



Model DG-102SH

VoIP Station Gateway

Draft User's Guide

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RECYCLABLE

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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 communications. 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.

The device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interface.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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Introduction

Thank you for choosing the D-Link DG-102SH, the value leader for VoIP products.

The D-Link DG-102SH VoIP Station Gateway links traditional telephony networks to IP networks with conventional telephony devices such as analog phones or fax machines. The DG-102SH includes two loop start Foreign Exchange Subscriber (FXS) interfaces with normal RJ-11 telephone connectors that provide voice/fax communication over the IP network, and it also provide two 10/100 Mbps dual speed Ethernet ports. One Ethernet port is for a DSL/Cable Modem or other WAN devices, and the other is for connection to create a home or small office LAN networks. The built-in DHCP server/client and Network Address Translation (NAT) function automatically assign IP address for LAN users, allowing multiple users to share a single Internet connection. It can be configured/monitored via the Console, Web browser or Telnet and SNMP management is also supported.

By routing calls over the Internet or any IP network, this gateway can reduce or eliminate long distance or inter-office phone charges. Corporations can also enjoy the benefits of network consolidation and reduction of leased lines by relying on the Internet service providers to deliver toll-quality voice communications over the IP networks.

Features

Designed for versatility and performance, the DG-102SH VoIP Gateway provides the following features:

- ◆ Two analog loop-start FXS interfaces using female RJ-11 connectors
- ◆ One analog POTS interface for PSTN Life Line
- ◆ One 10/100 WAN port for connecting to a call agent
- ◆ One 10/100 LAN port for connecting to a local network
- ◆ IP address assignment using DHCP (Dynamic Host Configuration Protocol) or static configuration
- ◆ Silence suppression to reduce bandwidth consumption
- ◆ Comfort noise generation for a more natural feel
- ◆ Adaptive jitter buffer for smooth voice reception
- ◆ Lost packet recovery ability for improved voice quality
- ◆ Command port for easy configuration
- ◆ Remote software download/update
- ◆ Support IP sharing to allow multiple users to access the Internet via a single IP address
- ◆ Build-in PPPoE function to support dial-up connection for broadband technology
- ◆ Support Caller ID
- ◆ Support QoS to guarantee voice quality
- ◆ Life Line support
 1. Automatic fall back to PSTN in case of power failure or network breakdown
 2. Intelligent dialing mode (IP/PSTN Call) alternation via configurable hot key (" # " key is the default)
 3. Listening of incoming call from PSTN

Unpacking and Setup

Unpacking

Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

- ◆ One DG-102SH VoIP Gateway
- ◆ A/C Power Adapter

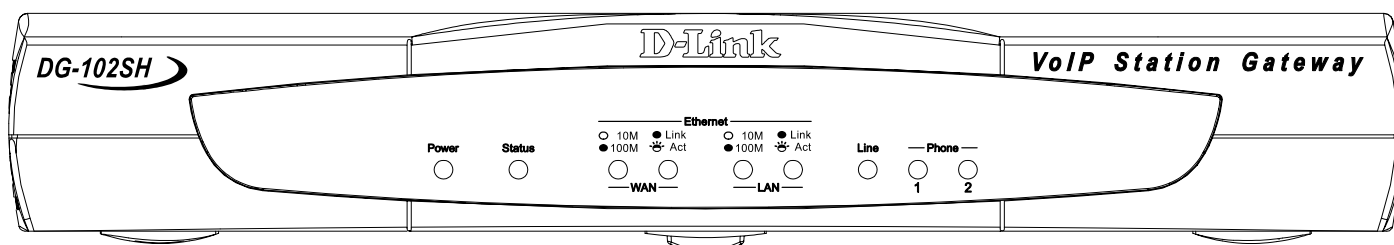
If any item is found missing or damaged, please contact your local reseller or D-Link directly at one of the offices listed at the rear of the manual for replacement.

Identifying External Components

This section identifies all the major external components of the device. Both the front and rear panels are shown, followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

Front Panel

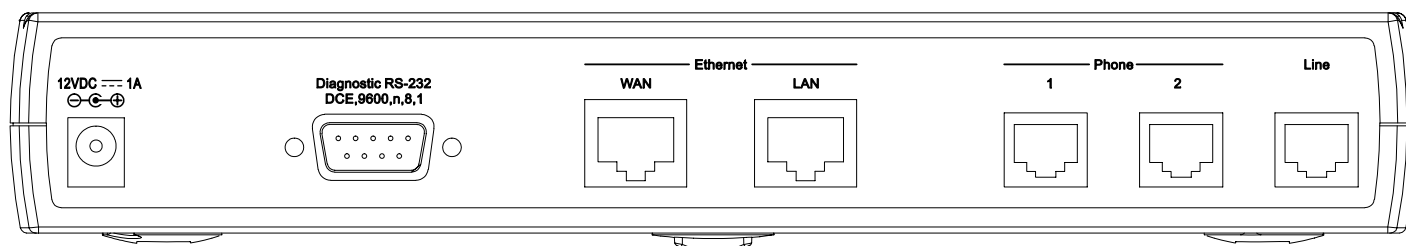
The figure below shows the front panels of the device.



- ◆ **LED Indicator Panel** Refer to the next chapter, “*Understanding Indicators*,” for detailed information about each of the VoIP Gateway’s LED indicators.

Rear Panel

The figure below shows the rear panel of the device.



- ◆ **AC Power Connector** For the included power adapter. If you use a power adapter other than the one included with the product please make sure it has a DC output of 12VDC/1A.
- ◆ **Diagnostic Port** An RS-232 serial port used to configure the device. Plug one end of a straight-through wired RS-232 cable to the device and the other end to a serial port of a PC running a terminal emulation program (such as Microsoft HyperTerminal) or a VT-100 terminal.
- ◆ **Ethernet WAN** A 10/100 dual-speed Ethernet port fitted with an RJ-45 connector used to connect the VoIP gateway to a WAN device (usually a router). This port accepts Category 3, 4 or 5 UTP cabling with an RJ-45 connector.
- ◆ **Ethernet LAN** A 10/100 dual-speed Ethernet port fitted with an RJ-45 connector used to connect the VoIP gateway to a LAN device (hub, switch, PC, etc.). This port accepts Category 5 or better UTP cabling with an RJ-45 connector.
- ◆ **Line** RJ-11 phone jack for connecting to a standard telephone wall outlet through an approved (No. 26 AWG or larger) telecommunications line cord.
- ◆ **Phone 1 to 2** Normal RJ-11 phone jacks used to connect telephones and fax machines. Plug your normal telephone(s) and/or fax machine directly into any of these jacks.

Physical Installation

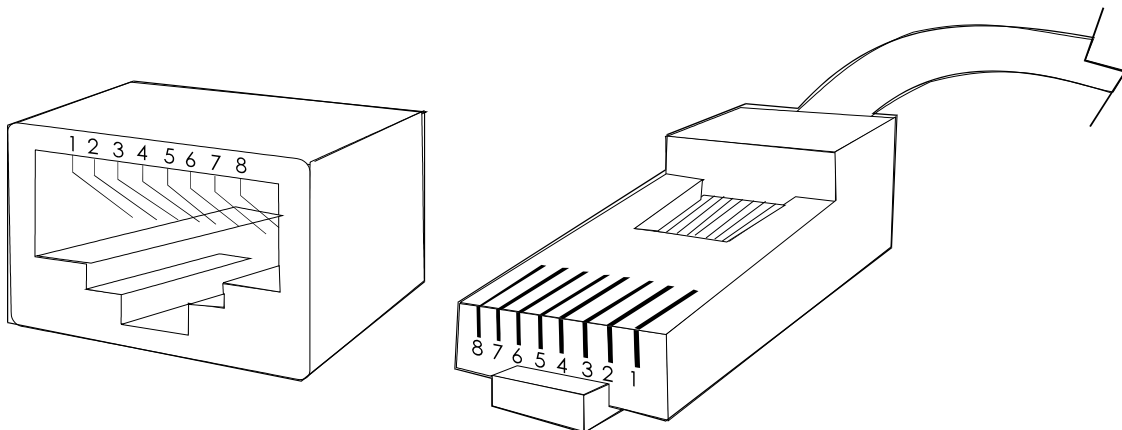
Use the following guidelines when choosing a place to install the VoIP Gateway:

- ◆ The surface must support at least 1 kg.
- ◆ The power outlet should be within 1.82 meters (6 feet) of the device.
- ◆ Visually inspect the power cord and see that it is secured to the AC power connector.
- ◆ Make sure that there is proper heat dissipation from and adequate ventilation around the device. Do not place heavy objects on the unit.

When installing the unit on a desktop or shelf, the rubber feet included with the device should first be attached. Attach these cushioning feet on the bottom at each corner of the device. Allow adequate space for ventilation between the device and the objects around it.

Connecting the Network Cable

Category 3, 4 or 5 UTP cable can be used to make the Ethernet connection to your WAN router.



The maximum cable run between the DG-102SH and the supporting call agent is 100 meters. The cable must be *straight* (not a *crossover* cable) with RJ-45 connectors at each end. Make the network connection

by plugging one end of the cable into the RJ-45 jack of the DG-102SH, and the other end into a port on your WAN router.

Connecting the VoIP Gateway to a PC

Once the device has been connected to a PC, you will need a separate IP address and a straight cable.

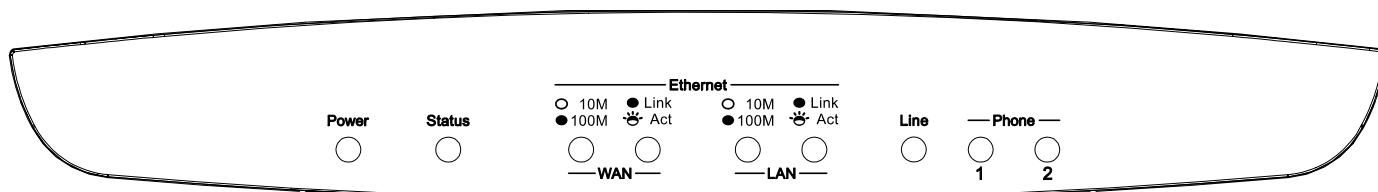
Connecting the VoIP Gateway to a Hub/Switch

To connect the device to either a hub or switch, you must connect the straight cable to the Uplink port.

3

Understanding Indicators

Before configuring your VoIP Gateway, take a few minutes to look over this section and familiarize yourself with the front panel LED indicators depicted below.



- ◆ **Power** This LED is lit when the device is receiving power; otherwise, it is unlit.
- ◆ **Status** This LED will flash quickly when the CPE is either performing a self test or booting up. The LED will remain lit when the system is ready for a connection with the Gatekeeper; it will remain dark when the system is ready but can not receive an acknowledgement from the Gatekeeper.
- ◆ **WAN** This LED displays the connection speed, link status, and activity on the 10/100 dual-speed Ethernet port that is used to connect to your WAN device (usually a router).
 - 10/100M** – This indicator remains unlit when there is no connection, or the port is operating at 10Mbps through a connection to a 10BASE-T device. It is lit when the port is operating at 100Mbps through a connection to a dual-speed or 100BASE-TX Fast Ethernet device.
 - Link/Act** – When a good link to a powered-up but idle device is detected on a port, this indicator shines steadily. When packets are received from the device, the indicator blinks off and on.
- ◆ **LAN** This LED displays the connection speed, link status, and activity on the 10/100 dual-speed Ethernet port that is used to connect to your LAN.
 - 10/100M** – This indicator remains unlit when there is no connection, or the port is operating at 10Mbps through a connection to a 10BASE-T device. It is lit when the port is operating at 100Mbps through a connection to a dual-speed or 100BASE-TX Fast Ethernet device.
 - Link/Act** – When a good link to a powered-up but idle device is detected on a port, this indicator shines steadily. When packets are received from the device, the indicator blinks off and on.
- ◆ **Line** Lights when PSTN line is in use.
- ◆ **Phone 1 to 2** Lights when standard phone port is in use.

NOTE: If a powered-up device is connected to a port and the port's Link/Act status indicator is unlit, the most probable cause is a cabling or connection problem (for example, wrong cable type or bad contact) or a device malfunction.

Configuration

In order to use the DG-102SH VoIP gateway, you must first configure it.

Configuring the VoIP Gateway

There are two ways to configure the VoIP gateway, both of which are discussed below. They are:

- ◆ Using a terminal or PC running terminal emulation software connected to the diagnostic port via an RS-232 cable. In the discussion below, the terminal (or PC) is referred to as a console and the connection a console connection.
- ◆ Using a web browser on a PC connected to the device via the WAN or LAN Ethernet connections. In the discussion below, the PC running the browser is referred to as the management station.

Configuring the VoIP Gateway using a Console

Setting Up a Console

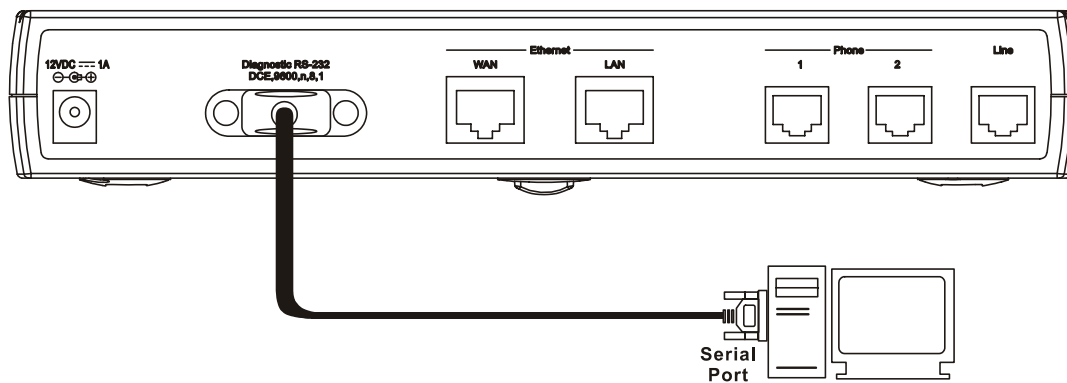
First-time configuration must be carried out through a "console," that is, either (a) a VT100-type serial data terminal, or (b) a computer running communications software set to emulate a VT100. The console must be connected to the Diagnostics port. This is an RS-232 port with a 9-socket D-shell connector and DCE-type wiring. Make the connection as follows:

1. Obtain suitable cabling for the connection.

You can use either (a) a "null-modem" RS-232 cable or (b) an ordinary RS-232 cable and a null-modem adapter. One end of the cable (or cable/adaptor combination) must have a 9-pin D-shell connector suitable for the Diagnostics port; the other end must have a connector suitable for the console's serial communications port.

2. Power down the devices, attach the cable (or cable/adaptor combination) to the correct ports, and restore power.
3. Set the console to use the following communication parameters for your terminal:
 - ◆ 9600 baud
 - ◆ VT-100/ANSI compatible
 - ◆ No parity checking (sometimes referred to as "no parity")
 - ◆ 8 data bits (sometimes called a "word length" of 8 bits)
 - ◆ 1 stop bit (sometimes referred to as a 1-bit stop interval)
 - ◆ No Flow control
 - ◆ VT-100/ANSI compatible
 - ◆ Arrow keys enabled

A typical console connection is illustrated below:



Example of a Console Connection

Configuring the VoIP Gateway Using Telnet

Once you have set an IP address for your device, you can use a Telnet program (in a VT-100 compatible terminal mode) to access and configure it. Most of the screens are identical, whether accessed from the console port or from a Telnet interface.

Console Usage Conventions

The console interface makes use of the following conventions:

Items in <angle brackets> can be toggled on or off using the space bar.

Items in [square brackets] can be changed by typing in a new value. You can use the Backspace and Delete keys to erase characters behind and in front of the cursor.

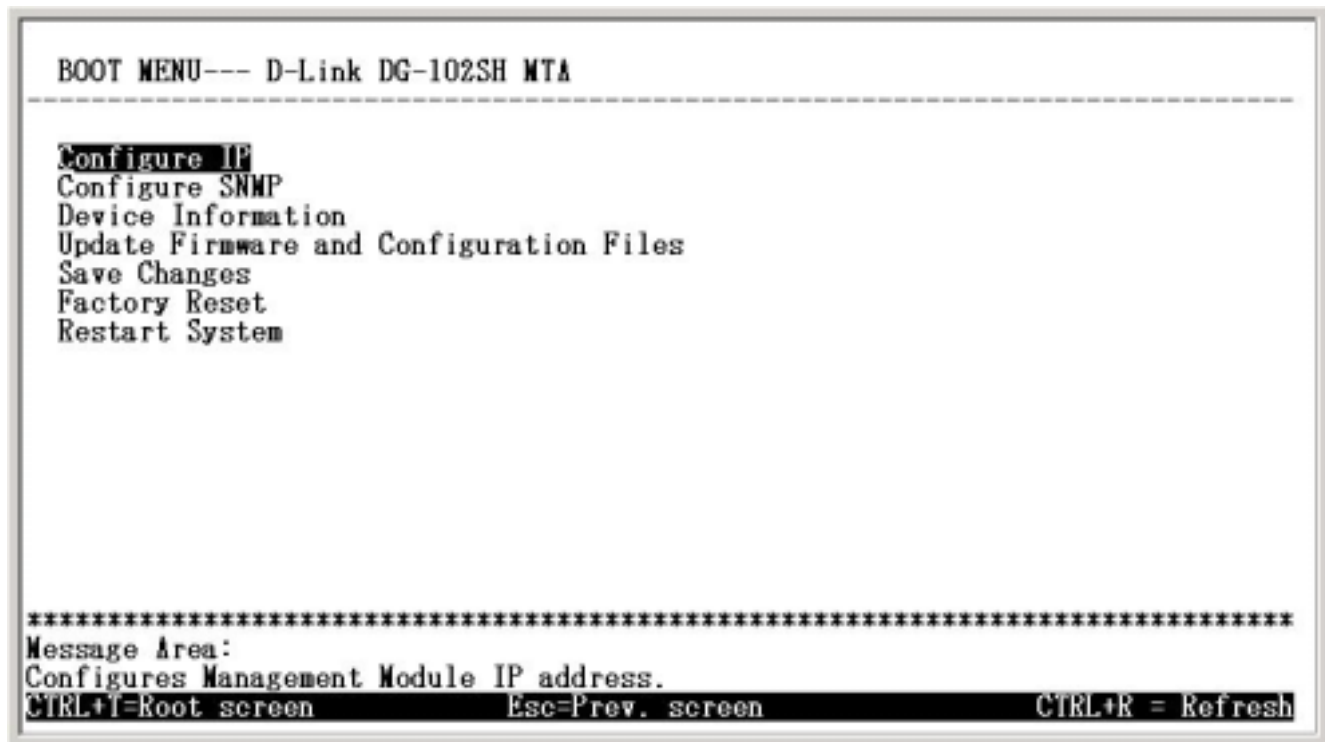
The up and down arrow keys, the left and right arrow keys, the Tab key and the Backspace key can be used to move between selected items. It is recommended that you use the Tab key and Backspace key for moving around the console.

Items in UPPERCASE are commands. Moving the selection to a command and pressing Enter will execute that command, e.g. APPLY, etc.

Please note that the command **APPLY** only applies for the current session. Use **Save Changes** from the **Main Menu** for permanent changes.

First Time Connecting To The VoIP Gateway

First make the console connection to the device and then power it on. If your terminal (or terminal emulation program) is properly configured according to the specifications defined above, you will see the POST test and the boot up process. During this process, press <Ctrl+C> to reach the Boot Menu (shown below).



Initial Screen, First Time Connecting to the device

If the boot up process has proceeded too far and you did not reach the Boot Menu shown above, unplug the device, plug it back in (to restart the boot up process), and press <Ctrl+C> until the Boot Menu appears.

