

HAWNR3

## Hi-Gain™ Wireless 300N Router with Range Amplifier

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**USER'S MANUAL** ►►

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## **LIMITED WARRANTY**

Hawking Technology guarantees that every HAWNR3 Hi-Gain™ Wireless 300N Router with Range Amplifier is free from physical defects in material and workmanship under normal use for one (1) year from the date of purchase. If the product proves defective during this one-year warranty period, call Hawking Customer Service in order to obtain a Return Authorization number. Warranty is for repair or replacement only. Hawking Technology does not issue any refunds. **BE SURE TO HAVE YOUR PROOF OF PURCHASE. RETURN REQUESTS CAN NOT BE PROCESSED WITHOUT PROOF OF PURCHASE.** When returning a product, mark the Return Authorization number clearly on the outside of the package and include your original proof of purchase.

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# Federal Communication Commission

## Interference Statement

### FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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:

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

### FCC Caution

This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm spacing must be provided between computer mounted antenna and person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

### **Federal Communication Commission (FCC) Radiation Exposure Statement**

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## **R&TTE Compliance Statement**

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

### **Safety**

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

### **EU Countries Intended for Use**

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.

### **EU Countries NOT intended for use**

None.

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## Chapter I: Product Information

### *1-1 Introduction and Safety Information*

Thank you for purchasing the HAWNR3 Hi-Gain™ Wireless 300N Router with Range Amplifier. This highly efficient router is the best choice for ***Small office / Home office*** users. It allows computers and network devices to share a single xDSL / cable modem internet connection at high speed. Easy install procedures allow any computer user to setup a network environment in a very short time. When the number of your computers and network-enabled devices grow, you can also expand the number of network slots by simply attaching a hub or switch, instantly extending the scope of your network

With built-in IEEE 802.11b/g/Draft-N wireless network capability, all computers and wireless-enabled network devices (*including PDAs, cellular phones, game consoles, etc.*) can connect to this wireless router without additional cabling. ***With a compatible wireless card installed in your PC, you can transfer files at up to 300Mbps (transfer data rate)!***

*Other features of this router include:*

- High-Speed Internet Access throughput
- Allows multiple users to share a single Internet line
- Supports up to 253 users
- Share a single Cable or xDSL internet connection
- Access private LAN servers from the internet
- Four wired LAN ports (10/100M) and one WAN port (10/100M)
- Provides IEEE 802.11b/g/Draft-N wireless LAN capability
- Support DHCP (Server/Client) for easy IP-address setup
- Advanced network and security features like: Special Applications, QoS, DMZ, Virtual Servers, Access Control, Firewall.
- Allows you to monitor the router's status: DHCP Client Log, System Log, Security Log and Device/Connection Status

- Easy to use Web-based GUI for network configuration and management purposes
- Remote management function allows configuration and upgrades from a remote computer (over the Internet)
- Auto MDI / MDI-X function for all wired Ethernet ports.

## ***1-2 Safety Information***

In order to keep the safety of users and property, please follow these safety instructions:

1. This router is designed for indoor use only; DO NOT place this router outdoors.
2. DO NOT put this router at or near hot or humid places, like kitchens or bathrooms. Also, do not leave this router in the car in summer.
3. DO NOT pull any connected cable with force; disconnect them from the router first.
4. If you want to place this router in a high place or hang on the wall, please make sure the router is firmly secured. Falling can damage the router and its accessories and the warranty will be void.
5. Accessories of this router, like antennas and power supply, are a danger to small children under 3 years old. **KEEP THIS ROUTER OUT OF THE REACH OF CHILDREN!**
6. The router will become warm when used for a long period of time (***This is normal and is not a malfunction***). DO NOT put this router on paper, cloth, or other flammable materials.
7. There are no user-serviceable parts inside the router. If you have found that the router is not working properly, please contact technical support or your place of purchase and ask for help. DO NOT disassemble the router, or warranty will be void.
8. If the router falls into water when it's powered on, DO NOT use your hands to pick it up. Switch the electrical power off before you do anything, or contact an experienced technician for help.
9. If you smell something strange, or see smoke coming out from the router or power supply, remove the power supply or switch the electrical power off immediately, and call techsupport or your place of purchase for help.

### ***1-3 System Requirements***

- One computer (Mac or PC).
- Internet Web Browser (Internet Explorer, Safari, etc.)
- A Wired or Wireless network adapter (e.g. Airport card, built-in Ethernet adapter, etc.)
- Broadband Modem (e.g. Cable or DSL)

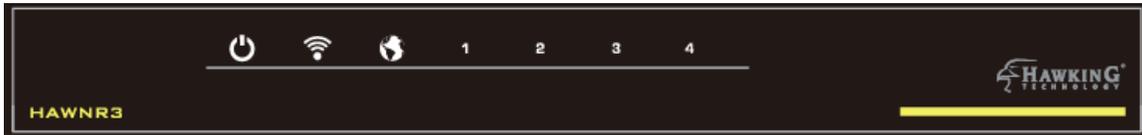
### ***1-4 Package Contents***

Before you start to use this router, please check if there's anything missing in the package, and contact your place of purchase or contact Hawking Technologies.

- Broadband Router (main body, 1 pcs)
- Quick Installation Guide (1 pcs)
- Setup CD-ROM (1pcs)
- A/C power adapter 12V/1A (1 pcs)
- 3dBi Dipole Antennas (2 pcs)

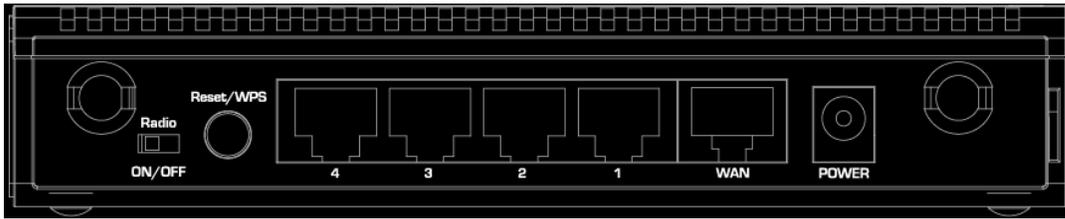
## 1-5 Product Overview

### Front Panel



LED Name	Light Status	Description
Power 	ON	Router is switched on and correctly powered
Wireless 	On	Wireless network is switched on or WPS mode is on.
	Off	Wireless network is switched off
	Flashing	Wireless LAN activity (transferring or receiving data).
Internet 	On	WAN port (Internet) is connected
	Off	WAN port is not connected
	Flashing	WAN activity (transferring or receiving data)
LAN 1-4	On	LAN port is connected
	Off	LAN port is not connected
	Flashing	LAN activity (transferring or receiving data)

## Back Panel



Item Name	Description
Antenna	3dBi dipole antennas.
Power	Power connector, connects to A/C power adapter 12V/1A.
Reset/W{S	Reset the router to factory default settings (clear all settings). Press this button and hold for 30 seconds to restore all settings to factory defaults.
LAN (1 – 4)	Local Area Network (LAN) ports 1 to 4.
WAN/MODEM	Wide Area Network (WAN / Internet) port.
Wireless On/Off	Switch the wireless radio on or off

## Chapter II: System and Network Setup

### *2-1 Build Network Connection*

Please follow the following instructions to build the network connection between your new HAWNR3 router and your computers and other network devices:

1. Connect your xDSL /cable modem to the WAN port of this router by Ethernet cable.
2. Connect all your computers and network devices (network-enabled consumer devices other than computers, like game console, or switch / hub) to the LAN port of the router.
3. Connect the A/C power adapter to the wall socket, and then connect it to the 'Power' socket of the router.
4. Please check all LEDs on the front panel. 'PWR' LED should be steadily on, WAN and LAN LEDs should be on if the computer / network device connected to the respective port of the router is powered on and correctly connected. If PWR LED is not on, or any LED you expected is not on, please recheck the cabling, or jump to '**5-2 Troubleshooting**' for possible reasons and solutions.

## ***2-2 Connecting to the HAWNR3 via Web Browser***

After the network connection is built, the next step you should do is setup the router with proper network parameters, so it can work properly in your network environment.

Before you can connect to the router and start configuration procedures, your computer must be able to get an IP address automatically (use dynamic IP address). If it's set to use static IP address, or you're unsure, please follow the following instructions to configure your computer to use dynamic IP address:

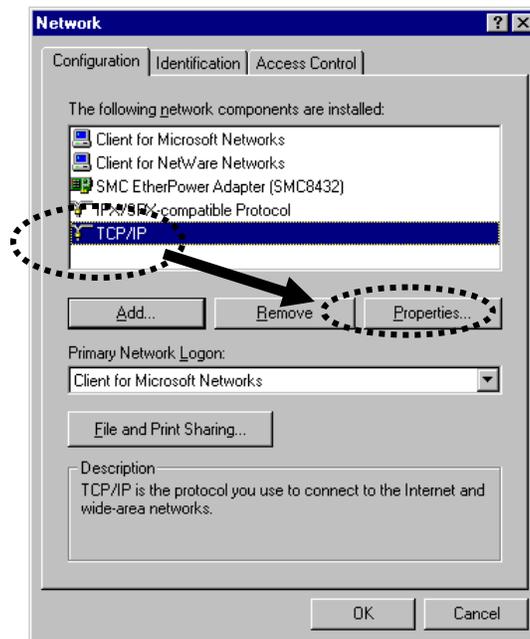
***If the operating system of your computer is....***

<b>Windows 95/98/Me</b>	<b>- please go to section 2-2-1</b>
<b>Windows 2000</b>	<b>- please go to section 2-2-2</b>
<b>Windows XP</b>	<b>- please go to section 2-2-3</b>
<b>Windows Vista/7</b>	<b>- please go to section 2-2-4</b>
<b>Mac OS X</b>	<b>- please go to section 2-2-5</b>
<b>Tablet/Smartphone</b>	<b>- please go to section 2-2-6</b>

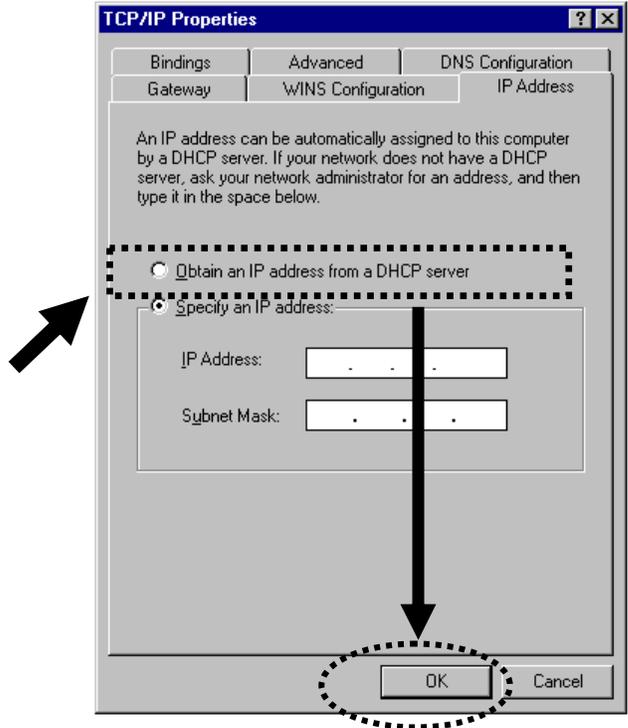


## 2-2-1 Windows 95/98/Me IP Address setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Double-click *Network* icon, and *Network* window will appear. Select 'TCP/IP', then click 'Properties'.

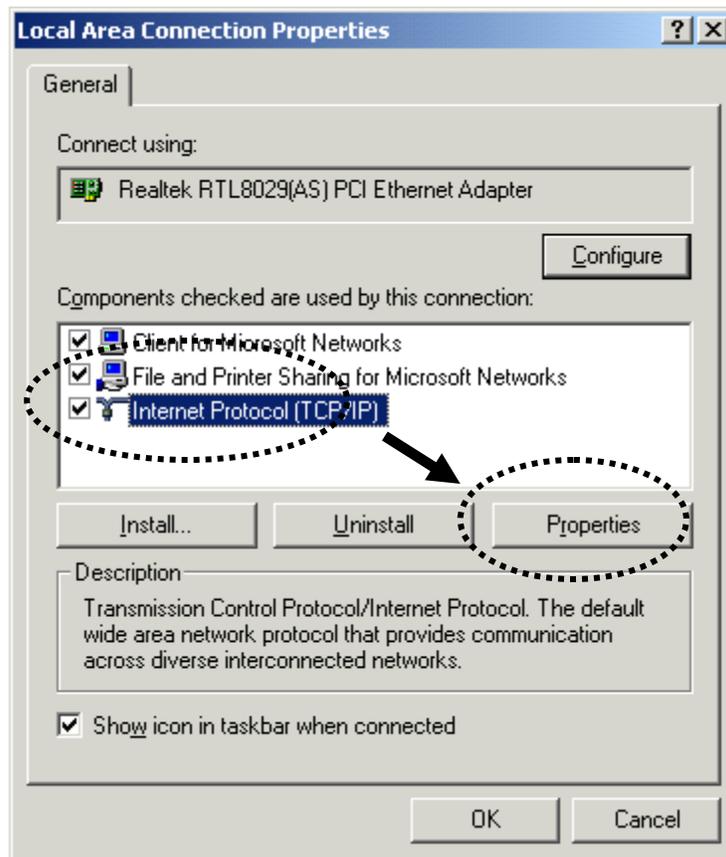


2. Select 'Obtain an IP address from a DHCP server' and then click 'OK'.

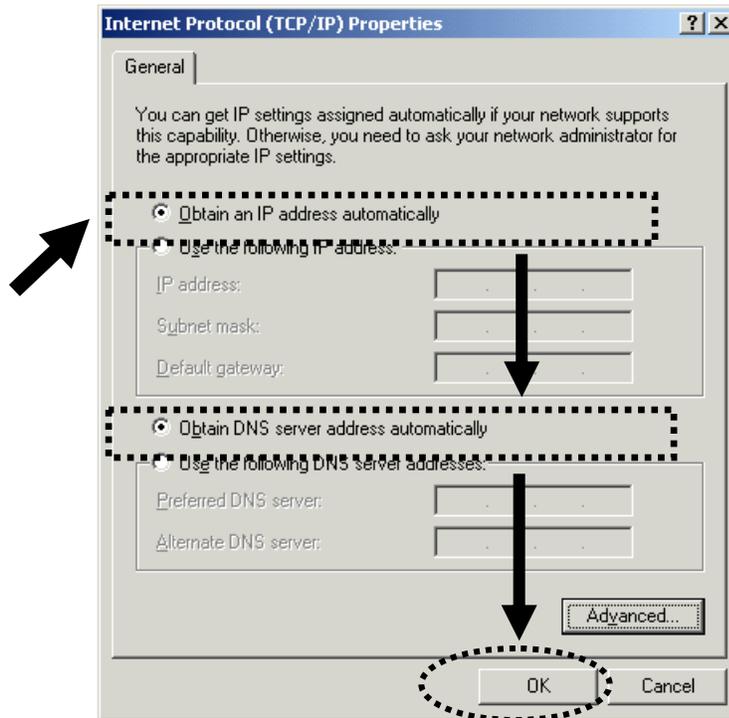


## 2-2-2 Windows 2000 IP Address Setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Double-click *Network and Dial-up Connections* icon; click *Local Area Connection*, and *Local Area Connection Properties* window will appear. Select 'Internet Protocol (TCP/IP)' and then click 'Properties'



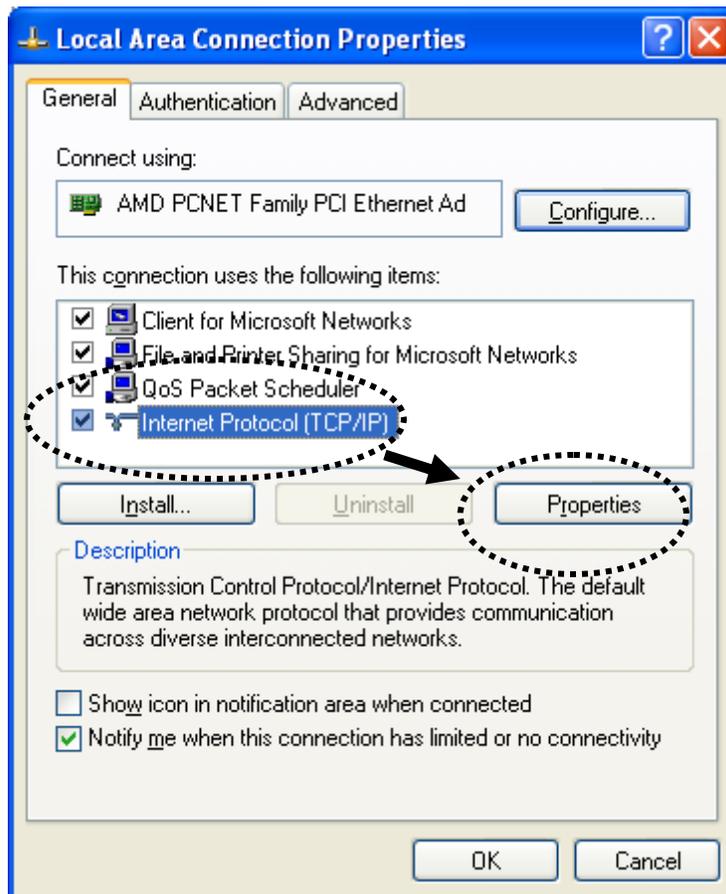
2. Select 'Obtain an IP address automatically' and 'Obtain DNS server address automatically', then click 'OK'.



