IEEE 802.11n Wireless Series

Wireless-11n-Router

Wireless 11n 2T2R Router

Wireless 11n 1T1R Router

User Manual

Version 2.2

Date: August 19, 2010

FCC Certifications

Federal Communication Commission Interference Statement

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

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

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CE Mark Warning

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class B for ITE, the essential protection requirement of Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility and R&TTE Directive 1999/5/EC to meet the regulation of the radio equipment and telecommunications terminal equipment.

Company has an on-going policy of upgrading its products and it may be possible that information in this document is not up-to-date. Please check with your local distributors for the latest information. No part of this document can be copied or reproduced in any form without written consent from the company.

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低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Contents

Unpacking Information

Thank you for purchasing the product. Before you start, please check all the contents of this package.

The product package should include the following:

1. One Wireless Router
2. One Power Adapter
3. Antenna
4. One resource CD, including:
   - ✧ User's Manual
   - ✧ QIG

Note:
Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

Conventions

The Router mentioned in this guide stands for IEEE 802.11n Wireless Router without any explanation.

Chapter 1 Introduction to the Wireless Router

1.1 General Description

IEEE 802.11n Wireless Connectivity

The IEEE802.11n Wireless Router provides a better wireless signal for network than existing wireless 802.11g technology. It complies with IEEE 802.11n and IEEE802.11b/g wireless standards.

Greater Range and Coverage

The router allows multiple users to share one broadband connection, as well as secures your private network. With its built-in switch port and wireless AP, LAN users can share files, printers, or playing network games all at a blazing speed. This technology maximizes the speed and range of your wireless signal to significantly outperform 802.11g devices.

Advanced Network Security

As for security, it also supports the latest wireless security features to help prevent unauthorized access, be it from over a wireless network or from the Internet. Moreover, supporting for WPA and WPA2 standards ensure that you will be able to use the best possible encryption, regardless of your client devices. In addition, this Wireless 11n Router utilizes dual active firewalls (SPI and NAT) to prevent potential attacks from across the Internet.

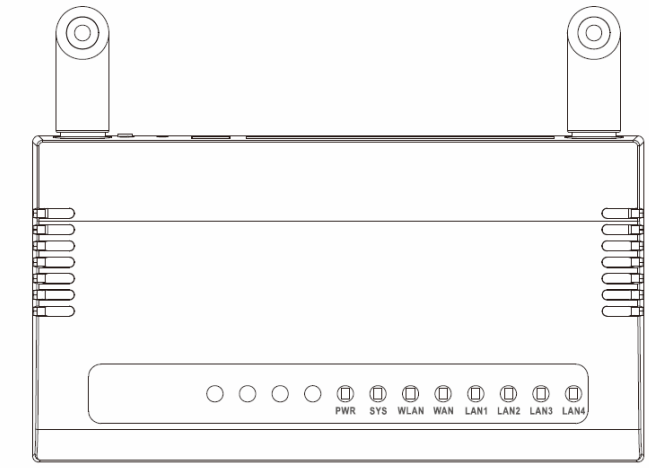
1.2 Key Features

- Supports 2.4 GHz frequency band
- Supports wireless data encryption with WPA, WPA2, Open/ shared key, and pair-wise key authentication services
- Supports QoS: WMM, WMM-SA Client mode, Ingress and Egress bandwidth control
- Supports authentication for wireless connectivity based on ESSID
- Provides MAC access control and hidden SSID function
- Support MDI/MDIX auto crossover function
- Supports NAT IP Sharing and DHCP server
- Supports WAN connection type: Static IP, PPPoE, PPTP, DHCP L2TP client
- Supports ACL, DOS, Virtual DMZ, DNS relay, UPnP, VPN-Pass through
- Supports DDNS (DynDNS, TZO)
- Supports firmware upgrade function via Web

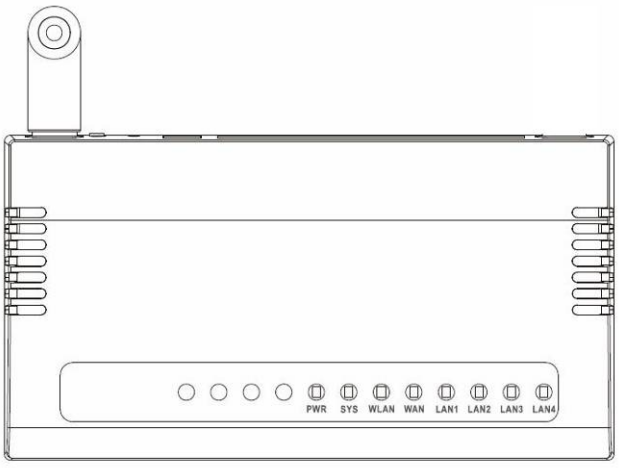
1.3 The Front Panel

The front panel of the Wireless Router:

Wireless 11n 2T2R Router:



Wireless 11n 1T1R Router:



Name	Status	Indication
PWR	Off	No power
	On	Power is on
SYS	Blink Green	System Resetting
	Dark	System stability
WLAN	Off	The wireless function is disabled
	Flashing	The wireless function is enabled
	Flashing fast	Sending or receiving data over wireless
WAN / LAN 1-4	Off	There is no device linked to the corresponding port or the connection is dropping off.
	On	There are devices linked to the corresponding ports but no data transmitted or received
	Flashing	Sending or receiving data over corresponding port

1.4 The Rear Panel

The rear panel of the Wireless Router is shown below.

Wireless 11n 2T2R Router:

Wireless 11n 1T1R Router

- **LAN:** Through these ports, you can connect the Router to your PCs and the other Ethernet network devices.
- **WAN:** This WAN port is where you will connect the cable/DSL Modem, or Ethernet.
- **DC IN**

  Plug the circle end of the power adapter firmly into the rear panel of the Wireless Router, and put the other end into an electric service outlet then the system is ready.

- **Reset Button**

  Push the button for more than 5 seconds and then release it, the system will return to factory default setting. In the meantime, system rewrites flash to default value and Status LED flash for a while. Approximately 60 seconds later, the Status LED turn dark, now the whole system parameters have returned to factory default value. If the process has been interrupted by any reason(like power off), the system will fail. Before performing the process, ensure a safe operating environment please!

- **Antenna:** For the purpose of enhancing the wireless signal, and expanding the range of signal.

- **WPS:** Help users to connect this Router to Internet quickly. It uses PIN configuration method or PBC configuration method, in which users can easy setup WPS connection. Please refer

to WPS settings for more information.

Warning : Incomplete factory setting recovery procedure will cause the Wireless Router malfunction ! If you are unfortunately in this situation, do not try to repair it by yourself. Consult your local distributor for help!

1.5 Placement (Optional)

There are two ways to place the Router. The first way is to place the Router vertically on a surface. The second way is to attach it to the wall. If you select a wall-mount option, please follow the steps below:

1. Select a location with access for cables and a power outlet.
2. Unplug the unit. Place it upside down on a flat surface and mark the two holes for anchors.
3. Installing the wall mount anchor (not supplied) into the wall with tools such as drill or hammer.
4. Insert the screws (not supplied) in each hole of the stand parts.
5. Attach the unit to the anchors on the wall.

Chapter 2 Installation and Basic Configuration

This chapter provides a step-by-step guide to the installation and configuration of the Wireless Router. We suggest you go over the whole chapter and then do more advanced operation.

2.1 Connecting This Router to Your Network

Steps to build up the network:

- Connect the phone line from the wall socket to the line-in port on the ADSL modem, or the coaxial cable to the line-in port on the Cable modem.
- Connect the ADSL or Cable modem to the Ethernet WAN port on the back of the Wireless Router by using the UTP cable.
- Plug-in the power adapter to the modem and turn on the power. Install the Ethernet card into the computer by referring to the User Guide that came with the card.
- Connect the computer to the Wireless Router by using standard twisted-pair Ethernet cable from the computer's Ethernet card to a 10/100Mbps Ethernet port on the back of the Wireless Router.
- Plug-in the power adapter to the Router and the other side to the wall outlet.

2.2 Configuring the IP Address of Your Computer

In order to communicate with this Wireless Router, you have to configure the IP addresses of your computer to make it compatible with the device.

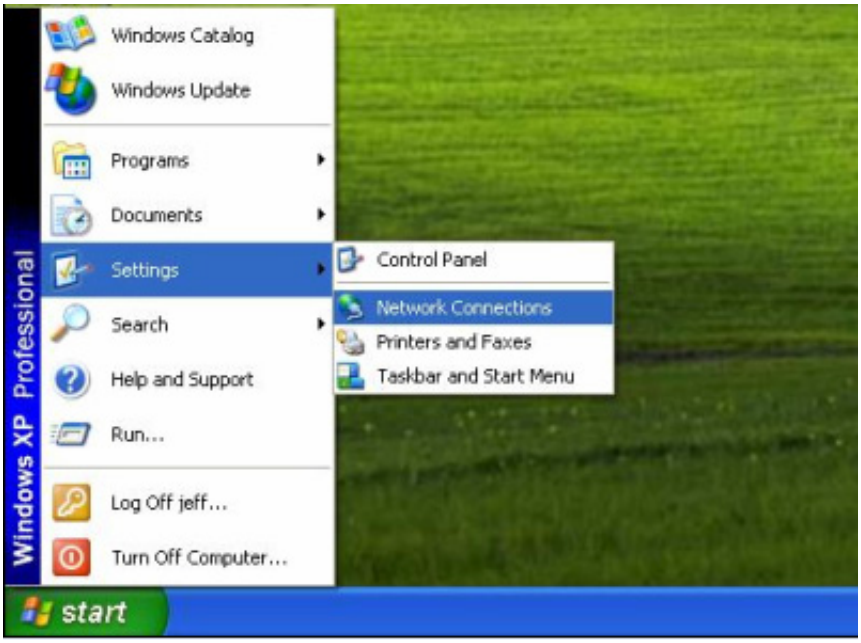
Note: The router supports DHCP server and it is enabled as default. Users that configure your IP address as **"Obtain an IP address automatically"** may skip the following IP configuration instruction.

1. The default network setting of the device:
   IP address: 192.168.100.1
   Subnet Mask: 255.255.255.0
   DHCP Server: enable
2. In the following TCP/IP configuration guide, the IP address "192.168.100.2" is assumed to be your IP address if you want to specify IP addresses manually. Please **DO NOT** choose "192.168.100.1" as the IP address. For the IP address "192.168.100.1"has been set as the default IP for this device.

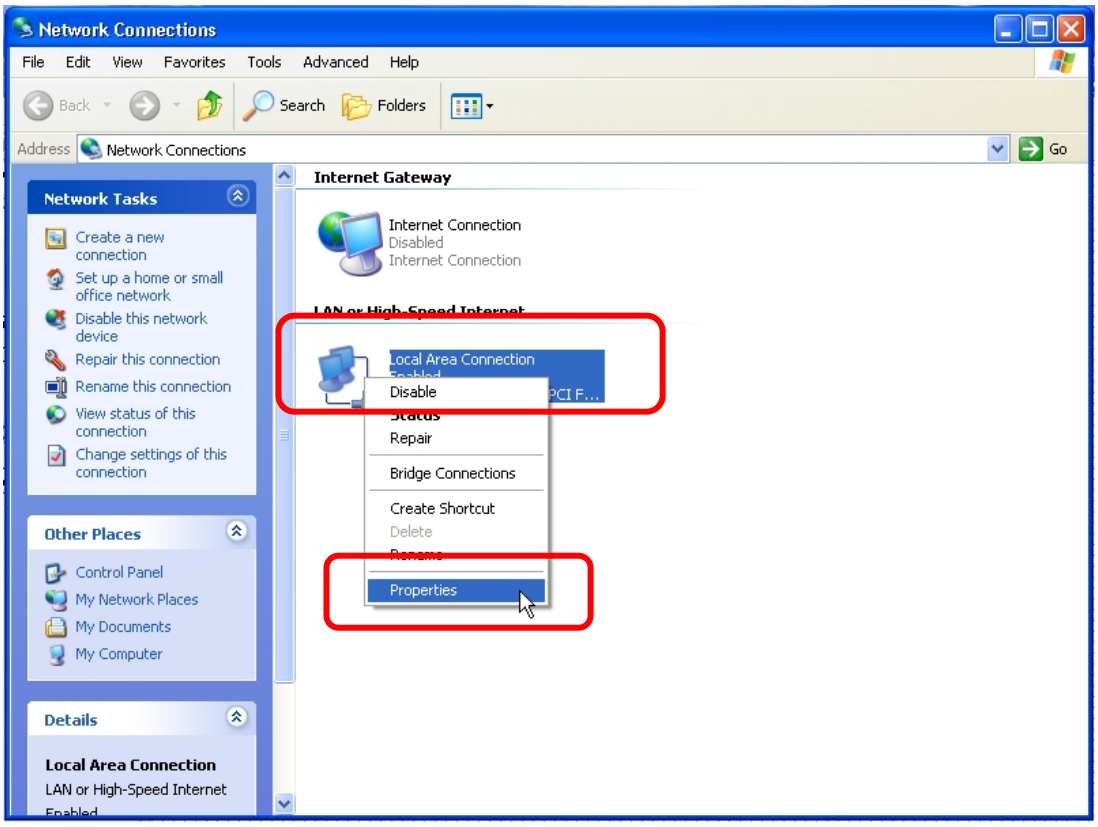
3. The following TCP/IP configuration guide uses windows XP as the presumed operation system.

Procedures to configure IP addresses for your computer

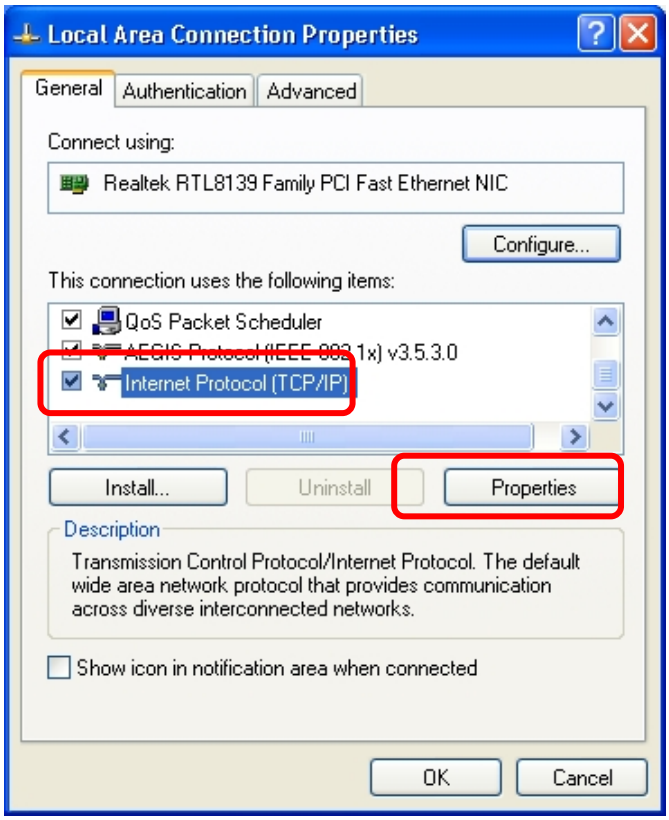
1. If you are in Classic Start menu view, click **Start > Settings > Network Connections**.
   If you are in Start menu view, click **Start > Control Panel > Network Connections.**



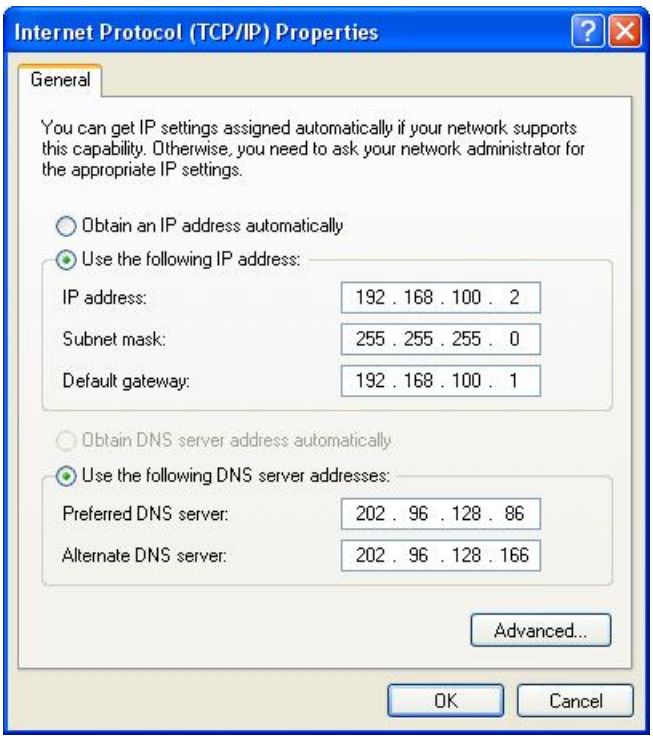
2. Right-click on **Local Area Connection** item and click on **Properties**.



3. Choose **Internet Protocol (TCP/IP)** and click **Properties**.



4. You may choose “Obtain an IP address automatically” (recommend) to get IP address automatically or choose “Use the following IP address” to specify IP addresses manually. Please click the OK button after your configuration.



Chapter 3 Web-Based Management

3.1 Starting the Web-Based Management Interface

The device uses Web as the management interface. You can use a browser to access the management interface easily. Please follow the steps listed below.

1. Open the Internet Web browser.
2. Type **192.168.100.1** into the URL Web address location and press Enter.
3. The Login window appears.