Configuration Settings

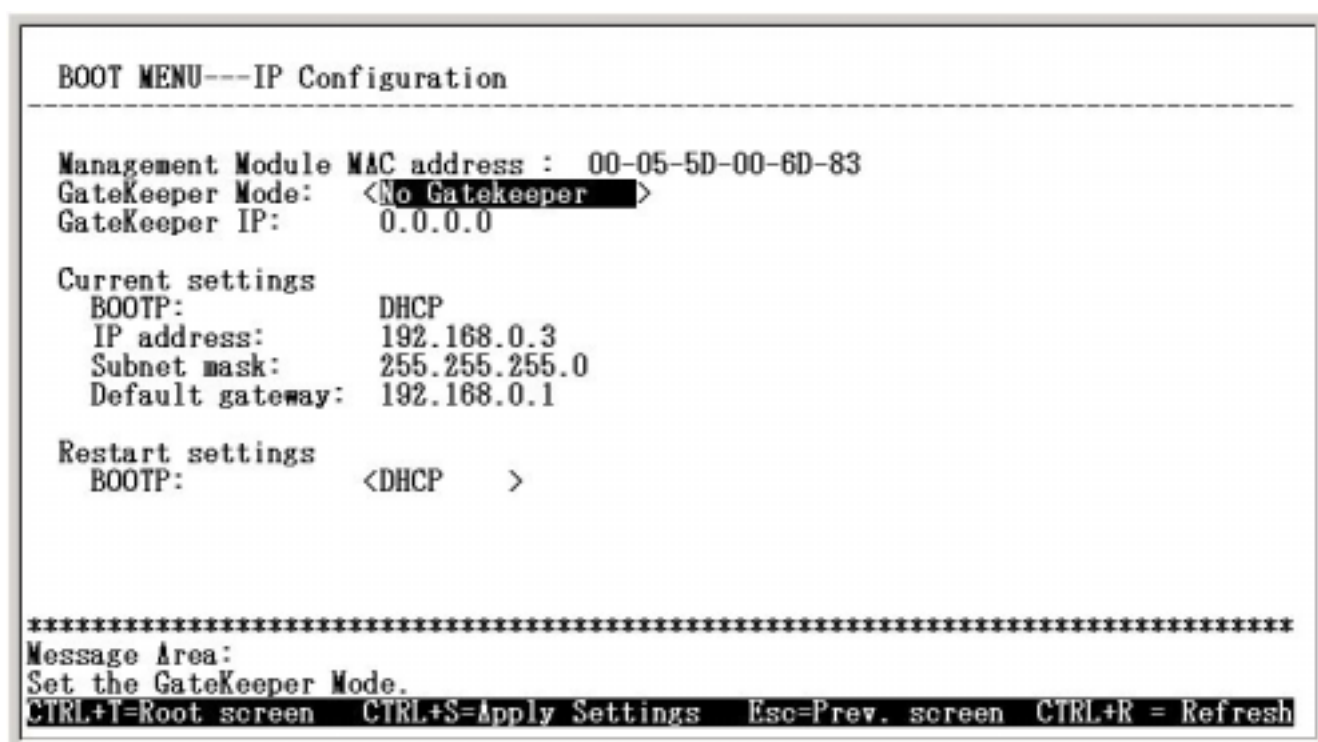
In order for the VoIP to function, you must provide the device with the following information:

- ◆ Define where the device receives its IP settings from.
- ◆ IP settings – IP Address, Subnet Mask, and Default Gateway
- ◆ Gatekeeper Mode– Choose the Gatekeeper mode
- ◆ Gatekeeper IP –The Gatekeeper IP address is necessary if you chose the <Manual Discovery> item within the Gatekeeper Mode

All of these settings are found in the first menu item in the Boot Menu named **IP Configuration**.

Configure IP

Use the <Tab> key to highlight the first menu item Configure IP and press <Enter>. The **IP Configuration** screen will now be displayed:



Boot Menu---IP Configuration screen

- ◆ **Gatekeeper Mode** Use the <Space> key to choose the Gatekeeper mode once the device is rebooted (restarted). Choices include:

Auto Discovery – When *Auto Discovery* is chosen, the VoIP gateway will auto-search the Gatekeeper from your LAN or WAN.

Manual Discovery – When *Manual Discovery* is chosen, the VoIP gateway will attempt to obtain the Gatekeeper settings from the fields located just below.

No Gatekeeper – When *No Gatekeeper* is chosen, the VoIP gateway will not need Gatekeeper.

- ◆ **Gatekeeper IP** Enter an IP address for the Gatekeeper.
- ◆ **BOOTP** Use the <Space> key to choose the method that the VoIP gateway will use to obtain its IP settings once it is rebooted (restarted). Choices include:

Manual – When *Manual* is chosen, the VoIP gateway will obtain its IP settings from the fields located just below.

BOOTP – When *BOOTP* is chosen, the VoIP gateway will attempt to obtain its IP settings from a BOOTP server located on your LAN.

DHCP – When *DHCP* is chosen, the VoIP gateway will attempt to obtain its IP settings from a DHCP server located on your LAN.

- ◆ **IP Address** Enter an IP address for the VoIP gateway.
- ◆ **Subnet Mask** Enter a subnet mask for the VoIP gateway.
- ◆ **Default Gateway** Enter the IP address of the WAN device (usually a router) you are using to make the WAN connection.

After you have finished, press <Ctrl+S> to save changes to RAM. Next, press the <Esc> key to return to the Boot Menu. Position the cursor over the *Save Changes* item and press <Enter>. This will save the settings to NV-RAM so they will still be present after powering off or restarting the device. Position the cursor over the *Restart System* item and press <Enter> for the changes to take effect.

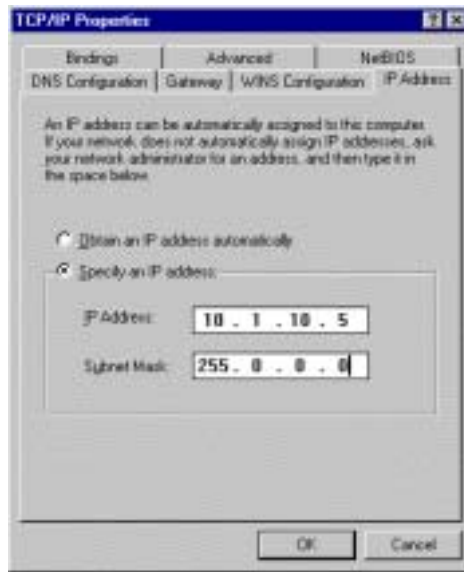
Your VoIP is now configured for use.

Configuring the VoIP Gateway using a Web Browser

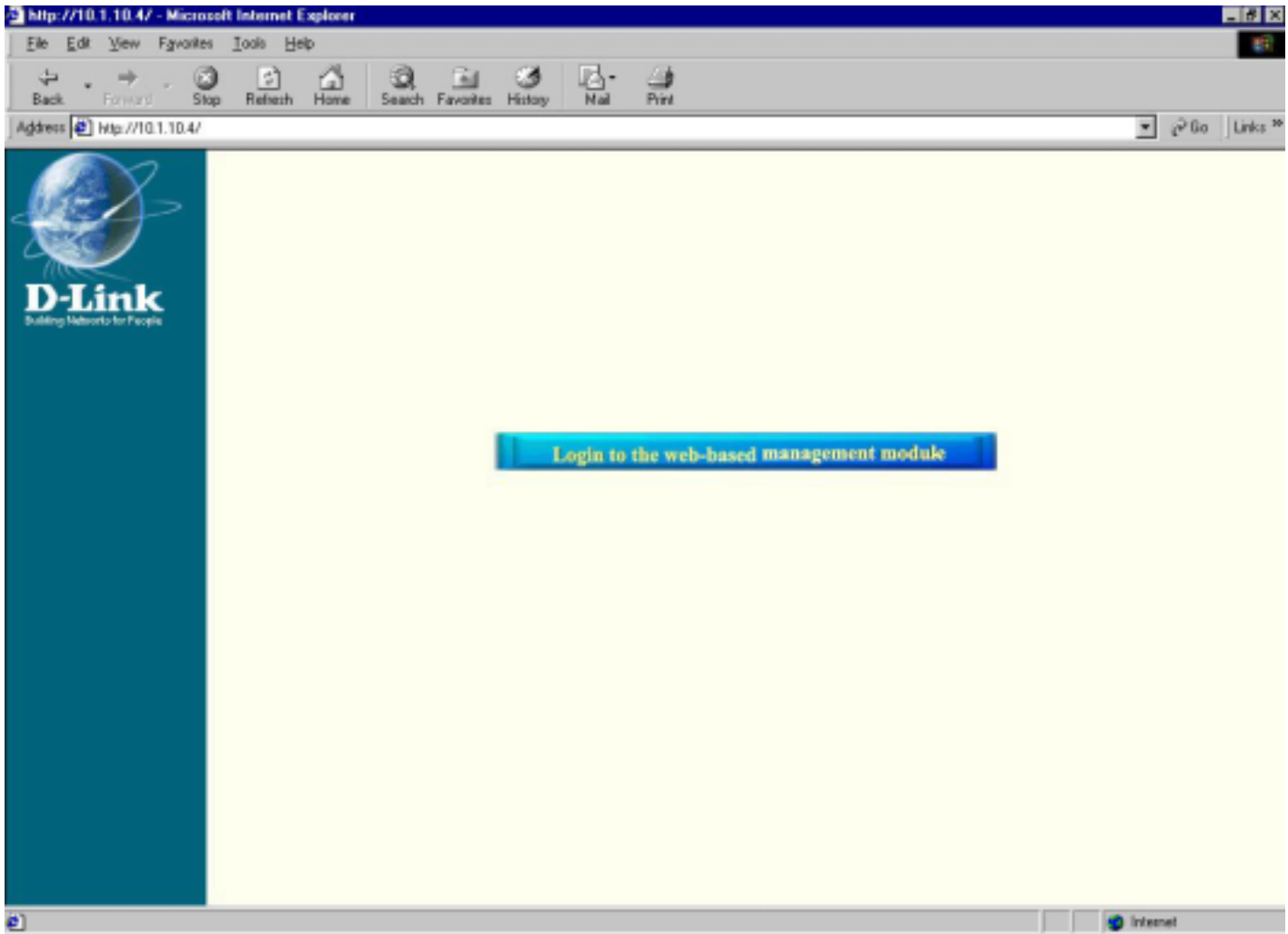
Setting Up the Connection

In order to use a web browser to configure the VoIP gateway, you must make sure it has a valid Ethernet connection to a PC or LAN via its LAN or WAN ports.

The VoIP gateway comes with a default IP address of 10.1.10.4. You must make sure the PC is in the same IP domain as the VoIP gateway. You can do this by changing the IP address of the PC as shown below.



Once this is done, run any browser on the PC and point it to the default IP address of the VoIP as shown below:



Initial Window, First Time Connecting to the Web-Based Management Module

Click on the *Login to the web-based management module* button in the middle of the window. The following window will be displayed:

A screenshot of a dialog box titled 'Enter Network Password'. It contains a key icon and the text 'Please type your user name and password.' Below this, it shows 'Site: 10.1.10.4' and 'Realm:'. There are two input fields: 'User Name' and 'Password'. At the bottom, there is a checkbox labeled 'Save this password in your password list' and two buttons: 'OK' and 'Cancel'.

Initially, the VoIP gateway does not have a Username or Password. To log in, simply click on the OK button. The following window will be displayed:

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- Config IP & H.323
- Device Information
- Telephony Configuration
- Dial Address Configuration
- DHCP Configuration
- NAT Configuration
- SNMP Trap Configuration
- Administration Management
- Monitor
- Update Firmware
- Save Changes
- Factory Reset
- Restart System

Device Information

| | |
|------------------------|-----------------------|
| Device Type | VoIP Gateway |
| MAC Address | 00:05:5d:00:6d:83 |
| Boot PROM Version | 0.00-B04 |
| Firmware Version | 0.00-B08 |
| Hardware Revision | |
| DSP Version | Not yet loaded |
| Country Code | Japan |
| Life Line Prefix Digit | |
| Life Line Status | enabled |
| Serial Number | |
| System Name | |
| System Location | |
| System Contact | D-Link Technical Supp |

Save

Device Information window

To begin configuring the device, click on the **Config IP & H.323** folder on the left-hand side of the window (shown below).



Next, click on **Config Device IP Address**. The following window will appear:

Configure Device IP Address

MAC Address: 00:05:5d:00:6d:83

Current Settings

| | |
|-----------------|-------------|
| Get IP From | Manual |
| IP Address | 10.38.48.16 |
| Subnet Mask | 255.0.0.0 |
| Default Gateway | 10.1.1.254 |

Restart Settings

| | |
|-----------------|-------------------|
| Get IP From | Manual |
| IP Address | 10 . 38 . 48 . 16 |
| Subnet Mask | 255 . 0 . 0 . 0 |
| Default Gateway | 10 . 1 . 1 . 254 |

PPPoE Settings

| | |
|-----------|----------|
| State | disabled |
| User Name | |

Configure Device IP Address window

The items on this window are described below:

Restart Settings

- ♦ **Get IP From** Choose the method the VoIP gateway will use to obtain its IP settings once it is rebooted (restarted). Choices include:

Manual – When *Manual* is chosen, the VoIP gateway will obtain its IP settings from the fields located just below.

BOOTP – When *BOOTP* is chosen, the VoIP will attempt to obtain its IP settings from a BOOTP server located on your LAN.

DHCP – When *DHCP* is chosen, the VoIP will attempt to obtain its IP settings from a DHCP server located on your LAN.

- ♦ **IP Address** Enter an IP address for the VoIP gateway.
- ♦ **Subnet Mask** Enter a subnet mask for the VoIP gateway.
- ♦ **Default Gateway** Enter the IP address of the WAN device (usually a router) you are using to make the WAN connection.

PPPoE Settings

- ♦ **State** Enables or disables the PPPoE function.
- ♦ **User Name** Enter the User Name for the PPPoE function.
- ♦ **Password** Enter the Password for the PPPoE function.

Click on the **Save** button at the bottom right of the screen to save the settings.

Next, click on the **Config H.323** item in the list at the left of the screen. The following window will appear:

Configure H.323

GateKeeper Information

| | |
|----------------------------------|----------------------|
| Mode | Auto |
| GateKeeper IP Address | 0 . 0 . 0 . 0 |
| Send Keepalive RRQ to GateKeeper | disabled |
| Keepalive Interval | 120 (1 .. 65535 sec) |

H.323 Information

| | |
|--------------------------|-----------------|
| Display Name | DG102SH |
| H.323 ID | DEFAULT_H323_ID |
| Terminal Type (0 .. 255) | 60 |

Save

Send Register/Unregister to GateKeeper Register Unregister

Configure H.323 window

The items on this window are described below:

Gatekeeper Information

- ◆ **Mode** Choose the Gatekeeper mode.(Default is Auto)
- ◆ **Gatekeeper IP Address** This IP address is necessary if you chose the Manual mode defined as above.
- ◆ **Send Keepalive RRQ to Gatekeeper** Enables or disables the Keepalive function.
- ◆ **Keepalive Interval** This is a user-defined Keepalive Interval

H.323 Information

- ◆ **Display Name**
- ◆ **H.323 ID**
- ◆ **Terminal Type (0...255)**

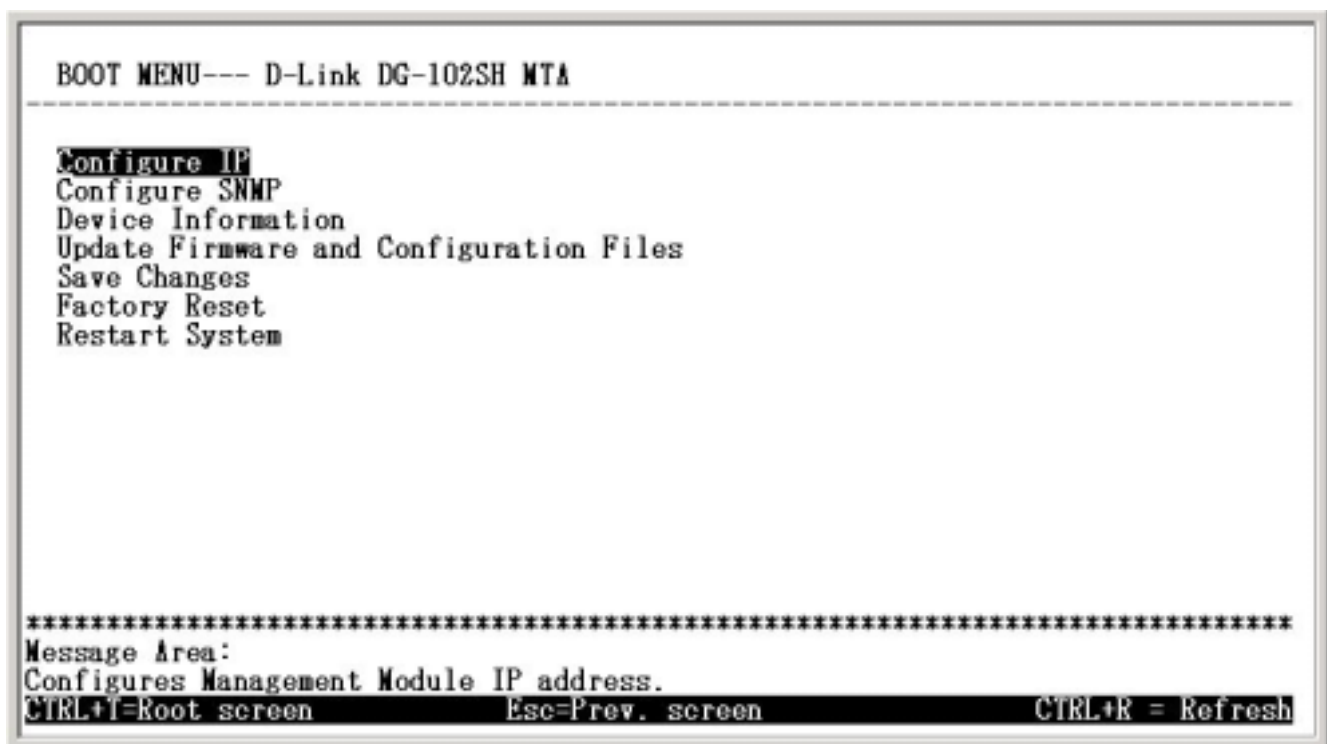
Click on the **Save** button at the bottom right of the screen to save the settings.

Send Register/Unregister to Gatekeeper Determines whether or not the device register to Gatekeeper.

Using The Boot Menu

The DG-102SH VoIP gateway features a Boot Menu, which is described in this chapter.

To access the Boot Menu, you must first make sure the console is connected to the Diagnostics port (an RS-232 port with a 9-socket D-shell connector and DCE-type wiring) and the appropriate cabling for the connection is being used. Please see the previous chapter, “*Configuration*,” for additional information. Next, power the device on by simply plugging it in. You will see the POST test and the boot up process. During this process, press <Ctrl+C> to reach the Boot Menu. If the boot up process has proceeded too far and you did not reach the Boot Menu shown below, unplug the device, plug it back in (to restart the boot up process), and press <Ctrl+C> until the Boot Menu appears.



Boot Menu---Opening screen

Configure IP

This screen allows you to enter information necessary for the initial configuration of this device.

Use the <Tab> key to highlight the first menu item on the Boot Menu, Configure IP, and press <Enter>. The **IP Configuration** screen will be displayed:

```

BOOT MENU---IP Configuration
-----
Management Module MAC address : 00-05-5D-00-6D-83
GateKeeper Mode:  <No Gatekeeper>
GateKeeper IP:    0.0.0.0

Current settings
  BOOTP:          DHCP
  IP address:      192.168.0.3
  Subnet mask:     255.255.255.0
  Default gateway: 192.168.0.1

Restart settings
  BOOTP:          <DHCP  >

*****
Message Area:
Set the GateKeeper Mode.
CTRL+I=Root screen  CTRL+S=Apply Settings  Esc=Prev. screen  CTRL+R = Refresh

```

Boot Menu---IP Configuration screen

Each item on the **IP Configuration** screen is described below:

- ◆ **Gatekeeper Mode** Use the <Space> key to choose the Gatekeeper mode once the device is rebooted (restarted). Choices include:

Auto Discovery – When *Auto Discovery* is chosen, the VoIP gateway will auto-search the Gatekeeper from your LAN or WAN.

Manual Discovery – When *Manual Discovery* is chosen, the VoIP gateway will attempt to obtain the Gatekeeper settings from the fields located just below.

No Gatekeeper – When *No Gatekeeper* is chosen, the VoIP gateway will not need Gatekeeper

- ◆ **Gatekeeper IP** Enter an IP address for the Gatekeeper.
- ◆ **BOOTP** Use the <Space> key to choose the method that the VoIP gateway will use to obtain its IP settings once it is rebooted (restarted). Choices include:

Manual – When *Manual* is chosen, the VoIP gateway will obtain its IP settings from the fields located just below.

BOOTP – When *BOOTP* is chosen, the VoIP gateway will attempt to obtain its IP settings from a BOOTP server located on your LAN.

DHCP – When *DHCP* is chosen, the VoIP gateway will attempt to obtain its IP settings from a DHCP server located on your LAN.

- ◆ **IP address** Enter an IP address for the VoIP gateway.
- ◆ **Subnet mask** Enter a subnet mask for the VoIP gateway.
- ◆ **Default gateway** Enter the IP address of the WAN device (usually a router) you are using to make the WAN connection.

After you have finished, press <Ctrl+S> to save changes to RAM. Next, press the <Esc> key to return to the Boot Menu. Position the cursor over the *Save Changes* item and press <Enter>. This will save the settings

to NV-RAM so they will still be present after powering off or restarting the device. Make sure the *Reset* button on the rear panel of the device is in the down position. Position the cursor over the *Restart System* item and press <Enter> for the changes to take effect. Your VoIP is now configured for use.

Configure SNMP

This screen allows you to set an SNMP trap manager.

```
BOOT MENU---SNMP Configuration
-----
SNMP AuthTrap :  <Disabled>
Trap Manager:
Community:      [          ]
IP:             [0.0.0.0    ]

*****
Message Area:
Select SNMP Trap state.
CTRL+I=Root screen  CTRL+S=Apply Settings  Esc=Prev. screen  CTRL+R = Refresh
```

Boot Menu---SNMP Configuration screen

Each item on the **SNMP Configuration** screen is described below:

- ◆ **SNMP AuthTrap** Enables or disables the SNMP trap function.
- ◆ **Community** Enter the community name of the trap manager.
- ◆ **IP** Enter the IP address of the trap manager.

Device Information

This screen displays various types of information about the DG-102SH as well as allowing you to enter information pertaining to name, location, and how to reach the person responsible for maintaining the device.