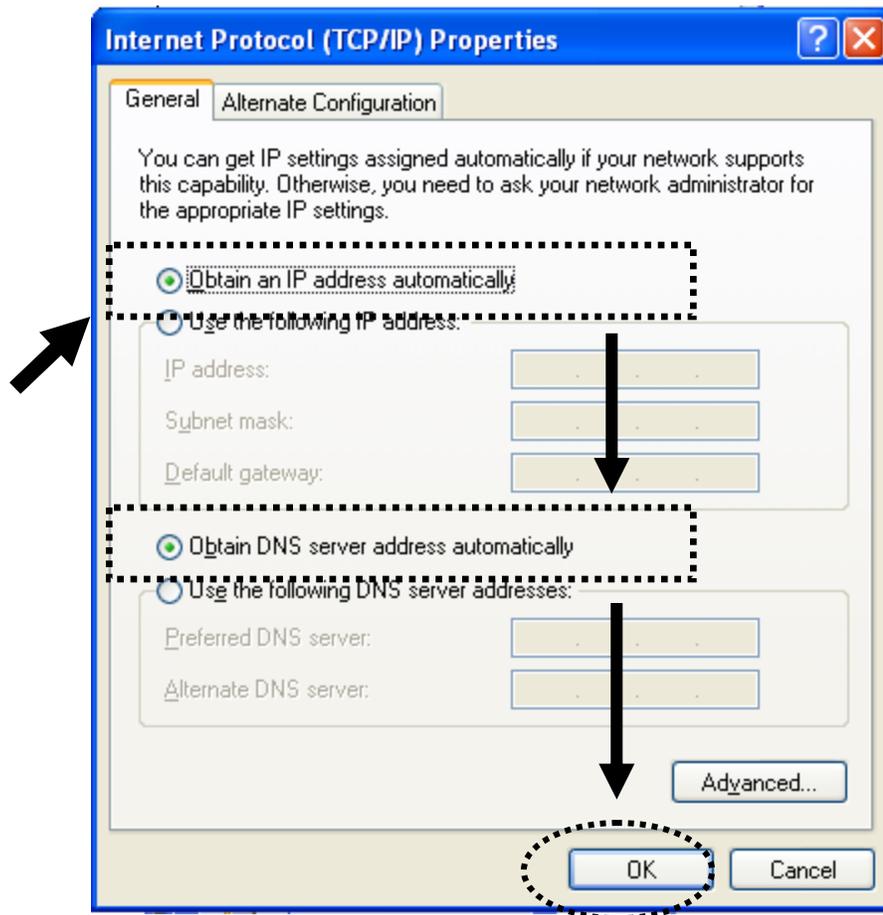


### 2-2-3 Windows XP IP Address Setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Double-click **Network and Internet Connections** icon, click **Network Connections**, and then double-click **Local Area Connection**, **Local Area Connection Status** window will appear, and then click 'Properties'



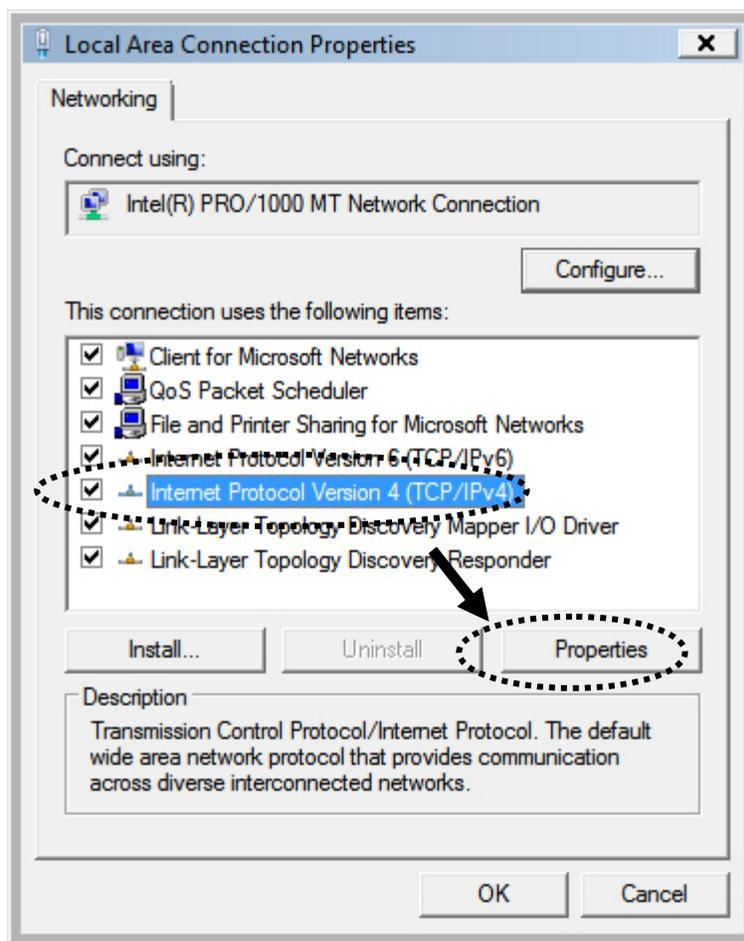
2. Select 'Obtain an IP address automatically' and 'Obtain DNS server address automatically', then click 'OK'.



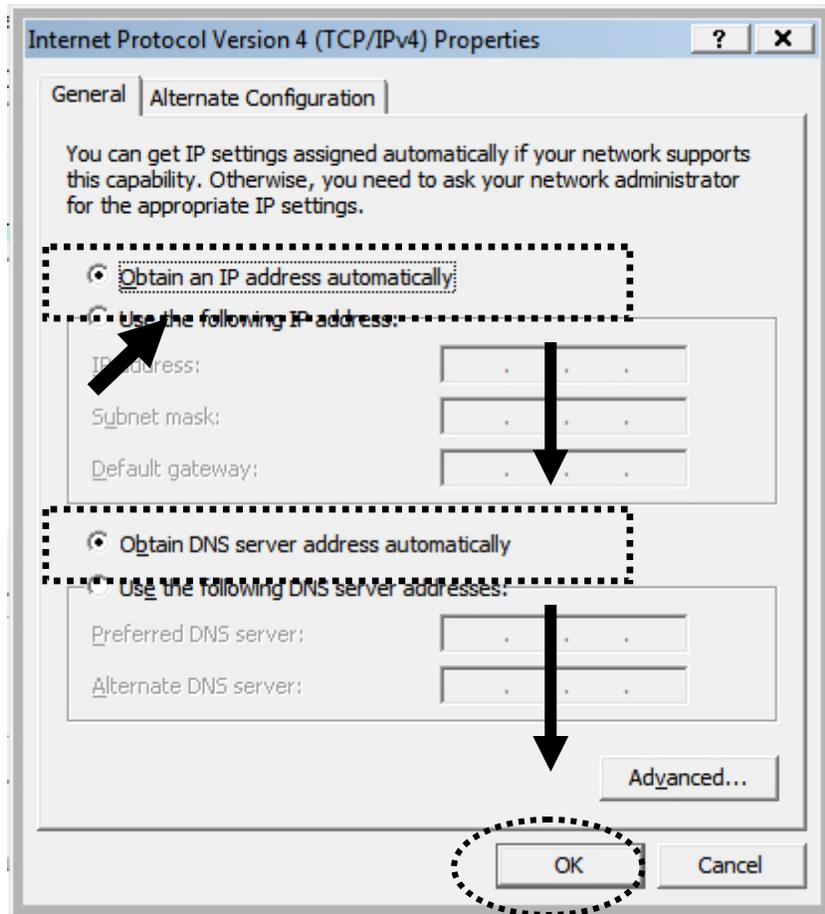


## 2-2-4 Windows Vista/7 IP Address Setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Click *View Network Status and Tasks*, and then click *Manage Network Connections*. Right-click *Local Area Network*, then select '*Properties*'. *Local Area Connection Properties* window will appear, select 'Internet Protocol Version 4 (TCP / IPv4)', and then click 'Properties'

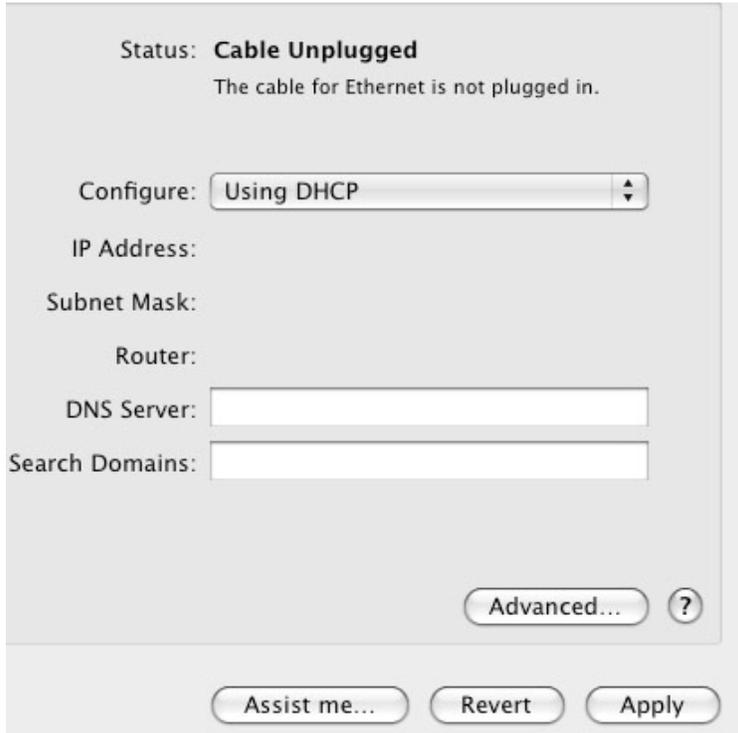


2. Select 'Obtain an IP address automatically' and 'Obtain DNS server address automatically', then click 'OK'.



## 2-2-5 Mac OS X IP Address Setup

Go to your system preferences, go to network. Select your network connection. Make sure 'Configure' is set to 'Using DHCP'.



The screenshot shows the Network System Preferences window for an Ethernet connection. The status is 'Cable Unplugged' with a sub-message 'The cable for Ethernet is not plugged in.' The 'Configure' dropdown menu is set to 'Using DHCP'. Below this, there are fields for 'IP Address:', 'Subnet Mask:', 'Router:', 'DNS Server:', and 'Search Domains:', all of which are currently empty. At the bottom of the window, there are three buttons: 'Assist me...', 'Revert', and 'Apply'. An 'Advanced...' button with a help icon (?) is also visible.

Status: **Cable Unplugged**  
The cable for Ethernet is not plugged in.

Configure: Using DHCP

IP Address:

Subnet Mask:

Router:

DNS Server:

Search Domains:

Advanced... ?

Assist me... Revert Apply

## 2-2-6 Tablet/Smartphone Setup

### iOS (iPhone or iPad)

Go to your settings on your tablet or smart phone



First, make sure JavaScript is On: Go to Settings icon Select (a) Safari > make sure (b) JavaScript is ON.

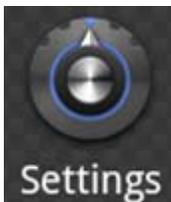


back to Home Screen > Select Settings > In Wi-Fi Networks, select (c) "Hawking\_300N" > (d) Make sure your Wi-Fi is connected to Hawking\_300N



## Android (Android 2.1 +)

Go to Settings



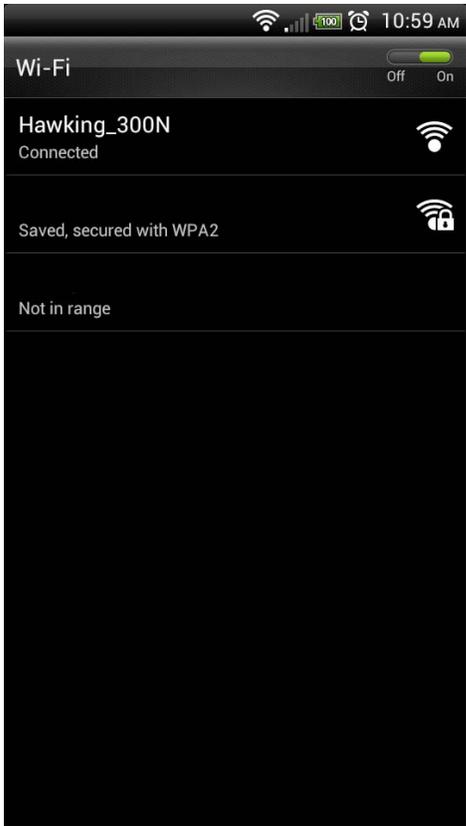
Go to Wireless & Networks



Check "Turn on Wi-Fi" and then click on Wi-Fi settings



Look for Hawking\_300N, then select to connect



## 2-2-7 Accessing the Web Based Setup Page

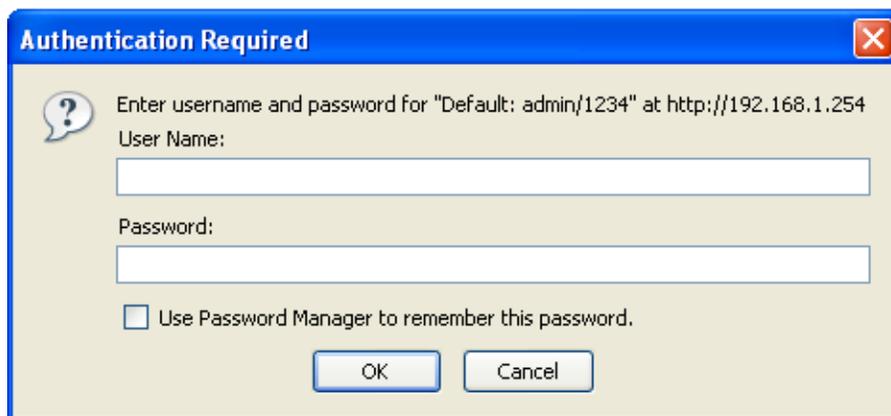
Open your web browser,

In the address field, please type: 192.168.1.254



Press enter.

The following message should be shown:



Please input user name and password in the field respectively,

Default Username: admin

Default Password: 1234

Press 'OK' button, and you will then see the management interface of this router:



### Welcome to the Setup Wizard

This wizard will guide you through the initial setup of your Hi-Gain™ Wireless 300N Router with Range Amplifier and your broadband Internet connection. The configuration of advanced features is not included in this wizard.

**Set Time Zone:**

(GMT- 8:00) Pacific Time (US & Canada); Tijuana ▼

**Time Server Address:**

192.43.244.18

**Daylight Savings:**

Enable Function

Times From Jan ▼ 1 ▼ to Jan ▼ 1 ▼

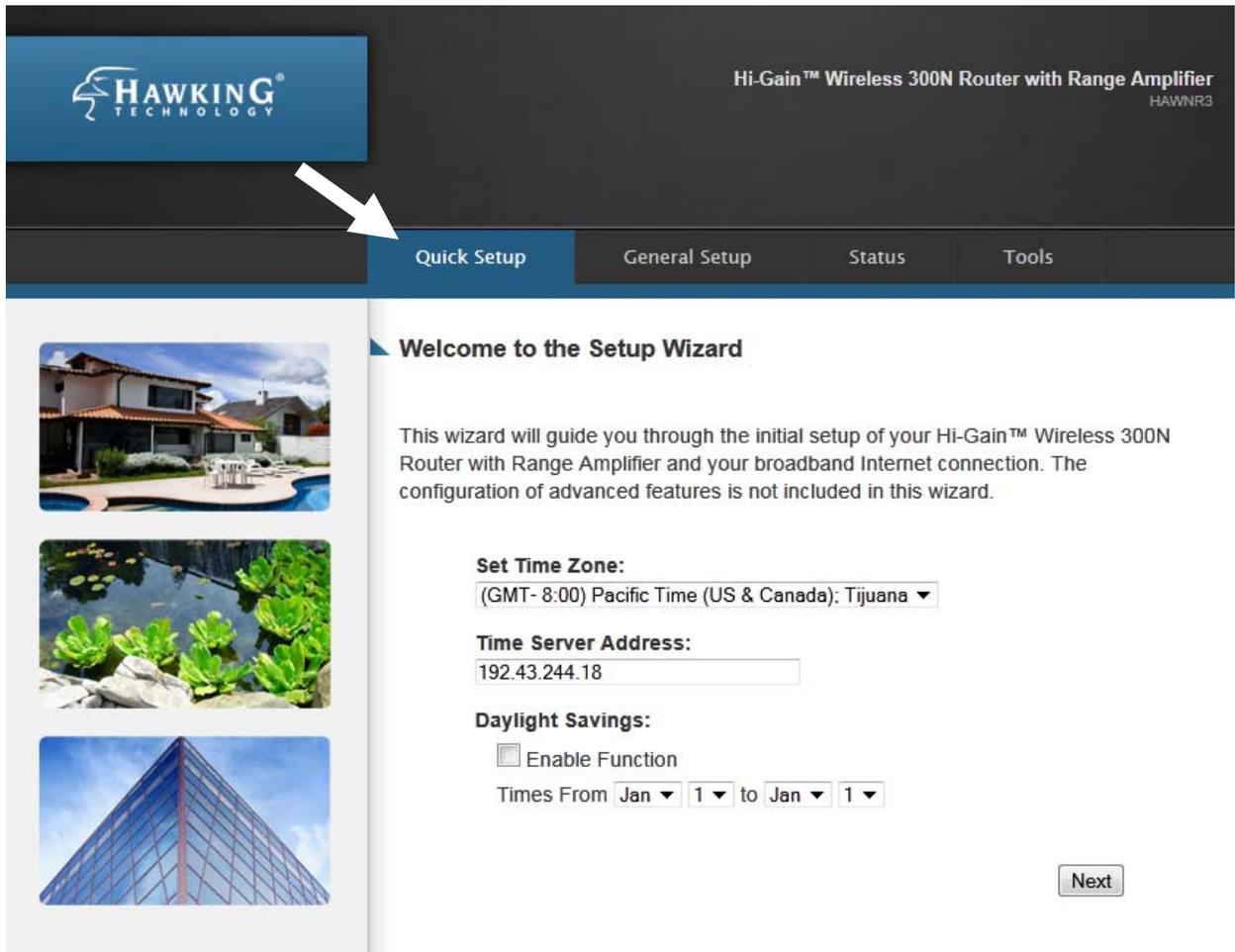
Next

**NOTE: If you can't see the web management interface, and you are being prompted to input user name and password again, it means you didn't input username and password correctly. Please retype user name and password again. If you are certain that user name and password you typed are correct, please go to '5-2 Troubleshooting' to perform a factory reset, to set the password back to default value.**

## 2-3 'Quick Setup'

This router provides a 'Quick Setup' procedure, which will help you to complete all required settings you need to access the Internet in very short time. Please follow the following instructions to complete the 'Quick Setup':

Please go to Quick Setup Wizard menu by clicking 'Quick Setup' button.



The screenshot shows the web interface of a Hawking Technology router. At the top left is the Hawking Technology logo. At the top right, the text reads "Hi-Gain™ Wireless 300N Router with Range Amplifier" and "HAWNR3". Below this is a navigation bar with four tabs: "Quick Setup", "General Setup", "Status", and "Tools". A white arrow points to the "Quick Setup" tab. The main content area is titled "Welcome to the Setup Wizard" and contains the following text: "This wizard will guide you through the initial setup of your Hi-Gain™ Wireless 300N Router with Range Amplifier and your broadband Internet connection. The configuration of advanced features is not included in this wizard." Below the text are three configuration sections: "Set Time Zone:" with a dropdown menu showing "(GMT- 8:00) Pacific Time (US & Canada); Tijuana"; "Time Server Address:" with a text input field containing "192.43.244.18"; and "Daylight Savings:" with an unchecked checkbox for "Enable Function" and a "Times From" section with dropdown menus for "Jan", "1", "to", "Jan", and "1". A "Next" button is located at the bottom right of the configuration area. On the left side of the main content area, there are three small images: a house with a pool, a pond with lily pads, and a modern glass building.

# 1. Set Time Zone

## Welcome to the Setup Wizard

This wizard will guide you through the initial setup of your Hi-Gain™ Wireless 300N Router with Range Amplifier and your broadband Internet connection. The configuration of advanced features is not included in this wizard.

