Air Live®
Powered by OvisLink Corp.

AC-1200R

1200Mbps 802.11AC
AP Router

User's Manual

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This product requires professional installation. Please do not attempt to install the device without the necessary knowledge in regards to your country's wireless regulations.

Regulatory Information

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.

FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. 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.

For product available in the USA/Canada market, only channel 1~11 can be operated.

Selection of other channels is not possible.

Article 12

Without permission, any company, firm or user shall not alter the frequency, increase the power, or change the characteristics and functions of the original design of the certified lower power frequency electric machinery.

Article 14

The application of low power frequency electric machineries shall not affect the navigation safety nor interfere a legal communication, if an interference is found, the service will be suspended until improvement is made and the interference no longer exists.

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.

FCC NOTICE: To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

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1 Introduction

1.1 Overview

The AC-1200R is a multi-functional dual band concurrent AP Router that can operate in 5 different wireless modes. The AP features 2 radios that run in 5GHz or 2.4GHz frequency band. Moreover, it supports latest standard 802.11ac which provide the higher throughout than pervious standard.

Feature Summary

- 2.4G/5G Dual Band Concurrent
- 11ac + 11b/g/n, data rate up to 1200Mbps
- 5 Wireless Modes
- 23dBm* Hi-Power with standard antennas. (Limit 20dBm in EU)
- QoS and Bandwidth Control
- Multiple SSID and VLAN

- 10/20/40/80 Channel Width
- PPPoE Server
- Virtual Server and DMZ support
- Syslog Support

1.2 Firmware Upgrade and Tech Support

If you encounter a technical issue that can not be resolved by information on this guide, we recommend that you visit our comprehensive website support at www.airlive.com. The tech support FAQ are frequently updated with latest information.

In addition, you might find new firmware that either increase software functions or provide bug fixes for AC-1200R. You can reach our on-line support center at the following link:

http://www.airlive.com/support/support_3.php

1.3 Wireless Operation Modes

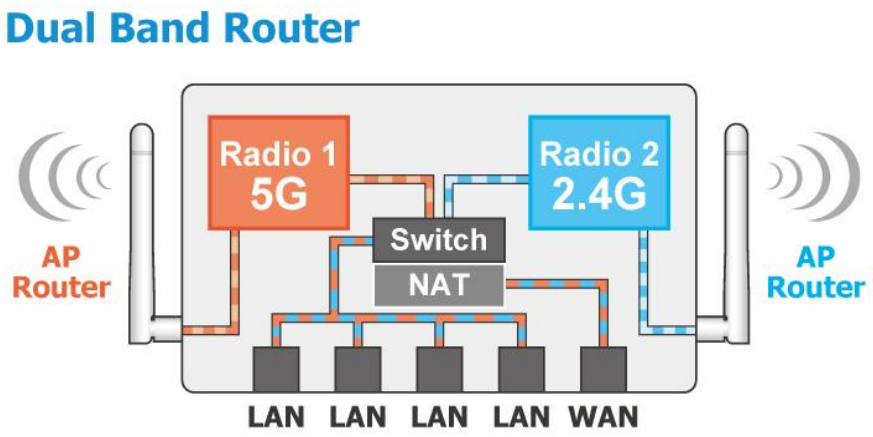
The AC-1200R can perform as a multi-function wireless device. Through the AirLive web interface, users can easily select which wireless mode they wish the AC-1200R to perform.

The AC-1200R provides 5 modes of wireless operational applications. It can transform the AC-1200R into different roles in the wireless infrastructure. Below is the example application table for AC-1200R.

Mode	Radio 1(5G)	Radio2(2.4G)	Applications
Dual Band Router	AP Router	AP Router	Dual Home Networks: 5GHz for Games/AV and 2.4GHz for PC
Dual AP Mode	Access Point	Access Point	Dual Band Hotspots
WISP + AP	Client Mode	AP Router	Sharing WISP 5GHz Broadband Wirelessly
Bridge + AP	Bridge Mode	Access Point	WDS Wireless Repeater
Client + AP	Client	Access Point	Universal Repeater

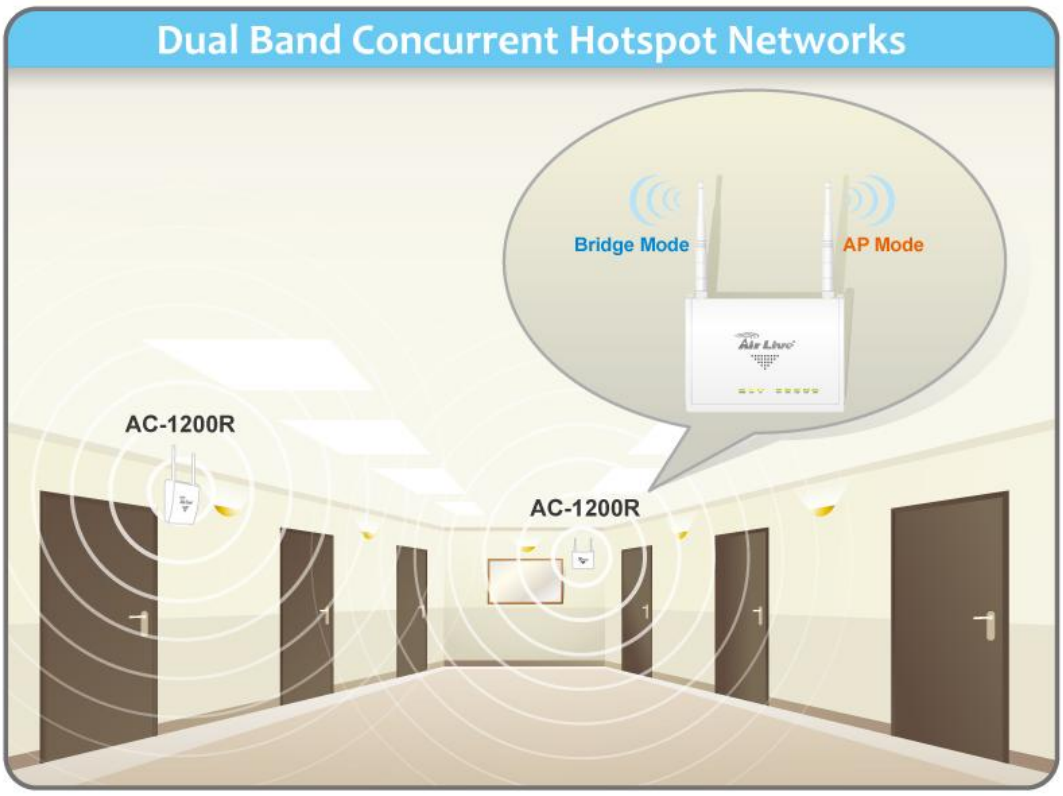
1.3.1 Dual Band Router Mode

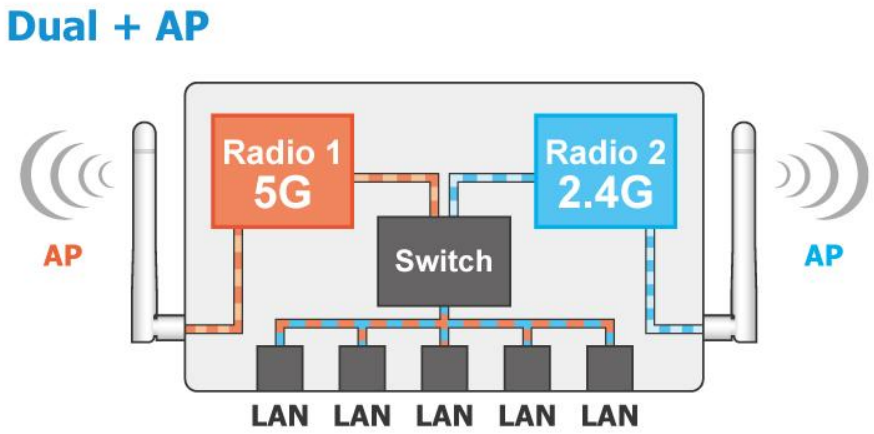
In Dual Band Concurrent mode, the radio1 works in 5GHz while radio2 works in 2.4GHz mode. That means the AC-1200R can provide Internet service to both 5GHz (like game network) and 2.4GHz (like PC network) at the same time.



1.3.2 Dual AP Mode

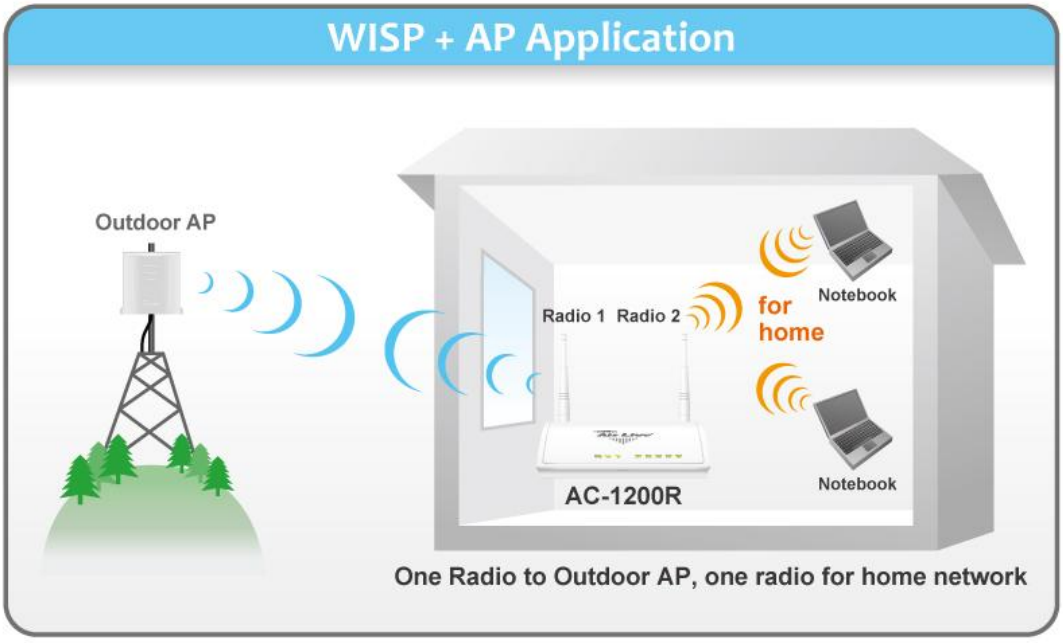
In Dual AP mode, both wireless interface of AC-1200R are set as AP and provide hotspot service on each interface. Radio1 is set to 11ac mode while Radio2 is set to 11g/b/n Mode. This mode is most useful for Dual Band Hotspot function such as in the hotels, shopping malls, or offices.

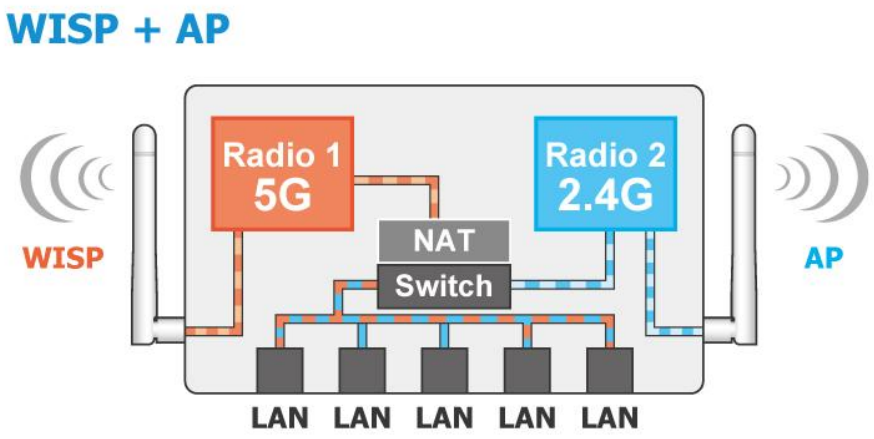




1.3.3 WISP + AP Mode

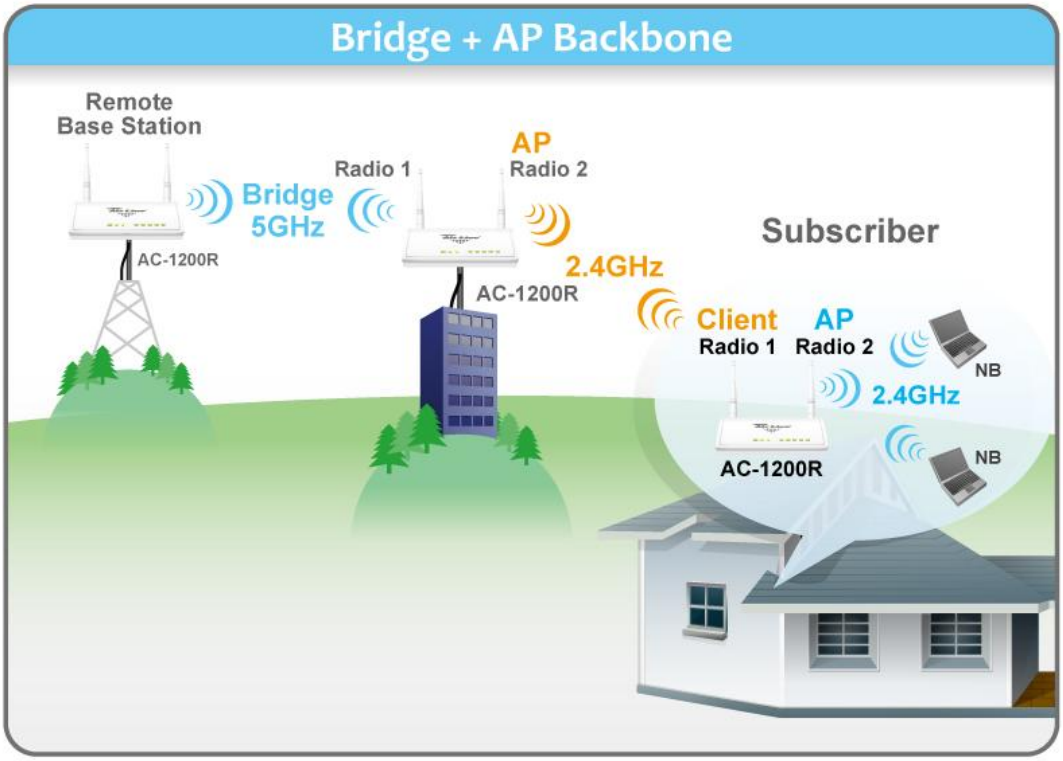
In this mode, Radio1 (5GHz) acts as a client to connect with remote WISP Base Station. Radio2 (in 11g/b/n mode) works as an AP router to allow subscriber to share the WISP connection wirelessly. Using the AC-1200R, WISP no longer requires 2 AP/CPE to provide wireless access in subscriber's home or office.



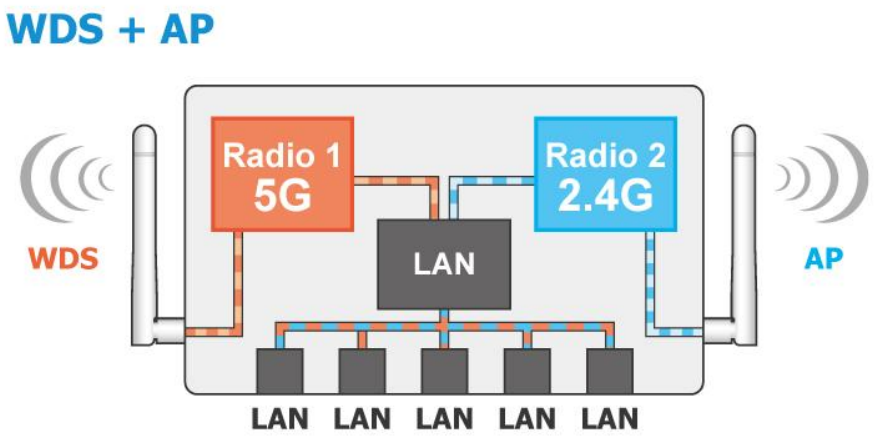


1.3.4 Bridge + AP Mode

In this mode, Radio1 is working as Bridge mode in 5GHz while Radio 2 is working as AP mode in 2.4GHz. This mode is useful for WISP backbone application where Radio 1 is used for connection to another Base Station and Radio2 is used for service to subscribers. This mode can also be used as repeater in indoor environment.

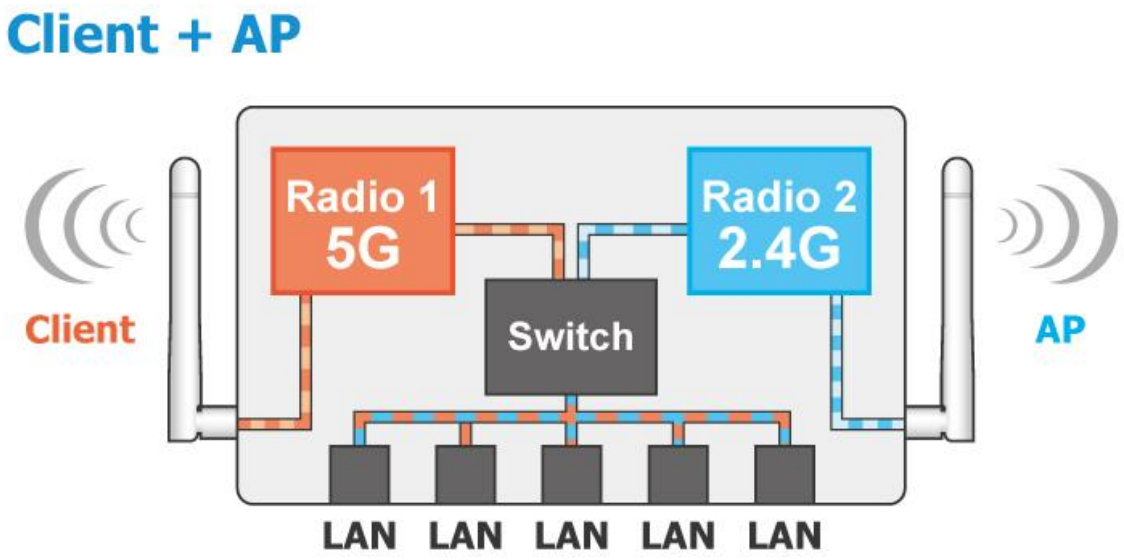


The AC-1200R's Bridge mode can be configured as "WDS Bridge". In WDS Bridge, you must enter the remote AP's MAC Address. It can connect with another AC-1200R via WDS Bridge.



1.3.5 Client + AP Mode

In this mode, it can work as a wireless repeater to extend the coverage of remote wireless router.



2 Installing the AC-1200R

This section describes the hardware features and the hardware installation procedure for the AC-1200R. For software configuration, please go to chapter 3 for more details.

2.1 Before You Start

It is important to read through this section before you install the AC-1200R.

- The use of 5GHz spectrum might be prohibited in some countries. Please consult with your country's telecom regulation first.
- Please installation the antennas first before connecting the power. Connecting the power without installing the antennas may result in damage to the wireless radios which may void your warranty.

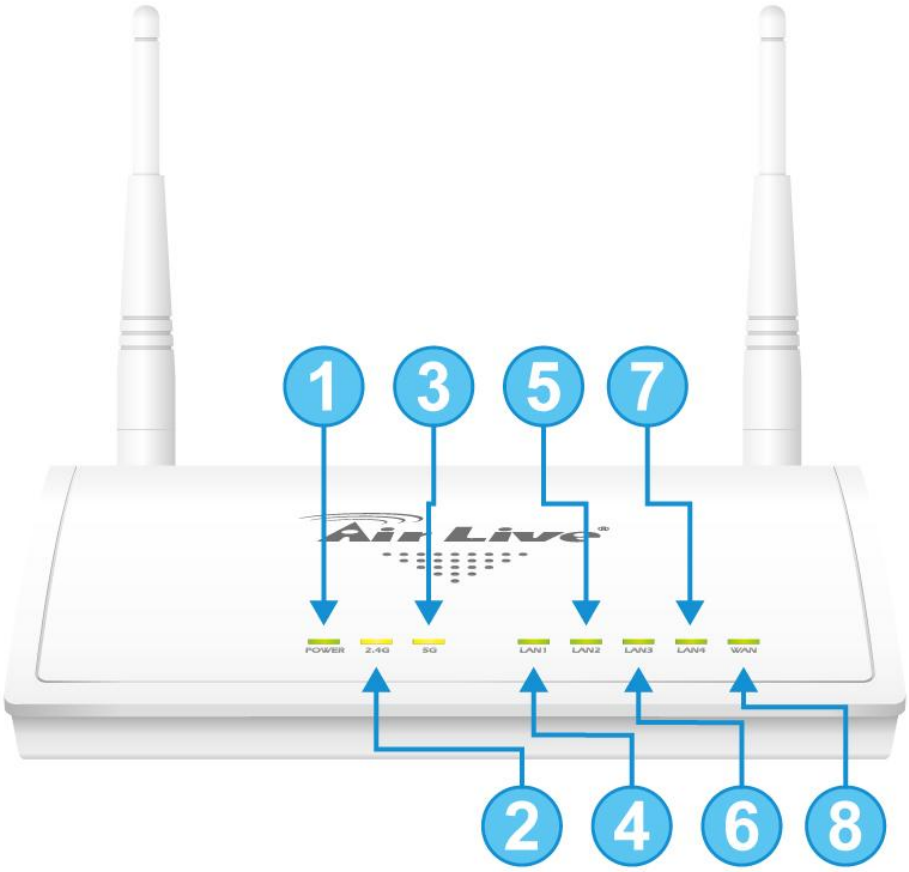
2.2 Installing AC-1200R

The AC-1200R package contains the following items:

- One AC-1200R main unit
- One 12V 1A DC power adapter
- Indoor detachable dual band Omni Antenna x 2
- Quick Start Guide
- User's Guide CD