Use the <Tab> keys to highlight the second menu item on the Boot Menu, Device Information, and press <Enter>. The **Device Information** screen will be displayed:


```

BOOT MENU---Device Information
-----
Device Type:      D-Link DG-102SH WTA
MAC Address:      [00-05-5D-00-6D-83]
Serial Number:    [
Boot PROM Version: 0.00-B04
Firmware Version: 0.00-B08
Hardware Revision:

System Country Code: [1 ]
System Name:        [
System Location:     [
System Contact:      [ D-Link Technical Support.
Lifeline State:      <enabled >
Lifeline prefix:     [#]

*****
Message Area:
CTRL+T=Root screen  CTRL+S=Apply Settings  Esc=Prev. screen  CTRL+R = Refresh

```

Boot Menu---Device Information screen

Each item on the **Device Information** screen is described below:

- ◆ **Device Type** This displays the model name of this device.
- ◆ **MAC Address** This displays the MAC address of this device.
- ◆ **Serial Number** This displays the serial number of this device.
- ◆ **Boot PROM Version** This displays the version number of the device's startup code.
- ◆ **Firmware Version** This displays the version number of the device's runtime code.
- ◆ **Hardware Revision** This displays the revision number of the hardware circuitry.
- ◆ **System Country Code** This is a user-defined country code for this device. < 0:USA, 1:Japan (Default), 2:Hong Kong, 3:Sweden >
- ◆ **System Name** This is a user-defined name for this device.
- ◆ **System Location** This is a user-defined physical location of the device.
- ◆ **System Contact** This is user-defined contact information for the person or department responsible for the maintenance of this device.
- ◆ **Lifeline State** Enables or disables the Lifeline function
- ◆ **Lifeline Prefix** This is a user-defined Lifeline prefixed key for this device. (Default is “#” key)

Update Firmware and Configuration Files

New software can be downloaded from a TFTP server.

Use the <Tab> keys to highlight the third menu item on the Boot Menu, Update Firmware and Configuration Files, and press <Enter>. The **Update Firmware and Configuration Files** screen will be displayed:

```

BOOT MENU---Update Firmware and Configuration Files
-----

Software Update Mode:  WAN Link
TFTP Server Address: [0.0.0.0]

Update Firmware:
  Firmware Update: <disabled>
  File Name: [                ]

Use Configuration File:
  Use Config File: <disabled>
  File Name: [                ]

Last TFTP Server Address: 0.0.0.0

RESET DEVICE TO START UPDATE

*****
Message Area:
Specify TFTP Server IP address.
CTRL+T=Root screen  CTRL+S=Apply Settings  Esc=Prev. screen  CTRL+R = Refresh

```

Boot Menu---Update Firmware and Configuration Files screen

After making your changes in the fields above, press **RESET DEVICE TO START UPDATE** to initiate the update sequence.

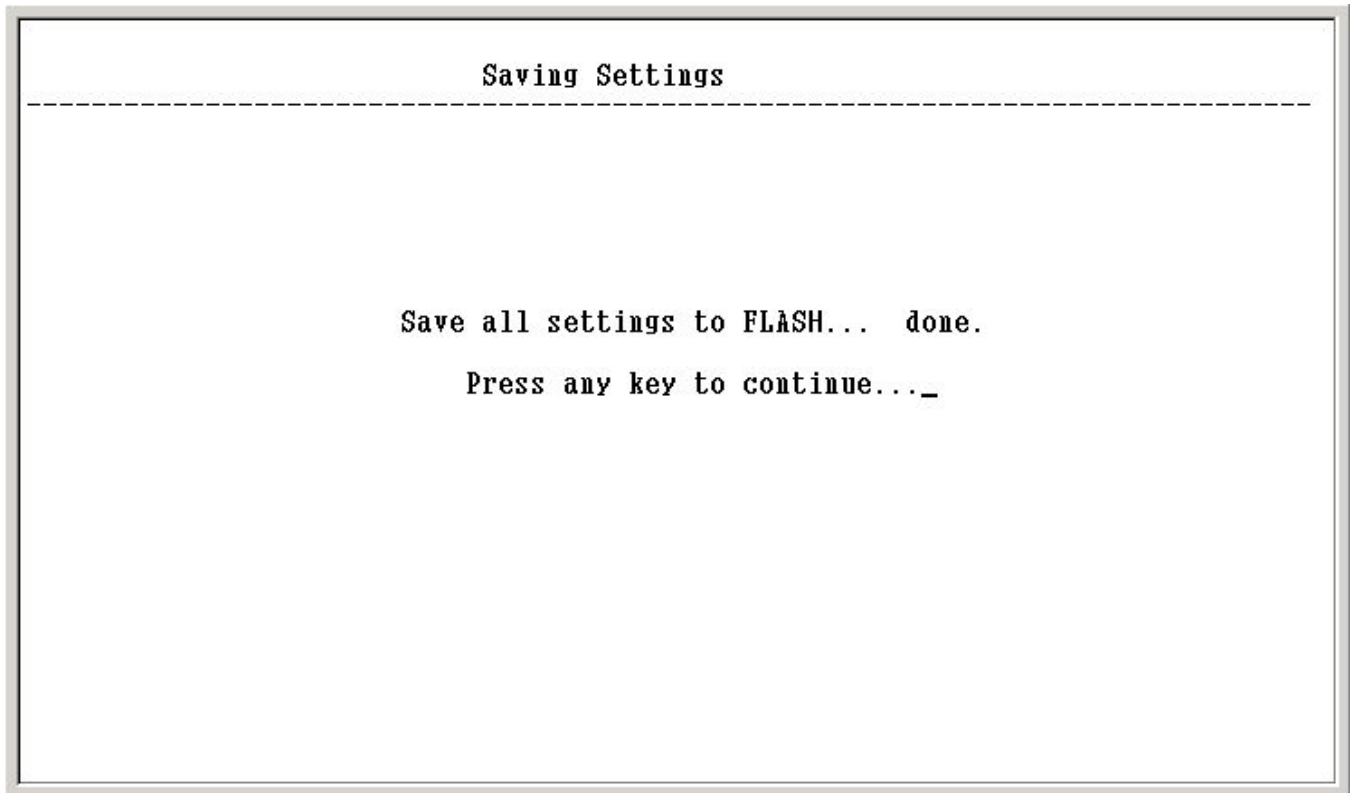
Each item on the **Update Firmware and Configuration Files** screen is described below:

- ◆ **Software Update Mode** This specifies downloading the image file through a *WAN Link*.
- ◆ **TFTP Server Address** The IP address of the TFTP server where the runtime or configuration file is located. This entry is used only if the Firmware Update is set to *Enable*.
- ◆ **Firmware Update** Determines whether or not the device will try to look for a runtime image file on the TFTP server.
- ◆ **File Name** The complete path and filename of the runtime image file on your TFTP server to be uploaded to the device.
- ◆ **Use Config File** Toggle to *Enabled* to use the settings in a configuration text file when the device is reset (rebooted).
- ◆ **File Name** The complete path and filename on the TFTP server for the desired configuration file.
- ◆ **Last TFTP Server Address** This is a read-only field that displays the IP address of the last TFTP server to be accessed.

Note: After finishing the **Update Firmware**, please **Must** perform **Factory Reset** to make sure firmware update is complete

Save Changes

To save all the changes made in the current session to the device's flash memory, use the <Tab> keys to highlight the fourth menu item on the Boot Menu, Save Changes, and press <Enter>. The **Saving Settings** screen will be displayed:



Boot Menu---Saving Settings screen

After the settings have been saved to NV-RAM, they will become the default settings for the device, and they will be used every time it is powered on, reset or rebooted. The only exception to this is a factory reset, which will clear all settings and restore them to their initial values, which were present when the device was purchased.

Factory Reset

Before performing a Factory Reset, be absolutely certain that this is what you want to do. Once the reset is done, all of the device's settings stored in NV-RAM will be erased and restored to values present when the device was purchased.

Note: After performing the Factory Reset, make sure to redefine the IP settings for the device in the **IP Configuration** menu. Then perform a Restart System on the device. After these three procedures are performed, your Factory Reset is complete.

To perform a Factory Reset, use the <Tab> keys to highlight the fifth menu item on the Boot Menu, Factory Reset, and press <Enter>. The **Factory Reset** screen will be displayed:

Factory Reset

CAUTION! This function resets the configuration to default values.
All changes made to settings since the device was purchase will be erased.
Make sure to set the Restart Settings in the IP Configuration screen
after applying the Factory Reset and before Rebooting.

Are you sure you want to proceed with the factory reset?

☒ No Yes

Message Area:

CTRL+T=Root screen Esc=Prev. screen CTRL+R = Refresh

Boot Menu---Factory Reset screen

Restart System

To perform a system reset, use the <Tab> keys to highlight the last menu item on the Boot Menu, Restart System, and press <Enter>. The following **Reboot Device** screen will be briefly displayed:

Reboot Device

Please wait, the device is rebooting..._

Boot Menu---Restart System screen

6

Web-Based Management

Introduction

The DG-102SH VoIP gateway offers an embedded Web-based (hypertext) interface allowing users to manage the device from anywhere on the network through a standard browser such as Netscape Navigator/Communicator, 4.x or later, or Microsoft Internet Explorer, 4.x or later. The Web browser acts as a universal access tool and can communicate directly with the device using HTTP protocol. Your browser screen may vary with the screen shots (pictures) in this guide.

Note: This Web-based Management Module does not accept Chinese language input (or other languages requiring two bytes per character).

Getting Started

The first step in getting started in using Web-based management for your device is to secure a browser. A Web browser is a program that allows a person to read hypertext, for example, Netscape Navigator, 4.x or later, or Microsoft Internet Explorer, 4.x or later. Follow the installation instructions for the browser.

The second and last step is to configure the IP interface of the device. This can be done manually through a console. See the *Configuring the VoIP Gateway using a Web Browser* section of the “*Configuration*” chapter for specific instructions.

Management

To begin managing your device simply run the browser you have installed on your computer and point it to the IP address you have defined for the device. The URL in the address bar should read something like: `http://123.123.123.123`, where the numbers 123 represent the IP address of the device.

In the page that opens, click on the following **Login to the web-based management module** button:



This categories listed on the left-side of the web-based management module include: **Config IP & H.323** (**Config Device IP Address** and **Config H.323**), **Device Information**, **Telephony Configuration** (**System Gains** and **Prefer Codec Table**), **Dial Address Configuration** (**Basic** and **Advance**), **DHCP Configuration** (**Dynamic IP Assignment** and **Static IP Assignment**), **NAT Configuration** (**NAT Configuration** and **Local Server Configuration**), **SNMP Trap Configuration**, **Administration Management**, **Monitor** (**Ethernet Statistics**, **DSP Statistics**, **Tcid Configuration**, and **Coding Profile**), **Firmware and Configuration Update**, **Save Changes**, **Factory Reset**, and **Restart System**.

Config Device IP Address

D-Link
Building Networks for People

D-Link DG-102SH

- Config IP & H.323
 - Config Device IP Address**
 - Config H.323
- Device Information
- Telephony Configuration
- Dial Address Configuration
- DHCP Configuration
- NAT Configuration
- SNMP Trap Configuration
- Administration Management
- Monitor
- Update Firmware
- Save Changes
- Factory Reset
- Restart System

Configure Device IP Address

MAC Address: 00:05:5d:00:6d:83

Current Settings

| | |
|-----------------|-------------|
| Get IP From | Manual |
| IP Address | 10.38.48.16 |
| Subnet Mask | 255.0.0.0 |
| Default Gateway | 10.1.1.254 |

Restart Settings

| | |
|-----------------|-------------------|
| Get IP From | Manual |
| IP Address | 10 . 38 . 48 . 16 |
| Subnet Mask | 255 . 0 . 0 . 0 |
| Default Gateway | 10 . 1 . 1 . 254 |

PPPoE Settings

| | |
|-----------|----------|
| State | disabled |
| User Name | |

Configure Device IP Address window

The items on this window are described below:

Restart Settings

- ♦ **Get IP From** Choose the method the VoIP gateway will use to obtain its IP settings once it is rebooted (restarted). Choices include:

Manual – When *Manual* is chosen, the VoIP gateway will obtain its IP settings from the fields located just below.

BOOTP – When *BOOTP* is chosen, the VoIP will attempt to obtain its IP settings from a BOOTP server located on your LAN.

DHCP – When *DHCP* is chosen, the VoIP will attempt to obtain its IP settings from a DHCP server located on your LAN.

- ♦ **IP Address** Enter an IP address for the VoIP gateway.
- ♦ **Subnet Mask** Enter a subnet mask for the VoIP gateway.
- ♦ **Default Gateway** Enter the IP address of the WAN device (usually a router) you are using to make the WAN connection.

PPPoE Settings

- ♦ **State** Enables or disables the PPPoE function.
- ♦ **User Name** Enter the User Name for the PPPoE function.
- ♦ **Password** Enter the Password for the PPPoE function.

Click on the **Save** button at the bottom right of the window to save the settings.

Configure H.323

The screenshot shows the 'Configure H.323' window in the D-Link DG-102SH web interface. On the left is a sidebar with a tree view containing options like 'Config IP & H.323', 'Device Information', 'Telephony Configuration', 'Dial Address Configuration', 'DHCP Configuration', 'NAT Configuration', 'SNMP Trap Configuration', 'Administration Management', 'Monitor', 'Update Firmware', 'Save Changes', 'Factory Reset', and 'Restart System'. The main area is titled 'Configure H.323' and contains two sections:

- GateKeeper Information:**
 - Mode:** A dropdown menu set to 'Auto'.
 - GateKeeper IP Address:** Four input boxes showing '0', '0', '0', and '0'.
 - Send Keepalive RRQ to GateKeeper:** A dropdown menu set to 'disabled'.
 - Keepalive Interval:** An input box showing '120' with a range '(1 .. 65535 sec)'.
- H.323 Information:**
 - Display Name:** An input box containing 'DG102SH'.
 - H.323 ID:** An input box containing 'DEFAULT_H323_ID'.
 - Terminal Type (0 .. 255):** An input box containing '60'.

At the bottom right is a 'Save' button. At the bottom center, there is a label 'Send Register/Unregister to GateKeeper' followed by 'Register' and 'Unregister' buttons.

Configure H.323 window

The items on this window are described below:

Gatekeeper Information

- ♦ **Mode** Choose the Gatekeeper mode.(Default is Auto)
- ♦ **Gatekeeper IP Address** This IP address is necessary if you chose the Manual mode defined as above.
- ♦ **Send Keepalive RRQ to Gatekeeper** Enables or disables the Keepalive function.
- ♦ **Keepalive Interval** This is a user-defined Keepalive Interval

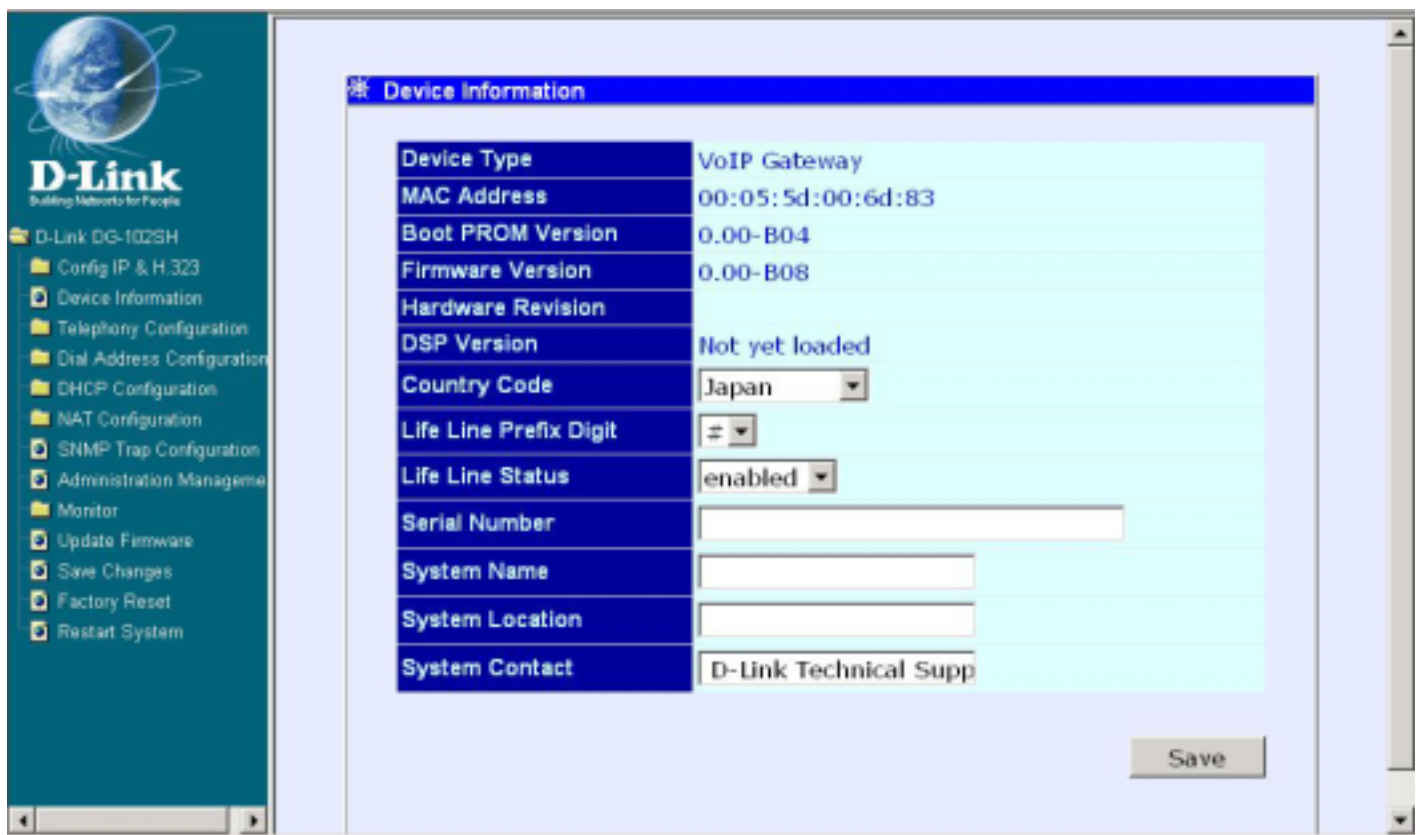
H.323 Information

- ♦ **Display Name**
- ♦ **H.323 ID**
- ♦ **Terminal Type (0...255)**

Click on the **Save** button at the bottom right of the screen to save the settings.

Send Register/Unregister to Gatekeeper Determines whether or not the device register to Gatekeeper.

Device Information



| * Device Information | |
|------------------------|-----------------------|
| Device Type | VoIP Gateway |
| MAC Address | 00:05:5d:00:6d:83 |
| Boot PROM Version | 0.00-B04 |
| Firmware Version | 0.00-B08 |
| Hardware Revision | |
| DSP Version | Not yet loaded |
| Country Code | Japan |
| Life Line Prefix Digit | # |
| Life Line Status | enabled |
| Serial Number | |
| System Name | |
| System Location | |
| System Contact | D-Link Technical Supp |

Save

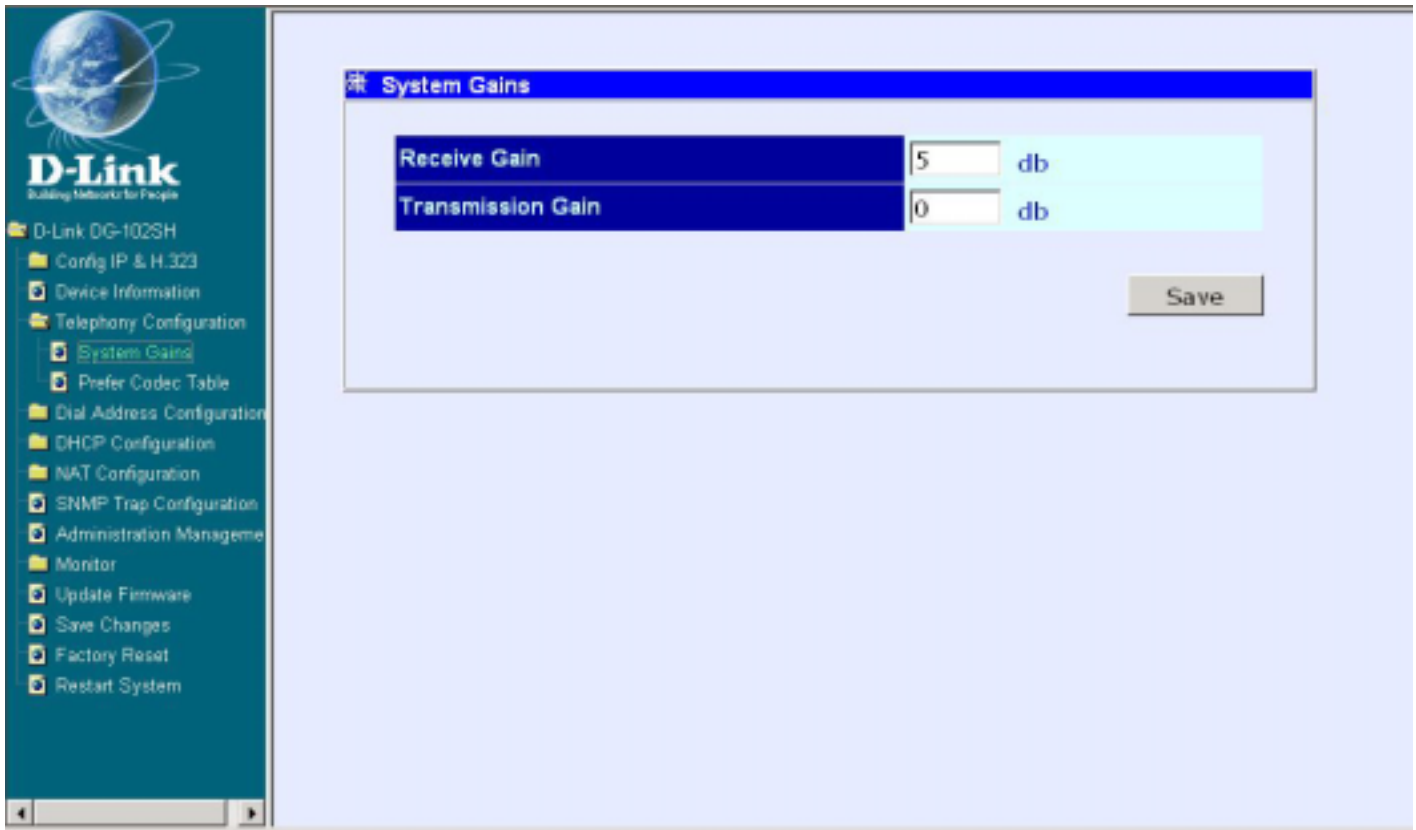
Device Information window

The items on this window are described below:

- ◆ **Device Type** This displays the model name of this device.
- ◆ **MAC Address** This displays the MAC address of this device.
- ◆ **Boot PROM Version** This displays the version number of the device's startup code.
- ◆ **Firmware Version** This displays the version number of the device's runtime code.
- ◆ **Hardware Revision** This displays the revision number of the hardware circuitry.
- ◆ **DSP Version** This displays the Digital Signal Processor version, if any.
- ◆ **Country Code** This is a user-defined country code for this device. < 0:USA, 1:Japan (Default), 2:Hong Kong, 3:Sweden >
- ◆ **Lifeline Prefix Digit** This is a user-defined Lifeline prefixed key for this device. (Default is “#” key)
- ◆ **Lifeline State** Enables or disables the Lifeline function
- ◆ **Serial Number** This field is for a user-determined identification number.
- ◆ **System Name** This is a user-defined name for this device.
- ◆ **System Location** This is a user-defined physical location of the device.
- ◆ **System Contact** This is user-defined contact information for the person or department responsible for the maintenance of this device.