### Set Time Zone:

(GMT- 8:00) Pacific Time (US & Canada): Tijuana ▼ 1

### Time Server Address:

192.43.244.18 2

### Daylight Savings:

Enable Function 3

Times From Jan ▼ 1 ▼ to Jan ▼ 1 ▼

Next 4

---

*Set Time Zone (1):* Please press ▼ button, a drop-down list will be shown, and you can choose a time zone of the location you live.

*Time Server Address (2):* Input the IP address / host name of time server here.

*Daylight Savings(3):* If the country you live uses daylight saving, please check 'Enable Function' box, and choose the duration of daylight saving.

---

After you finish with all settings, please click 'Next' (4) button.

**NOTE: There are several time servers available on internet:**

129.6.15.28 (time-a.nist.gov)

132.163.4.101 (time-a.timefreq.bldrdoc.gov)

131.107.1.10 (time-nw.nist.gov)

**If you found that the time of router is incorrect, try another time server.**

## 2. Broadband Type

### Welcome to the Setup Wizard

Select the type of broadband Internet connection that you are currently configuring:

- Cable Modem Setup (Dynamic IP)**  
For Internet connections using coaxial cables (TV cables). Typically used with Cable modem setups.
- DSL and Cable Modem Setup (Static IP)**  
Some Internet service providers frequently use a Fixed IP Address for your Broadband connection. If you have been provided with this information, choose this option and enter the assigned IP Address, Subnet Mask, Gateway IP Address and DNS IP Address in the next step.
- DSL (PPPoE)**  
If you connect to the Internet using a DSL Modem and your ISP has provided you with a Password and a Service Name, then your ISP uses PPPoE to establish a connection. You must choose this option and enter the required information.
- DSL (PPTP)**  
If you connect to the Internet using a DSL Modem and your ISP has provided you with a Password, Local IP Address, Remote IP Address and a Connection ID, then your ISP uses PPTP to establish a connection. You must choose this option and enter the required information.
- DSL (L2TP)**  
Layer Two Tunneling Protocol DSL connections.

Next

Please choose the broadband (Internet connection) type you're using and then click 'Next'. There are six types of Internet connection, they are:

<b>Cable Modem Setup (Dynamic IP)</b>	<b>- Please go to section 2-3-1</b>
<b>DSL and Cable Modem Setup (Static IP)</b>	<b>- Please go to section 2-3-2</b>
<b>DSL (PPPoE)</b>	<b>- Please go to section 2-3-3</b>
<b>DSL (PPTP)</b>	<b>- Please go to section 2-3-4</b>
<b>DSL (L2TP)</b>	<b>- Please go to section 2-3-5</b>

If you're not sure, please contact your Internet Service Provider (ISP). A wrong Internet connection type will cause connection problems, and you will not be able to connect to internet.

If you want to go back to previous step, please press 'Back' button on the bottom of this page.

**NOTE: Some service providers use 'DHCP' (Dynamic Host Configuration Protocol) to assign IP address to you. In this case, you can choose 'Cable Modem' as Internet connection type, even if you're using another connection type, like xDSL. Also, some cable modem uses PPPoE, so you can choose 'PPPoE xDSL' for such cable modem connections, even if you're using a cable modem.**

## 2-3-1 Setup Procedure for ‘Cable Modem Setup (Dynamic IP)’:

### Cable Modem Setup (Dynamic IP)

If required by your Internet Service Provider, you can enter the Host Name and Mac Address of your registered network device here. If you do not know or do not have a Host Name and Mac Address, simply click 'Continue' to proceed.

Host Name:  1

MAC Address:  2

3

4

---

*Host Name (1): Please input the host name of your computer, this is optional, and only required if your service provider asks you to do so.*

*MAC address (2): Please input MAC address of your computer here, if your service provider only permits computer with certain MAC address to access internet.*

*Clone Mac Address (3): If you're using the computer which used to connect to Internet via cable modem, you can simply press 'Clone Mac address' button to fill the MAC address field with the MAC address of your computer.*

---

After you finish with all settings, please click ‘Continue’ (4) button; if you want to go back to previous menu, click ‘Back’.

## 2-3-2 Setup Procedure for ‘DSL and Cable Modem Setup (Static IP Address)’:

### DSL and Cable Modem Setup (Static IP Address)

Enter the assigned IP Address, Subnet Mask, Default Gateway and DNS Address provided by your Internet Service Provider. Click 'Continue' to proceed.

IP Address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	1
Subnet Mask:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	2
Default Gateway:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	3
DNS Address:	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	4
	<input type="button" value="Back"/> <input type="button" value="Continue"/>	5

---

*IP address assigned Provider (1):*      *Please input IP address assigned by your service provider.*

*Subnet Mask (2):*      *Please input subnet mask assigned by your service provider*

*DNS address (3):*      *Please input the IP address of DNS server provided by your service provider.*

*Default Gateway Address (4):*      *Please input the IP address of DNS server provided by your service provider.*

---

**You must use the addresses provided by your Internet service provider, wrong value settings will cause connection problems.**

When you finish with all settings, press ‘Continue’ (5); if you want to go back to previous menu, click ‘Back’.

**NOTE: You can choose this Internet connection method if your service provider assigns a fixed IP address (also known as a static address) to you, and not using DHCP or PPPoE protocol. Please contact your service provider for further information.**

## 2-3-3 Setup procedure for ‘DSL (PPPoE)’:

### Point-to-Point Protocol over Ethernet (PPPoE)

Enter the Point-to-Point Protocol over Ethernet (PPPoE) User Name and Password assigned by your Service Provider. The Service Name is normally optional, but may be required by some Service Providers. Enter a Idle Time (in minutes) to define a maximum period of time for which the Internet connection is maintained during inactivity. If the connection is inactive for longer than the Maximum Idle Time, then the connection will be dropped. You can enable the Connect on Demand option to automatically re-establish the connection as soon as you attempt to access the Internet again. If your Internet Service Provider requires the use of PPPoE, enter the information below.

User Name:  1  
Password:  2  
Service Name:  3  
MTU:  (512<=MTU Value<=1492) 4  
Connection Type:    5  
Idle Time Out:  (1-1000 minutes) 6  
  7

- 
- User Name (1): Please input user name assigned by your Internet service provider here.*
- Password (2): Please input the password assigned by your Internet service provider here.*
- Service Name (3): Please give a name to this Internet service, this is optional*
- MTU (4): Please input the MTU value of your network connection here. If you don't know, you can use default value.*
- Connection Type (5): Please select the connection type of Internet connection you wish to use (detailed explanation listed below).*
- Idle Time Out (6): Please input idle time out, (detailed explanation listed below).*

---

When you finish with all settings, please click 'Continue' (7); if you want to go back to previous menu, click 'Back'.

**MTU - Please use default value if you don't know what it is, or ask your service provider for a proper value.**

**Connection Type - There are 3 options: 'Continuous' - keep internet connection alive, do not disconnect, connect on Demand - only connects to Internet when there's a connect attempt, and 'Manual' - only connects to Internet when 'Connect' button on this page is pressed, and disconnects when 'Disconnect button is pressed.**

**Idle Time Out: Specify the time to shutdown internet connect after no internet activity is detected by minute. This option is only available when connection type is 'Connect on Demand'.**

### 2-3-4 Setup procedure for ‘DSL (PPTP)’:

DSL (PPTP) requires two kinds of setting: WAN interface setting (setup IP address) and PPTP setting (PPTP user name and password). Here we start from WAN interface setting:



The screenshot shows the 'WAN Interface Settings' configuration page. It features two radio button options for IP address acquisition. The first option, 'Obtain an IP address automatically', is selected and includes fields for 'Host Name' (0.0.0.0) and 'MAC Address' (000f3c1a08b2), with a 'Clone MAC Address' button. The second option, 'Use the following IP address', is unselected and includes fields for 'IP Address' (0.0.0.0), 'Subnet Mask' (0.0.0.0), and 'Default Gateway' (0.0.0.0).

Select how you obtain IP address from your service provider here. You can choose ‘Obtain an IP Address Automatically’ (equal to DHCP, please refer to ‘Cable Modem’ section above), or ‘Use the following IP address’ (i.e. static IP Address).

WAN interface settings must be correctly set, or the Internet connection will fail even if those settings of PPTP settings are correct. Please contact your Internet Service Provider if you don’t know what you should fill in these fields.

Now please go to PPTP settings section:

**PPTP Settings**

User ID:  1

Password:  2

PPTP Gateway:  3

Connection ID:  (Optional) 4

MTU:  (512<=MTU Value<=1492) 5

BEZEQ-ISRAEL:  Enable (for BEZEQ network in ISRAEL use only) 6

Connection Type:    7

Idle Time Out:  (1-1000 minutes) 8

9

---

*User ID (1): Please input user ID (user name) assigned by your Internet service provider here.*

*Password (2): Please input the password assigned by your Internet service provider here.*

*PPTP Gateway (3): Please input the IP address of PPTP gateway assigned by your Internet service provider here.*

*Connection (4): Please input the connection ID here, this is optional and you ID can leave it blank.*

*MTU (5): Please input the MTU value of your network connection here. If you don't know, you can use default value.*

*BEZEQ-ISRAEL (6): Enable this setting if you live in Israel. \**

*Connection type (7): Please select the connection type of Internet connection you wish to use, please refer to last section for detailed descriptions.*

*Idle Time Out (8): Please input the idle time out of Internet connection you wish to use, and refer to last section for detailed descriptions.*

---

\* Setting item 'BEZEQ-ISRAEL' is only required to check if you're using the service provided by BEZEQ network in Israel.

When you finish with all settings, please click 'Continue' (9); if you want to go back to previous menu, click 'Back'.

### 2-3-5 Setup Procedure for L2TP

L2TP requires two kinds of setting: WAN interface setting (setup IP address) and L2TP setting (L2TP user name and password). Here we start from WAN interface setting:

#### Layer Two Tunneling Protocol DSL connections

Enter the information relevant to your L2TP Internet connection:

**WAN Interface Settings**  
 **Obtain an IP address automatically**  
Host Name:   
MAC Address:    
 **Use the following IP address**  
IP Address:   
Subnet Mask:   
Default Gateway:

Select the type of how you obtain IP address from your service provider here. You can choose ‘Obtain an IP Address automatically’ (equal to DHCP, please refer to ‘Cable Modem’ section above), or ‘Use the following IP Address’ (i.e. static IP address)

WAN interface settings must be correctly set, or the Internet connection will fail even if settings of PPTP settings are correct. Please contact your Internet service provider if you don’t know what you should fill in these fields.

**L2TP Settings**

User ID:  1

Password:  2

L2TP Gateway:  3

MTU:  (512<=MTU Value<=1492) 4

Connection Type:    5

Idle Time Out:  (1-1000 minutes) 6

7

---

*User Name (1): Please input user ID (user name) assigned by your Internet service provider here.*

*Password (2): Please input the password assigned by your Internet service provider here.*

*L2TP Gateway (3): Please input the IP address of PPTP gateway assigned by your Internet service provider here.*

*MTU (4): Please input the MTU value of your network connection here. If you don't know, you can use default value.*

*Connection Type (5): Please select the connection type of Internet connection you wish to use*

*Idle Time Out (6): Please input the idle time out of Internet connection you wish to use.*

When you finish with all settings, please click 'Continue' (7); if you want to go back to previous menu, click 'Back'.

## 2-3-6 Wireless Setup

### Wireless Settings

To create a custom name for your **home wireless connection**, enter it below (this will be the name that you will use when connecting wirelessly from your home/office computers):

SSID:

Please enter your SSID you wish for your wireless network

Default: Hawking\_300N

To add wireless security for your **local/home wireless network**, enter an alphanumerical password (8 characters or more) below (If you do not wish to use a password, leave the field blank and click 'Continue'). Users signing on to your home wireless network will be required to enter this password to connect to the internet:



Back

Continue

Enter a wireless security key. By default, this device uses WPA TKIP security. Please enter a key 8 characters or more or leave it blank if you do not wish to use any security. If you wish to use another type of security, skip this section and refer to Section 3-6-3.

Click 'Continue' to go on to the next step; if you want to go back to previous menu, click 'Back'.

## 2-3-7 Finishing Up

### Save and Restart

Select 'Back' to make changes or press 'Finish' to restart the system and have your new changes take effect.

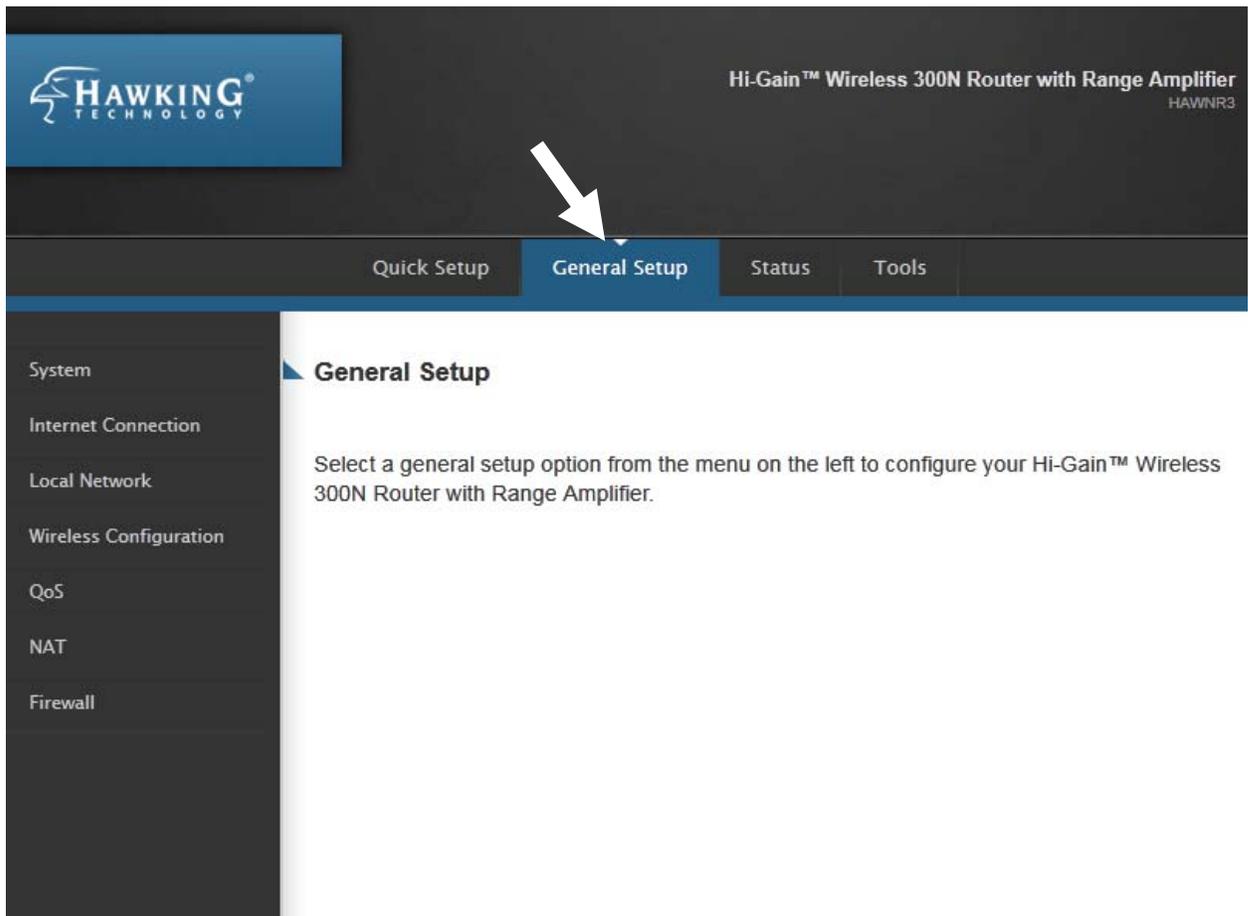


Click 'Finish' to reset the router and have it reboot; if you want to go back to previous menu, click 'Back'.

Congratulations! You have setup your HAWNR3.

## Chapter III General Setup

In this chapter, you'll know how to change the time zone, password, and remote management settings. Please start your web browser and log onto router web management interface, then click 'General Setup' tab.



### ***3-1 Time zone and time auto-synchronization***

Please follow the following instructions to set time zone and time auto-synchronization parameters:

Please click 'General Setup' at the top of web management interface, select 'System' on the left hand column, and select 'Time Zone'.

#### **Time Zone**

Set Time Zone:

(GMT- 8:00) Pacific Time (US & Canada): Tijuana ▼

Time Server Address:

192.43.244.18

Daylight Savings:

Enable Function

Times From Jan ▼ 1 ▼ to Jan ▼ 1 ▼

Back

Apply

The time zone settings will be displayed in your web browser: Please select the correct time zone from the drop-down list, and input the IP address or host name of the time server. If you want to enable daylight savings setting, please check 'Enable Function' box, and set the duration of daylight setting.

After you finish with all settings, please click 'Apply' button and the following message will be displayed on your web browser:

#### **Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Go Back

Apply

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

**NOTE: You can refer to the instructions given in the last chapter '2-3-1', for detailed descriptions on time zone settings.**

### 3-2 Change management password

Default password of this router is '1234', and it's displayed on the login prompt when accessed from the web browser. There's a security risk if you don't change the default password, since everyone can see it. This is very important when you have wireless function enabled.

To change password, please follow the instructions:

Please click 'General Setup' at top of web management interface, select 'System' tab on the left hand column, and then click 'Password Settings', and the following message will be displayed on your web browser:

#### Password Settings

You can change the password required while logging into the Hi-Gain™ Wireless 300N Router's web-based management system. By default, the password is 1234.

Passwords can contain 0 to 30 alphanumeric characters and are case sensitive.

Current Password:  1  
New Password:  2  
Confirm Password:  3

---

*Current*                      *Please input current password here.*

*Password (1):*

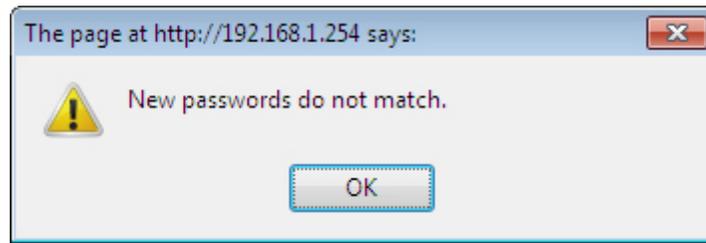
*New Password (2):*        *Please input new password here.*

*Confirm*                      *Please input new password here again.*

*Password (3):*

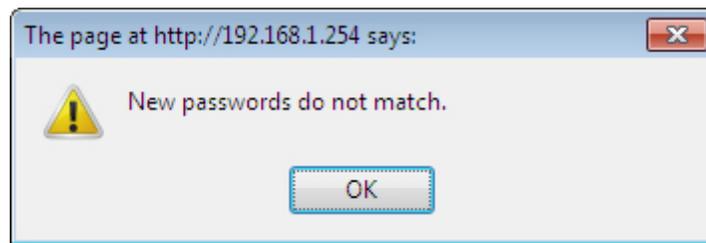
---

If the password you typed in 'New Password' (2) and 'Confirm Password' (3) field are not the same, you'll see the following message:



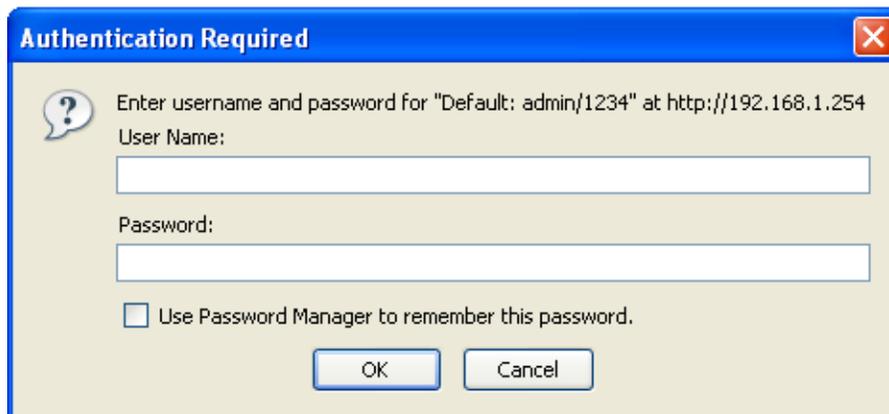
Please retype the new password again when you see above message.