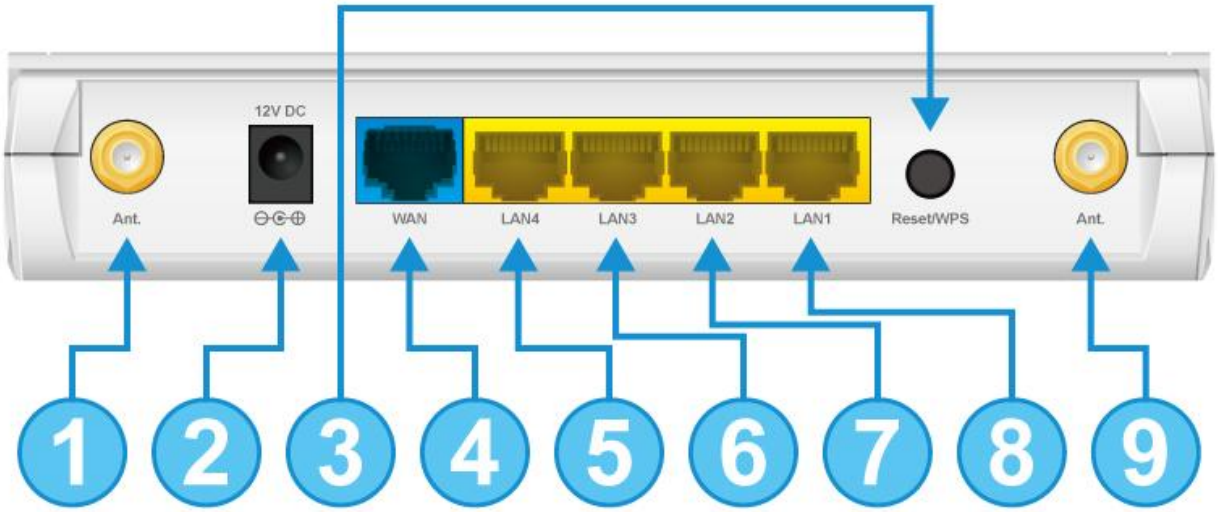
2.3 Knowing Your AC-1200R

2.3.1. Front Side Introduction



LED #	Display	Description
1	Power	Solid Green LED while the device is powered on, either by power adaptor or PoE.
2	2.4G	Solid Green LED while the device is powered on. Blinking while there is Data transmission, dark when this interface is turn off.
3	5G	
4~8	LAN WAN	LAN ports status LED, Solid Green LED shows when a port is actively connected, blinking while there is data transmission, turns into dark when this disconnected. LAN5 is also the WAN port

2.3.2. Back Side Introduction

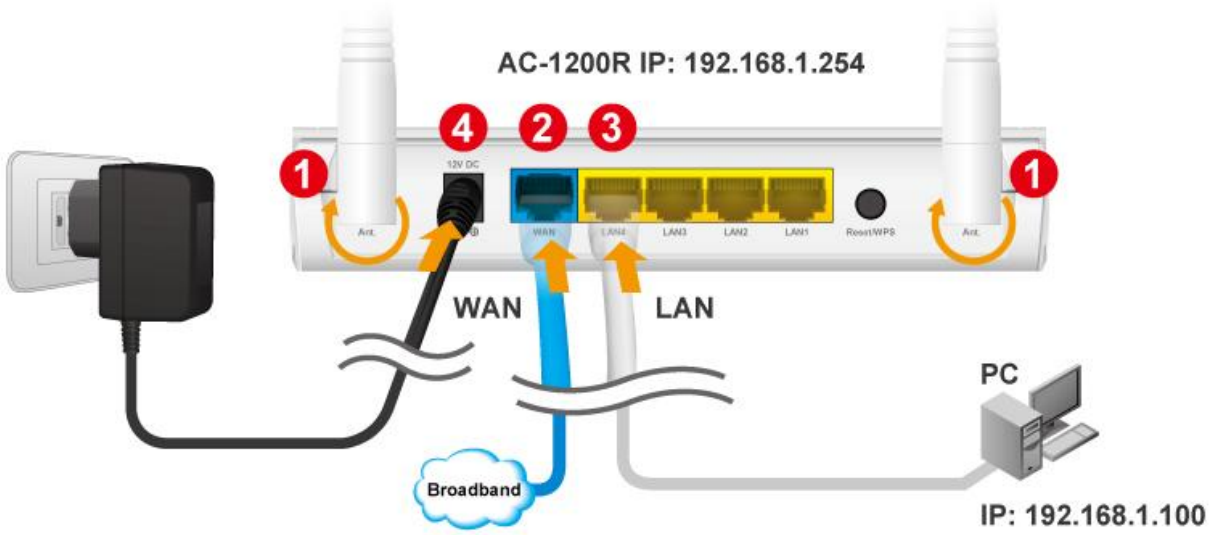


Port #	Display	Description
1	WLAN1	Detachable antenna with R-SMA connector. 2 indoor dual band antennas are delivered.
2	Power Adaptor	12V 1A power supply adaptor delivered with product.
3	WPS/Reset	It works as WPS or Reset button. Push 15 sec of the button, the device will reset to default
4	WAN Port	WAN Port. When it is in Dual Band Router mode, it function as a WAN port. In Dual AP mode , it work as LAN port
5~8	LAN	LAN port
9	WLAN2	Detachable antenna with R-SMA connector.

2.4 Installation Steps

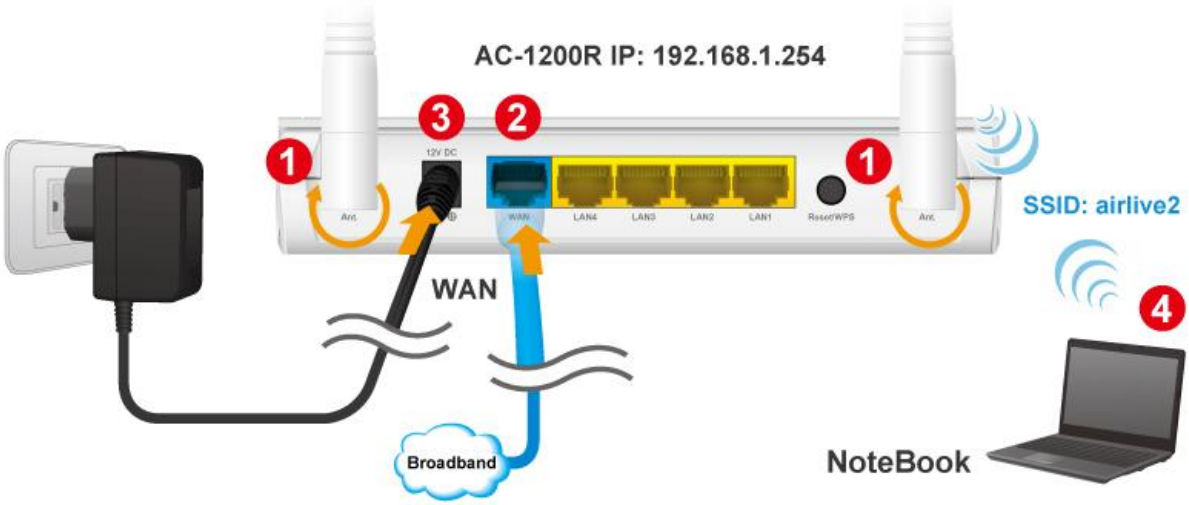
This section describes installation steps required for the AC-1200R before it can work properly in your network.

2.4.1. Installation Steps by using LAN port

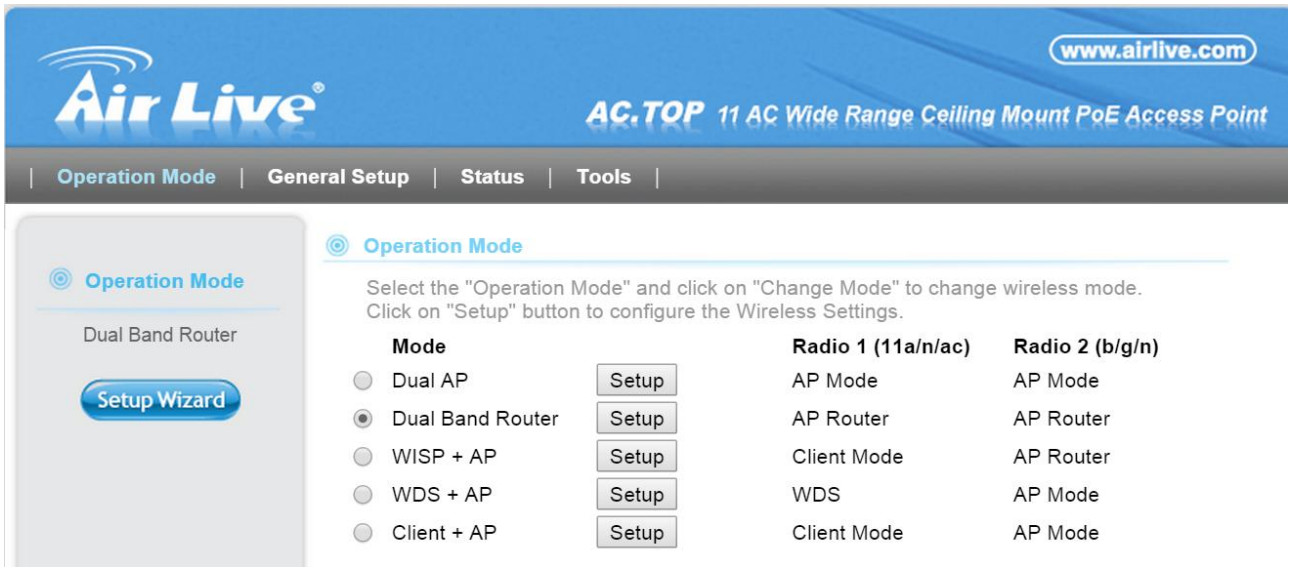


1. Install antennas into the AC-1200R
2. Connect the broadband line into the WAN port of the AC-1200R
3. Connect your PC to any LAN port.
4. Connect the power jack to the power port.
5. Wait for 5 minutes. Then open the browser on your PC and type in "192.168.1.254" to reach the web management
6. For software configuration, please go to chapter 3 for more details.

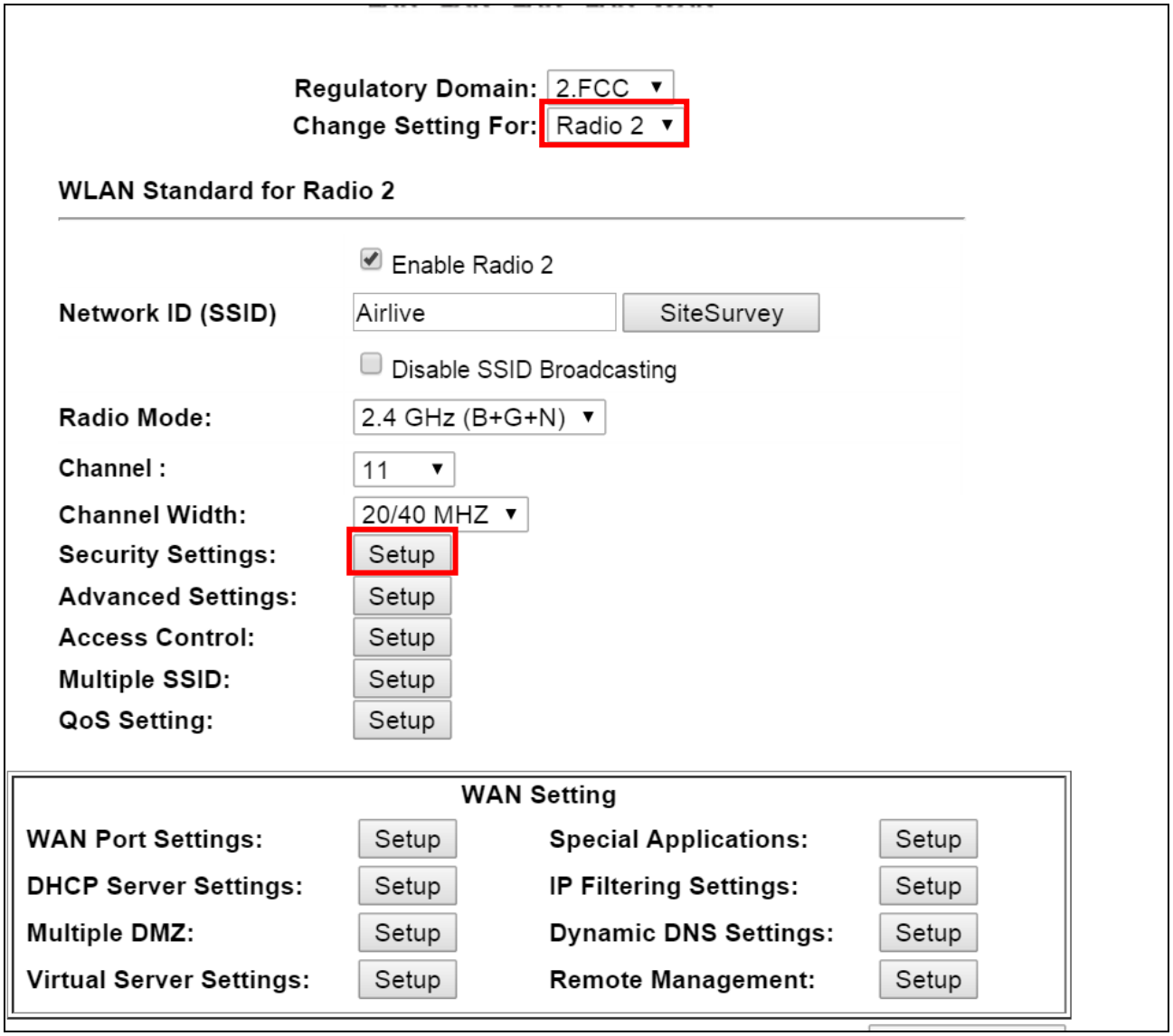
2.4.2. Wireless Installation Steps



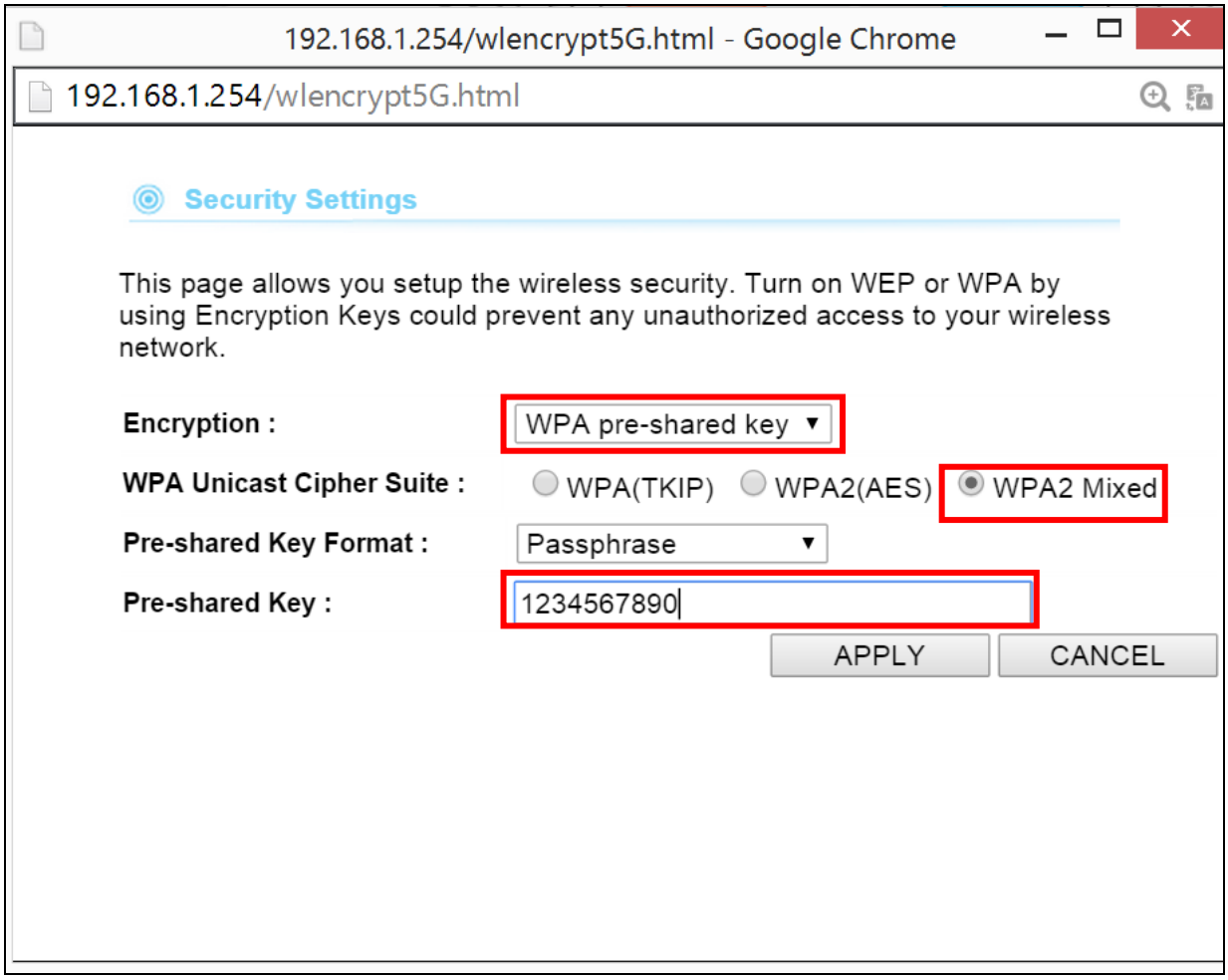
1. Install antennas into the AC-1200R
2. Connect the broadband line into the WAN port of the AC-1200R
3. Connect the power jack to the power port.
4. Wait for 5 minutes. Then on your Notebook PC, scan and connect to “airlive” wireless network
5. Open your web browser and type “192.168.1.254” to configure your AC-1200R
6. When prompt for username/password, type “admin” as username and “airlive” as password
7. When the following screen appears, click on “Setup” to configure wireless settings.



8. Select “Change Settings for: Radio2”. Then click on “Security Settings”



9. Choose WPA2-PSK and enter your own encryption key (please write down and do not forget it is case sensitive). Then click on “Apply” button



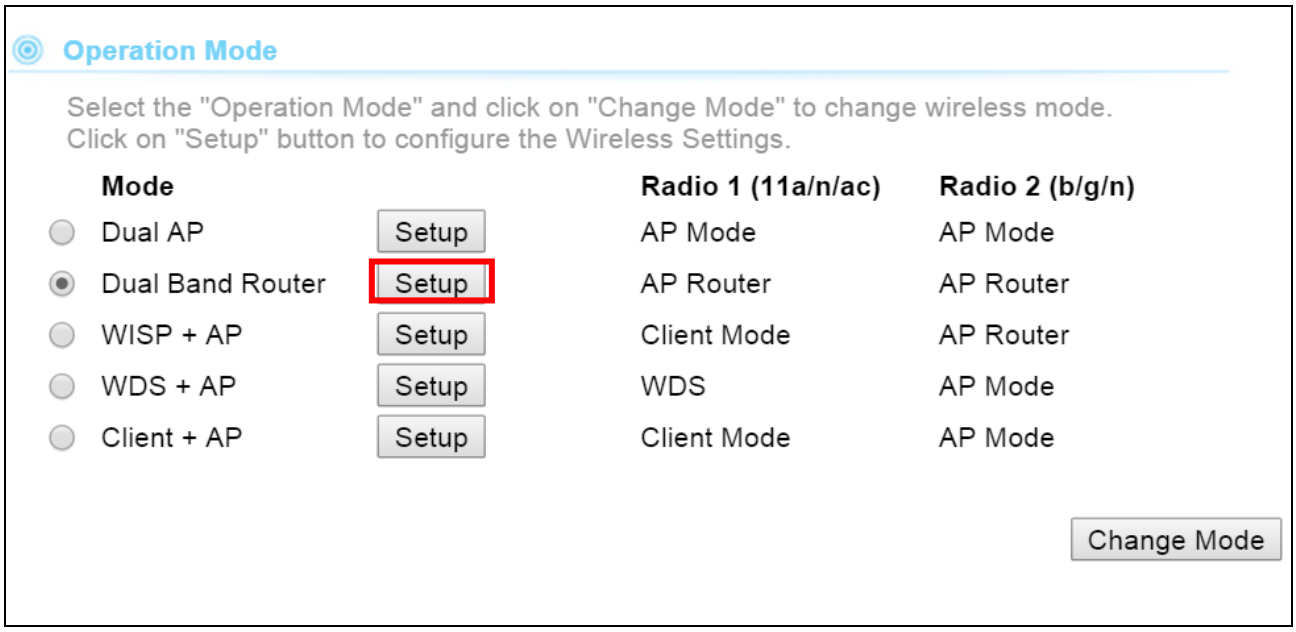
10. The AC-1200R will reboot. After about 3 minutes, please try to access the network again. You will be prompted to enter your encryption key.

2.4.3. Internet Installation Steps

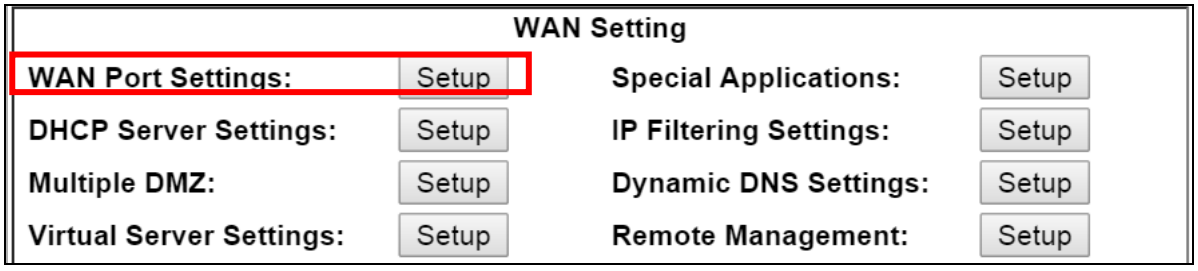
Please finish the LAN port and Wireless installations first in 2.4.1 and 2.4.2 before performing the following steps.

If you are using AC-1200R as a router, please follow the steps below:

1. Please make sure the Internet line is connected to the WAN port.
2. Open your web browser and type 192.168.1.254
3. When prompt for password, enter “admin” for username and “airlive” for password.
4. Choose “Wireless Settings” on Welcome Screen and click on “Setup”



5. Choose “WAN Port Settings” on the bottom.



6. Please enter your ISP’s authentication Information and Click on “Apply” button. Here are some guidelines.

- If your Internet connection is ADSL, it is most likely using the following option:

  Your ISP already provides you with PPPoE authentication information, select this button and enter the information below:

- If your internet connection is Cable Modem, it is most likely to use the option: **If your ISP already provides you with a Host Name, select this button and enter the information below: (DHCP)**

However, please still consult with your ISP about the correct account information.

7. Click on “Apply” to finish.

3 Configuring the AC-1200R

The AC-1200R offers web based management interface. You can configure through standard web browser (http). In this chapter, we will explain AC-1200R's available management interfaces and how to get into them. Then, we will provide the introduction on Web Management and recommended initial settings.

3.1 Important Information

The following information will help you to get start quickly. However, we recommend you to read through the entire manual before you start. Please note the password and SSID are case sensitive.