Click on the **Save** button at the bottom right of the window to save the settings.

System Gains



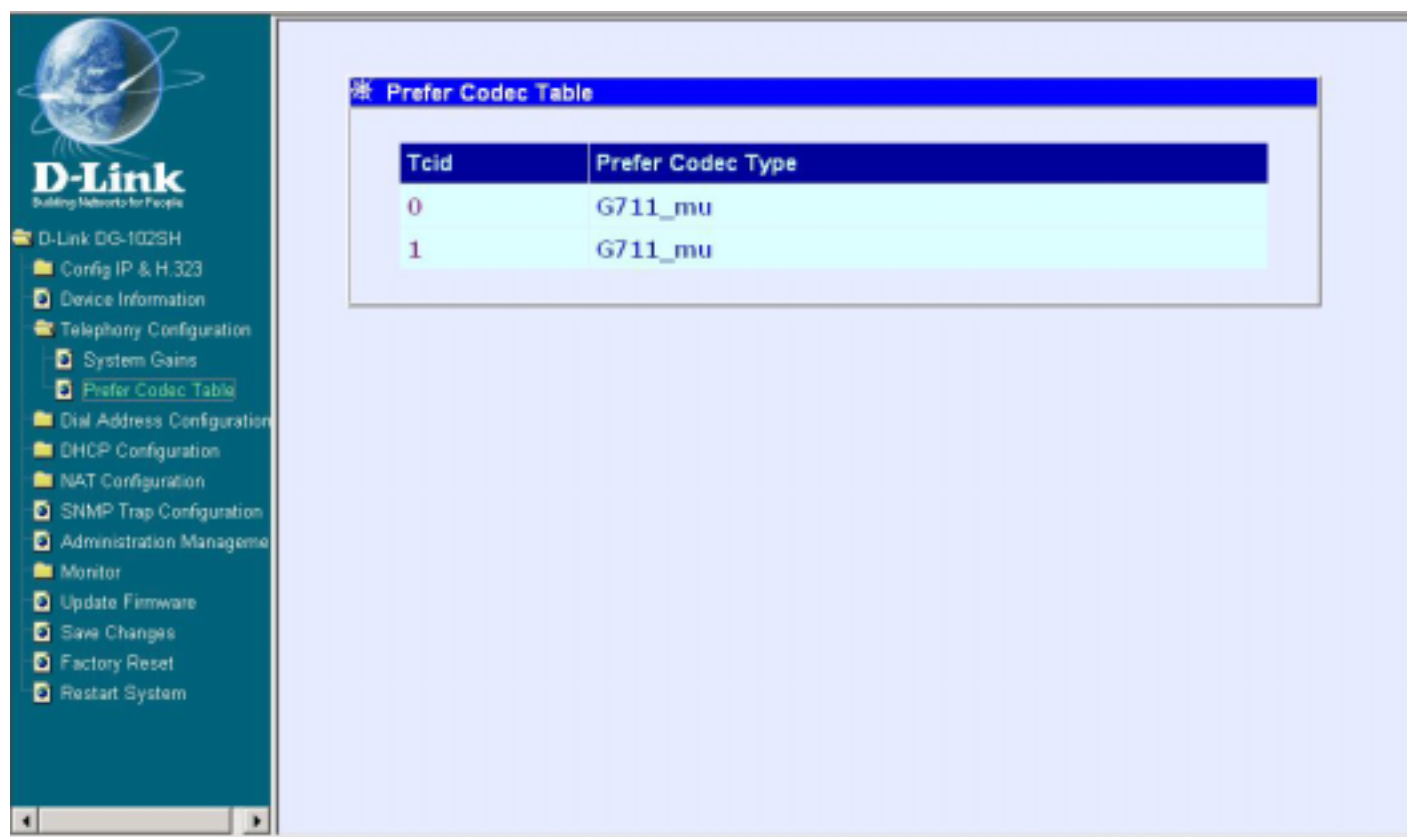
The screenshot shows the D-Link DG-102SH configuration interface. On the left is a sidebar with the D-Link logo and a list of configuration options: Config IP & H.323, Device Information, Telephony Configuration (highlighted), Prefer Codec Table, Dial Address Configuration, DHCP Configuration, NAT Configuration, SNMP Trap Configuration, Administration Manageme, Monitor, Update Firmware, Save Changes, Factory Reset, and Restart System. The main area displays the 'System Gains' window, which has a blue title bar. Inside, there are two rows: 'Receive Gain' with a text box containing '5' and a unit dropdown set to 'db', and 'Transmission Gain' with a text box containing '0' and a unit dropdown set to 'db'. A 'Save' button is located at the bottom right of the window.

| Gain Type | Value | Unit |
|-------------------|-------|------|
| Receive Gain | 5 | db |
| Transmission Gain | 0 | db |

System Gains window

Enter the desired information on the window above and then click **Save**.

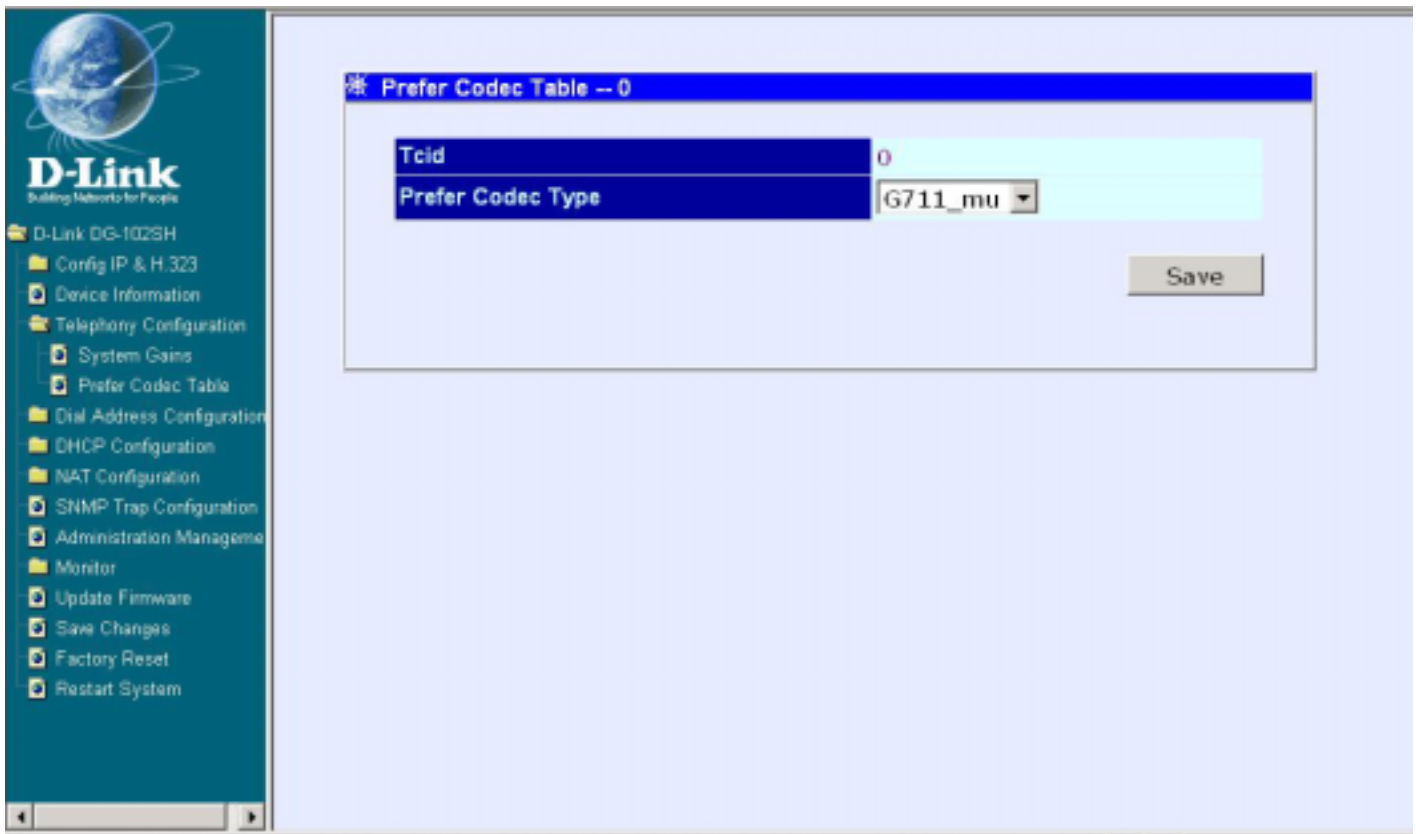
Prefer Codec Table



First Prefer Codec Table window

This window allows you to view the Prefer Codec Table settings.

Click the number of Tcid column on the window above to access the second Prefer Codec Table window:



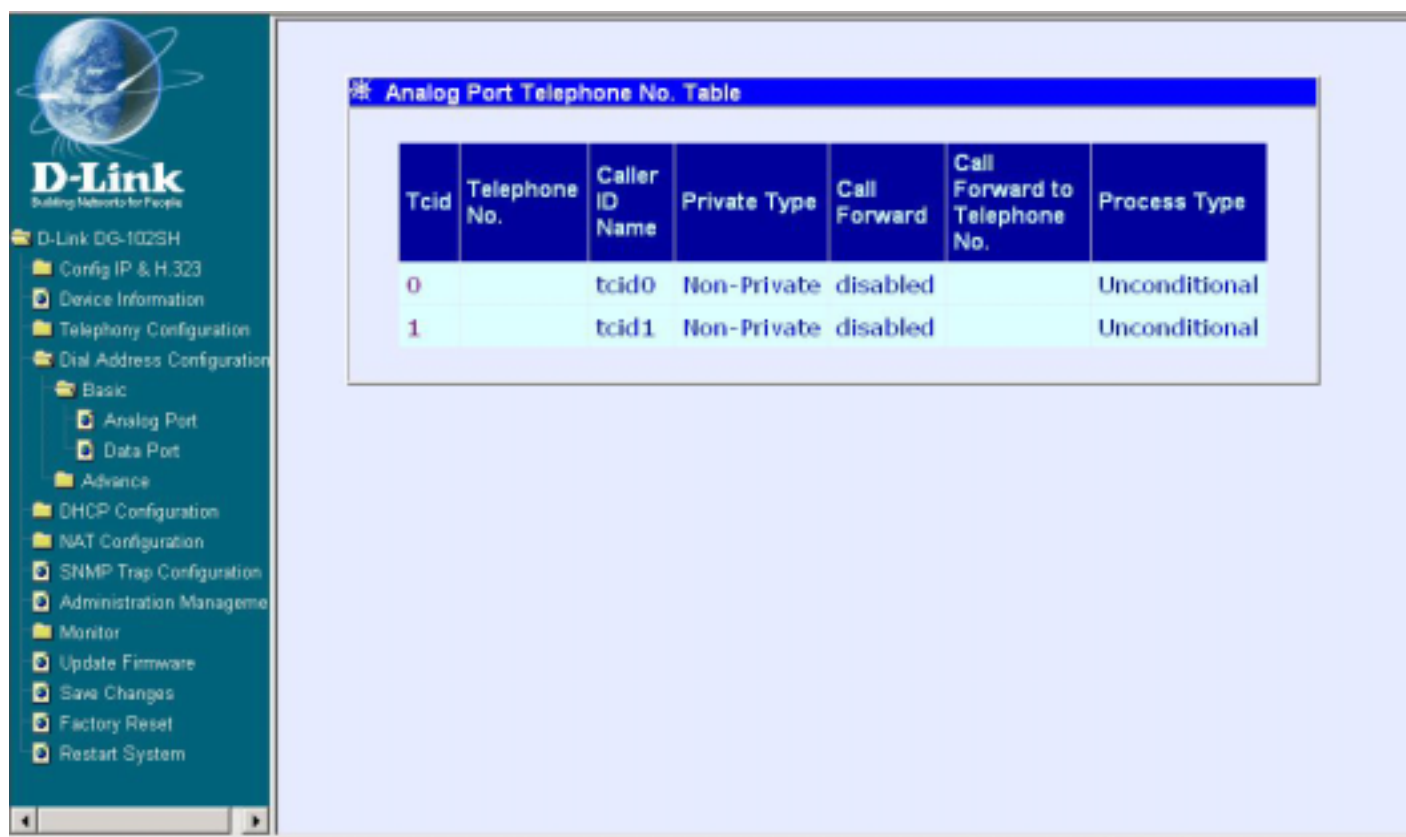
Second Prefer Codec Table window

The items on this window are described below:

- ♦ **Tcid** This displays the port number of this device. (0: port1, 1: port2, 2: port3, 3: port4)
- ♦ **Prefer Codec Type** This is a user-defined prefer codec type for the port shown as above.

Click on the **Save** button at the bottom right of the window to save the settings.

Analog Port (Ingress Calls and Dialing Rule Settings for the Gateway's Voice Ports)



First Analog Port Telephone No. Table window

This window allows you to view the Analog Port Telephone No. Table settings.

Click the number of Tcid column on the window above to access the second Analog Port Telephone No. Table window.

The screenshot shows the D-Link configuration web interface. On the left is a sidebar with a tree view of configuration options. The main area displays the 'Analog Port Telephone No. Table -- 0' configuration window. This window has a light blue background and contains several configuration fields. The 'Tcid' field is set to '0'. The 'Caller ID Name' field contains 'tcid0'. The 'Private Type' dropdown is set to 'Non-Private'. The 'Call Forward' dropdown is set to 'disabled'. The 'Process Type' dropdown is set to 'Unconditional'. A 'Save' button is located at the bottom right of the configuration window.

| * Analog Port Telephone No. Table -- 0 | |
|--|-----------------|
| Tcid | 0 |
| Telephone No. | |
| Caller ID Name | tcid0 |
| Private Type | Non-Private ▼ |
| Call Forward | disabled ▼ |
| Call Forward to Telephone No. | |
| Process Type | Unconditional ▼ |

Save

Second Analog Port Telephone No. Table window

The items on this window are described below:

- ◆ **Tcid** This displays the port number of this device. (0: port1, 1: port2, 2: port3, 3: port4)
- ◆ **Telephone No.** This is a user-defined Caller ID number for the port shown as above.
- ◆ **Caller ID Name** This is a user-defined Caller ID name.
- ◆ **Private Type** Determines whether or not the user would like to block/unblock the Caller ID number and Caller ID name.
- ◆ **Call Forward** Toggle to *Enabled* to use the Call Forward function.
- ◆ **Call Forward to Telephone No.** This is a user-defined telephone number for call forward.
- ◆ **Process Type** This is a user-defined which situation will activate Call Forward function. The entry is used only if the Call Forward is set to *Enable*.

Click on the **Save** button at the bottom right of the window to save the settings.

Data Port (Egress Calls and Dialing Rule Settings)



First Data Port Telephone No. Table window

This window allows you to view the Data Port Telephone No. Table settings

Click the Add icon on the window above to access the First Data Port Telephone No. Table window:



Second Data Port Telephone No. Table window

The items on this window are described below:

- ♦ **Prefix Strip Dial No.** This is a user-defined prefix strip dial number for outgoing call to another device.
- ♦ **Destination IP Address** Enter the IP address of the destination you would like to call. One prefix telephone number will map to one destination IP address.

Enter the desired information on the window above and then click **Save**.

ATPM (Address Translation and Parsing Module) Wizard



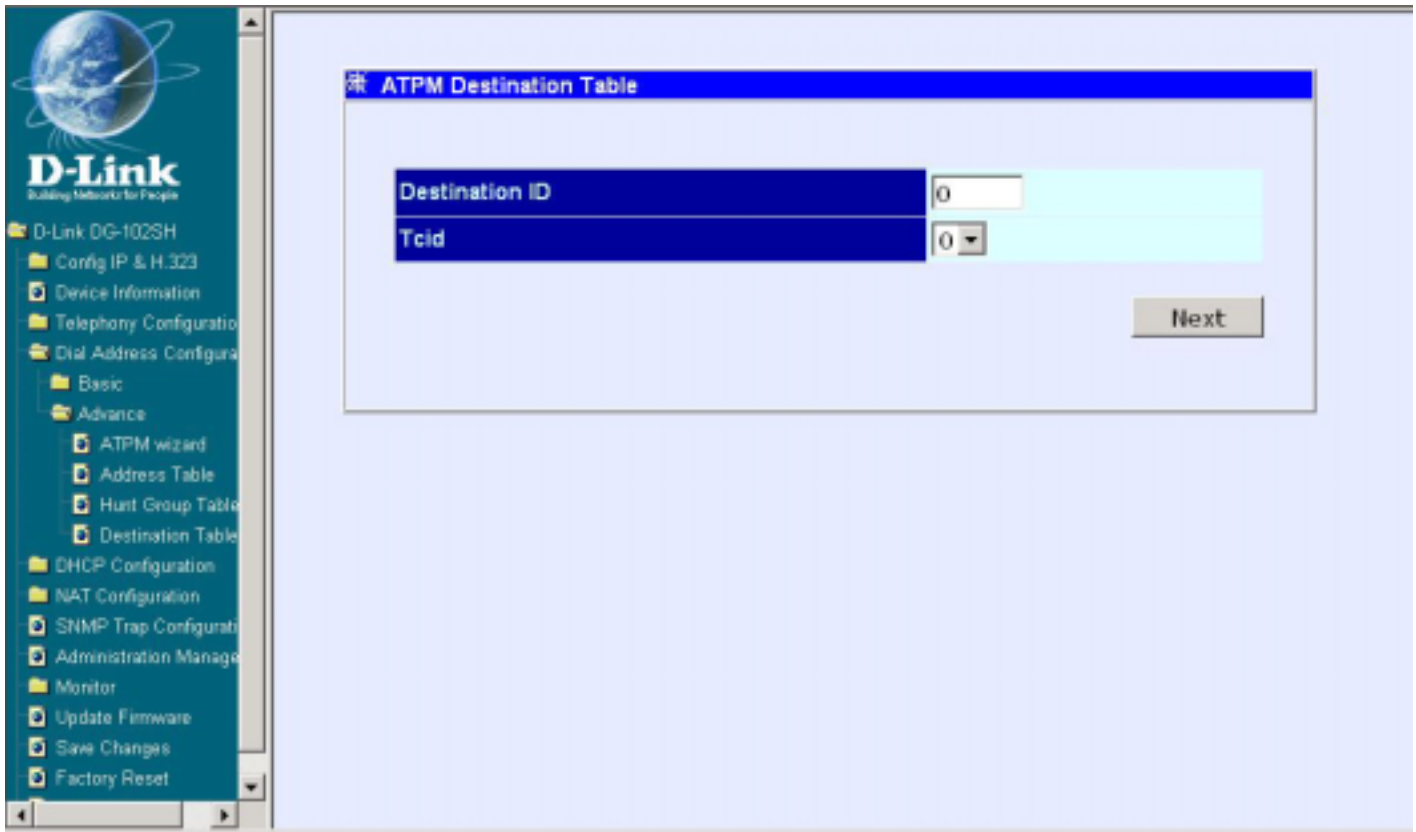
ATPM Mode window

The items on this window are described below:

- ♦ **Analog** This Mode allow user to setup advanced ingress calls and dialing rule settings for the gateway's voice ports.
- ♦ **Data** This Mode allow user to setup advanced egress calls and dialing rule settings via the gateway's data ports

Choose the Analog or Data Mode then click **Next**.