If you see the following message:



It means the content in 'Current Password' field is wrong, please click 'OK' to go back to previous menu, and try to input current password again.

If the current and new passwords are correctly entered, after you click 'Apply', you'll be prompted to input your new password:



Please use new password to enter web management interface again, and you should be able to login with new password.

### 3-3 Remote Management

This router does not allow management access from Internet, to prevent possible security risks (especially when you defined a weak password, or didn't change default password). However, you can still manage this router from a specific IP address by enabling the 'Remote Management' Function.

Please click 'General Setup' tab at top of web management interface, then click 'Remote Management' on the left hand column, and the following message will be displayed on your web browser:

#### Remote Management

The remote management function allows you to designate a host over the Internet to have management/configuration access to the Hi-Gain™ 300N Router. Enter the designated host IP Address in the Host IP Address field.

Host Address	Port	Enable
<input type="text" value="0.0.0.0"/>	8080	<input type="checkbox"/>
1	2	3

4

---

*Host Address (1):*      *Input the IP address of the remote host you wish to initiate a management access.*

*Port (2):*              *You can define the port number this router should expect an incoming request. If you're providing a web service (default port number is 80), you should try to use other port number. You can use the default port setting '8080', or something like '32245' or '1429'. (Any integer between 1 and 65534)*

*Enabled (3):*              *Select the field to start the configuration.*

---

After you finish with all settings, please click 'Apply' (4) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Go Back

Apply

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

**NOTE: When you want to manage this router from another computer over the internet, you have to input the IP address and port number of this router. If your Internet service provider assigns you with a static IP address, it will not be a problem; but if the IP address your service provider assigns to you will vary every time you establish an internet connection, this will be a problem.**

**Please either ask your service provider to give you a static IP address, or use dynamic IP to host name mapping services like DDNS. Please refer to chapter 2-5-8 'DDNS client' for details.**

**NOTE: Default port number the web browser will use is '80'. If the 'Port' setting in this page is not '80', you have to assign the port number in the address bar of web browser manually. For example, if the IP address of this router is 1.2.3.4, and the port number you set is 8888, you have to input following address in the address bar of web browser:**

**http://1.2.3.4:8888**

### ***3-4 Setup Internet Connection (Setup)***

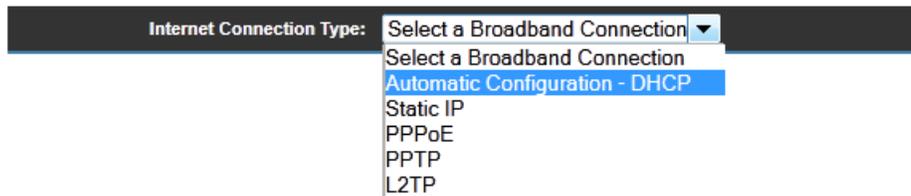
Internet connection setup can also be done by using ‘Quick Setup’ menu described in Chapter 2-3.

To start configuration, please follow the instructions:

Please click ‘General Setup’ tab at the top of the web management interface, and on the left hand column, click ‘Internet Connection’.

#### **Internet Connection**

Select your Broadband Internet connection type from the menu below to begin adjusting your configuration settings:



The image shows a screenshot of a web interface. On the left, there is a label 'Internet Connection Type:'. To its right is a dropdown menu. The dropdown menu is currently open, showing a list of options. The top option is 'Select a Broadband Connection' with a small downward arrow. Below it are five other options: 'Automatic Configuration - DHCP' (which is highlighted in blue), 'Static IP', 'PPPoE', 'PPTP', and 'L2TP'.

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| <b>Automatic Configuration (DHCP)</b> | <b>- Please go to section 3-4-1</b> |
| <b>Static IP</b>                      | <b>- Please go to section 3-4-2</b> |
| <b>PPPoE</b>                          | <b>- Please go to section 3-4-3</b> |
| <b>PPTP</b>                           | <b>- Please go to section 3-4-4</b> |
| <b>L2TP</b>                           | <b>- Please go to section 3-4-5</b> |

### 3-4-1 Setup procedure for ‘Cable Modem Setup (Dynamic IP)’:

#### Internet Connection

Internet Connection Type: Automatic Configuration - DHCP ▾

**DHCP Settings**

Host Name:  1

MAC Address: 000000000000 2

3

---

*Host Name (1): Please input host name of your computer, this is optional, and only required if your service provider asks you to do so.*

*MAC Address (2): Please input MAC address of your computer, if your service provider only permits computer with certain MAC address to access internet.*

*Clone MAC Address (3): If you're using the computer which used to connect to Internet via cable modem, you can simply press 'Clone MAC Address' button to fill the MAC address field with the MAC address of your computer*

---

After you finish with all settings, please click ‘Apply’ (4) button and the following message will be displayed on your web browser:

#### Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-4-2 Setup procedure for ‘DSL Modem (Static IP)’:

Internet Connection Type:

**Static IP Settings**

IP Address:  .  .  .  1

Subnet Mask:  .  .  .  2

Default Gateway:  .  .  .  3

DNS Address 1:  .  .  .  4

DNS Address 2:  .  .  .

---

*IP address (1): Please input IP address assigned by your service provider.*

*Subnet Mask (2): Please input subnet mask assigned by your service provider*

*Default Gateway (3): Please input the Default Gateway provided by your service provider*

*DNS Address (4): Please input the DNS server provided by your service provider.*

---

After you finish with all settings, please click ‘Apply’ (4) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-4-3 Setup procedure for ‘DSL (PPPoE)’:

Internet Connection Type: PPPoE

PPPoE Settings

User Name:  1

Password:  2

Service Name:  3

MTU:  (512<=MTU Value<=1492) 4

Connection Type:    5

Idle Time Out:  (1-1000 minutes) 6

7

- 
- User Name (1): Please input user name assigned by your Internet service provider here.*
- Password (2): Please input the password assigned by your Internet service provider here.*
- Service Name (3): Please give a name to this Internet service, this is optional*
- MTU (4): Please input the MTU value of your network connection here. If you don't know, you can use default value.*
- Connection Type (5): Please select the connection type of Internet connection you wish to use.*
- Continuous – The connection will be kept always on. If the connection is interrupted, the router will re-connect automatically.*
- Connect On-Demand – Only connect when you want to surf the*

*Internet. “Idle Time Out” is set to stop the connection when the network traffic is not sending or receiving after an idle time.*

*Manual – After you have selected this option, you will see the “Connect” button and “Disconnect” button, click “Connect” and the router will connect to the ISP. If you want to stop the connection, please click “Disconnect” button.*

*Idle Time Out (6): If you have selected the connection type to “Connect-On-Demand”, please input the idle time out.*

---

After you finish with all settings, please click ‘Apply’ (7) button and the following message will be displayed on your web browser:

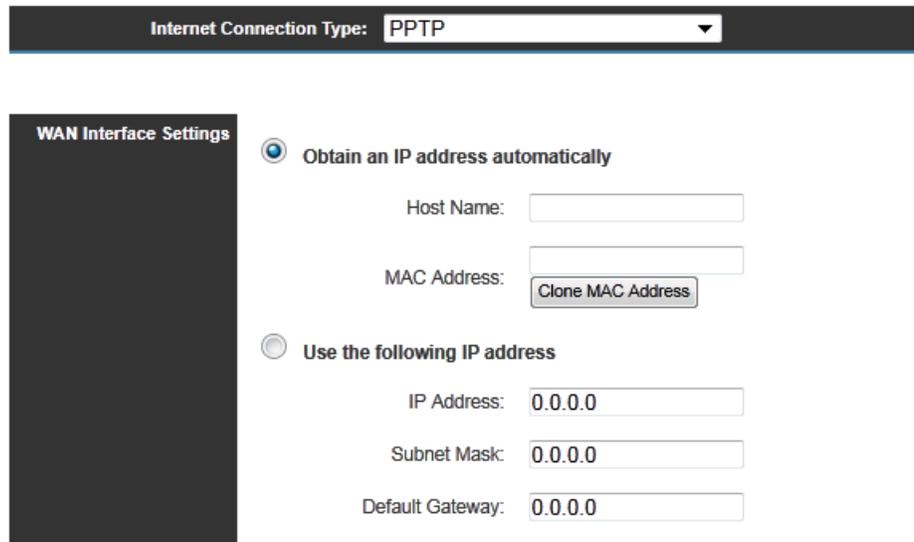
**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-4-4 Setup procedure for ‘PPTP’:

PPTP requires two kinds of setting: WAN interface setting (setup IP address) and PPTP setting (PPTP user name and password). Here we start from WAN interface setting:



The screenshot shows a configuration interface for a PPTP connection. At the top, there is a dark bar with the text "Internet Connection Type:" followed by a dropdown menu set to "PPTP". Below this, on the left, is a dark vertical sidebar with the text "WAN Interface Settings". The main area contains two radio button options. The first option, "Obtain an IP address automatically", is selected. It includes fields for "Host Name:" and "MAC Address:", with a "Clone MAC Address" button next to the MAC field. The second option, "Use the following IP address", is unselected and includes fields for "IP Address:", "Subnet Mask:", and "Default Gateway:", all of which are currently set to "0.0.0.0".

Select the type of how you obtain IP address from your service provider here. You can choose ‘Obtain an IP Address automatically’ (equal to DHCP, please refer to ‘Cable Modem’ section above), or ‘Use the following IP Address’ (i.e. static IP address)

WAN interface settings must be correctly set, or the Internet connection will fail even if settings of PPTP settings are correct. Please contact your Internet service provider if you don’t know what you should fill in these fields.

Now please go to PPTP settings section:

The image shows a 'PPTP Settings' dialog box with the following fields and controls:

- User ID:** Text input field (1)
- Password:** Password input field (2)
- PPTP Gateway:** Text input field containing '0.0.0.0' (3)
- Connection ID:** Text input field with '(Optional)' label (4)
- MTU:** Text input field containing '1392' with '(512<=MTU Value<=1492)' label (5)
- BEZEQ-ISRAEL:** Checkable option with label 'Enable (for BEZEQ network in ISRAEL use only)' (6)
- Connection Type:** Dropdown menu set to 'Continuous' with 'Connect' and 'Disconnect' buttons (7)
- Idle Time Out:** Text input field containing '10' with '(1-1000 minutes)' label (8)
- Buttons:** 'Cancel' and 'Apply' buttons (9)

- 
- User Name (1): Please input user ID (user name) assigned by your Internet service provider here.*
- Password (2): Please input the password assigned by your Internet service provider here.*
- PPTP Gateway (3): Please input the IP address of PPTP gateway assigned by your Internet service provider here.*
- Connection ID (4): Please input the connection ID here, this is optional and you can leave it blank.*
- MTU (5): Please input the MTU value of your network connection here. If you don't know, you can use default value.*
- BEZEQ-ISRAEL (6): If you are connecting to the BEZEQ network in Israel. Please enable this function.*
- Connection Type (7): Please select the connection type of Internet connection you wish to use, please refer to section 3-4-3 for detailed descriptions.*

*Idle Time Out (8): Please input the idle time out of Internet connection you wish to use, and refer to section 3-4-3 for detailed descriptions.*

---

Setting item 'BEZEQ-ISRAEL' is only required to check if you're using the service provided by BEZEQ network in Israel.

When you finish with all settings, please click 'Apply' (9); if you want to go back to previous menu, click 'Cancel'.

The following message will be displayed on your web browser:

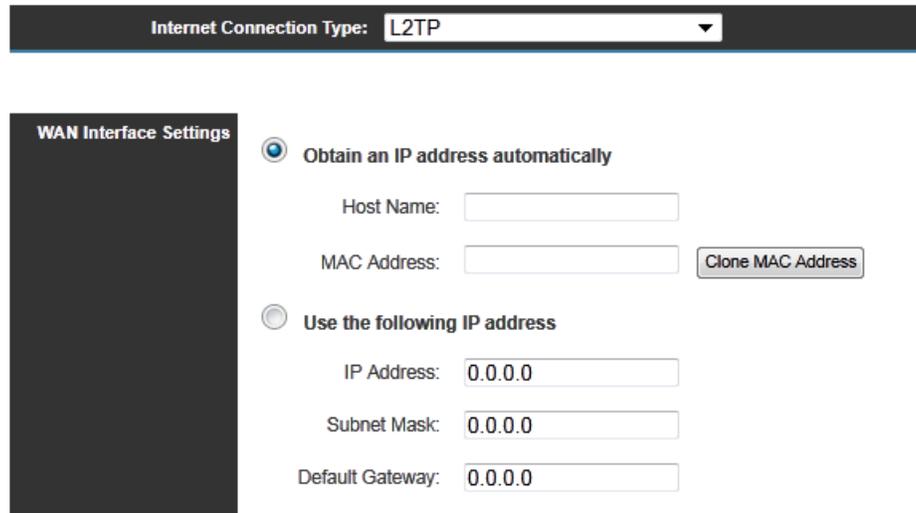
**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu; to continue on router setup, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-4-5 Setup procedure for ‘L2TP’:

L2TP requires two kinds of setting: WAN interface setting (setup IP address) and L2TP setting (L2TP user name and password). Here we start from WAN interface setting:

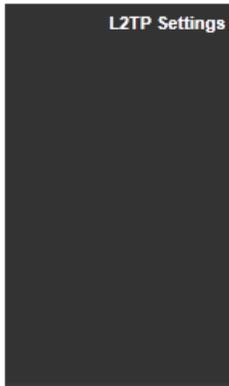


The screenshot shows a configuration interface for an L2TP connection. At the top, a dark bar contains the text "Internet Connection Type: L2TP" with a dropdown arrow. Below this, a dark sidebar on the left is labeled "WAN Interface Settings". The main content area has two radio button options. The first option, "Obtain an IP address automatically", is selected. It includes a "Host Name" input field, a "MAC Address" input field, and a "Clone MAC Address" button. The second option, "Use the following IP address", is unselected and includes three input fields: "IP Address" (0.0.0.0), "Subnet Mask" (0.0.0.0), and "Default Gateway" (0.0.0.0).

Select the type of how you obtain IP address from your service provider here. You can choose ‘Obtain an IP Address automatically’ (equal to DHCP, please refer to ‘Cable Modem’ section above), or ‘Use the following IP Address’ (i.e. static IP address)

WAN interface settings must be correctly set, or the Internet connection will fail even if settings of PPTP settings are correct. Please contact your Internet service provider if you don’t know what you should fill in these fields.

Now please go to L2TP settings section:



User ID:  1

Password:  2

L2TP Gateway:  3

MTU:  (512<=MTU Value<=1492) 4

Connection Type:    5

Idle Time Out:  (1-1000 minutes) 6

7

- 
- User Name (1): Please input user ID (user name) assigned by your Internet service provider here.*
- Password (2): Please input the password assigned by your Internet service provider here.*
- L2TP Gateway (3): Please input the IP address of PPTP gateway assigned by your Internet service provider here.*
- MTU (4): Please input the MTU value of your network connection here. If you don't know, you can use default value.*
- Connection Type (5): Please select the connection type of Internet connection you wish to use, please refer to section 2-5-3 for detailed descriptions.*
- Idle Time Out (6): Please input the idle time out of Internet connection you wish to use, and refer to section 2-5-3 for detailed descriptions.*
- 

When you finish with all settings, please click 'Apply' (7); if you want to go back to previous menu, click 'Cancel'.

The following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu; to continue on router setup, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-4-6 Setup procedure for 'DNS':

If you select 'Dynamic IP' or 'PPPoE' as Internet connection method, at least one DNS server's IP address should be assigned automatically. However, if you have preferred DNS server, or your service provider didn't assign the IP address of DNS server, you can input the IP address of DNS server here.

#### DNS

A Domain Name System (DNS) server is similar to an index of IP Addresses and Web Addresses. If you type a Web address into your browser, such as `www.broadbandrouter.com`, a DNS server will find that name in its index and find the matching IP address. Most Internet Service Providers (ISPs) provide a DNS server for speed and convenience. Since your ISP may connect you to the Internet through dynamic IP settings, it is likely that the DNS server IP Address is also provided dynamically. However, if there is a DNS server that you would rather use, you need to specify the IP Address of that DNS server. The primary DNS will be used for domain name access first, in case the primary DNS access failures, the secondary DNS will be used.

Primary DNS:  1

Secondary DNS:  2

Back

Apply 3

---

*Primary DNS (1): Please input the IP address of DNS server provided by your service provider.*

*Secondary DNS (2): Please input the secondary IP address of DNS server provided by your service provider.*

---

**NOTE: Only IP address can be entered here; DO NOT use the hostname of DNS server! (i.e. only numeric characters and dots are accepted)**  
**10.20.30.40..... Correct**  
**dns.serviceprovider.com..... Incorrect**

After you finish with all settings, please click 'Apply' (3) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### 3-4-7 Setup procedure for 'DDNS':

DDNS (Dynamic DNS) is an IP-to-Host name mapping service for those Internet users who don't have a static (fixed) IP address. It will be a problem when such users want to provide services to other users on the Internet, because their IP address will vary every time when connected to the Internet, and other user will not be able to know the IP address they're using at a certain time.

This router supports DDNS service of several service providers, for example:

DynDNS (<http://www.dyndns.org>)

TZO (<http://www.tzo.com>)

Please go to one of the DDNS service provider's web pages listed above, and get a free DDNS account by the instructions given on their webpage.

#### Dynamic DNS

DynamicDNS (DDNS) allows users to map the static domain name to a dynamic IP address. You must get an account, password and your static domain name from the DDNS service providers.