- The default IP address is: **192.168.1.254** Subnet Mask: **255.255.255.0**
- When using Web UI, the login as follow:
  - User name: **admin**
  - Password: **airlive**
- The default radio mode for Radio 1 is **802.11ac/n**
- The default radio mode for Radio 2 is **802.11g/b/n**
- The default SSID for Radio 1 is: **AirLive**
- The default SSID for Radio 2 is: **AirLive 5G**
- The default wireless mode is : **Dual Band Router Mode**
- After power on, please wait for 2 minutes for AC-1200R to finish boot up
- Please remember to click on "Apply" for new settings to take effect

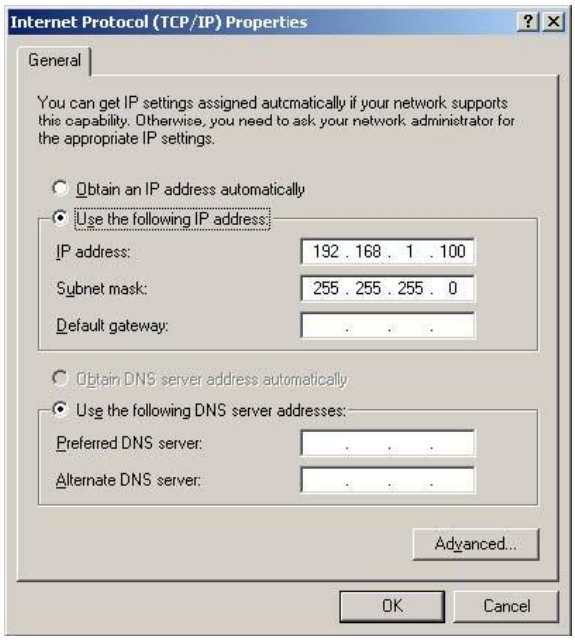
3.2 Prepare Your PC

The AC-1200R can be managed remotely by a PC through either the wired or wireless network. The default IP address of the AC-1200R is **192.168.1.254** with a *subnet mask* of 255.255.255.0. This means the IP address of the PC should be in the range of 192.168.1.1 to 192.168.1.253.

The default mode for AC-1200R is “Dual Band Router” mode. In this mode, the AC-1200R’s DHCP server is turned on; therefore, your PC can get IP automatically from AC-1200R. You just need to set your PC to “Obtain IP address automatically” on the TCP/IP setting. By default, Windows already do this so you do not need to change.

However, if you are using AC-1200R in non-router modes (Dual AP, Dual Band Router, WDS+AP, Cllient+AP), you need to set your IP manually. To prepare your PC for management with the AC-1200R, please do the following:

1. Connect your PC directly to the LAN port on the DC Injector of AC-1200R
2. Set your PC’s IP address manually to 192.168.1.100 (or other address in the same subnet)



You are ready now to configure the AC-1200R using your PC.

3.3 Management Interface

The AC-1200R can be configured using web management interfaces below:

3.3.1 Web Management (HTTP):

You can manage your AC-1200R by simply typing its IP address in the web browser. Most functions of AC-1200R can be accessed by web management interface. We recommend using this interface for initial configurations. To begin, simply enter AC-1200R's IP address (default is 192.168.1.254) on the web browser. The default user name is "admin"; default password is "airlive".

3.4 Introduction to Web Management

3.4.1 Getting into Web Management

Normal Web Management (HTTP)

To get into the Normal Web Management, simply type in the AC-1200R's IP address (default IP is 192.168.1.254) into the web browser's address field.

3.4.2 Login

After the procedure above, the Login username and password is required.

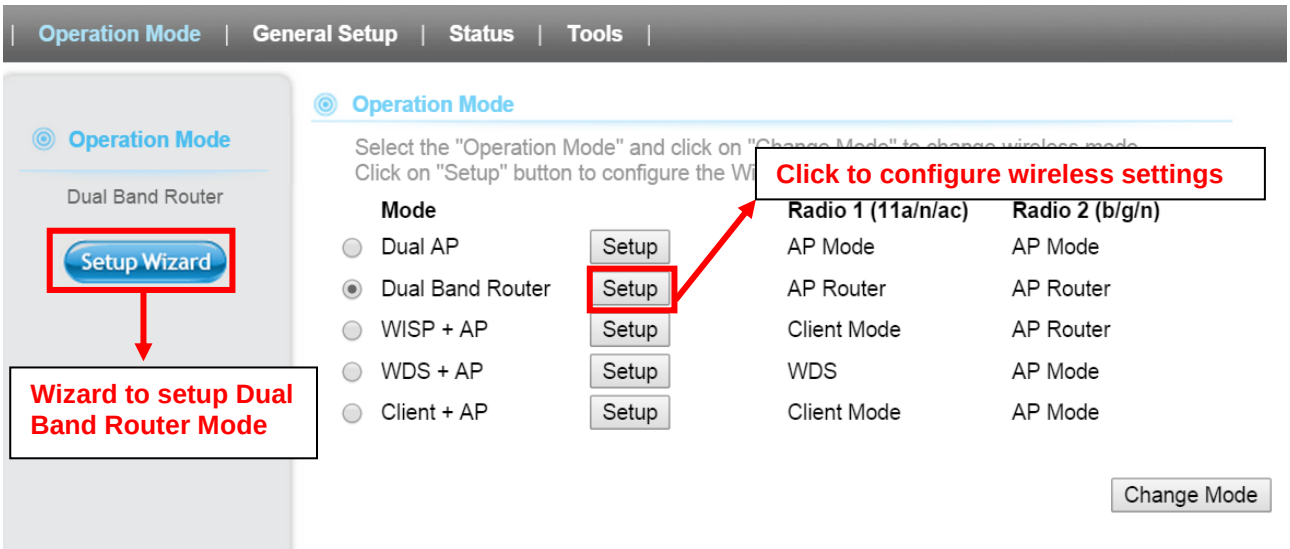
Please type in the username and password. The default username is "admin" and password is "airlive". After that Operation Mode page will appear.

3.5 Initial Configuration

We recommend users to browse through AC-1200R's web management interface to get an overall picture of the functions and interface. Below are the recommended initial configurations for first time login:

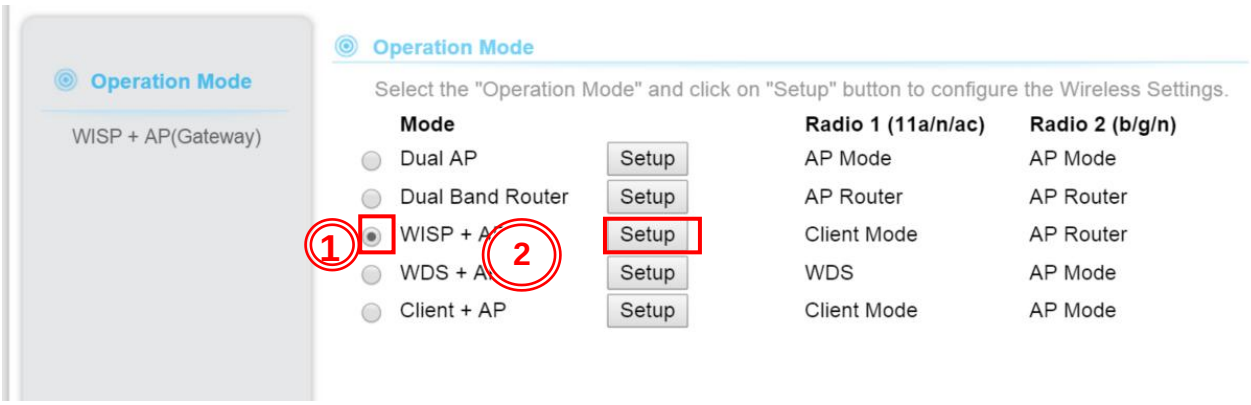
3.5.1 Choose the wireless Operation Modes

The wireless settings of AC-1200R are dependent on the wireless operation mode you choose. Therefore, the first step is to choose the operation mode. For explanation on when to use what operation mode, please refer to Chapter 1.



Follow the example below to change to "WISP + AP" mode

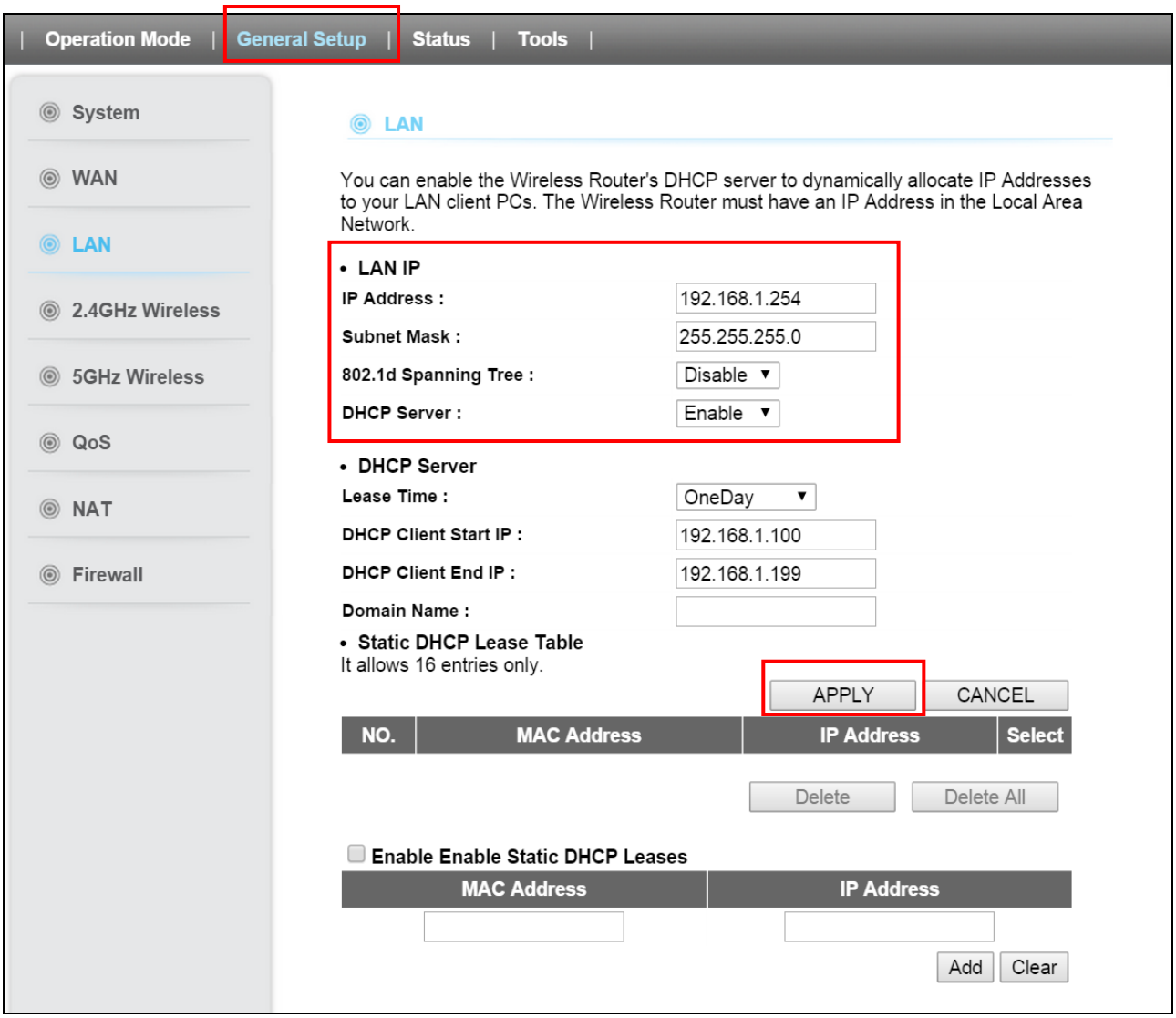
1. Select "WISP + AP" mode
2. Click on "setup" button
3. The AP will reboot, wait for about one minute



3.5.2 Change the Device's IP Address

The default IP address is at 192.168.1.254. You should change it to the same subnet as your network. Also, if you want to manage AC-1200R remotely, you have to set the Gateway and DNS server information.

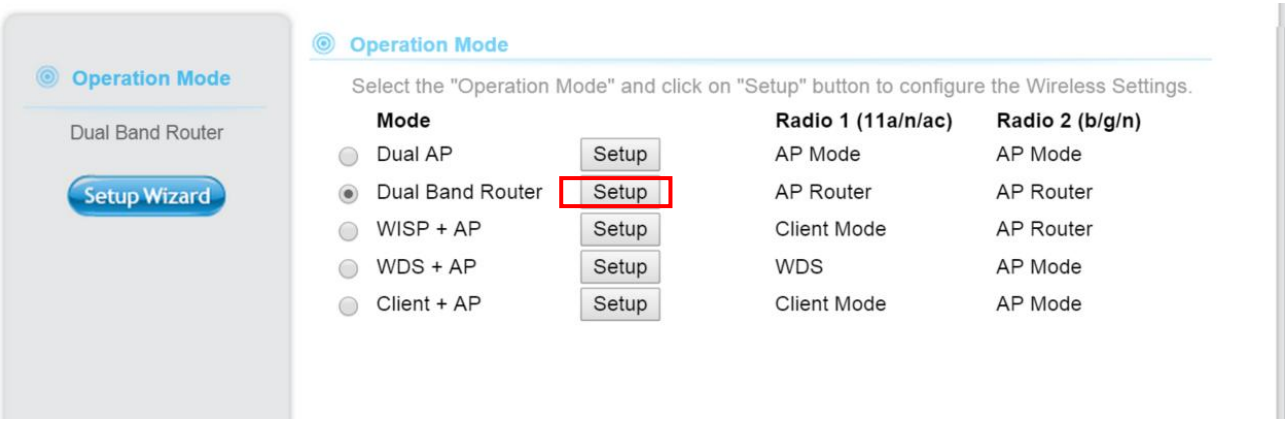
To setup the IP settings for AC-1200R, please select "General Setup" -> LAN". After entering the IP information, click on "Apply" to finish.



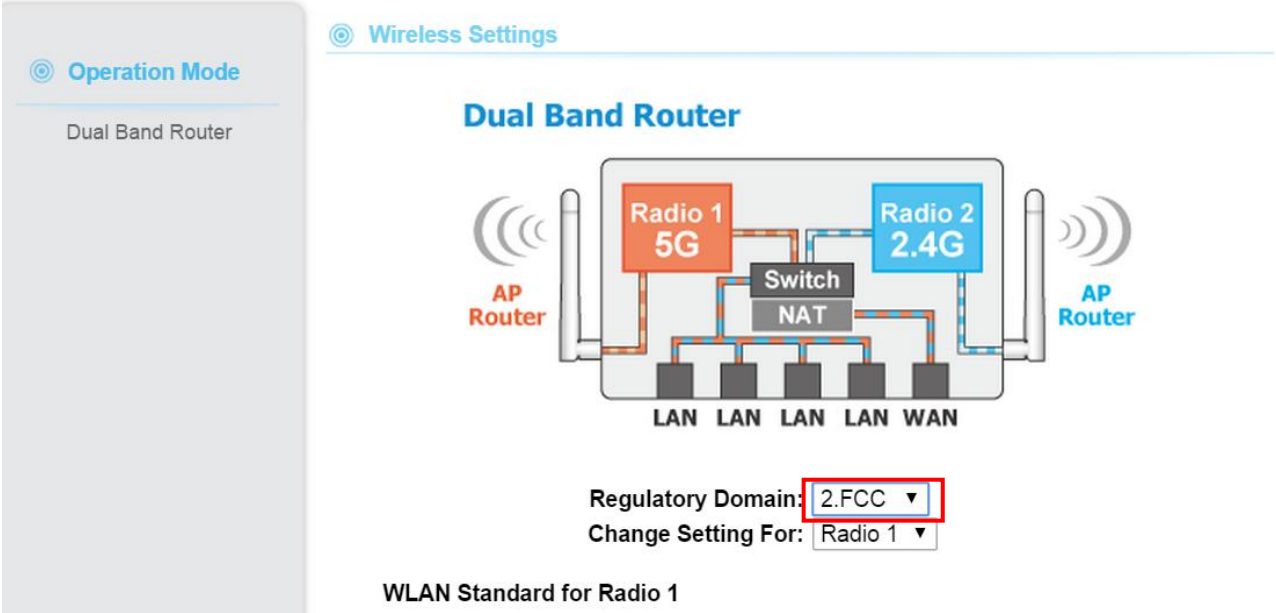
3.5.3 Change the Country Code

The legal frequency and channels in 5GHz spectrum varies between countries. The default country code is ETSI which should require no changes If you are living in Europe. If you are living outside EU, you should change the country code accordingly. In the example below, we will change the country code to FCC

Step 1. Select “Operation Mode” -> “Setup”

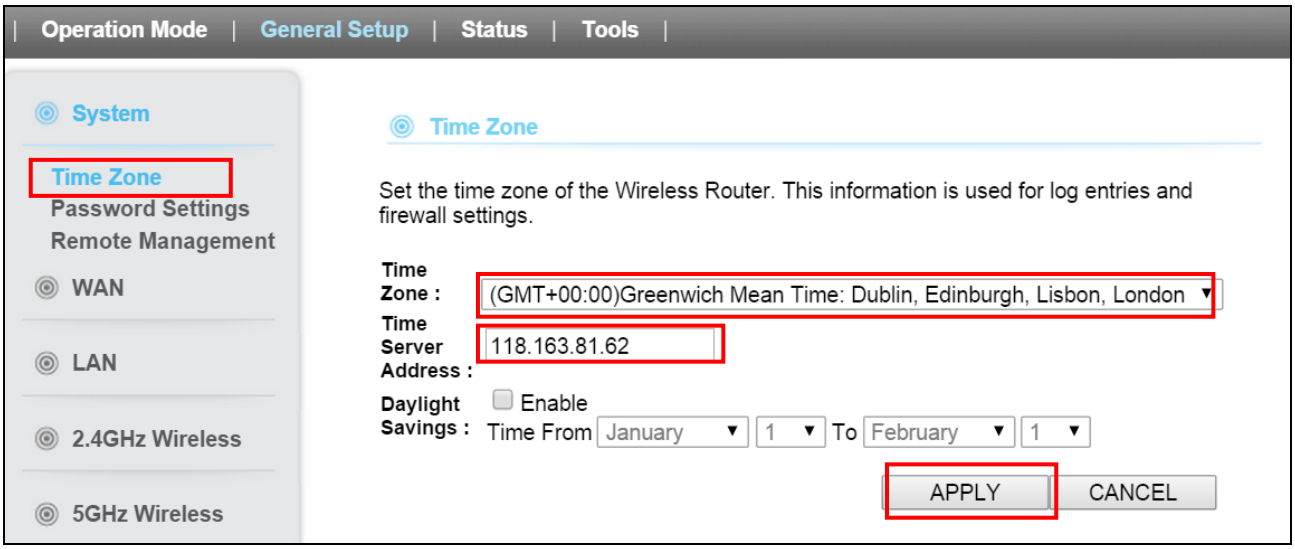


Step 2. From the Regulatory Domain, please select your country and click on “Apply” to finish.



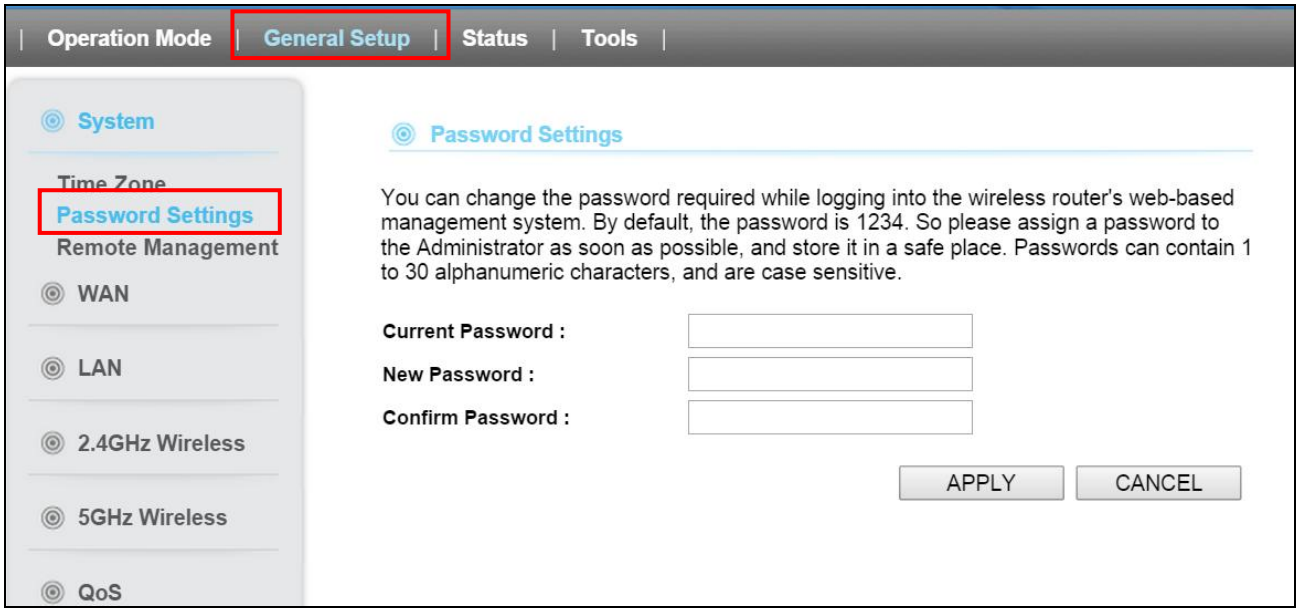
3.5.4 Set the Time and Date

It is important that you set the date and time for your AC-1200R so that the system log will record the correct date and time information. Please go to "*System Configuration" ->Time Settings*. We recommend you choose "Enable NTP" so the time will be keep even after reboot. If your AC-1200R is not connected to Internet, please enter the time manually. Please remember to select your local time zone and click "Apply" to finish.



3.5.5 Change Password

You should change the password for AC-1200R at the first login. To change password, please go to *"General Setup -> "Password Settings"* menu.