Analog Mode



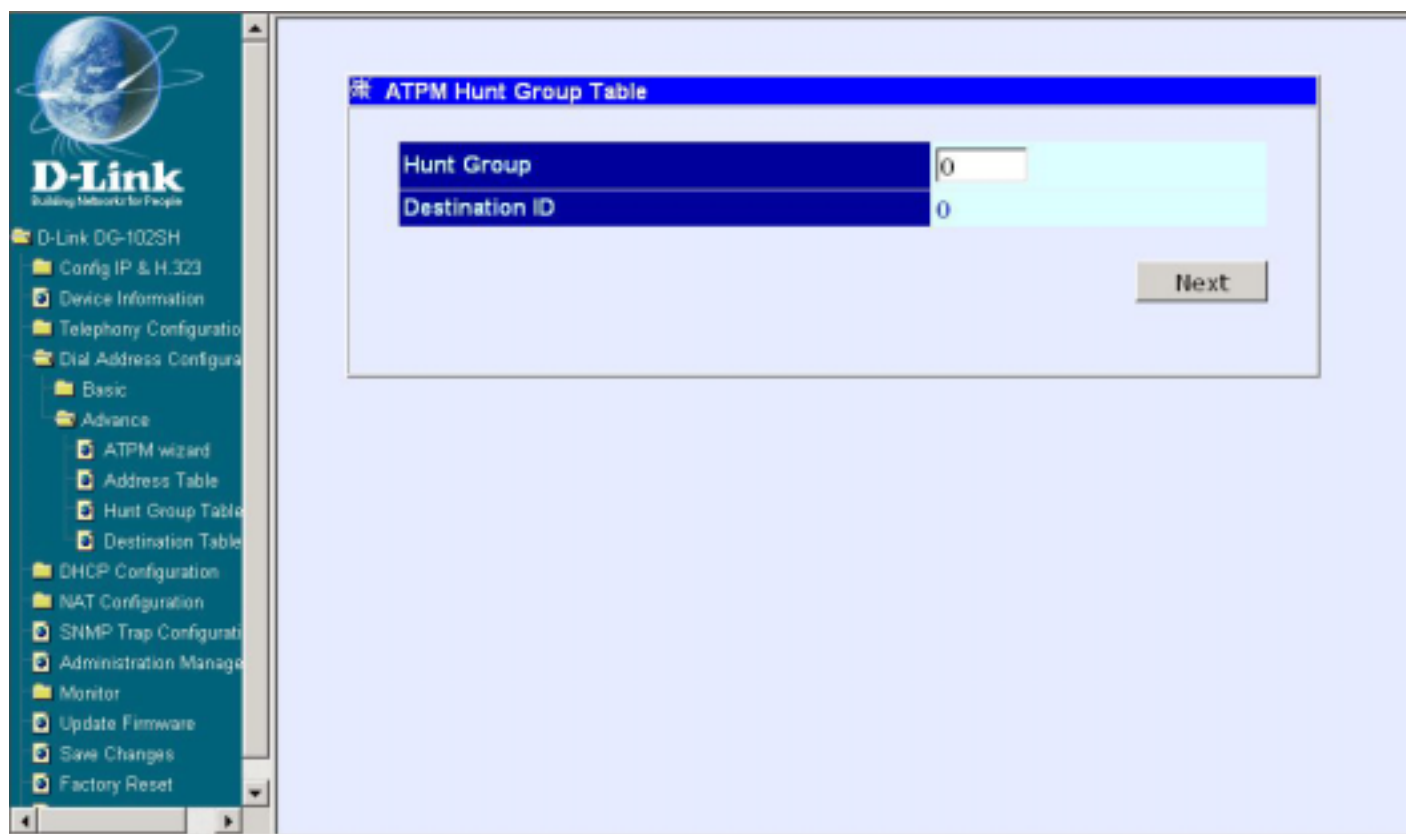
The screenshot shows the D-Link DG-102SH web interface. On the left is a navigation tree with the following items: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration (expanded), Basic, Advance, ATPM wizard, Address Table, Hunt Group Table, Destination Table, DHCP Configuration, NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware, Save Changes, and Factory Reset. The main content area displays the 'ATPM Destination Table' window. This window has a title bar and two input fields: 'Destination ID' with a text box containing '0' and 'Tcid' with a dropdown menu showing '0'. A 'Next' button is located at the bottom right of the window.

ATPM Destination Table window

The items on this window are described below:

- ♦ **Destination ID.** This is a user-defined destination ID for the port shown as below. The ID is only and cannot duplicate.
- ♦ **Tcid** This is a user-defined port number of this device. (0: port1, 1: port2, 2: port3, 3: port4)

Enter the desired information on the window above and then click **Next**.

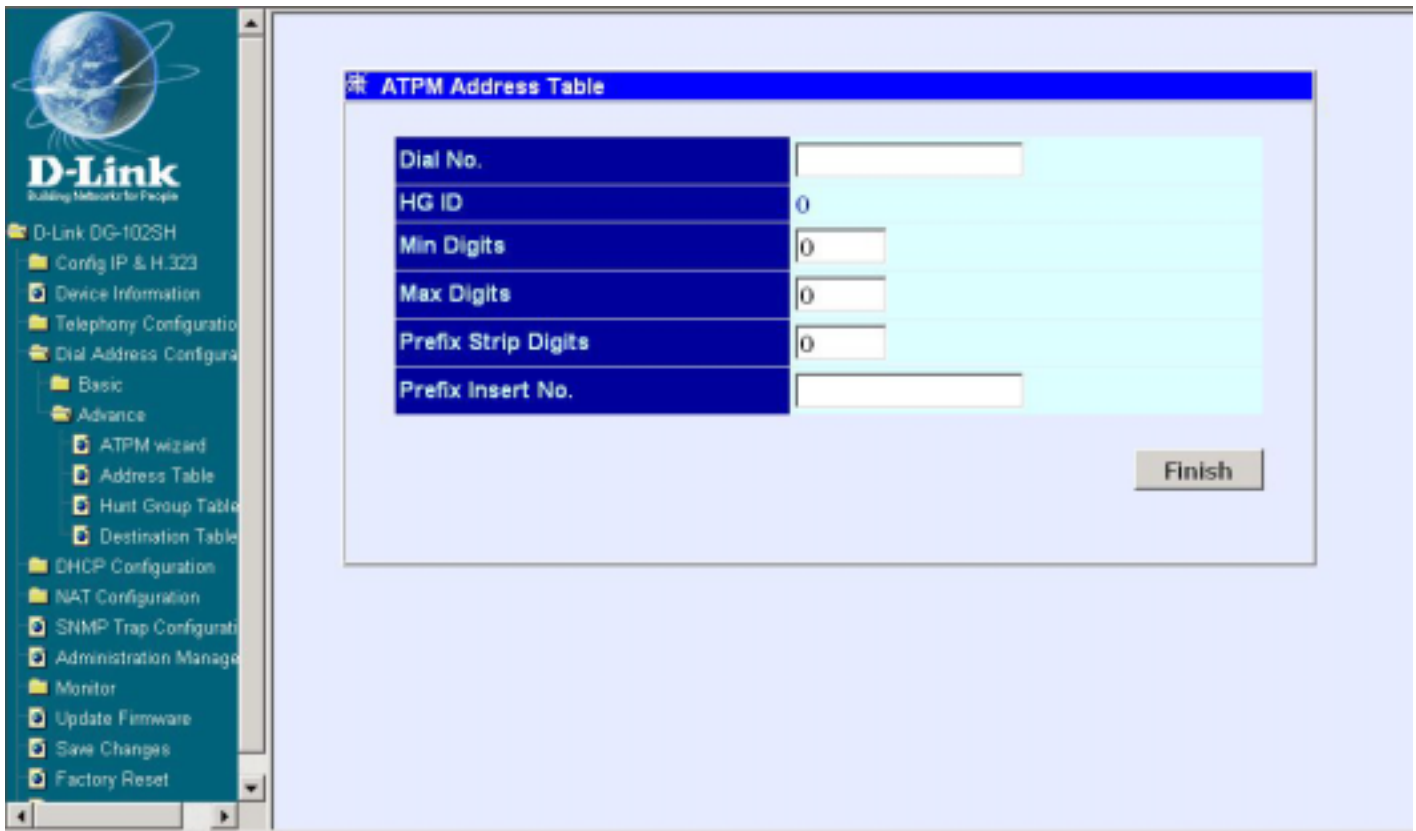


ATPM Hunt Group Table window

The items on this window are described below:

- ◆ **Hunt Group.** This is a user-defined hunt group number for the destination ID shown as below.
- ◆ **Destination ID.** This displays the destination ID we set last page.

Enter the desired information on the window above and then click **Next**.



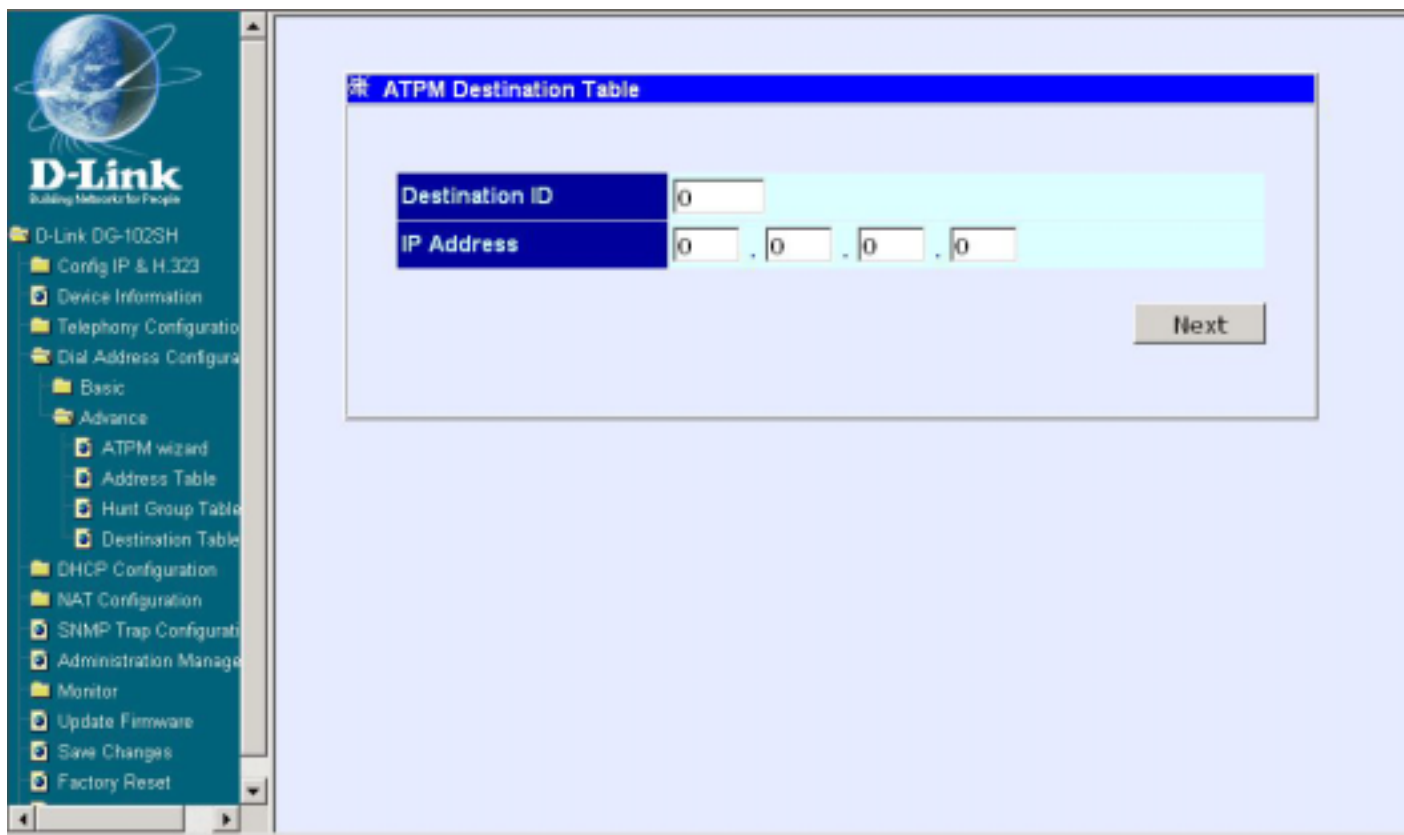
ATPM Address Table window

The items on this window are described below:

- ◆ **Dial No.** This is a user-defined prefix dial number when user make the call.
- ◆ **HG ID** This displays the Hunt Group ID we set last page.
- ◆ **Min Digits** This is a user-defined min digits of the dial number
- ◆ **Max Digits** This is a user-defined max digits of the dial number
- ◆ **Prefix Strip Digits** This is a user-defined prefix stripped digits of the dial number
- ◆ **Prefix Insert No.** This is a user-defined prefix insert number

Enter the desired information on the window above and then click **Finish**.

Data Mode



The screenshot shows the D-Link DG-102SH web interface. On the left is a navigation tree with the following items: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration (expanded), Basic, Advance, ATPM wizard, Address Table, Hunt Group Table, Destination Table, DHCP Configuration, NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware, Save Changes, and Factory Reset. The main content area is titled 'ATPM Destination Table'. It contains two input fields: 'Destination ID' with a value of '0' and 'IP Address' with a value of '0.0.0.0'. A 'Next' button is located at the bottom right of the form.

ATPM Destination Table window

The items on this window are described below:

- ♦ **Destination ID.** This is a user-defined destination ID for the port shown as below. The ID is only and cannot duplicate.
- ♦ **IP Address** Enter the destination IP address of outgoing calls.

Enter the desired information on the window above and then click **Next**.

The screenshot shows the D-Link DG-102SH configuration web interface. On the left is a sidebar menu with the D-Link logo and various configuration options. The main area displays the 'ATPM Hunt Group Table' window. This window contains two input fields: 'Hunt Group' and 'Destination ID', both with the value '0' entered. A 'Next' button is located at the bottom right of the window.

| ATPM Hunt Group Table | |
|-----------------------|---|
| Hunt Group | 0 |
| Destination ID | 0 |

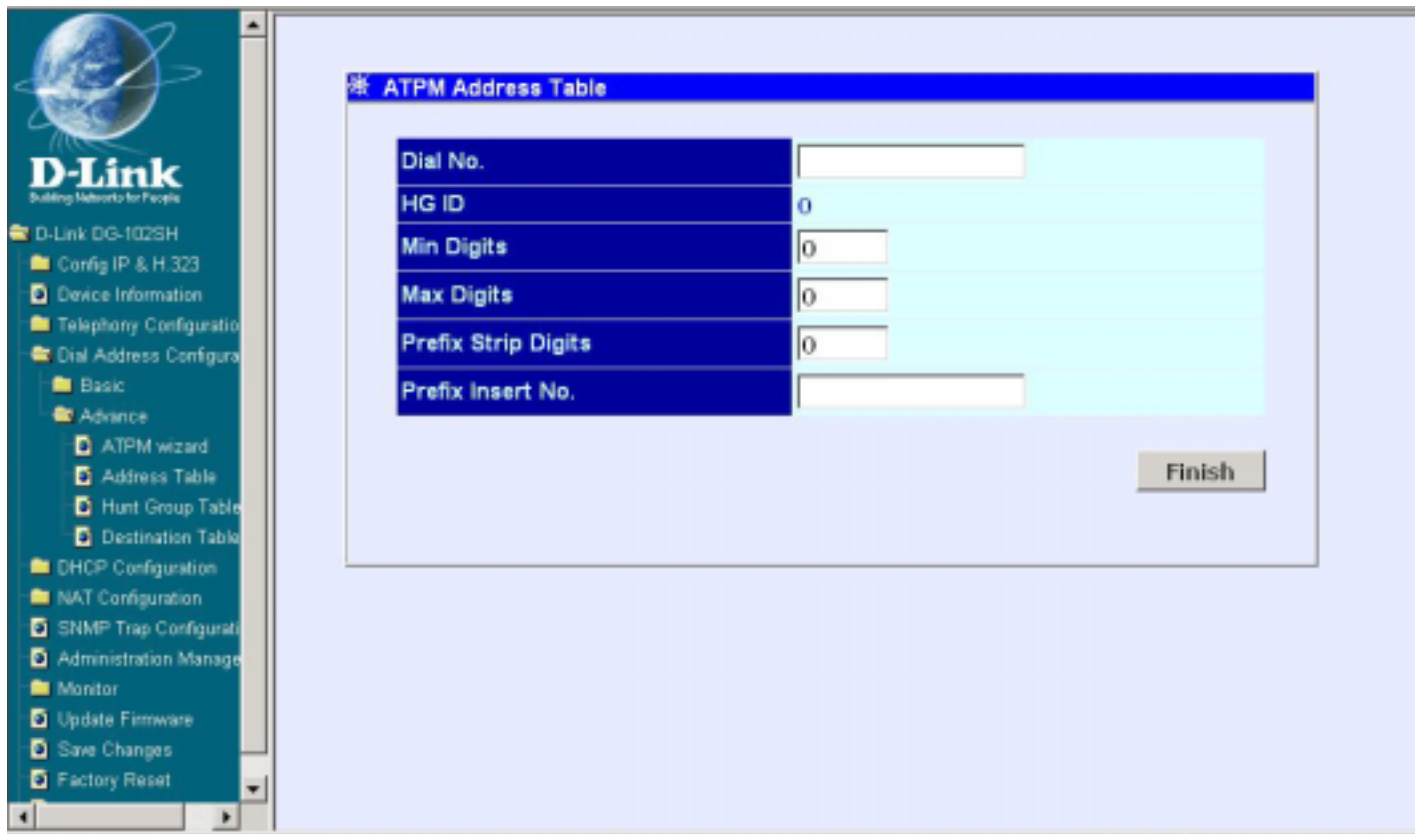
Next

ATPM Hunt Group Table window

The items on this window are described below:

- ◆ **Hunt Group.** This is a user-defined hunt group number for the destination ID shown as below.
- ◆ **Destination ID.** This displays the destination ID we set last page.

Enter the desired information on the window above and then click **Next**.



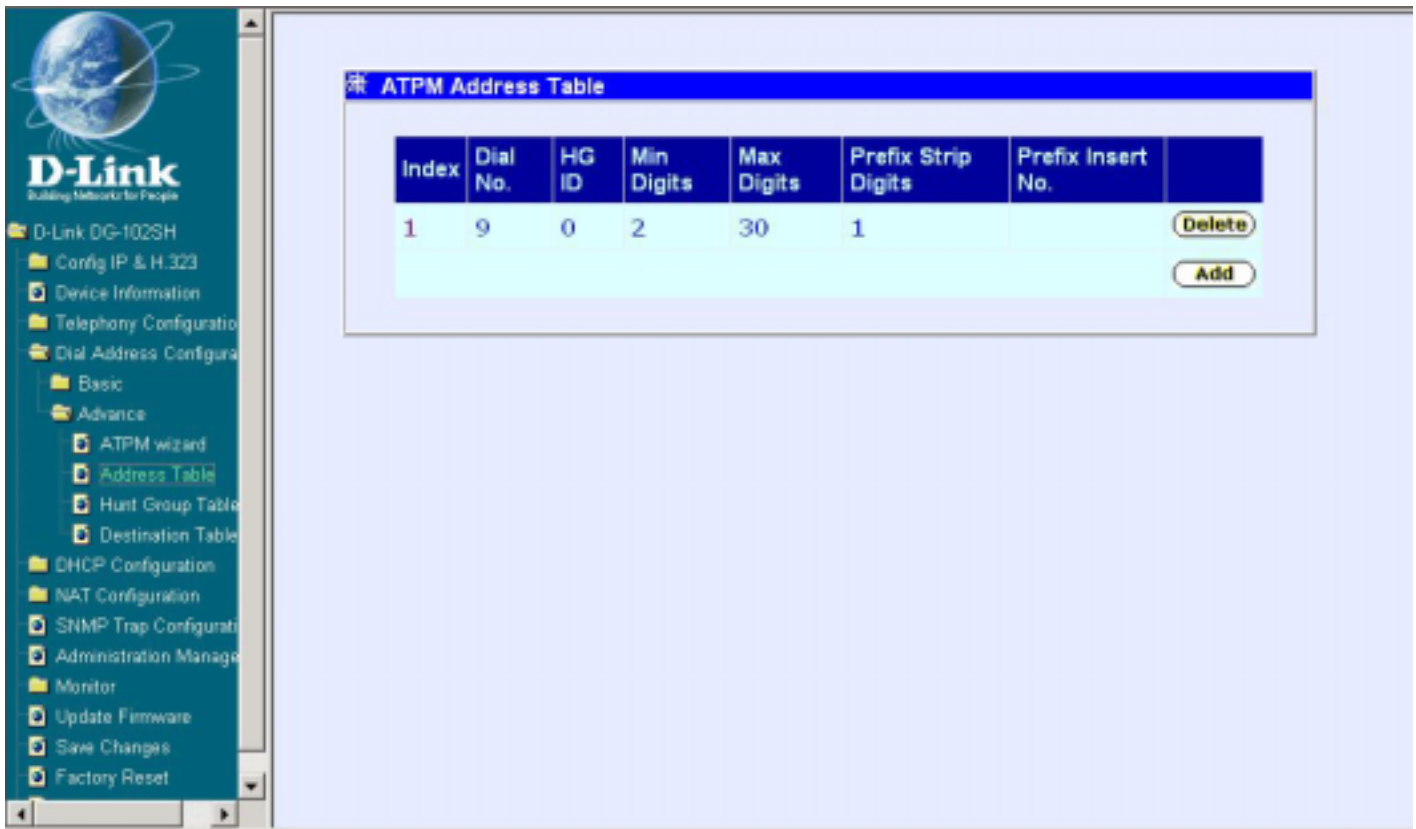
ATPM Address Table window

The items on this window are described below:

- ◆ **Dial No.** This is a user-defined prefix dial number when user make the call.
- ◆ **HG ID** This displays the Hunt Group ID we set last page.
- ◆ **Min Digits** This is a user-defined min digits of the dial number
- ◆ **Max Digits** This is a user-defined max digits of the dial number
- ◆ **Prefix Strip Digits** This is a user-defined prefix stripped digits of the dial number
- ◆ **Prefix Insert No** This is a user-defined prefix insert number

Enter the desired information on the window above and then click **Finish**.