Dynamic DNS:  Enable  Disable <sup>1</sup>

Provider: 3322(qdns) ▾ <sup>2</sup>

Domain Name:  <sup>3</sup>

Account:  <sup>4</sup>

Password/Key:  <sup>5</sup>

Back

Apply <sup>6</sup>

---

*Dynamic DNS (1): If you want to enable DDNS function, please select 'Enabled'; otherwise please select 'Disabled'.*

*Provider (2): Select your DDNS service provider here.*

*Domain Name (3):      Input the domain name you've obtained from DDNS service provider.*

*Account /  
E-Mail (4):              Input account or email of DDNS registration.*

*Password / Key (5):      Input DDNS service password or key.*

---

After you finish with all settings, please click 'Apply' (6) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### ***3-5 Wired LAN Configuration***

Before all computers using wired Ethernet connection (i.e. those computers connected to this router's LAN port 1 to 4 by Ethernet cable) can communicate with each other and access Internet, they must have a valid IP address.

There are two ways to assign IP addresses to computers: static IP address (set the IP address for every computer manually), and dynamic IP address (IP address of computers will be assigned by router automatically). It's recommended for most computers to use dynamic IP address, it will save a lot of time on setting IP addresses for every computer, especially when there are a lot of computers in your network; for servers and network devices which will provide services to other computers and users that come from the Internet, a static IP address should be used.

***Suggestions on IP Address numbering plan:***

**If you have no idea on how to define an IP address plan for your network, here are some suggestions.**

- 1. A valid IP address has 4 fields: a.b.c.d, for most of home and company users, it's suggested to use 192.168.c.d, where c is an integer between 0 and 254, and d is an integer between 1 and 254. This router is capable to work with up to 253 clients, so you can set 'd' field of IP address of router as 1 or 254 (or any number between 1 and 254), and pick a number between 0 and 254 for field 'c'.**
- 2. In most cases, you should use '255.255.255.0' as subnet mask, which allows up to 253 clients (this also meets router's capability of working with up to 253 clients).**
- 3. For all servers and network devices which will provide services to other people (like Internet service, print service, and file service), they should use static IP address. Give each of them a unique number between 1 and 253, and maintain a list, so everyone can locate those servers easily.**
- 4. For computers which are not dedicated to provide specific service to others, they should use dynamic IP address.**

Please click 'General Setup' at the top of web management interface and click 'Local Network' on the left hand column.

There are three setup groups here: 'LAN IP', 'DHCP Server', and 'Static DHCP Leases Table'.

### 3-5-1 Local Network

LAN IP

IP Address:  1

Subnet Mask:  2

802.1d Spanning Tree:  3

DHCP Server:  4

---

*IP address (1): Please input the IP address of this router.*

*Subnet Mask (2): Please input subnet mask for this network.*

*802.1d Spanning Tree (3): If you wish to activate 802.1d spanning tree function, select 'Enabled' for setup item '802.1d Spanning Tree', or set it to 'Disabled'*

*DHCP Server (4): If you want to activate DHCP server function of this router, select 'Enabled', or set it to 'Disabled'.*

---

**Recommended Value if you don't know what to fill:**

IP Address: 192.168.1.254

802.1d Spanning Tree: Disabled

Subnet Mask: 255.255.255.0

DHCP Server: Enabled

### 3-5-2 DHCP Server:

DHCP Server

Lease Time: Forever ▾ 1

DHCP Client Start IP: 0.0.0.0 2

DHCP Client End IP: 0.0.0.0 3

Domain Name: 4

These settings are only available when 'DHCP Server' in 'LAN IP' section is 'Enabled'.

---

*Lease Time (1): Please choose a lease time (the duration that every computer can keep a specific IP address) of every IP address assigned by this router from dropdown menu.*

*Start IP (2): Please input the start IP address of the IP range.*

*End IP (3): Please input the end IP address of the IP range.*

*Domain Name (4): If you wish, you can also optionally input the domain name for your network. This is optional.*

---

**Recommended Value if you don't know what to fill:**

Lease Time: Two Weeks (or 'Forever', if you have less than 20 computers)  
Start IP: 192.168.1.100  
End IP: 192.168.1.200  
Domain Name: (leave it blank)

**NOTE:**

- 1. The number of the last field (mentioned 'd' field) of 'End IP' must be greater than 'Start IP', and can not be the same as router's IP address.**
- 2. The former three fields of IP address of 'Start IP', 'End IP', and 'IP Address of 'LAN IP' section (mentioned 'a', 'b', and 'c' field) should be the same.**
- 3. These settings will affect wireless clients too.**



### 3-5-3 Static DHCP Leases Table:

This function allows you to assign a static IP address to a specific computer forever, so you don't have to set the IP address for a computer, and still enjoy the benefit of using DHCP server. A maximum of 16 static IP addresses can be assigned here.

*(If you set 'Lease Time' to 'forever' in 'DHCP Server' section, you can also assign an IP address to a specific computer permanently, however, you will not be able to assign a certain IP address to a specific computer, since IP addresses will be assigned in random order by this way).*

Enable Static DHCP Leases 1

MAC Address	IP Address
0.0.0.0 2	0.0.0.0 3
<input type="button" value="Clear"/> <input type="button" value="Add"/> 4	

---

*Enable Static DHCP Leases (1):* Check this box to enable this function, otherwise uncheck it to disable this function.

*MAC Address (2):* Input the MAC address of the computer or network device (total 12 characters, with characters from 0 to 9, and from a to f, like '001122aabbcc')

*IP Address (3):* Input the IP address you want to assign to this computer or network device

*'Apply' (4):* After you inputted MAC address and IP address pair, click this button to add the pair to static DHCP leases table.

---

If you want to remove all characters you just entered, click 'Clear'.

After you clicked 'Add', the MAC address and IP address mapping will be added to 'Static DHCP Leases Table' section.

Static DHCP Lease Table - Up to 16 entries.

No.	MAC Address	IP Address	Select
			1

2      3      4

If you want to delete a specific item, please check the 'Select' box of a MAC address and IP address mapping (1), then click 'Delete Selected' button (2); if you want to delete all mappings, click 'Delete All' (3). If you want to deselect all mappings, click 'Reset' (4).

After you finish all LAN settings, please click 'Apply' button on the bottom of this page. After you click 'Apply', the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### ***3-6 Wireless Network***

If your computer, PDA, game console, or other network devices is equipped with a wireless network adapter, you can use the wireless function of this router to let them connect to the Internet and share resources with other computers.

Please click 'General Setup' tab at the top of web management interface, and then click 'Wireless Network' tab on the left hand column. The following message will be displayed on your web browser:

#### **Wireless**

The Hi-Gain™ Wireless 300N Router can be quickly configured as a wireless access point for roaming clients by setting the access identifier and channel number. It also supports data encryption and client filtering.

Wireless Module :  Enable  Disable

Click Enable/Disable to turn on/off the wireless feature.  
The default is 'Enable'.

#### **Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### 3-6-1 Basic Wireless Settings

Please click 'General Setup' menu at the top of web management interface, then click 'Wireless Configuration' on the left hand column. Choose 'Basic Settings'.

#### Basic Settings

The standard wireless operating mode is Wireless Access Point where users are allowed to log onto your network wirelessly. The SSID is the name used by others to identify your network.

Mode:  ▼

Band:  ▼ **1**

SSID:  **2**

Channel Number:  ▼ **3**

Associated Clients:  **4**

*Band (1):*

*Please select the radio band from one of following options:*

2.4 GHz (B)	2.4GHz band, only allows 802.11b wireless network clients to connect to this router (maximum transfer rate 11Mbps).
2.4 GHz (N)	2.4GHz band, only allows 802.11n wireless network clients to connect to this router (maximum transfer rate 300Mbps).
2.4 GHz (B+G)	2.4GHz band, only allows 802.11b and 802.11g wireless network clients to connect to this router (maximum transfer rate 11Mbps for 802.11b clients, and maximum 54Mbps for 802.11g clients).
2.4 GHz (G)	2.4GHz band, only allows 802.11g wireless network clients to connect to this router (maximum transfer rate 54Mbps).
2.4 GHz (B+G+N)	2.4GHz band, allows 802.11b, 802.11g, and 802.11n wireless network clients to connect to this router (maximum transfer rate 11Mbps for 802.11b clients, maximum 54Mbps for 802.11g

**NOTE: For 802.11b and 802.11g mode, the signals can be transmitted only by antenna 1 (The antenna on the right side of the rear panel).**

**For 802.11n mode: The router is operating in a 2T2R Spatial Multiplexing MIMO configuration. Two (2) antennas are for signal transmitting and two (2) antennas are for signal receiving.**

*ESSID (2): This is the name of wireless router. You can type any alphanumerical characters here, maximum 32 characters. ESSID is used to identify your own wireless router from others when there are other wireless routers in the same area. Default SSID is 'Hawking\_300N', it's recommended to change default ESSID value to the one which is meaningful to you, such as, 'myhome', 'office\_room1', etc.*

*Channel Number (3): Please select a channel from the dropdown list of 'Channel Number', available channel numbers are 1 to 13 for European countries, 1 to 11 for USA. You can choose any channel number you want to use, and almost all wireless clients can locate the channel you're using automatically without any problem. However, it's still useful to remember the channel number you use, as some wireless clients support manual channel number selecting, and this would help in certain scenarios when there are radio communication conflicts.*

*Associated Clients (4): Click 'Show Active Clients' button, then an "Active Wireless Client Table" will pop up. You can see the status of all active wireless stations that are connecting to the access point.*

---

After you finish these wireless settings, please click 'Apply' button, button, and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu; to continue on router setup, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

**NOTE: If you don't have special reason to limit the type of allowed wireless clients, it's recommended to choose '2.4 GHz (B+G+N) to maximize wireless client compatibility.**

**TIP: You can try to change channel number to another one if you think the data transfer rate is too slow. There could be some other wireless routers using the same channel, which will disturb the radio communication between wireless client and the wireless router.**

### 3-6-2 Advanced Wireless Settings

This router provides some advanced control of wireless parameters, if you want to configure these settings, please click ‘General Setup’ at the top of web management interface and click ‘Wireless Configuration’ on the left hand column. Choose “Advanced Settings”.

#### Advanced Settings

Advanced wireless settings for your Wireless Network.

Fragment Threshold:  (256 - 23456) 1  
RTS Threshold:  (0-2347) 2  
Beacon Interval:  (20-1000 ms) 3  
DTIM Period:  (0-2347) 4  
Data Rate:  5  
N Data Rate:  6  
Channel Width:  Auto 20/40 MHz  20 MHz 7  
Preamble Type:  Short Preamble  Long Preamble 8  
Broadcast ESSID:  Enable  Disable 9  
CTS Protect:  Auto  Always  None 10  
Transmit Power:  11  
WMM:  Enable  Disable 12

---

*Fragment Threshold(1): Set the Fragment threshold of wireless radio.*

***Do not modify the default value if you do not understand the function, default value is ‘2346’.***

*RTS Threshold(2):*

***Set the RTS threshold of wireless radio. Do not modify the default value if you do not understand the function, default value is ‘2347’.***

*Beacon Interval(3):*

***Set the beacon interval of wireless radio. Do not modify the default value if you do not understand the function, default***

*value is '100'.*

- DTIM Period(4): Set the DTIM period of wireless radio. **Do not modify the default value if you do not understand the function, default value is '3'.***
- Data Rate(5): Set the wireless data transfer rate to a certain value. Since most of wireless devices will negotiate with each other and pick a proper data transfer rate automatically. **It is not necessary to change this value unless you know what will happen after modification.***
- N Data Rate(6): Same as above, but only for 802.11n clients.*
- Channel Width(7): Set channel width of wireless radio. **Do not modify the default value if you do not understand the function, default setting is 'Auto 20/40 MHz'.***
- Preamble Type(8): Set the type of preamble, **do not modify the default value if you do not know what it is, default setting is 'Short Preamble'.***
- Broadcast ESSID(9): Decide if the wireless router will broadcast its own ESSID or not. You can hide the ESSID of your wireless router (set the option to 'Disable'), so only those people who know the ESSID of your wireless router can connect to the unit.*
- CTS Protect(10): Enabling this setting will reduce the chance of radio signal collisions between 802.11b and 802.11g/n wireless access points. It is recommended to set this option to 'Auto' or 'Always'. However, if you set to 'None', your wireless router should be able to function properly.*
- Transmit Power(11): You can set the output power of wireless radio. Unless you are using this wireless router in a large open space, you may not have to set output power to 100%. **This will enhance security (malicious / unauthorized users in distance will not be able to***

*reach your wireless router).*

*WMM(12): Wi-Fi MultiMedia (WMM) will enhance the data transfer performance of multimedia contents when they are being transferred over a wireless network. **If you do not understand the function, then it is safe to set this option to 'Enable', however, default value is 'Disable'.***

---

After you finish these wireless settings, please click 'Apply' button, button, and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu; to continue on router setup, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-6-3 Security Settings

***It is important to set your wireless security settings properly!*** If you do not configure a wireless security setting, unauthorized users can use your network and/or obtain valuable data without your consent.

To set wireless security settings, please click 'General Setup' tab at the top of web management interface, then click 'Wireless Configuration' on the left hand column. Choose 'Security Settings'.

Please select an encryption method from the 'Encryption' dropdown menu, there are four options:

<b>Disable</b>	<b>-Please go to section 3-6-3-1</b>
<b>WEP</b>	<b>-Please go to section 3-6-3-2</b>
<b>WPA</b>	<b>-Please go to section 3-6-3-3</b>
<b>WPA Radius</b>	<b>-Please go to section 3-6-3-4</b>

#### 3-6-3-1 Disable wireless security

When you select this mode, data encryption is disabled, and every wireless device in proximity will be able to connect your wireless router if no other security measure is enabled (like MAC address access control - see section 3-6-4, or disable SSID broadcast).



***Use this option only when you want to allow any user to use your wireless router, and you are not concerned about unauthorized access to your files and/or transfers over your network.***

#### 3-6-3-2 WEP - Wired Equivalent Privacy

When you select this mode, the wireless router will use WEP encryption,

and the following setup menu will be shown on your web browser:

Wireless Security WEP 1

Key Length: 64-bit 2

Key Format: HEX (10 Characters) 3

Default Transmit Key: Key 1 4

Encryption Key 1: \*\*\*\*\* 5

Encryption Key 2: \*\*\*\*\* 6

Encryption Key 3: \*\*\*\*\* 7

Encryption Key 4: \*\*\*\*\* 8

9  Enable 802.1x Authentication

RADIUS Server IP Address: \_\_\_\_\_ 10

RADIUS Server Port: 1812 11

RADIUS Server Password: \_\_\_\_\_ 12

Cancel Apply 13

*Key Length (2): There are two types of WEP key length: 64-bit and 128-bit. Using '128-bit' is safer than '64-bit', but will reduce some data transfer performance.*

*Key Format (3): There are two types of key format: ASCII and Hex. When you select a key format, the number of characters of key will be displayed. For example, if you select '64-bit' as key length, and 'Hex' as key format, you'll see the message at the right of 'Key Format' is 'Hex (10 characters)', which means the length of WEP key is 10 characters.*

*Default Tx Key (4): You can set up to four sets of WEP key, and you can decide which key is being used by default here. **If you don't know which one you should use, select 'Key 1'.***

*Encryption Key 1 to 4 (5-8): Input WEP key characters here, the number of characters must be the same as the number displayed at 'Key Format' field. You can use any alphanumeric characters (0-9, a-z, and A-Z) if you select 'ASCII' key format, and if you select*

*'Hex' as key format, you can use characters 0-9, a-f, and A-F. You must enter at least one encryption key here, and if you entered multiple WEP keys, they should not be same with each other.*

*Enable 802.1x Authentication (9):*

*IEEE 802.1x is an authentication protocol. Every user must use a valid account to login to this wireless router before accessing the wireless LAN. The authentication is processed by a RADIUS server. This mode only authenticates user by IEEE 802.1x, but it does not encryption the data during communication. If there is a RADIUS server in you environment, please enable this function. Check this box and another sub-menu will appear:*

*RADIUS Server IP address (10):*

*Please input the IP address of RADIUS server here.*

*RADIUS Server Port (11):*

*Please input the port number of RADIUS server here.*

*RADIUS Server Password (12):*

*Please input the password here.*

---

**TIPS: Examples of WEP key**

ASCII (5 characters): pilot phone 23561 2Hyux #@xmL

ASCII (13 characters): digitalFAMILY 82Jh26xHy3m&n

Hex (10 characters): 287d2aa732 1152dabc85

Hex (26 characters): 9284bcda8427c9e036f7abcd84

**To improve security level, do not use words that can be found in a dictionary or are easy to remember! Wireless clients will automatically remember the WEP key, so you only have to input the WEP key on wireless client once, and it is suggested that to use a complex WEP key to improve security level. Once you have chosen a password, write it down and keep it in a secure place.**

After you finish WEP setting, please click 'Apply' (13) button and the

following message will be displayed on your web browser:

### Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.



Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-6-3-3 Wi-Fi Protected Access (WPA):

When you select this mode, the wireless router will use WPA encryption, and the following setup menu will be shown on your web browser:

A screenshot of a web browser configuration page for 'Wireless Security'. The page title is 'WPA Pre-Shared Key'. There are three radio buttons for 'WPA Unicast Cipher Suite': 'WPA(TKIP)', 'WPA(AES)', and 'WPA2(Mixed)'. A dropdown menu for 'Pre-shared Key Format' is set to 'Passphrase'. Below it is a text input field for 'Pre-shared Key'. At the bottom right are 'Cancel' and 'Apply' buttons. Numbers 1 through 5 are placed next to the title, radio buttons, dropdown, input field, and Apply button respectively.

- 
- |                                      |   |
|--------------------------------------|---|
| <i>WPA Unicast Cipher Suite (2):</i> | <i>Please select a type of WPA cipher suite. Available options are: WPA (TKIP), WPA2 (AES), and WPA2 Mixed. You can select one of them, but you have to make sure your wireless client support the cipher you selected.</i> |
| <i>Pre-shared Key Format (3):</i>    | <i>Select the type of pre-shared key, you can select Passphrase (8 or more alphanumeric characters, up to 63), or Hex (64 characters of 0-9, and a-f).</i>  |
| <i>Pre-shared Key (4):</i>           | <i>Please input the WPA passphrase here. It's not recommended to use a word that can be found in a</i>  |

*dictionary due to security reason.*

---

After you finish WPA Pre-shared key setting, please click ‘Apply’ button (5) and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

**NOTE: Some wireless clients (especially those manufactured before year 2003) only support WEP or WPA (TKIP) cipher. A driver upgrade would be needed for those clients to use WPA and WPA2 encryption.**

### 3-6-3-4 WPA RADIUS:

If you have a RADIUS server, this router can work with it and provide safer wireless authentication.

Wireless Security WPA Radius

WPA Unicast Cipher Suite:  WPA(TKIP)  WPA(AES)  WPA2(Mixed)

RADIUS Server IP Address:  3

RADIUS Server Port:  4

RADIUS Server Password:  5

6

---

WPA Unicast

*Please select a type of WPA cipher suite.*

*Cipher Suite:* Available options are: WPA (TKIP), WPA2 (AES), and WPA2 Mixed. You can select one of them, but you have to make sure your wireless client support the cipher you selected.