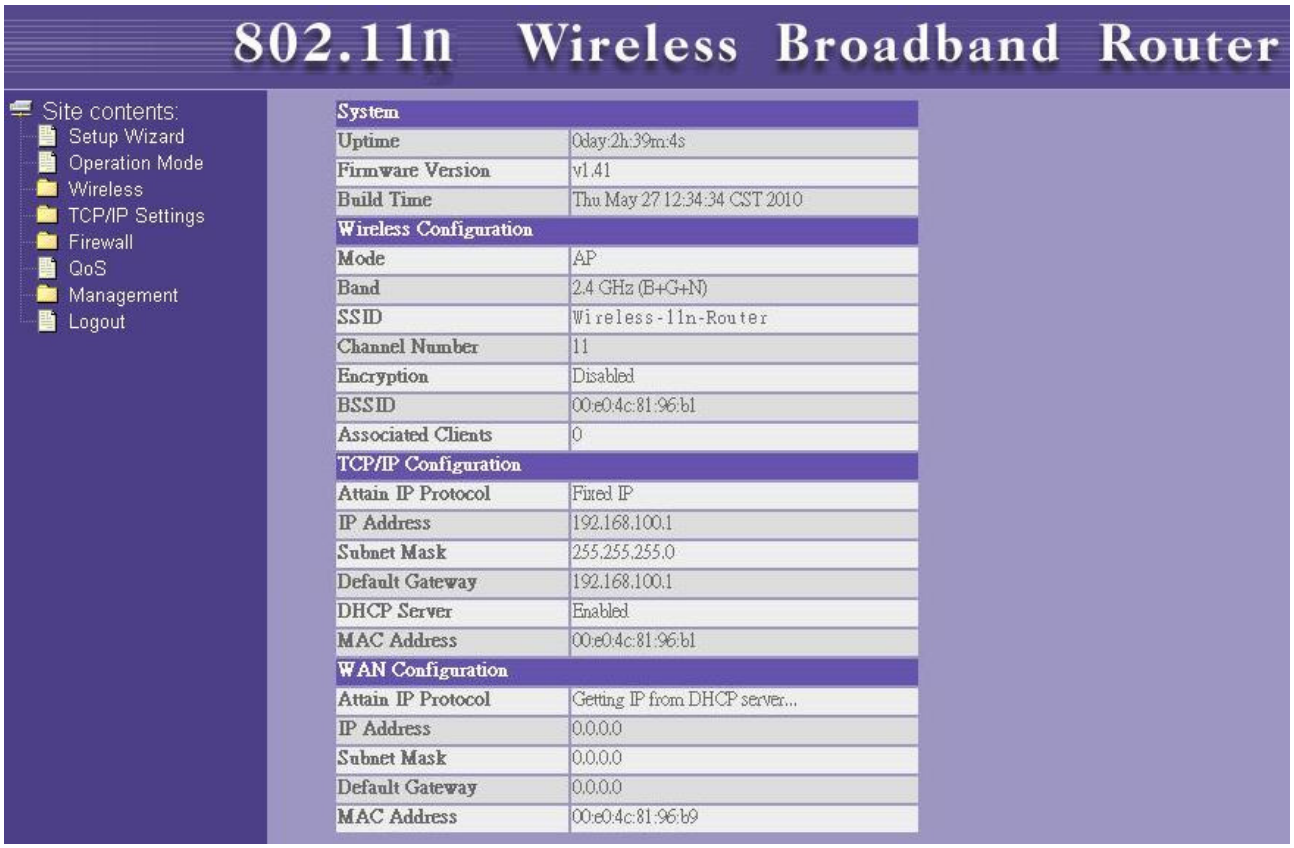
- Enter **admin** in the User Name location (default value).

- Enter **admin** in the Password location (default value).

- Click **OK** button.

3.2 The Graphic User Interface

After the password authorization, the information page shows up as the home page of the Graphic User interface. You may click on each folder on left column of each page to get access to each configuration page. Please note that you should click the Save Settings button to apply your configuration to this device. You can also restore the default settings by clicking the Reset Settings button.



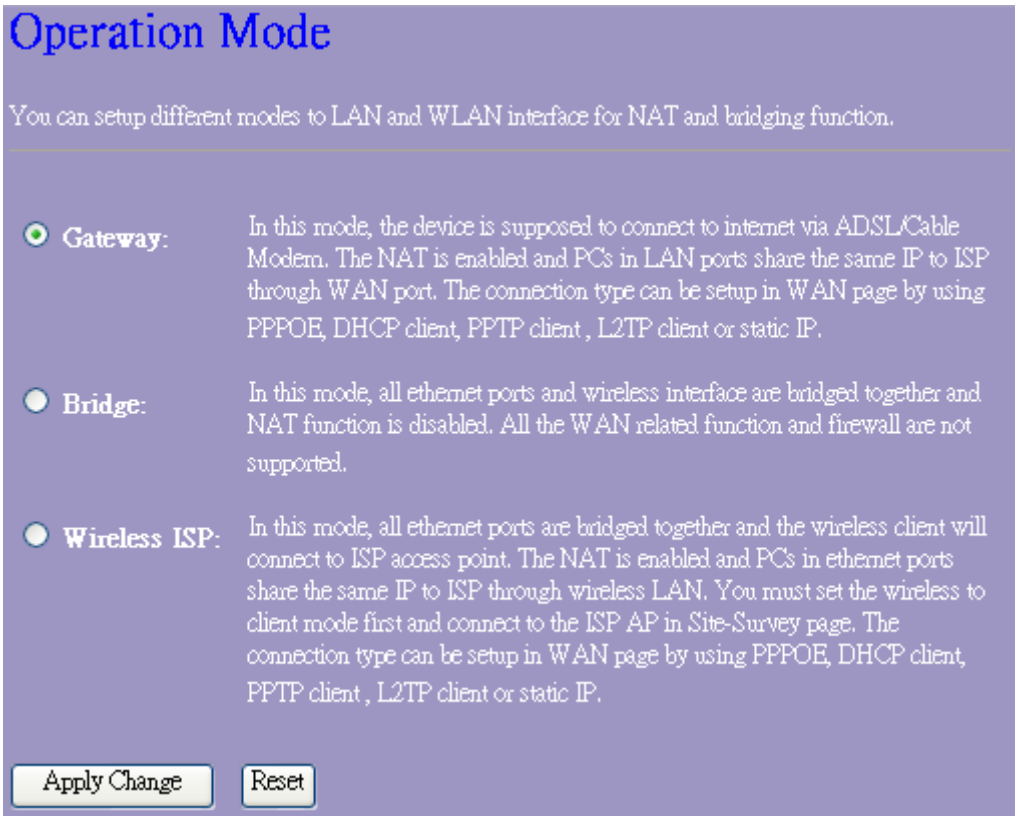
3.3 Setup Wizard

If you are using the router for the first time, please follow the procedures of the setup wizard to do a step-by-step configuration.

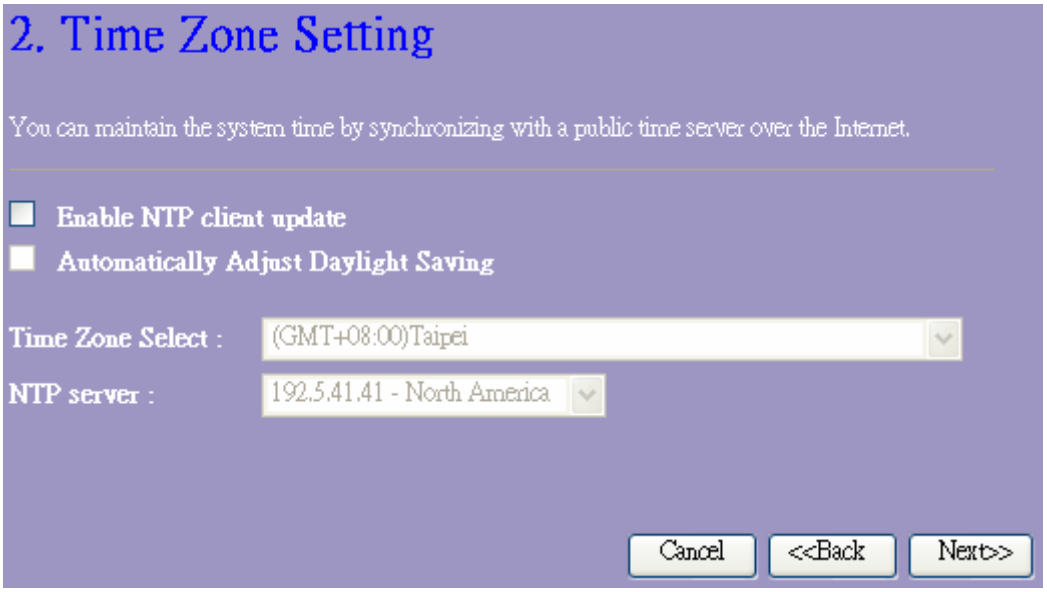
Note: The following instruction does an overall introduction to the Setup Wizard. For detail information to each item, please refer to instruction of each page.

1. To start the Setup Wizard, click the “Next” button to proceed.

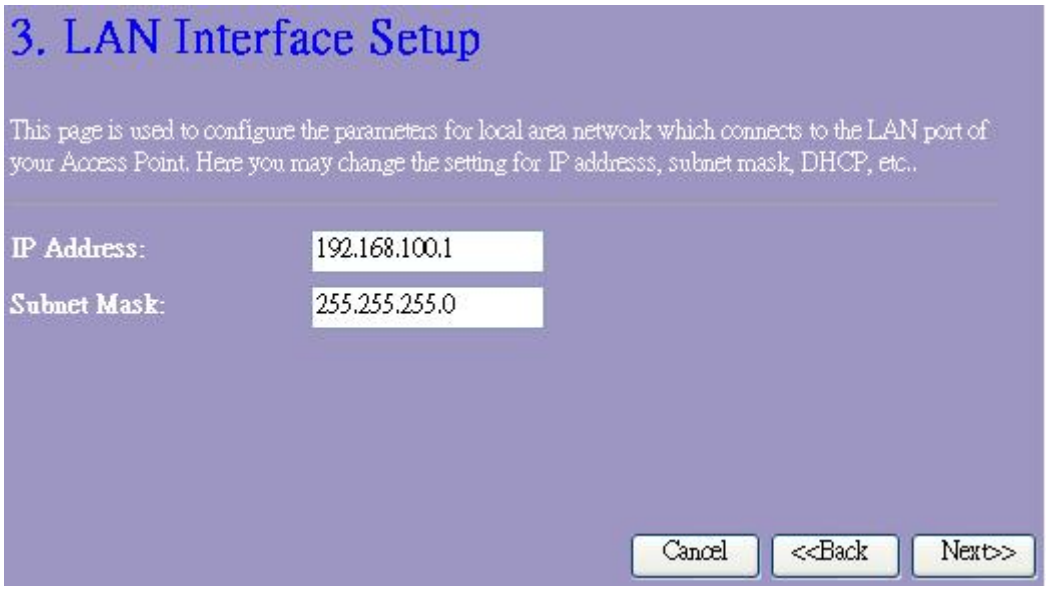
2. Select your demanding operation mode and click “Next”.



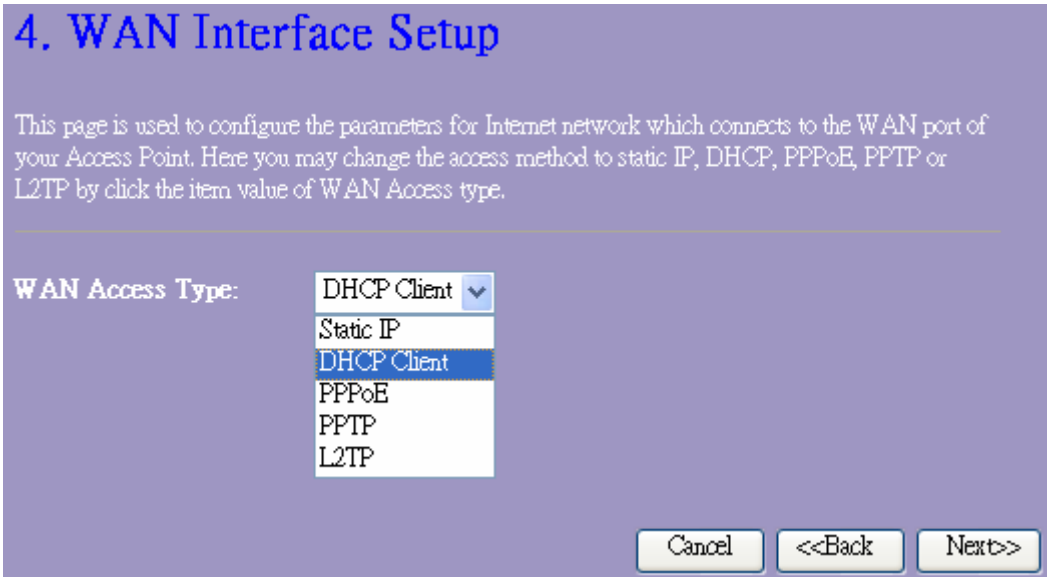
3. Mark the check box to enable synchronizing time by NTP server. Select the religion you live and a NTP server by clicking the drop list then click “Next”.



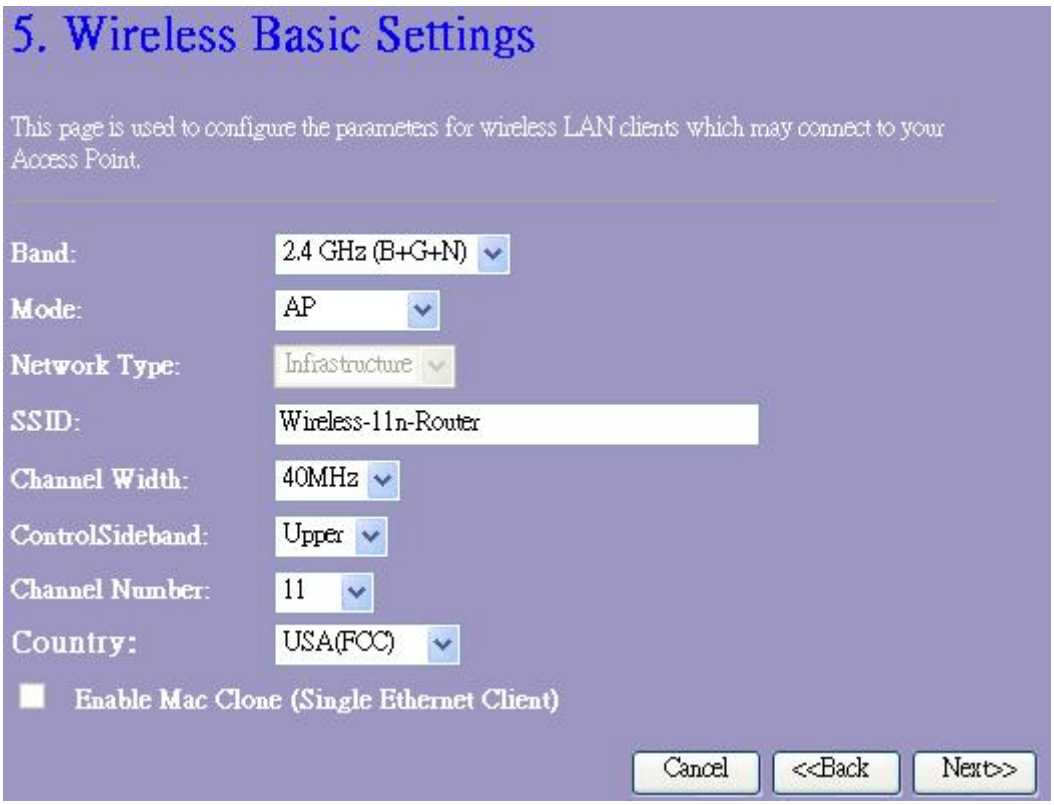
4. Specify an IP address and subnet mask for connecting to the router in LAN.



5. Select a WAN access type for the router to connect to Internet. Fill in the parameters that required in each blank, and then click the “Next” button. You may get those parameters from your ISP. WAN Access Type : Static IP, DHCP Client, PPPoE, PPTP, L2TP.



6. Select the wireless parameters that are used for associating with this router and click “Next”.

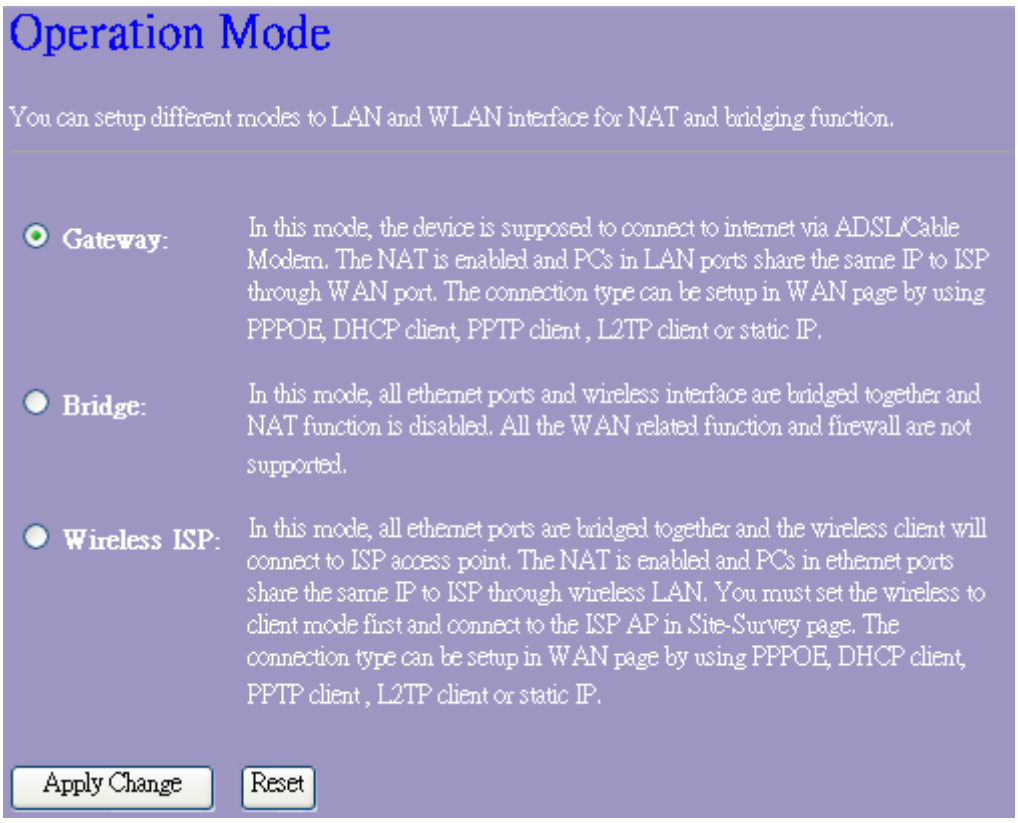


Items	Information
Band	2.4GHz(B),2.4GHz(G),2.4GHz(N),2.4GHz(B+G),2.4GHz(G+N), 2.4GHz(B+G+N)
Mode	AP, Client, WDS, AP+WDS, AP+MESH, MESH
Network Type	Infrastructure, Ad-hoc
Channel Width	40MHz, 20MHz
Control Sideband	Upper, Lower
Channel Number	Auto,5,6,7,8,9,10,11
Country	This contains USA(FCC), Canada(IC), Europe(ETSI), Spain, France, Japan(MKK)