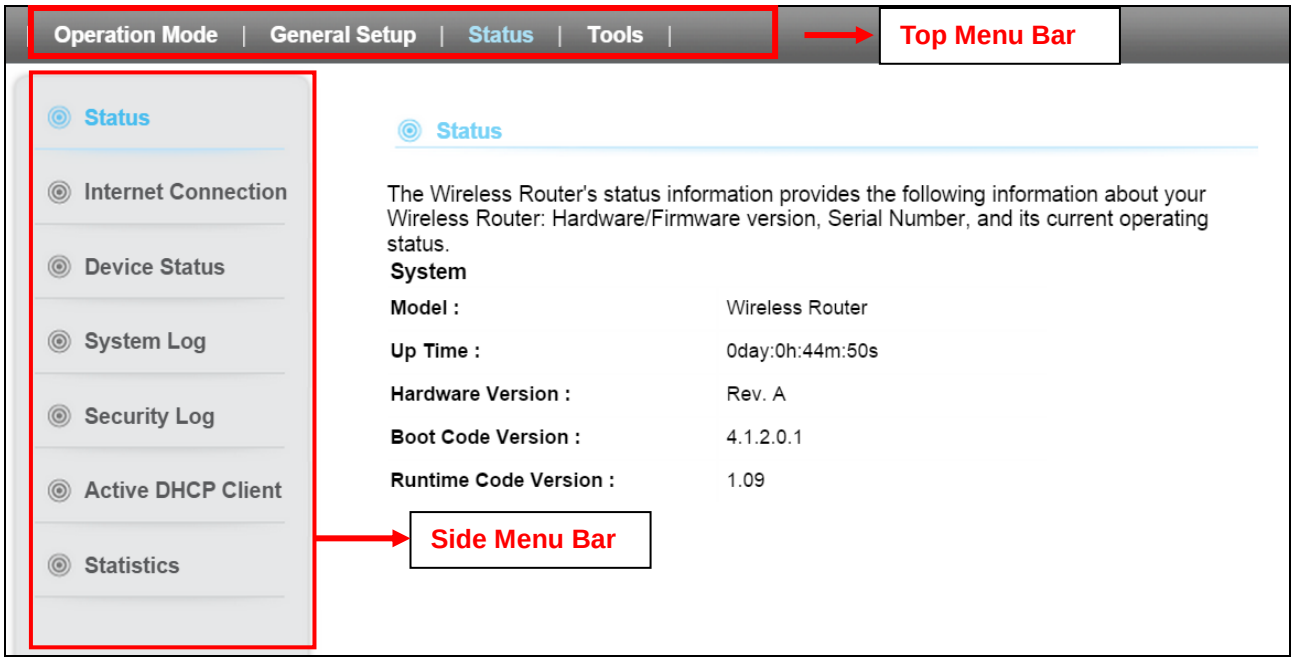


4 Wireless and WAN Settings

In this chapter, we will explain about the wireless settings and router mode settings in web management interface. Please be sure to read through Chapter 3's "Introduction to Web Management" and "Initial Configurations" first. For system configurations, device status, and other non-wireless related settings; please go to Chapter 5.

4.1 About AC-1200R Menu Structure

The AC-1200R's web management menu is divided into 4 main sections: **Operation Modes**, **General Setup**, **Tools** and **Status**. The main menus' options are always displayed on the top of the web management page. Within each main menu category, there are sub-menu options which are displayed on the side of the web management page.



- **Operation Mode**: This menu is where you will find wireless and WAN settings. The AC-1200R's wireless settings are dependent on the wireless operation mode you choose; only the applicable wireless settings for selected operation mode are shown. For example; WAN port setting is available only for AP Router and WISP Router mode, it will only be shown in those modes. To access wireless settings, click on the "Setup" button within each operation mode. For explanation on different wireless modes, please refer to Chapter 1. We will talk about functions in this menu for this chapter.

- **General Setup:** All settings besides Wireless and WAN functions are in this category. The system configuration including changing password, upload firmware, backup configuration, settings PING watchdog, and setting management interface. We will talk about this menu's function in Chapter 5.

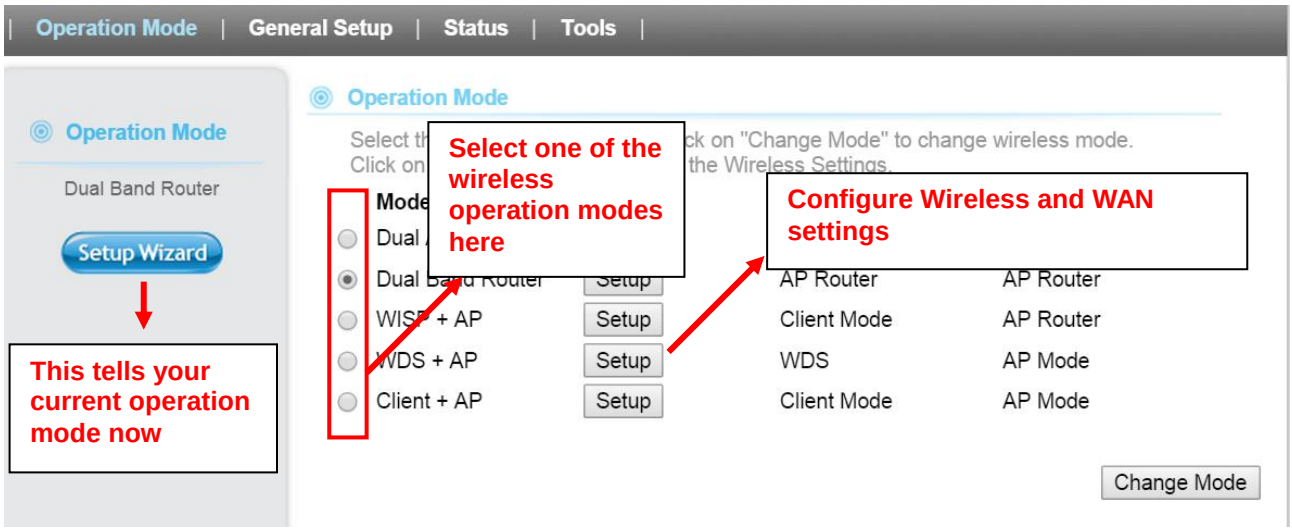
- **Tools:** Discover network status using ping, trace route and other tools

- **Status**: This section for monitoring the status of AC-1200R. It provides information on device status, Ethernet status, wireless status, wireless client table, and system log.

4.2 General Wireless Settings

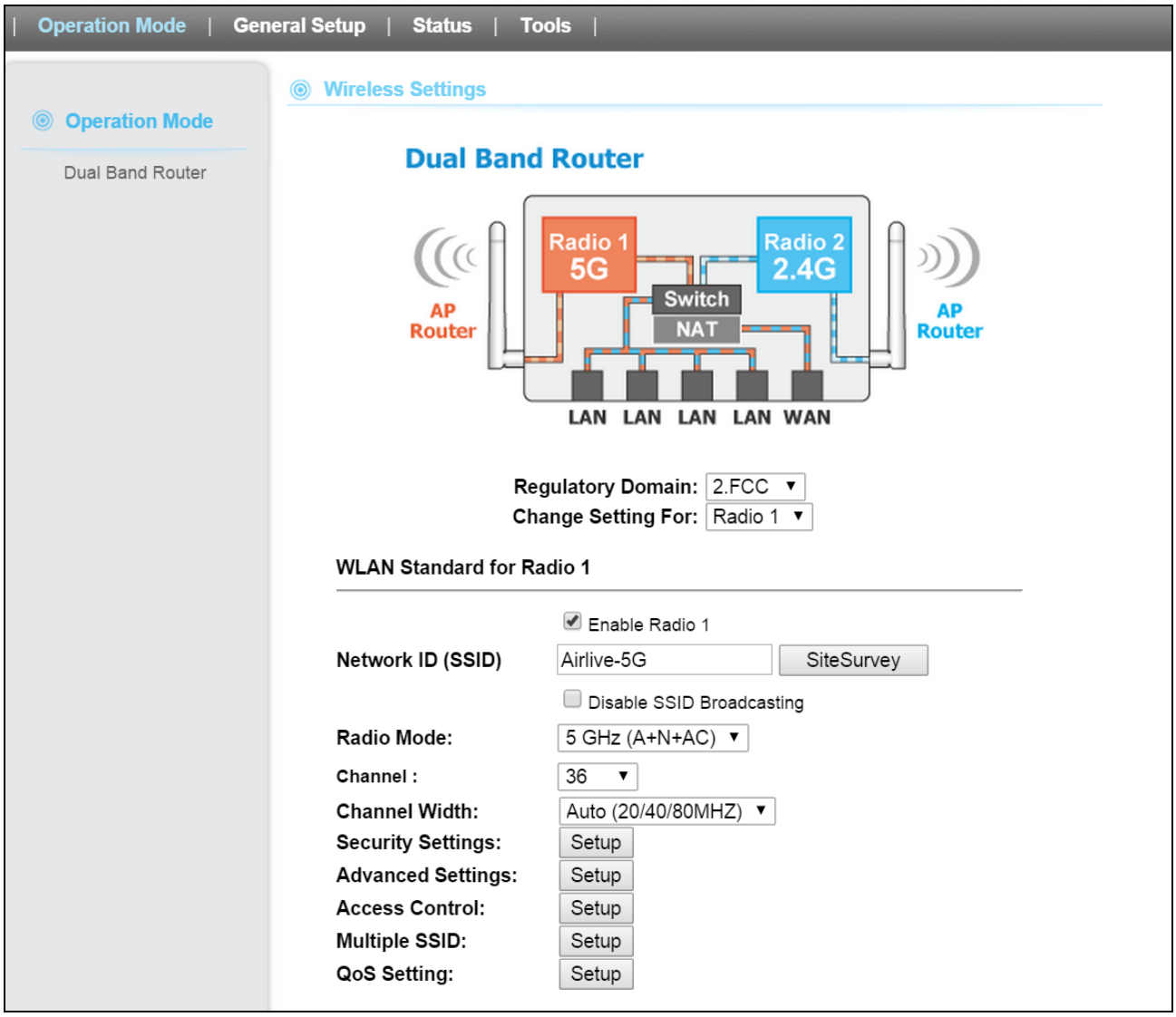
The wireless settings of AC-1200R are dependent on the wireless operation mode you choose. Therefore, the first step is to choose the operation mode. For explanation on when to use what operation mode, please refer to Chapter 1.

When you select "Wireless Settings" in the welcome screen, or click on the "Operation Mode" on the top menu; the following screen will appear:



- **Mode:** The available wireless operation modes for AC-1200R. Select one and click on "Change Mode" button to switch between modes.
- **Setup:** Click here to configure the Wireless and WAN (in router mode) settings.

Once you click on the "Setup" page, the wireless settings will appear



The AC-1200R device provides all 14 modes of wireless operational applications with:

Mode	Radio 1(11a)	Radio2(11a/b/g)	Applications
Dual Band Router	AP Router	AP Router	Dual Home Networks: 5GHz for Games/AV and 2.4GHz for PC
Dual AP Mode	Access Point	Access Point	Dual Band Hotspots
WISP + AP	Client Mode	AP Router	Sharing WISP 5GHz Broadband Wirelessly
WDS + AP	WDS Bridge Mode	Access Point	WDS Wireless Repeater
Client + AP	Client	Access Point	Universal Repeater

4.2.1 Regulatory Domain

Operation Mode -> Setup -> Regulatory Domain

The legal frequency and channels in 5GHz spectrum varies between countries. Please select your country from here. It is for compatibility testing only. Please make sure the channel you used is allowed in your country when select this special domain.

4.2.2 Network SSID

Operation Mode -> Setup -> Network SSID

The SSID is the network name used to identify a wireless network. The SSID must be the same for all devices in the same wireless network. In AC-1200R, it is possible to create more than one SSID or guest Mode in AP and AP Router mode, please check the "General Setup→2.4G-> Guest" for 2.4 radio and "General Setup→5G-> Guest" for 5G radio. The SSID length is up to 32 characters. The default SSID is "**airlive**".

- **Enable Radio 1/2**: The default wireless is on. You can uncheck this box to disable wireless interface.
- **Disable SSID Broadcasting**: If you check this box, the SSID will be hidden; only users who know the SSID can associate with this network.

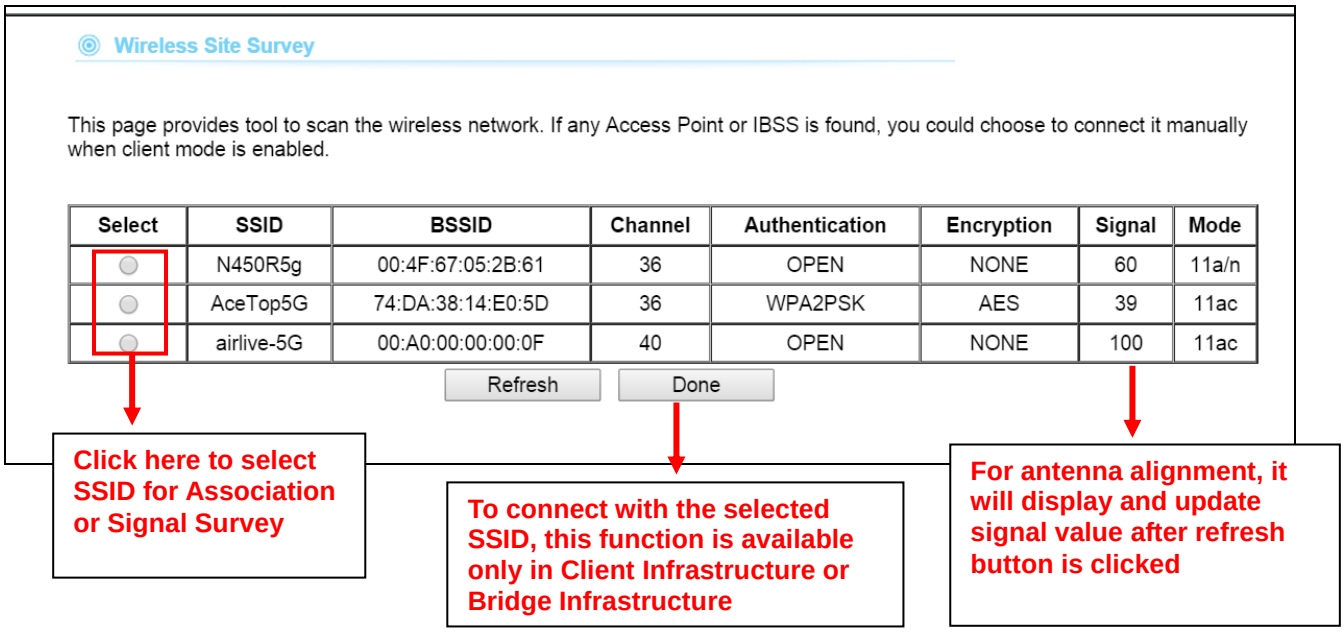
4.2.3 Site Survey

Operation Mode -> Setup -> Site Survey

The Site Survey function in AC-1200R provides 4 important functions

- In Client and Bridge Infrastructure mode, site survey will scan for available AP network. Then allow user to select and connect to the AP. These greatly simplify the installation.
- Once Site Survey displays the available AP or Bridge networks, you can select a particular SSID to display its RSSI value continuously. This function is called “Signal Survey”. Signal Survey can be used for antenna alignment.
- For WDS Bridge mode, the Site Survey will scan for available AP and Bridge networks. User can then find the MAC address (BSSID) of the remote Bridges.
- For AP and AP router mode, the Site Survey allows administrator to check what channels are already occupied for choosing a cleaner channel.
-

When you click on Site Survey, the following screen will appear. It might take a few minutes to scan all the channels in the 2.4G or 5GHz spectrum.



- **Done**: Please choose a SSID before click on this button. This button is available only in Client Infrastructure or Bridge Infrastructure modes. Once you click on this button, AC-1200R will attempt to make a connection with the selected ESSID. If there is encryption needed, the AC-1200R will prompt you to enter the encryption key. Please make sure you enter the correct encryption key, the AC-1200R will not check whether the encryption key is correct.

- **Signal**: Signal is a value to show the Signal Level for other access point R. In general, remote APs with stronger signal will display higher signal values. For RSSI value, the smaller the absolute value is, the stronger the signal.

4.2.4 Radio Mode

Operation Mode -> Setup -> Radio Mode

AC-1200R has different options for WLAN transmission. All devices in the same network should use the same WLAN mode. In radio 1 (5G), 6 options can be selected: A+N+AC , N+AC, AC,A+N,N,A

In radio 2 (2.4G): 5 options can be selected: B+G+N,G,B+G, N,B

4.2.5 Channel

Operation Mode -> Setup -> Channel

The channel is the frequency range used by radio. In 802.11ac standard, each channel occupies 80MHz width. For 2 wireless devices to connect, they must use the same channel. The number of available legal channels might be different between countries. If you are living outside EU, please change the country from the “Regulatory Domain” option in this page.

4.2.6 Channel Width

Operation Mode -> Setup -> Channel Width

In radio1 (5G) spec, each channel occupies 20MHz channel width. Therefore, each channel will jump by number of 4 (i.e. 36, 40, 44…etc). You can change the Channel Width to 10MHz (Half) or 5MHz (Quarter) to either increase performance or reduce the interference problem.

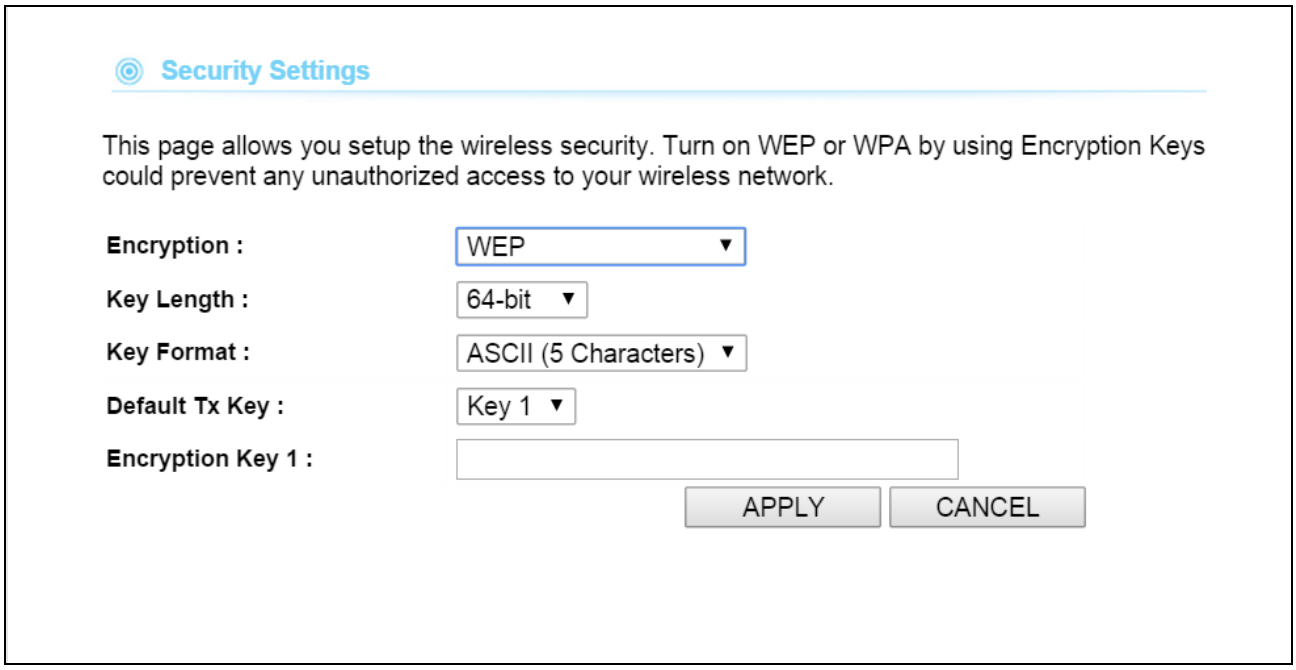
- **Auto(20/40/80MHz)**: This is the default channel width specified by IEEE 802.11ac specification
- **20/40**: Using this option would reduce the interference when AC-1200R is deployment in congested areas. However, the performance will also drop by half when using this option.
- **20MHz:** It is a good choice for deployment in very congested areas. However, the performance will also drop greatly when using this option.

4.2.7 Security Settings

Operation Mode -> Setup -> Security Settings

Security settings allow you to use encryption to secure your data from eavesdropping. You can select different security policy to provide association authentication and/or data encryption. The AC-1200R features various security policies including WEP, WPA radius, WPA, WPA-PSK, WPA2, and WPA2-PSK. Please note not all security policies are available in all operation modes. For example, only WEP is available currently in WDS Bridge mode. All wireless devices on the same network must use the same security policy. We recommend using WPA-PSK or WPA2-PSK whenever possible.

WEP: WEP Encryption is the oldest and most available encryption method. However, it is also the least secure.



- **Select one of the WEP key for wireless network:** There are total of 4 possible keys for WEP encryption. You need to choose which key will be used for encryption. All wireless devices on the same network have to use the same settings. We recommend using WEP Key 1 as in default setting.

- **WEP Keys:** Please enter the WEP keys used for encryption. You need to fill at least the “Select WEP Key”. For example; if you choose “Encrypt Data with WEP Key 1” in the previous field, then it is necessary to fill WEP Key 1. The length of key is dependant on the Key Length and Key type you choose.

Key Length: The AC-1200R offers 64bit, 128 bit, and 152 bit for WEP key length. The longer the Key Length, the more secure the encryption is.

Key Type: 2 types are available: ASCII and HEX. ASCII is a string of ASCII code including alphabetical characters, space, signs and numbers (i.e. “airlivepass12”). HEX is a string of 16-bit hexadecimal digits (0..9, a, b, c, d, e, f). All wireless devices on the network must match the exact key length and Key type. Some Wireless clients only allow HEX type for WEP.

ASCII-64: This is a key with 64-bit key length of ASCII type. Please enter 5 ASCII Characters if you choose this option. For example, “passw”

HEX-64: This is a key with 64-bit key length of HEX type. Please enter 10 Hexadecimal digits if you choose this option. For example, “12345abcdef”

ASCII-128: This is a key with 64-bit key length of ASCII type. Please enter 13 ASCII Characters if you choose this option. For example, “airlivewepkey”

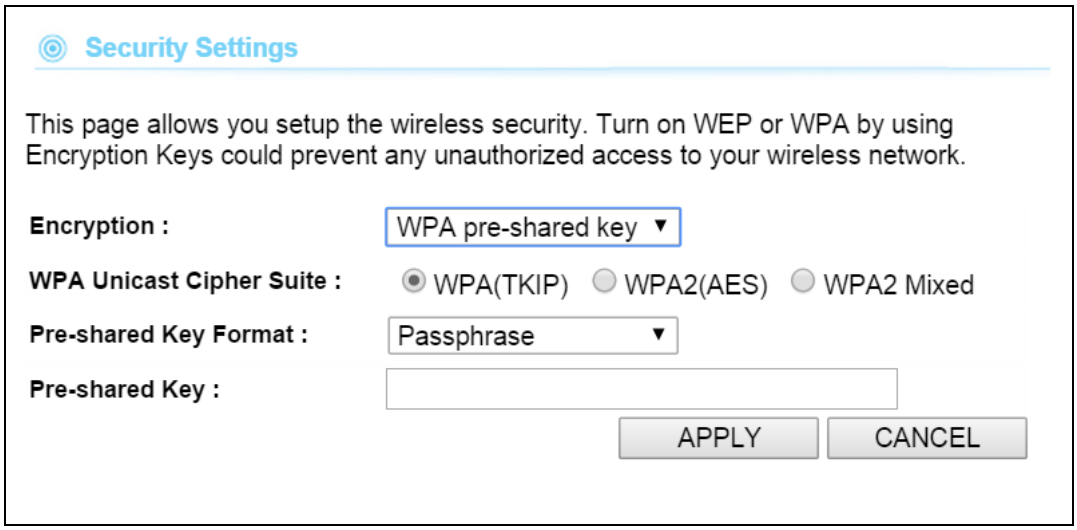
HEX-128: This is a key with 128-bit key length of HEX type. Please enter 26 Hexadecimal digits if you choose this option. For example, “1234567890abcdef1234567890”

WPA radius: WPA radius allows users to leverage a RADIUS server to do association authentications.