*RADIUS Server IP address (3):* Please input the IP address of your Radius authentication server here.

*RADIUS Server Port (4):* Please input the port number of your Radius authentication server here.  
**Default setting is 1812.**

*RADIUS Server Password (5):* Please input the password of your Radius authentication server here.

---

After you finish with all settings, please click ‘Apply’ (6) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### 3-6-4 Wireless Access Control

This function will help you prevent unauthorized users from connecting to your wireless router; only those wireless devices who have a MAC address you assigned can gain access to your wireless router. Use this function with other security measures described in previous section, to create a safer wireless environment.

You can add up to 20 MAC addresses by using this function. Please click 'General Setup' at the top of web management interface and click 'Wireless Configuration' on the left hand column. Select 'Access Control'.

**Access Control**

For additional security, the Hi-Gain™ Wireless 300N Router features MAC Address Filtering that only allows authorized MAC Addresses to connect through the Repeater.

1  Enable Access Control

MAC Address	Comment
2 0.0.0.0	3

5 Clear Add 4

**MAC Address Filtering Table - up to 20 entries.**

No.	MAC Address	Comment	Select
-----	-------------	---------	--------

6 Delete Delete All 7

Cancel Apply 8

All allowed MAC addresses will be displayed in 'MAC Address Filtering Table.'

---

*Enable Wireless*

*To enforce MAC address filtering, you have to check*

*Access Control (1): 'Enable Wireless Access Control'. When this item is unchecked, wireless router will not enforce MAC address filtering of wireless clients.*

*MAC Address (2): Input the MAC address of your wireless devices here, dash ( - ) or colon ( : ) are not required. (i.e. If the MAC address label of your wireless device indicates 'aa-bb-cc-dd-ee-ff' or 'aa:bb:cc:dd:ee:ff', just input 'aabbccddeeff'.*

*Comment (3): You can input any text here as the comment of this MAC address, like 'ROOM 2A Computer' or anything. You can input up to 16 alphanumerical characters here. This is optional and you can leave it blank, however, it's recommended to use this field to write a comment for every MAC addresses as a memory aid.*

*Add (4): Click 'Apply' button to add the MAC address and associated comment to the MAC address filtering table.*

*Clear (5): Click 'Clear' to remove the value you inputted in MAC address and comment field.*

*Delete Selected (6): If you want to delete a specific MAC address entry, check the 'select' box of the MAC address you want to delete, then click 'Delete Selected' button. (You can select more than one MAC addresses).*

*Delete All (7): If you want to delete all MAC addresses listed here, please click 'Delete All' button.*

---

After you finish with all settings, please click 'Apply' (8) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### **3-6-5 Wi-Fi Protected Setup (WPS)**

Wi-Fi Protected Setup (WPS) is the simplest way to build connection between wireless network clients and this wireless router. You don't have to select an encryption mode and input a long encryption passphrase every time when you need to set up a wireless client, you only have to press a button on the wireless client and this wireless router, and the WPS will automatically configure for you.

This wireless router supports two types of WPS: Push-Button Configuration (PBC), and PIN code. If you want to use PBC, you have to push a specific button on the wireless client to start WPS mode, and switch this wireless router to WPS mode too. You can push Reset/WPS button of this wireless router, or click 'Start PBC' button in the web configuration interface to do this; if you want to use PIN code, you have to know the PIN code of wireless client and switch it to WPS mode, then provide the PIN code of the wireless client you wish to connect to this wireless router. The detailed instructions are listed follow:

Please click 'General Setup' at the top of web management interface and click 'Wireless Configuration' on the left hand column. Select 'WPS'

## Wi-Fi Protected Setup (WPS)

This section allows you to change the setting for Wi-Fi Protected Setup (WPS). Wi-Fi Protected Setup can help your wireless client automatically connect to the Hi-Gain™ Wireless 300N Router.

1  Enable WPS

**WPS Information**

WPS Status: Unconfigured  
PinCode Self: 0  
SSID: default  
Authentication Mode: Disable  
Paraphrase Key:

2

**Device Configure**

Config Mode:  3

Configure by Push Button:  4

Configure by Client PinCode:   5

---

*Enable WPS (1)*      *Check this box to enable WPS function, uncheck it to disable WPS.*

*WPS Information (2)*      *WPS Status: If the wireless security (encryption) function of this wireless router is properly set, you'll see 'Configured' message here. If wireless security function has not been set, you'll see 'Not configured'.*

*Self PIN code: This is the WPS PIN code of this wireless router. This code is useful when you need to build wireless connection by WPS with other WPS-enabled wireless devices.*

*SSID: The SSID of this wireless router will be displayed here.*

*Authentication Mode: The wireless security authentication mode of this wireless router will be displayed here. If you do not*

*enable security function of the wireless router before WPS is activated, the router will auto set the security to WPA (AES) and generate a set passphrase key for WPS connection.*

*Passphrase Key: The wireless security key of the router will be displayed here.*

*Config Mode (3)*

*There are 'Registrar' and 'Enrollee' modes for the WPS connection. When 'Registrar' is enabled, the wireless clients will follow the router's wireless settings for WPS connection. When 'Enrollee' mode is enabled, the router will follow the wireless settings of wireless client for WPS connection.*

*Configure  
by Push Button (4)*

*Click 'Start PBC' to start Push-Button style WPS setup procedure. This wireless router will wait for WPS requests from wireless clients for 2 minutes. The 'WLAN' LED light on the wireless router will be steady for 2 minutes when this wireless router is waiting for incoming WPS request.*

*Configure  
by client  
PinCode (5)*

*Please input the PIN code of the wireless client you wish to connect, and click 'Start PIN' button.  
The 'WLAN' LED light on the wireless router will be steady when this wireless router is waiting for incoming WPS request.*

---

### **3-6-6 Security Tips for Wireless Network**

Here are some quick tips to help you improve the security level of your wireless network:

1. Never use simple words for your password, such as “password” or “1234567890”.
2. A complicated (combination of numbers, alphabets, and even symbols) WEP key and WPA passphrase is more secure than simple and short words. Remember that the wireless client is capable of keeping the key or passphrase for you, so you only have to input the complicated key or passphrase once. Once you have chosen a password, write it down and keep it in a secure place.
3. You can hide the ESSID of this router by setting the ‘Broadcast ESSID’ option to ‘Disable’. Your wireless router will not be found by other people in proximity if they are using the Access Point scanning function of their wireless client, and this can reduce unauthorized access.
4. Use ‘Access Control’ function, described in section 3-6-4, to allow authorized users access to the wireless router using their specific MAC address.

## **Chapter IV Advanced Functions**

### ***4-1 Quality of Service (QoS)***

Quality of Service provides an efficient way for computers on the network to share Internet bandwidth with a promised quality of Internet service.

Without QoS, all computers and devices on the network will compete with each other to receive Internet bandwidth, and some applications which require guaranteed bandwidth (ie. video streaming and network telephone) will be affected, therefore an unpleasing result will occur, such as, the interruption of video / audio transfer.

With this function, you can limit the maximum bandwidth or give a guaranteed bandwidth for a specific computer, to avoid unstable bandwidth results.

## 4-1-1 Basic QoS Settings

Please follow the following instructions to set QoS parameters:

Please click 'General Setup' at the top of web management interface and click 'QoS' on the left hand column.

### Quality of Service (QoS)

Quality of Service (QoS) refers to the capability of a network to provide better service to selected network traffic. The primary goal of QoS is to provide priority including dedicated bandwidth, controlled jitter and latency (required by some real-time and interactive traffic), and improved loss characteristics. Also important is making sure that providing priority for one or more flows does not make other flows fail.

1  Enable QoS

Total Download Bandwidth : ---Select--- >> 0 kbits 2

Total Upload Bandwidth: ---Select--- >> 0 kbits 3

Current QoS Table				
Priority	Rule Name	Upload Bandwidth	Download Bandwidth	Select
4				<input type="button" value="Add"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Delete All"/> <input type="button" value="Move Up"/> <input type="button" value="Move Down"/>
		5	6	7
			8	9
				10
				11 <input type="button" value="Apply"/> <input type="button" value="Cancel"/>

---

*Enable QoS (1):* Check this box to enable QoS function, unselect this box if you do not want to enforce QoS bandwidth limitations.

*Total Download Bandwidth (2):* You can set the limit of total download bandwidth in kbits. To disable download bandwidth limitation, input '0' here.

*Total Upload* You can set the limit of total upload bandwidth in kbits

<i>bandwidth (3):</i>	<i>To disable upload bandwidth limitation, input '0' here.</i>
<i>Current QoS Table (4):</i>	<i>All existing QoS rules will be displayed here.</i>
<i>Add (5):</i>	<i>Click 'add' button to add a new QoS rule, see section 4-1-2 'Add a new QoS rule' below.</i>
<i>Edit (6):</i>	<i>If you want to modify the content of a specific rule, please check the 'select' box of the rule you want to edit, then click 'Edit' button. <b>Only one rule should be selected a time!</b> If you didn't select a rule before clicking 'Edit' button, you'll be prompted to add a new rule.</i>
<i>Delete Selected (7):</i>	<i>You can delete selected rules by clicking this button. You can select one or more rules to delete by check the 'select' the box of the rule(s) you want to delete a time. <b>If the QoS table is empty, this button will be grayed out and cannot be clicked.</b></i>
<i>Delete All (8):</i>	<i>By clicking this button, you can delete all rules currently in the QoS table. <b>If the QoS table is empty, this button will be grayed out and cannot be clicked.</b></i>
<i>Move Up (9):</i>	<i>You can pull up the priority of the QoS rule you selected by clicking this button.</i>
<i>Move Down (10):</i>	<i>You can lower the priority of the QoS rule you selected by clicking this button.</i>

---

After you finish with all settings, please click 'Apply' (11) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

## 4-1-2 Add a New QoS Rule

After you click 'Add' button in QoS menu, the following message will appear:

Rule Name :  1

Bandwidth :   Kbps  2

Local IP Address :  -  3

Local Port Range :  4

Remote IP Address :  -  5

Remote Port Range :  6

Traffic Type :  7

Protocol :  8

9

---

*Rule Name (1): Please give a name to this QoS rule (enter up to 15 alphanumerical characters)*

*Bandwidth (2): Set the bandwidth limitation of this QoS rule. You have to select the data direction of this rule (Upload of Download), and the speed of bandwidth limitation in Kbps, then select the type of QoS: 'guarantee' (guaranteed usable bandwidth for this rule) or 'max' (set the maximum bandwidth for the application allowed by this rule).*

*Local IP Address (3): Specify the local (source) IP address that will be affected by this rule. Please input the starting IP address in the left field, and input the end IP address in the right field to define a range of IP addresses, or just input the IP address in the left field to define a single IP address.*

*Local Port Range (4):* Please input the range of local (source) port number that will be affected by this rule. If you want to apply this rule on port 80 to 90, please input '80-90'; if you want to apply this rule on a single port, input the port number, such as '80'.

*Remote IP Address: (5):* Specify the remote (destination) IP address that will be affected by this rule. Please input the starting IP address in the left field, and input the end IP address in the right field to define a range of IP addresses, or input the IP address in the left field to define a single IP address.

*Remote Port Range (6):* Please input the range of remote (destination) port number that will be affected by this rule. If you want to apply this rule on port 80 to 90, please input '80-90'. if you want to apply this rule on a single port, input the port number, such as '80'. If the remote (destination) IP address and/or port number is universal, leave the field blank.

*Traffic Type (7):* Please select the traffic type of this rule, available options are None, SMTP, HTTP, POP3, and FTP. You can select a specific traffic type for this rule, if you want to make this rule as a IP address based rule (apply the limitation on all traffics from / to the specified IP address / port number), select 'None'.

*Protocol (8):* Please select the protocol type of this rule, the available options are TCP and UDP. If you do not know what protocol your application uses, please try 'TCP' first, and switch to 'UDP' if this rule does not work.

---

After you finish with all settings, please click 'save' button (9), you'll be brought back to previous menu, and the rule you set will appear in the current QoS table.

If your action is incomplete, you will be prompted with an error message when you click 'Save' button, please correct your input by the instructions given by the error message.

If you want to erase all values you entered, click the 'Reset' button.

## ***4-2 Network Address Translation (NAT)***

Network Address Translations (NAT) solves the problem of sharing a single IP address to multiple computers. Without NAT, all computers must be assigned with a valid Internet IP address to get connected to Internet, but Internet service providers only provide very few IP addresses to every user. Therefore it's necessary to use NAT technology to share a single Internet IP address to multiple computers on local network, so everyone can connect to the Internet.

Note: Disabling NAT will disable the routing function of the router and will not allow you to share internet with multiple computers.

#### 4-2-1 Basic NAT Settings (Enable or disable NAT function)

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column.

##### Network Address Translation (NAT)

Network Address Translation (NAT) allows multiple users at your local site to access the Internet through a single Public IP Address or multiple Public IP Addresses. NAT provides firewall protection from unauthorized access, and has the flexibility to allow you to map Private IP Addresses to Public IP Addresses for key services, such as the Web or FTP.

NAT Module:  Enable  Disable 1

2

To enable NAT function, please select 'Enable' for 'Enable NAT module function' (1); to disable, please select 'Disable'.

After you made the selection, please click 'Apply' button (2) and the following message will be displayed on your web browser:

##### Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

## 4-2-2 Port Forwarding

If you enable Network Address Translation (NAT), the Port Forwarding section will be available for configuration.

This function allows you to redirect a single port or consecutive ports of Internet IP address to the same port of the IP address on local network. The port number(s) of Internet IP address and private IP address (the IP address on local network) must be the same. If the port number of Internet IP address and private IP address is different, please use 'Virtual Server' function, described in next section.

12

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column. Choose 'Static Router'.

The screenshot shows a web management interface for port forwarding configuration. It includes a checkbox to enable port forwarding, a form for adding a new rule with fields for Private IP, Computer Name, Type, Port Range, and a Select dropdown, and a table for the current port forwarding rules. The interface also features buttons for Reset, Add, Delete, Delete All, and Cancel.

1  Enable Port Forwarding

Private IP	Computer Name	Type	Port Range	Select
3	--- Select --- 4	Both 5	-	6

7

Current Port Forwarding Table

No.	Computer Name	Private IP	Type	Port Range	Comment	Select
-----	---------------	------------	------	------------	---------	--------

10

11  13

14

*Enable Port Forwarding (1):*

*Check this box to enable port mapping, and uncheck this box to disable port mapping.*

- Private IP (2): Input the IP address of the computer on local network which provides internet service.*
- Computer Name (3): Pull down the menu and all the computers connected to the router will be listed here. You can easily to select the computer name without checking the IP address of the computer.*
- Type (4): Select the type of connection, TCP or UDP. If you are not sure, please select 'Both'.*
- Port Range (5): Input the starting port number in the left field, and input the ending port number in the right field. If you only want to redirect a single port number, just fill the port number in the left field.*
- Comment (6): Please input any text to describe this mapping, up to 16 alphanumerical characters.*
- Add (7): Add the mapping to port forwarding table.*
- Reset (8): Remove all inputted values.*
- Port Forwarding Table (9): All existing port forwarding mappings will be displayed here.*
- Delete Selected (10): Please select a port forwarding mapping by clicking the 'Select' box of the mapping, then click 'Delete Selected' button to remove the mapping. If there's no existing mapping, this button will be grayed out.*
- Delete (11): Delete selected existing mapping in virtual server table.*
- Delete All (12): Delete all mappings existed in virtual server table.*
- Reset (13): Unselect all mappings.*
- 

Click 'Cancel' (14), if you do not want to make any changes.

After you finish with all settings, please click 'Apply' (15) button and the

following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### 4-2-3 Virtual Server

This function allows you to redirect a port on Internet IP address (on WAN port) to a specified port of an IP address on the local network. This allows you to setup an Internet service on the computer on the local network, without exposing it on the Internet directly. You can also build many sets of port redirection to provide many different Internet services on different local computers via a single Internet IP address.

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column. Choose 'Virtual Server'.

The screenshot shows the 'Virtual Server' configuration page. At the top, there is a checkbox labeled 'Enable Virtual Server' with a checkmark, indicated by callout 1. Below this is a table for adding new virtual servers. The table has columns: Private IP, Computer Name, Private Port, Type, Public Port, and Comment. Callout 2 points to the Private IP input field. Callout 3 points to the Computer Name dropdown menu. Callout 4 points to the Private Port input field. Callout 5 points to the Type dropdown menu (set to 'Both'). Callout 6 points to the Public Port input field. Callout 7 points to the Comment input field. Below the table are 'Reset' and 'Add' buttons, with callouts 8 and 9 respectively. Below the table is a section titled 'Current Virtual Server Table' with a table containing one row with the number '10' in the 'No.' column. Callout 10 points to this row. Below this table are 'Delete', 'Delete All', and 'Reset' buttons, with callouts 11, 12, and 13 respectively. At the bottom are 'Cancel' and 'Apply' buttons, with callout 14 pointing to the 'Apply' button.

*Enable Virtual Server (1):* Check this box to enable virtual server, and uncheck this box to disable virtual server.

*Private IP (2):* Input the IP address of the computer which provides Internet service.

*Computer Name (3):* Pull down the menu and all the computers connected to the

*router will be listed here. You can easily to select the computer name without checking the IP address of the computer.*

*Private Port (4): Input the port number of the IP address which provides Internet service.*

*Type (5): Select the type of connection, TCP or UDP. If you're not sure, please select 'Both'.*

*Public Port (6): Please select the port number of Internet IP address which will be redirected to the port number of local IP address defined above.*

*Comment (7): Please input any text to describe this mapping, up to 16 alphanumerical characters.*

*Add (8): Add the mapping to virtual server table.*

*Reset (9): Remove all inputted values.*

*Virtual Server Table (10): All existing virtual server mappings will be displayed here.*

*Delete Selected (11): Please select a virtual server mapping by clicking the 'Select' box of the mapping, then click 'Delete Selected' button to remove the mapping. If there's no existing mapping, this button will be grayed out.*

*Delete All (12): Delete all mappings existed in virtual server table.*

*Reset (13): Unselect all mappings.*

---

After you finish with all settings, please click 'Apply' (14) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Continue' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

If you want to reset all settings in this page back to previously saved value, please click 'Cancel' button.

## 4-2-4 Port Mapping for Special Applications

Some applications require more than one connection at a time; these applications won't work with simple NAT rules. In order to make these applications work, you can use this function to let these applications work.

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column. Choose 'Special Applications'.

1  Enable Special Applications

IP Address	Computer Name	TCP Port to Open	UDP Port to Open	Comment
2 0.0.0.0	3 --- Select ---	4	5	6

Popular Applications: Select Game Add 7

9 Reset Add 8

**Current Trigger-Port Table**

No.	Computer Name	IP Address	TCP Port to Open	UDP Port to Open	Public Port	Comment	Select
10							

11 Delete 12 Delete All 13 Reset

Cancel Apply 14

---

*Enable (1):* Check this box to enable special applications and uncheck this box to disable virtual server.

*Private IP (2):* Input the IP address of the computer which you want to open the ports.