7. Click the drop list to select the encryption type for your wireless network. Fill in the parameters for the encryption type you select and click finish to complete configuration. Encryption type : None, WEP, WPA(TKIP), WPA2(AES), WPA2 Mixed

3.4 Operation Mode

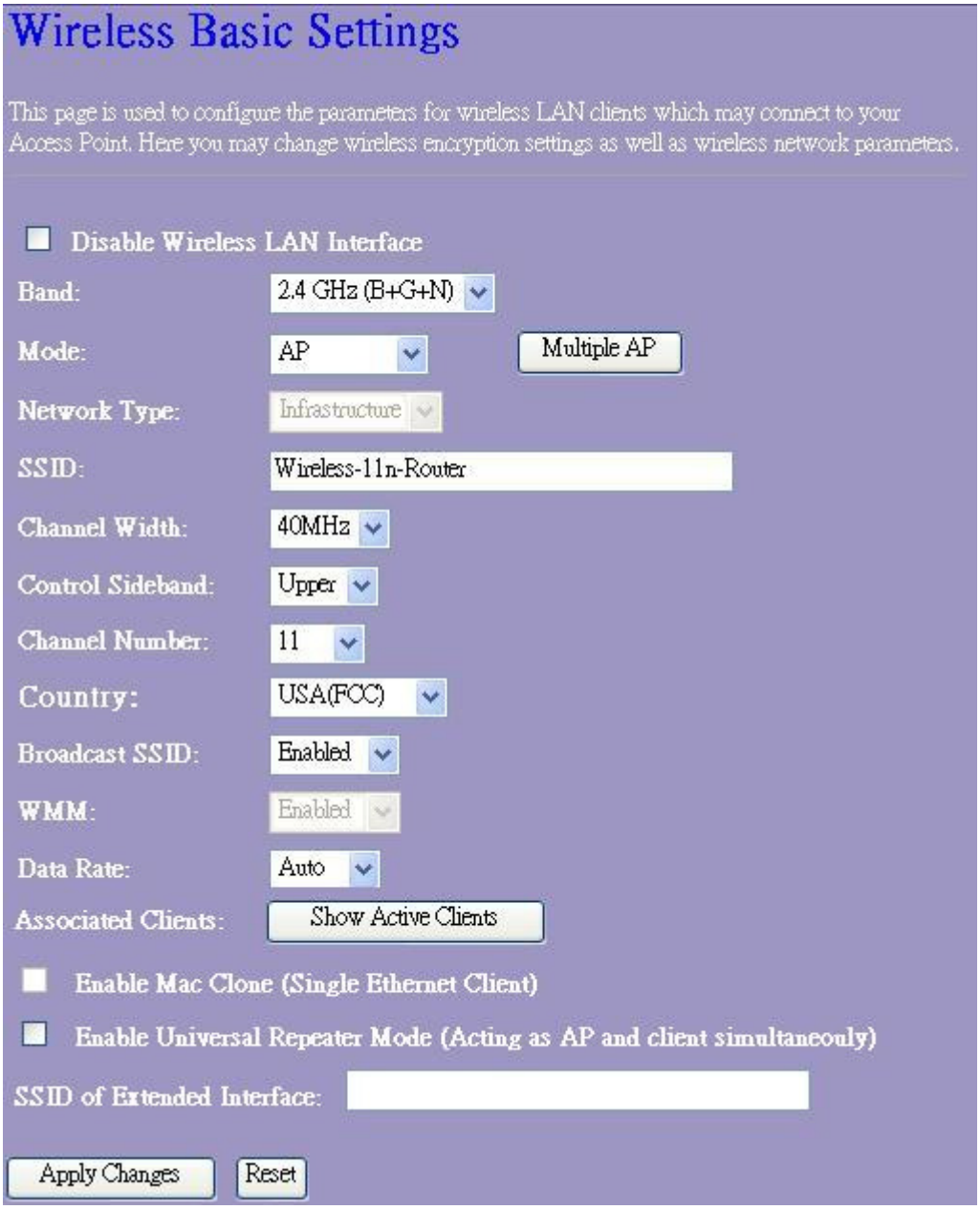
To select an operation mode for this router, click on the mode that you want to perform and click the Apply Change button to execute.



3.5 Wireless

3.5.1 Basic Settings

You can set up the configuration of your Wireless basic settings and monitor the Wireless Clients associate with your router.



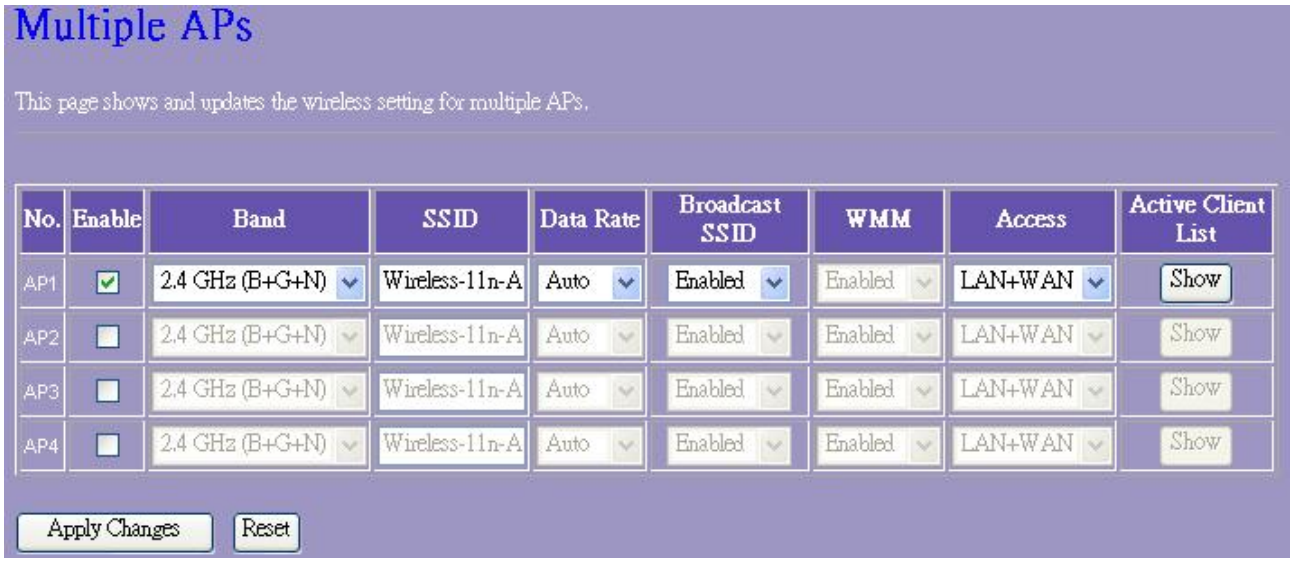
Items	Information
Disable Wireless LAN Interface	Mark the checkbox to disable interface of Wireless LAN
Band	To select a band for this device to match 802.11b, 802.11g, 802.11n, 802.11b/g, 802.11g/n or 802.11b/g/n. optional parameters:

	2.4GHz(B),2.4GHz(G),2.4GHz(N),2.4GHz(B+G),2.4GHz(G+N), 2.4GHz(B+G+N)
Mode	Configure this device as AP, Client, WDS or AP+WDS. If you set this device as AP or AP+WDS mode, the Multiple AP button is available for you to set up four SSID for this wireless network. Click on this button to do more configurations.
Network Type	When you configure this device in Client mode, this drop-down list allows users to change the network type into infrastructure mode or ad-hoc mode. **Ad-Hoc mode:** Connects two computers directly without the use of a router or AP. It is also know as a peer-to-peer network. **Infrastructure Mode:** The wireless network contains at least one wireless client and one wireless AP or router. This client connects to Internet or intranet by communicating with this wireless AP.
SSID	Service set identifier (SSID) for the name of the wireless network.
Channel Width	Select to use 20MHz or 40MHz as the wireless channel frequency.
Control Sideband	If you have selected the channel width of 40MHz for this router, you can control this router to use the frequency for a deflection of “Upper” or “Lower.”
Channel Number	Select a channel for the wireless network of this device.
Country	This contains USA(FCC), Canada(IC), Europe(ETSI), Spain, France, Japan(MKK)
Broadcast SSID	If you enable "Broadcast SSID", every wireless station located within the coverage of this wireless router can discover this wireless router easily. If you are building a public wireless network, enabling this feature is recommended. Disabling "Broadcast SSID" can provide better security.
WMM	This will enhance the data transfer performance of multimedia contents when they’re being transferred over wireless network. WMM is not available in 11n mode.
Data Rate	The transmit limitation of data packets of this wireless router. The wireless router will use the highest possible selected transmission rate to transmit the data packets.
Associated Client	Click "Show Active Clients" button, then an "Active Wireless Client Table" pops up. You can see the status of all active wireless stations that are connecting to the access point.
Enable MAC clone	Mark the checkbox to clone the MAC address of the device. This function is only available when you set this router as Client mode. You can also manually set the MAC address in WAN setting.
Enable Universal Repeater Mode	Mark this checkbox to enable Universal Repeater Mode which acts this device as an AP and client simultaneously.
SSID of Extended Interface	While you enable the Universal Repeater Mode, you have to specify an SSID for the extended interface.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

1. Multiple APs

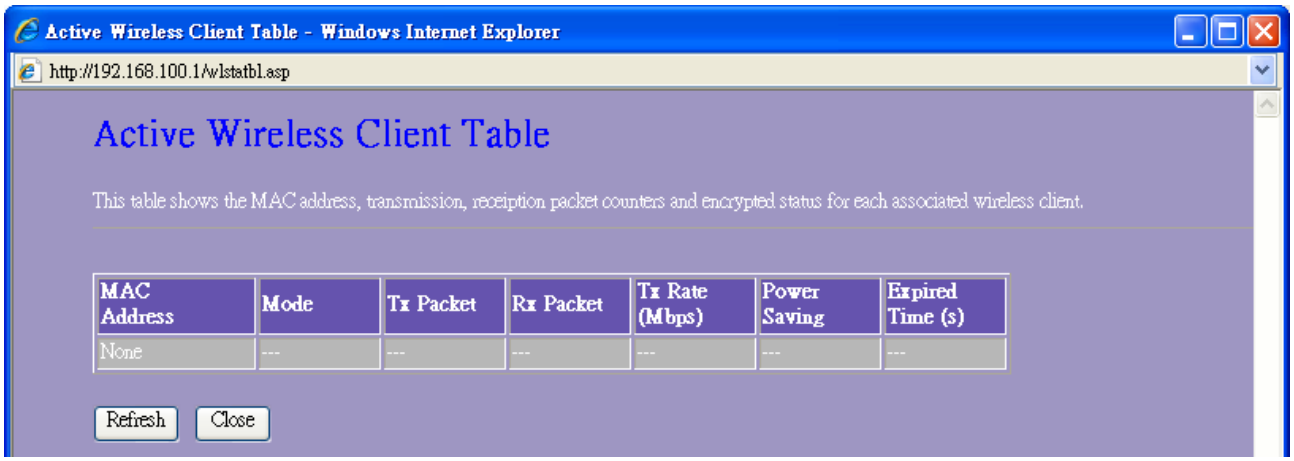
This is the window that pops up after clicking the Multiple AP button.



Select one of the AP, and then click the button “Show”, “Active Wireless Client Table – AP1” windows pops up.

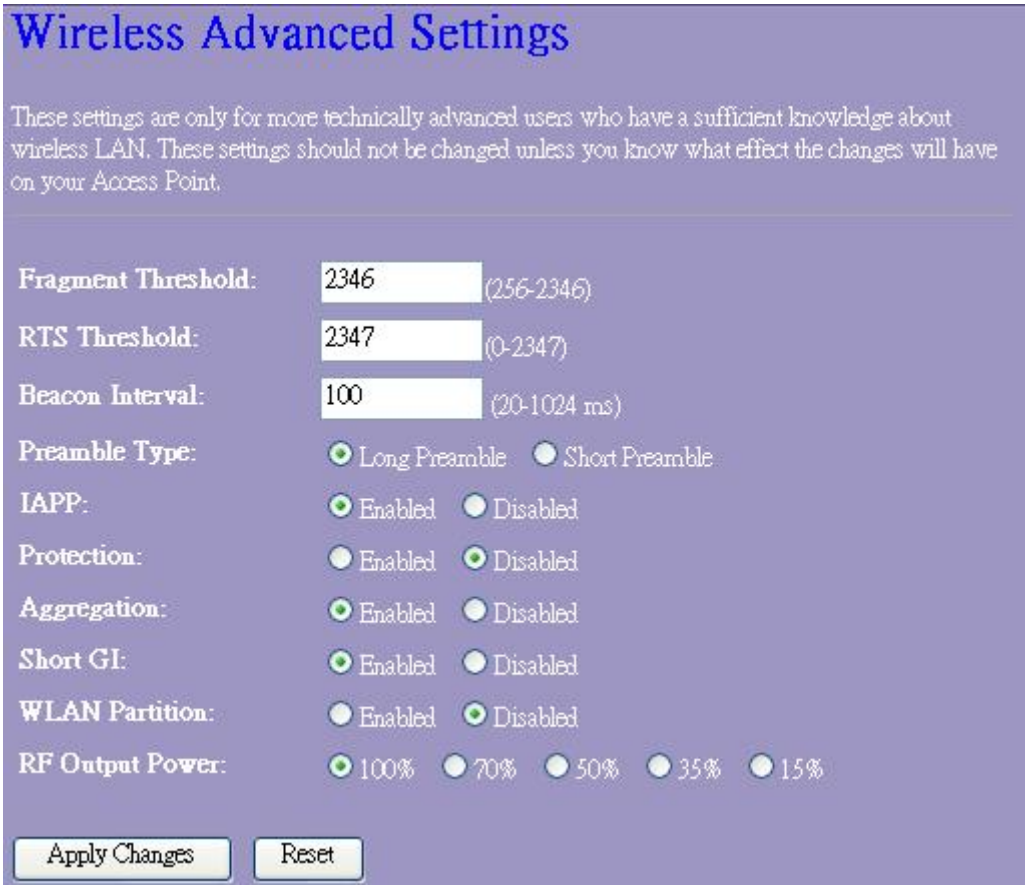
2. Active Wireless Client Table

This is the window that pops up after clicking the Show Active Clients button.



3.5.2 Advanced Settings

You can set advanced wireless LAN parameters for this router. We recommend not changing these parameters unless you know what changes will be on this router.



Items	Information
Fragment Threshold	This value should remain at its default setting of 2346. If you experience a high packet error rate, you may slightly increase your fragmentation threshold within the value range of 0 to 2346. Setting the fragmentation threshold too low may result in poor performance.
RTS Threshold	Request To Send Threshold. This value should remain at its default setting of 2347. If you encounter inconsistent data flow, only minor modifications to the value range between 1 and 2347 are recommended.
Beacon Interval	Beacons are packets sent by an access point to synchronize a wireless network. Specify a beacon interval value. Default (100ms) is recommended.
Preamble Type	The length of CRC blocks in the frames during the wireless communication.
IAPP	To enables multiple AP to communicate and pass information regarding the location of associated Stations.
Protection	Some 802.11g wireless adapters support 802.11g protections, which allows the adapter search for 802.11b/g singles only. Select “Enabled” to support protection or select “Disabled” to disable this function.
Aggregation	To aggregate lots of packets into a big one before transmitting packets. This can reduce control packet overhead.
Short GI	Indicates that the 802.11g network is using a short slot time because there are no legacy (802.11b) stations present
WLAN Partition	WLAN Partition controls your inter-client communication. Enabling WLAN Partition prevents associated wireless clients from communicating with each other.
RF Output Power	Select the signal strength for the wireless network.

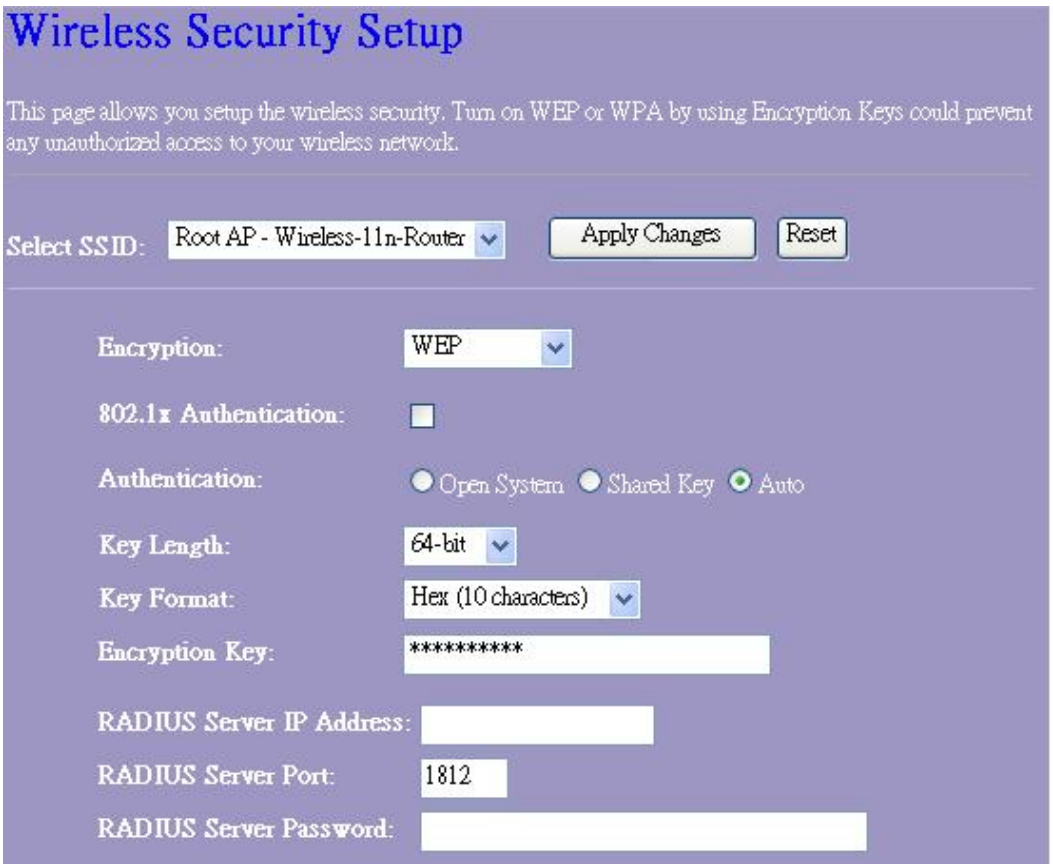
* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.5.3 Security

The Security function protects your wireless network from invasion. We provide WEP and WPA encryption to secure your wireless network. Please select Disable, WEP, WPA, WPA2, and WPA-Mixed in the drop list. If you select none, any data will be transmitted without encryption and any station can access the router.

