Choose the proper Profile ID and click **VoIP Route Profile** to set the priority of VoIP Route Profile.

ADVANCED → VoIP → Digit Map → VoIP Route Profile



VOIP ROUTE PROFILE

Please select your VoIP priority route by phone book or Proxy server.

| | Description | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|
| 1 | LocalServer | Server 1 | None | None | None | 📝 |
| 2 | LongDistance | Server 2 | Server 1 | None | None | 📝 |
| 3 | InternationalCall | Server 3 | Server 2 | Server 1 | None | 📝 |
| 4 | VoIPSTUN | Server 2 | None | None | None | 📝 |
| 5 | UKServer | Server 3 | None | None | None | 📝 |
| 6 | | None | None | None | None | 📝 |
| 7 | | None | None | None | None | 📝 |
| 8 | | None | None | None | None | 📝 |
| 9 | | None | None | None | None | 📝 |
| 10 | | None | None | None | None | 📝 |

There are 10 VoIP route profiles. Each VoIP route profile provides four routes to select. **Server 1**, **Server 2**, **Server 3**, **Phone Book** and **None** can be selected for each route.

**Example of VoIP Route Profile:**

Assume that VoIP TA is registered to three servers.

Server 1 is local VoIP Service Provider.

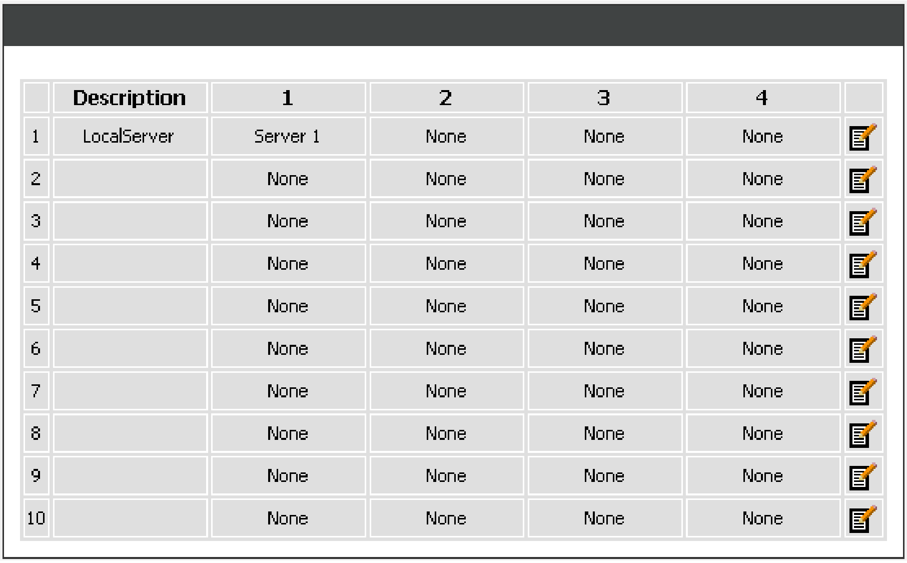
Server 2 is VoIP STUN (free to dial to some cities without charge).

Server 3 is VSP in UK.

**Example 1 – Single VoIP route,**

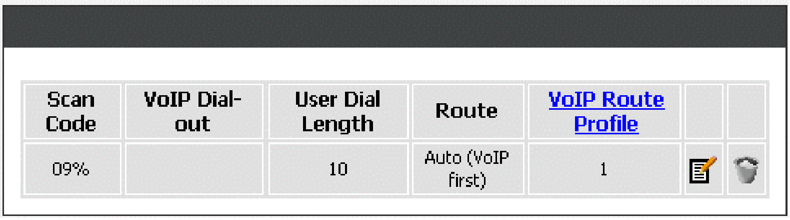
The number translation of each server is blank.

The VoIP route profile appears like:



| | Description | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|
| 1 | LocalServer | Server 1 | None | None | None | ✎ |
| 2 | | None | None | None | None | ✎ |
| 3 | | None | None | None | None | ✎ |
| 4 | | None | None | None | None | ✎ |
| 5 | | None | None | None | None | ✎ |
| 6 | | None | None | None | None | ✎ |
| 7 | | None | None | None | None | ✎ |
| 8 | | None | None | None | None | ✎ |
| 9 | | None | None | None | None | ✎ |
| 10 | | None | None | None | None | ✎ |

Digit Map Table appears like:

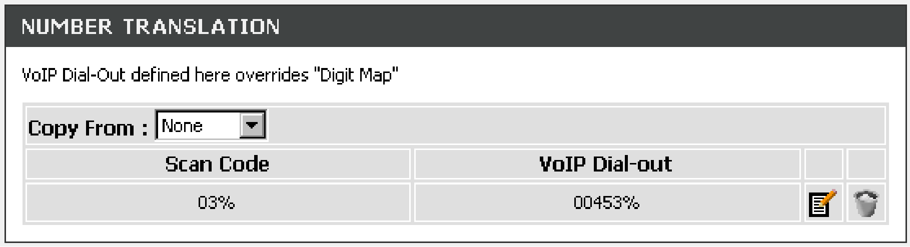


| Scan Code | VoIP Dial-out | User Dial Length | Route | VoIP Route Profile | | |
|---|---|---|---|---|---|---|
| 09% | | 10 | Auto (VoIP first) | 1 | ✎ | 🗑 |

As you dial the phone numbers starting with 09, like 0912345678, the call will only go through Server 1 (local VSP).

**Example 2 – Multiple Route,**

The number translation of Server 1 is blank, and the number translation of Server 2 appears like:



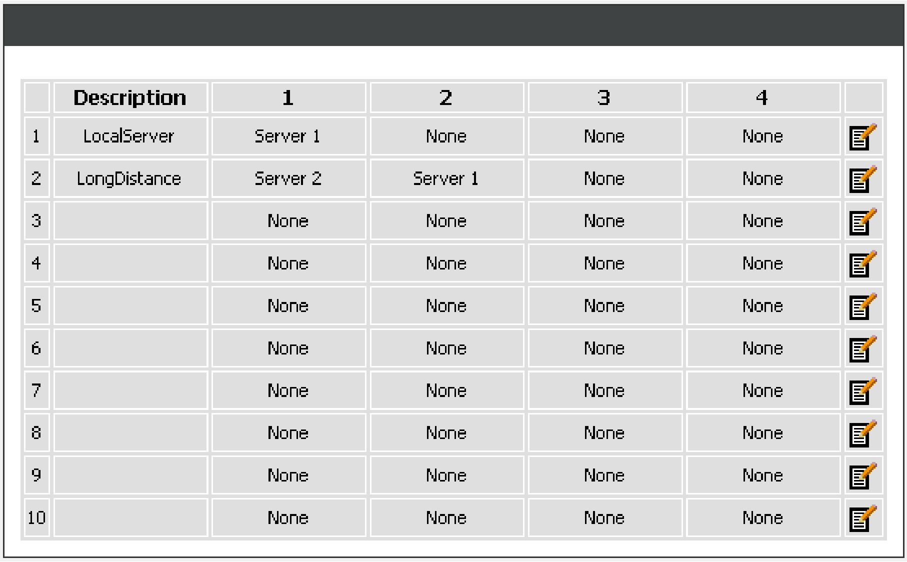
NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

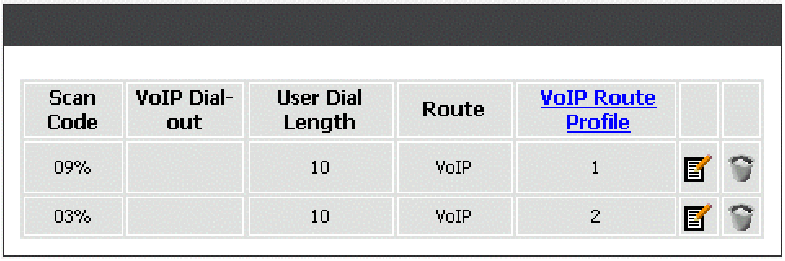
| Scan Code | VoIP Dial-out | | |
|---|---|---|---|
| 03% | 00453% | ✎ | 🗑 |

The VoIP route profile appears like:



| | Description | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|
| 1 | LocalServer | Server 1 | None | None | None | ✎ |
| 2 | LongDistance | Server 2 | Server 1 | None | None | ✎ |
| 3 | | None | None | None | None | ✎ |
| 4 | | None | None | None | None | ✎ |
| 5 | | None | None | None | None | ✎ |
| 6 | | None | None | None | None | ✎ |
| 7 | | None | None | None | None | ✎ |
| 8 | | None | None | None | None | ✎ |
| 9 | | None | None | None | None | ✎ |
| 10 | | None | None | None | None | ✎ |

Digit Map Table appears like:

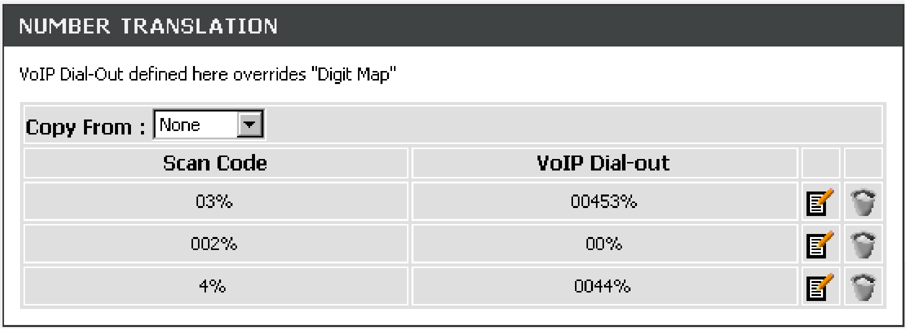


| Scan Code | VoIP Dial-out | User Dial Length | Route | VoIP Route Profile | | |
|---|---|---|---|---|---|---|
| 09% | | 10 | VoIP | 1 | ✎ | 🗑 |
| 03% | | 10 | VoIP | 2 | ✎ | 🗑 |

As you dial the phone numbers staring with 03, like 0312345678, the number will be changed to 0045312345678, followed the number translation of Server 2, and the call will go through Server 2 (free VSP) at first. If failed, the number will be back to 0312345678, and the route will be changed to Server1 (local VSP).

**Example 3 – Multiple Route,**

The number translation of Server 1 is blank, and the number translation of Server 2 appears like:



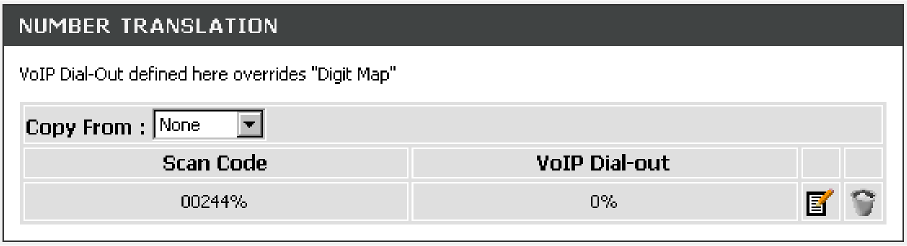
NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

| Scan Code | VoIP Dial-out | | |
|---|---|---|---|
| 03% | 00453% | ✎ | 🗑 |
| 002% | 00% | ✎ | 🗑 |
| 4% | 0044% | ✎ | 🗑 |

The number translation of Server 3 appears like:



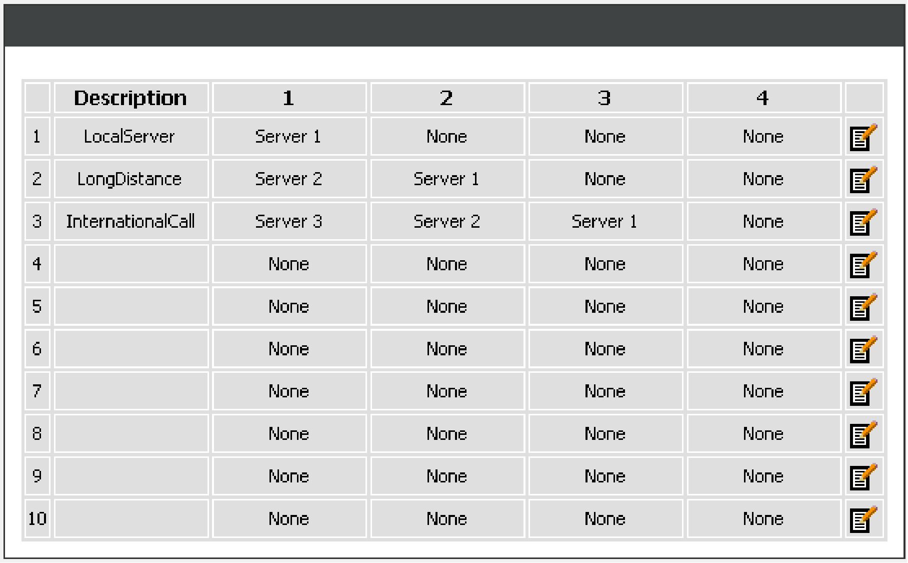
NUMBER TRANSLATION

VoIP Dial-Out defined here overrides "Digit Map"

Copy From : None

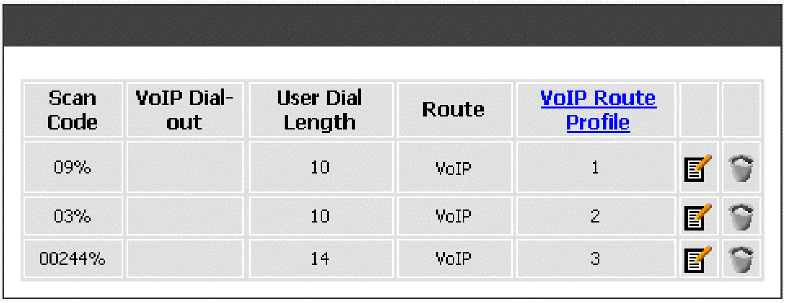
| Scan Code | VoIP Dial-out | | |
|---|---|---|---|
| 00244% | 0% | ✎ | 🗑 |

The VoIP Route Profile appears like:



| | Description | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|
| 1 | LocalServer | Server 1 | None | None | None | ✎ |
| 2 | LongDistance | Server 2 | Server 1 | None | None | ✎ |
| 3 | InternationalCall | Server 3 | Server 2 | Server 1 | None | ✎ |
| 4 | | None | None | None | None | ✎ |
| 5 | | None | None | None | None | ✎ |
| 6 | | None | None | None | None | ✎ |
| 7 | | None | None | None | None | ✎ |
| 8 | | None | None | None | None | ✎ |
| 9 | | None | None | None | None | ✎ |
| 10 | | None | None | None | None | ✎ |

Digit Map Table appears like:

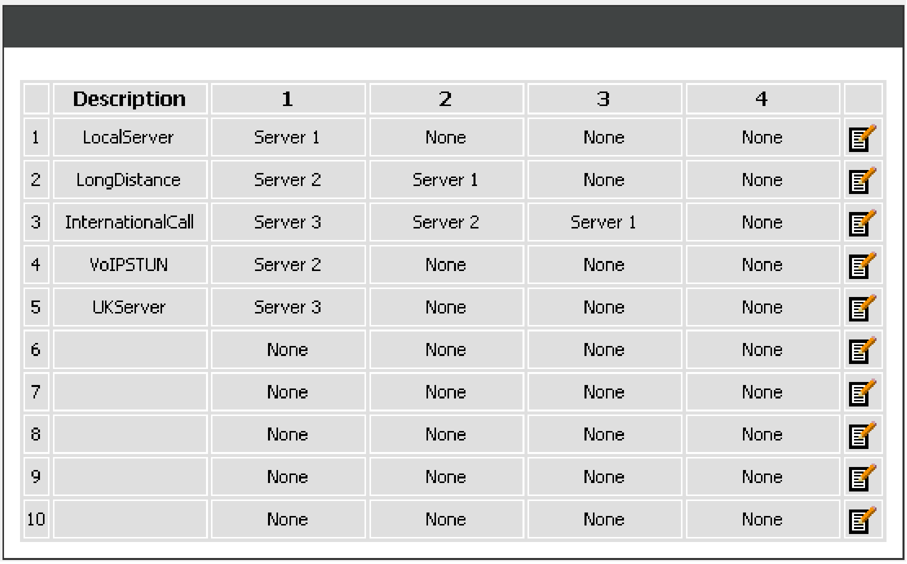


| Scan Code | VoIP Dial-out | User Dial Length | Route | VoIP Route Profile | | |
|---|---|---|---|---|---|---|
| 09% | | 10 | VoIP | 1 | ✎ | 🗑 |
| 03% | | 10 | VoIP | 2 | ✎ | 🗑 |
| 00244% | | 14 | VoIP | 3 | ✎ | 🗑 |

As you dial the phone numbers staring with 00244, like 00244123456789, the number will be changed to 0123456789 followed the number translation of Server3, and the call will go through Server 3 (UK VSP) at the first. If the first route is failed, the number is changed to 0044123456789, and the route is changed to Server 2 (free VSP). If the second route is failed, the number is back to 00244123456789, and the route is changed to Server 1 (local VSP).

**Methods of Digit Map:**

The VoIP route profile appears like:



| | Description | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|
| 1 | LocalServer | Server 1 | None | None | None | ✎ |
| 2 | LongDistance | Server 2 | Server 1 | None | None | ✎ |
| 3 | InternationalCall | Server 3 | Server 2 | Server 1 | None | ✎ |
| 4 | VoIPSTUN | Server 2 | None | None | None | ✎ |
| 5 | UKServer | Server 3 | None | None | None | ✎ |
| 6 | | None | None | None | None | ✎ |
| 7 | | None | None | None | None | ✎ |
| 8 | | None | None | None | None | ✎ |
| 9 | | None | None | None | None | ✎ |
| 10 | | None | None | None | None | ✎ |

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

**For example,**

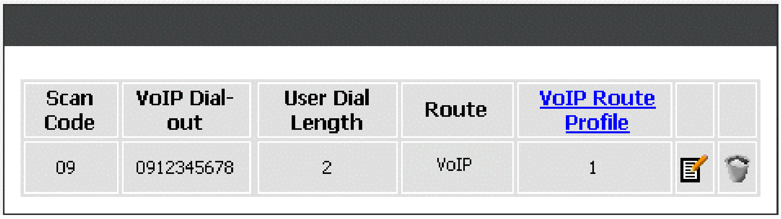
Scan Code: 09

VoIP Dial-out: 0912345678

User Dial Length: 2

Route: Auto

VoIP Route Profile: Route # 1



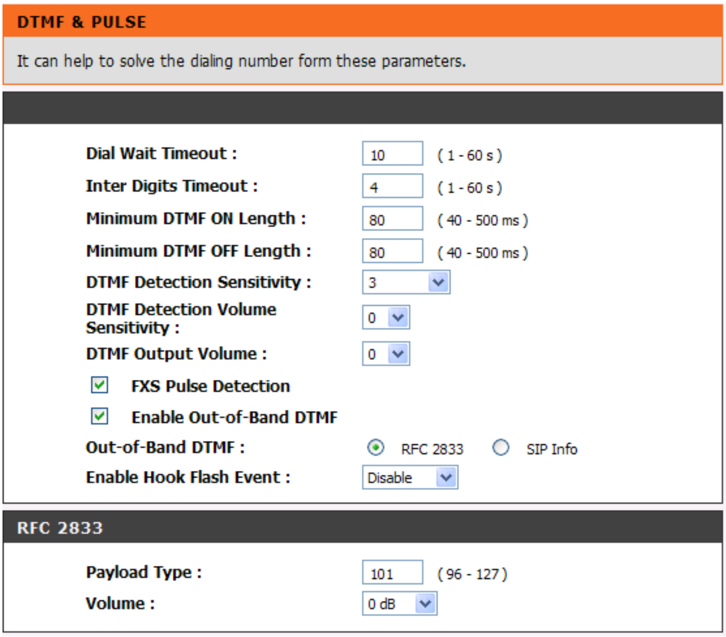
| Scan Code | VoIP Dial-out | User Dial Length | Route | VoIP Route Profile | | |
|---|---|---|---|---|---|---|
| 09 | 0912345678 | 2 | VoIP | 1 | | |

Pick up the handset and dial 09, and the system will do the things as follow:

1. Change the phone number to the global number. 09 is changed to 0912345678. Then, follow the VoIP Route Profile # 1.

## 3-2-1-7 DTMF & PULSE

ADVANCED → VoIP → DTMF & PULSE



DTMF & PULSE

It can help to solve the dialing number form these parameters.

|  |  |
|---|---|
| Dial Wait Timeout : | 10 ( 1 - 60 s ) |
| Inter Digits Timeout : | 4 ( 1 - 60 s ) |
| Minimum DTMF ON Length : | 80 ( 40 - 500 ms ) |
| Minimum DTMF OFF Length : | 80 ( 40 - 500 ms ) |
| DTMF Detection Sensitivity : | 3 |
| DTMF Detection Volume Sensitivity : | 0 |
| DTMF Output Volume : | 0 |
| ☑ FXS Pulse Detection | |
| ☑ Enable Out-of-Band DTMF | |
| Out-of-Band DTMF : | ● RFC 2833 ○ SIP Info |
| Enable Hook Flash Event : | Disable |

RFC 2833

|  |  |
|---|---|
| Payload Type : | 101 ( 96 - 127 ) |
| Volume : | 0 dB |

**Dial Wait Timeout:** Enter the timeout duration after the user picks up the phone set.

**Inter Digits Timeout:** Enter the timeout duration between the intervals of each key pressed. When exceeding the set timeout duration without entering further digits, the numbers entered will be dialed out.