To Enable RADIUS Server:

- **Server IP:** The IP address of the RADIUS server.
- **Port Number:** The port number that your RADIUS server uses for authentication. The default setting is 1812.
- **Radius Server Password:** This is used by your RADIUS server in the Shared Secret field in RADIUS protocol messages. The password configured in the AC-1200R must match the password configured in the RADIUS server. The password can contain up to 64 alphanumeric characters.

WPA-PSK, WPA2-PSK: Wi-Fi Protected Access (WPA) with Pre-Shared Key (PSK) provides better security than WEP keys. It does not require a RADIUS server in order to provide association authentication, but you do have to enter a shared key for the authentication purpose. The encryption key is generated automatically and dynamically. WPA2-PSK adds AES encryption for even better security. WPA2 mixed tries to authenticate wireless clients using WPA-PSK or WPA2-PSK.



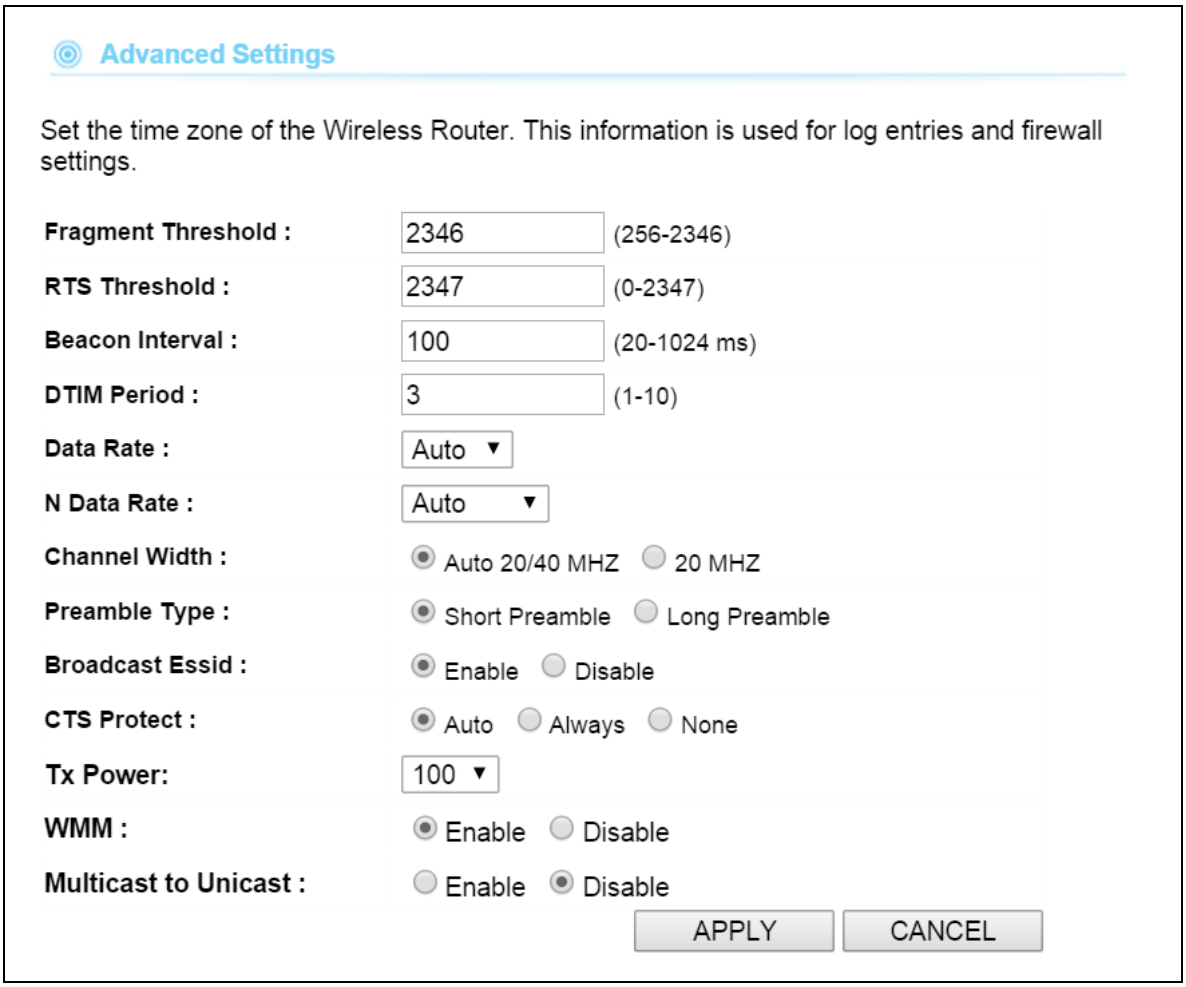
- **Pre-shared Key**: This is an ASCII string with 8 to 63 characters. Please make sure that both the AC-1200R and the wireless client stations use the same key.

- **WPA unicast Cipher Suite**: There are three cipher suite : WPA (TKIP),WPA2(AES), WPA2 Mixed
- **Pre-shared Key format:** To select the key format

4.2.8 Advance Settings

Operation Mode -> Setup -> Advance Settings

This page includes all the wireless settings that change the RF behaviors of AC-1200R. It is important to read through this section before attempting to make changes.



- **Beacon Interval**: **Beacon Interval:** The device broadcasts beacon frames regularly to announce its existence. The beacon Interval specifies how often beacon frames are transmitted in time unit of milliseconds. The default value is **100**, and a valid value should be between 1 and 65,535.

- **RTS Threshold:** RTS/CTS frames are used to gain control of the medium for transmission. Any unicast (data or control) frames larger than specified RTS threshold must be transmitted following the RTS/CTS handshake exchange mechanism. The RTS threshold should have a value between 256-2347 bytes, with a default of **2347**. It is recommended that this value does not deviate from the default too much.

- **Fragmentation Threshold:** When the size of a unicast frame exceeds the fragmentation threshold, it will be fragmented before the transmission. It should have a value of 256-2346 bytes, with a default of 2346. If you experience a high packet error rate, you should slightly decrease the Fragmentation Threshold.

- **DTIM Interval:** The AC-1200R buffers packets for stations that operate in the

power-saving mode. The Delivery Traffic Indication Message (DTIM) informs such power-conserving stations that there are packets waiting to be received by them. The DTIM interval specifies how often the beacon frame should contain DTIMs. It should have a value between 1 to 255, with a default value of 3.

- **Transmit Power:** You can adjust the transmit output power of the AC-1200R's radio from 10dBm to 24dBm. The higher the output power, the more distance AC-1200R can deliver. However, it is advised that you use just enough output power so it will not create excessive interference for the environment. Also, using too much power at close distance can create serious performance drop due to signal distortion. At less than 200meter distance, the best output power is about 14dBm. At 2km distance; the best output power setting is 18dBm for "11a".

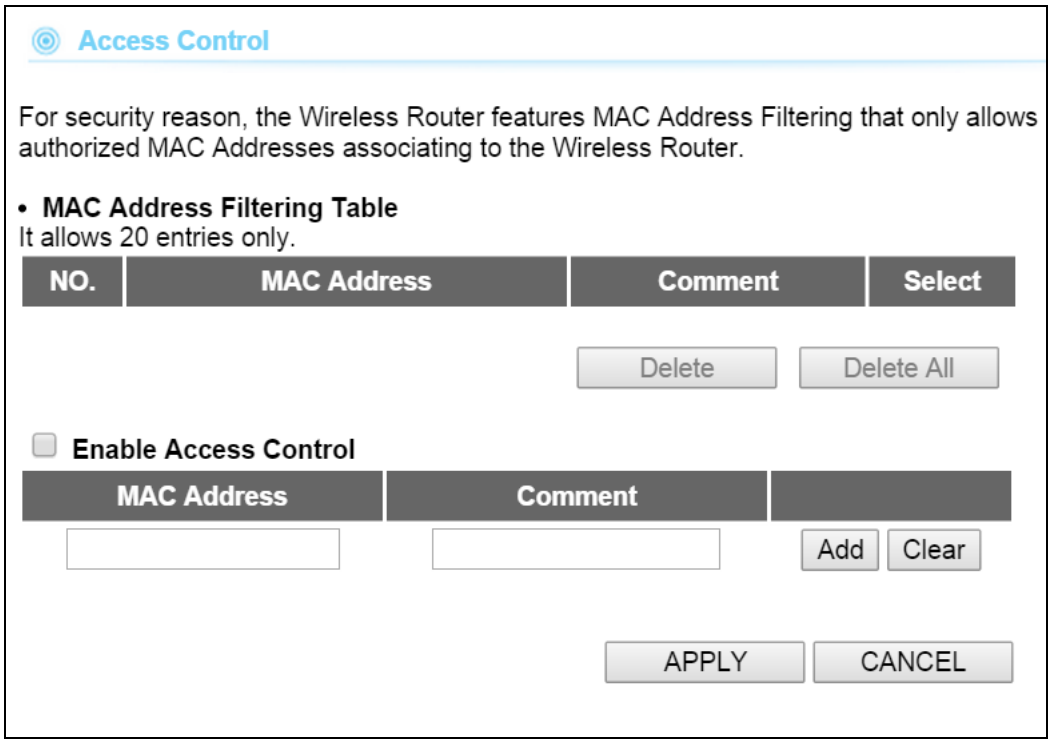
- **Data Rate:** Select here to change the Data Rate for the radio. Lower data rate sometimes provide longer distance. In most cases, however, we recommend to keep the setting at "Auto

- **Enable 802.1d STP:** Enable the Spanning Tree Protocol to prevent forming a network loop. This option is especially important for WDS Bridge mode.

4.2.9 Access Control (ACL)

Operation Mode -> Setup -> Access Control

The AC-1200R allows you to define a list of MAC addresses that are allowed or denied to access the wireless network. This function is available only for Access Point and AP Router modes.



To add a MAC address into the table, enter a Mnemonic Name and the MAC Address, and then click Add. The table lists all configured MAC Filter entries.

To delete entries, check the corresponding Select boxes and then press *Delete Selected or delete all*.

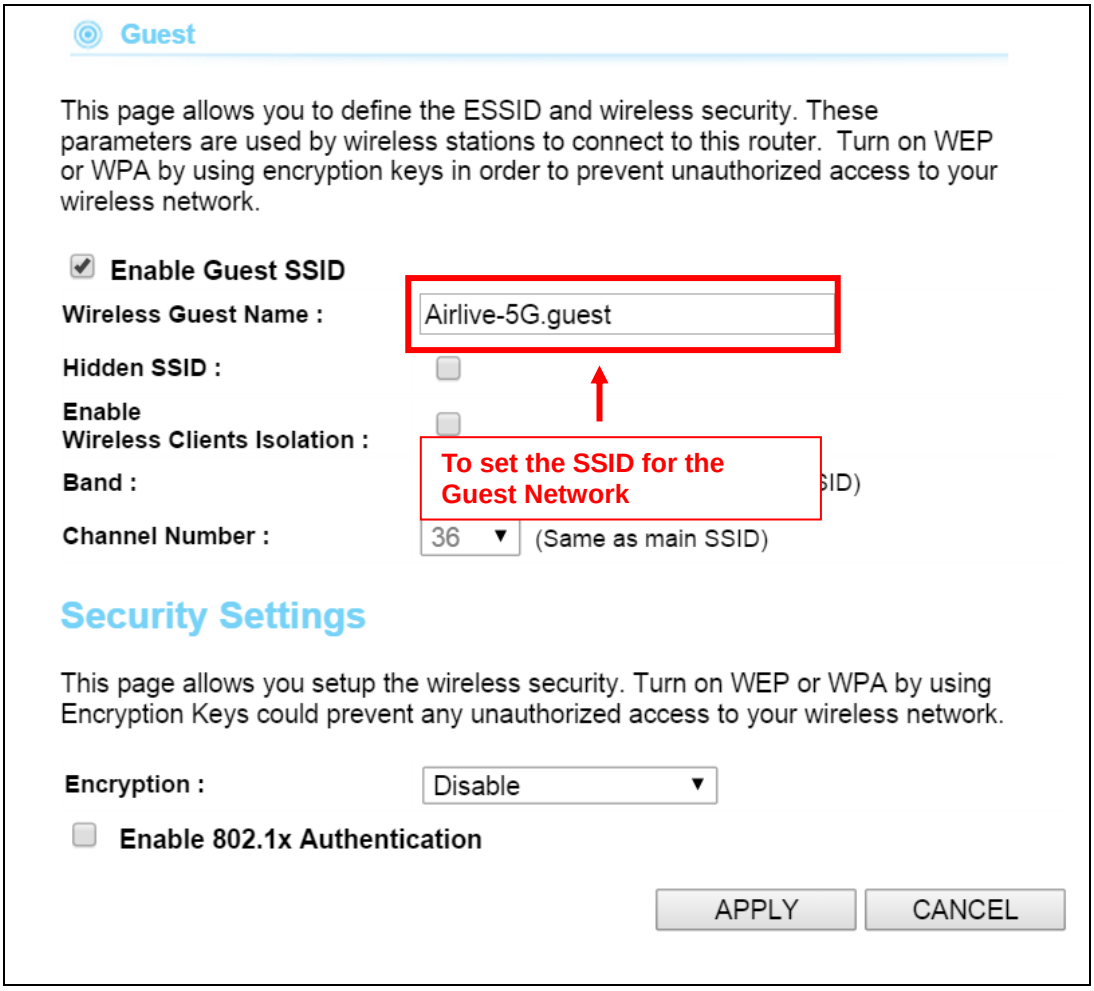
4.2.10 Multiple SSID

Operation Mode -> Setup -> Multiple SSID

This function is available only for Access Point and AP Router modes. Multiple SSID also known as guess mode allows AC-1200R to create up to 1 different wireless networks (SSID). It is also known as “Virtual AP or guess” function. Each SSID can have its Encryption type. The users who access the Guess mode SSID can not access the AC-1200R.

Configuring the Multiple SSID

When you click on the “Multiple SSID” button, the following screen will appear.



How to enable Guess SSID

You can add 1 SSID for guest in each radio. Please follow the procedure below:

1. Enter the Wireless Guest Name (SSID) name (i.e. BridgeNet)
2. Select the Security Policy (i.e. WPA-PSK)
3. Enter the Security Key (i.e. BridgeNetKey).
4. Click on “Apply” to add SSID

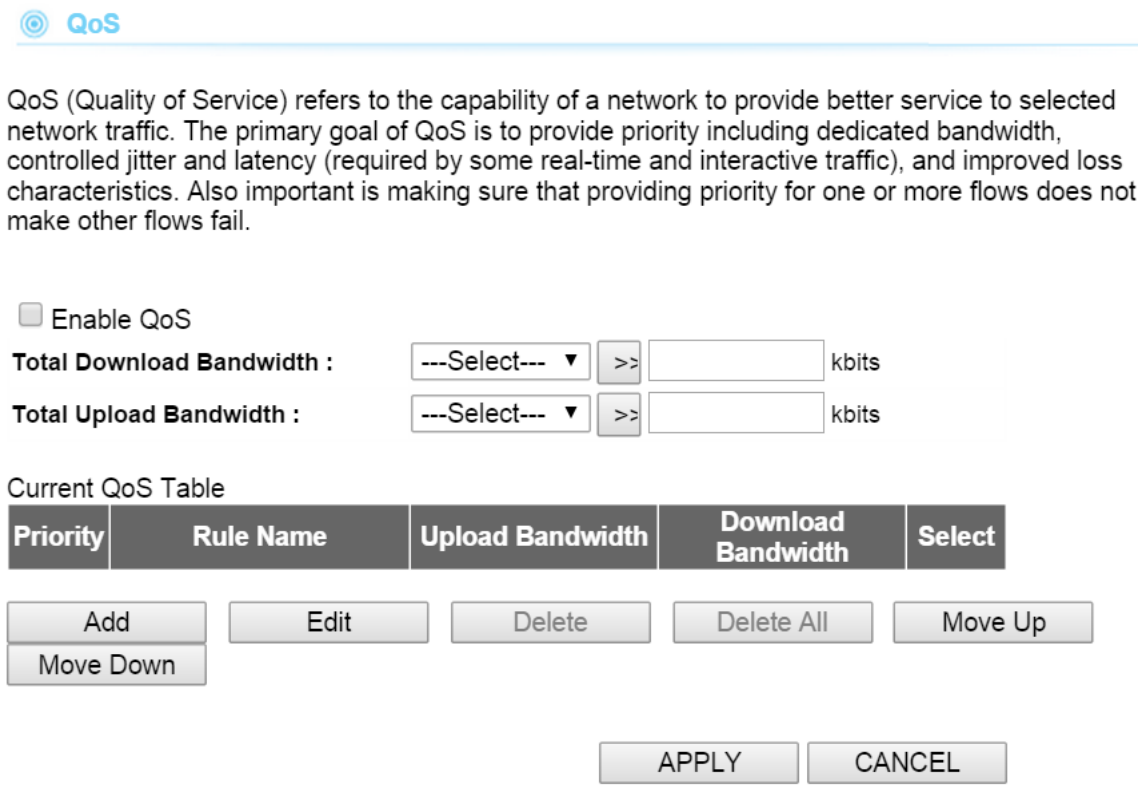
How to disable guess SSID

To disable the guess SSID, please uncheck the “Enable Guess SSID”.

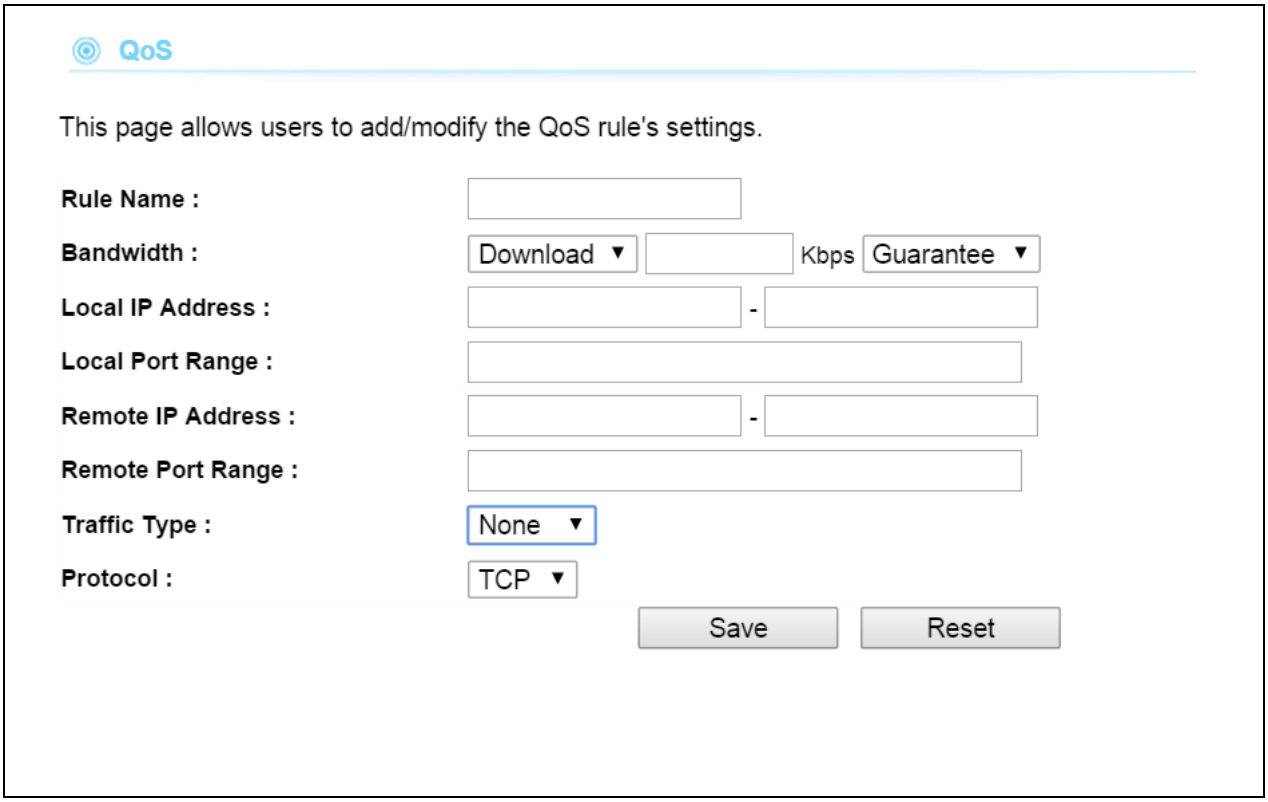
4.2.11 QoS Setting

Operation Mode -> Setup -> QoS Setting

QoS also known as the Bandwidth Control, administrator can set up the bandwidth for each IP address.