ATPM Address Table



First ATPM Address Table window

This window allows you to view the ATPM Address Table settings

Click the **Add** or **Delete** icon on the window above to access the Second ATPM Address Table window:

| ATPM Address Table | |
|---------------------|--------------------------------|
| Dial No. | <input type="text"/> |
| HG ID | <input type="text" value="0"/> |
| Min Digits | <input type="text" value="0"/> |
| Max Digits | <input type="text" value="0"/> |
| Prefix Strip Digits | <input type="text" value="0"/> |
| Prefix Insert No. | <input type="text"/> |

Save

Second ATPM Address Table window

Enter the desired information on the window above and then click **Save**.

ATPM Hunt Group Table



First ATPM Hunt Group Table window

This window allows you to view the ATPM Hunt Group Table settings

Click the **Add** or **Delete** icon on the window above to access the Second ATPM Hunt Group Table window:

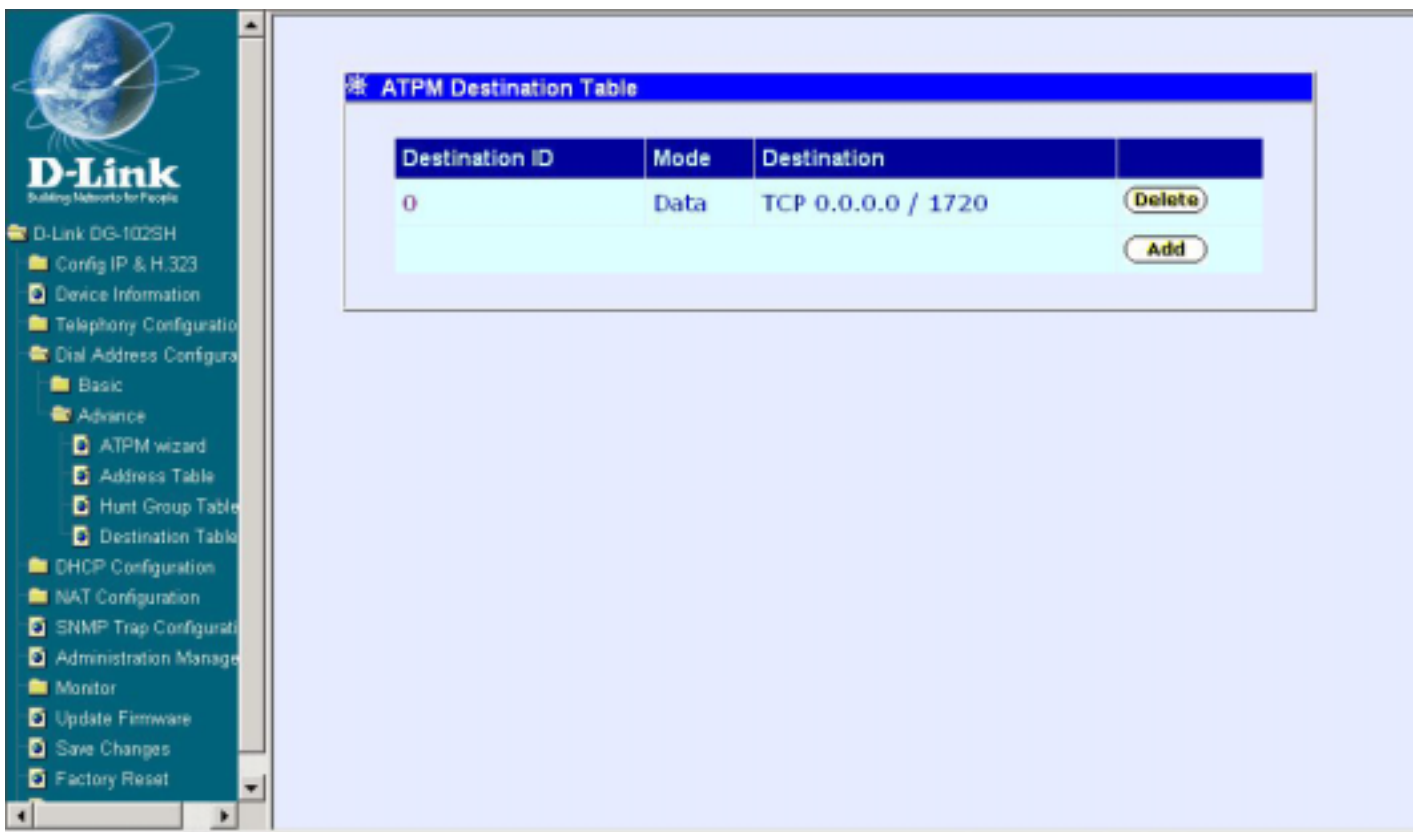
| Hunt Group | Destination IDs |
|------------|-----------------|
| 0 | |

Save

Second ATPM Hunt Group Table window

Enter the desired information on the window above and then click **Save**.

ATPM Destination Table



First ATPM Destination Table window

This window allows you to view the ATPM Destination Table settings

Click the **Add** or **Delete** icon on the window above to access the Second ATPM Destination Table window:

The screenshot shows the D-Link DG-102SH configuration web interface. On the left is a navigation tree with the following items: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration, Basic, Advance, ATPM wizard, Address Table, Hunt Group Table, Destination Table, DHCP Configuration, NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware, Save Changes, and Factory Reset. The 'Destination Table' option under 'Telephony Configuration' is selected. The main content area displays the 'ATPM Destination Table' configuration window. This window contains four fields: 'Destination ID' with a text input containing '0', 'Mode' with a dropdown menu set to 'Analog', 'Tcid' with a dropdown menu set to '0', and 'IP Address' with four text inputs containing '0', '.', '0', and '.' respectively. A 'Save' button is located at the bottom right of the configuration window.

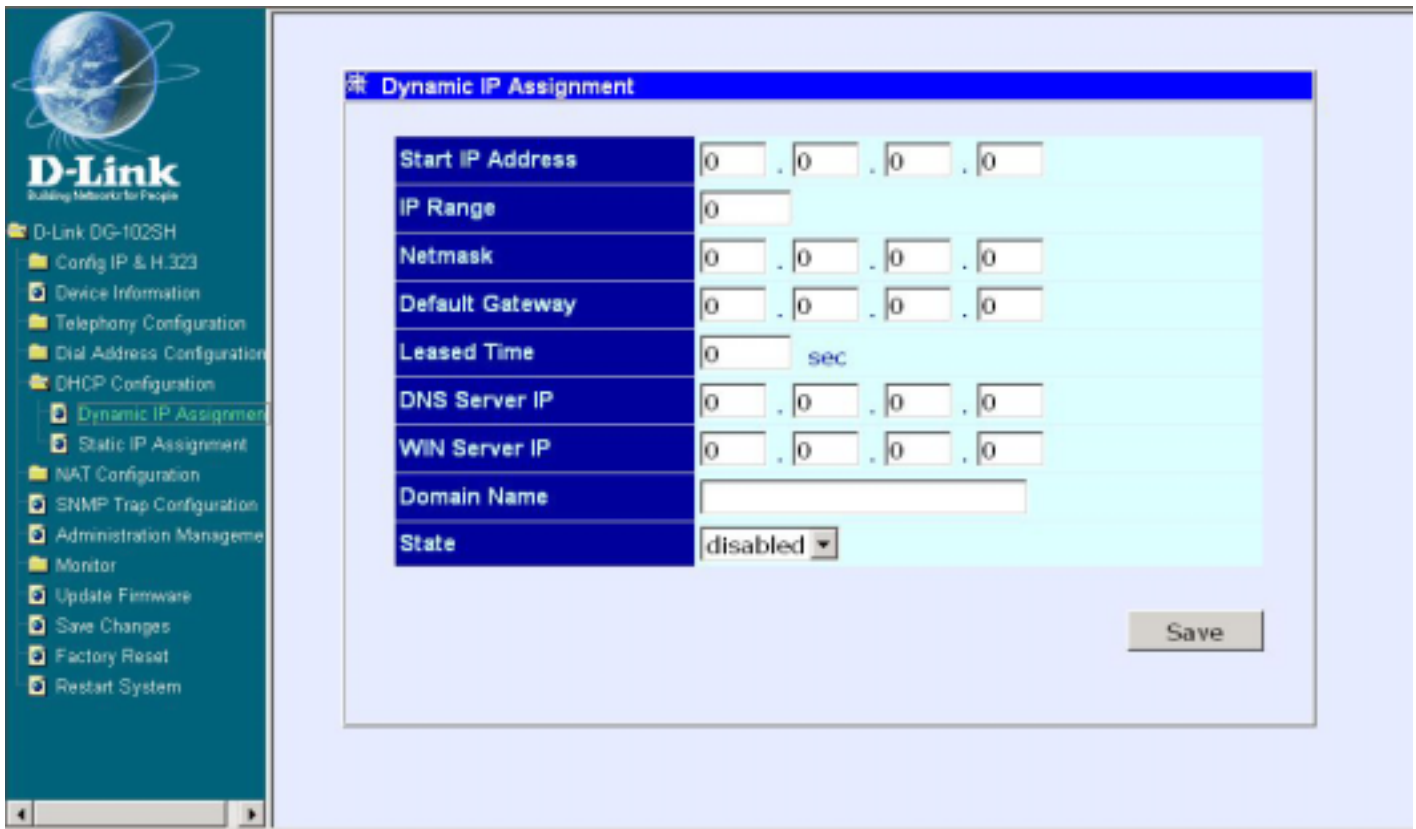
| ATPM Destination Table | |
|------------------------|---------------|
| Destination ID | 0 |
| Mode | Analog |
| Tcid | 0 |
| IP Address | 0 . 0 . 0 . 0 |

Save

Second ATPM Destination Table window

Enter the desired information on the window above and then click **Save**.

Dynamic IP Assignment



The screenshot shows the D-Link DG-102SH configuration interface. On the left is a sidebar with a tree view containing the following items: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration, DHCP Configuration (expanded), Dynamic IP Assignment (selected), Static IP Assignment, NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware, Save Changes, Factory Reset, and Restart System. The main area displays the 'Dynamic IP Assignment' window with the following fields:

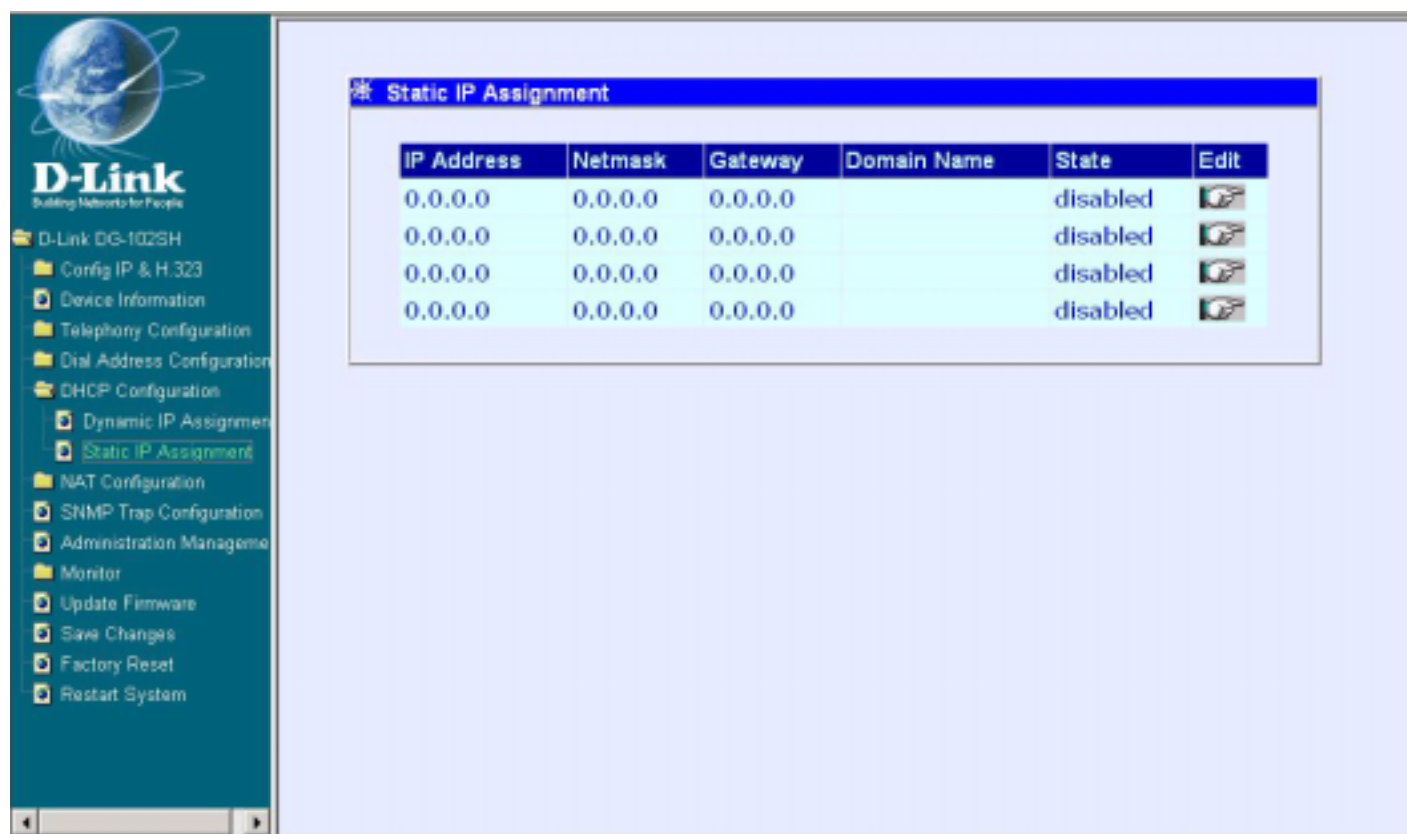
| Field | Value |
|------------------|---------------|
| Start IP Address | 0 . 0 . 0 . 0 |
| IP Range | 0 |
| Netmask | 0 . 0 . 0 . 0 |
| Default Gateway | 0 . 0 . 0 . 0 |
| Leased Time | 0 sec |
| DNS Server IP | 0 . 0 . 0 . 0 |
| WIN Server IP | 0 . 0 . 0 . 0 |
| Domain Name | |
| State | disabled |

A 'Save' button is located at the bottom right of the configuration window.

Dynamic IP Assignment window

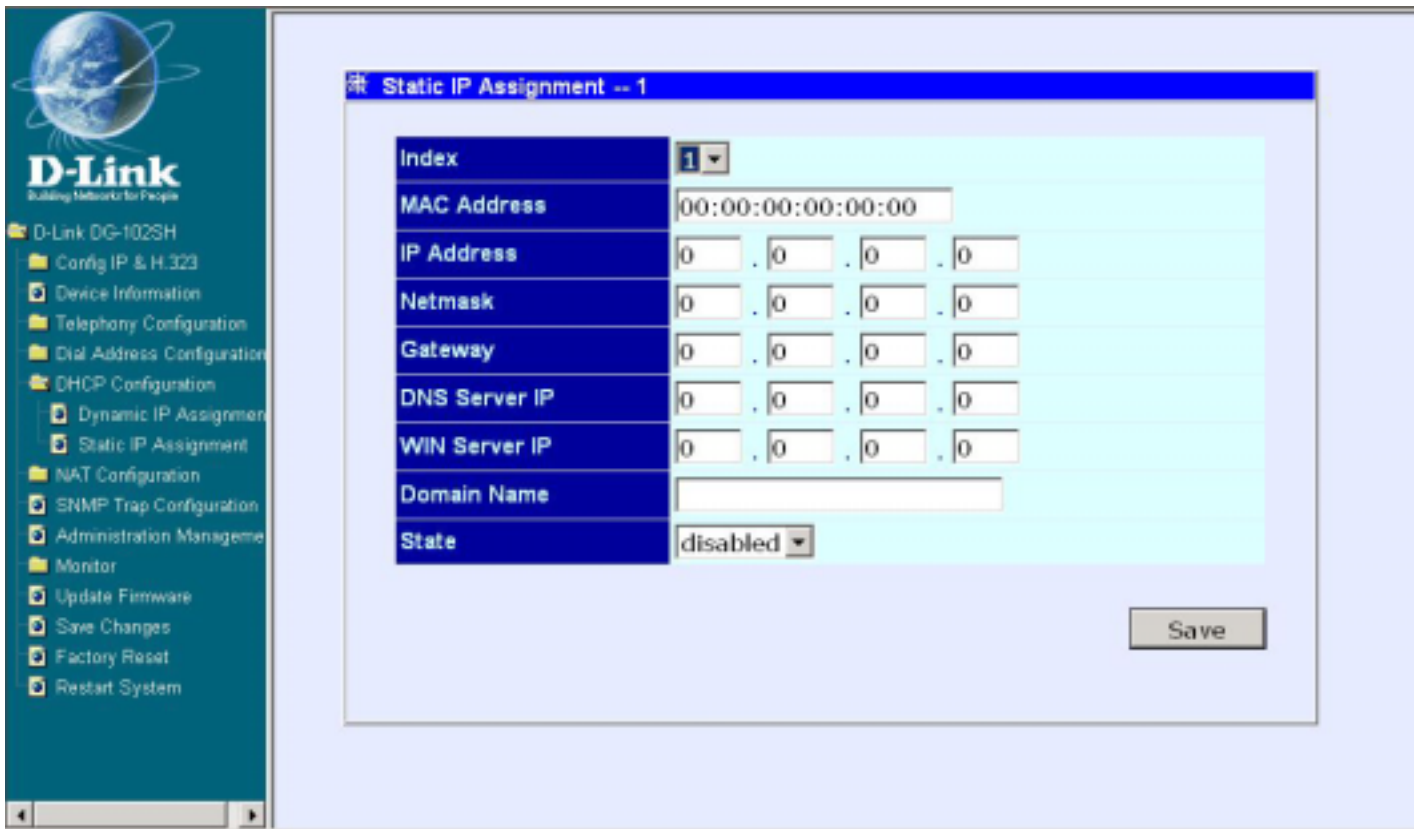
Enter the desired information on the window above and then click **Save**.

Static IP Assignment



First Static IP Assignment window

Click the pointer icon on the window above to access the second **Static IP Assignment** window:



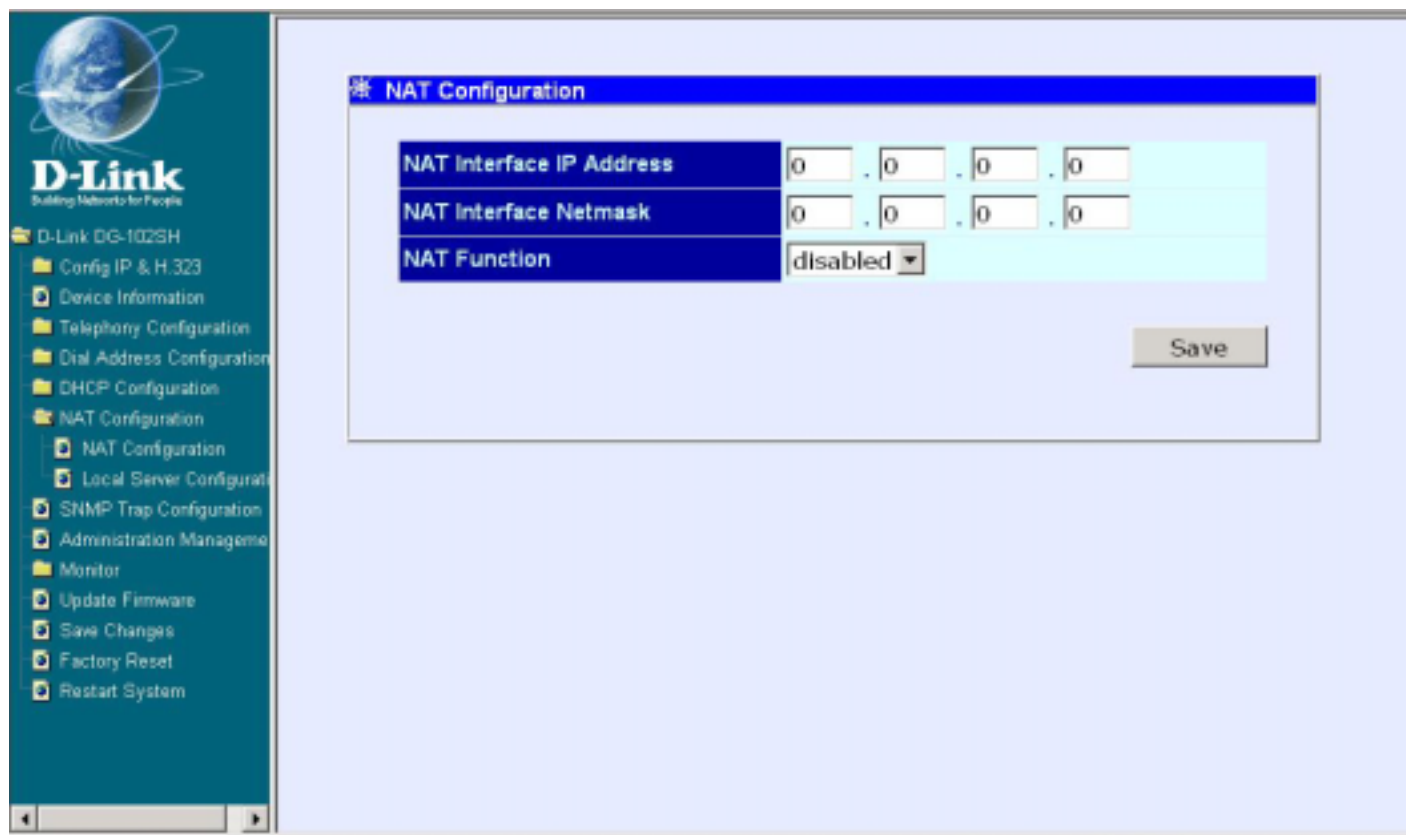
The screenshot shows the D-Link DG-102SH web interface. On the left is a vertical navigation menu with the D-Link logo and the tagline 'Building Networks for People'. The menu items include: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration, DHCP Configuration (with sub-items Dynamic IP Assignment and Static IP Assignment), NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware, Save Changes, Factory Reset, and Restart System. The main content area displays the 'Static IP Assignment -- 1' window. This window contains a table with the following fields: Index (dropdown menu showing '1'), MAC Address (text field with '00:00:00:00:00:00'), IP Address (four text boxes each containing '0'), Netmask (four text boxes each containing '0'), Gateway (four text boxes each containing '0'), DNS Server IP (four text boxes each containing '0'), WIN Server IP (four text boxes each containing '0'), Domain Name (empty text field), and State (dropdown menu showing 'disabled'). A 'Save' button is located at the bottom right of the window.

| Index | MAC Address | IP Address | Netmask | Gateway | DNS Server IP | WIN Server IP | Domain Name | State |
|-------|-------------------|------------|---------|---------|---------------|---------------|-------------|----------|
| 1 | 00:00:00:00:00:00 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 | | disabled |

Second Static IP Assignment window

Enter the desired information on the window above and then click **Save**.