**Minimum DTMF ON Length (Dial on)/ Minimum DTMF OFF Length (Dial off - between tones):** This variable is to set the length of DTMF playback.

**DTMF Detection Sensitivity:** This variable is to set the sensitivity of the telephone keys for the VoIP Router to detect the DTMF.

**DTMF Detection Volume Sensitivity:** Adjust DTMF detect threshold of DTMF volume

**DTMF Output Volume:** Adjust the Tx volume of FXS port for DTMF Caller ID or Out of Band DTMF.

**FXS Pulse Detection:** It allows FXS detect PULSE dial method sends from a phone set.

**Enable Out-of-Band DTMF:** This variable is to set the method of DTMF transmission. RFC2833 or SIP Info.

> **Note:** Out-of-Band DTMF transport method varies from VoIP networks, please contact your VoIP provider for the preferred method.

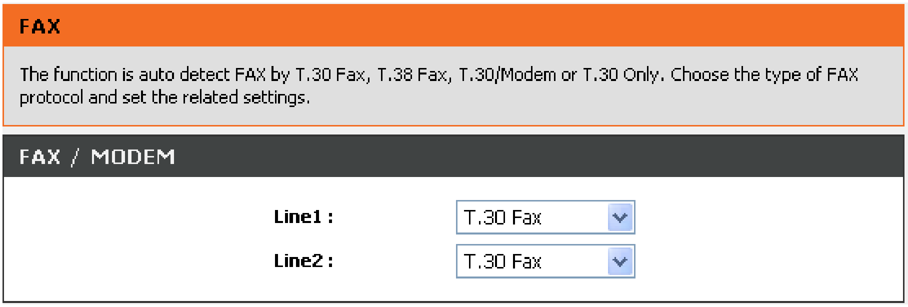
**Enable Hook Flash Event:** Select **Auto**, **RFC2833**, or **SIP info** for the signaling method of Hook Flash Event.

**Payload Type:** payload type of RFC2833.

**Volume:** Select the volume of RFC 2833 from the drop-down menu.

### 3-2-1-8 Fax

ADVANCED → VoIP → FAX



FAX

The function is auto detect FAX by T.30 Fax, T.38 Fax, T.30/Modem or T.30 Only. Choose the type of FAX protocol and set the related settings.

FAX / MODEM

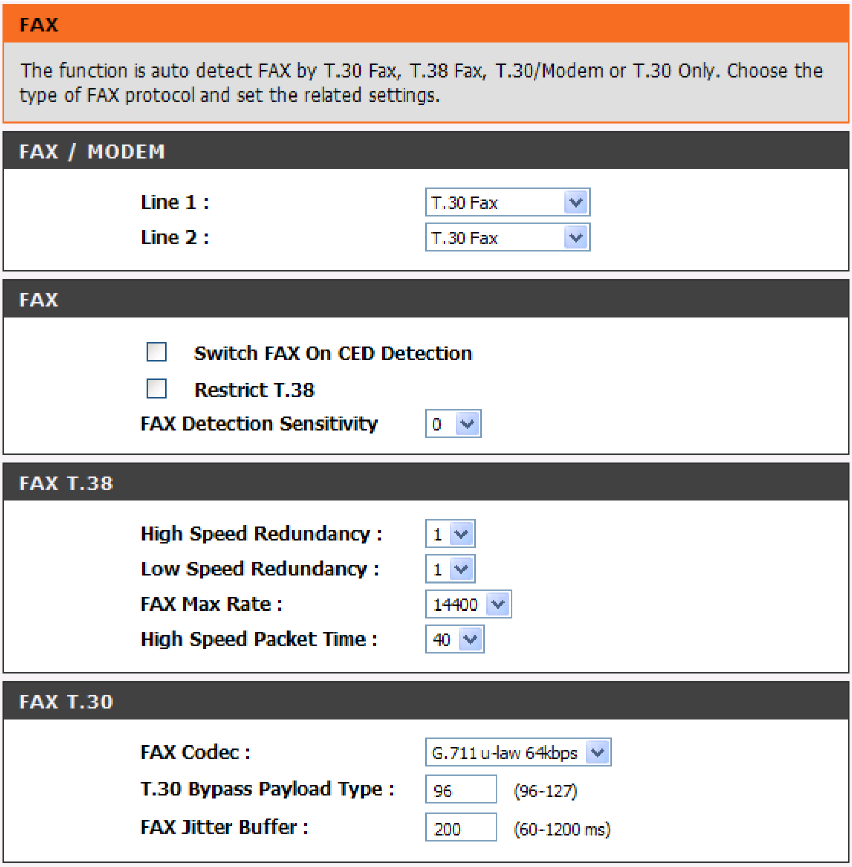
Line1 : T.30 Fax

Line2 : T.30 Fax

| Option | Fax Detection | Content of SDP of re-INVITE | re-INVITE with T.38 from remote party |
|---|---|---|---|
| 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 | Accept and change RTP to T.38 |
| T.38 Native | Yes | re-INVITE with T.38 | Accept and change RTP to T.38 |
| T.30 V.152 | Yes | N/A | Accept and change RTP to T.38 |

**Note:** When a fax tone is detected from the call, the VoIP Router 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.

ADVANCED → VoIP → FAX



**FAX**

The function is auto detect FAX by T.30 Fax, T.38 Fax, T.30/Modem or T.30 Only. Choose the type of FAX protocol and set the related settings.

**FAX / MODEM**

Line 1 : T.30 Fax

Line 2 : T.30 Fax

**FAX**

□ Switch FAX On CED Detection

□ Restrict T.38

FAX Detection Sensitivity 0

**FAX T.38**

High Speed Redundancy : 1

Low Speed Redundancy : 1

FAX Max Rate : 14400

High Speed Packet Time : 40

**FAX T.30**

FAX Codec : G.711 u-law 64kbps

T.30 Bypass Payload Type : 96 (96-127)

FAX Jitter Buffer : 200 (60-1200 ms)

**Switch FAX On CED Detection:** DVG will send FAX Re-Invite immediately as it detect FAX CED tone, that will save handshaking time between FAX machines.

**Restrict T.38:** DVG will reject T.38 Re-invite in case the FAX type contains without T.38.

**FAX Detection Sensitivity:** To set higher value to make DVG to be more sensitive.

**High Speed Redundancy:** Set redundancy packets for FAX image. It could repair FAX image for non-continuous packets lost. The higher redundancy the higher bandwidth required.

**Low Speed Redundancy:** Set redundancy packets for FAX handshaking signaling.

**FAX Codec:** Select **G.711 a-law** or **G.711 u-law** for T.30 from the drop-down menu.

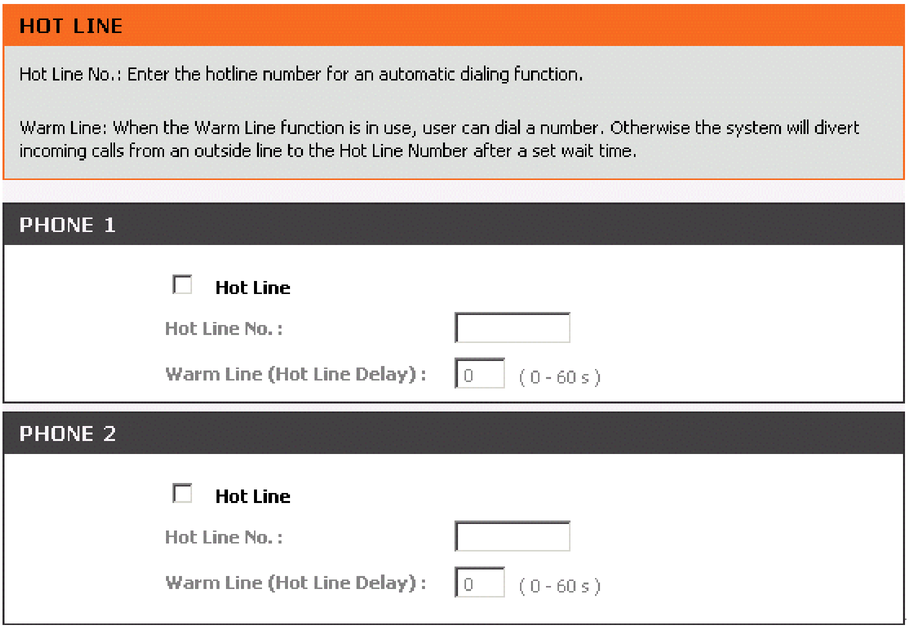
**T.30 Bypass Payload Type:** Fill correct payload type of T.30 bypass method.

**FAX Jitter Buffer:** Enter the buffer or jitter when receiving packets.

> **Note:** When you send a fax over an IP network, the IP network needs to support fax over IP functionality (either T.38 or T.30). Please consult your VoIP Service Provider for this setting.

## 3-2-1-9 Hot Line

ADVANCED → VoIP → Hot Line



HOT LINE

Hot Line No.: Enter the hotline 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.

PHONE 1

□ Hot Line

Hot Line No. :

Warm Line (Hot Line Delay) : 0 ( 0 - 60 s )

PHONE 2

□ Hot Line

Hot Line No. :

Warm Line (Hot Line Delay) : 0 ( 0 - 60 s )

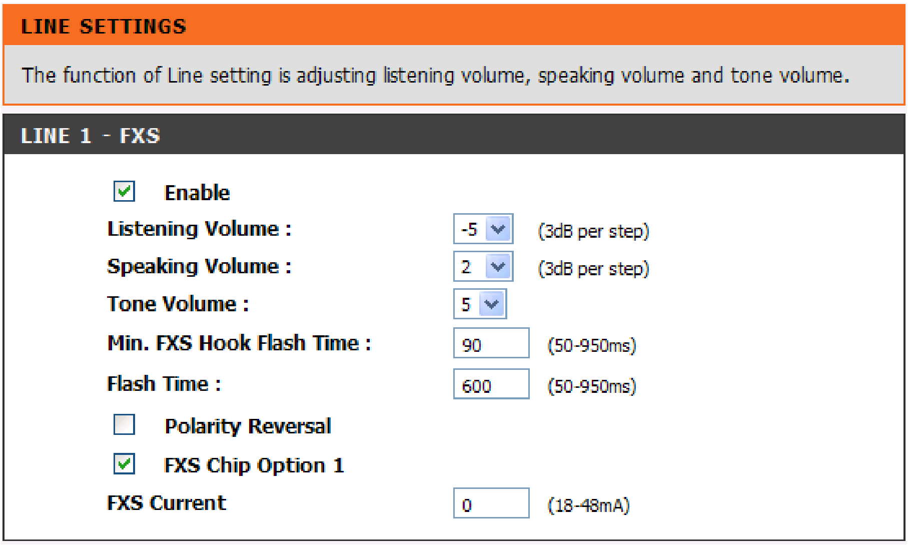
**Hot Line:** Check to direct the call automatically to a pre-configured destination without any action when the FXS is off-hook. (ie. as the user picks up the phone). When the FXS is under Hot Line mode, no other phone numbers can be dialed.

**Hot Line No.:** Enter the number for pre-defined destination.

**Warm Line:** Enter the time for the call to start with a pause, so the user can dial another number. The call will be automatically directed to the pre-configured destination within timeout period.

### 3-2-1-10 Line

ADVANCED → VoIP → Line



LINE SETTINGS

The function of Line setting is adjusting listening volume, speaking volume and tone volume.

LINE 1 - FXS

☑ Enable

Listening Volume : -5 (3dB per step)

Speaking Volume : 2 (3dB per step)

Tone Volume : 5

Min. FXS Hook Flash Time : 90 (50-950ms)

Flash Time : 600 (50-950ms)

□ Polarity Reversal

☑ FXS Chip Option 1

FXS Current 0 (18-48mA)

**Enable:** Tick the check box to enable a line. If some lines are not used, disable them (Pause Function) to avoid unnecessary waiting when an incoming call is diverting to the line.

**Listening Volume:** Use the drop-down menu to adjust the hearing (listening) volume.

**Speaking Volume:** Use the drop-down menu to adjust the speaking volume.

**Tone Volume:** Use the drop-down menu to adjust the tone volume. It will apply to all tones generated by the VoIP Router including Dial Tone, Ring Back Tone and Busy Tone.

**Min. FXS Hook Flash Time:** Enter the minimum flash time for FXS detecting. When the flash signal generated by the phone set is shorter than Min. FXS Hook Flash Time, FXS port will be on-hook.

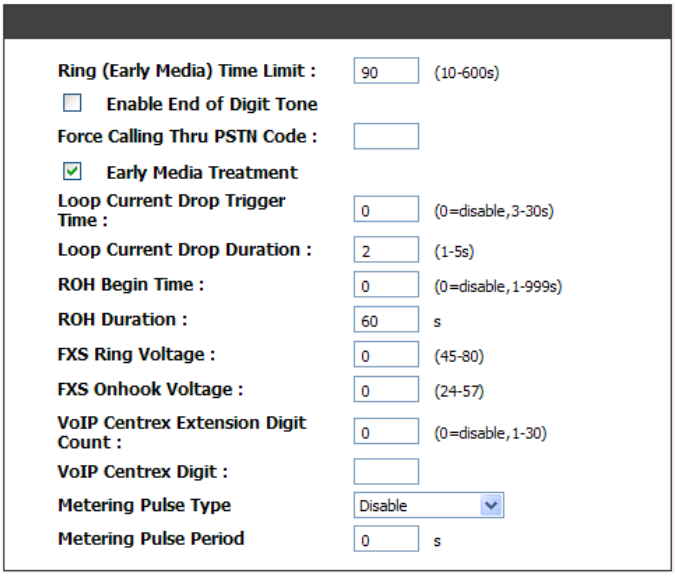
**Flash Time:** Enter the maximum flash time for FXS detecting. When the flash signal generated by the phone set is longer than the Flash Time, FXS port will be on-hook.

**Polarity Reversal:** Check the box to activate the generation of polarity reversal from FXS.

**FXS Chip Option 1:** Check the box to avoid mis-detecting the loop state of a subscriber line or PBX user loop from FXS interface. In some cases, the off-hook voltage might cause the FXS interface mis-detect the idle and the active state, in order to avoid this situation, un-check this feature.

**FXS Current:** Set the output D.C. current of FXS port.

ADVANCED → VoIP → Line



| | | |
|---|---|---|
| Ring (Early Media) Time Limit : | 90 | (10-600s) |
| □ Enable End of Digit Tone | | |
| Force Calling Thru PSTN Code : | | |
| ☑ Early Media Treatment | | |
| Loop Current Drop Trigger Time : | 0 | (0=disable,3-30s) |
| Loop Current Drop Duration : | 2 | (1-5s) |
| ROH Begin Time : | 0 | (0=disable,1-999s) |
| ROH Duration : | 60 | s |
| FXS Ring Voltage : | 0 | (45-80) |
| FXS Onhook Voltage : | 0 | (24-57) |
| VoIP Centrex Extension Digit Count : | 0 | (0=disable,1-30) |
| VoIP Centrex Digit : | | |
| Metering Pulse Type | Disable | |
| Metering Pulse Period | 0 | s |

**Ring (Early Media) Time Limit[10 - 600secs]:** Enter the timeout to cancel a call if no one answers the phone.

**Enable End of Digit Tone:** Check the box to activate the function of playing a "Beep-Beep" tone to notify the user that the call is in progress.

**Early Media Treatment:** Check the box to send the one-way RTP immediately when a connection with a VoIP service provider has been set up.

**Loop Current Drop Trigger Time:** Enter the time to avoid the line being engaged when FXS port is connected to PBX. It stops the loop current from FXS port when FXS port is playing busy tone. The setting "0" zero is to disable this function.

**Loop Current Drop Duration:** Enter the drop duration for loop current.

**ROH Begin Time:** As users forget hang up phone set it makes FXS play loud Howler Tone to notify users put hand set correctly. If this timer is set to be 20 seconds, that FXS play busy tone for 20 seconds then play ROH.

**ROH Duration:** It is the maximum time for FXS play ROH, then FXS will stop play ROH and keep silence.

**FXS Ring Voltage:** It is to set the Ring Voltage of FXS.

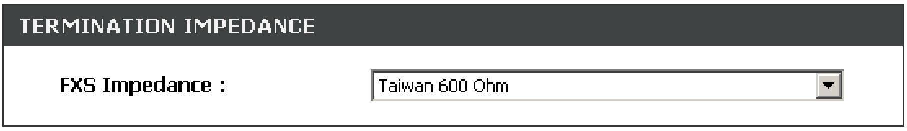
**FXS Onhook Voltage:** It is to set the idle Voltage of FXS.

**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.

**Metering Pulse Type/ Metering Pulse Period:** It is used for telephony device which connected to FXS port for billing purpose. **DVG-N5402FF provide 14k Hz and 16k Hz metering capacity. The fully support for detail Metering Pulse Period is not free charge, please contact with your vendor.**

ADVANCED → VoIP → Line

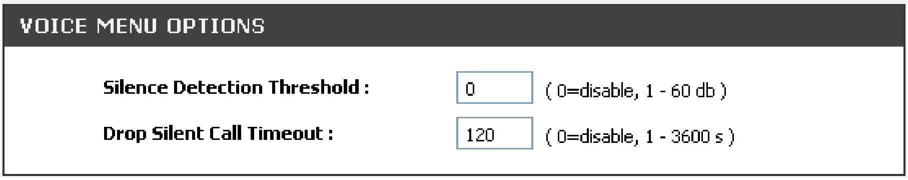


TERMINATION IMPEDANCE

FXS Impedance : Taiwan 600 Ohm

**FXS Impedance:** Select different impedance from the drop-down menu.

ADVANCED → VoIP → Line



VOICE MENU OPTIONS

Silence Detection Threshold : 0 ( 0=disable, 1 - 60 db )

Drop Silent Call Timeout : 120 ( 0=disable, 1 - 3600 s )

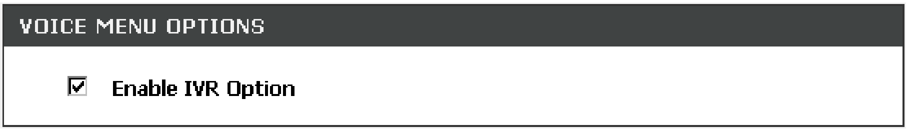
This feature is a call drop standard for a VoIP Router to determine whether or not to hang up the phone. The VoIP Router will disconnect the call automatically to avoid keeping the line engaged if the detected volume is below the **Silence Detection Threshold** or the time exceeds the **Drop Silent Call Timeout**.