Items	Information
Select SSID	Please choose a SSID you have set for this router in the Wireless > Basic Settings from the drop-down list. The SSID will be shown on the wireless network for recognizing.
Encryption	There are 5 modes for you to select: Disable, WEP, WPA, WPA2, and WPA-Mixed. Please refer to the following description.
802.1x Authentication	Users that do not use this function or connecting to an open-wireless network please skip this part. Please configure the settings in accordance with the Certificated Server.

1. Security Mode -- WEP



Items	Information
Encryption	Select a security encryption mode for this router.
802.1x Authentication	Users that do not use this function or connecting to an open-wireless network please skip this part. Please configure the settings in accordance with the Certificated Server.
Authentication	There provide three options for selecting: Open System, Shared Key, Auto
Key Length	Select 64-bit or 128-bit as the key encryption length.
Key Format	Select ASCII[1] or Hex[2] to setup the key value.
Encryption Key	Enter the key according to the key format you select.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

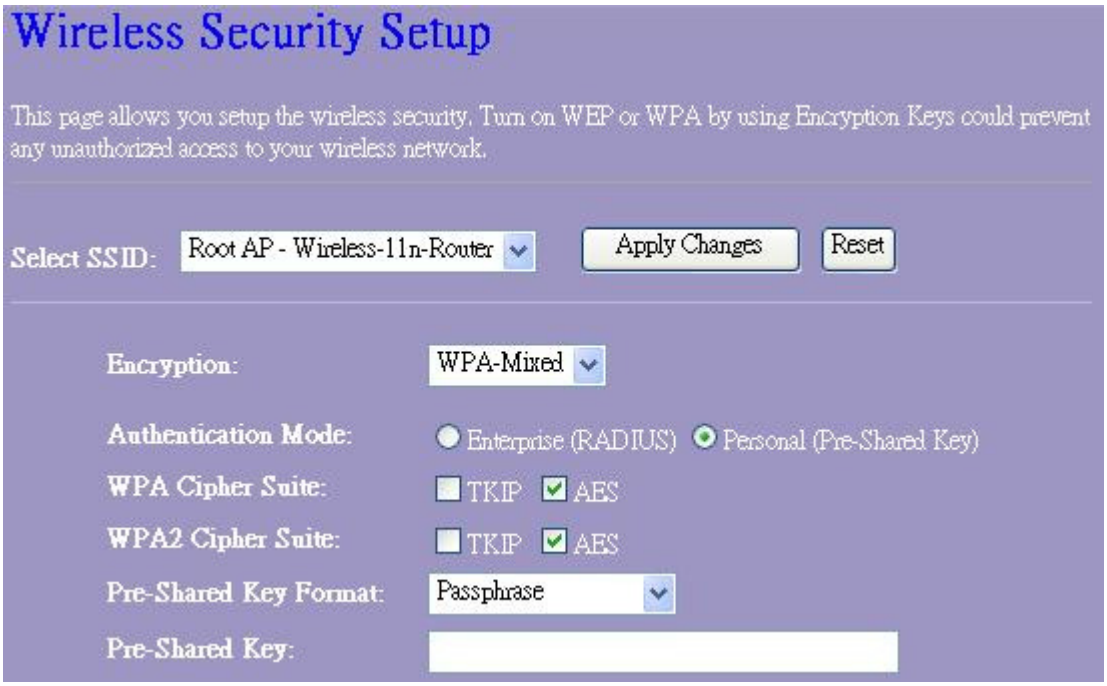
2. Security Mode – WPA / WPA 2

Items	Information
Authentication Mode	There are two items, “Enterprise (RADIUS)” and “Personal (Pre-Shared Key)”. You can select the mode by clicking the item.
WPA Cipher Suite	Select the WPA Cipher Suite to be TKIP or AES.
Pre-Shared Key Format	To decide the format, select Pass phrase or Hex in the drop list.
Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This is the shared secret between AP and STA. This field must be filled with character longer than 8 and less than 64 lengths.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

[1] ASCII (American Standard Code for Information Interchange) is a code for representing English letters as numbers from 0-127.
[2] Hexadecimal digits consist of the numbers 0-9 and the letters A-F.

3. Security Mode – WPA-Mixed



Items	Information
Authentication Mode	There are two items, “Enterprise (WPA-Radius)” and “Personal (Pre-Shared Key)”. You can select the mode by clicking the item.
WPA / WPA2 Cipher Suite	Select the WPA/WPA2 Cipher Suite to be TKIP or AES.
Pre-Shared Key Format	To decide the format, select Passphrase or Hex in the drop list.
Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This field must be filled with character longer than 8 and less than 64 lengths.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

3.5.4 Access Control

To restrict the clients of Access authentication of Stations, set up the control list in this page.

Items	Information
Wireless Access Control Mode	Click on the drop list to choose the access control mode. You may select “Allow listed” to allow those allowed MAC addresses or select “Deny Listed” to ban those MAC addresses from accessing to this device or select “Disable”.
MAC Address & Comment	Fill in the MAC address that you wish to control, and give a definition to it.
Current Access Control list	Lists the MAC Access Control Settings you have added before. Click on the list to change configuration. To Delete the station on the list, mark the check box in the select item and click the “Delete Selected”. If you want to delete all stations on the list, click “Delete All” to remove all of them.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configurations.

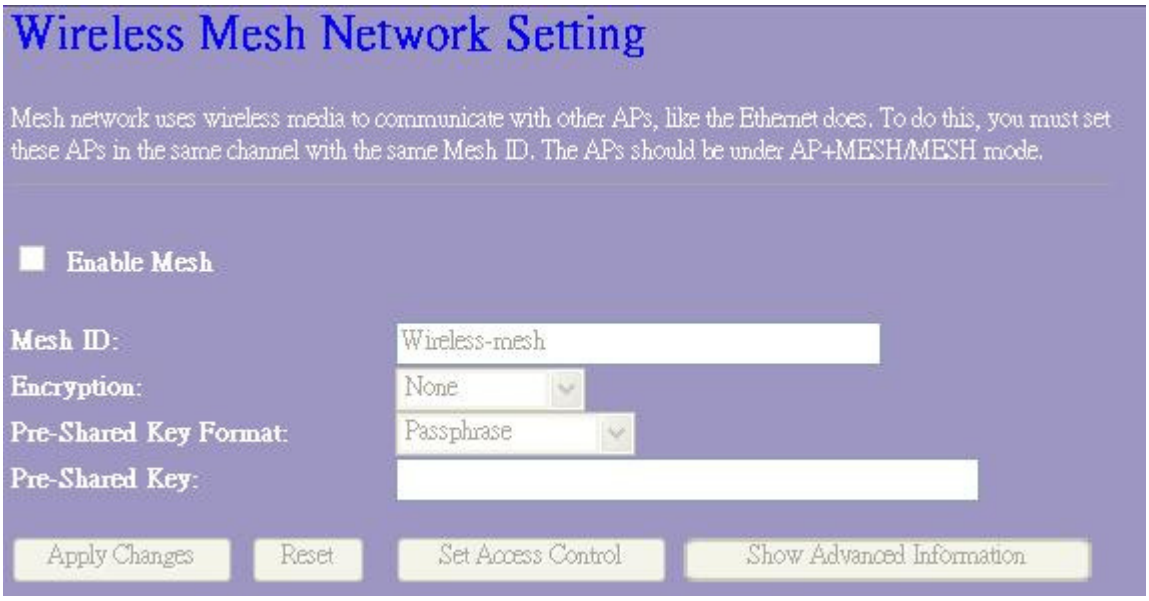
3.5.5 WDS Settings

When you use this device as WDS or AP+WDS mode, “WDS Setting” function can be operated. Wireless Distribution System allows the router to communicate with other APs wirelessly. To make it work, you must ensure that these APs and the Router are in the same channel. Please add these APs MAC address and comment values into the WDS list. Don’t Forget to Enable the WDS by click the check box of “Enable WDS” and press “Apply Changes” button to save. To Delete the AP on the list, Click the check box in the select item and click the “Delete Selected”. If you want to delete all APs on the list, click “Delete All” to remove all of them.

Items	Information
Enable WDS	Click to enable WDS.
MAC Address & Comment	Fill in the MAC address that you wish to control, and give a definition to it.
Data Rate	The transmit limitation of data packets of this wireless router. The wireless router will use the highest possible selected transmission rate to transmit the data packets.
Current WDS AP List	Lists the WDS Settings you have added before. Click on the list to change configuration. To Delete the station on the list, mark the check box in the select item and click the “Delete Selected”. If you want to delete all stations on the list, click “Delete All” to remove all of them.

3.5.6 Mesh Settings

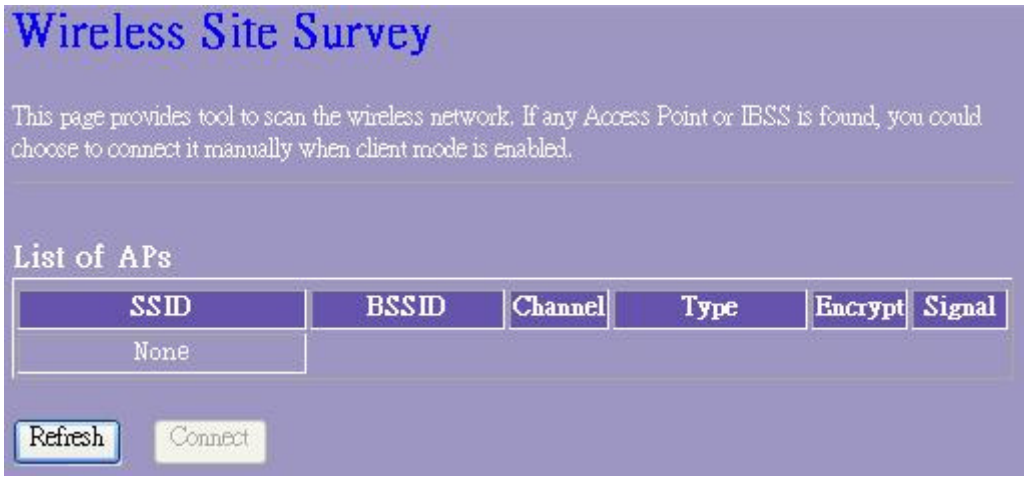
A Wireless Mesh Network (WMN) is a communications network made up of radio nodes organized in a mesh topology.Mesh networking allows for continuous connections and reconfiguration around broken or blocked paths by “hopping” from node to node until the destination is reached.



Items	Information
Enable Mesh	Click this checkbox to enable mesh.
Mesh ID	A character string ranging form 1 to 32 that will be used in the mesh node beacons.
Encryption	Select a security encryption mode for this router.
Pre-Shared Key Format	To decide the format, select Passphrase or Hex in the drop list.
Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This is the shared secret between AP and STA. This field must be filled with character longer than 8 and less than 64 lengths.

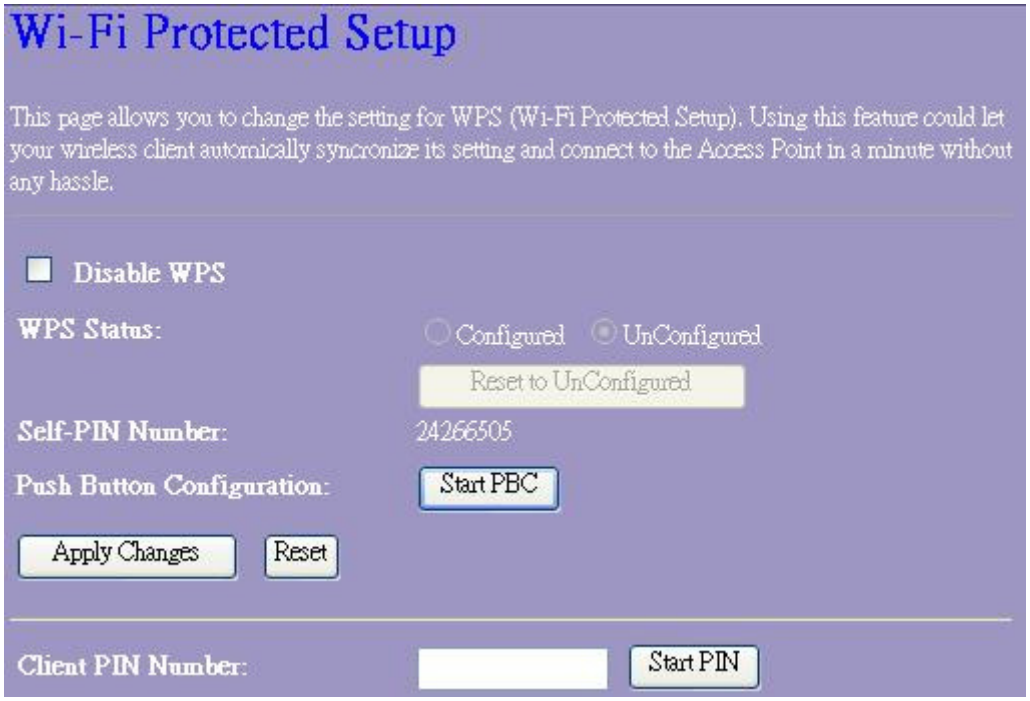
3.5.7 Site Survey

This page shows available wireless network information. When you use this device as a client station (STA), you may connect to other AP or Router. Select one of the lists in the site survey table and click on Connect to connect to other wireless network nearby. The Refresh button can be used to scan nearby Router and AP again.



3.5.8 WPS Settings

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This Router supports the configuration setup using PIN configuration method or PBC configuration method through an internal or external Registrar.

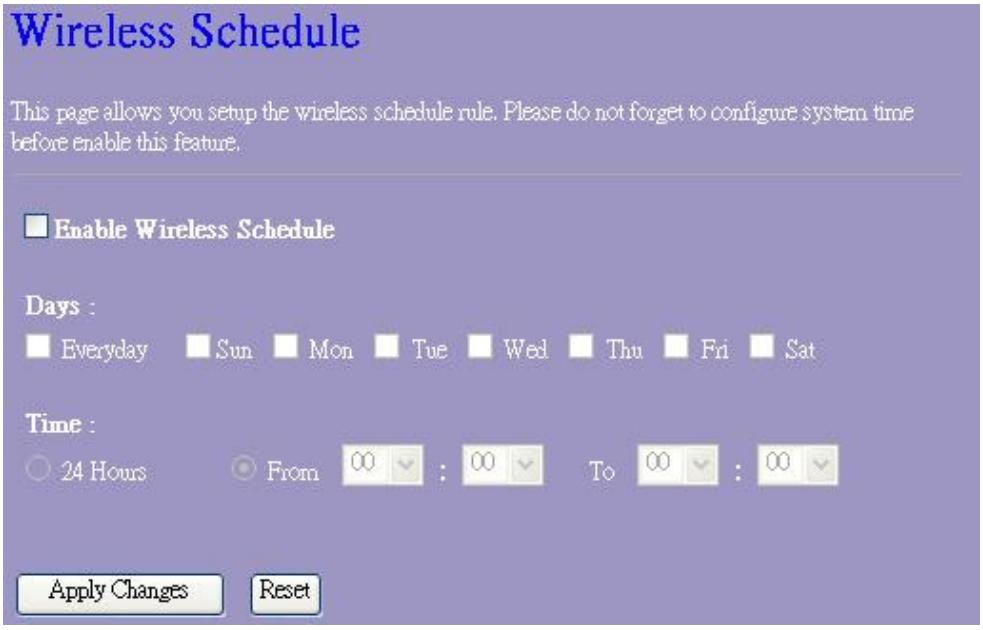


Items	Information
Disable WPS	Click this checkbox to undo WPS.
WPS Status	You cannot manually select the items here. The WPS Status will change from “UnConfigured” to “Configured” after you enable WPS function and setup a wireless security key for this device.
Self-PIN Number	If you use this device as a client, you can use this code when trying to connect this device to other AP by using the PIN method.
Push Button Configuration	Push Button Communication (PBC) method use a simple action of pushing a button on both the AP and the new STA to reach the function of easy setup WPS connection. You can simply click the Start PBC button in this GUI page. After click on the button, please run the client’s WPS and push the PBC button within 2 minutes.
Client PIN Number	Personal Identification Number (PIN) method. Users have to fill in the PIN code of enrollee device and click on the Start PIN button to make communication with other AP. After click on the button, please run the client’s WPS and push the PIN button within 2 minutes.

*Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.5.9 Schedule

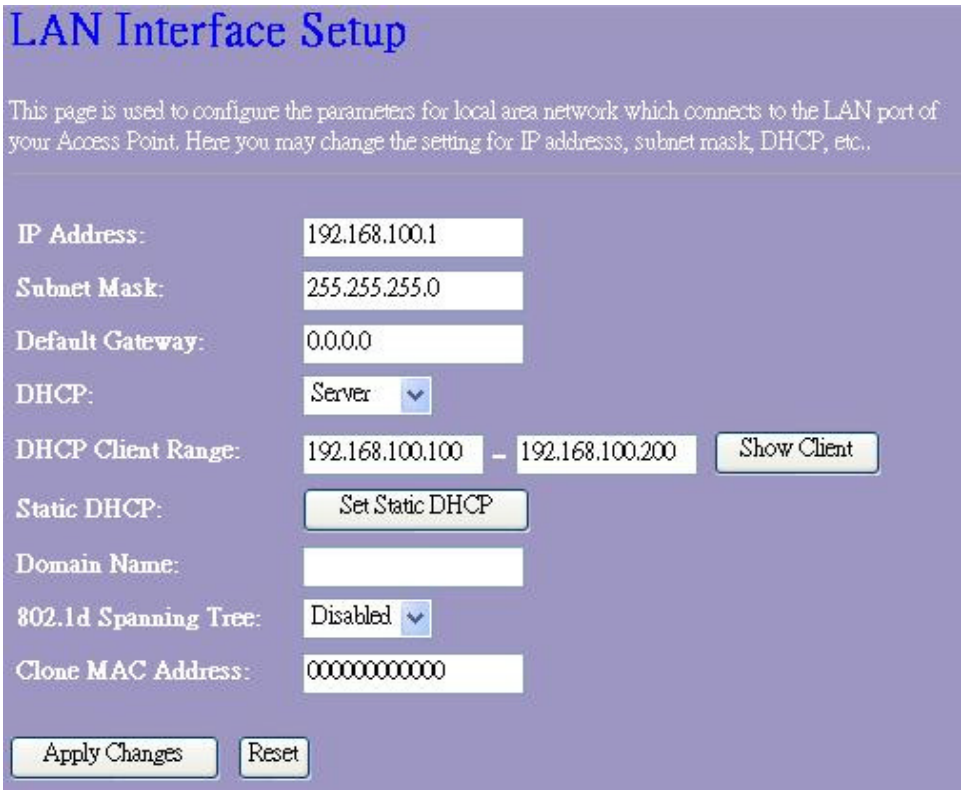
You can configure the schedule via this page. Click “Enable Wireless Schedule”, then configure days or time which you want. Wireless will start or stop at your scheduled time. Please do not forget to configure system time before enabling this feature.