Configure the QoS Parameters



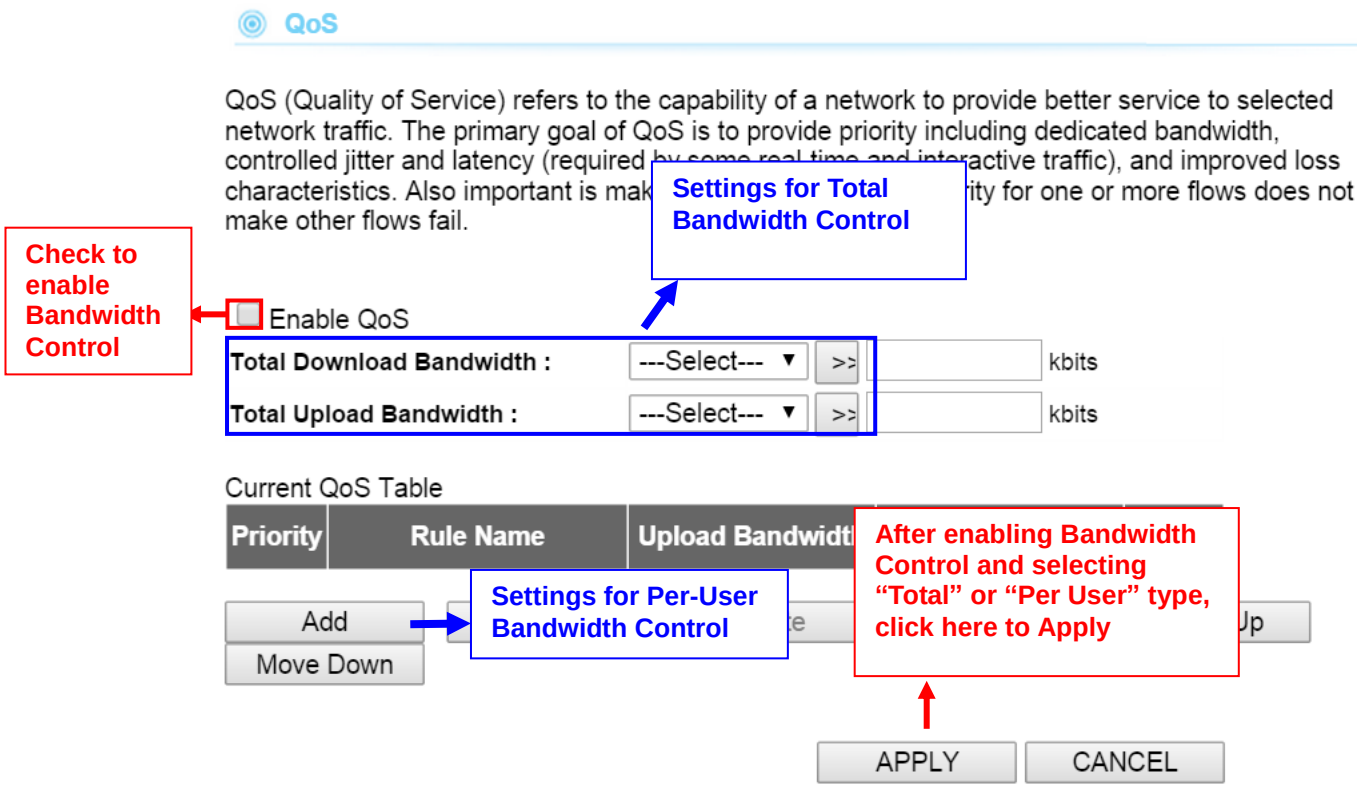
- **Rule Name:** Set the name for the rule
- **Bandwidth:** Set the number which you want to limit
- **Local IP address:** Set the IP address which you want to manage
- **Local Port Range:** Set the port number for which you want to manage
- **Remote IP address:** Set the IP address
- **Remote Port Range:** Set the port range
- **Specific the Traffic Type:** Select the specific traffic you want to manage
- **Protocol:** select the QoS protocol: TCP or UDP

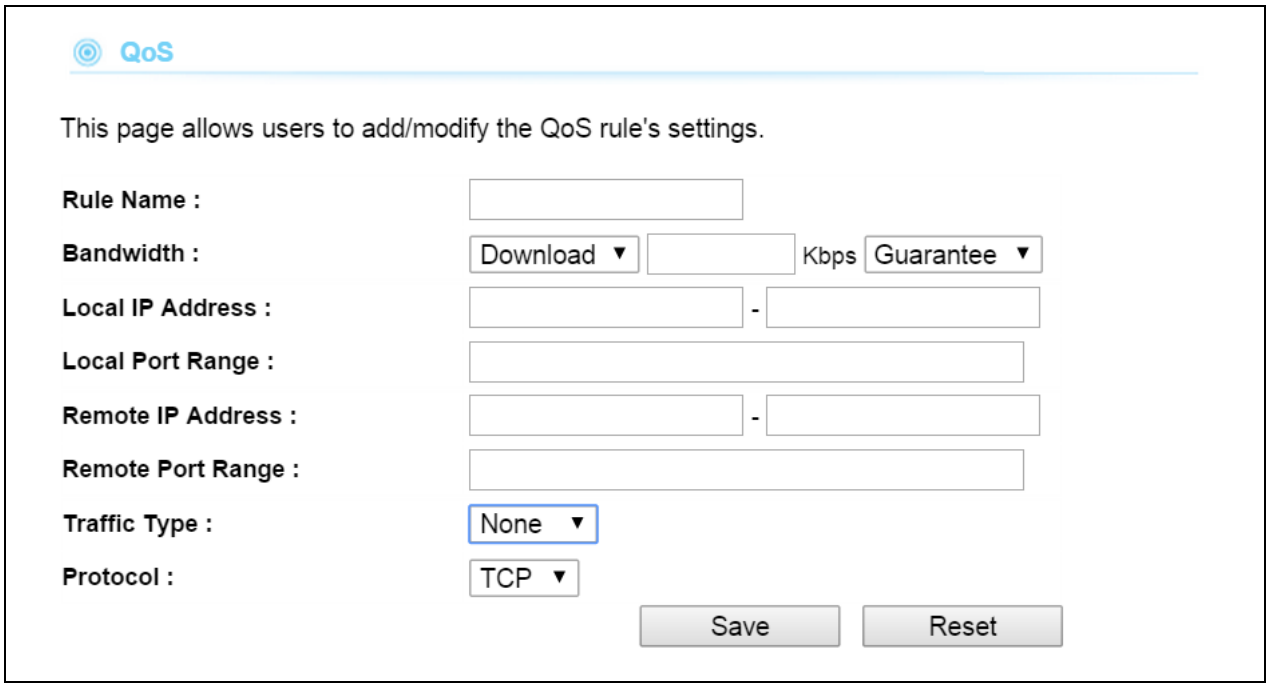
4.2.12 Bandwidth Control

Operation Mode -> Setup -> QoS

QoS also known as Bandwidth Control can limit the maximum speed of entire wireless interface or individual device. It is also known as Traffic Shaping. The AC-1200R provides both Total Bandwidth and Per-User Bandwidth Control for both uplink and downlink speed. It controls the speed of both wireless and wired interface.

To configure, please click on the “Bandwidth Control” button under wireless settings. The following screen will appear:





- **Enable Bandwidth**: Check to enable Bandwidth Control. Uncheck to disable it. The default value is disabled.
- **Total Download Bandwidth**: Total Download Bandwidth control limit the bandwidth which all users can download from the WAN. Enter speed you wish to limit the download traffic in Kbps
- **Total Upload Bandwidth:** Enter the speed you wish to limit the upload traffic in Kbps units.

QoS table: QoS table can limit speed of individual PC and network device. The AC-1200R allows multiple rule for QoS bandwidth control and it can limit the bandwidth by IP address, Port segment. Please first enable the Bandwidth Control, then click add to add the *Rule*.

- **Rule Name:** Enter a description for the bandwidth policy. For example, “VIP” subscriber
- **Bandwidth:** To set the download, upload bandwidth limited
- **IP address:** To limit the bandwidth of one single MAC address
- **Port Range:** This is available only in WISP router and AP Router mode. It can limit the bandwidth by application ports.
- **Traffic type:** This option is special for WISP router and AP Router mode. It can limit the bandwidth of HTTP, FTP,POP3, and SMTP traffic.

4.3 AP Specific Settings

The Access Point mode is the most basic mode of multi-function Access Point. In this mode, the AP will act as a central hub for different Wireless LAN clients. Some hotspot Access Points requires 802.1x authenticator function to authenticate a user before providing internet service.

Change Setting For: Radio 1

WLAN Standard for Radio 1

	☑ Enable Radio 1
Network ID (SSID)	Airlive-5G SiteSurvey
	☐ Disable SSID Broadcasting
Radio Mode:	5 GHz (A+N+AC)
Channel :	165
Channel Width:	Auto (20/40/80MHZ)
Security Settings:	Setup
Advanced Settings:	Setup
Access Control:	Setup
Multiple SSID:	Setup
QoS Setting:	Setup

Apply

NOTE: To access the wireless network, user must have correct SSID and encryption key, if enabled.

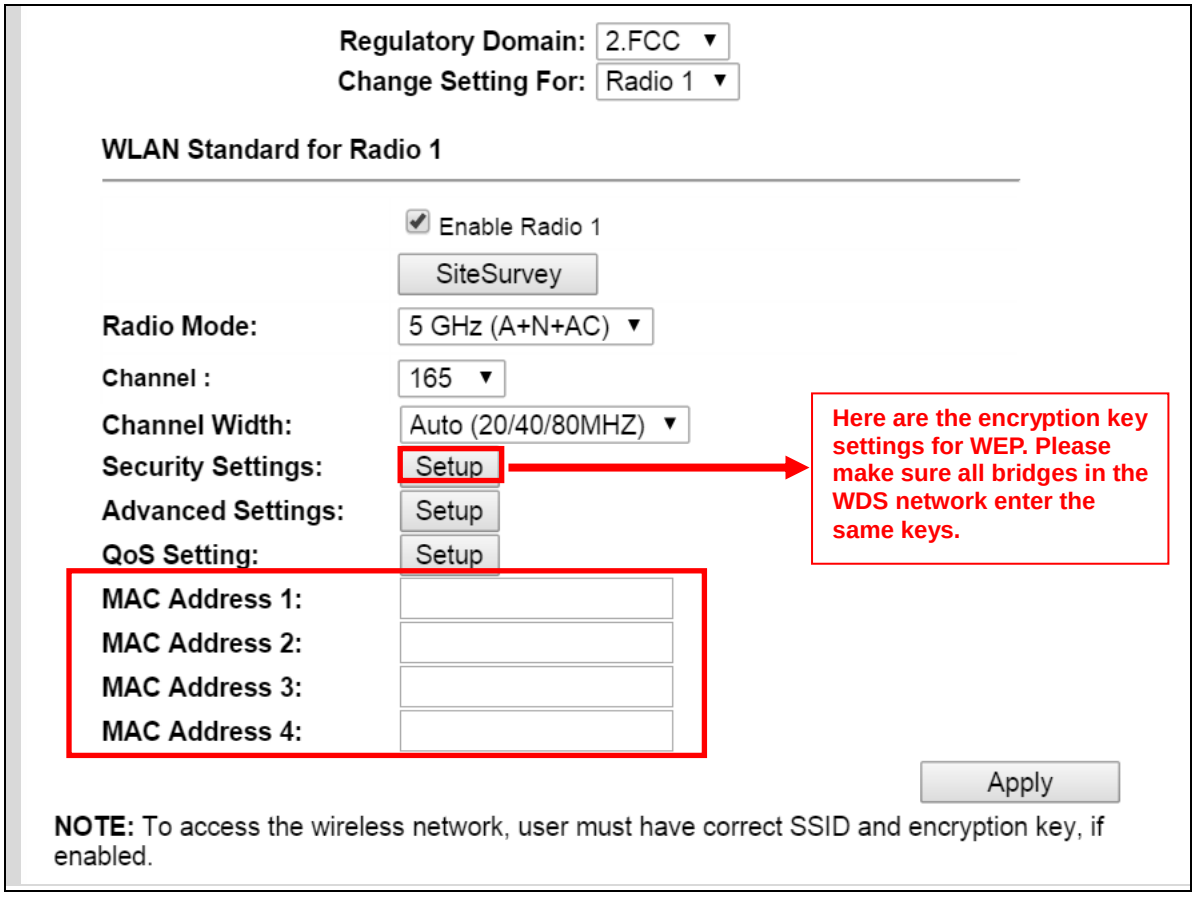
Enable Radio: Use this check box to turn on or turn off the radio.

- **Network ID (SSID):** This is to change your SSID.
- **Disable SSID Broadcasting:** Enable the check box if you want to hide your SSID in the network. This prevent an un-welcomed client survey your radio.
- **Radio Mode:** Connection modes on AC-1200R and its wireless client. Note that the client must support the same mode as AC-1200R to connect.
- **Channel:** The radio for channel in Radio 1 (5G) and Radio 2 (2.4G) is totally depend on the country regulation

4.4 Bridge Mode Specific Settings

The AC-1200R supports WDS Bridge connection. In a WDS network, each node can have up to 4 connections.

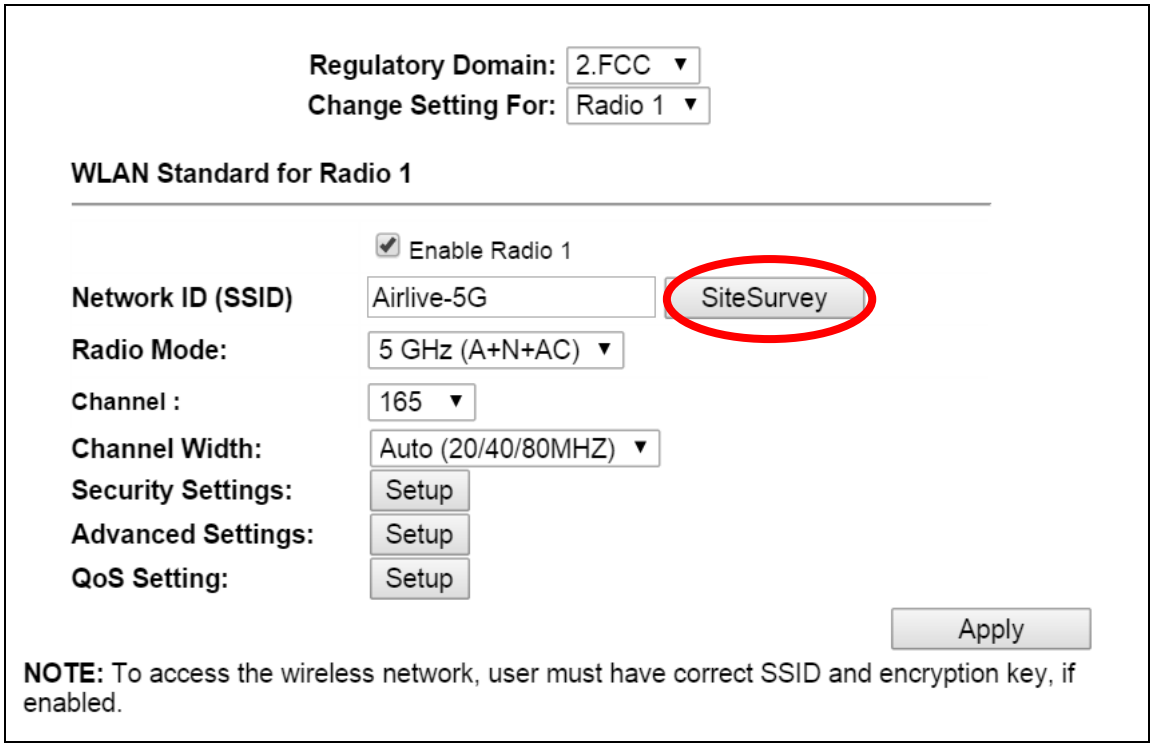
WDS Bridges are using BSSID (AP's Wireless MAC address) to authenticate each other. Therefore, it is necessary to know the remote Bridge's wireless MAC addresses. You can always do a "Site Survey" to find out the MAC Addresses. You also need to set the same encryption with remote Bridge. You can set up the encryption in Security Setting.



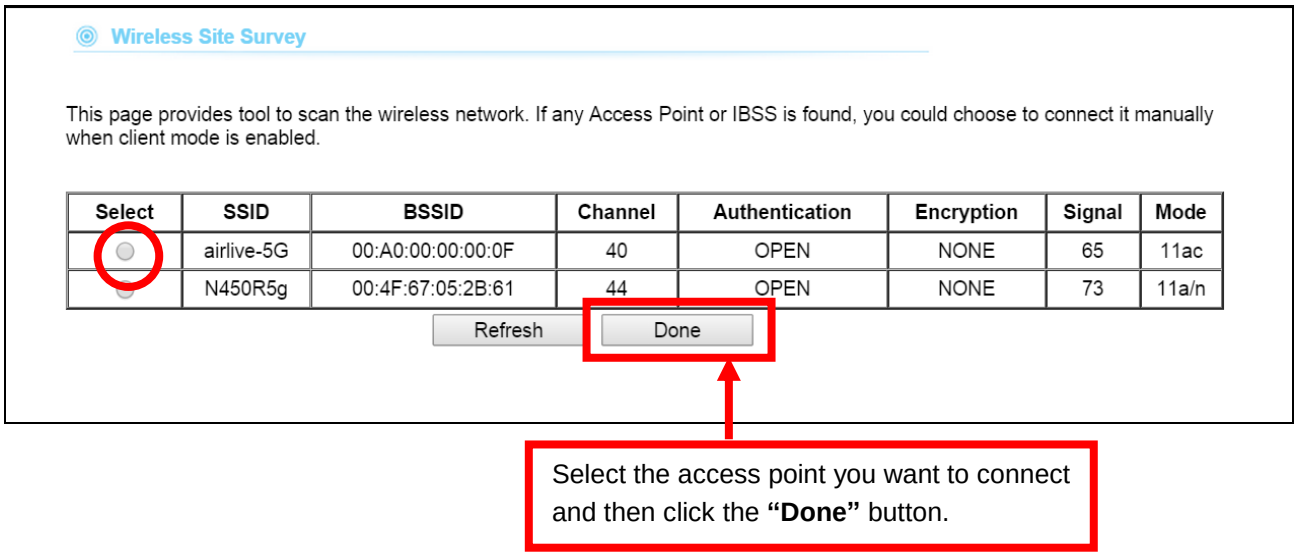
4.5 Client Mode Specific Settings

Client mode is also known as Ethernet Client. In this mode, the AP will act as a WLAN card to connect with the remote AP. Users can connect PC or local LAN to the Ethernet port of local LAN to the Ethernet port of the client mode AP. This mode is mostly used as a CPE device for WISP subscriber.

1. To connect to an access point, use the **"Site Survey"** button to find the Access Point.

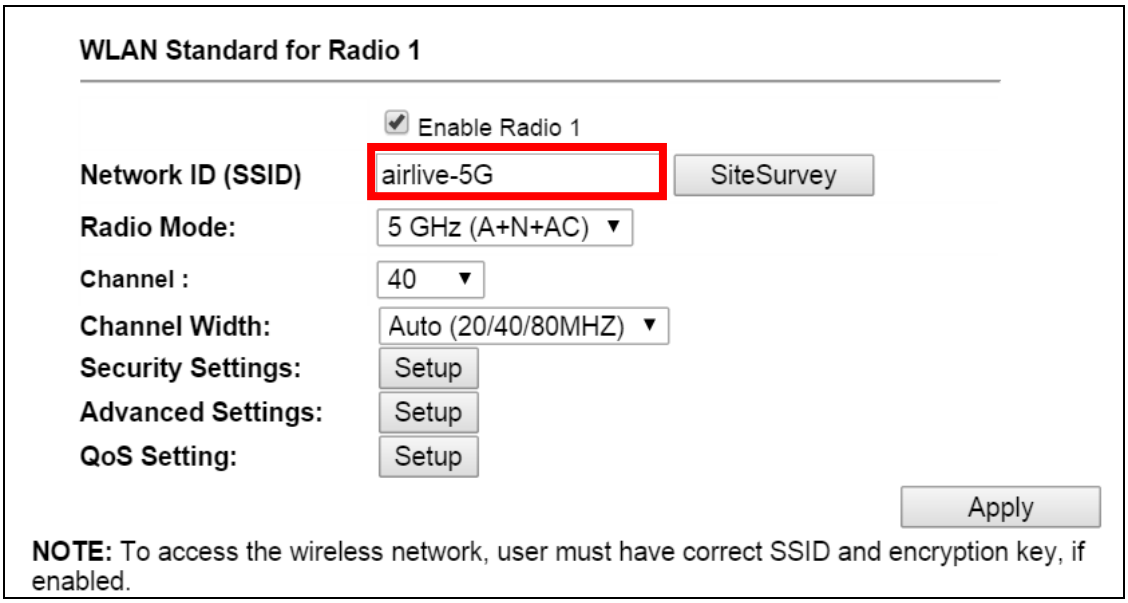


2. The Site Survey pop up window then shows up and lists available access point with relative information.



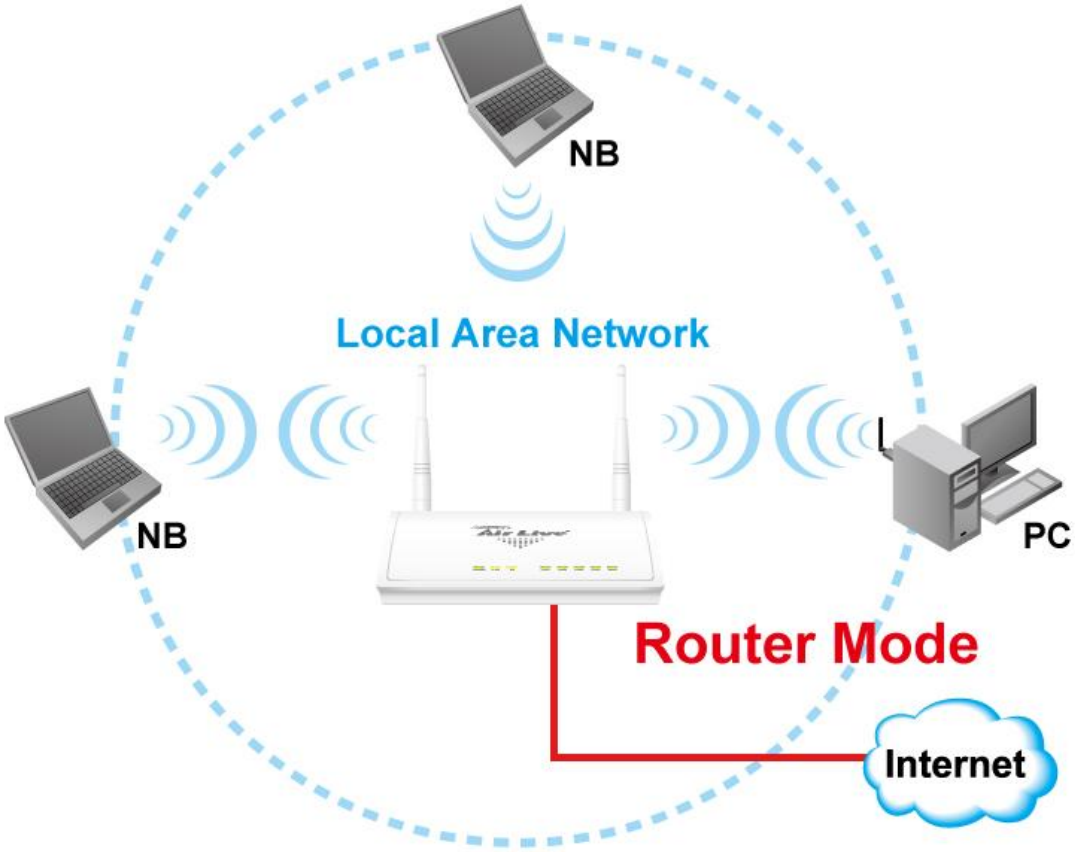
Select the access point you want to connect and then click the **"Done"** button.