**Silence Detection Threshold:** Enter the threshold (dB) to detect if there is voice coming from RJ-11 interface.

**Drop Silent Call Timeout:** Enter the duration (second) for detecting if there are RTP packets receiving from RJ-45 interface.

**Note:** Improper values for above settings might cause unexpected automatic disconnection of a call. Default values are recommended.

ADVANCED → VoIP → Line

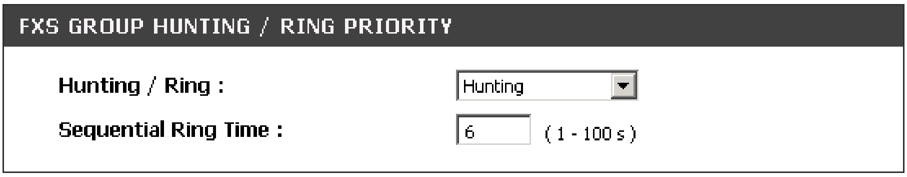


VOICE MENU OPTIONS

☑ Enable IVR Option

**Enable IVR Option:** Check the box to enable IVR function.

ADVANCED → VoIP → Line



FXS GROUP HUNTING / RING PRIORITY

Hunting / Ring : Hunting

Sequential Ring Time : 6 ( 1 - 100 s )

**Hunting/Ring:** It is used to set FXS group hunting mode. There are **Hunting**, **Simultaneous Ring** and **Sequential Ring**.

**Hunting:** When someone calls in by dialing FXS representative number, the system will always assign the call to the first line.

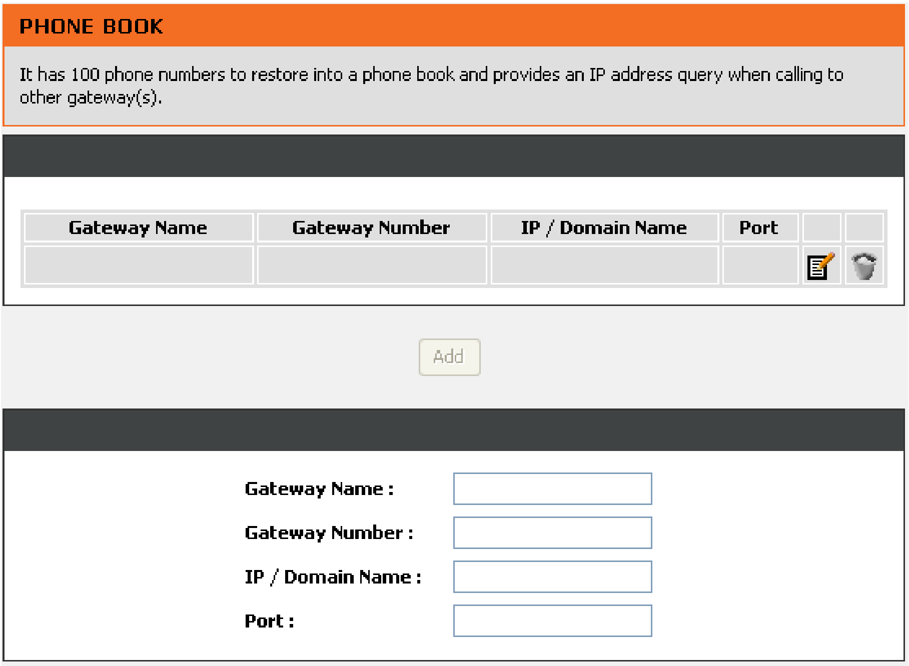
**Simultaneous Ring:** When someone calls in by dialing FXS representative number, all FXS ports will ring at the same time.

**Sequential Ring:** When someone calls in by dialing FXS representative number, the system will assign the call to each FXS ports in order according **Sequential Ring Time**. You can adjust **Sequential Ring Time** for the ring time of each port.

### 3-2-1-11 Phone Book

**Phone Book:** It is used for peer-to-peer communication. Some peer information needs to be added to this section prior to making peer-to-peer calls. You need to enter the phone number and the IP address of the remote peer.

ADVANCED → VoIP → Phone Book



PHONE BOOK

It has 100 phone numbers to restore into a phone book and provides an IP address query when calling to other gateway(s).

| Gateway Name | Gateway Number | IP / Domain Name | Port | | |
|---|---|---|---|---|---|
| | | | | ✎ | 🗑 |

| | |
|---|---|
| Gateway Name : | |
| Gateway Number : | |
| IP / Domain Name : | |
| Port : | |

**Gateway Name:** Enter the alias of the remote peer.

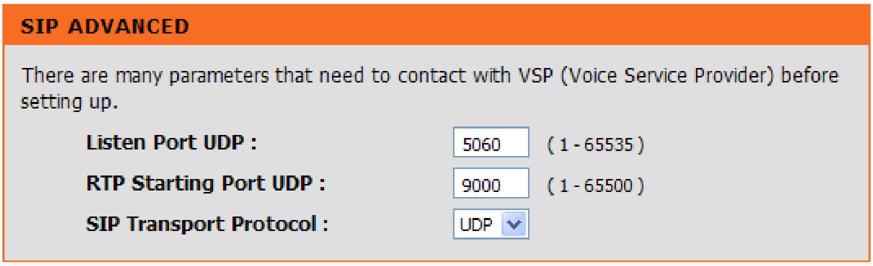
**Gateway Number:** Enter the phone number of the remote peer.

**IP / Domain Name:** Enter the IP address or URL (Uniform Resource Locator) of the remote peer.

**Port:** Enter the listen port of the remote peer.

### 3-2-1-12 SIP Advanced

ADVANCED → VoIP → SIP Advanced



SIP ADVANCED

There are many parameters that need to contact with VSP (Voice Service Provider) before setting up.

|  |  |  |
|---|---|---|
| Listen Port UDP : | 5060 | ( 1 - 65535 ) |
| RTP Starting Port UDP : | 9000 | ( 1 - 65500 ) |
| SIP Transport Protocol : | UDP |  |

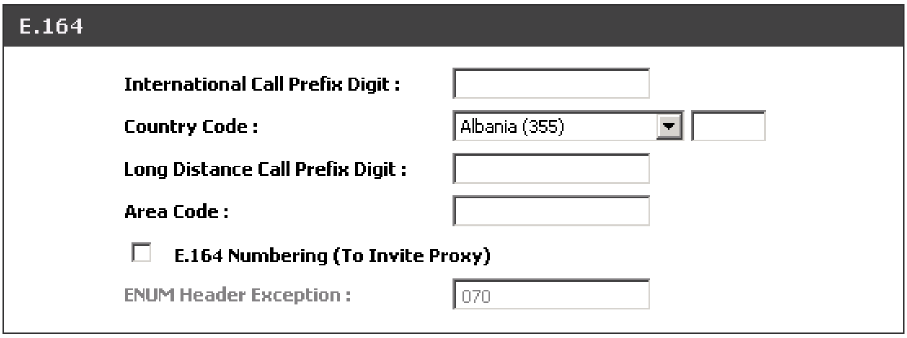
**Listen Port UDP:** Enter the VoIP Router's listening port in this field. Leave it as default settings, unless it conflicts with ports used by other device in your network.

**RTP Starting Port UDP:** Enter the starting port number or transmitting voice data among VoIP devices. Each line requires 2 ports.

> **For example**, if the starting port is 9000, then Line 1 will take up ports 9000 and 9001, and Line 2 will take up ports 9002 and 9003, and so forth.

**SIP Transport Protocol:** DVG-N5402FF supports UDP, TCP and TLS for SIP signaling. Most of SIP Server support UDP, if you prefer TCP or TLS please make sure whether remote party supports TCP/TLS or not.

ADVANCED → VoIP → SIP Advanced



E.164

|  |  |
|---|---|
| International Call Prefix Digit : |  |
| Country Code : | Albania (355) |
| Long Distance Call Prefix Digit : |  |
| Area Code : |  |
| □ E.164 Numbering (To Invite Proxy) |  |
| ENUM Header Exception : | 070 |

**International Call Prefix Digit:** Enter the International call prefix.

**Country Code:** Select the desired country code from the drop-down menu or enter the country code if **Other** is selected.

**Long Distance Call Prefix Digit:** Enter the long-distance prefix digit for making a long-distance call.

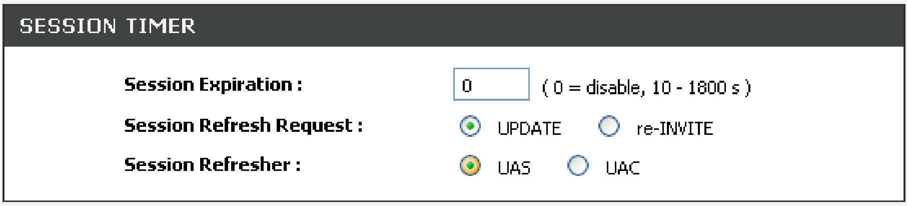
**Area Code:** Enter the area code.

**E.164 Numbering(To Invite Proxy):** This variable is followed the E.164 rule, but it depends on the SIP proxy server. Click the check box to send the number following the E.164 rule by the VoIP Router.

**ENUM Header Exception:** Enter the prefix number that the VoIP Router sends the number without followed the E.164 rule.

**Note:** E.164 Numbering depends on the proxy. If you fail to make a call, please contact your VoIP Service Providers.

ADVANCED → VoIP → SIP Advanced



SESSION TIMER

Session Expiration : 0 ( 0 = disable, 10 - 1800 s )

Session Refresh Request : ● UPDATE ○ re-INVITE

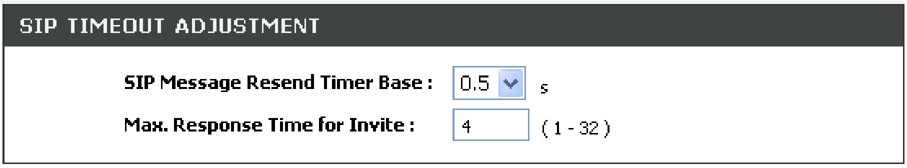
Session Refresher : ● UAS ○ UAC

**Session Expiration:** This field will set the time that the VoIP Router will allow a SIP session to remain die (without traffic) before dropping it.

**Session Refresh Request:** Select **UPDATE** or **re-INVITE** to send refresh requests to the Server.

**Session Refresher:** This determines which side of an expired call session will initiate the session refresh. uac – specifies that the Caller side will initiate the session refresh. uas – specifies that the Call receiver (the "Callee") will initiate the session refresh.

ADVANCED → VoIP → SIP Advanced



SIP TIMEOUT ADJUSTMENT

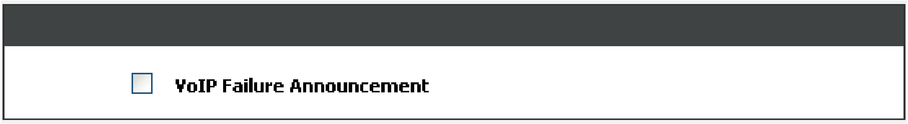
SIP Message Resend Timer Base : 0.5 s

Max. Response Time for Invite : 4 ( 1 - 32 )

**SIP Message Resend Timer Base:** Select the resend timer base from the drop-down menu if response is not received within the base time. The sequence of sending is like "base time" * 2, and send again at "base time" *2 *2. The maximum resend time is four seconds. Resend action will stop when the total resend time has reached 20 seconds.

**Max. Response Time for Invite:** Enter the maximum response time for INVITE packet. When the destination does not reply within the set time, the call is failed.

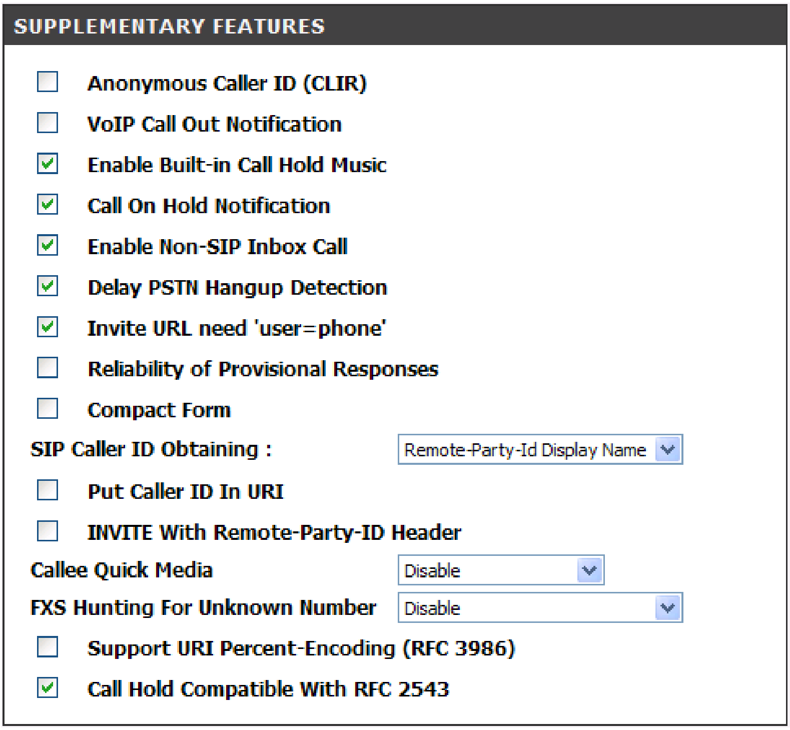
ADVANCED → VoIP → SIP Advanced



□ VoIP Failure Announcement

**VoIP failure announcement:** Check the box to play a voice announcement if the VoIP Router fails to register to the SIP proxy server while FXS is off-hook.

ADVANCED → VoIP → SIP Advanced



SUPPLEMENTARY FEATURES

- □ Anonymous Caller ID (CLIR)
- □ VoIP Call Out Notification
- ☑ Enable Built-in Call Hold Music
- ☑ Call On Hold Notification
- ☑ Enable Non-SIP Inbox Call
- ☑ Delay PSTN Hangup Detection
- ☑ Invite URL need 'user=phone'
- □ Reliability of Provisional Responses
- □ Compact Form

SIP Caller ID Obtaining : Remote-Party-Id Display Name

- □ Put Caller ID In URI
- □ INVITE With Remote-Party-ID Header

Callee Quick Media: Disable

FXS Hunting For Unknown Number: Disable

- □ Support URI Percent-Encoding (RFC 3986)
- ☑ Call Hold Compatible With RFC 2543

**Anonymous Caller ID (CLIR):** Check the box to lock the delivery of the Caller ID to the called party.

**VoIP Call Out Notification:** Check the box to enable the function of playing a tone to notify user that the call is through VoIP.

**Enable Built-in Call Hold Music:** Check the box to enable the function of playing music when receiving Call Hold request.

**Call On Hold Notification:** FXS will send alert to phone set as users hang up if there is a call still held in another line.

**Enable Non-SIP Inbox Call:** Check the box to make local calls. Local Call here means the call does not go through the Internet and if the dialed number is the extension of other line. You can un-check it to configure as all calls go through the Internet.

**Invite URL need 'user=phone':** Check the box to add 'user=phone' as a hint that the part left to the '@' sign is actually a phone number.

**Reliability of Provisional Responses:** Check the box to send a PRACK request during the progress of the request processing. Reliability of Provisional Responses is to ACK at every SIP packet. With this method, SIP packet will act like TCP, ie. every packet sent will receive an ACK to make sure that packet sent has been received by other peer.

**Compact Form:** Check the box to represent common header field names in an abbreviated form. This may be useful when SIP message is too large to be carried on and recognized by the user agent.

**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 locates 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.

**Callee Quick Media:** DVG-N5402FF will send RTP to remote party immediately as user answer an inbound call.

**FXS Hunting For Unknown Number:** Select the response for an incoming call which the called number is not exist in on the DVG.

**Disable –** DVG responses 404 not fornd.
**Hunt and Transit Dial –** DVG sends alert to an available FXS port and dial the number to PBX as the FXS port picked up by PBX. It works with SoftSwitch or IPPBX to allow a remote client reach the PBX extension for one step dial. (For virtual extension)
**FXS Group Hunting/ Ring Type --** DVG sends alert to an available FXS port for hunting group.

**Support URI Percent-Encoding(RFC 3986):** Check the box to encode/decode the letters of the basic Latin alphabet, digits, and a few special characters which follow RFC 3986.

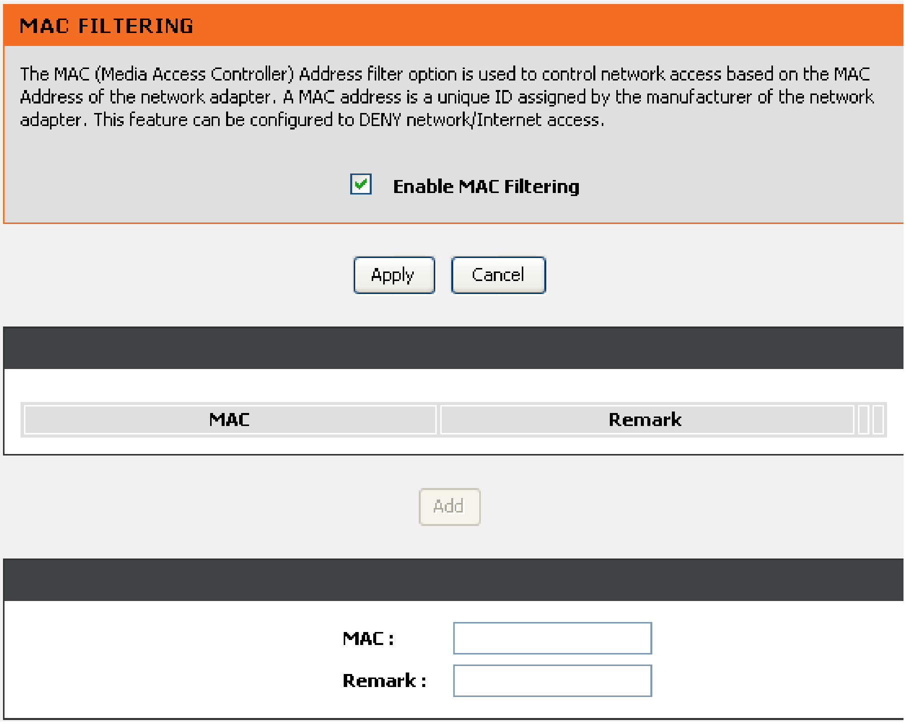
**Call Hold Compatible With RFC 2543:** It is used to set the procedure of Call Hold being compatible with RFC 2543.

# 3-2-2 Access Control

## 3-2-2-1 MAC Filtering

Use MAC Filters to deny computers within the local area network from accessing the Internet. You can either manually add a MAC address that are connected to the VoIP Router.