*Computer Name (3):* Pull down the menu and all the computers connected to the router will be listed here. You can easily to select the computer name without checking the IP address of the computer.

*TCP Port to Open (4): This is the out going (Outbound) range of TCP port numbers for this particular application.*

*UDP Port to Open (5): This is the out going (Outbound) range of UDP port numbers for this particular application.*

*Comment (6): The description of this setting.*

*Pop. Applications: (7): This section lists the more popular applications that require multiple connections. Select an application from the Popular Applications selection and click 'Add' to save the setting to 'Current Trigger-Port Table.'*

*Add (8): Add the setting to the 'Current Trigger-Port Table.'*

*Reset (9): Click 'Reset' will clear all above setting and you can set up again.*

*Current Trigger-Port (10): All the settings for the special applications will be listed here. If you want to remove some Special Application settings from the " Current Trigger-Port Table", select the Special Application settings you want to remove in the table and then click "Delete Selected". If you want remove all Special Application settings from the table, just click "Delete All" button. Click "Reset" will clear your current selections.*

*Delete Selected (11): Please select a special application by clicking the 'Select' box of the mapping, then click 'Delete Selected' button to remove the setting. If there's no setting here, this button will be grayed out.*

*Delete All (12): Delete all settings existed in trigger port table.*

*Reset (13): Unselect all settings.*

---

Note: Only one LAN client can use a particular special application at a time.

After you finish with all the settings, please click ‘Apply’ (14) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

## 4-2-5 UPnP Setting

This function enables network auto-configuration for peer-to-peer communications, with this function, network devices will be able to communicate with other devices directly, and learn about information about other devices. Many network device and applications rely on UPnP function nowadays.

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column. Choose 'UPnP Settings'.

### UPnP Settings

UPnP is more than just a simple extension of the Plug and Play peripheral model. It is designed to support zero-configuration, "invisible" networking, and automatic discovery for a breadth of device categories from a wide range of vendors. With UPnP, a device can dynamically join a network, obtain an IP address, convey its capabilities, and learn about the presence and capabilities of other devices—all automatically; truly enabling zero configuration networks. Devices can subsequently communicate with each other directly; thereby further enabling peer to peer networking.

Note: This service may not function properly if your Router is behind another firewall.

UPnP Module:  Enable  Disable

Cancel

Apply

There is only one option in this page, please select 'Enable' or 'Disable' to enable or disable UPnP function, then click 'Apply' button, and the following message will be displayed on your web browser:

### Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Go Back

Apply

Please click 'Continue' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

## 4-2-6 ALG Settings

Application Layer Gateway (ALG) is a special function of this router. It includes many preset routing rules for numerous applications which require special support. With these supports, those applications which required special support will be able to work with NAT architecture.

Please click 'General Setup' at the top of web management interface and click 'NAT' on the left hand column. Choose 'ALG' tab.

Enable	Name	Comment
<input type="checkbox"/>	Amanda	Support for Amanda backup tool protocol.
<input type="checkbox"/>	Egg	Support for eggdrop bot networks.
<input type="checkbox"/>	FTP	Support for FTP.
<input type="checkbox"/>	H323	Support for H323/netmeeting.
<input type="checkbox"/>	IRC	Allows DCC to work though NAT and connection tracking.
<input type="checkbox"/>	Quake3	Support for Quake III Arena connection tracking and nat.
<input type="checkbox"/>	Talk	Allows netfilter to track talk connections.
<input type="checkbox"/>	TFTP	Support for IPsec pass through.
<input type="checkbox"/>	Amanda	Support for Amanda backup tool protocol.
<input type="checkbox"/>	StarCraft	Support for StarCraft/Battle.net game protocol.
<input type="checkbox"/>	MSN	Support for MSN file transfer.
<input type="checkbox"/>	PPTP Pass Through	Support for PPTP pass through.

Reset

Apply

There are many applications listed here. Please check the box of the special support for applications you need, and then click 'Apply' button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

### ***4-3 Firewall***

Besides NAT, this router also provides firewall function to block malicious intruders from accessing your computers on local network. These functions include inbound attack prevention, and block outbound traffics, like block URLs which have pre-defined keywords.

Please follow instructions to enable or disable firewall function:

Please click 'General Setup' at the top of web management interface and click 'Firewall' on the left hand column.

Note: the other Firewall features will not be enabled until you choose 'Enable'.

#### **Firewall**

The Hi-Gain™ Wireless 300N Router provides extensive firewall protection by restricting connection parameters, thus limiting the risk of unauthorized access, and defending against a wide array of common attacks. Most wireless Internet connections will have a pre-existing firewall enabled. If you wish to configure your own firewall settings, click enable below.

Firewall Module:  Enable  Disable

Apply

Please select 'Enable' or 'Disable' to enable or disable firewall function of this router.

Note: the other Firewall features will not be enabled until you choose 'Enable'.

Click 'Apply' button, and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### 4-3-1 Access Control

This function allows or denies computers with specific MAC address from connecting to the network; it can also allow or deny computers with specific IP address, protocol, or port.

Please click 'General Setup' at the top of web management interface and click 'Firewall' on the left hand column. Choose 'Access Control'.

1  Enable Access Control

2

MAC Address	Comment
<input type="text" value="00EEFFGGEE33"/>	<input type="text" value="3"/>

5   4

MAC Address Filtering Table - up to 20 entries.

No.	MAC Address	Comment	Select
6			

7   8

9  Enable IP Filtering

No.	Client PC Description	Client PC IP Address	Client Service	Protocol	Port Range	Select
<input type="text"/>	Local Host ▾	<input type="text"/>				

10

4 11 12 13

---

*Enable MAC Filtering (1): Check this box to enable MAC address based filtering, and please select 'Deny' or 'Allow' to decide the behavior of MAC filtering table. If you select deny, all MAC addresses listed in filtering table will be denied from connecting to the network; if you select allow, only MAC addresses listed in filtering table*

*will be able to connect to the network, and rejecting all other network devices.*

- Client PC  
MAC Address (2):* Please input the MAC address of computer or network device here, dash ( - ) or colon ( : ) are not required. (i.e. If the MAC address label of your wireless device indicates 'aa-bb-cc-dd-ee-ff' or 'aa:bb:cc:dd:ee:ff', just input 'aabbccddeeff')
- Comment (3):* You can input any text here as the comment of this MAC address, like 'ROOM 2A Computer' or anything. You can input up to 16 alphanumerical characters here. This is optional and you can leave it blank, however, it's recommended to use this field to write a comment for every MAC addresses as a memory aid.
- Add (4):* Click 'Add' button to add the MAC address and associated comment to the MAC address filtering table.
- Reset (5):* Remove all inputted values.
- MAC Filtering Table (6):* All existing MAC addresses in filtering table will be listed here.
- Delete Selected (7):* If you want to delete a specific MAC address entry, check the 'select' box of the MAC address you want to delete, then click 'Delete Selected' button. (You can select more than one MAC addresses).
- Delete All (8):* If you want to delete all MAC addresses listed here, please click 'Delete All' button.
- Enable IP Filtering Table (9):* Check this box to enable IP address based filtering, and please select 'Deny' or 'Allow' to decide the behavior of IP filtering table. If you select deny, all IP addresses listed in filtering table will be denied from connecting to the network; if you select allow, only IP addresses listed in filtering table will

*be able to connect to the network, and rejecting all other network devices.*

*IP Filtering  
Table (10):*

*All existing IP addresses in filtering table will be listed here.*

*Add PC (11):*

*Click this button to add a new IP address to IP filtering table, up to 20 IP addresses can be added. Please refer to section 3-3-1-1 'Add PC' below.*

*Delete  
Selected (12):*

*If you want to delete a specific IP address entry, check the 'select' box of the IP address you want to delete, then click 'Delete Selected' button. (You can select more than one IP addresses).*

*Delete All (13):*

*If you want to delete all IP addresses listed here, please click 'Delete All' button.*

---

After you finish with all settings, please click 'Apply' (14) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

## 4-3-1-1 Add PC

After button is clicked, the following message will be displayed on your web browser:

**3**

### Access Control - Add PC

This page allows users to define service limitation of client PC, including IP address and service type.

Client PC Description:  **1**

Client PC IP Address:  -  **2**

Client Service:		
Service Name	Detail Description	
WWW	HTTP, TCP Port 80, 3128, 8000, 8080, 8081	<input type="checkbox"/>
E-mail Sending	SMTP, TCP Port 25	<input type="checkbox"/>
News Forums	NNTP, TCP Port 119	<input type="checkbox"/>
E-mail Receiving	POP3, TCP Port 110	<input type="checkbox"/>
Secure HTTP	HTTPS, TCP Port 443	<input type="checkbox"/>
File Transfer	FTP, TCP Port 21	<input type="checkbox"/>
MSN Messenger	TCP Port 1863	<input type="checkbox"/>
Telnet Service	TCP Port 23	<input type="checkbox"/>
AIM	AOL Instant Messenger, TCP Port 5190	<input type="checkbox"/>
NetMeeting	H.323, TCP Port 389,522,1503,1720,1731	<input type="checkbox"/>
DNS	UDP Port 53	<input type="checkbox"/>
SNMP	UDP Port 161, 162	<input type="checkbox"/>
VPN-PPTP	TCP Port 1723	<input type="checkbox"/>
VPN-L2TP	UDP Port 1701	<input type="checkbox"/>
TCP	All TCP Port	<input type="checkbox"/>
UDP	All UDP Port	<input type="checkbox"/>

**User Define Service:**

Protocol: **Both** **4**

Port Range:  **5**

**6**

---

<i>Client PC Description (1):</i>	<i>Please input any text to describe this IP address, up to 16 alphanumerical characters.</i>
<i>Client PC IP address (2):</i>	<i>Please input the starting IP address in the left field, and input the end IP address in the right field to define a range of IP addresses, or just input the IP address in the left field to define a single IP address.</i>
<i>Client PC Service (3):</i>	<i>Please check all services you want to allow or deny this IP address to use, you can check multiple services.</i>
<i>Protocol (4):</i>	<i>If the service you need is not listed above, you can create a new service on your own. Please select TCP or UDP, if you're not sure, please select 'Both'.</i>
<i>Port Range (5):</i>	<i>Please input the port range of new service here. If you want to specify port 80 to 90, please input '80-90'; if you want to apply this rule on a single port, just input the port number, like '80'.</i>
<i>Add (6):</i>	<i>When you finish with all settings, please click 'Add' to save settings, you'll be brought back to previous menu, and the rule you just set will appear in current IP filtering table.</i>

---

### 4-3-2 URL Blocking

If you want to prevent computers in a local network from accessing certain website (like pornography, violence, or anything you want to block), you can use this function to stop computers in a local network from accessing the site you define here.

This function is useful for parents and company managers.

Please follow the following instructions to set URL blocking parameters:

Please click 'General Setup' at the top of web management interface and click 'Firewall' on the left hand column. Choose 'URL Blocking'.

1  Enable URL Blocking

URL/Keyword

http://  2

3  4

Current URL Blocking Table

No.	URL/Keyword	Select
5		<input type="button" value="Delete"/> 6 <input type="button" value="Delete All"/> 7 <input type="button" value="Reset"/> 8

9

---

*Enable URL Blocking (1):* Check this box to enforce URL Blocking, uncheck it to disable URL Blocking.

*URL/Keyword (2):* Input the URL (host name or IP address of website, like

*http://www.blocked-site.com or http://11.22.33.44), or the keyword which is contained in URL, such as pornography, cartoon, stock, etc.).*

- Add (3): Click 'Add' button to add the URL / keyword to the URL / Keyword filtering table.*
- Reset (4): Click 'Reset' to remove the value you inputted in URL/Keyword field.*
- Current URL Blocking Table (5): All existing URL/Keywords in filtering table will be listed here.*
- Delete Selected (6): If you want to delete a specific URL/Keyword entry, check the 'select' box of the MAC address you want to delete, then click 'Delete Selected' button. (You can select more than one MAC addresses).*
- Delete All (7): If you want to delete all URL/Keyword listed here, please click 'Delete All' button.*
- Reset (8): You can also click 'Reset' button to unselect all URL/Keywords.*

After you finish with all settings, please click 'Apply' (9) button, and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot



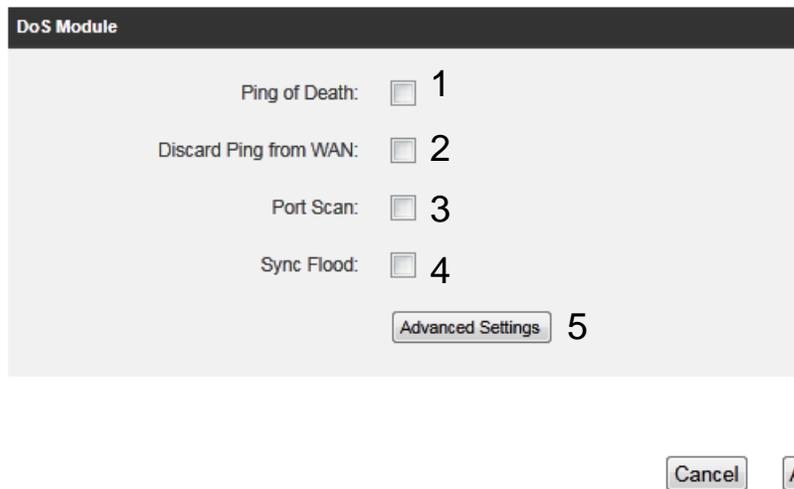
### 4-3-3 DoS Attack Prevention

Denial of Service (DoS) is a common attack measure, by transmitting a great amount of data or request to your Internet IP address and server, the Internet connection will become very slow, and server may stop responding because it is not capable of handling too much traffic.

This router has a built-in DoS attack prevention mechanism; when you activate it, the router will stop the DoS attack for you.

Please follow the following instructions to set DoS prevention parameters:

Please click 'General Setup' at the top of web management interface and click 'Firewall' on the left hand column. Choose 'DoS' tab.



---

*Ping of Death (1): Ping of Death is a special packet, and it will cause certain computer to stop responding. Check this box and the router will filter this kind of packet out.*

*Discard Ping From WAN (2): Ping is a common and useful tool to know the connection status of a specified remote network device, but some malicious intruder will try to fill your network bandwidth with a lot of PING request data packet, to make your internet*

*connection become very slow, even unusable. Check this box and the router will ignore all inbound PING request, but when you activate this function, you will not be able to ping your own router from internet, too.*

*Port Scan (3): Some malicious intruder will try to use a 'port scanner' to know how many ports of your Internet IP address are open, and they can collect a lot of valuable information by doing so. Check this box and the router will block all traffics which are trying to scan your Internet IP address.*

*Sync Flood (4): This is another kind of attack, which uses a lot of fake connection request to consume the memory of your server, and try to make your server become unusable. Check this box and the router will filter this kind of traffic out.*

*Advanced Settings (5): Click this button and you can set advanced settings of the DoS prevention method listed above, please see section 4-3-3-1 'DoS – Advanced Settings' below.*

---

After you finish with all settings, please click 'Apply' (6) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

### **4-3-3-1 DoS - Advanced Settings**

When you click 'Advanced' button in DoS menu, the following message

will be displayed on your web browser:

### Denial of Service (DoS) Firewall Settings

The Hi-Gain™ Wireless-150N Router with Range Amplifier's firewall can block common unauthorized access, including Denial of Service (DoS) attacks such as Ping of Death, Discard Ping from WAN and Port Scan.

**DoS Module**

1  Ping of Death      5 Packet(s) per Second      Burst 5

2  Discard Ping from WAN

3  Port Scan

- NMAP FIN / URG / PSH
- Xmas tree
- Another Xmas tree
- Null scan
- SYN / RST
- SYN / FIN
- SYN (only unreachable port)

4  Sync Flood      30 Packet(s) per Second      Burst 30

5

---

*Ping of Death (1):      Set the threshold of when this DoS prevention mechanism will be activated. Please check the box of Ping of Death, and input the frequency of threshold (how many packets per second, minute, or hour), you can also input the 'Burst' value, which means when this number of 'Ping of Death' packet is received in very short time, this DoS prevention mechanism will be activated.*

*Discard Ping From WAN (2):      Check the box to activate this DoS prevention mechanism.*

*Port Scan (3):      Many kind of port scan methods are listed here, please check one or more DoS attack methods you want to prevent.*

*Sync Flood (4):      Like Ping of Death, you can set the threshold of when this DoS prevention mechanism will be activated.*

---

After you finish with all settings, please click ‘Apply’ (5) button and the following message will be displayed on your web browser:

**Settings Saved Successfully!**

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.



Please click ‘Go Back’ to go back to previous setup menu, or click ‘Apply’ to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot

#### 4-3-4 Demilitarized Zone (DMZ)

Demilitarized Zone (DMZ) refers to a special area in your local network. This area resides in the local network, and all computers in this area use private IP addresses, too. However, these private IP addresses are mapped to a certain Internet IP address, so other users on the Internet can fully access those computers in DMZ.

Please follow the instructions to set DMZ parameters:

Please click 'General Setup' at the top of web management interface and click 'Firewall' on the left hand column. Choose 'DMZ'.

1  Enable DMZ

Public IP	Client PC IP Address	Computer Name
2 <input type="radio"/> Dynamic IP <input type="radio"/> Static IP	3 <input type="text"/>	4 Local Host
Session 1		

6   5

7 **Current DMZ Table**

No.	Computer Name	Public IP	Client IP Address	Select
-----	---------------	-----------	-------------------	--------

8  9  10

11

---

*Enable DMZ (1):* Check this box to enable DMZ function, uncheck this box to disable DMZ function.

*Public IP* You can select 'Dynamic IP' or 'Static IP' here.

- address (2):*                    *If you select ‘Dynamic IP’, you have to select an Internet connection session from dropdown menu; if you select ‘Static IP’, please input the IP address that you want to map to a specific private IP address.*
- Client PC IP address (3):*            *Please input the private IP address that the Internet IP Address will be mapped to.*
- Computer Name (4):*        *Pull down the menu and all the computers connected to the router will be listed here. You can easily to select the computer name without checking the IP address of the computer.*
- Add (5):*                    *Click ‘Add’ button to add the public IP address and associated private IP address to the DMZ table.*
- Reset (6):*                    *Click ‘Clear’ to remove the value you inputted in Public IP address and Client PC IP address field.*
- Current DMZ table (7):*      *All existing public IP address and private IP Address mapping will be displayed here.*
- Delete Selected (8):*        *If you want to delete a specific DMZ entry, check the ‘select’ box of the DMZ entry you want to delete, then click ‘Delete Selected’ button. (You can select more than one DMZ entries).*
- Delete All (9):*            *If you want to delete all DMZ entries listed here, please click ‘Delete All’ button.*
- Reset (10):*                *You can also click ‘Reset’ button to unselect all DMZ entries.*
- 

After you finish with all settings, please click ‘Apply’ (11) button and the following message will be displayed on your web browser:

## Settings Saved Successfully!

You may press Go Back button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

[Go Back](#) [Apply](#)

Please click 'Go Back' to go back to previous setup menu, or click 'Apply' to reboot the router so the settings will take effect. Please wait 30-60 seconds for the router to reboot.