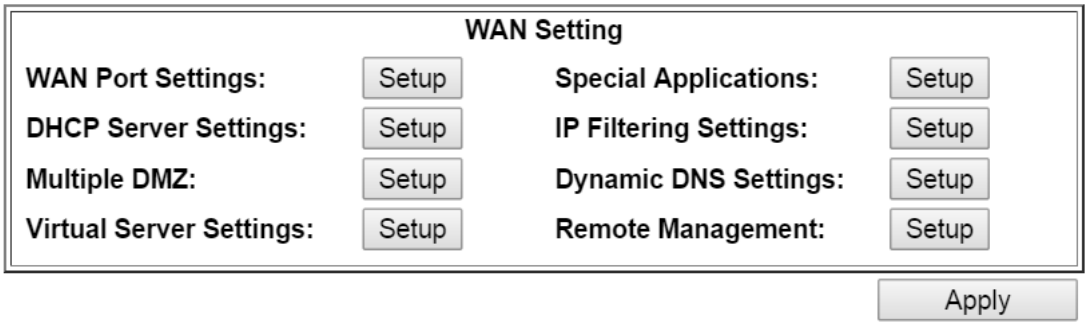
3. After the access point is selected, its SSID shows automatically in the Network ID (SSID) field.



4.6 Router Mode Specific Settings

In Router mode, router functions are added between one Ethernet port and other network interfaces. Therefore, the ISP subscriber can share the ISP connection without need for extra router.

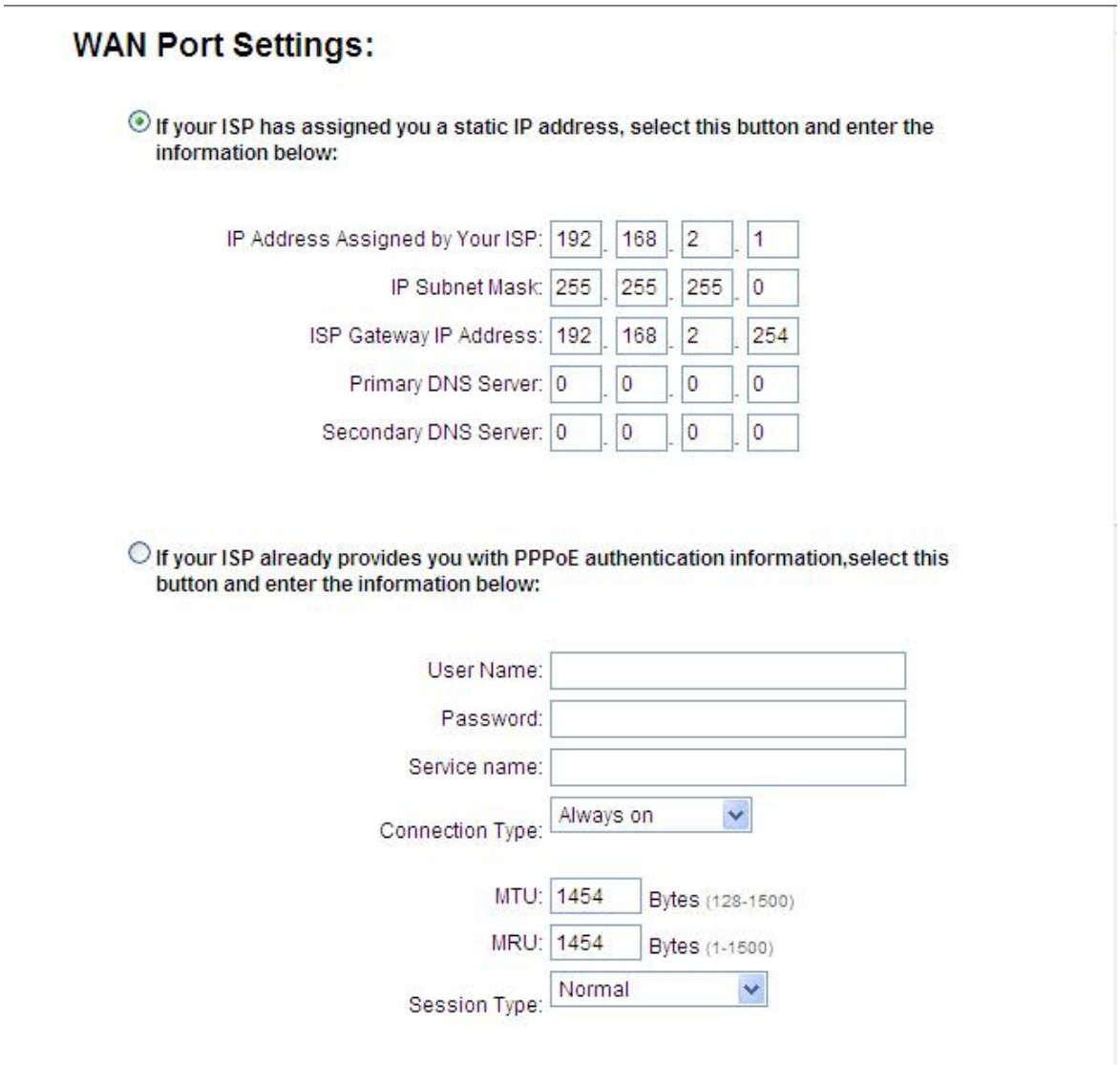




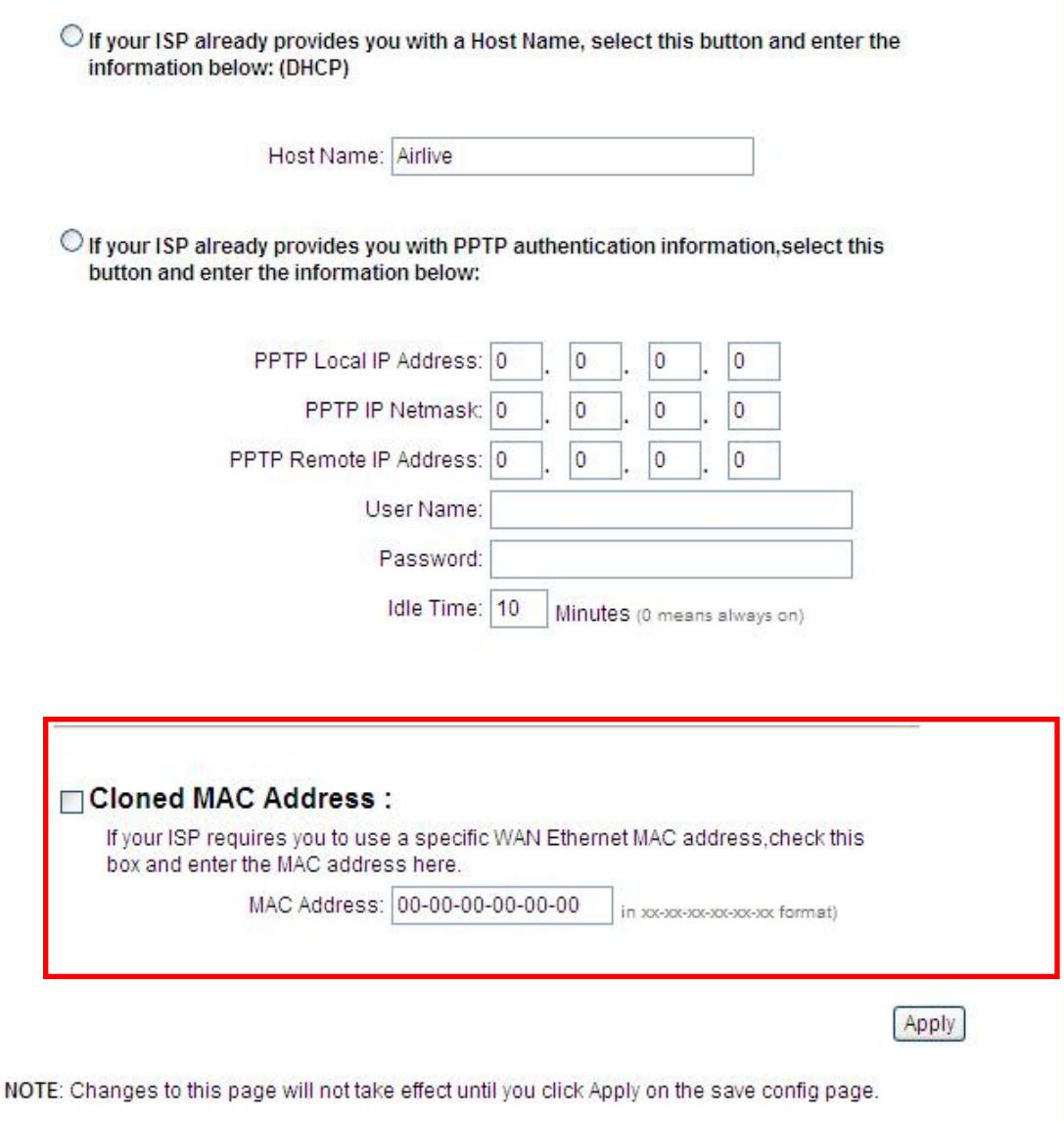
4.6.1 WAN Port Settings

Operation Mode -> Setup -> WAN Port Settings

The AC-1200R support different authentication and IP assignment standards for the WAN port. It includes fixed IP, DHCP, PPPoE and PPTP protocols. Please consult with your ISP about what authentication type is used for the WAN port connection.

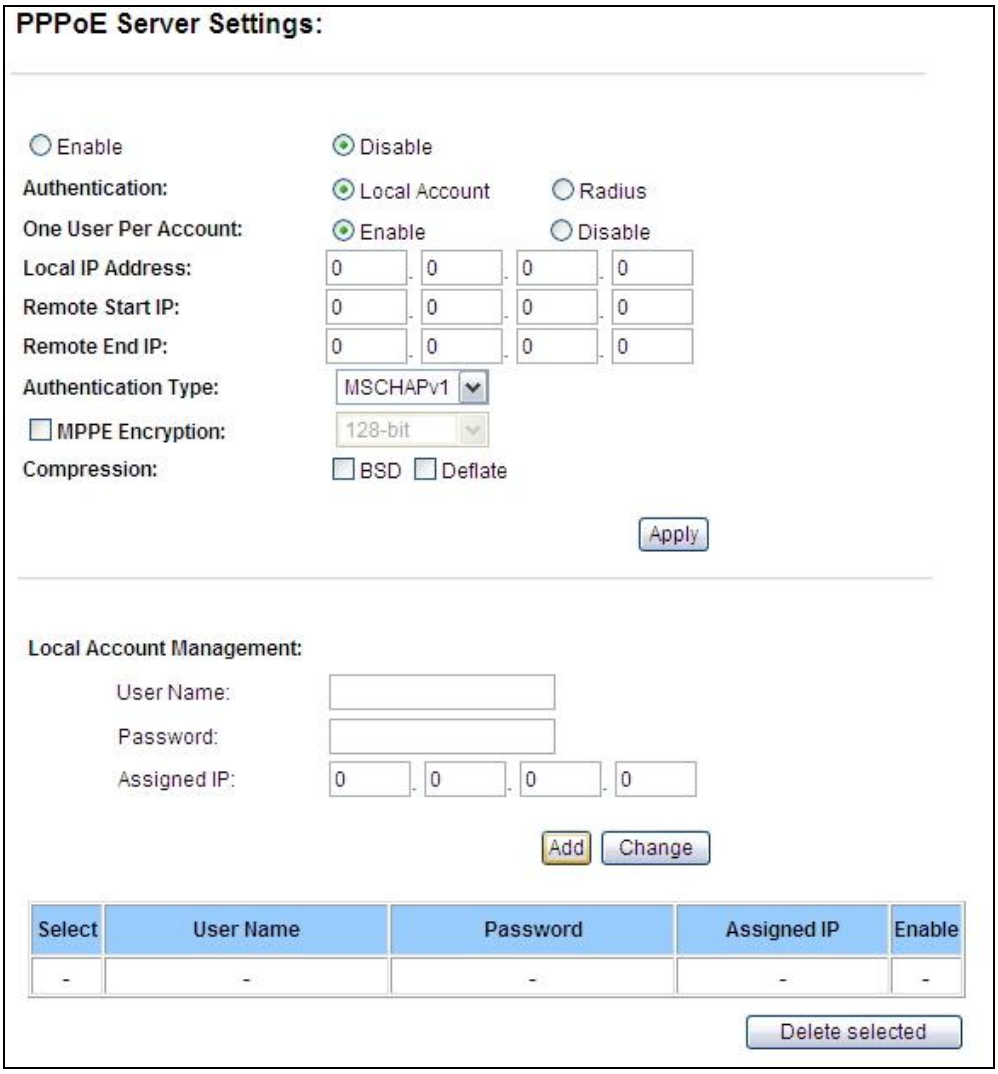


- **Clone MAC Address:** Some service provider (Cable Modem provider) lock to certain MAC address. In this situation, the WAN port of AC-1200R needs to clone the MAC address. Please check the “Clone MAC address” box and enter the address that need to be cloned.


If your ISP already provides you with a Host Name, select this button and enter the information below: (DHCP)
Host Name: Airlive
If your ISP already provides you with PPTP authentication information,select this button and enter the information below:
PPTP Local IP Address: 0 . 0 . 0 . 0
PPTP IP Netmask: 0 . 0 . 0 . 0
PPTP Remote IP Address: 0 . 0 . 0 . 0
User Name:
Password:
Idle Time: 10 Minutes (0 means always on)
Cloned MAC Address :
If your ISP requires you to use a specific WAN Ethernet MAC address,check this box and enter the MAC address here.
MAC Address: 00-00-00-00-00-00 in xx-xx-xx-xx-xx-xx format)
Apply
NOTE: Changes to this page will not take effect until you click Apply on the save config page.

4.6.2 PPPoE Server Settings

The PPPoE server setting is only available when the AC-1200R is in Dual Band Router mode. The maximum number of concurrent accounts is 14.



Operation Mode -> Setup -> PPPoE Server Settings

- **Enable/Disable:** Used to enable or disable PPPoE server.
- **Authentication:** Choose to use "**Local Account**" or "**Radius**" as authentication mechanism. If choosing "**Local Account**", you have to configure "**Local Account Management**". If choosing "**Radius**", you have to configure Radius server.
- **Local IP Address:** Assign IP address to the interface of PPPoE server.
- **Remote Start/Remote End IP:** Define IP address pool that is used to assign address to the connected PPPoE clients.

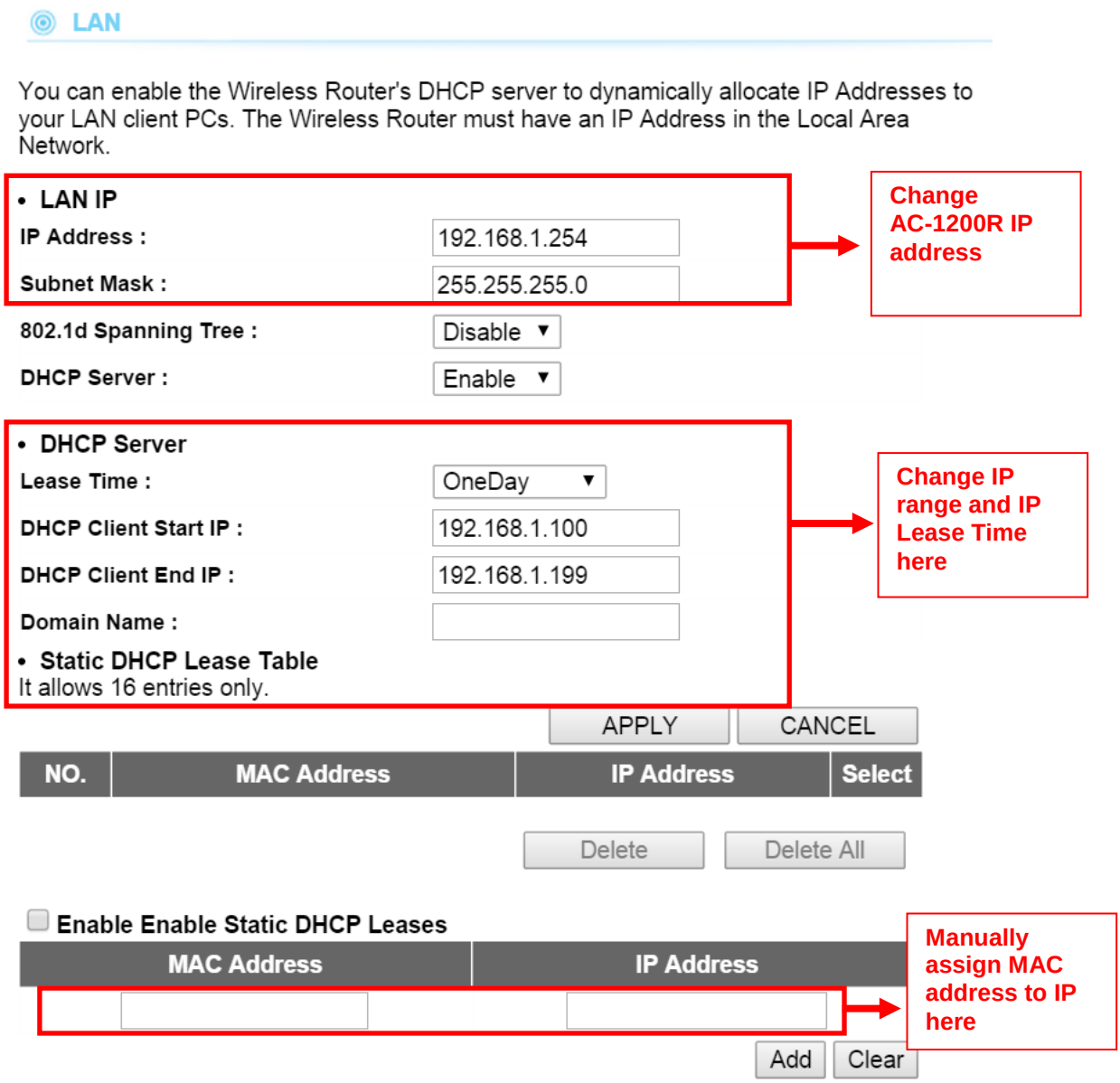
- **MPPE Encryption:** Used to enable or disable special MPPE encryption function.
- **Compression**: Used to enable compression function.
- **Local Account Management**
  - **User Name:** Specify authentication username.
  - **Password:** Specify authentication password.
  - **Assign IP:** Specify the IP address of PPPoE client. If 0.0.0.0 is specified, then PPPoE client will get an IP address between remote start IP and remote end IP.

4.6.3 DHCP Server Settings

Operation Mode -> Setup -> DHCP Server Settings

DHCP Server Settings is to assign private IP address to the devices in your local area network (LAN). Note that AC-1200R keeps the IP address of 192.168.1.254 and act as the default gateway of the LAN.

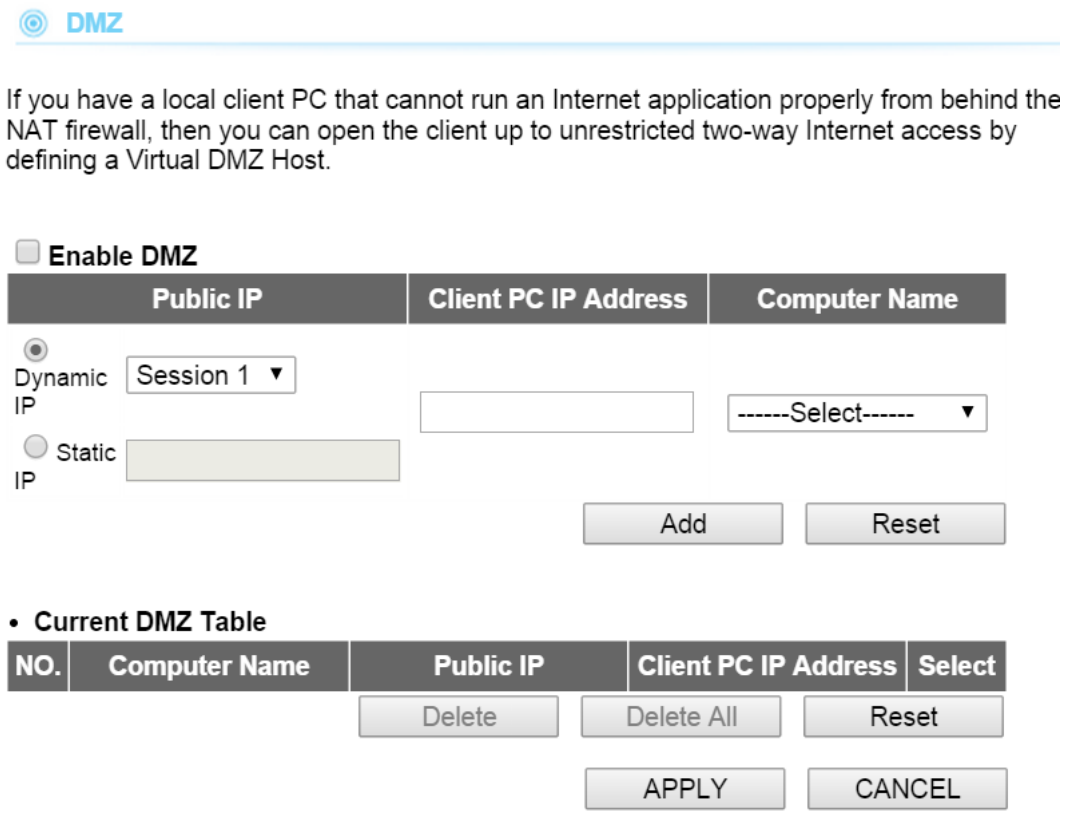
You can assign IP address to MAC address; the DHCP server will keep the IP for the MAC address.



4.6.4 Multiple DMZ

Operation Mode -> Setup -> Multiple DMZ

Multiple DMZ opens all TCP/UDP ports to particular IP address on the LAN side. It allows setting up servers behind the AC-1200R.