ADVANCED → Access Control → MAC Filtering



MAC FILTERING

The MAC (Media Access Controller) Address filter option is used to control network access based on the MAC Address of the network adapter. A MAC address is a unique ID assigned by the manufacturer of the network adapter. This feature can be configured to DENY network/Internet access.

☑ Enable MAC Filtering

| MAC | Remark |
|---|---|

MAC :

Remark :

**Enable MAC Filtering:** Check the box to deny from accessing Internet.

**MAC:** Enter the MAC of the computer in the LAN (Local Area Network) to be used in the MAC filter table.

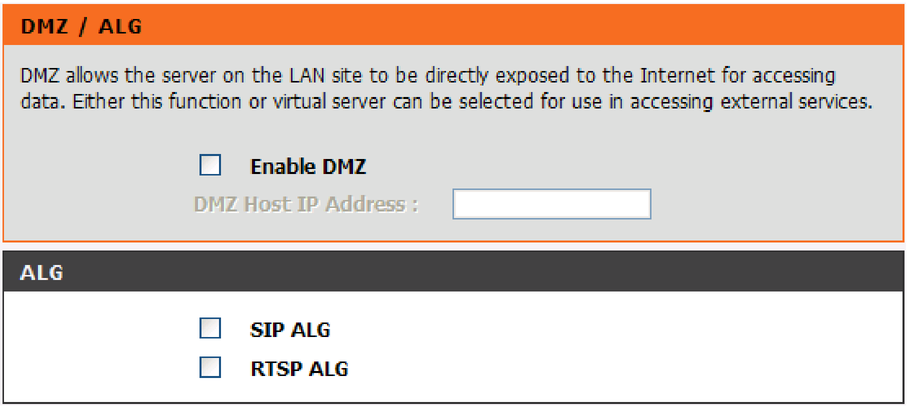
**Remark:** Enter comments.

# 3-2-3 Firewall and DMZ

## 3-2-3-1 DMZ

DMZ (Demilitarized Zone) allows the server on the LAN site to be directly exposed to the Internet for accessing data and to forward all incoming ports to the DMZ Host. Adding a client to the DMZ may expose that computer to a variety of security risks; so only use this option as a last resort.

ADVANCED → Firewall and DMZ → DMZ



DMZ / ALG

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

DMZ Host IP Address :

ALG

□ SIP ALG

□ RTSP ALG

**Enable DMZ:** Check the box to enable DMZ feature.

**DMZ Host IP Address:** Enter the IP address of that computer as a DMZ Host with unrestricted Internet access.

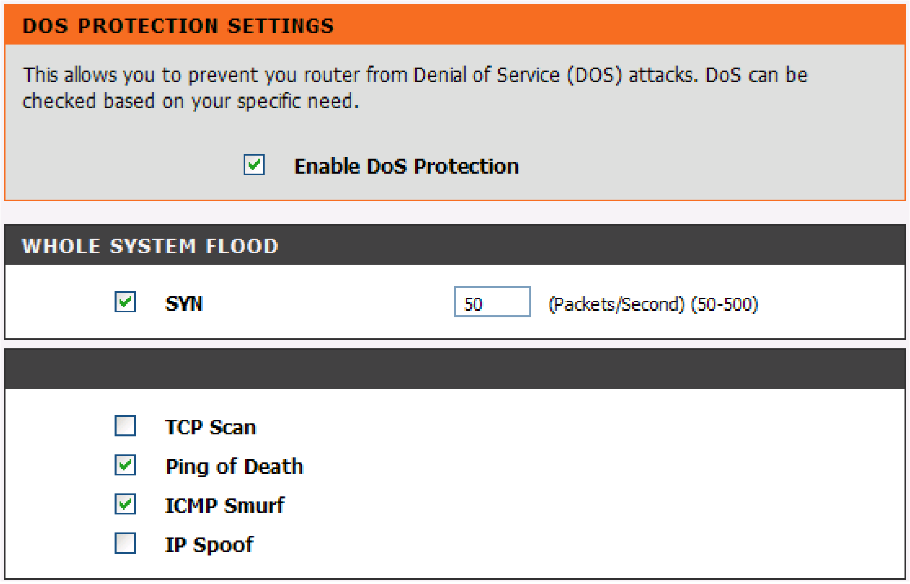
**Note:** Either this function or virtual server can be selected for use in accessing external services.

**SIP ALG:** Enable ALG for LAN port SIP UA.

**RTSP ALG:** Enable ALG for RTSP multimedia stream.

### 3-2-3-2 DoS Prevention

ADVANCED → Firewall and DMZ → DoS Prevention



DOS PROTECTION SETTINGS

This allows you to prevent you router from Denial of Service (DOS) attacks. DoS can be checked based on your specific need.

☑ Enable DoS Protection

WHOLE SYSTEM FLOOD

☑ SYN 50 (Packets/Second) (50-500)

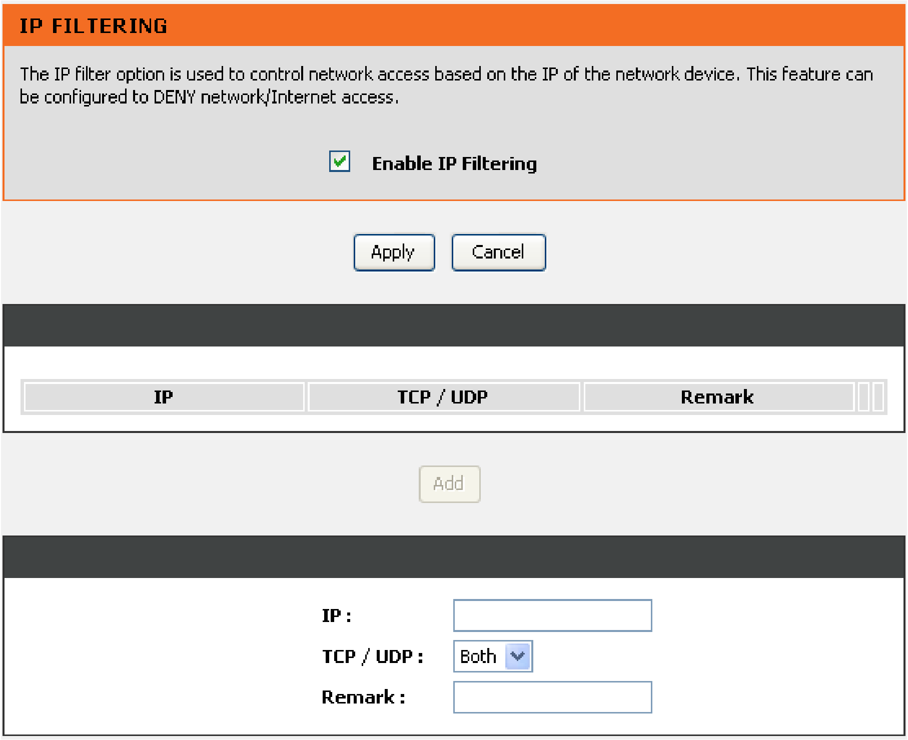
☐ TCP Scan
☑ Ping of Death
☑ ICMP Smurf
☐ IP Spoof

**Enable DoS Prevention:** Check the box to prevent DoS attacks from WAN or LAN. There are various types of DoS attacking. Leave settings in this field to the default if you are not familiar with it.

### 3-2-3-3 IP Filtering

Use IP Filters to deny particular LAN IP addresses from accessing the Internet. You can deny specific port numbers or all ports for a specific IP address. The screen will display well-known ports that are defined. To use them, click on the edit icon. You will only need to input the LAN IP address(es) of the computer(s) that will be denied Internet access.

ADVANCED → Firewall and DMZ→ IP Filtering



IP FILTERING

The IP filter option is used to control network access based on the IP of the network device. This feature can be configured to DENY network/Internet access.

☑ Enable IP Filtering

| IP | TCP / UDP | Remark |
|---|---|---|

| | |
|---|---|
| IP : | |
| TCP / UDP : | Both |
| Remark : | |

**Enable IP Filtering:** Check the box to deny particular LAN IP addresses from accessing the Internet.

**IP:** Enter the IP address that you want to deny in this filed.

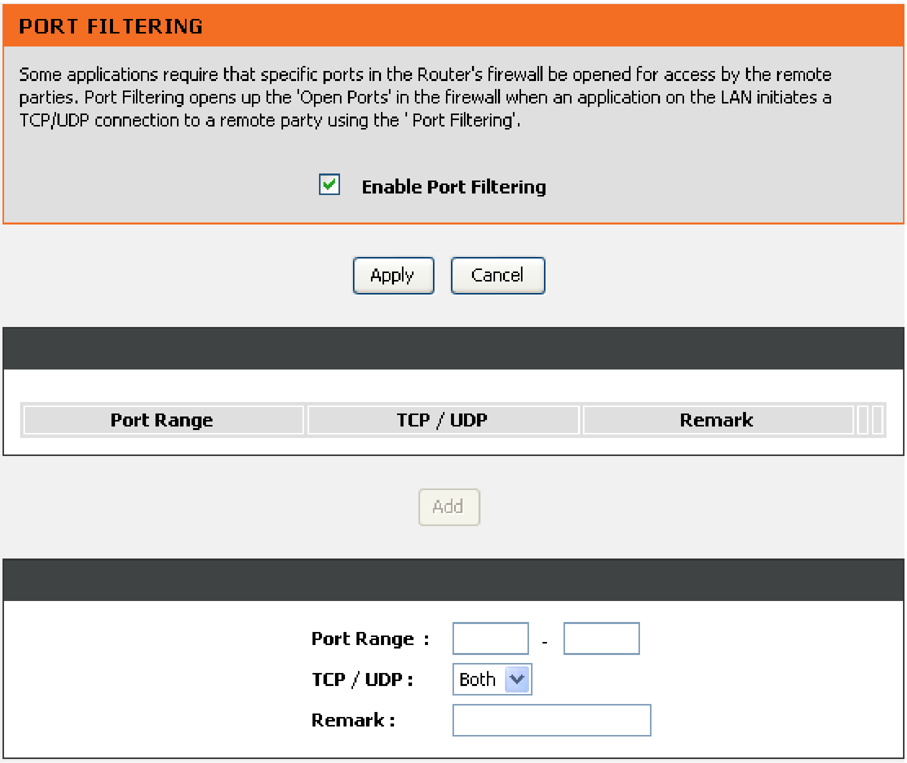
**TCP/UDP:** Select **TCP**, **UDP** or **Both** that will be used with the IP address that will be blocked.

**Remark:** Enter comments.

### 3-2-3-4 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.

ADVANCED → Firewall and DMZ→ Port Filtering



PORT FILTERING

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Filtering opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the ' Port Filtering'.

☑ Enable Port Filtering

| Port Range | TCP / UDP | Remark |
|---|---|---|

| | |
|---|---|
| Port Range : | - |
| TCP / UDP : | Both |
| Remark : | |

**Enable Port Filtering:** This variable is to restrict certain types of data packets by port.

**Port Range:** Enter the port range that will be denied access to the Internet.

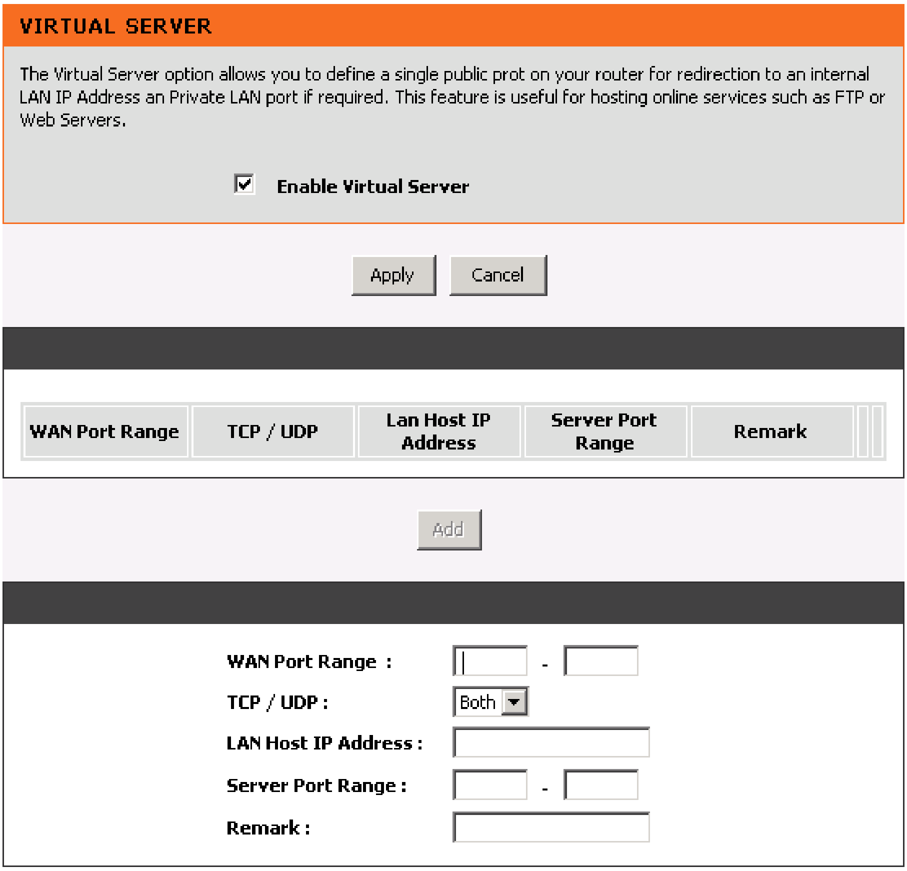
**TCP/UDP:** Select **TCP**, **UDP** or **Both** that will be used with the port that will be blocked.

**Remark:** Enter comments.

## 3-2-3-5 Virtual Server

Enable users on Internet to access the WWW, FTP and other services from your NAT. It is also known as port forwarding. When remote users are accessing Web or FTP servers through WAN IP address, it will be routed to the server with LAN IP address.

ADVANCED → Firewall and DMZ→ Virtual Server



VIRTUAL SERVER

The Virtual Server option allows you to define a single public prot on your router for redirection to an internal LAN IP Address an Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.

☑ Enable Virtual Server

| WAN Port Range | TCP / UDP | Lan Host IP Address | Server Port Range | Remark |
|---|---|---|---|---|

| | |
|---|---|
| WAN Port Range : | - |
| TCP / UDP : | Both |
| LAN Host IP Address : | |
| Server Port Range : | - |
| Remark : | |

**Enable Virtual Server:** Check the box to enable port forwarding.

**WAN Port Range:** Enter the port range for the WAN side.

**TCP/UDP:** Select the communication protocols used by the server, **TCP**, **UDP** or **Both**.

**LAN Host IP Address:** Enter the IP address of the device that provides various services.

**Server Port Range:** Enter LAN side server port range.

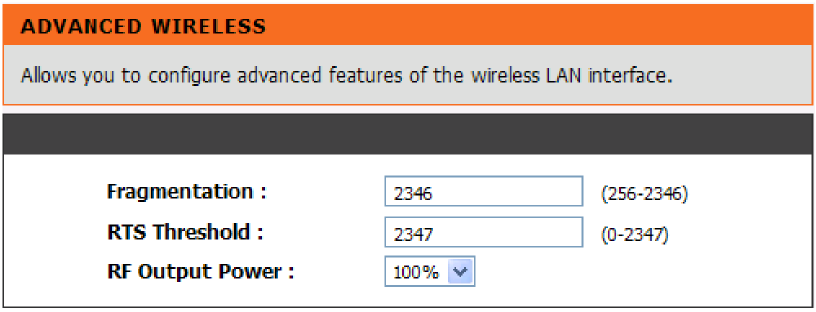
**Remark:** Enter comments.

# 3-2-4 Advanced Wireless

## 3-2-4-1 Advanced

This section introduces advanced configuration for the wireless access point. If you are not familiar with the following functions, keep the default parameters. In some cases, incorrect settings may reduce wireless performance.

ADVANCED -> Advanced Wireless -> Advanced



ADVANCED WIRELESS

Allows you to configure advanced features of the wireless LAN interface.

| | | |
|---|---|---|
| Fragmentation : | 2346 | (256-2346) |
| RTS Threshold : | 2347 | (0-2347) |
| RF Output Power : | 100% | |

**Fragmentation:** A packet can be fragmented into small units to pass over a network medium that can not support the original packet size. If you encounter a busy network, a lower value of Fragment Threshold could improve performance. If the traffic flows are not very busy, a higher Fragment Threshold provides good network performance. In most case, keeping the default value=2346 is recommended.

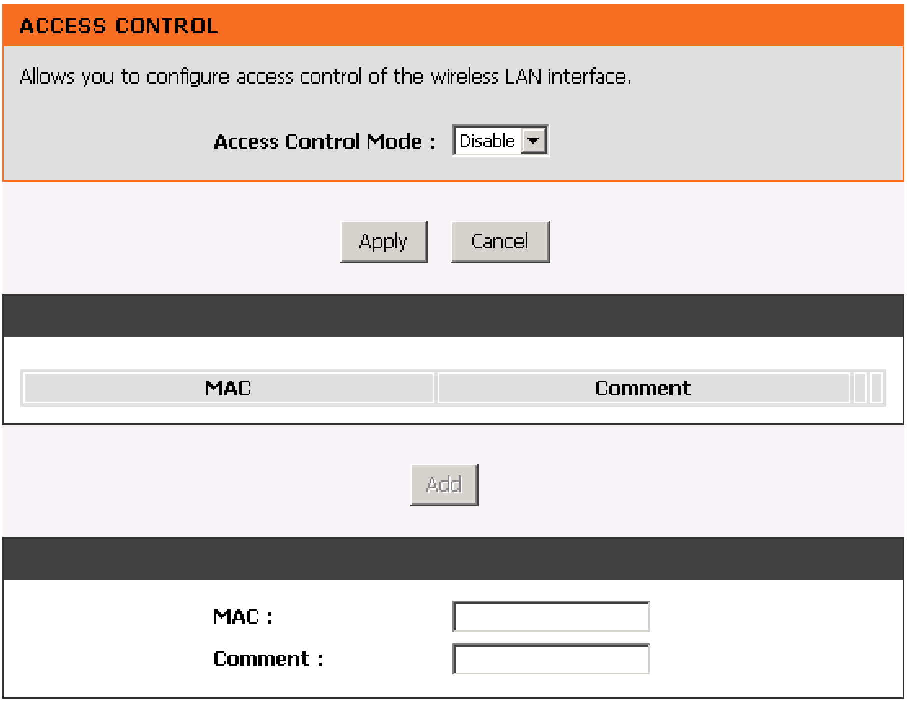
**RTS Threshold:** RTS Threshold is a mechanism to implement in collision avoidance. In a large wireless network, two stations do not hear each other but can hear wireless access point. When the two send data to Access Point at the same time, it may result in data collision and a loss of messages for both wireless stations. In most case, keeping the default value=2347 is recommended.

**RF Output Power:** You can adjust the percentage of power 100, 50, 25, 10, 5 of your VoIP Router to change the coverage of wireless network. Keep the default value, 100% to reach full range.

### 3-2-4-2 Access Control

The Access Control setting provides a service that you can control different access rights for different wireless clients connected to your VoIP Router. The local and remote stations are limited to access Internet through your Access Points using MAC address of wireless client. Choose the appropriate Access Control Services from Wireless Access Control Mode option.

ADVANCED -> Advanced Wireless -> Access Control



ACCESS CONTROL

Allows you to configure access control of the wireless LAN interface.

Access Control Mode : Disable

| MAC | Comment |
|---|---|

MAC :

Comment :

**Access Control Mode--**

**Disable:** The VoIP Router does not response to any access rules. You are not allowed to make configuration changes on this page.