3.6 TCP/IP Settings

3.6.1 LAN Interface Setup

To set up the configuration of LAN interface, private IP of your router LAN port and subnet mask for your LAN segment.



Items	Information
IP Address	The IP of your Router LAN port (default 192.168.100.1).
Subnet Mask	Subnet Mask of you LAN (default 255.255.255.0). All devices on the network must have the same subnet mask to communicate on the network.
Default Gateway	Enter the IP Address of the router in your network.
DHCP	DHCP stands for Dynamic Host Configuration Protocol. It is a protocol for assigning dynamic IP addresses “automatically.” You can select to use this router as a DHCP client or DHCP server. To give your LAN client an IP, you have to enable “DHCP Server”. If not, manual setting up your client IP is necessary when you want to use the router as your client’s default gateway.
DHCP Client Range	Specify the DHCP Client IP address range (default start from 150 and end to 200). You can also click the “Show Client” button to list those connected DHCP clients.
Static DHCP	This function is only available when you use this router as a DHCP server. This router may automatically assign the static DHCP address to the specific clients.
Domain Name	(Optional) The name of your local domain.
802.1d Spanning Tree	To prevent from network loops and preserve the quality of bridged network
Clone MAC Address	Your ISP may require a particular MAC address in order to connect to the Internet. This MAC address is the PC’s MAC address that your ISP had originally connected your Internet connection to. MAC cloning feature allows the MAC address reported by WAN side network interface card to be set to the MAC address already registered with the ISP eliminating the need to register the new MAC address with the ISP. This feature does not change the actual MAC address on the NIC, but instead changes the MAC address reported by Wireless Router to client requests. To Change the MAC address, enter it in the text box.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

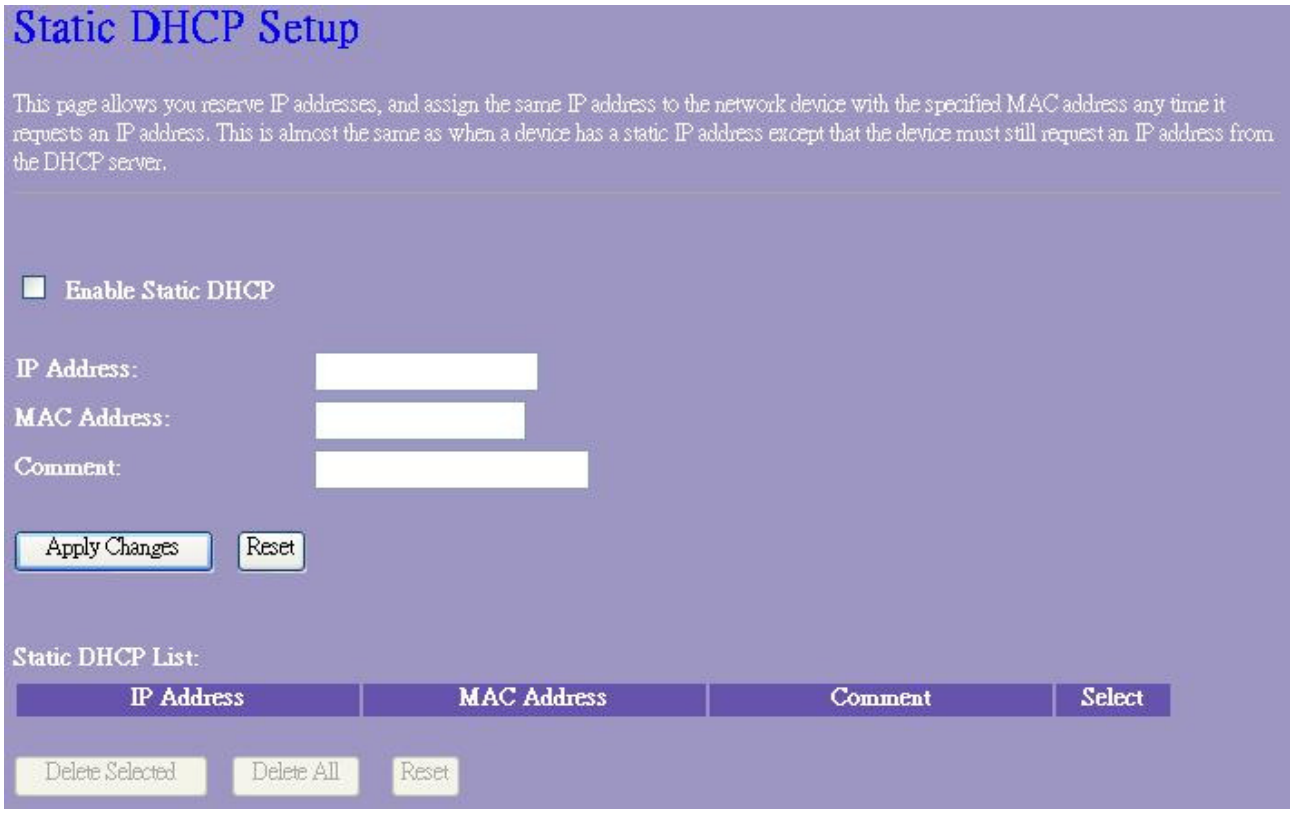
1. Active DHCP Client List

This is the window that pops up after clicking the 

button. It shows the information of IP/MAC address and expire time of the DHCP clients that have connected with this device.

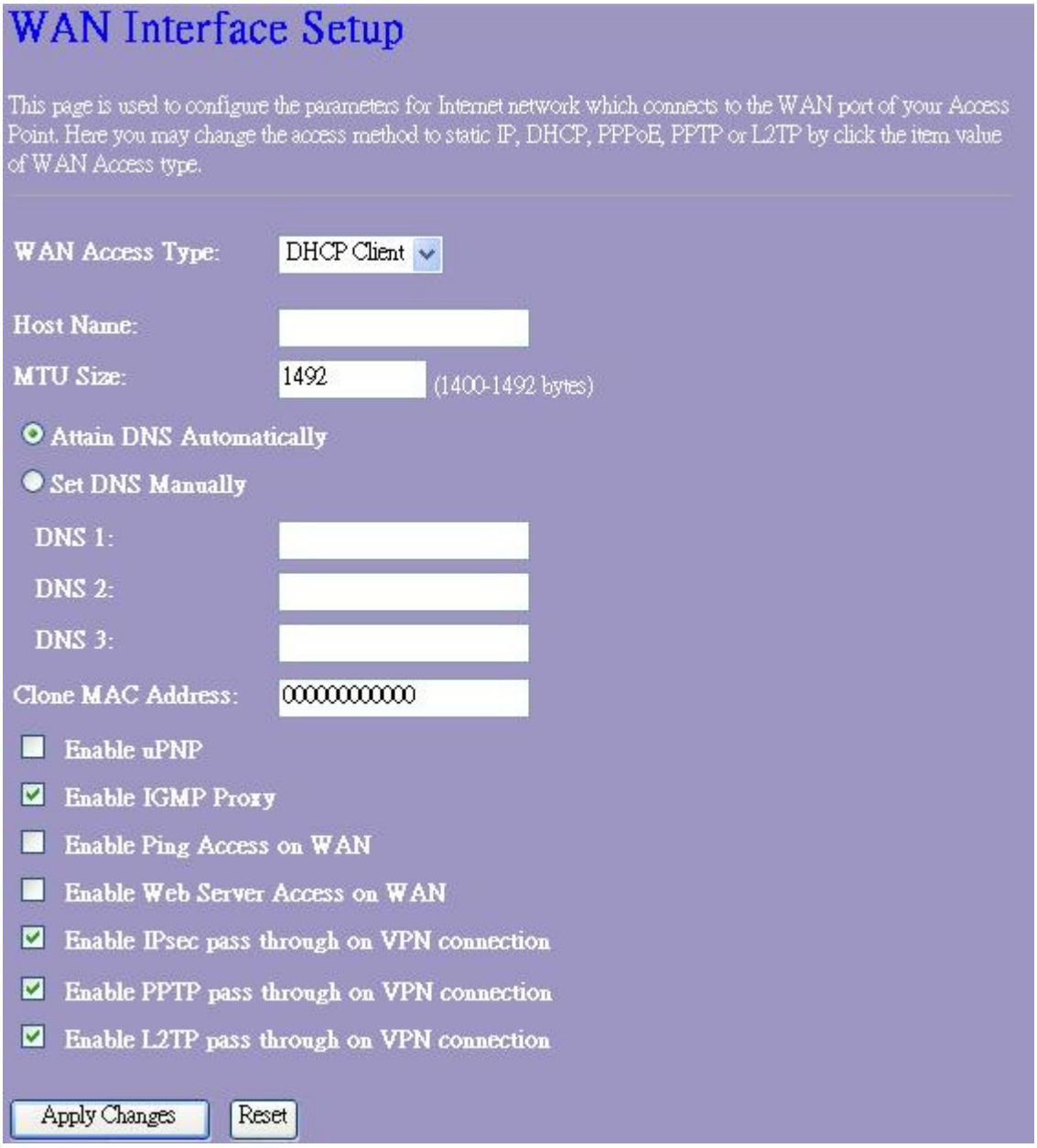
2. Static DHCP Setup

This is the window that pops up after clicking the Set Static DHCP button. Click on the list to change configuration. To delete the station on the list, mark the check box in the select item and click the “Delete Selected”. If you want to delete all stations on the list, click “Delete All” to remove all of them.



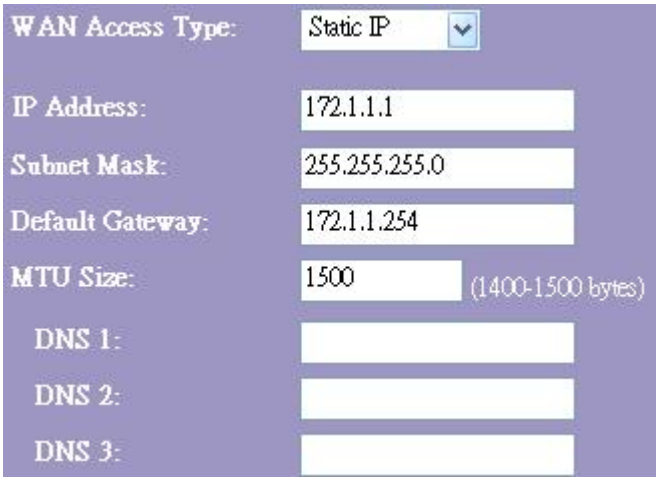
3.6.2 WAN Interface Setup

This page allows users to configure those parameters for connecting to Internet. You may select the Internet connection type from the “My Connection type” drop list and configure parameters for each mode. Five modes for selection: Static, DHCP, PPPoE, L2TP, and PPTP mode.



1. Static Mode (fixed IP)

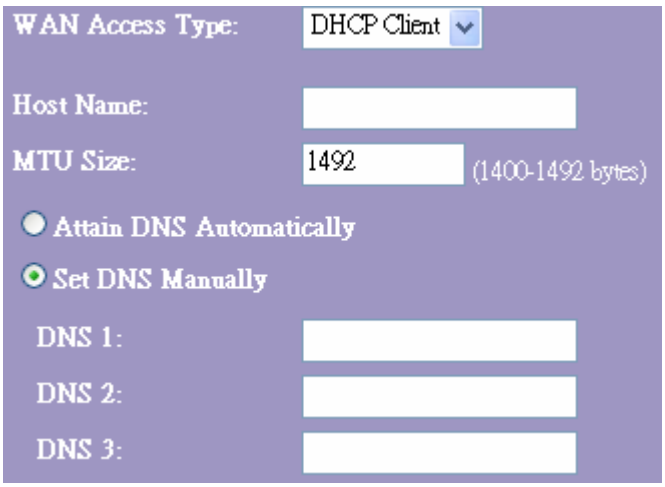
Devices that are assigned the same IP address may not be visible on the network. Enter the IP address of the DNS server. The DNS server translates domain names into IP addresses.



Items	Information
IP Address, Subnet Mask and Default Gateway	Fill in the IP address, Subnet Mask and Default Gateway that provided by your Internet Service Provider (ISP).
MTU Size	To Enable the Maximum Transmission Unit of Router setup. Any packet over this number will be chopped up into suitable size before sending. Larger number will enhance the transmission performance. Enter the MTU number in the blank to set the limitation (default 1500 bytes).
DNS 1~3	To specify the Domain Name System (DNS). The DNS server translates domain names into IP addresses. Enter the DNS provided by your ISP in first, second and third server.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

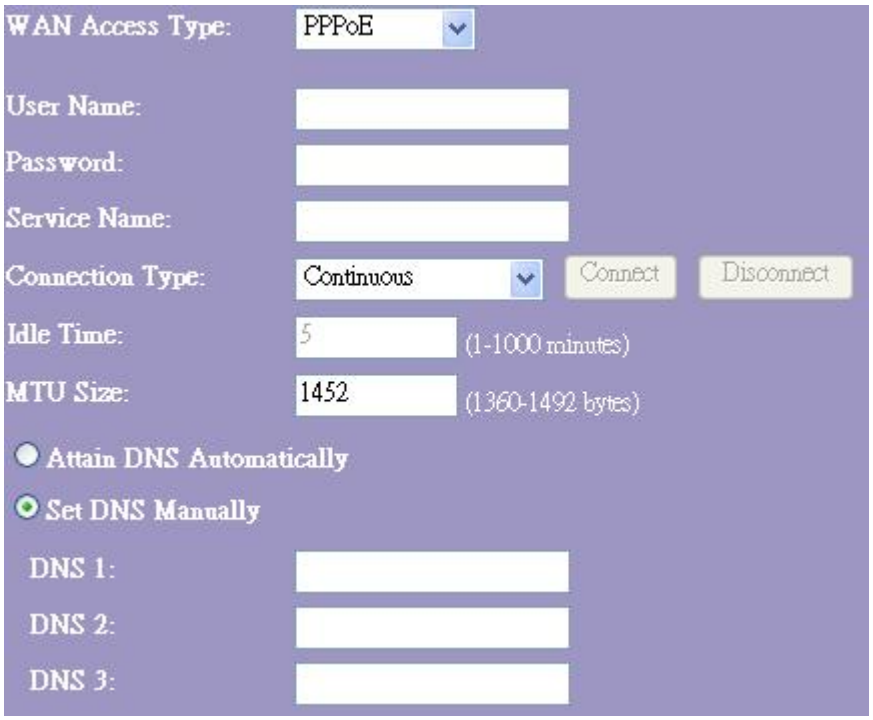
2. DHCP (Auto Config)



Items	Information
Host Name	The name of this device.
MTU Size	To Enable the Maximum Transmission Unit of Router setup. Any packet over this number will be chopped up into suitable size before sending. Larger number will enhance the transmission performance. Enter your MTU number in the text-box to set the limitation (default 1492 bytes).
Attain DNS Automatically	If your DNS provide by ISP is dynamic, choose “Attain DNS automatically
Set DNS Manually	To specify the Domain Name System (DNS). The DNS server translates domain names into IP addresses. Enter the DNS provided by your ISP in first, second and third server.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3. PPPoE (ADSL)

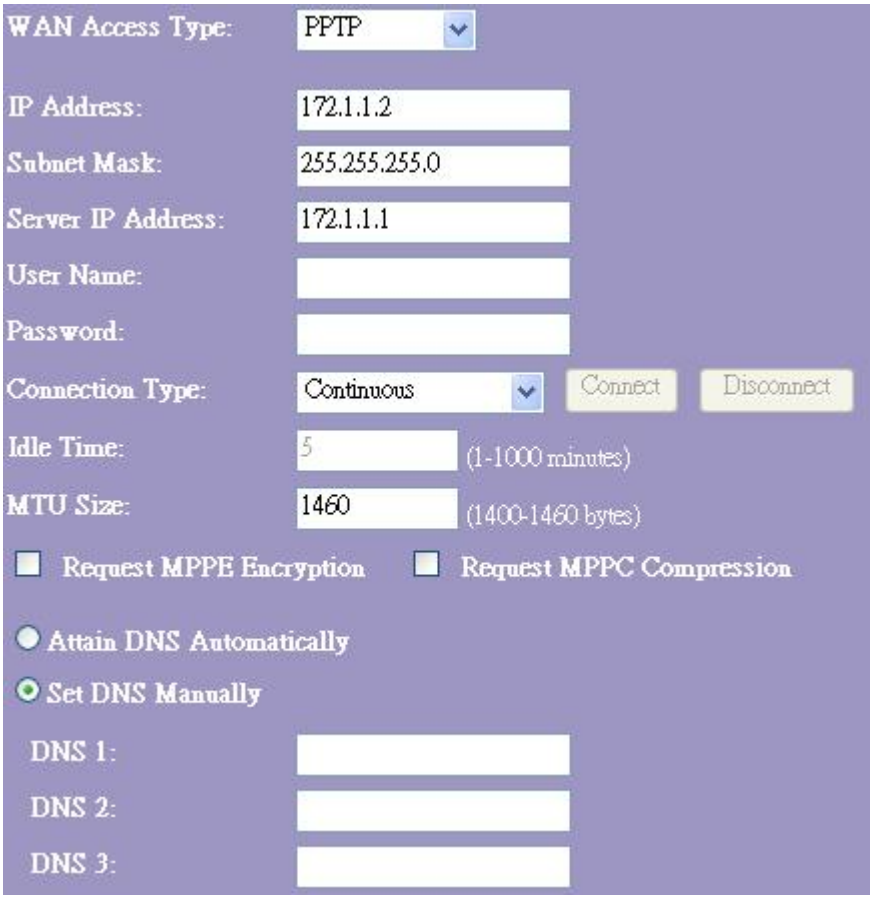


Items	Information
Username, Password and Service Name	Fill in the User Name, password and service name that provided by your ISP.
Connection Type	There are three connection types: **"Continuous":** always keep connection. **"Connect on demand":** bill by connection time. You can set up the idle time for the value. Specifies the number of time that elapses before the system automatically disconnects the PPPoE session. **"Manual":** To connect to ISP, click "Connect" manually from the WEB user interface. The WAN connection will not lose its connection even the idle time is out. If the WAN line breaks down and latter links again, the router will not auto-connect to the ISP.
Idle Time	The value specifies the number of idle time that elapses before the system automatically disconnects the PPPoE session.
MTU Size	To Enable the Maximum Transmission Unit of Router setup. Any packet over this number will be chopped up into suitable size before sending. Larger number will enhance the transmission performance. Enter your MTU number in the text-box to set the limitation (default 1452 bytes).
Attain DNS Automatically	If your DNS provide by ISP is dynamic, choose "Attain DNS automatically
Set DNS Manually	To specify the Domain Name System (DNS). The DNS server translates domain names into IP addresses. Enter the DNS provided by your ISP in first, second and third server.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

4. PPTP

Point-to-Point Tunneling Protocol (PPTP) is a method for implementing virtual private networks (VPNs).