NAT Configuration



NAT Configuration

| | | | | | | | |
|--------------------------|------------|---|---|---|---|---|---|
| NAT Interface IP Address | 0 | . | 0 | . | 0 | . | 0 |
| NAT Interface Netmask | 0 | . | 0 | . | 0 | . | 0 |
| NAT Function | disabled ▼ | | | | | | |

Save

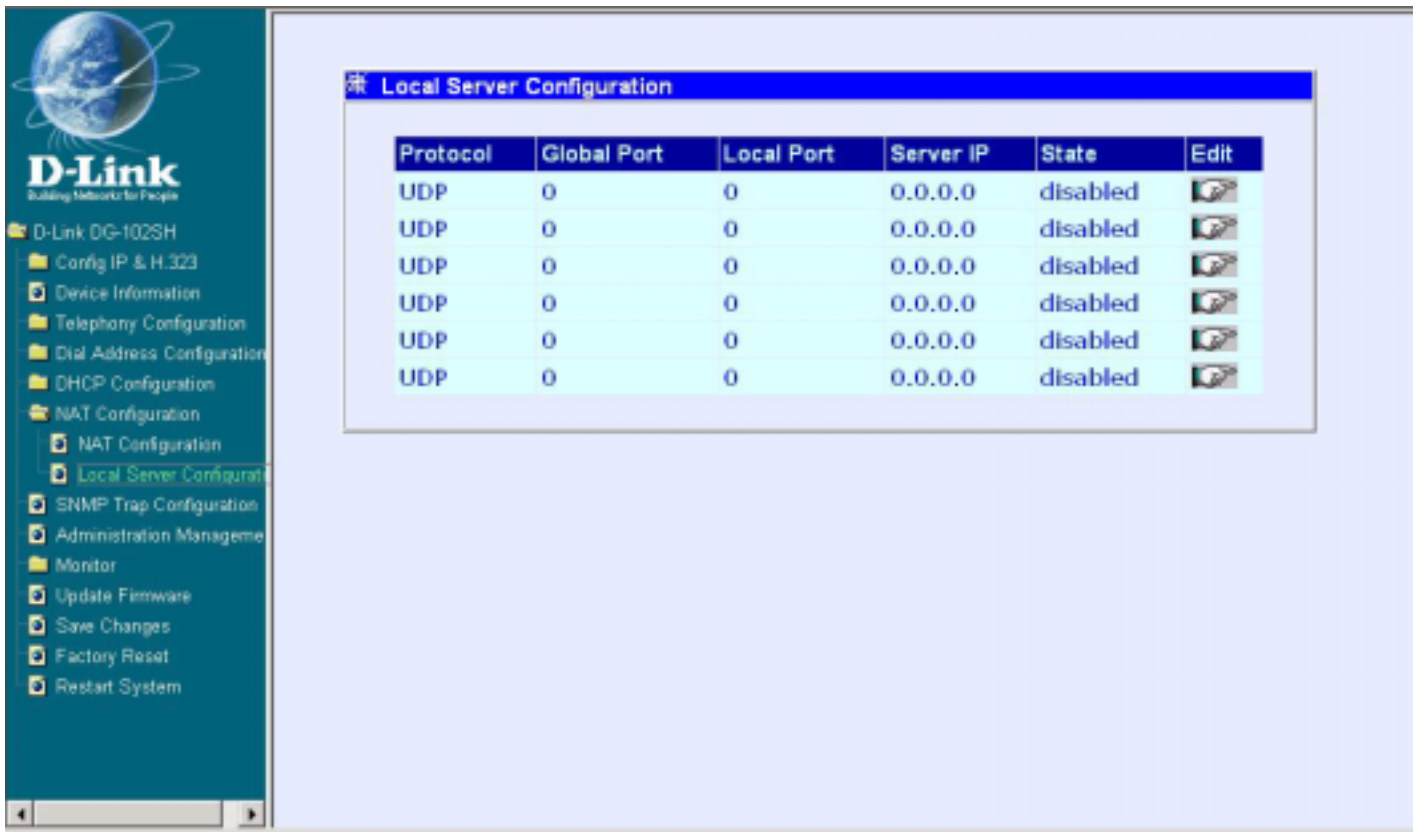
D-Link DG-102SH

- Config IP & H.323
- Device Information
- Telephony Configuration
- Dial Address Configuration
- DHCP Configuration
- NAT Configuration**
 - NAT Configuration
 - Local Server Configuration
- SNMP Trap Configuration
- Administration Management
- Monitor
- Update Firmware
- Save Changes
- Factory Reset
- Restart System

NAT Configuration window

After entering the desired information on the window above, enable or disable the NAT Function and then click **Save**.

Local Server Configuration



First Local Server Configuration window

This window allows you to view the current local server configuration settings.

Click the pointer icon on the window above to access the second **Local Server Configuration** window:

| Local Server Configuration -- 1 | | | | | |
|---------------------------------|----------|---|---|---|-------|
| Index | 1 | | | | |
| Protocol | UDP | | | | |
| Global Port | 0 | | | | |
| Local Port | 0 | | | | |
| Server IP | 0 | . | 0 | . | 0 . 0 |
| State | disabled | | | | |

Save

Second Local Server Configuration window

After completing the local server configuration settings on the window above, select *enabled* or *disabled* in the drop-down menu under State and then click **Save**.

SNMP Trap Configuration

The screenshot shows the 'SNMP Trap Configuration' window. The sidebar on the left lists the following options: D-Link DG-102SH, Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration, DHCP Configuration, NAT Configuration, **SNMP Trap Configuration** (highlighted), Administration Management, Monitor, Update Firmware, Save Changes, Factory Reset, and Restart System. The main configuration area includes:

- Trap Manager IP Address:** Four input boxes, each containing the digit '0'.
- Community Name:** A text input field.
- SNMP AuthTrap:** A dropdown menu currently set to 'disabled'.
- Save:** A button located at the bottom right of the configuration area.

SNMP Trap Configuration window

The items on this window are described below:

- ♦ **Trap Manager IP Address** The IP address of the trap receiving station.
- ♦ **Community Name** A user-defined SNMP community name.
- ♦ **SNMP AuthTrap** Enable or disable the SNMP trap.

Click on the **Save** button at the bottom right of the window to save the settings.

Administration Management

Administration Management

| | | |
|----------------------|----------------------|----------------------|
| User Name | <input type="text"/> | <input type="text"/> |
| Old Password | <input type="text"/> | <input type="text"/> |
| New Password | <input type="text"/> | <input type="text"/> |
| Confirm New Password | <input type="text"/> | <input type="text"/> |

Save

Administration Management window

To add or change a User Account, fill in the appropriate information in the User Name, Old Password (if applicable), New Password, and Confirm New Password fields. Click on the **Save** button to keep the settings.

Ethernet Statistics



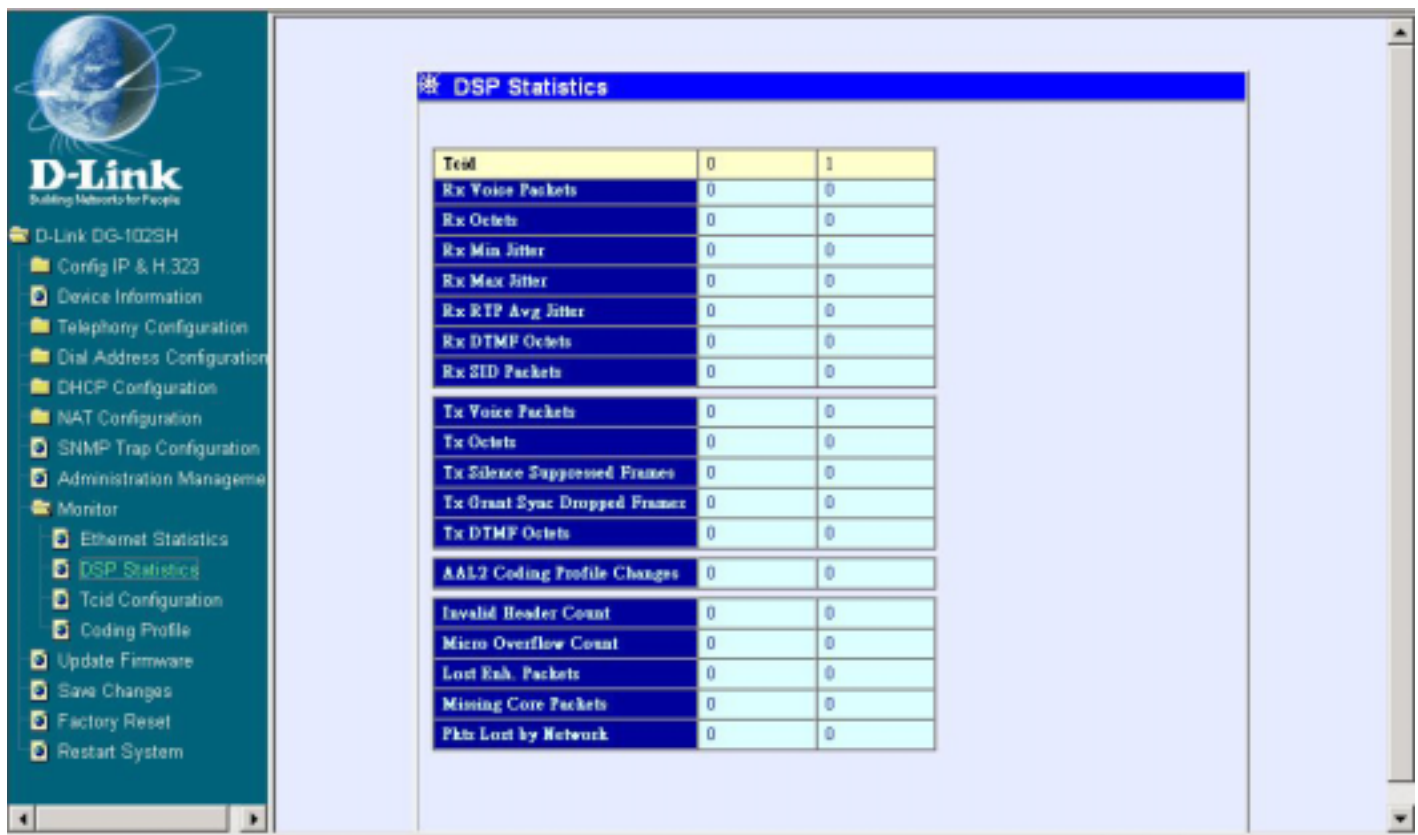
Ethernet Statistics window

Items in the window are described as follows:

- ◆ **Rx Packets** The total number of packets received by the device.
- ◆ **Rx Bytes** The total number of bytes contained in packets received by the device.
- ◆ **Rx Non Ucast Packets** The number of non-unicast packets received by the device.
- ◆ **Rx Discard Packets** The number of packets dropped by the device.
- ◆ **Rx Frame Too Long** The number of packets that are larger than the 1514 Ethernet packet limit.
- ◆ **Rx Non-Aligned Errors** The number of packets that are not aligned properly.
- ◆ **Rx Collision Errors** The number of collision errors.
- ◆ **Rx Short Frames** The number of packets smaller than the 64-octet minimum.
- ◆ **Rx CRC Errors** The number of packets received that failed the CRC checksum test.
- ◆ **Rx Overrun Packets** The number of packets received that exceed the 1518 octet maximum length imposed on Ethernet packets. Overrun packets are generated by some proprietary software applications.
- ◆ **Tx Packets** The total number of valid packets transmitted by the device since the last reset.
- ◆ **Tx Bytes** The total number of bytes transmitted by the device.
- ◆ **Tx Non Ucast Packets** The number of non-unicast packets sent.
- ◆ **Tx Discard Packets** The number of packets dropped by the device.

- ◆ **Tx Heartbeat Errors** The number of heartbeat errors. This relates to an internal timing function.
- ◆ **Tx Late Collision** The number of late collisions.
- ◆ **Tx Retransmission Limit** The number of times the device had to retransmit packets.
- ◆ **Tx Underrun Packets** This counter shows the number of runt packets transmitted by the device that are less than the allowed 64-octet minimum length. Underrun packets occur due to jam signals generated by collisions, backpressure, etc.
- ◆ **Tx Carrier Sense Lost** The number of times packets were lost due to carrier sense lost.

DSP Statistics

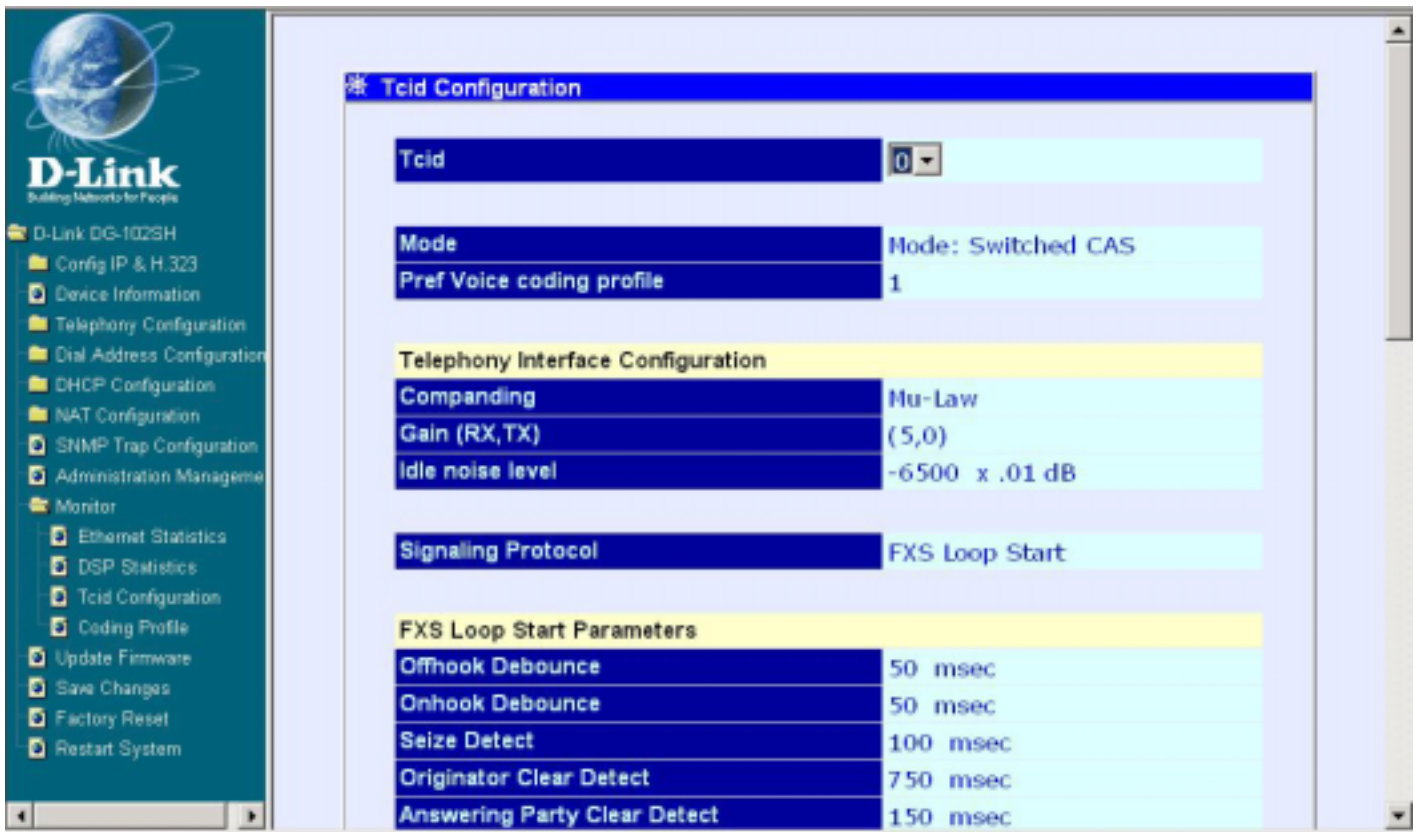


| Txid | 0 | 1 |
|------------------------------|---|---|
| Rx Voice Packets | 0 | 0 |
| Rx Octets | 0 | 0 |
| Rx Min Jitter | 0 | 0 |
| Rx Max Jitter | 0 | 0 |
| Rx RTP Avg Jitter | 0 | 0 |
| Rx DTMF Octets | 0 | 0 |
| Rx SID Packets | 0 | 0 |
| Tx Voice Packets | 0 | 0 |
| Tx Octets | 0 | 0 |
| Tx Silence Suppressed Frames | 0 | 0 |
| Tx Grant Sync Dropped Frames | 0 | 0 |
| Tx DTMF Octets | 0 | 0 |
| AAL2 Coding Profile Changes | 0 | 0 |
| Invalid Header Count | 0 | 0 |
| Micro Overflow Count | 0 | 0 |
| Lost Enh. Packets | 0 | 0 |
| Missing Core Packets | 0 | 0 |
| Pkts Lost by Network | 0 | 0 |

DSP Statistics window

This window displays a variety of DSP statistics.

Tcid Configuration



Tcid Configuration

| | |
|---------------------------|--------------------|
| Tcid | 0 |
| Mode | Mode: Switched CAS |
| Pref Voice coding profile | 1 |

Telephony Interface Configuration

| | |
|------------------|----------------|
| Companding | Mu-Law |
| Gain (RX,TX) | (5,0) |
| Idle noise level | -6500 x .01 dB |

Signaling Protocol

| | |
|--------------------|----------------|
| Signaling Protocol | FXS Loop Start |
|--------------------|----------------|

FXS Loop Start Parameters

| | |
|------------------------------|----------|
| Offhook Debounce | 50 msec |
| Onhook Debounce | 50 msec |
| Seize Detect | 100 msec |
| Originator Clear Detect | 750 msec |
| Answering Party Clear Detect | 150 msec |

Tcid Configuration window

This read-only window displays a variety of Tcid configuration settings.

Coding Profile



Coding Profile window

This read-only window displays various Coding Profile settings.

Firmware and Configuration Update

The screenshot shows the 'Update Firmware' window in the D-Link DG-102SH web interface. On the left is a sidebar with the D-Link logo and a list of configuration options: Config IP & H.323, Device Information, Telephony Configuration, Dial Address Configuration, DHCP Configuration, NAT Configuration, SNMP Trap Configuration, Administration Management, Monitor, Update Firmware (highlighted), Save Changes, Factory Reset, and Restart System. The main window has a title bar 'Update Firmware' and three sections:

- Software Update Mode & TFTP Server Address**: Contains 'Software Update Mode' (WAN Link), 'TFTP Server Address' (0.0.0.0), and 'Last TFTP Server Address' (0.0.0.0).
- Update Management Module Firmware**: Contains 'Firmware Update' (disabled) and 'File Name'.
- Change Configuration File**: Contains 'Use Config File' (disabled) and 'Config File Name'.

A 'Save' button is located at the bottom right of the window.