**Allow:** When **Allow Listed** is enabled, only those wireless clients whose MAC addresses are in the Access Control List have rights to connect to your Access Point.

**Deny:** When **Deny Listed** is enabled, only those wireless clients whose MAC addresses are in the Access Control List will be blocked and restricted access to your Access Point.

**MAC Address:** Specify the MAC address which you want to allow/deny access your Access Point.

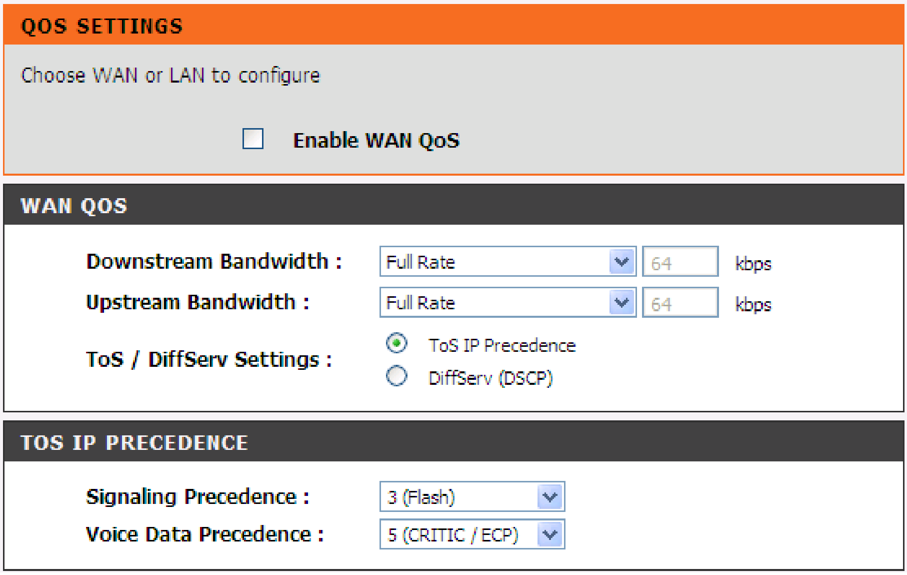
**Comment:** The space is reserved for comment or notation.

# 3-2-5 Advanced Network

## 3-2-5-1 QOS

## WAN QoS

ADVANCED → Advanced Network → QoS



QOS SETTINGS

Choose WAN or LAN to configure

□ Enable WAN QoS

WAN QOS

Downstream Bandwidth : Full Rate 64 kbps

Upstream Bandwidth : Full Rate 64 kbps

ToS / DiffServ Settings : ● ToS IP Precedence ○ DiffServ (DSCP)

TOS IP PRECEDENCE

Signaling Precedence : 3 (Flash)

Voice Data Precedence : 5 (CRITIC / ECP)

**Enable WAN QoS:** Check the box to guaranty the voice quality. The system reserves the bandwidth for voice packets, and the data transmission is distributed to less bandwidth.

**Downstream Bandwidth -** Select the downstream bandwidth that is less than the actual bandwidth subscribed from the drop-down menu.

**Upstream Bandwidth -** Select the upstream bandwidth that is less than the actual bandwidth subscribed from the drop-down menu.

**ToS IP Precedence:** Select the precedence for signaling (data) and voice (voice data) to tag voice packets.

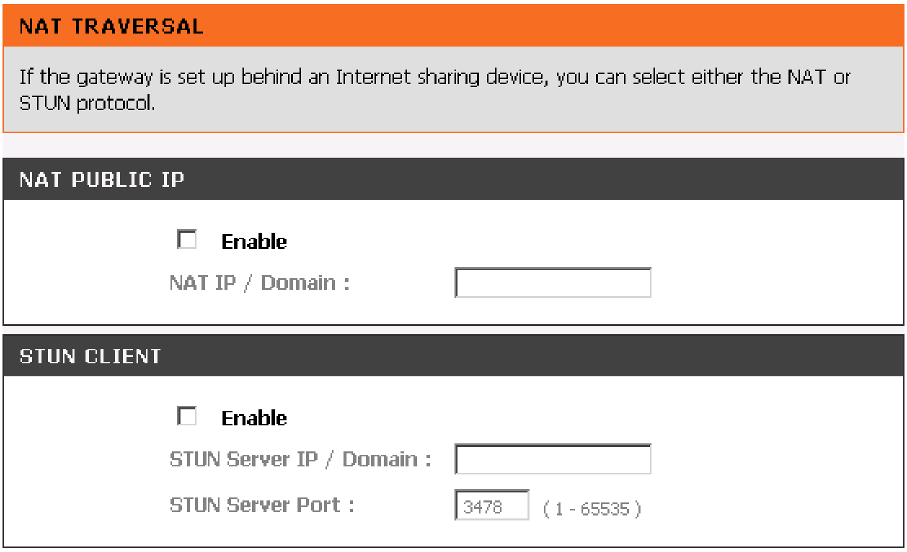
**DiffServ (DSCP):** Select the number of signaling (data) and voice (voice data) values to tag voice packets.

**Note:** For the VoIP Router, ToS IP Precedence and DiffServ are the same function. You only select one for priority marking.

### 3-2-5-2 NAT Traversal

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

ADVANCED → Advanced Network → NAT Traversal



NAT TRAVERSAL

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

NAT PUBLIC IP

□ Enable

NAT IP / Domain :

STUN CLIENT

□ Enable

STUN Server IP / Domain :

STUN Server Port : 3478 ( 1 - 65535 )

**Enable NAT Public IP:** Check the box to use the IP address of the Internet sharing device if the VoIP Router is set up behind an Internet sharing device. Also the VoIP Router will use the IP address of the Internet sharing device as the public IP when it connects to Internet. Furthermore, some of the Internet sharing device's type is symmetric NAT. You need to set Virtual Server or Port Mapping (Forwarding) from the Internet sharing device for the listen port and communication ports (RTP ports) of the VoIP Router.

**NAT IP/Domain:** Enter the real public IP address of the IP sharing device or the router; 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 if your Internet connection has static public IP addresses.

**Enable STUN Client:** Check the box to use the STUN protocol prevents problems from setting the IP sharing function. (Some NATs do not support this protocol.)

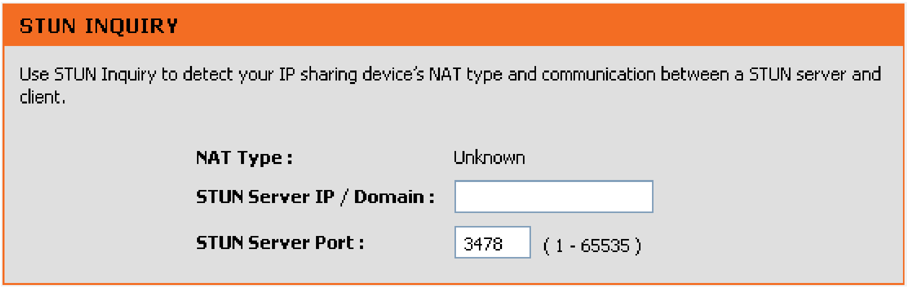
**Note:** You can use the "Status → STUN Inquiry" page to detect the NAT type of your Internet sharing device. If the NAT type is "Symmetric NAT," then the VoIP Router is not able to traverse the NAT. It is not a flaw of the VoIP Router design, but rather a limitation of the STUN protocol.

**STUN Server IP/Domain and Port:** Enter the IP address and listen port of the STUN server. You can set two STUN server IPs separated by a semicolon.

### 3-2-5-3 STUN Inquiry

Use "STUN Inquiry" to detect your IP sharing device's NAT type and communication between a STUN server and client.

ADVANCED → Advanced Network → STUN Inquiry



STUN INQUIRY

Use STUN Inquiry to detect your IP sharing device's NAT type and communication between a STUN server and client.

NAT Type : Unknown

STUN Server IP / Domain :

STUN Server Port : 3478 ( 1 - 65535 )

**NAT Type:** It shows the NAT type of your router.

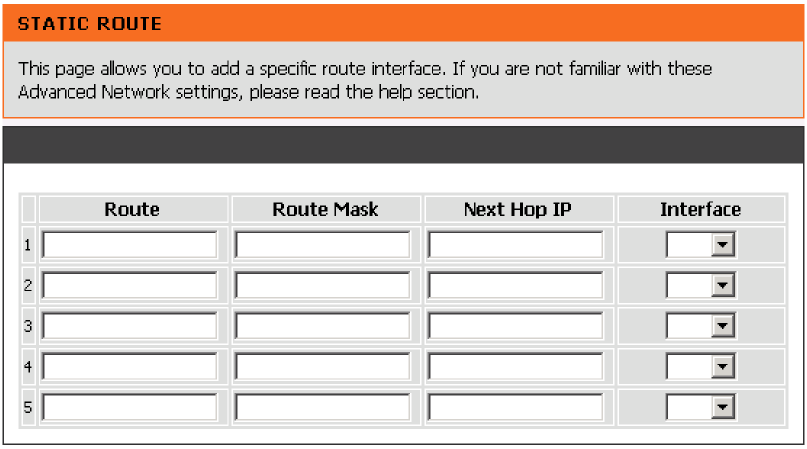
**STUN Server IP/Domain:** Enter the IP address or URL of the STUN server for query.

**STUN Server Port:** Enter the STUN Server's listening port

### 3-2-5-4 Static Route

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

ADVANCED → Advanced Network → Static Route



STATIC ROUTE

This page allows you to add a specific route interface. If you are not familiar with these Advanced Network settings, please read the help section.

|  | Route | Route Mask | Next Hop IP | Interface |
|---|---|---|---|---|
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |

**Route:** Destination network of the route.

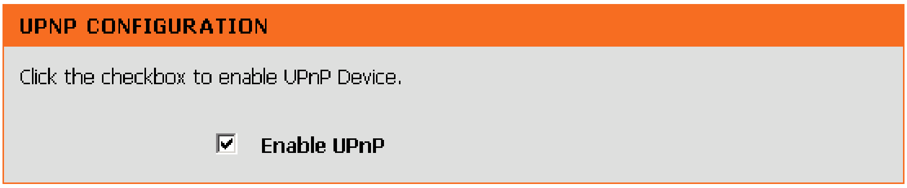
**Route Mask:** Subnet mask to apply on destination network.

**Next Hop IP:** The next hop IP address to the specified network.

**Interface:** The interface attached to this route.

### 3-2-5-5 UPnP

ADVANCED → Advanced Network → UPnP



UPNP CONFIGURATION

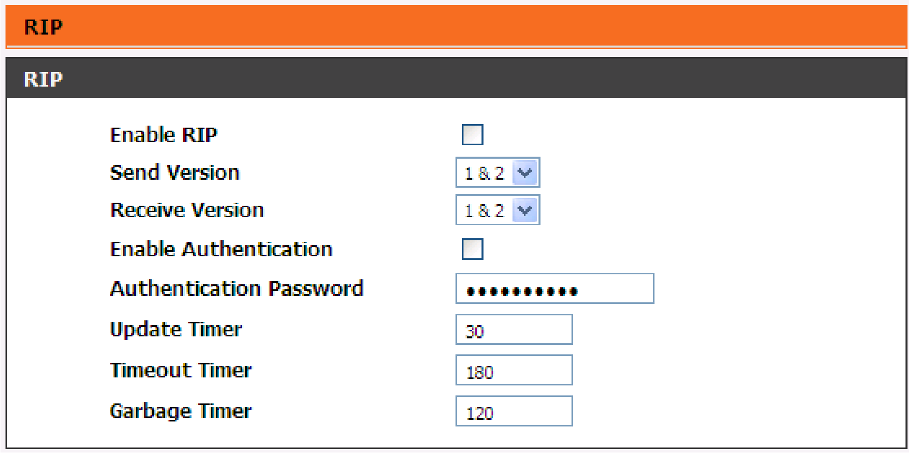
Click the checkbox to enable UPnP Device.

☑ Enable UPnP

**Enable UPnP:** Check the box to enable UPnP device on DVG.

### 3-2-5-6 RIP

ADVANCED → Advanced Network → RIP



RIP

RIP

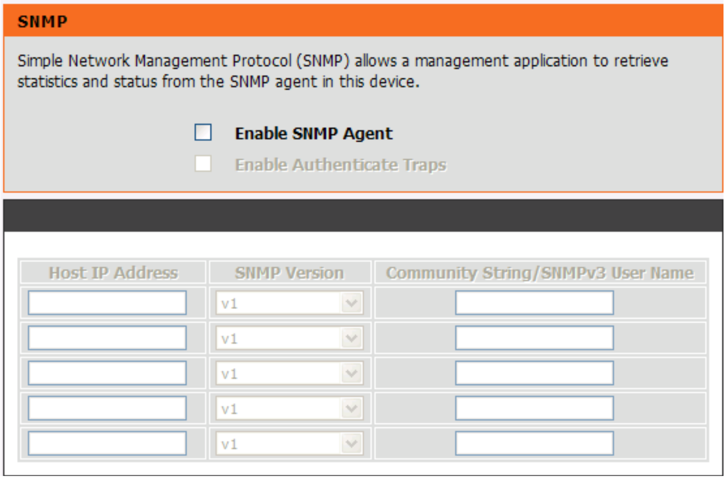
| | |
|---|---|
| Enable RIP | □ |
| Send Version | 1 & 2 |
| Receive Version | 1 & 2 |
| Enable Authentication | □ |
| Authentication Password | •••••••••• |
| Update Timer | 30 |
| Timeout Timer | 180 |
| Garbage Timer | 120 |

**Enable RIP:** Check the box to enable RIP to build small-multi router network via RIP protocol. This function is useless for home network.

## 3-2-6 SNMP

ADVANCED → Advanced Network → SNMP

DVG-N5402FF supports SNMP V1, V2 and V3. Please enter required parameter for SNMP V3 on each SNMP setting pages.



**SNMP**

Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device.

□ Enable SNMP Agent

□ Enable Authenticate Traps

| Host IP Address | SNMP Version | Community String/SNMPv3 User Name |
|---|---|---|
|  | v1 |  |
|  | v1 |  |
|  | v1 |  |
|  | v1 |  |
|  | v1 |  |

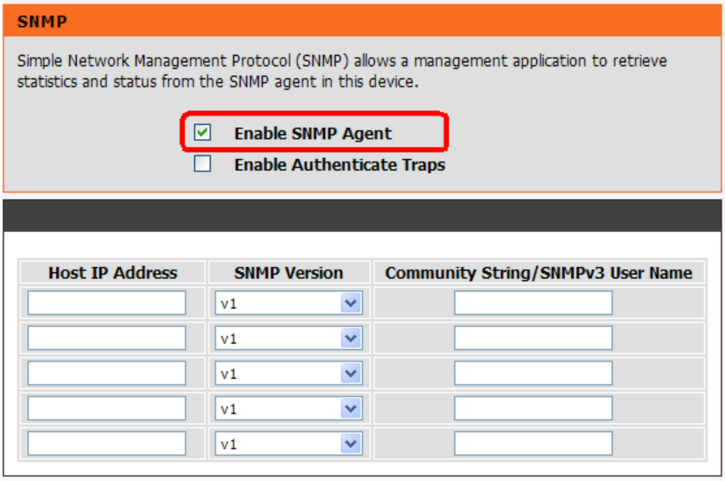
If the MIB browser supports SNMP V1 and V2 only, please refer to following configuration:

**Example for SNMP V2 configuration**:

Some keys configured on MIB browser:

Get Community: **public**<br>
Set Community: **private**<br>
Trap Community: **public**

- Enable [**Advanced-> SNMP Management-> SNMP-> Enable SNMP Agent**]



SNMP

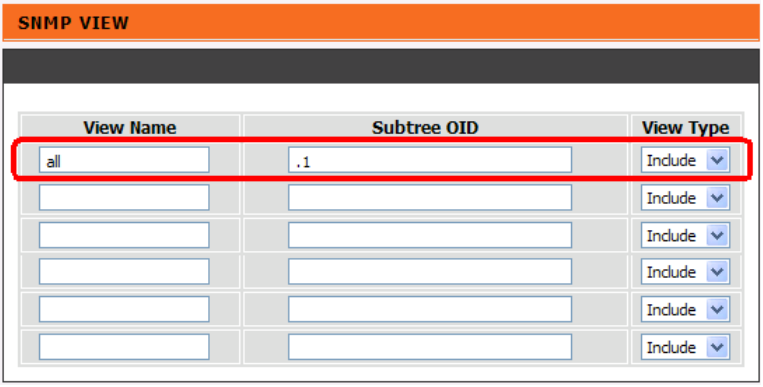
Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device.

☑ Enable SNMP Agent

☐ Enable Authenticate Traps

| Host IP Address | SNMP Version | Community String/SNMPv3 User Name |
|---|---|---|
| | v1 | |
| | v1 | |
| | v1 | |
| | v1 | |
| | v1 | |

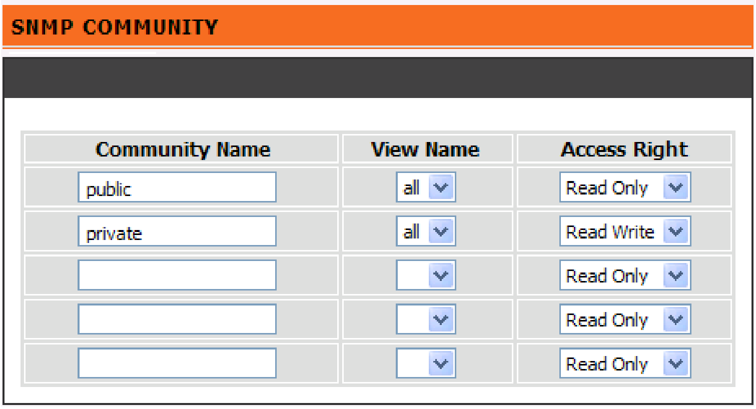
- Set [**Advanced-> SNMP Management-> SNMP View-> View Name**] as "all".
- Set [**Advanced-> SNMP Management-> SNMP View-> View Name**] as ".1"



SNMP VIEW

| View Name | Subtree OID | View Type |
|---|---|---|
| all | .1 | Include |
| | | Include |
| | | Include |
| | | Include |
| | | Include |
| | | Include |

- Set [**Advanced-> SNMP Management-> SNMP Community-> Community Name**] for public and private.
- Select a configured View Name.