## 4-4 System Status

The functions described here will provide you with system related information. To enter system status menu, please either click 'Status' link located at top of web management interface.

### 4-4-1 System information and firmware version

You can use this function to know the system information and firmware version of this router.

Please click 'Status' tab at the top of web management interface.

System
Model: Router
Up Time: 12day : 3h : 26m : 24s
Hardware Version: Default
Boot Code Version: 1.0
Firmware Version: Final Version

**NOTE: Information displayed here may vary.**

## 4-4-2 Internet Connection Status

You can use this function to know the status of current Internet connection.

Please click 'Status' menu at the top of web management interface, and then click 'Internet Connection' on the left hand column. The following message will be displayed on your web browser:

### Internet Connection

View the current Internet connection status and related information.

Attain IP Protocol : Dynamic IP disconnect

IP Address :

Subnet Mask :

Default Gateway :

MAC Address :

Primary DNS :

Secondary DNS :

**NOTE: Information displayed here may vary.**

### 4-4-3 Home Network

You can use this function to know the status of your router.

Please click 'Status' menu at the top of web management interface, and then click 'Home Network' on the left hand column.

View the current status of the Hi-Gain™ Wireless 300N Router .

#### Wireless Network Configuration

Mode: Access Point  
ESSID: HawkingTech  
Channel Number: 11  
Security: Disable

#### Local Network Configuration

IP Address: 0.0.0.0  
Subnet Mask: 0.0.0.0  
DHCP Server: Enable  
MAC Address: 00:00:00:00:00:00

**NOTE: Information displayed here may vary.**

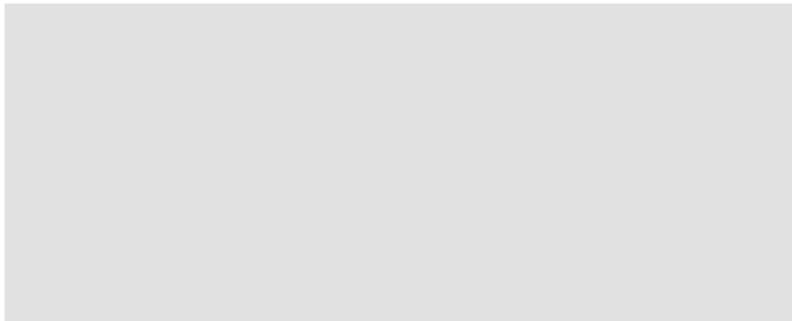
#### 4-4-4 System Log

All important system events are logged. You can use this function to check the event log of your router.

Please click 'Status' menu at the top of web management interface, and then click 'System Log' on the left hand column.

##### System Log

View the system operation information. You can view the system startup time, connection process and more.



The system events will be displayed in this page, and here are descriptions of every buttons:

---

*Save (1): Save current event log to a text file.*

*Clear (2): Delete all event logs displayed here.*

---

*Refresh (3): Refresh the event log display.*

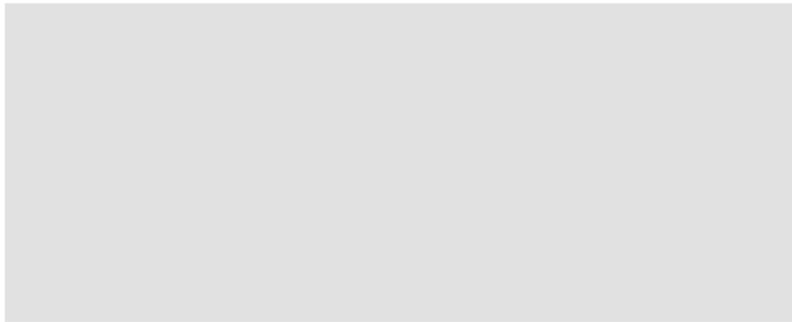
## 4-4-5 Security Log

All information about network and system security is kept here, and you can use this function to check the security event log of your router.

Please click 'Status' menu at the top of web management interface, and then click 'Security Log' on the left hand column.

### Security Log

View the system operation information. You can view the system startup time, connection process and more.



The system events will be displayed in this page, and here are descriptions of every buttons:

---

*Save (1):                      Save current event log to a text file.*

*Clear (2):                      Delete all event logs displayed here.*

---

*Refresh (3):                      Refresh the event log display.*

#### 4-4-6 Active DHCP client list

If you're using the DHCP server function of this router, you can use this function to check all active DHCP leases issued by this router.

Please click 'Status' menu at the top of web management interface, and then click 'Active DHCP Client' on the left hand column.

##### Active DHCP Client

This section shows the assigned IP address, MAC address and time expired for each DHCP leased client.

Wireless Configuration	MAC Address	Time Expired (Second)
192.168.1.1	00:00:00:00:00:00	forever
192.168.1.2	00:00:00:00:00:00	forever

All information about active DHCP leases issued by this router will be displayed here. You can click 'Refresh' button to display latest information.

## 4-4-7 Statistics

You can use this function to check the statistics of wireless, LAN, and WAN interface of this router.

Please click 'Status' menu at the top of web management interface, and then click 'Statistics' on the left hand column.

### Statistics

This section shows the assigned IP address, MAC address and time expired for each DHCP leased client.

Wireless LAN	Packet Sent: 0 Packet Received: 0
Ethernet LAN	Packet Sent: 0 Packet Received: 0
Ethernet WAN	Packet Sent: 0 Packet Received: 0

Refresh

You can click 'Refresh' button to display latest information.

## 4-5 Tools

You can backup all configurations of this router to a file, so you can make several copied of router configuration for security reason.

To backup or restore router configuration, please follow the instructions:

Please click 'Tool' menu at the top of web management interface, and then click 'Configuration Tools' on the left hand column.

### Configuration Tools

Use the "Backup" tool to save the Hi-Gain™ Wireless 300N Router's current configurations to a file named "config.bin". You can then use the "Restore" tool to restore the saved configuration to the Router. Alternatively, you can use the "Restore to Factory Default" tool to force the Router to perform System Reset and restore the original factory settings.

The screenshot shows three sections of the Configuration Tools interface. The first section is 'Backup Settings' with a 'Save' button labeled '1'. The second section is 'Restore Settings' with a text input field, a 'Browse' button, and an 'Upload' button labeled '2'. The third section is 'Restore to Factory Default' with a 'Reset' button labeled '3'. A horizontal line separates the top section from the bottom two sections.

---

**Backup Settings (1):** *Press 'Save...' button, and you'll be prompted to download the configuration as a file, default filename is 'default.bin', you can please save it as another filename for different versions, and keep it in a safe place.*

**Restore Settings (2):** *Press 'Browse...' to pick a previously-saved configuration file from your computer, and then click 'Upload' to transfer the configuration file to router. After the configuration is uploaded, the router's configuration will be replaced by the file you just uploaded.*

**Restore to Factory Default (3):** *Click this button to remove all settings you made, and restore the configuration of this router back to factory default*

*settings.*

---

## ***4-6 Firmware Upgrade***

The system software used by this router is known as ‘firmware’, just like any applications on your computer, when you replace the old application with a new one; your computer will be equipped with new function. You can also use this firmware upgrade function to add new functions to your router, even fix the bugs of this router.

To upgrade firmware, please follow the instructions:

Please click ‘Tool’ menu at the top of web management interface, and then click ‘Firmware Upgrade’ on the left hand column.

### **Firmware Upgrade**

This tool allows you to upgrade the Hi-Gain™ Wireless 300N Router's system firmware. Enter the path and name of the upgrade file and then click the APPLY button below. You will be prompted to confirm the upgrade. See below for the router's current firmware. You can go to [www.hawkingtech.com](http://www.hawkingtech.com) for the latest firmware files.

The system will automatically reboot the Router after you finished the firmware upgrade process. If you don't complete the firmware upgrade process in the next step, you have to manually restart the Router.

Firmware Version: Final Version

Next

Click ‘Next’ button if you wish to upgrade your firmware.

## Firmware Upgrade

This tool allows you to upgrade the Hi-Gain™ Wireless 300N Router. Enter the path and name of the upgrade file and then click the Apply button below. You will be prompted to confirm the upgrade.

Click 'Browse' button, and you'll be prompted to provide the filename of the firmware upgrade file. Please download the latest firmware file from the Hawking Technologies website at [www.hawkingtech.com](http://www.hawkingtech.com), and use it to upgrade your router.

After a firmware upgrade file is selected, click 'Apply' button, and the router will start firmware upgrade procedure automatically. The procedure may take several minutes, please be patient.

**NOTE: Never interrupt the upgrade procedure by closing the web browser or physically disconnect your computer from router. If the firmware you uploaded is corrupt, the firmware upgrade will fail, and you may have to return this router to the dealer of purchase to ask for help. Warranty is void if you interrupt the upgrade procedure.**

## ***4-7 System Reset***

If you think your network performance is bad, or you find the behavior of the router is strange, you can perform a router reset. Sometimes it will solve the problem.

Please click 'Tool' menu at the top of web management interface, and then click 'Reset' on the left hand column.

### **Reset and Reboot**

In the event that the system stops responding correctly or stops functioning, you can perform a Reboot. Your settings will not be changed. To perform the reboot, click on the Reboot button below. You will be asked to confirm your decision. The Reboot will be complete when the LED Power light stops blinking.

Reboot:

If resetting the Router does not work you may attempt to reset the Router back to factory default settings. Note that all your current settings will be erased.

Reset to Factory Default Setting:

Please click 'Apply' to reset your router, and it will be available again after a few minutes, please be patient.

## **Chapter V: Appendix**

### ***5-1 Hardware Specification***

CPU + Wireless Chipsets : Realtek RTL8196C+RTL8192CE

Flash: 2MB

SDRAM: 16MB

WAN Port: 10/100M UTP Port x 1

LAN Ports: 10/100M UTP Port x 4

Antenna: 2x 3dBi Dipole antennas

Power: 12VDC, 1A Switching Power Adapter

Output Power spec:

11n (40MHz)@MCS15: 23+/-1.5dBm

11n (20MHz)@MCS15: 23+/-1.5dBm

11g@54Mbps: 23+/-1.5dBm

11b@11Mbps: 26+/-1.5dBm

Receive Sensitivity spec:

11n (40MHz)@MCS15: -69+/-2dBm

11n (20MHz)@MCS15: -73+/-2dBm

11g@54Mbps: -78+/-2dBm

11b@11Mbps: -89+/-2dBm

Temperature: 32~104°F (0 ~ 40°C)

Humidity: 10-90% (NonCondensing)

Certification: FCC, CE

## 5-2 Troubleshooting

If you find that the router is working improperly or stops responding, check some of the FAQs below. You can also contact our support by email or phone.

Scenario	Solution
Router is not responding to me when I want to access it by web browser	<ul style="list-style-type: none"><li>a. Please check the connection of power cords and network cables of this router. All cords and cables should be correctly and firmly inserted into the router.</li><li>b. If all LEDs on this router are off, please check the status of A/C power adapter, and make sure it's correctly powered.</li><li>c. You must use the same IP address section which router uses.</li><li>d. Are you using MAC or IP address filter? Try to connect the router by another computer and see if it works; if not, please restore your router to factory default settings (pressing 'reset' button for over 10 seconds).</li><li>e. Set your computer to obtain an IP address automatically (DHCP), and see if your computer can get an IP address.</li><li>f. If you did a firmware upgrade and this happens, contact your dealer of purchase for help.</li><li>g. If all above solutions don't work, contact the dealer of purchase for help.</li></ul>
Can't get connected to Internet	<ul style="list-style-type: none"><li>a. Go to 'Status' -&gt; 'Internet Connection' menu, and check Internet connection status.</li><li>b. Please be patient, sometimes Internet is just that slow.</li><li>c. If you connect a computer to Internet</li></ul>

	<p>directly before, try to do that again, and check if you can get connected to Internet with your computer directly attached to the device provided by your Internet service provider.</p> <ul style="list-style-type: none"> <li>d. Check PPPoE / L2TP / PPTP user ID and password again.</li> <li>e. Call your Internet service provide and check if there's something wrong with their service.</li> <li>f. If you just can't connect to one or more websites, but you can still use other internet services, please check URL/Keyword filter.</li> <li>g. Try to reset the router and try again later.</li> <li>h. Reset the device (modem) provided by your Internet service provider.</li> <li>i. Try to use IP address instead of hostname. If you can use IP address to communicate with a remote server, but can't use hostname, please check DNS setting.</li> </ul>
<p>I can't locate my router by my wireless client</p>	<ul style="list-style-type: none"> <li>a. 'Broadcast ESSID' set to off?</li> <li>b. All three antennas are properly secured.</li> <li>c. Are you too far from your router? Try to get closer.</li> <li>d. Please remember that you have to input ESSID on your wireless client manually, if ESSID broadcast is disabled.</li> </ul>
<p>File download is very slow or breaks frequently</p>	<ul style="list-style-type: none"> <li>a. Are you using QoS function? Try to disable it and try again.</li> <li>b. Internet is slow sometimes, be patient.</li> <li>c. Try to reset the router and see if it's better after that.</li> <li>d. Try to know what computers do on your local network. If someone's transferring big files, other people will think Internet is</li> </ul>

	<p>really slow.</p> <p>e. If this has never happened before, call your Internet service provider to know if there is something wrong with their network.</p>
I can't log onto web management interface: password is wrong	<p>a. Make sure you're connecting to the correct IP address of the router!</p> <p>b. Password is case-sensitive. Make sure the 'Caps Lock' light is not illuminated.</p> <p>c. If you really forgot the password, do a hard reset.</p>
Router becomes hot	<p>a. This is not a malfunction, as long as it is not so hot that you cannot touch it for a prolonged period of time</p> <p>b. If you smell something wrong or see smoke coming out from router or A/C power adapter, please disconnect the router and A/C power adapter from utility power (make sure it's safe before you're doing this!), and call your dealer of purchase for help.</p>
The date and time of all event logs are wrong	<p>a. Adjust the internal clock of router.</p>

### ***5-3 Glossary***

**Default Gateway (Router):** Every non-router IP device needs to configure a default gateway's IP address. When the device sends out an IP packet, if the destination is not on the same network, the device has to send the packet to its default gateway, which will then send it out towards the destination.

**DHCP:** Dynamic Host Configuration Protocol. This protocol automatically gives every computer on your home network an IP address.

**DNS Server IP Address:** DNS stands for Domain Name System, which allows Internet servers to have a domain name (such as `www.Broadbandrouter.com`) and one or more IP addresses (such as `192.34.45.8`). A DNS server keeps a database of Internet servers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "`Broadbandrouter.com`" into your Internet browser), the user is sent to the proper IP address. The DNS server IP address used by the computers on your home network is the location of the DNS server your ISP has assigned to you.

**DSL Modem:** DSL stands for Digital Subscriber Line. A DSL modem uses your existing phone lines to transmit data at high speeds.

**Ethernet:** A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10/100 million bits per second (Mbps).

**Idle Timeout:** Idle Timeout is designed so that after there is no traffic to the Internet for a pre-configured amount of time, the connection will automatically be disconnected.

**IP Address and Network (Subnet) Mask:** IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, which identifies a single, unique Internet computer host in an IP network. Example: `192.168.1.254`. It consists of 2 portions: the IP network address, and the host identifier.

The IP address is a 32-bit binary pattern, which can be represented as four cascaded decimal numbers separated by ".": `aaa.aaa.aaa.aaa`, where each "aaa" can be anything from 000 to 255, or as four cascaded binary numbers separated by ".":

`bbbbbbbb.bbbbbbbb.bbbbbbbb.bbbbbbbb`, where each "b" can either be 0 or 1.

A network mask is also a 32-bit binary pattern, and consists of consecutive leading

1's followed by consecutive trailing 0's, such as 11111111.11111111.11111111.00000000. Therefore sometimes a network mask can also be described simply as "x" number of leading 1's.

When both are represented side by side in their binary forms, all bits in the IP address that correspond to 1's in the network mask become part of the IP network address, and the remaining bits correspond to the host ID.

For example, if the IP address for a device is, in its binary form, 11011001.10110000.10010000.00000111, and if its network mask is, 11111111.11111111.11110000.00000000

It means the device's network address is 11011001.10110000.10010000.00000000, and its host ID is, 00000000.00000000.00000000.00000111. This is a convenient and efficient method for routers to route IP packets to their destination.

**ISP Gateway Address:** (see ISP for definition). The ISP Gateway Address is an IP address for the Internet router located at the ISP's office.

**ISP:** Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

**LAN:** Local Area Network. A LAN is a group of computers and devices connected together in a relatively small area (such as a house or an office). Your home network is considered a LAN.

**MAC Address:** MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network. The MAC address is a unique identifier for a device with an Ethernet interface. It is comprised of two parts: 3 bytes of data that corresponds to the Manufacturer ID (unique for each manufacturer), plus 3 bytes that are often used as the product's serial number.

**NAT:** Network Address Translation. This process allows all of the computers on your home network to use one IP address. Using the broadband router's NAT capability, you can access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

**Port:** Network Clients (LAN PC) uses port numbers to distinguish one network application/protocol over another. Below is a list of common applications and protocol/port numbers:

Application	Protocol	Port Number
Telnet	TCP	23
FTP	TCP	21
SMTP	TCP	25
POP3	TCP	110
H.323	TCP	1720
SNMP	UCP	161
SNMP Trap	UDP	162
HTTP	TCP	80
PPTP	TCP	1723
PC Anywhere	TCP	5631
PC Anywhere	UDP	5632

**PPPoE:** Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a secure data transmission method originally created for dial-up connections; PPPoE is for Ethernet connections. PPPoE relies on two widely accepted standards, Ethernet and the Point-to-Point Protocol. It is a communications protocol for transmitting information over Ethernet between different manufacturers

**Protocol:** A protocol is a set of rules for interaction agreed upon between multiple parties so that when they interface with each other based on such a protocol, the interpretation of their behavior is well defined and can be made objectively, without confusion or misunderstanding.

**Router:** A router is an intelligent network device that forwards packets between different networks based on network layer address information such as IP addresses.

**Subnet Mask:** A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers (e.g. 255.255.255.0) configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must be assigned by InterNIC).

**TCP/IP, UDP:** Transmission Control Protocol/Internet Protocol (TCP/IP) and Unreliable Datagram Protocol (UDP). TCP/IP is the standard protocol for data transmission over the Internet. Both TCP and UDP are transport layer protocol. TCP performs proper error detection and error recovery, and thus is reliable. UDP on the other hand is not reliable. They both run on top of the IP (Internet Protocol), a network layer protocol.

**WAN:** Wide Area Network. A network that connects computers located in geographically separate areas (e.g. different buildings, cities, countries). The Internet is a wide area network.

**Web-based management Graphical User Interface (GUI):** Many devices support a graphical user interface that is based on the web browser. This means the user can use the familiar Netscape or Microsoft Internet Explorer to Control/configure or monitor the device being managed.