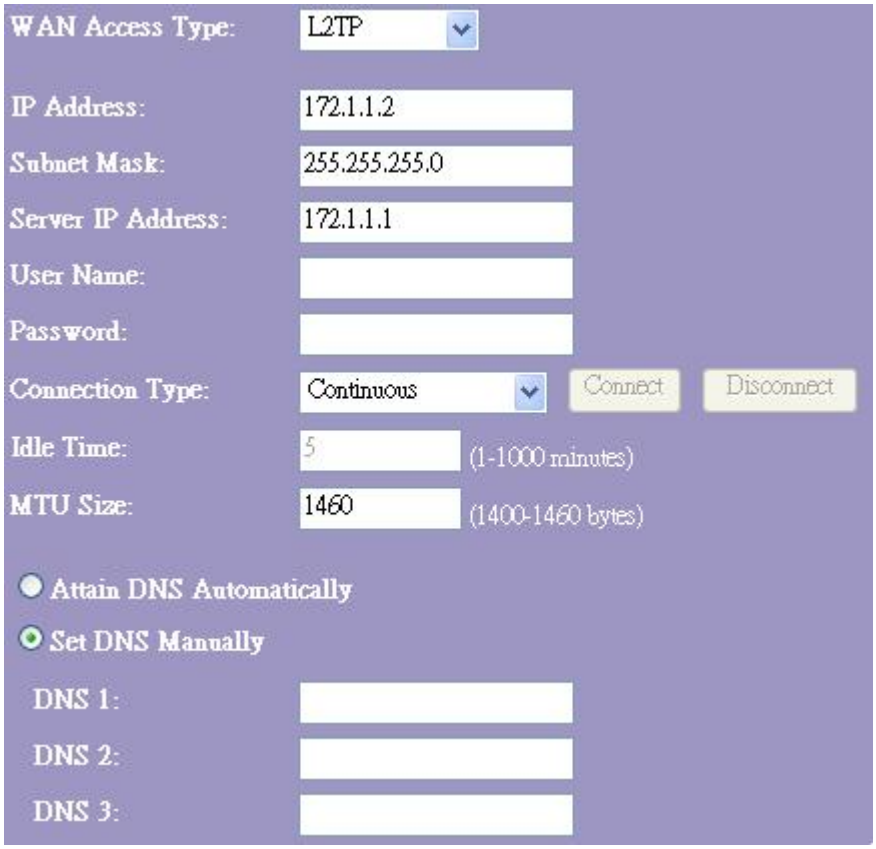
Items	Information
IP address & Subnet Mask	Fill in IP address & Subnet Mask that match the same subnet provided by your Internet Service Provider (ISP).
Username and Password	Fill in Username and Password that provided by your Internet Service Provider (ISP).
Idle Time	The value specifies the number of idle time that elapses before the system automatically disconnects the PPTP session.
MTU Size	To Enable the Maximum Transmission Unit of Router setup. Any packet over this number will be chopped up into suitable size before sending. Larger number will enhance the transmission performance. Enter the MTU number in the blank to set the limitation (default 1460 bytes).

Request MPPE Encryption	Mark to enable the Microsoft Point-to-Point Encryption function. MPPE compresses data across PPP or VPN links.
Request MPPC Compression	Mark to enable the Microsoft Point-to-Point Compression function. MPPC can only be used in products that implement the Point to Point Protocol AND for the sole purpose of interoperating with other MPPC and Point to Point Protocol implementations.
Attain DNS Automatically	If your DNS provide by ISP is dynamic, choose “Attain DNS automatically
DNS 1~3	To specify the Domain Name System (DNS). The DNS server translates domain names into IP addresses. Enter the DNS provided by your ISP in first, second and third server.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

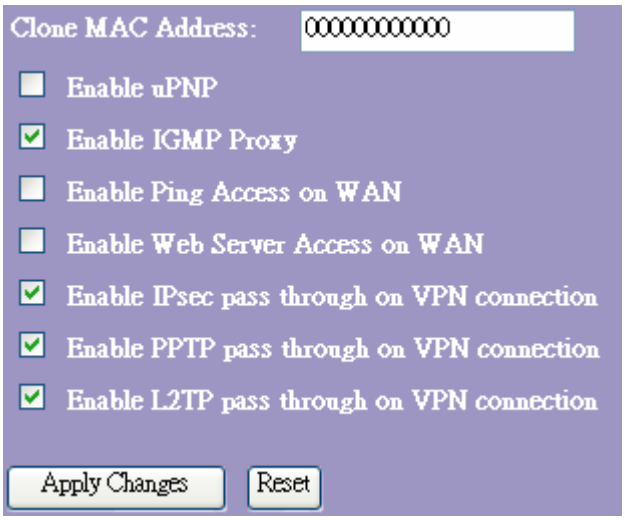
5. L2TP

The Layer Two Tunneling Protocol (L2TP) provides a standard method for transporting the link layer of the Point-to-Point Protocol (PPP) between a dial-up server and a Network Access Server, using a network connection in lieu of a physical point-to-point connection.



Items	Information
IP address & Subnet Mask	Fill in IP address & Subnet Mask that match the same subnet provided by your Internet Service Provider (ISP).
Username and Password	Fill in the Username and Password that provided by your Internet Service Provider (ISP).
MTU Size	To Enable the Maximum Transmission Unit of Router setup. Any packet over this number will be chopped up into suitable size before sending. Larger number will enhance the transmission performance. Enter the MTU number in the blank to set the limitation (default 1460bytes).
Attain DNS Automatically	If your DNS provide by ISP is dynamic, choose “Attain DNS automatically
DNS 1~3	To specify the Domain Name System (DNS). The DNS server translates domain names into IP addresses. Enter the DNS provided by your ISP in first, second and third server.

6. Common configurations for WAN interface



There are some settings are able to be configured on each WAN access type:

Items	Information
Clone MAC Address	When ISP use MAC address authentication (with DHCP), then the MAC address of the Ethernet card attached to your Cable modem must be registered with the ISP before connecting to the WAN (Internet). If the Ethernet card is changed, the new MAC address must be registered with the ISP.

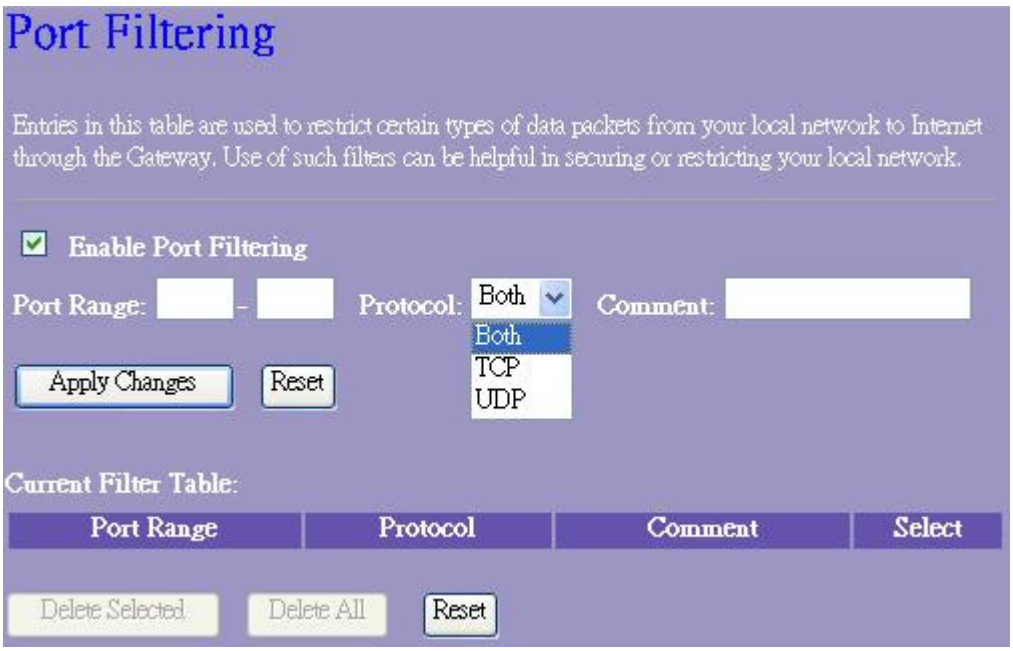
	MAC cloning feature allows the MAC address reported by WAN side network interface card to be set to the MAC address already registered with the ISP eliminating the need to register the new MAC address with the ISP. This feature does not change the actual MAC address on the NIC, but instead changes the MAC address reported by Wireless Router to client requests. To Change the MAC address, enter it in the text box.
Enable uPNA	Click to enable Universal Plug and Play for dynamically attaching devices directly to a computer, enabling clients that recognize the types of the devices to immediately begin using the device.
Enable IGMP Proxy	Enable IGMP proxy for the system to issue IGMP host messages on behalf of hosts that the system discovered through standard IGMP interfaces. The system acts as a proxy for its hosts.
Enable Ping Access on WAN	Click to enable your WAN IP address to be pingable.
Enable Web Server Access on WAN from port	To Enable the user to access this Router with WAN port IP address from Internet
Enable IPsec pass through on VPN connection	Mark the check box to enable IPsec pass through on VPN connection and clear the checkbox to disable.
Enable PPTP pass through on VPN connection	Mark the check box to enable PPTP pass through on VPN connection and clear the checkbox to disable.
Enable L2TP pass through on VPN connection	Mark the check box to enable L2TP pass through on VPN connection and clear the checkbox to disable.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.7 Firewall Settings

3.7.1 Port Filter

The firewall could not only obstruct outside intruders from intruding your system, but also restricting the LAN users. Port filter restricts certain type of data packets from your LAN to Internet through the router.

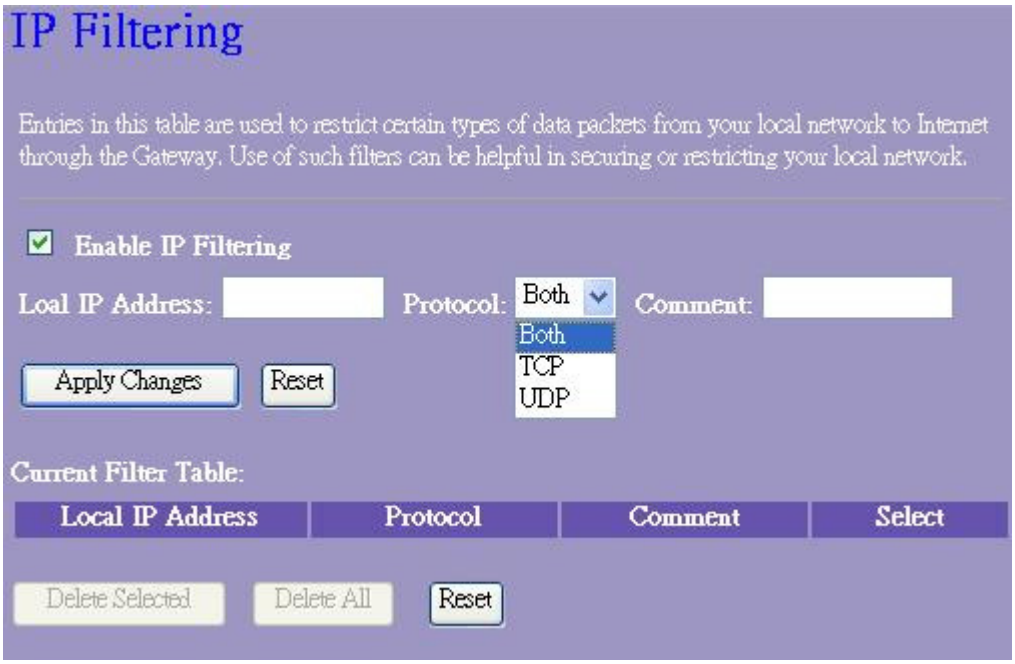


Items	Information
Enable Port Filtering	Mark to enable the configuration, and clear to disable.
Port Range	Fill in the port range that you wish to filter. The valid numbers are 1~65535.
Protocol	Select the protocol type of TCP, UDP or Both.
Comment	Input any text to describe this mapping
Current Filter Table	Lists the Port Filter Settings you have added before. To delete the settings on the list, click the check box in the select item and click the “Delete Selected”. If you want to delete all entries on the list, click “Delete All” to remove all of them.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.7.2 IP Filter

The Wireless Router could filter the outgoing packets for security or management consideration.

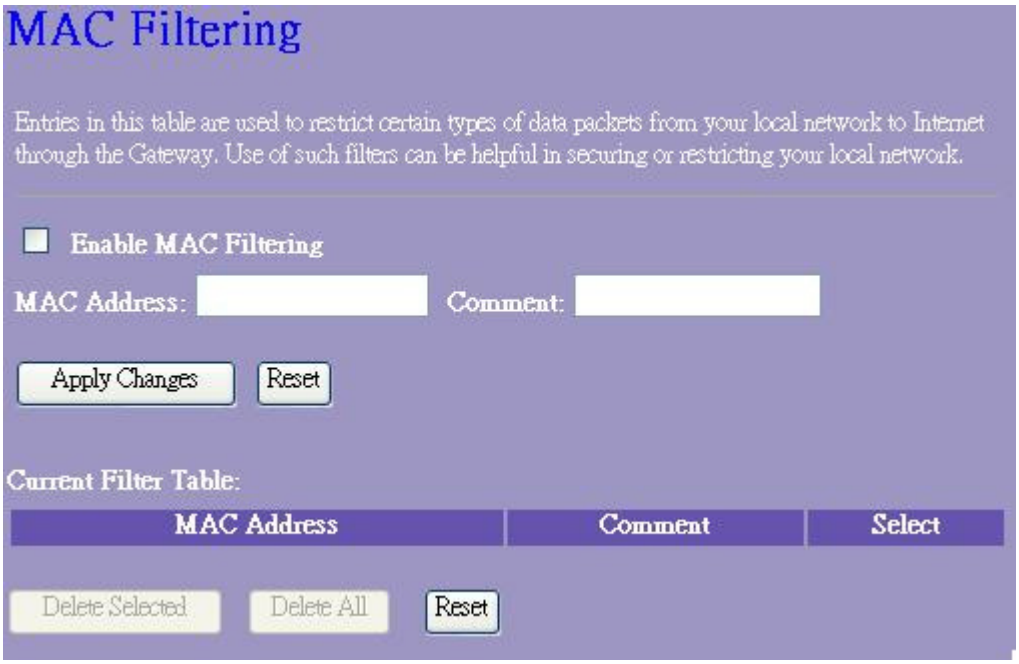


Items	Information
Enable IP Filtering	Mark to enable the configuration, and clear to disable.
Local IP Address	Fill in the IP address that you wish to filter.
Protocol	Select the protocol type of “TCP”, “UDP” or both.
Comment	Input any text to describe this mapping,
Current Filter Table	Lists the IP Filter Settings you have added before. To delete the settings on the list, click the check box in the select item and click the “Delete Selected”. If you want to delete all entries on the list, click “Delete All” to remove all of them.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.7.3 MAC Filter

The Wireless Router could filter the outgoing packets for security or management consideration.

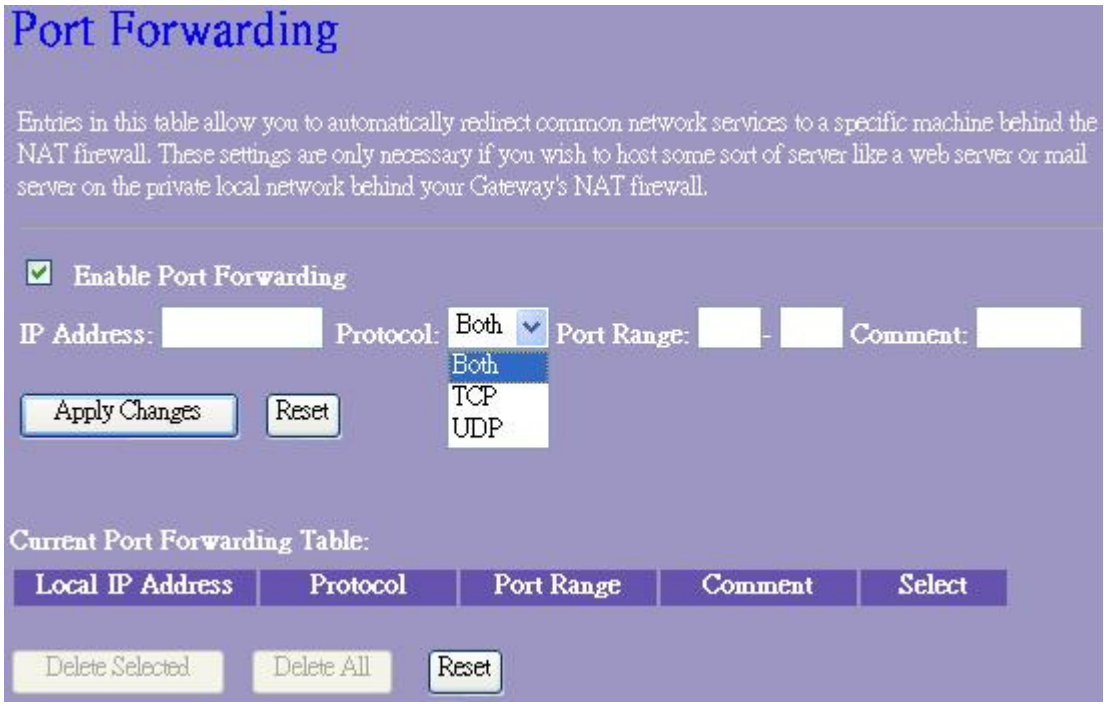


Items	Information
Enable MAC Filtering	Mark to enable the configuration, and clear to disable.
MAC Address	Fill in the MAC address that you wish to filter.
Comment	Input any text to describe this mapping.
Current Filter Table	Lists the MAC Filter Settings you have added before. To delete the settings on the list, click the check box in the select item and click the “Delete Selected”. If you want to delete all entries on the list, click “Delete All” to remove all of them.

Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.7.4 Port Forwarding

The Port Forwarding allows you to re-direct a particular range of service port numbers (from the Internet/WAN Ports) to a particular LAN IP address.

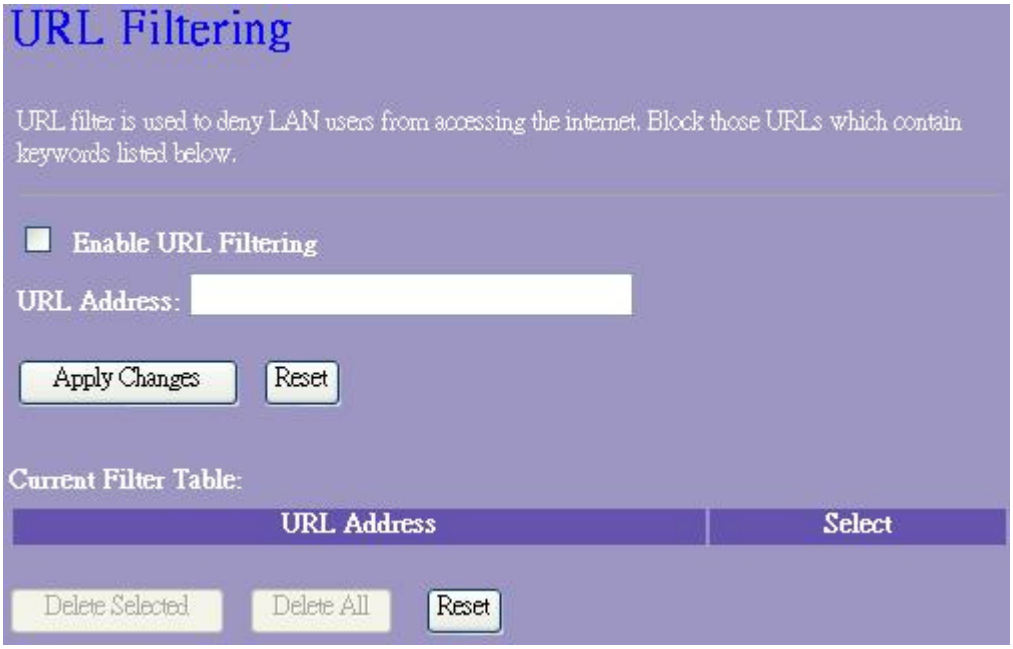


Items	Information
Enable Port Forwarding	Mark to enable the configuration, and clear to disable.
IP Address	Fill in the IP address that you wish to forward.
Protocol	Select the protocol type of TCP, UDP or Both.
Port Range	Fill in the port range that you wish to forward. The valid numbers are 1~65535.
Comment	Input any text to describe this mapping.
Current Port Forwarding Table	Lists the Port Forward Settings you have added before. To delete the settings on the list, click the check box in the select item and click the “Delete Selected”. If you want to delete all entries on the list, click “Delete All” to remove all of them.

Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.7.5 URL Filter

The URL Filter allows users to prevent certain URL from accessing by users in LAN. This filter will block those URLs that contain certain keywords.

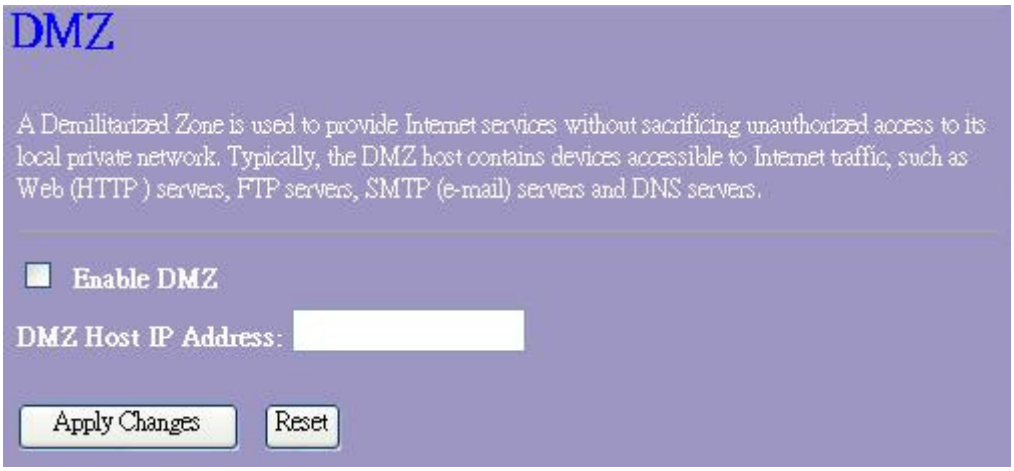


Items	Information
Enable URL Filtering	Mark to enable the configuration, and clear to disable.
URL Address	Fill in the URL address that you wish to filter.
Current Filter Table	Lists the URL Filter Settings you have added before. To delete the settings on the list, click the check box in the select item and click the “Delete Selected”. If you want to delete all entries on the list, click “Delete All” to remove all of them.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

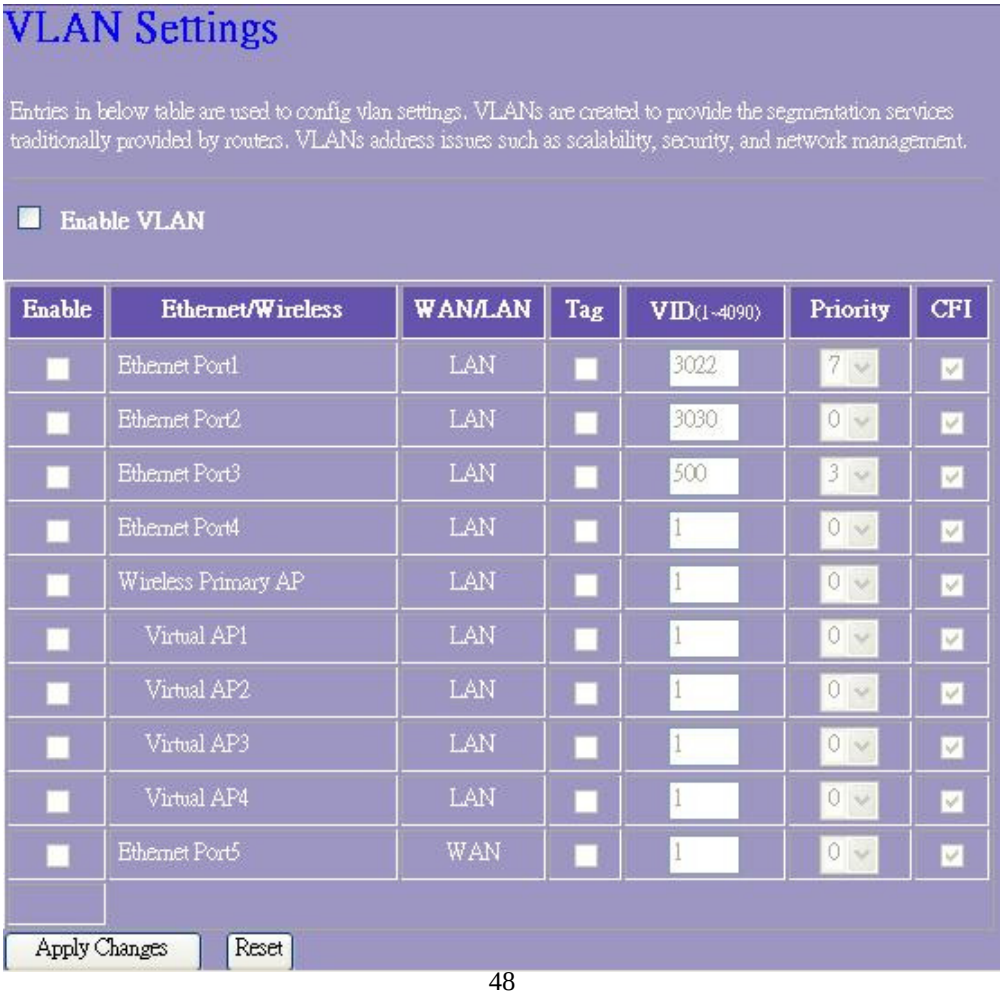
3.7.6 DMZ

To configure it, mark to enable virtual DMZ and then enter the Host IP (private IP address) and click Apply Changes to enact the setting.



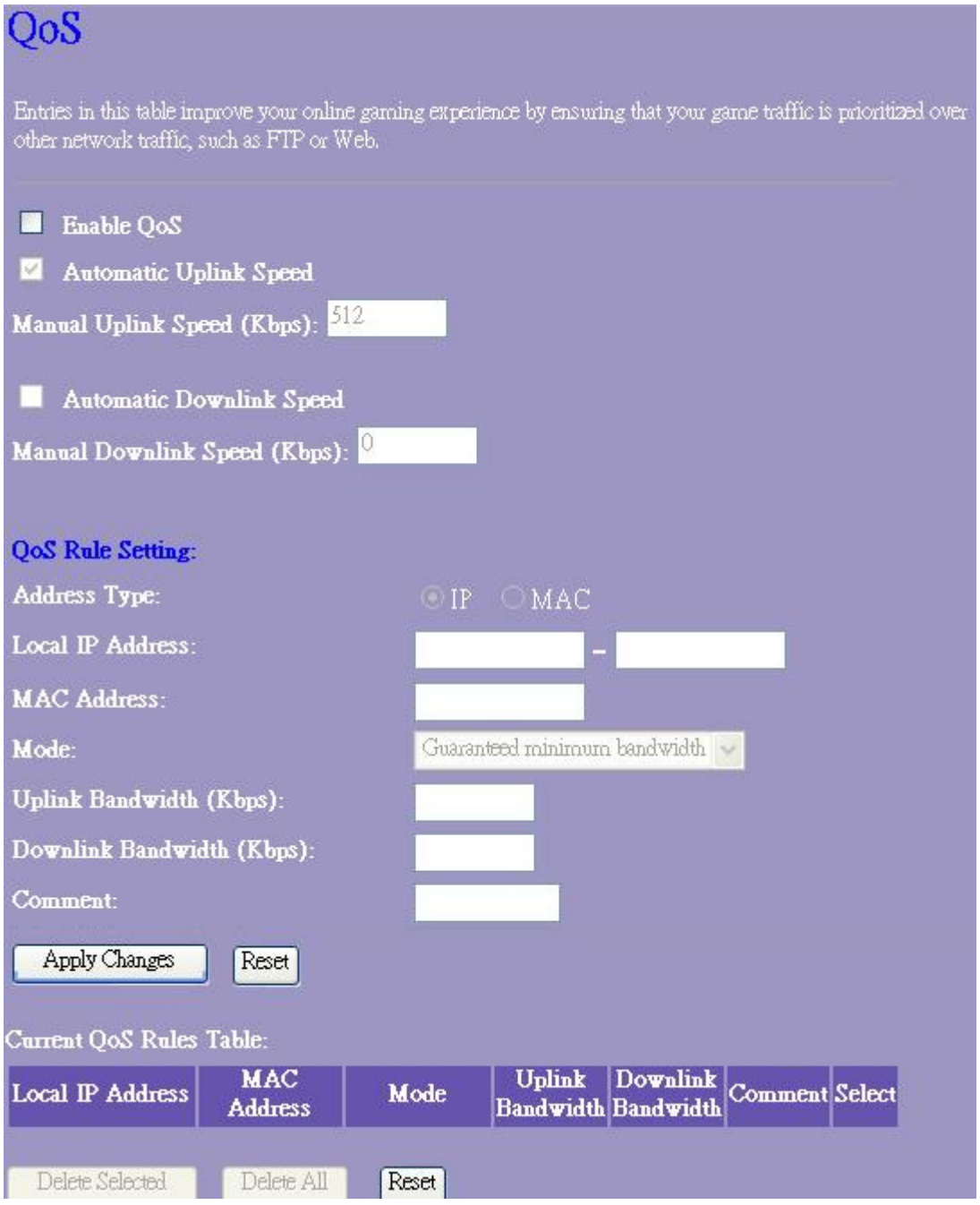
3.7.7 VLAN

VLAN(Virtual LAN), is a group of hosts with a common set of requirements that communicate as if they were attached to the same broadcast domain, regardless of their physical location. Click Enable VLAN to make the configuration for the ports and virtual APs.



3.8 QoS

The QoS (Quality of Service) Settings page provides different priority to different users.



3.9 Management

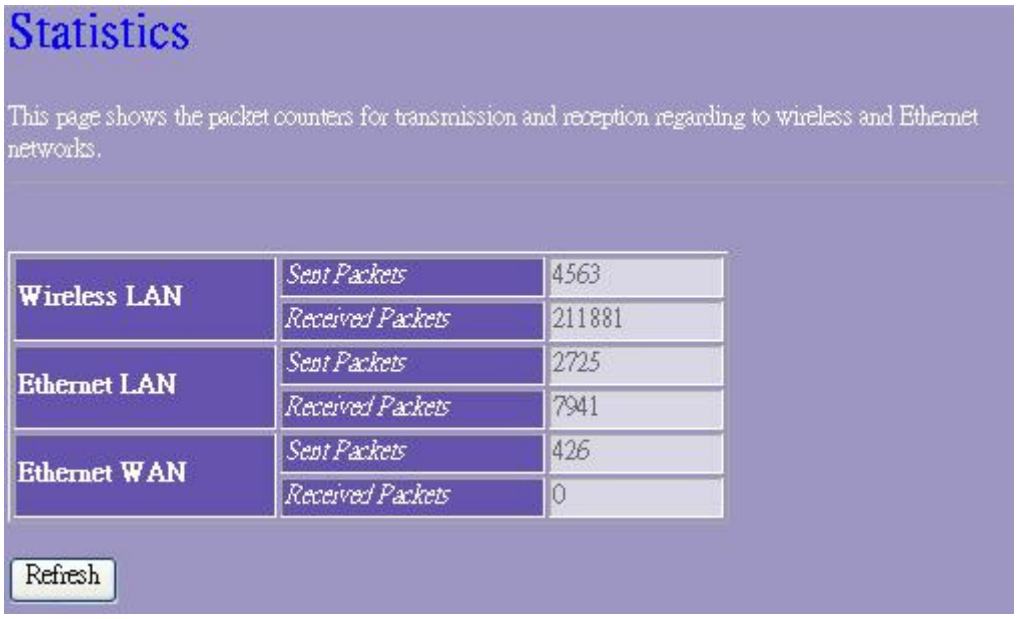
3.9.1 Status

This information page shows the current settings of this device. You could check if the parameters match your configuration.

System	
Uptime	0day:2h:39m:4s
Firmware Version	v1.41
Build Time	Thu May 27 12:34:34 CST 2010
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G+N)
SSID	Wireless-11n-Router
Channel Number	11
Encryption	Disabled
BSSID	00:e0:4c:81:96:b1
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.100.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.100.1
DHCP Server	Enabled
MAC Address	00:e0:4c:81:96:b1
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:e0:4c:81:96:b9

3.9.2 Statistics

This page allows users to get information of data transferring condition, and monitor the status and performance of this router including receiving and sending packets. To see the latest report, click Refresh button.