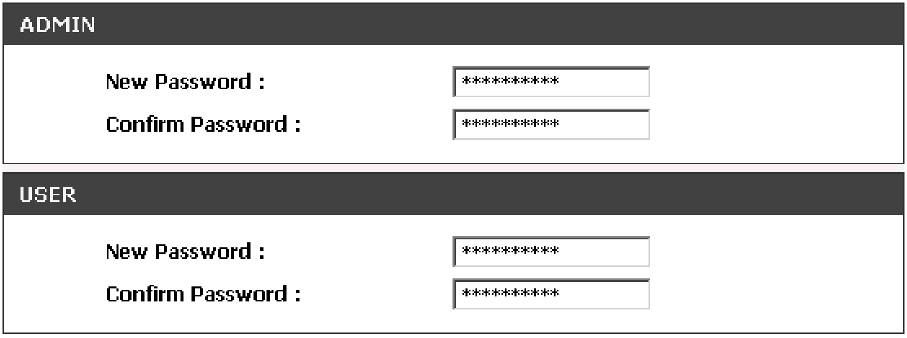
SNMP COMMUNITY

| Community Name | View Name | Access Right |
|---|---|---|
| public | all | Read Only |
| private | all | Read Write |
| | | Read Only |
| | | Read Only |
| | | Read Only |

# 3-3 MAINTENANCE

## 3-3-1 Device Management

MAINTENANCE → Device Management



ADMIN

New Password : **********

Confirm Password : **********

USER

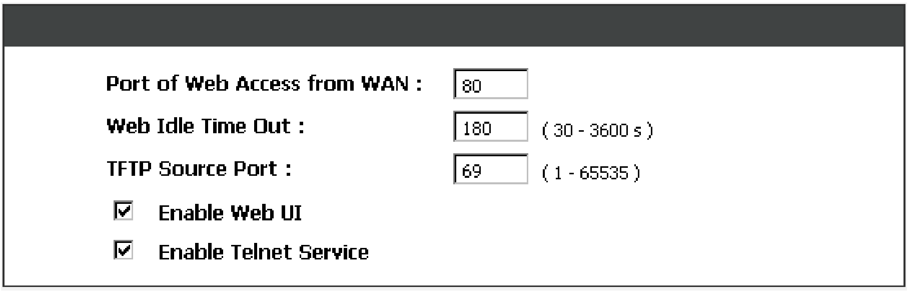
New Password : **********

Confirm Password : **********

**Note:** There are two operating levels when entering the Web UI. Logging-in as the ADMIN allows you to change all settings. A Web UI USER only has access to some settings.

**Password:** By default there is no password configured. It is highly recommended that you create a password to keep your router secure.

MAINTENANCE → Device Management



Port of Web Access from WAN : 80

Web Idle Time Out : 180 ( 30 - 3600 s )

TFTP Source Port : 69 ( 1 - 65535 )

☑ Enable Web UI

☑ Enable Telnet Service

**Port of Web Access from WAN:** Enter the port number when accessing the web-based configuration utility from the WAN port.

**Web Idle Time Out:** Enter the range of effective time when log-in the web interface. The user will be disconnected from the web page to allow others to log-in.

**TFTP Source Port:** Enter the port number for sending out sends TFTP sessions.

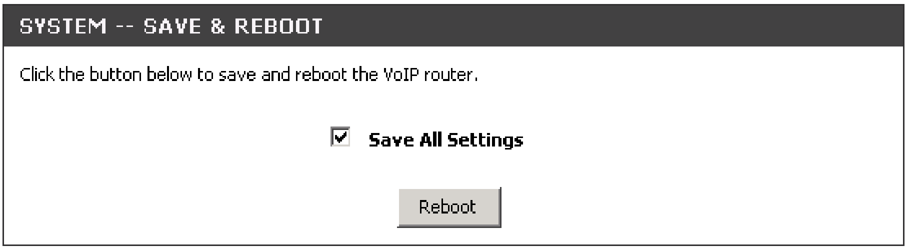
**Enable Web UI:** Check the box to enable WEB access from WAN or LAN.

**Enable Telnet Service:** Check the box to enable Telnet access from WAN or LAN.

# 3-3-2 Backup and Restore

## Save and Reboot

MAINTENANCE → Backup and Restore



SYSTEM -- SAVE & REBOOT

Click the button below to save and reboot the VoIP router.

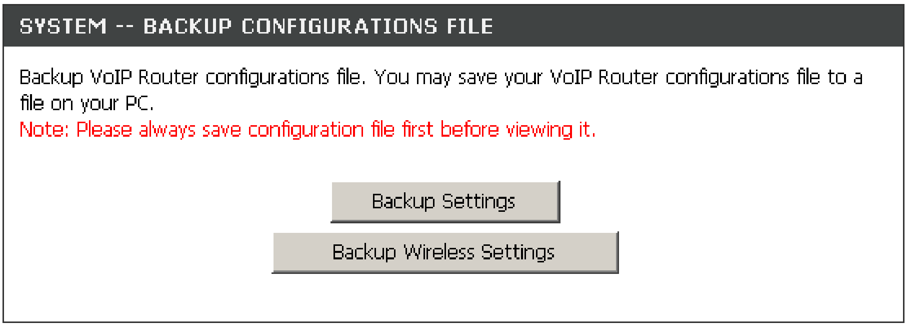
☑ Save All Settings

**Save All Settings:** Click the **Save All Settings** check box and reboot the system after completing changes. The new settings will take effect after the VoIP Router is restarted.

**Restart:** Click the **Reboot** button to reboot the system.

## Backup Configurations File

MAINTENANCE → Backup and Restore



SYSTEM -- BACKUP CONFIGURATIONS FILE

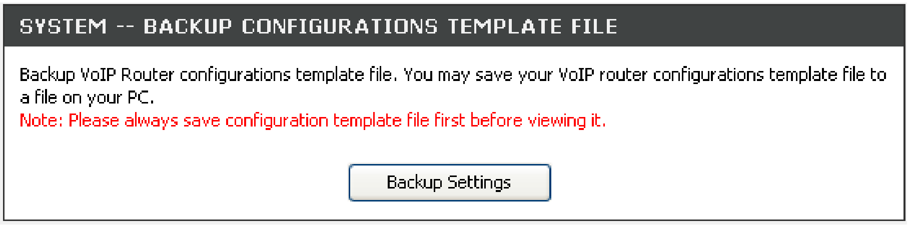
Backup VoIP Router configurations file. You may save your VoIP Router configurations file to a file on your PC.

Note: Please always save configuration file first before viewing it.

The current system settings can be saved as a file onto the local hard drive. Click the **Backup Settings** button to save all current settings to a file on your PC. Click the **Backup Wireless Settings** button to save only wireless settings to a file on your PC.

## Backup Configurations Template File

MAINTENANCE → Backup and Restore



SYSTEM -- BACKUP CONFIGURATIONS TEMPLATE FILE

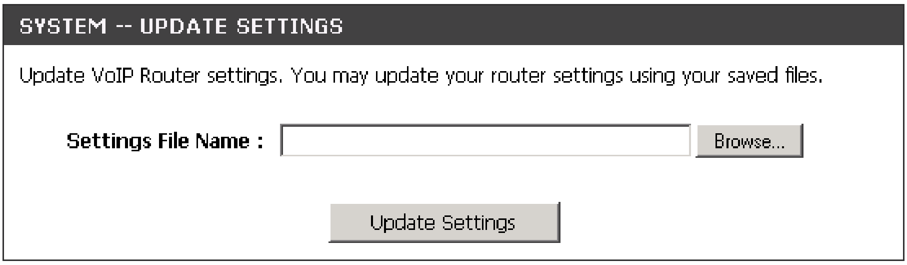
Backup VoIP Router configurations template file. You may save your VoIP router configurations template file to a file on your PC.

Note: Please always save configuration template file first before viewing it.

Click the **Backup Settings** button to save your current settings to a template file for editing.

## Update Settings

MAINTENANCE → Backup and Restore



SYSTEM -- UPDATE SETTINGS

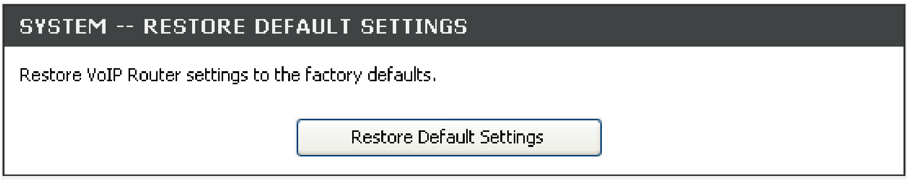
Update VoIP Router settings. You may update your router settings using your saved files.

Settings File Name :

To restore a system settings file, click on **Browse** to search the local hard drive for the file to be used. Once you locate the file, click **Upload Settings** to overwrite the current settings with the settings saved to the file.

## Restore Default Settings

MAINTENANCE → Backup and Restore



SYSTEM -- RESTORE DEFAULT SETTINGS

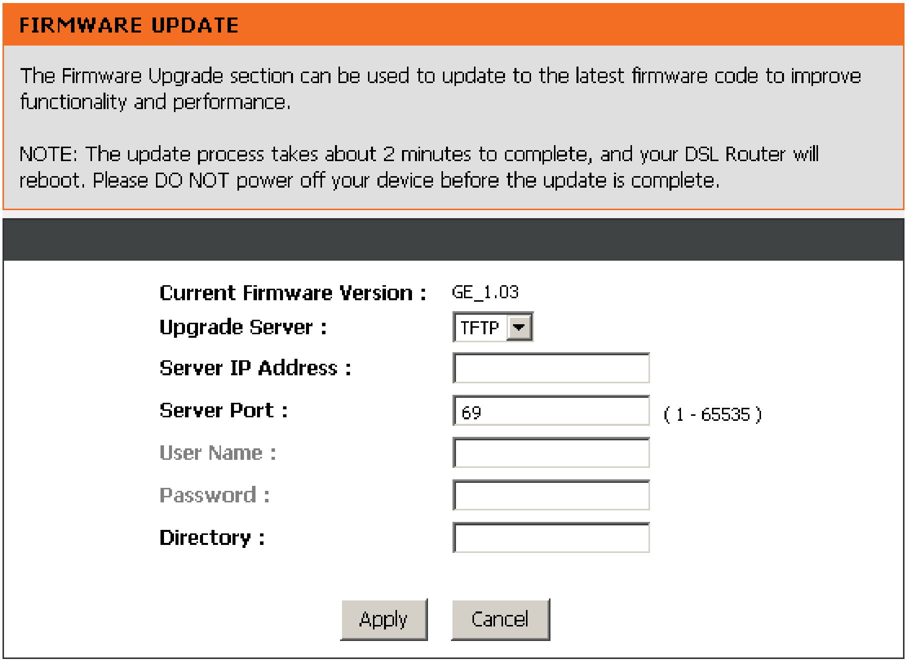
Restore VoIP Router settings to the factory defaults.

Select **Restore Default Settings** to reset the VoIP Router's settings back to the factory default settings.

## 3-3-3 Firmware Update

The VoIP Router supports a software upgrade function from a remote server. Please consult your VoIP Service Provider for information about the following details.

MAINTENANCE → Firmware Update



FIRMWARE UPDATE

The Firmware Upgrade section can be used to update to the latest firmware code to improve functionality and performance.

NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot. Please DO NOT power off your device before the update is complete.

| | |
|---|---|
| Current Firmware Version : | GE_1.03 |
| Upgrade Server : | TFTP |
| Server IP Address : | |
| Server Port : | 69 ( 1 - 65535 ) |
| User Name : | |
| Password : | |
| Directory : | |

**Upgrade Server:** Select the upgrade type: **TFTP**, **FTP**, or **HTTP**.

**Server IP Address:** Enter the server's IP address.

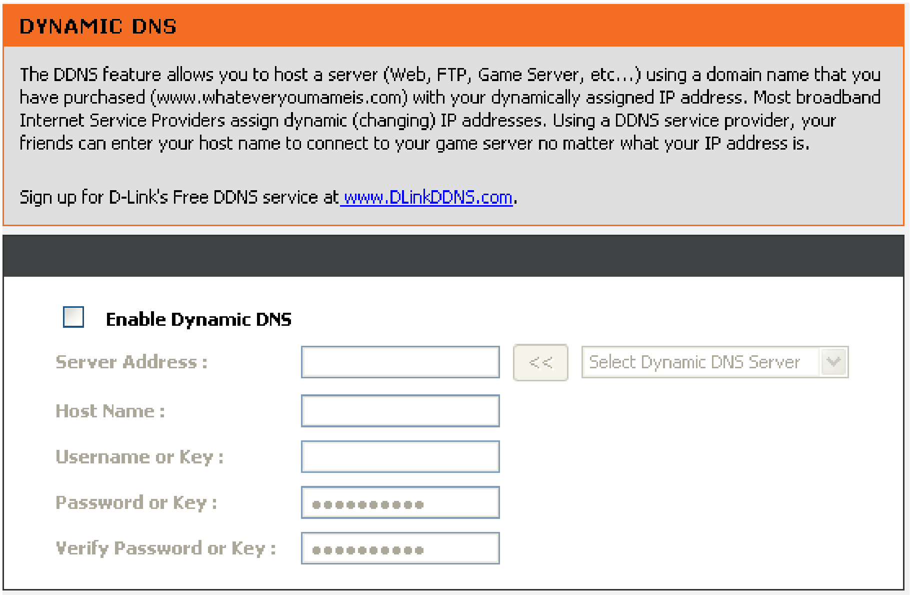
**Server Port:** Enter the server's port.

**User Name/ Password:** Enter the account information for accessing the server if needed.

**Directory:** Enter the location of the firmware file.

## 3-3-4 Dynamic DNS

ADVANCED → Dynamic DNS



DYNAMIC DNS

The DDNS feature allows you to host a server (Web, FTP, Game Server, etc...) using a domain name that you have purchased (www.whateveryoumameis.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter your host name to connect to your game server no matter what your IP address is.

Sign up for D-Link's Free DDNS service at www.DLinkDDNS.com.

□ Enable Dynamic DNS

Server Address : [ ] << Select Dynamic DNS Server

Host Name :

Username or Key :

Password or Key : ●●●●●●●●●●

Verify Password or Key : ●●●●●●●●●●

**Enable Dynamic DNS:** Check the box to enable DDNS function. It is only necessary when the VoIP Router is set up behind an Internet sharing device that uses a dynamic IP address and does not support DDNS.

**Server address:** Select a DDNS service from the drop and down arrow.

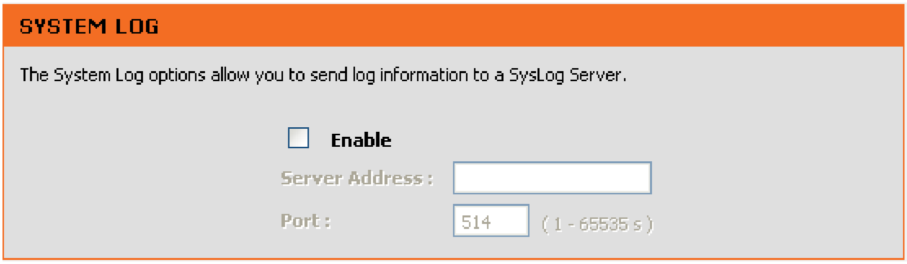
**Hostname:** Enter the URL of the system (or NAT) – applied from domain name registration providers (e.g. www.dyndns.org).

**Username or Key/Password or Key:** Enter the Login ID and password used to log-in to the DDNS server.

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

## 3-3-5 Log Settings

MAINTENANCE → Log Settings



SYSTEM LOG

The System Log options allow you to send log information to a SysLog Server.

☐ Enable

Server Address :

Port : 514 ( 1 - 65535 s )

**Enable:** Check the box to send event notification messages across IP networks to the Server.

**Server Address:** Enter the System Log Server's IP address.

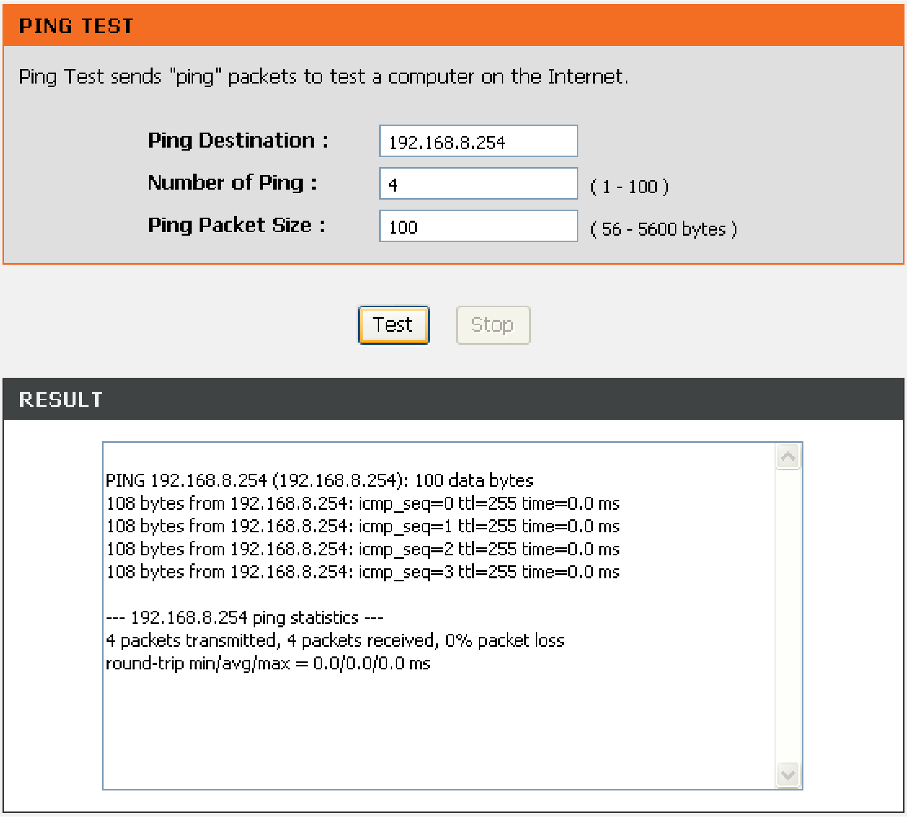
**Port:** Enter the System Log Server's listening port. Leave this field to the default if your VoIP Service Provider did not provide you a server port number for System Log Server.

## 3-3-6 Diagnostics

### 3-3-6-1 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. The result would be shown on **Result** Table

MAINTENANCE → Diagnostics → Ping Test



PING TEST

Ping Test sends "ping" packets to test a computer on the Internet.

| | | |
|---|---|---|
| **Ping Destination :** | 192.168.8.254 | |
| **Number of Ping :** | 4 | ( 1 - 100 ) |
| **Ping Packet Size :** | 100 | ( 56 - 5600 bytes ) |

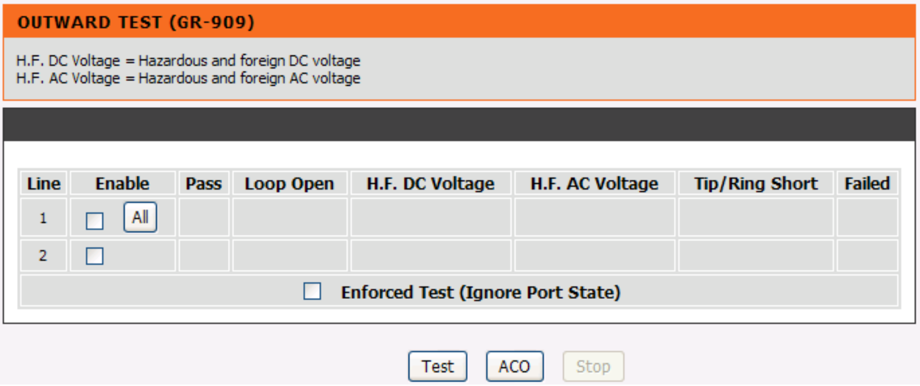
RESULT

```
PING 192.168.8.254 (192.168.8.254): 100 data bytes
108 bytes from 192.168.8.254: icmp_seq=0 ttl=255 time=0.0 ms
108 bytes from 192.168.8.254: icmp_seq=1 ttl=255 time=0.0 ms
108 bytes from 192.168.8.254: icmp_seq=2 ttl=255 time=0.0 ms
108 bytes from 192.168.8.254: icmp_seq=3 ttl=255 time=0.0 ms

--- 192.168.8.254 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
```

### 3-3-6-2 Outward Test

MAINTENANCE → Diagnostics → Outward Test



OUTWARD TEST (GR-909)

H.F. DC Voltage = Hazardous and foreign DC voltage
H.F. AC Voltage = Hazardous and foreign AC voltage

| Line | Enable | Pass | Loop Open | H.F. DC Voltage | H.F. AC Voltage | Tip/Ring Short | Failed |
|---|---|---|---|---|---|---|---|
| 1 | □ All | | | | | | |
| 2 | □ | | | | | | |
| □ Enforced Test (Ignore Port State) | | | | | | | |

It allows operator to verify whether it is some problem on the cable between phone sets and DVG-N5402FF FXS ports.