Update Firmware and Configuration Files window

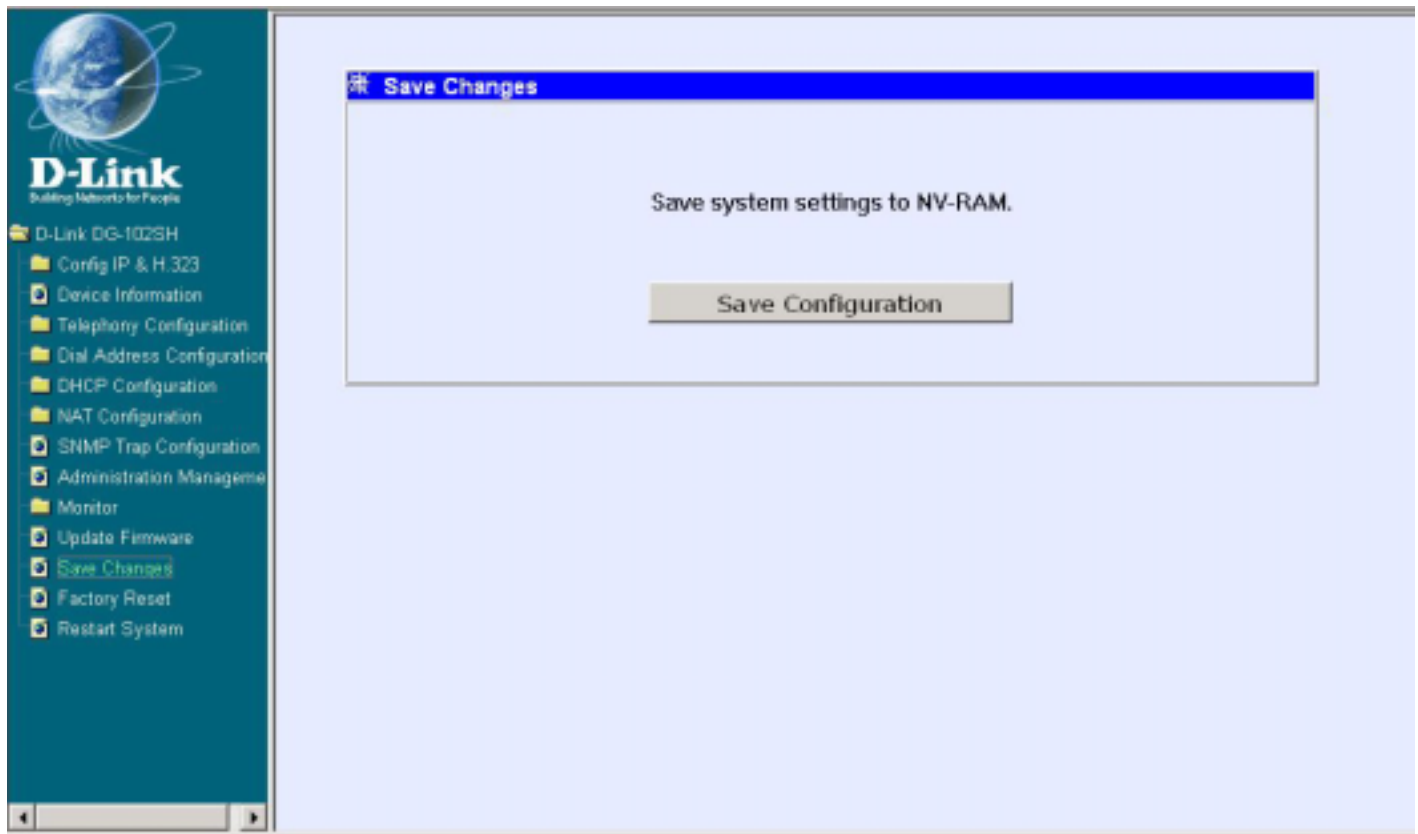
The items on this window are described below:

- ♦ **Software Update Mode** This specifies downloading the image file through a *WAN Link* or *LAN Link*.
- ♦ **TFTP Server Address** The IP address of the TFTP server where the runtime or configuration file is located. This entry is used only if the Firmware Update is set to *Enable*.
- ♦ **Last TFTP Server Address** This is a read-only field that displays the IP address of the last TFTP server to be accessed.
- ♦ **Firmware Update** Determines whether or not the device will try to look for a runtime image file on the TFTP server.
- ♦ **File Name** The complete path and filename of the runtime image file on your TFTP server to be uploaded to the device.
- ♦ **Use Config File** Toggle to *Enabled* to use the settings in a configuration text file when the device is reset (rebooted).
- ♦ **Config File Name** The complete path and filename on the TFTP server for the desired configuration file.

Click on the **Save** button at the bottom right of the window to save the settings.

Note: After finishing the **Update Firmware**, please **Must** perform **Factory Reset** to make sure firmware update is complete

Save Changes



Save Changes window

After the settings have been saved to NV-RAM, they will become the default settings for the device, and they will be used every time it is powered on, reset or rebooted. The only exception to this is a factory reset, which will clear all settings and restore them to their initial values, which were present when the device was purchased.

Click on the **Save Configuration** button at the bottom of the window to save the system settings to NV-RAM.

Factory Reset



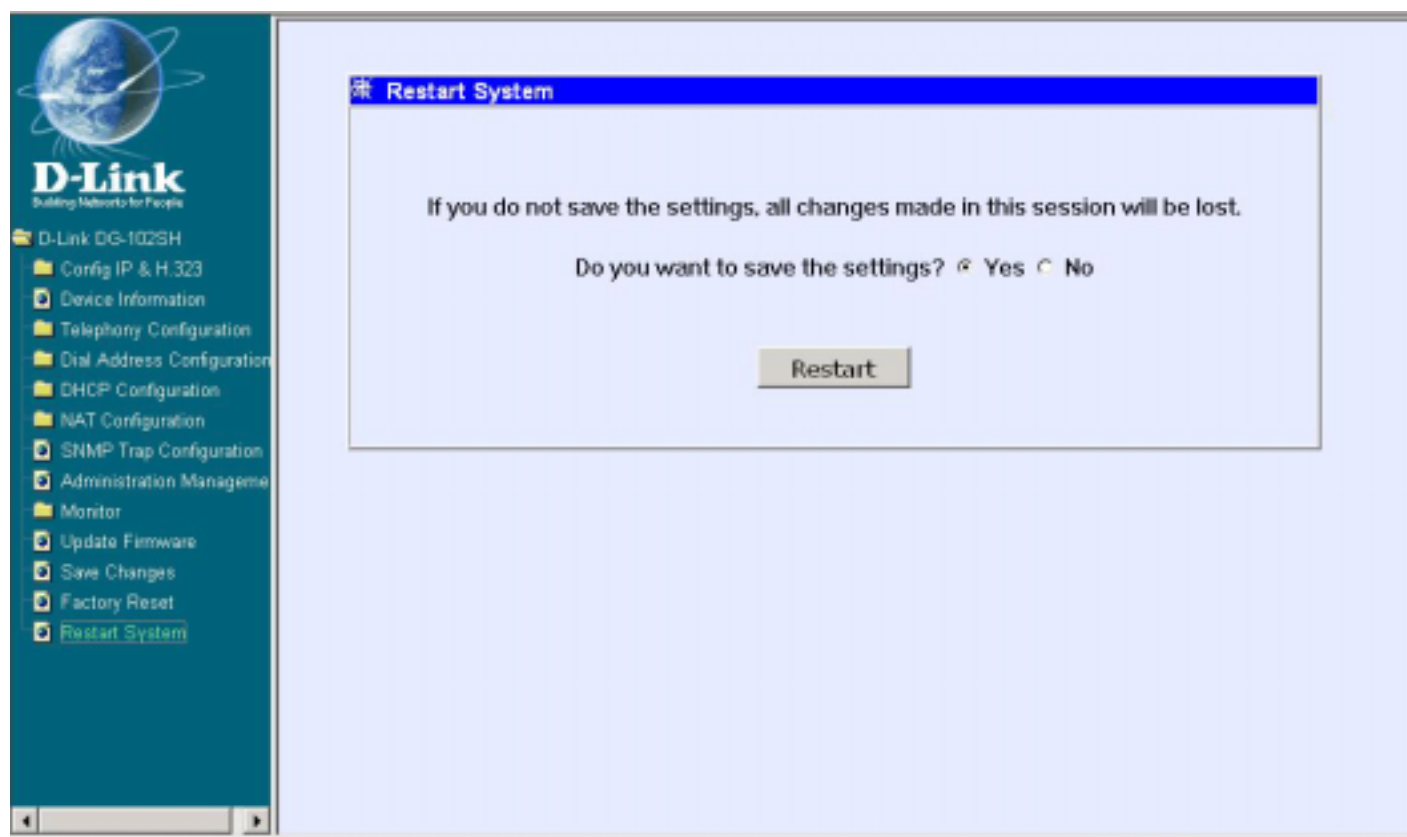
Factory Reset to Default Value window

Before performing a Factory Reset, be absolutely certain that this is what you want to do. Once the reset is done, all of the device's settings stored in NV-RAM will be erased and restored to values present when the device was purchased.

Note: After performing the Factory Reset, make sure to redefine the IP settings for the device in the **IP Configuration** menu. Then perform a Restart System on the device. After these three procedures are performed, your Factory Reset is complete.

Click on the **Reset to Factory Default** button at the bottom of the window to reset the NV-RAM to the default values that were present when you purchased the device.

Restart System



Restart System window

To perform a reboot of the device, which resets the system, click the **Restart** button.

Command Line Interface

The DG-102SH VoIP gateway offers a line-at-a-time prompt and response scheme to execute various configuration instructions. The interface displays a single prompt character **ggdbg>** when it is ready to accept a command (ex. **ggdbg>set** or **ggdbg>show**).

Typing a question mark after the **ggdbg>** prompt will display a list of helpful user commands. Please note that all characters must be entered in lower case. For the sake of explanation, all command line examples in this chapter are in **bold** type.

See below for a list of some of the most commonly used commands, parameter(s), and examples of their usage.

General Setup Commands

nwdbg system reboot

Definition: This command is used to restart the device.
 Parameter(s): None.
 Example: **nwdbg system reboot**

nwdbg save changes

Definition: This command is used to save configuration changes into flash and then restart the device.
 Parameter(s): None.
 Example: **nwdbg save changes**

nwdbg factory reset

Definition: This command is used to change all of the configuration data to the default values, save the new configuration data into flash, and then restart the device.
 Parameter(s): None.
 Example: **nwdbg factory reset**

nwdbg un <USERNAME>

Definition: This command sets the username if there is a username string, or shows the username/password if only **nwdbg un** is typed.
 Parameter(s): <USERNAME, maximum string length is 12 characters>
 Example: **nwdbg un 123456789012**

nwdbg pw <PASSWORD>

Definition: This command sets the password if there is a password string, or shows the username/password if only **nwdbg pw** is typed.
 Parameter(s): <PASSWORD, maximum string length is 12 characters>
 Example: **nwdbg pw**

nwdbg slic <0|1>

Definition: This command changes the Subscriber Line Interface Circuit (SLIC) state to standby or active, or shows the SLIC state if only **nwdbg slic** is typed.
 Parameter(s): <slic state, 0 : standby, 1 : active >
 Example: **nwdbg slic 0**

nwdbg dtmf_relay <0|1>

Definition: This command turns the Dual Tone Multiple Frequency (DTMF) relay function on or off, or shows the DTMF relay state if only **nwdbg dtmf_relay** is typed.

Parameter(s): <0 : off, 1 : on>

Example: **nwdbg dtmf_relay 0**

nwdbg mac <MAC ADDRESS>

Definition: This command sets the MAC address of the voice link, or shows the MAC address if only **nwdbg mac** is typed.

Parameter(s): <MAC ADDRESS, the format is XX:XX:XX:XX:XX:XX>

Example: **nwdbg mac 00:50:ba:08:24:56**

nwdbg ip <dhcp|bootp|manual>

Definition: This command sets the software boot mode to DHCP or BOOTP or Manual mode.
 If only **nwdbg ip** is typed, this command shows the IP configuration.
 DHCP: While the system is booting, the system acts as a DHCP client.
 BOOTP: While the system is booting, the system acts as a BOOTP client. This mode is used to set the device's IP address and upgrade the software.
 Manual: While the system is booting, the system uses a fixed IP address. The fixed IP address can be set by **nwdbg ip** <IP ADDRESS>.

Parameter(s): <dhcp|bootp|manual>

Example: **nwdbg ip dhcp**

nwdbg ip <IP ADDRESS>

Definition: This command sets the fixed IP address, which is used as the system's IP address if the software boot mode is Manual mode.

If only **nwdbg ip** is typed, this command shows the IP configuration.

Parameter(s): <IP ADDRESS>

Example: **nwdbg ip 10.1.1.120**

nwdbg mask <SUBNET MASK>

Definition: This command sets the fixed subnet mask, which is used as the system's subnet mask if the software boot mode is Manual mode.

If only **nwdbg mask** is typed, this command shows the IP configuration.

Parameter(s): <SUBNET MASK>

Example: **nwdbg mask 255.0.0.0**

nwdbg gw <GATEWAY IP>

Definition: This command sets the fixed GW address, which is used as the system's GW address if the software boot mode is Manual mode.

If only **nwdbg mask** is typed, this command shows the IP configuration.

Parameter(s): <GATEWAY IP>

Example: **nwdbg gw 10.1.1.254**

nwdbg tftp <0|1>

Definition: This command sets the software download link to either a WAN link or a LAN link.
 If only **nwdbg tftp** is typed, this command shows the download link.

Parameter(s): <0:WAN link, 1:LAN link>

Example: **nwdbg tftp 0**

nwdbg dns <DNS IP>

Definition: This command sets the Domain Name Server's IP address.
 If only **nwdbg dns** is typed, this command shows the DNS IP/STATE.
 Parameter(s): <DNS IP>
 Example: **nwdbg dns 10.1.1.5**

nwdbg dns <disable|enable>

Definition: This command turns on/off the DNS function.
 If only **nwdbg dns** is typed, this command shows the DNS IP/STATE
 Parameter(s): [disable | enable]
 Example: **nwdbg dns disable**

nwdbg country <code>

Definition: This command provides country code setting interface to config the tone frequency for different country.
 If only **nwdbg country** is typed, this command shows the COUNTRY CODE
 Parameter(s): <0:USA, 1:Japan (Default)>
 Example: **nwdbg country 1**

nwdbg config

Definition: This command shows all the configuration settings made by **nwdbg** commands.
 Parameter(s): None.
 Example: **nwdbg config**

ping <DEST IP> <OPTIONS>

Definition: This command lets the user ping an IP address from the device.
 Parameter(s): <DEST IP: The host ip address>
 <OPTIONS, -t : Ping the specified host until stopped (type SPACE).
 -n count: Number of echo requests to send.
 -w timeout: Timeout in seconds to wait for each reply.
 -i interval: The interval in half-seconds between two echo requests.>
 Example: **ping 10.1.1.6 -n 100 -w 2 -i 1**

TFTP Client Setup Commands

When the user enters **tftp**, the screen will show all commands about the TFTP client:

ggdbg>tftp

tftp srvip <IP ADDRESS> - set the IP address of TFTP server

tftp get <FILENAME> - get the remote image file
 if <FILENAME> is not specified, the
 image file name in EEPROM will be
 employed.

tftp update - update the image in flash

Current Settings :

TFTP Server IP Address : 172.16.6.245

Image File Name : 102nmm01.tfp

tftp srvip <IP ADDRESS>

Definition: This command sets the IP address of the TFTP server. The image must be resident on that TFTP server. If the IP address is invalid, the message **ERROR** will be displayed.
 Example: **ggdbg>tftp srvip 172.16.6.245**
OK

tftp get <FILENAME>

Definition: Gets the image from the TFTP server. The <FILENAME> is the name of the image on the TFTP server. If any error happened during downloading image, the message **ERROR** will be displayed. When the user enters **tftp get**, the file name in EEPROM will be employed.

Example: **ggdbg>tftp get c:\102nmm.tfp**
**Download d:\project\dg102\102nmm.tfp ...\
OK**

tftp update

Definition: This command updates the image in FLASH. The image is downloaded for storage in DRAM. If any error happens during the update of the image, the message **ERROR** will be displayed.

Example: **ggdbg>tftp update**
.. Erase Runtime Flash Memory ... Done
.. Program Runtime Flash Memory ... Done
OK

A

Specifications

Call Control Protocols Compliance:

H.323

Voice Compression:

G.711 (A-law and u-law), G.723.1, G.729a

Analog Voice Ports:

Type: Loop-Start FXS interfaces

DTMF tone detection/generation

V.21/V.25 Modem/Fax tone detection

Echo Cancellation: G.165/G.168

Ethernet Ports

WAN: NWay 10/100BASE-TX Fast Ethernet ports (MDI-II)

LAN: NWay 10/100BASE-TX Fast Ethernet ports (MDI-X)

IEEE 802.3 10BASE-T Ethernet compliance

IEEE 802.3u 100BASE-TX Fast Ethernet compliant

Quality of Service:

Voice service is prioritized over the data traffic

FAX Support:

V.21, V.27ter, V.29, V.17 Modulation/Demodulation.

Fax Relay Protocols: T.38

Network Protocols:

TCP/IP, UDP, ARP, ICMP, TFTP, Telnet, SNMP, HTTP

DHCP: Dynamic Host Configuration Protocol server and client

NAT: Network Address Translation

PPP over Ethernet Client

Network Management:

SNMP management agent base MIB II

Telnet provisioning

Manage functions through an intuitive web-based graphical user interface

Local management console

TFTP: The built-in Trivial File Transfer Protocol provides firmware upgrade

Security:

Password Authentication Protocol/Challenge Handshake Authentication Protocol (PAP/CHAP)

Administrative password through Telnet, Console, Web and SNMP

LEDs

General

Power

Status

Ethernet

WAN: 10/100M, Link/Act

LAN: 10/100M, Link/Act

Line

Hook/Ringing

Phone 1 to 2

Hook/Ringing

Dimensions

223.3(W) x 131.7(D) x 35(H) mm

Number of Ports

One 10/100BASE-TX Fast Ethernet port (WAN)

One 10/100BASE-TX Fast Ethernet port (LAN)

Two loop-start FXS RJ-11 ports

One PSTN POTS RJ-11 port for Life Line

One RS-232C, DB-9 Console port

Power Supply

AC-to-DC power adapter (provided)

DC Input: 12VDC/1A

Operating Temperature

0 - 50 °C

Storage Temperature

-10 - 55 °C

Humidity

5% - 95% non-condensing

Safety

CSA International (CSA 950, UL 1950, EN 60950, IEC 950)

Emission (EMI)

FCC Class B

VCCI Class B

BSMI Class B

CE Class B

C-Tick Class B

D-Link Offices

| | |
|------------------|---|
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| U.S.A. | D-LINK U.S.A. 53 Discovery Drive, Irvine, CA 92618, USA TEL: 1-949-788-0805 FAX: 1-949-753-7033 BBS: 1-949-455-1779 & 1-949-455-9616 INFO: 1-800-326-1688 URL: www.dlink.com E-MAIL: tech@dlink.com & support@dlink.com |

Registration Card

Print, type or use block letters.

Your name: Mr./Ms _____
 Organization: _____ Dept. _____
 Your title at organization: _____
 Telephone: _____ Fax: _____
 Organization's full address: _____

Country: _____ Date of purchase (Month/Day/Year): _____

| Product Model | Product Serial No. | * Product installed in type of computer (e.g., Compaq 486) | * Product installed Computer serial No. |
|---------------|--------------------|--|---|
| | | | |
| | | | |

(* Applies to adapters only)

Product was purchased from:

Reseller's name: _____
 Telephone: _____ Fax: _____
 Reseller's full address: _____

1. Where and how will the product primarily be used?

☐ Home ☐ Office ☐ Travel ☐ Company Business ☐ Home Business ☐ Personal

2. How many employees work at installation site?

☐ 1 employee ☐ 2-9 ☐ 10-49 ☐ 50-99 ☐ 100-499 ☐ 500-999 ☐ 1000 or more

3. What network protocol(s) does your organization use ?

☐ XNS/IPX ☐ TCP/IP ☐ DECnet ☐ Other _____

4. What network operating system(s) does your organization use ?

☐ D-Link LANsmart ☐ Novell NetWare ☐ NetWare Lite ☐ SCO Unix/Xenix
☐ PC NFS ☐ 3Com 3+Open ☐ Banyan Vines ☐ DECnet Pathwork
☐ Windows NT ☐ Windows NTAS ☐ Windows '95 ☐ Other _____

5. What network management program does your organization use ?

☐ D-View ☐ HP OpenView/Windows ☐ HP OpenView/Unix ☐ SunNet Manager ☐ Novell NMS
☐ NetView 6000 ☐ Other _____

6. What network medium/media does your organization use ?

☐ Fiber-optics ☐ Thick coax Ethernet ☐ Thin coax Ethernet
☐ 10BASE-T UTP/STP ☐ 100BASE-TX ☐ 100BASE-T4 ☐ 100VGAnyLAN ☐ Other _____

7. What applications are used on your network?

☐ Desktop publishing ☐ Spreadsheet ☐ Word processing ☐ CAD/CAM
☐ Database management ☐ Accounting ☐ Other _____

8. What category best describes your company?

☐ Aerospace ☐ Engineering ☐ Education ☐ Finance ☐ Hospital ☐ Legal ☐ Insurance/Real Estate ☐ Manufacturing
☐ Retail/Chainstore/Wholesale ☐ Government ☐ Transportation/Utilities/Communication ☐ VAR
☐ Systemhouse/company ☐ Other _____

9. Would you recommend your D-Link product to a friend?

☐ Yes ☐ No (why?) _____ ☐ I don't know yet

10. Your comments on this product: _____



TO:

Three vertical lines for an address.

D-Link®