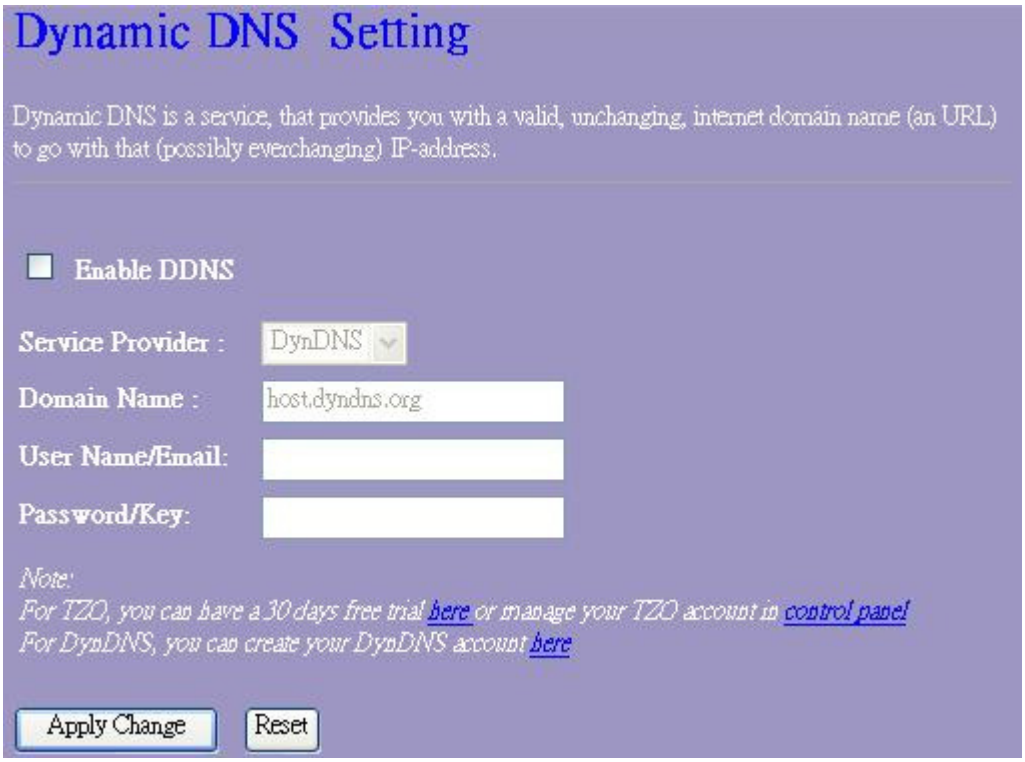


3.9.3 DDNS Settings

DDNS (Dynamic Domain Name Server) service allows users to connect to this device via a fixed and easy-to–remember hostname. This router supports DDNS service of following service providers:

DynDNS (http://www.dyndns.org), TZO (http://www.tzo.com)

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

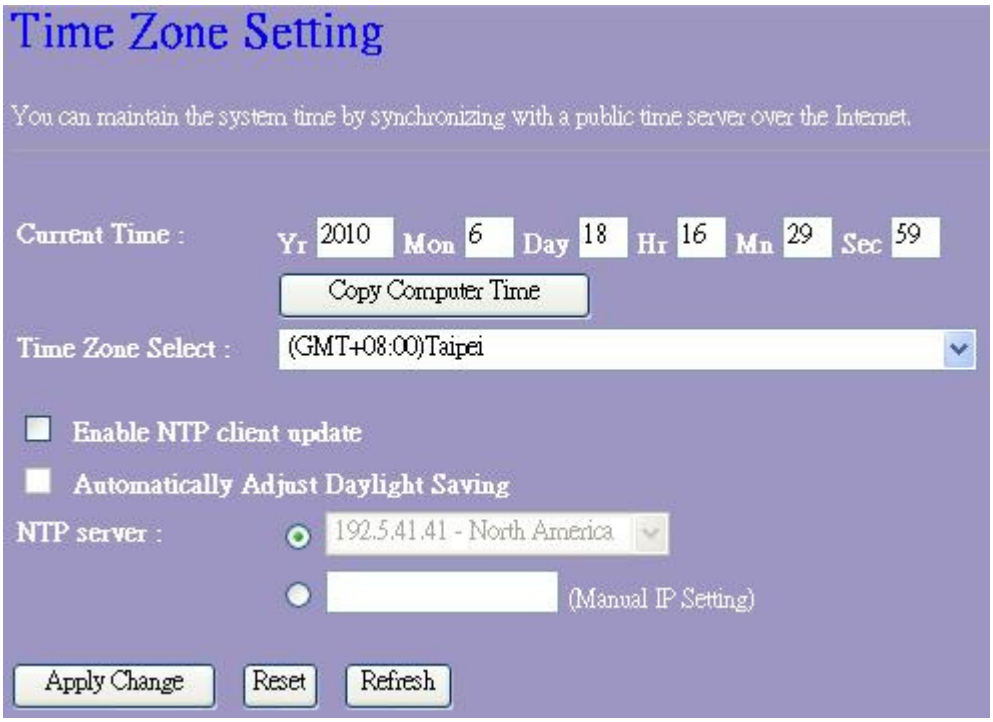


Items	Information
Service Provider	The website that provides DDNS service. Please select from the drop-down list.
Domain Name	The hostname that you have applied for the device.
User Name/Email	DDNS login account. For DynDNS users, please fill in your user name; for TZO users, please fill in your email address.
Password/Key	The password of your DDNS service account.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configurations.

3.9.4 Time Zone Setting

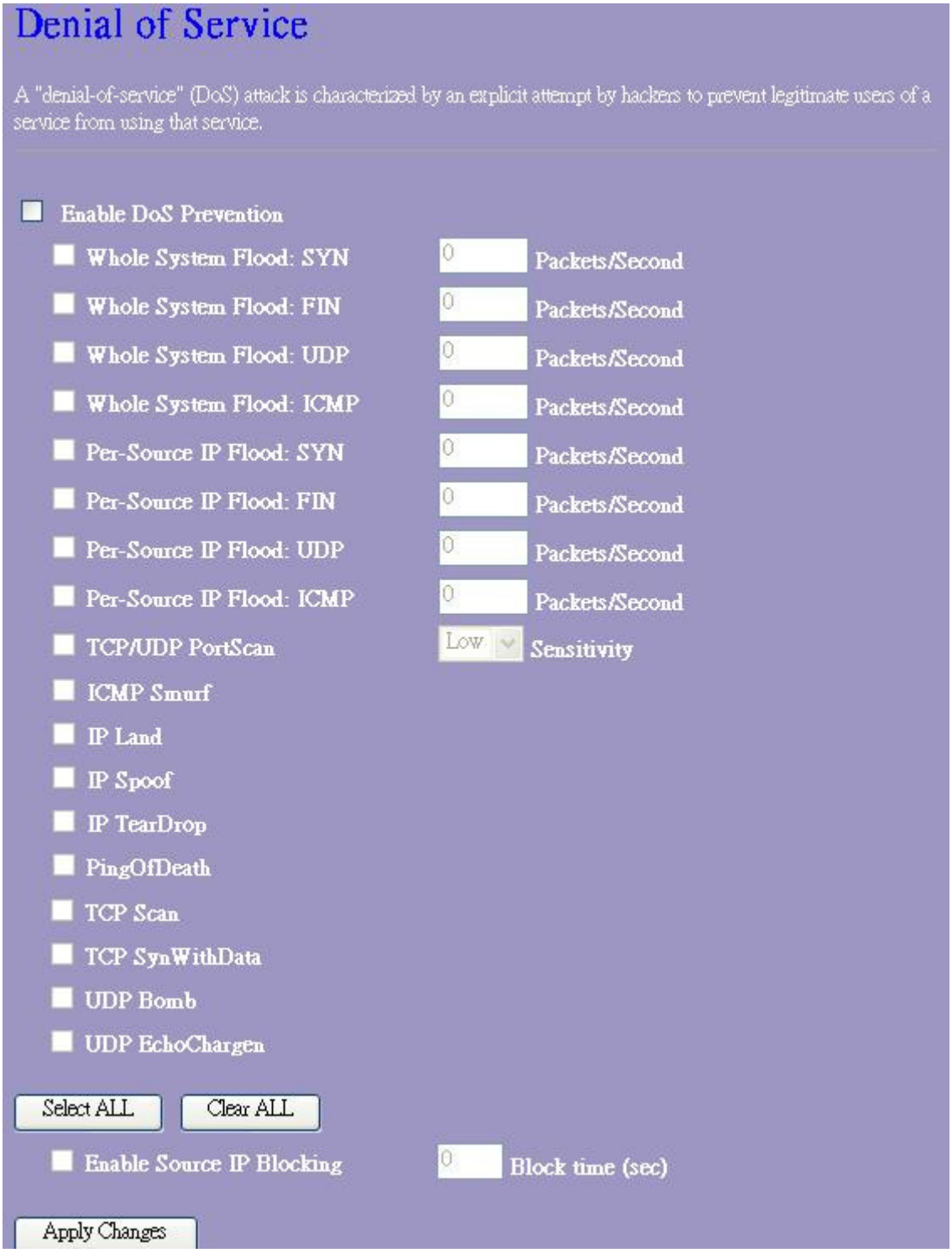
This page allows users to configure the time of the router. To specify manually, fill in the blanks in "Current Time" and click the "Apply Change" button. To synchronize time from a timeserver, please mark the "Enable NTP client update" checkbox, select a NTP server from the drop list or manually enter a NTP server. Click the "Apply Change" button after your configuration.



3.9.5 Denial-of-Service

A DoS (Denial of Service) attack attempt to disrupt the network and information system by sending abnormal packets to overload your Internet connection. DoS protect function helps to detect and

block those malevolent DoS attack. It is strongly recommended that this setting be left enabled. Please mark to enable the DoS protection function. Manually adjust the value of packet threshold and click Apply Changes to enact the setting.



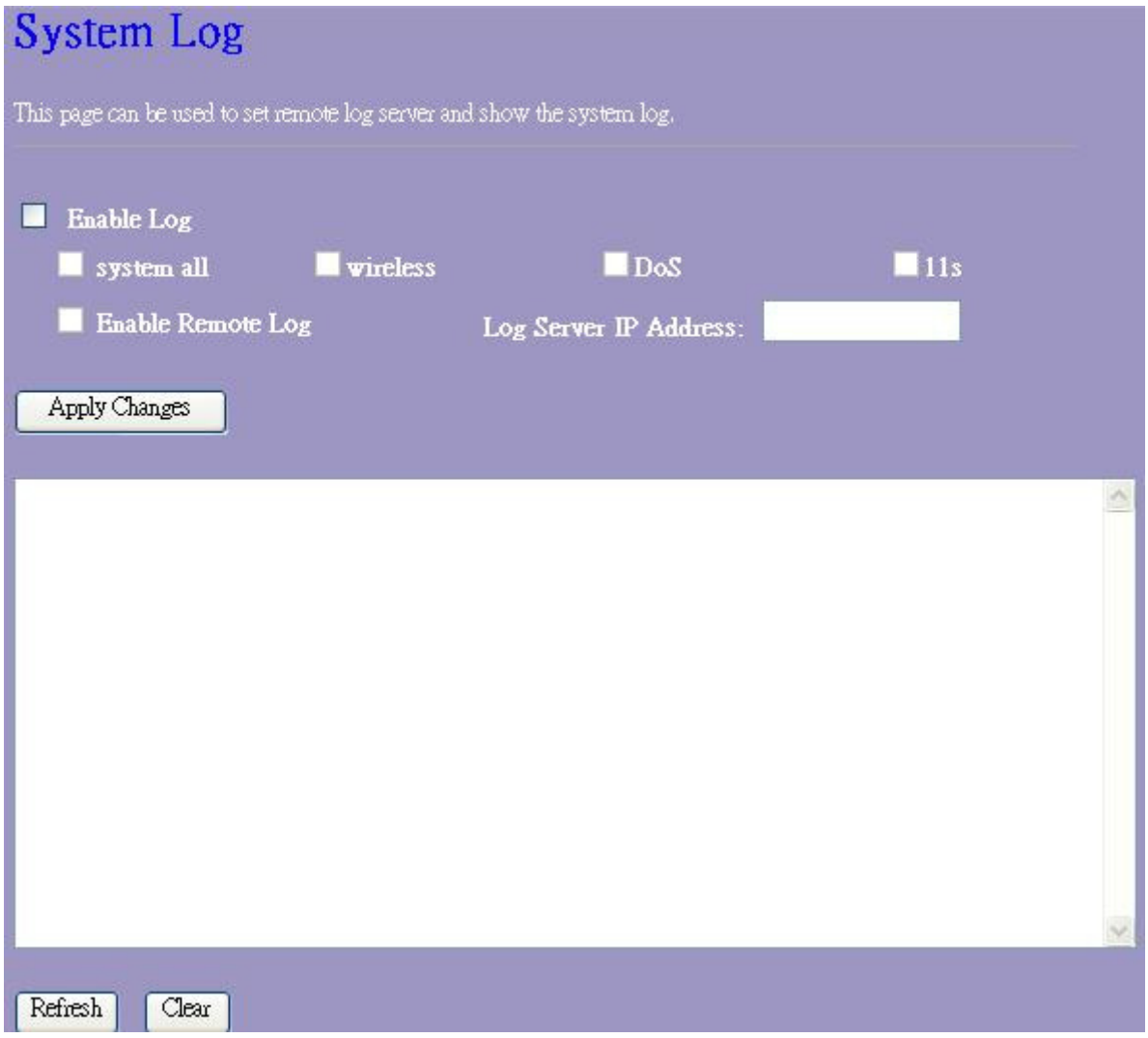
3.9.6 Log

This System Log page shows the information of the current activities on the router. To enable system log function:

1. Mark the “Enable Log” checkbox.

2. To see all information of the system, select the “system all” checkbox.
   To see wireless information only, select the “wireless” checkbox.
   To send the log information to a certain note, select the “Enable Remote Log” checkbox and fill in the IP address in the “Log Server IP Address” box.

3. Click the Apply Changes button to activate. You could also click the Refresh button to refresh the log information or click the Clear button to clean the log table.

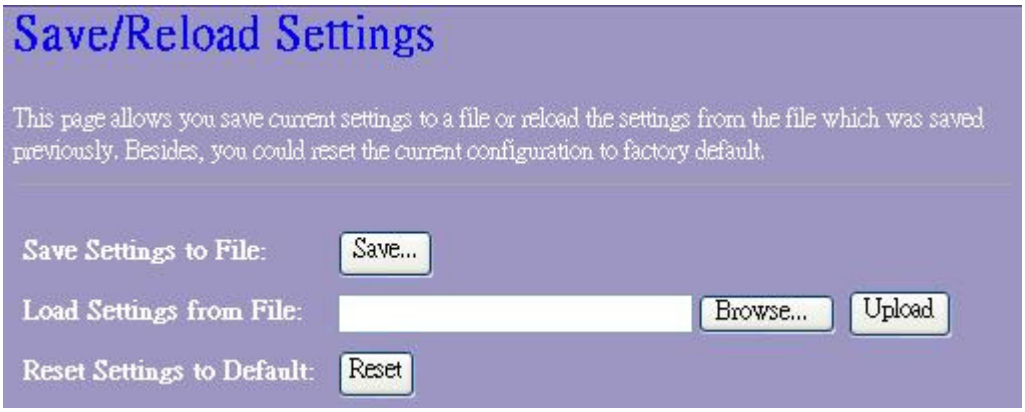


3.9.7 Upgrade Firmware

Sometimes a new firmware may be issued to upgrade the system of this device. You could upgrade the firmware you got in this page. To upgrade the firmware, please click on the Browse... button, locate the firmware in your computer and then click the Upload button to execute.

3.9.8 Save/Reload Setting

The Save/Reload Setting page allows users to backup and download the configuration status of the device or restore the factory default configuration.



Items	Information
Save Settings to File	Click on the Save... button to save the currently configure settings.
Load Settings from File	Click Browse... to select the file that you save, and then click Upload to start the process. Please wait for it to complete.
Reset Settings to Default	Click Reset to start the process and it will be completed till the status LED starts blinking.

3.9.9 Password

To set up the Administrator Account information, enter the Username, New password, and reenter the password on the text box. Don't forget to click the Apply Changes to save the configuration.

3.9.10 Logout

Click Apply Change then you will save the settings and log off the management interface.

Appendix A: Product Specifications

Standard	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b, IEEE 802.3, IEEE 802.3u
Interface	**Wireless 11n 2T2R Router:** LAN: 4 ports 10/100 Mbps Ethernet, RJ-45 WAN: One RJ-45 port 2* reverse SMA detachable antennas (Standard 2 dB) 1* reset to factory default button 1* WPS button **Wireless 11n 1T1R Router:** LAN: 4 ports 10/100 Mbps Ethernet, RJ-45 WAN: One RJ-45 port 1* reverse SMA detachable antenna (Standard 2 dBi) 1* reset to factory default button 1* WPS button
Antenna	Antenna type: Dipole Antenna connector type: Reverse SMA
WAN Connection	Ethernet 10/100 Mbps
Cable Connections	RJ-45 (10BASE-T): Category 3,4,5 UTP RJ-45 (100BASE-TX): Category 5 UTP
Transmission Mode	Auto-Negotiation (Full-duplex, Half-duplex)
Security	64/128-bit WEP, WPA, WPA2
Network Data Rate	802.11b: 1,2,5.5, and 11Mbps 802.11g: 6,9,12,18,24,36,48 and 54Mbps 802.11n: up to 150 / 300 Mbps
Receiver Sensitivity	802.11n Typical -68 dBm 802.11g Typical -73 dBm 802.11b Typical -84 dBm
Transmit Power	16dBm typically @ 802.11b 14dBm typically @ 802.11g 13dBm typically @ 802.11n
LED indications	**Wireless 11n 2T2R Router:** 1*PWR, 1*SYS, 1*WAN, 4*LAN, 1*WLAN **Wireless 11n 1T1R Router:** 1*PWR, 1*SYS, 1*WAN, 4*LAN, 1*WLAN
Channel	USA 11, Europe 13, Japan 14
Range Coverage	Indoor: 35~100 meters Outdoor: 100~300 meters
Emission	FCC,CE CLASS B FCC Part 15.247 for US (2.412~2.462MHz) ETS 300 328 for Europe (2.400~2483.5MHz) DGT LP0002 for Taiwan (2.412~2.462MHz)
Temperature	Operating: 0°C ~ 40°C (32°~104°F); Storage: -20°C ~ 70°C (-4°~158°F)
Humidity	Operating: 10% ~ 90% RH, non-condensing Storage: 5%~90% RH, non-condensing
Certification	FCC, CE, VCCI Class B

Appendix B: Glossary

- **802.11b -** The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- **802.11g -** specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- **802.11n -** 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- **DDNS** (**D**ynamic **D**omain **N**ame **S**ystem) **-** The capability of assigning a fixed host and domain name to a dynamic Internet IP Address.
- **DHCP** (**D**ynamic **H**ost **C**onfiguration **P**rotocol) **-** A protocol that automatically configure the TCP/IP parameters for the all the PC(s) that are connected to a DHCP server
- **DMZ** (**De****m**ilitarized **Z**one) **-** A Demilitarized Zone allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing.
- **DNS** (**D**omain **N**ame **S**ystem) **–** An Internet Service that translates the names of websites into IP addresses.
- **Domain Name -** A descriptive name for an address or group of addresses on the Internet.
- **DoS** (**D**enial **o**f **S**ervice) **-** A hacker attack designed to prevent your computer or network from operating or communicating.
- **DSL** (**D**igital **S**ubscriber **L**ine) **-** A technology that allows data to be sent or received over existing traditional phone lines.
- **ISP** (**I**nternet **S**ervice **P**rovider) **-** A company that provides access to the Internet.
- **MTU** (**Maximum Transmission Unit**) **-** The size in bytes of the largest packet that can be transmitted.
- **NAT** (**N**etwork **A**ddress **T**ranslation) **-** NAT technology translates IP addresses of a local area network to a different IP address for the Internet.
- **PPPoE** (**P**oint to **P**oint **P**rotocol **o**ver **E**thernet) **-** PPPoE is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.
- **SSID -** A **S**ervice **S**et **Id**entification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to

communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.

- **WEP** (**W**ired **E**quivalent **P**rivacy) **-** A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- **Wi-Fi -** A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.
- **WLAN** (**W**ireless **L**ocal **A**rea **N**etwork) **-** A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.