**Enable:** Select the lines you want to test.

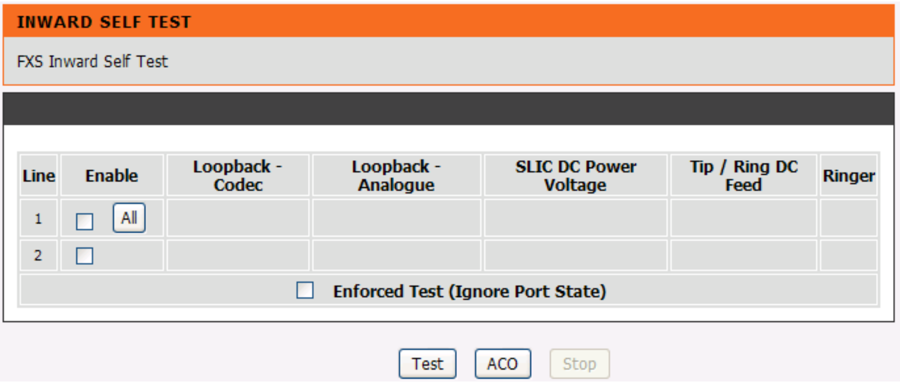
**Including Channel In Used:** Since the line test will interrupt a talking call, that DVG-N5402FF will ignore the in used line. If you would like to test all the lines you select even it is in used, please tick this item.

**Test:** Click start to test.

**ACO:** Clear alarm indication of the last test result.

## 3-3-6-3 FXS Inward Self Test

MAINTENANCE → Diagnostics → Inward Test



INWARD SELF TEST

FXS Inward Self Test

| Line | Enable | Loopback - Codec | Loopback - Analogue | SLIC DC Power Voltage | Tip / Ring DC Feed | Ringer |
|---|---|---|---|---|---|---|
| 1 | □ All | | | | | |
| 2 | □ | | | | | |
| □ Enforced Test (Ignore Port State) | | | | | | |

It allows operator to verify if it is some problem on the FXS chip set.

**Enable:** Select the lines you want to test.

**Including Channel In Used:** Since the line test will interrupt a talking call, that DVG-N5402FF will ignore the in used line. If you would like to test all the lines you select even it is in used, please tick this item.

**Test:** Click start to test.

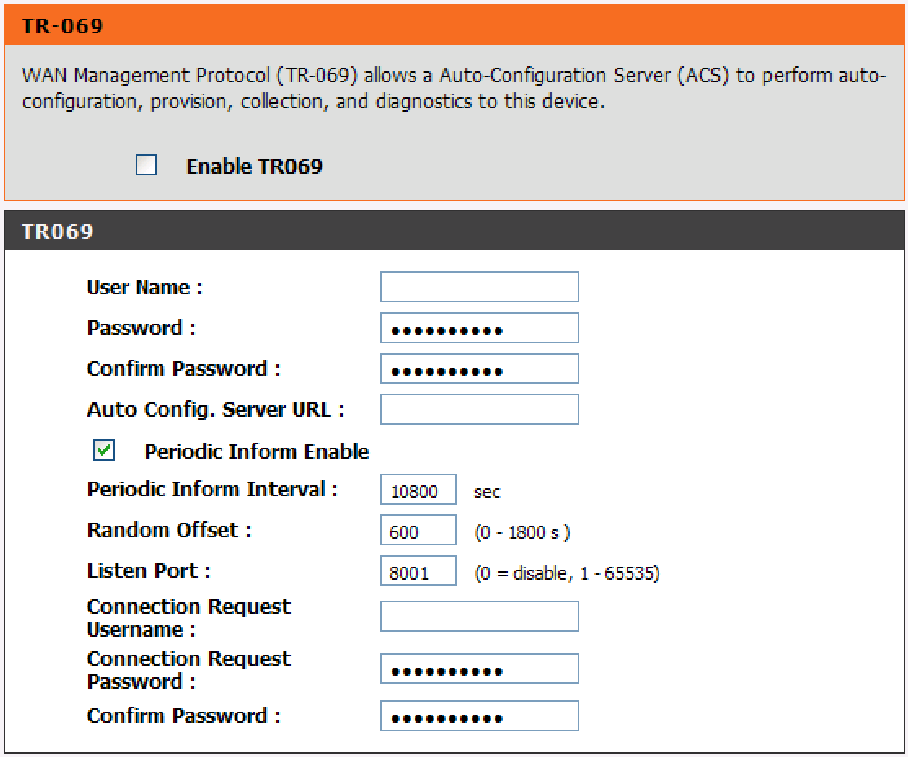
**ACO:** Clear alarm indication of the last test result.

## 3-3-7 TR069

TR069 allows operator to manage DVG-N5402FF with a TR069 standard protocol.

> **Note:** Fill in the parameters needed by your VoIP Service Provider. Please check with your VoIP Service Provider about the availability of these services.

Advanced Settings → TR069



**TR-069**

WAN Management Protocol (TR-069) allows a Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

□ Enable TR069

**TR069**

| | | |
|---|---|---|
| User Name : | | |
| Password : | •••••••••• | |
| Confirm Password : | •••••••••• | |
| Auto Config. Server URL : | | |
| ☑ Periodic Inform Enable | | |
| Periodic Inform Interval : | 10800 | sec |
| Random Offset : | 600 | (0 - 1800 s ) |
| Listen Port : | 8001 | (0 = disable, 1 - 65535) |
| Connection Request Username : | | |
| Connection Request Password : | •••••••••• | |
| Confirm Password : | •••••••••• | |

**Enable TR069:** Check the box to start TR069 service

**Username:** Enter an available ACS user name.

**Password:** Enter the ACS password.

**Auto Config. Server URL:** Enter the Provisioning Server’s URL required by your VoIP Service Provider.

**Periodic Info Enable:** It allows DVG connect to a TR069 server periodically according to following parameters.

**Periodic Info Interval:** Enter the time for auto provisioning.

**Random Offset:** Enter the offset of the time for auto provisioning.

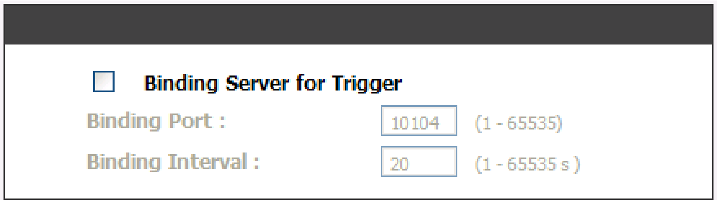
**Listen Port:** TR069 listen port for remote trigger.

**Connection Request Username:** Enter username for remote trigger.

**Connection Request Password:** Enter password for remote trigger**.**

**Note:** Contact your server provider if necessary.

MAINTENANCE → TR069



☐ Binding Server for Trigger

| | | |
|---|---|---|
| Binding Port : | 10104 | (1 - 65535) |
| Binding Interval : | 20 | (1 - 65535 s ) |

**Binding Server for Trigger:** Check the box to trigger a connection between Provisioning Server and the VoIP Gateway. Provisioning Server will bind a port for the VoIP Gateway to send provision request.

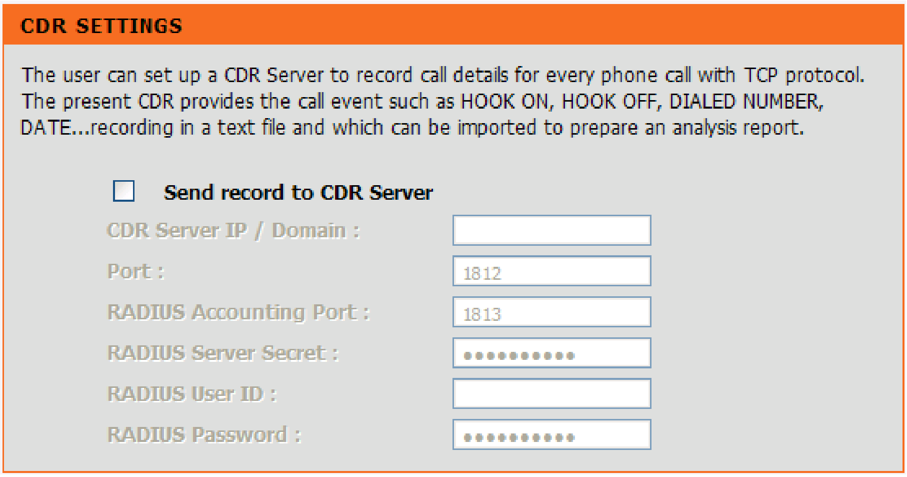
**Binding Port:** Enter the port number of Provisioning Server is used for binding.

**Binding Interval:** Enter the interval at which the VoIP Gateway will keep the binding.

## 3-3-8 CDR

The user can set up a CDR Server to record call details for every phone call with TCP protocol. The present CDR provides the call event such as HOOK ON, HOOK OFF, DIALED NUMBER, DATE…recording in a text file and which can be imported to prepare an analysis report.

MAINTENANCE → CDR



CDR SETTINGS

The user can set up a CDR Server to record call details for every phone call with TCP protocol. The present CDR provides the call event such as HOOK ON, HOOK OFF, DIALED NUMBER, DATE...recording in a text file and which can be imported to prepare an analysis report.

☐ Send record to CDR Server

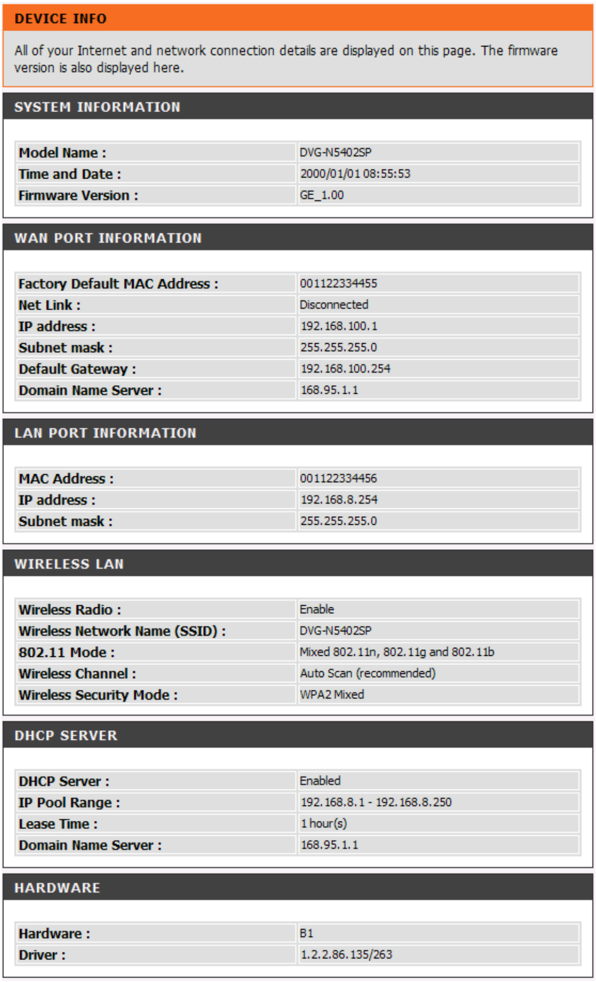
| | |
|---|---|
| CDR Server IP / Domain : | |
| Port : | 1812 |
| RADIUS Accounting Port : | 1813 |
| RADIUS Server Secret : | •••••••••• |
| RADIUS User ID : | |
| RADIUS Password : | •••••••••• |

**Send record to CDR Server:** Tick the check box to enable the call detail recording.
**CDR Server IP / Domain:** Enter the IP address of the CDR server.
**Port:** Enter the listen port of the CDR server.
**RADIUS:** Enter the information of RADIUS needed. It includes RADIUS Accounting Port, RADIUS Server Secret, RADIUS User ID and RADIUS Password.

# 3-4 STATUS

## 3-4-1 Device Info

STATUS → Device Info



**DEVICE INFO**

All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.

**SYSTEM INFORMATION**

| | |
|---|---|
| Model Name : | DVG-N5402SP |
| Time and Date : | 2000/01/01 08:55:53 |
| Firmware Version : | GE_1.00 |

**WAN PORT INFORMATION**

| | |
|---|---|
| Factory Default MAC Address : | 001122334455 |
| Net Link : | Disconnected |
| IP address : | 192.168.100.1 |
| Subnet mask : | 255.255.255.0 |
| Default Gateway : | 192.168.100.254 |
| Domain Name Server : | 168.95.1.1 |

**LAN PORT INFORMATION**

| | |
|---|---|
| MAC Address : | 001122334456 |
| IP address : | 192.168.8.254 |
| Subnet mask : | 255.255.255.0 |

**WIRELESS LAN**

| | |
|---|---|
| Wireless Radio : | Enable |
| Wireless Network Name (SSID) : | DVG-N5402SP |
| 802.11 Mode : | Mixed 802.11n, 802.11g and 802.11b |
| Wireless Channel : | Auto Scan (recommended) |
| Wireless Security Mode : | WPA2 Mixed |

**DHCP SERVER**

| | |
|---|---|
| DHCP Server : | Enabled |
| IP Pool Range : | 192.168.8.1 - 192.168.8.250 |
| Lease Time : | 1 hour(s) |
| Domain Name Server : | 168.95.1.1 |

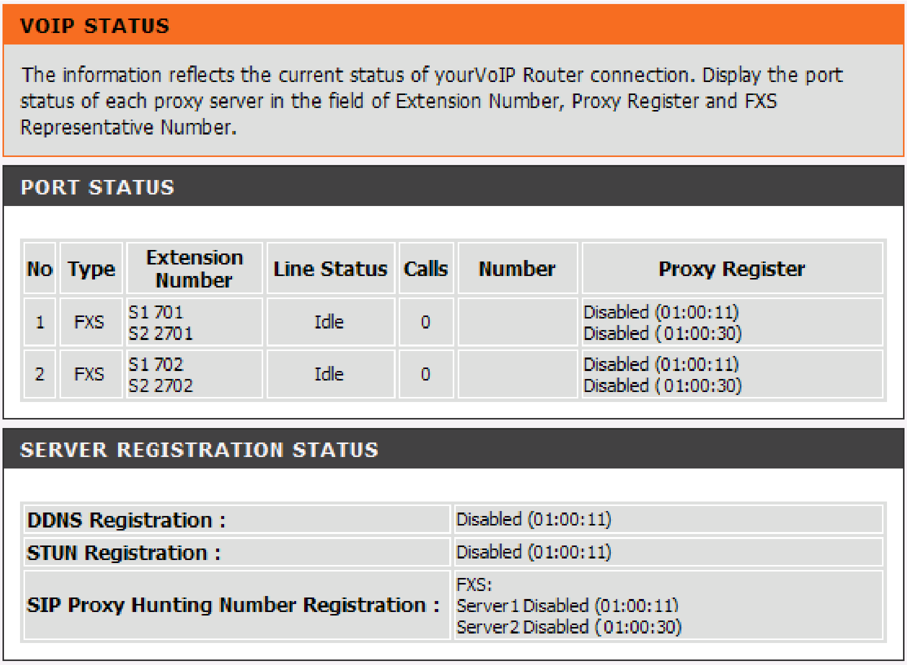
**HARDWARE**

| | |
|---|---|
| Hardware : | B1 |
| Driver : | 1.2.2.86.135/263 |

For 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 Router does not obtain IP.
For LAN Port Information, it shows LAN port IP, subnet mask, and the status of DHCP server.
For Hardware, it shows the hardware platform and driver version.

## 3-4-2 VoIP Status

STATUS → VoIP Status



**VOIP STATUS**

The information reflects the current status of yourVoIP Router connection. Display the port status of each proxy server in the field of Extension Number, Proxy Register and FXS Representative Number.

**PORT STATUS**

| No | Type | Extension Number | Line Status | Calls | Number | Proxy Register |
|---|---|---|---|---|---|---|
| 1 | FXS | S1 701<br>S2 2701 | Idle | 0 |  | Disabled (01:00:11)<br>Disabled (01:00:30) |
| 2 | FXS | S1 702<br>S2 2702 | Idle | 0 |  | Disabled (01:00:11)<br>Disabled (01:00:30) |

**SERVER REGISTRATION STATUS**

| | |
|---|---|
| **DDNS Registration :** | Disabled (01:00:11) |
| **STUN Registration :** | Disabled (01:00:11) |
| **SIP Proxy Hunting Number Registration :** | FXS:<br>Server1 Disabled (01:00:11)<br>Server2 Disabled (01:00:30) |

For Port Status, it includes if each port registers to Proxy successfully, the last dialed number, how many calls each port has made since the VoIP Router is start, etc.

**Example:**

**"S1 701" shows that the number of the first line which register to SIP Server 1 is 701.**
**"S2 2702" shows that the number of the second line which register to SIP Server 2 is 2701.**

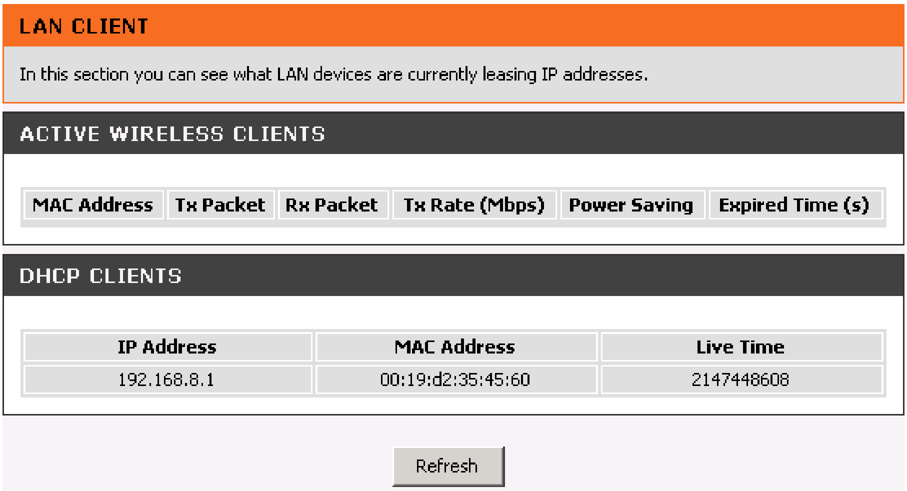
For Server Registration Status, it shows the registration status of DDNS, Phone Book Manager and STUN.

## 3-4-3 LAN Client

The **Active Wireless Clients** table displayed the identification and transmission status of active wireless clients on wireless LAN interface.

The **DHCP Clients** table displayed LAN device that has already been assigned an address from DVG-N5402FF. You can check if the DHCP client has obtain an IP address.

STATUS → LAN Client



LAN CLIENT

In this section you can see what LAN devices are currently leasing IP addresses.

ACTIVE WIRELESS CLIENTS

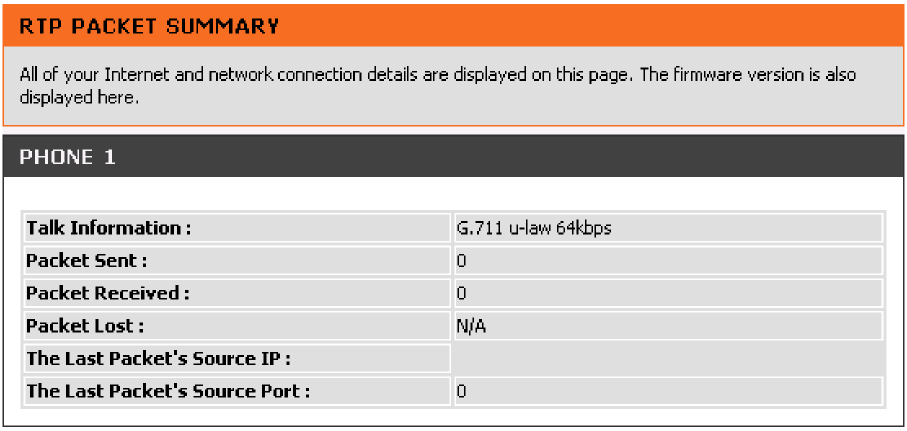
| MAC Address | Tx Packet | Rx Packet | Tx Rate (Mbps) | Power Saving | Expired Time (s) |
|---|---|---|---|---|---|

DHCP CLIENTS

| IP Address | MAC Address | Live Time |
|---|---|---|
| 192.168.8.1 | 00:19:d2:35:45:60 | 2147448608 |

## 3-4-4 Statistics

STATUS → Statistics



RTP PACKET SUMMARY

All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.

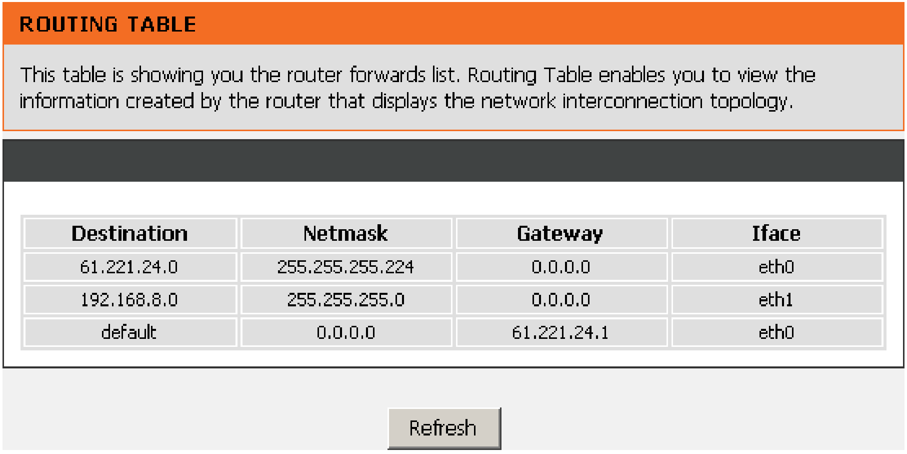
PHONE 1

| | |
|---|---|
| **Talk Information :** | G.711 u-law 64kbps |
| **Packet Sent :** | 0 |
| **Packet Received :** | 0 |
| **Packet Lost :** | N/A |
| **The Last Packet's Source IP :** | |
| **The Last Packet's Source Port :** | 0 |

Display the information of the last call made. Press **Refresh** button to get the latest RTP Packet Summary.

## 3-4-5 Routing Table

STATUS → Routing Table



ROUTING TABLE

This table is showing you the router forwards list. Routing Table enables you to view the information created by the router that displays the network interconnection topology.

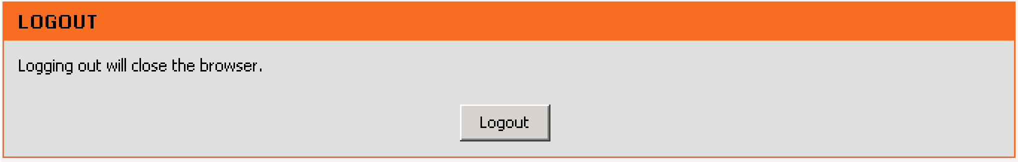
| Destination | Netmask | Gateway | Iface |
|---|---|---|---|
| 61.221.24.0 | 255.255.255.224 | 0.0.0.0 | eth0 |
| 192.168.8.0 | 255.255.255.0 | 0.0.0.0 | eth1 |
| default | 0.0.0.0 | 61.221.24.1 | eth0 |

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

## 3-4-6 Logout

If setting or parameter has been changed, remember to save the changes before you logout the configuration menu.

Logout



LOGOUT

Logging out will close the browser.

# 4. Configuring the VoIP Router through IVR

VoIP transmits voice data (packets) via the Internet, hence the condition and status of the network environment is relatively important to the telecommunications quality. If any one 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 VoIP Routers are connected to the Internet and when the network environment is stable.

**Preparation**

1. Connect the power supply, telephone set, telephone cable, and network cable properly.
2. If a static IP is provided, 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 question.
3. If you are using ADSL (PPPoE) for your network connection, confirm the account number and password.
4. If you intend to operate the VoIP Router under NAT, the IP range of VoIP Router WAN Port and LAN Port IP Address should not be the same in order to avoid phone failures.

**Basic Setup**

The VoIP Router 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 VoIP Router provides convenient IVR functions. Users are able to get query and setup the VoIP Router with a phone-set and function-codes without turning on the PC.

**Note:** When 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:** Connect to telephones. To access IVR mode, passwords should be entered, "* * password #". Alphabets to digits conversion information is provided in the PPPoE Character Conversion Table. (Refer to Page 71) When correct IVR passwords are entered and accepted, an indication tone can be heard indicates the system is in IVR setup mode. Enter function codes to check or configure the VoIP Router. (Please refer to page 68 for function codes).

**Example:** If your password is "1234", enter ＊(star) ＊(star) 1 2 3 4 # (pound)**,** and now you are entering IVR setup mode. Next, enter a function code to check or configure the VoIP Router. If your password is "admin", enter ＊(star) ＊(star) ＊(star) 41 44 53 49 54 # (pound). Please refer to the IVR Functions Table (page 68) for available functions and codes.

Once the setting or query has been completed, you can 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 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

When all setting procedures are completed, dial 509 (Save Settings) from phone keypad. Wait for about three seconds, you should hear a voice prompt "1 (one)." You can now hang up the phone and please reboot the VoIP Router to enable the new settings.

### To inquire about the current VoIP Router WAN Port IP address setting

After completing all your settings, dial 101 from the keypad, then you can hear the system play back the current WAN Port IP address. If the system does not play back the IP address after dialing 101, this indicates that the VoIP Router currently is not connected to the Internet. Please check and make sure the cable connections, account numbers, and passwords are correct.

## 4-1-1 IVR Functions Table:

| Function Code | Description | Example / Notes |
|---|---|---|
| 111/101 | WAN Port IP address Set/Query | Dial function code **114** and then dial 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 | |
| 118 | Restart | |
| 121 | Setup PPPoE Account | Dial function code **114** and then dial 3 for a PPPoE connection. |
| 122 | Set PPPoE Password | |
| 311/301 | LAN Port IP Set/Query | |
| 312/302 | LAN Port Subnet Mask Set/Query | |
| 409 | Restore factory default settings | |
| 509 | Save settings | |
| 900 | Set the IVR and the language used on the Web GUI<br>(1: English, 2: Traditional Chinese, 3: Simplified Chinese) | |

## 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 question.

| Function | Command |
|---|---|
| **Select a Static IP** | • After entering IVR mode, dial 114.<br>• When voice prompt plays "Enter value", dial 1 (to select static IP) |
| **IP address Settings** | • After entering IVR mode, dial 111. When voice prompt plays "Enter value", enter your IP address followed by "#".<br>**Example**: If the IP address is 192.168.1.200, dial 192*168*1*200#. |
| **Subnet Mask Settings** | • After entering IVR mode, dial 112. When voice prompt plays "Enter value", enter your subnet mask followed by "#".<br>**Example**: If the subnet mask value is 255.255.255.0, dial 255*255*255*0#. |
| **Default Gateway Settings** | • After entering IVR mode, dial 113. When voice prompt plays "Enter value", enter your default gateway's IP address followed by "#".<br>**Example**: If the default gateway is 192.168.1.254, dial 192*168*1*254#. |
| **Save Settings and Restart** | • To save settings, dial **509** (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 **101** to check whether the IP address was retained. If the system does not play back the IP address after dialing 101, this indicates that the VoIP Router currently is not connected to the Internet. Please check and make sure the cable connections, account numbers, and passwords are correct. |

### Dynamic IP (DHCP) Settings

After entering IVR mode, dial 114.

When voice prompt plays "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 play back the IP address, this indicates that the VoIP Router failed to communicate with a DHCP server. Please check with 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.

When voice prompt plays "Enter value," dial 3 (to select PPPoE).

### PPPoE Account Settings

After entering IVR mode, dial 121.

When voice prompt plays "Enter value", enter the account number followed by"#".

**Example:** If the account is "87654321@hinet.net," please enter 08 07 06 05 04 03 02 01 71 48 49 54 45 60 72 54 45 60#.

**Note:** It is necessary to enter two digits for each alphabet/number; for example, you must enter "01" for "1" and "11" for "A". Using the web Interface to configure your PPPoE account details is recommended. 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,

When voice prompt plays "Enter value," enter the new password followed by "#".

**Example:** If the password is "3t2ixiae", please enter "03 60 02 49 64 49 41 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 the IP address was retained. If the system does not play back the IP address after dialing **101**, this indicates that the VoIP Router currently is not connected to the Internet. Please check and make sure the cable connections, account numbers, and passwords are correct.

## 4-2-1 PPPoE Character Conversion Table:

The table below provides a list of PPPoE conversion codes. The first row (high-lighted) of each pair of the column lists the numbers, alphabets or symbols and the second row (high-lighted) of each pair of the column ("Input Key") represents the codes to be entered for the corresponding numbers, alphabets or symbols. For example, to enter "D-Link" according to the table 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

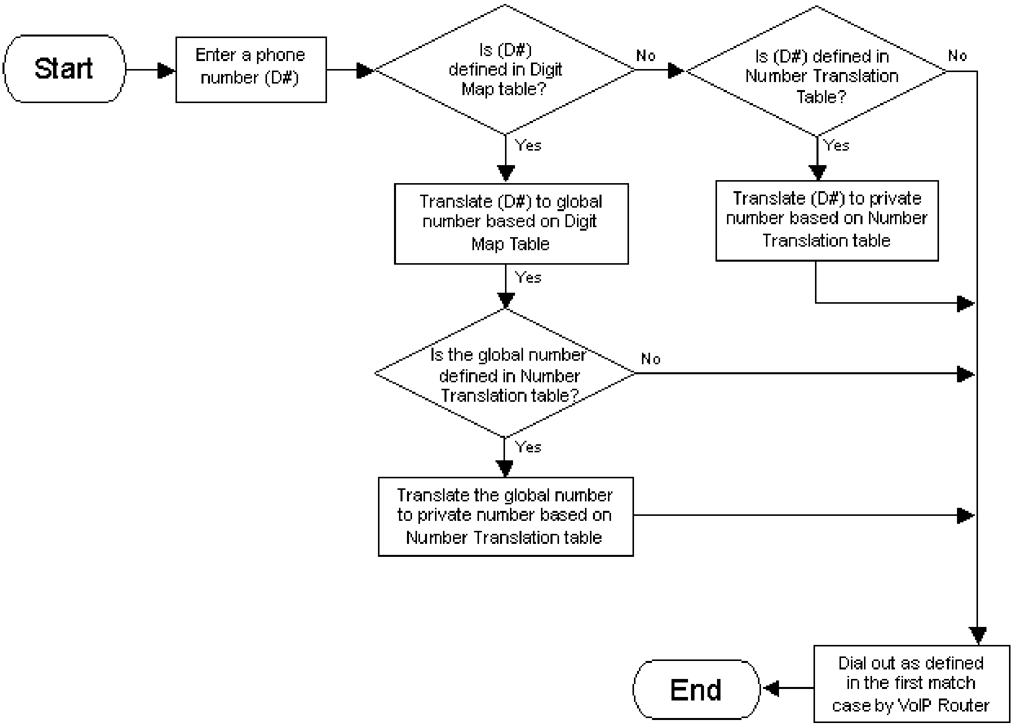
## 5-1 Dialing Options

Dial the phone number which you want to call and press # to call out immediately. Note that if the "# (pound)" not dialed, the number will be called out after 4 seconds by default. The period between number dialed and call out is named "Inter Digits Timeout". (Configurable from "DTMF and PULSE", default=4 seconds, see page 50).

If the phone number matches the setting of the Digit Map, the phone number will be dialed out through the assigned VoIP Service Provider according to VoIP Route Profile automatically.

## 5-2 Number Translation

Phone number is dialed by user. The system will check if the phone number is matched Digit Map Table. If no matched is found from Digit Map Table, it will use the phone number to look up number translation of the server set in VoIP Routing Profile.

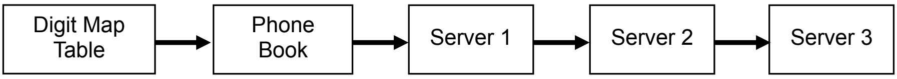

Start
Enter a phone number (D#)
Is (D#) defined in Digit Map table?
No
Is (D#) defined in Number Translation Table?
No
Yes
Yes
Translate (D#) to global number based on Digit Map Table
Translate (D#) to private number based on Number Translation table
Yes
Is the global number defined in Number Translation table?
No
Yes
Translate the global number to private number based on Number Translation table
Dial out as defined in the first match case by VoIP Router
End

# 5-3 Routing

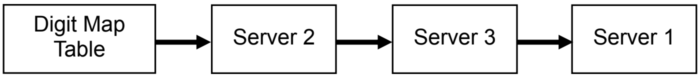
To achieve maximum flexibility, the number dialed will be looked up in several tables defined by VoIP Router. If no match is found from Digit Map Table, it will then look up the number from another table and to the registered VoIP Service Provdier.

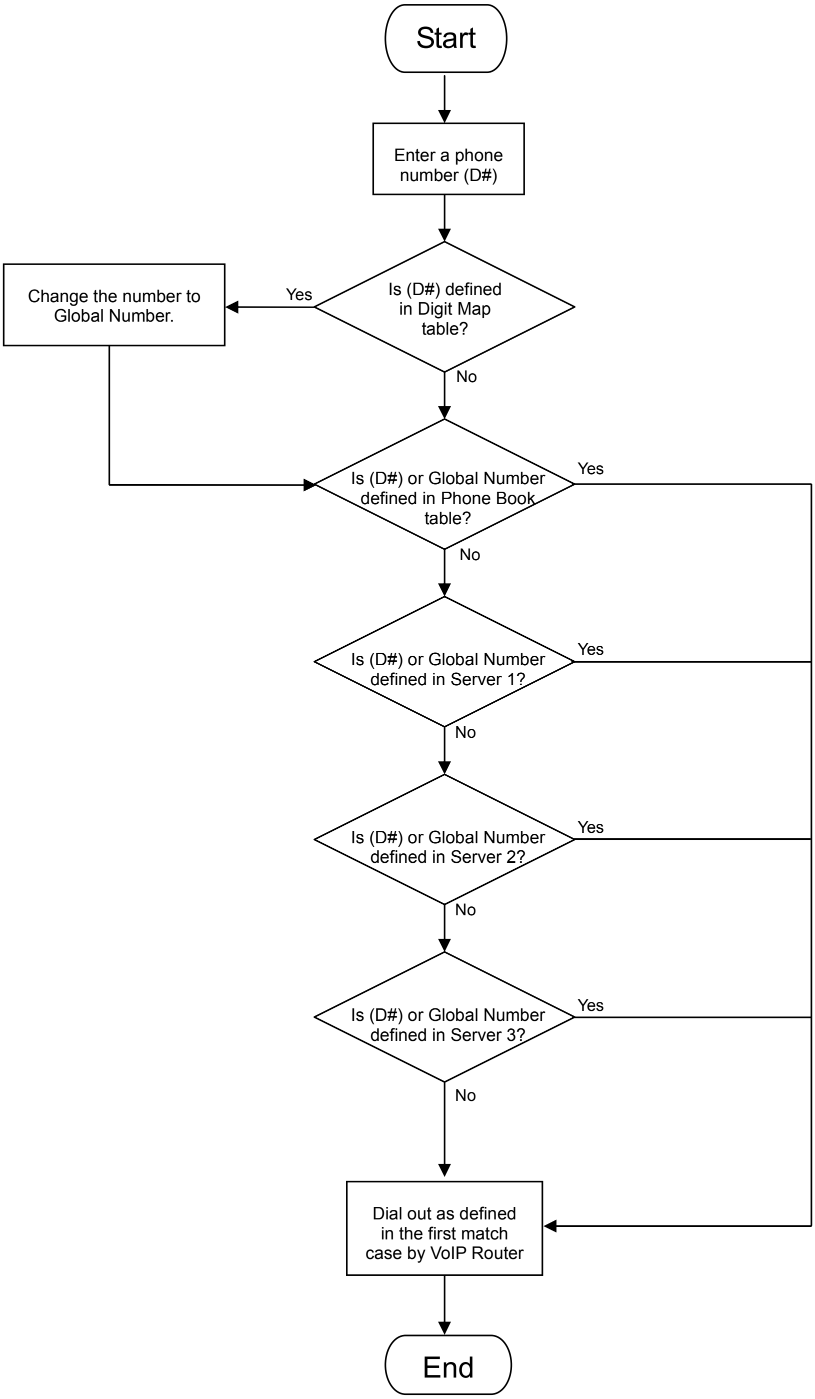
### Routing Processing Flow

The routing after checking Digit Map Table may be vary. The routing accords with VoIP Route Profile. By default, Phone Book is the first route of VoIP Route Profile. The second and third route is Server 1 and Server 2. Server 3 is the last route. Each server has a dialing plan, i.e. number translation, table, and the number will be translated according the dialing plan before dialing out. For default setting, the number look up flow appears like:



Assume that the route of Default Route Profile is Server 2 as the first route, Server 3 as the second route and Server 1 as the last route. The number look up flow appears like:




Start
Enter a phone number (D#)
Is (D#) defined in Digit Map table?
Yes
Change the number to Global Number.
No
Is (D#) or Global Number defined in Phone Book table?
Yes
No
Is (D#) or Global Number defined in Server 1?
Yes
No
Is (D#) or Global Number defined in Server 2?
Yes
No
Is (D#) or Global Number defined in Server 3?
Yes
No
Dial out as defined in the first match case by VoIP Router
End

# Appendix

## Product Features

***WAN***

- One 10/100Mbps auto-negotiation, auto-crossover RJ-45 Ethernet port
- Support static IP, PPPoE, 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 and Outbound Proxy
- NTP: (Network Time Protocol RFC 1305)
- 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-crossover RJ 45 Ethernet ports
- Supports router and bridge mode (NAT mode and Non-NAT mode)
- DHCP server

***Voice Features***

- SIP (RFC3261) compatible
- Voice codecs : G.711 a /ulaw, G.726, G.729A, G.723.1, iLBC, GSM and G.722
- 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.III) / Real time T.38 / Secured T.38 FAX relay
- DTMF, FSK (Bellcore & ETSI) Caller ID generation.
- Support Caller ID Restriction (CLIR)
- Digit Map for dial plan
- Speed Dial
- Local phone book for peer-to-peer calling
- E.164 Numbering & ENUM support
- Hot-Line, Warm-Line support
- Single Number / Account (reprehensive 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 & Maintenance**

- Configuration methods:
    - Web
    - IVR
    - Telnet
- Status reports:
    - Port status
    - Registration status
    - Ping tests
    - Hardware / software information
- Firmware Upgrade through TFTP, FTP or HTTP server
- Configuration Backup/Restore
- Reset button (with restore factory default function)