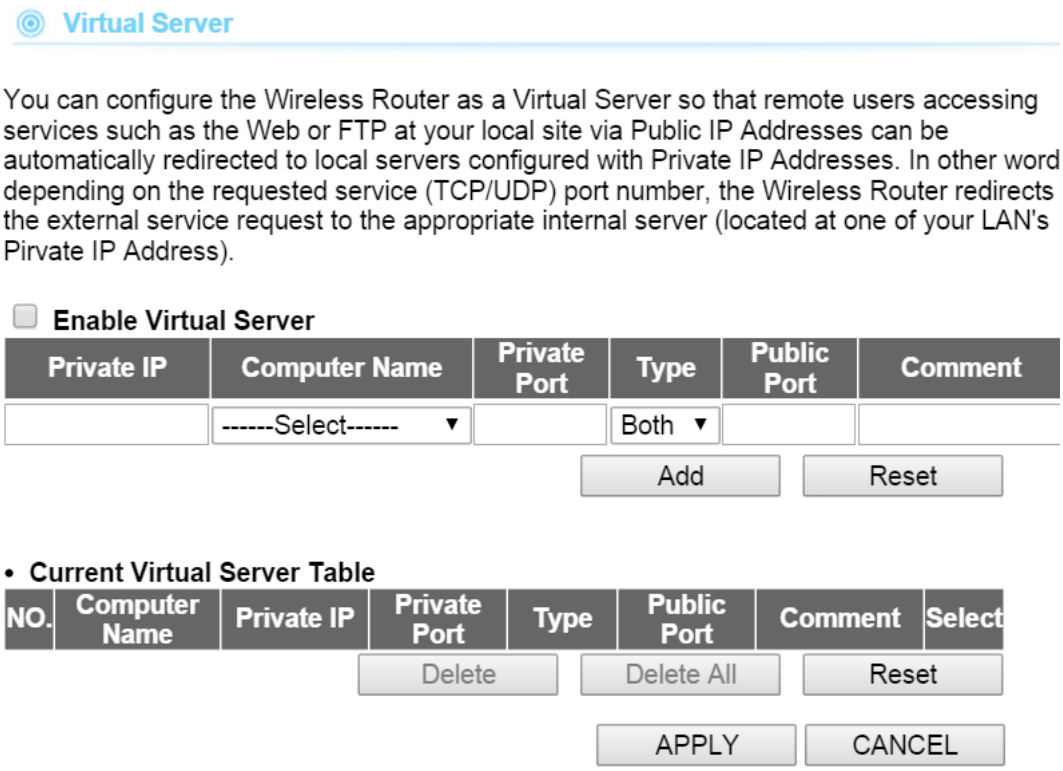
Select a DMZ type and then enter the local DMZ IP address

Note: A DMZ server is a common term used to describe the default virtual server. If the DMZ server is selected, Internet traffic not destined for a valid virtual server is redirected to this privately addressed LAN client. This can be used together with a separate firewall device to perform additional security functions.

4.6.5 Virtual Server Settings

Operation Mode -> Setup -> Virtual Setting

This allows you to specify one or more applications running on server computers on the LAN that may be accessed by any Internet user. Internet data destined for the specified public port will be directed to the specified private port number on the LAN client with the specified private IP address.

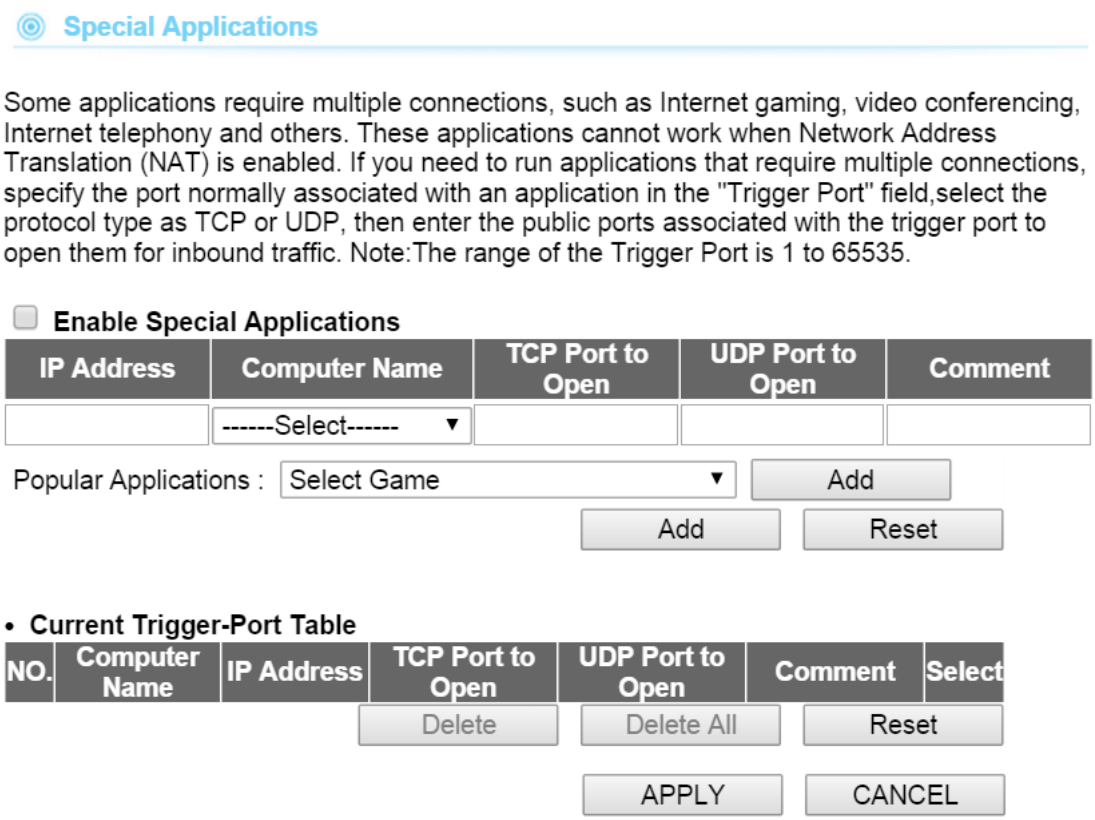


4.6.6 Special Applications

Operation Mode -> Setup -> Special Applications

Some Internet application such as Instant Messaging or games use groups of ports, and are not easy to work behind a firewall. To work well with these special applications we will open ports to let traffic pass through.

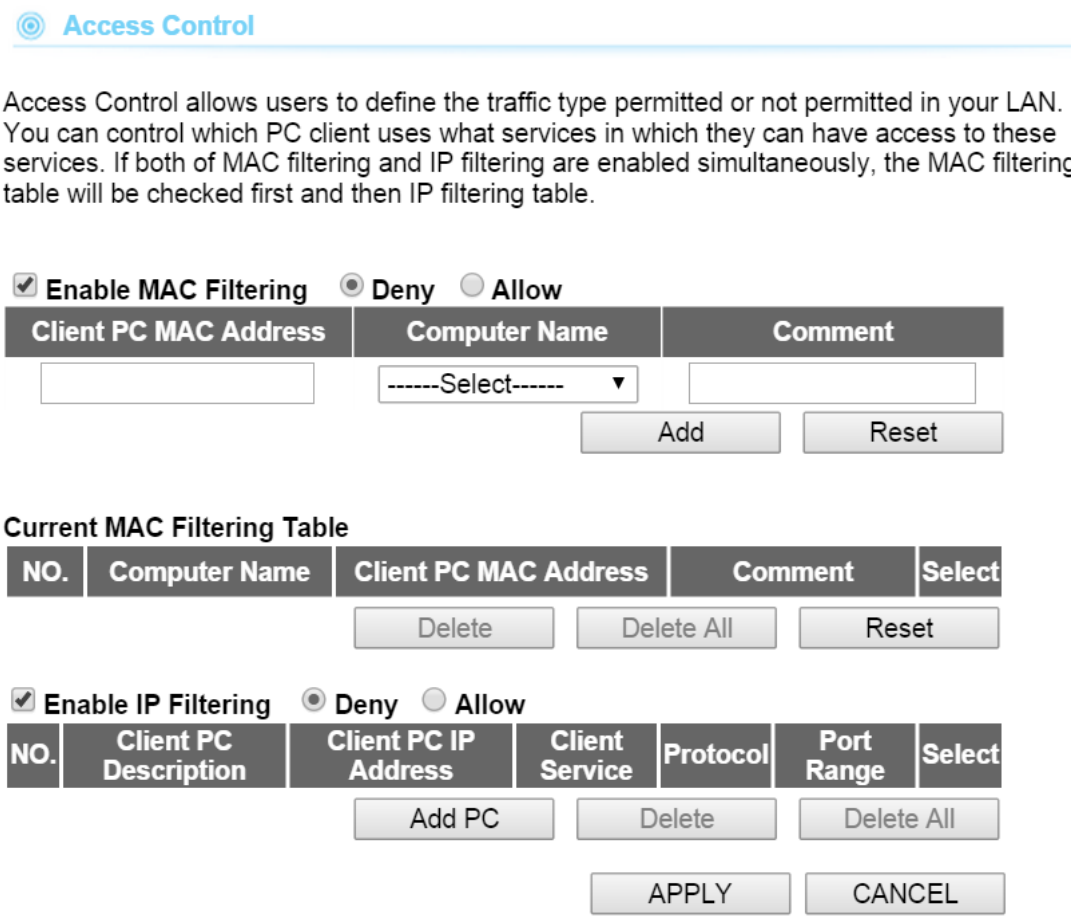
Note: You can use up to 3 sets of opened ports for a specific application. The opened ports can be separated by a comma and no spaces are allowed (e.g. 2300-2305, 4300-4305, 5300-5305).



4.6.7 IP Filtering Settings

Operation Mode -> Setup -> IP Filtering Settings

IP Filtering Settings allows users to define the traffic type permitted or not permitted in your LAN. You can control which PC client uses what services in which they can have access to these services. If both of MAC filtering and IP filtering are enabled simultaneously, the MAC filtering table will be checked first and then IP filtering table



This allows you to define who are allowing / denying access from / to the Internet.

- **Enable MAC Filtering:** To enable the MAC filtering.
- **Enable IP Filtering :** To enable the IP filtering
- **Allow:** Data traffic satisfying rules below are allowed / forwarded.
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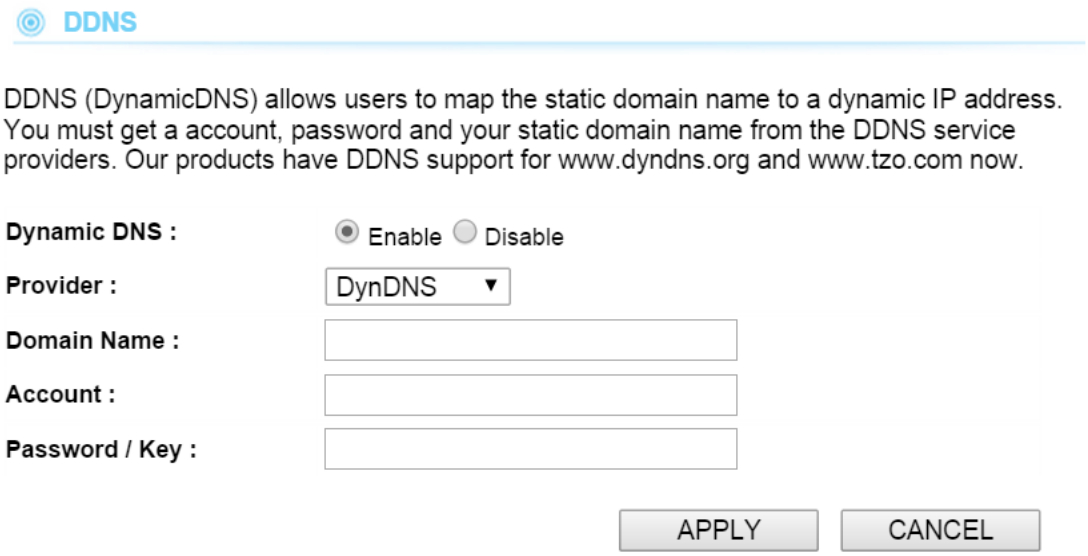
To grant or deny IP address, select **ADD ,ADD PC** or **Reset**.

4.6.8 Dynamic DNS Settings

Operation Mode -> Setup -> Dynamic DNS Settings

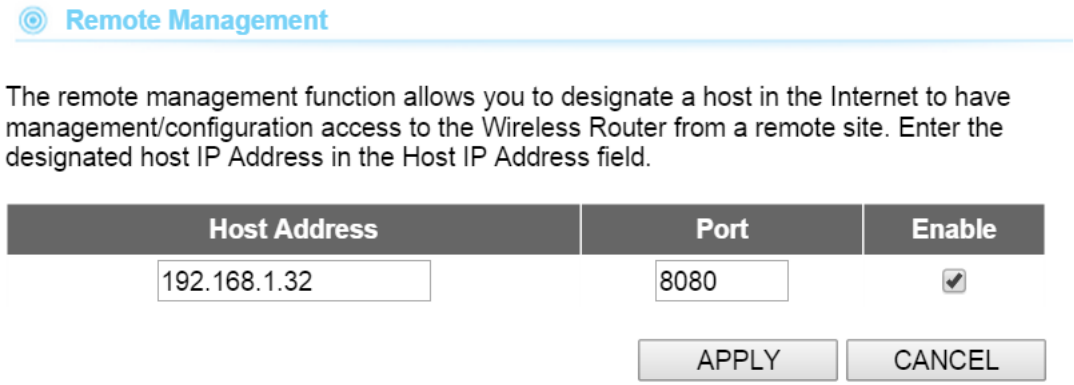
Dynamic DNS (DDNS) allows you to create a hostname that points to your dynamic IP or static IP address or URL. AC-1200R provide Dynamic DNS client using DynDNS, please visit http://dyn.com/dns/ for detail.



4.6.9 Remote Management Settings

Operation Mode -> Setup -> Remote Management

The remote management function allows you to designate a host in the Internet to have management/configuration access to the Wireless Router from a remote site. Enter the designated host IP Address in the Host IP Address field.



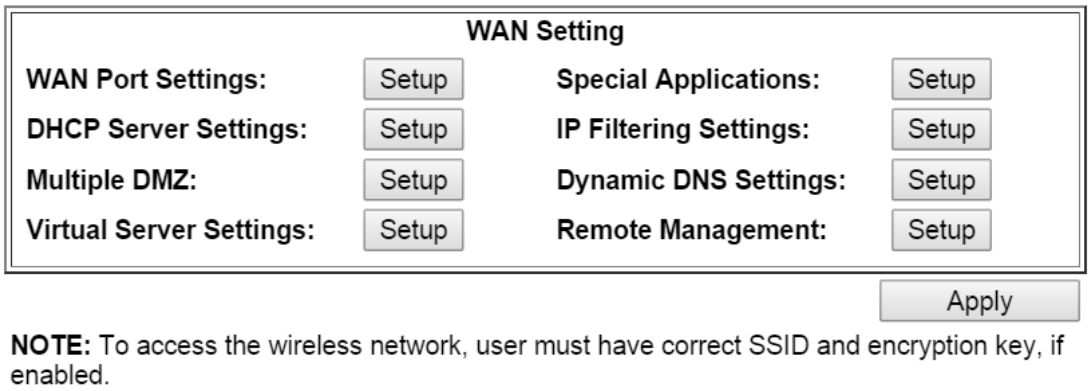
4.7 WISP Specific Settings

In WISP mode, the AP will behave just the same as the Client mode for wireless function. However, router functions are added between the wireless WAN side and the Ethernet LAN side. Therefore, the WISP subscriber can share the WISP connection without need for extra router.

WISP mode acts both in AP and Router which included in these operation modes: WISP + AP.

In WISP + AP mode, the Radio 1 is actually a wireless client of the WISP wireless node and also the gateway of the local area network.

Router mode acts both in AP and Router which included in these operation modes: Dual Band Router



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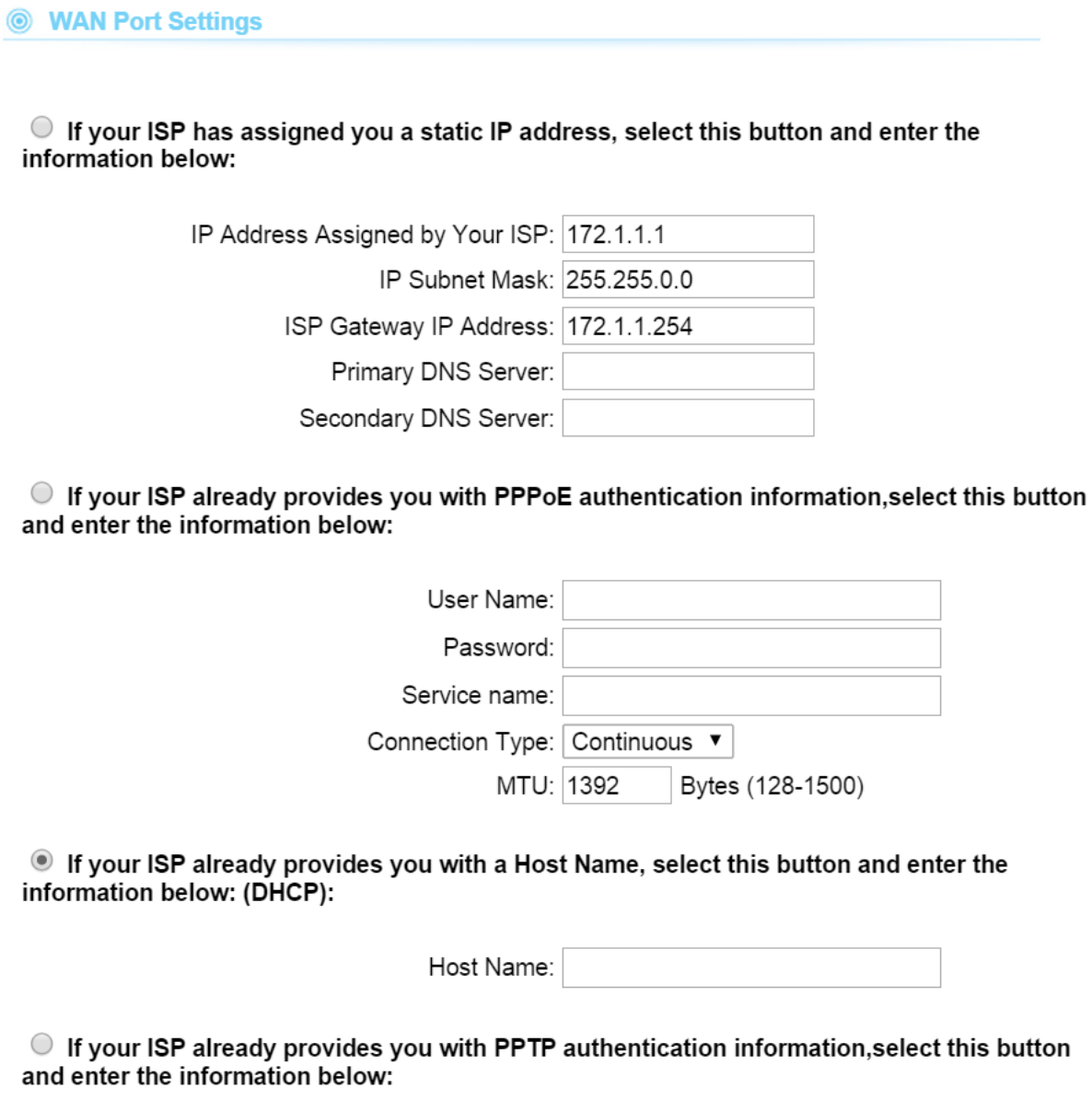
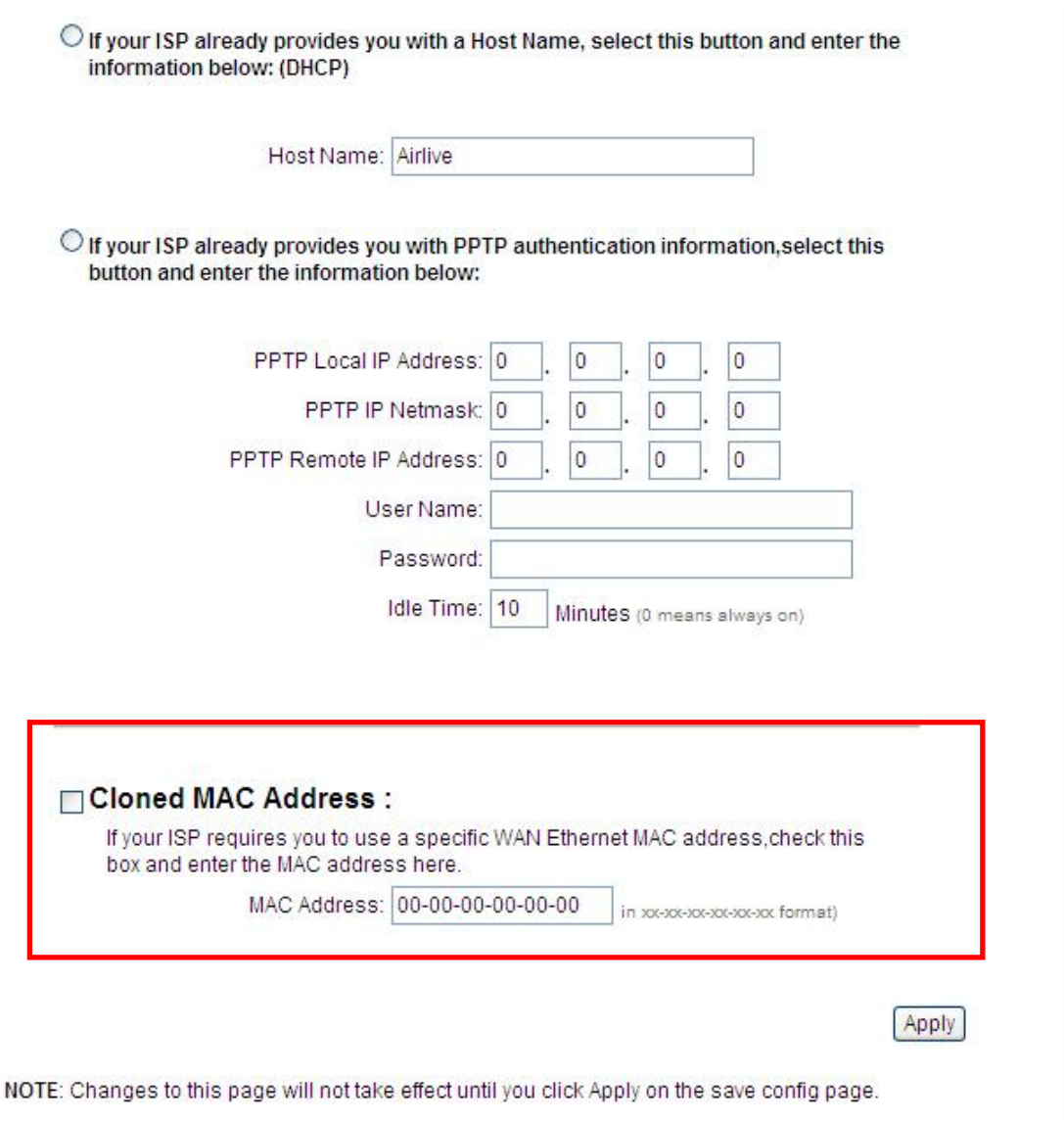


- **Clone MAC Address:** Some service provider (Cable Modem provider) lock to certain MAC address. In this situation, the WAN port of AC-1200R needs to clone the MAC address. Please check the “Clone MAC address” box and enter the address that need to be cloned.



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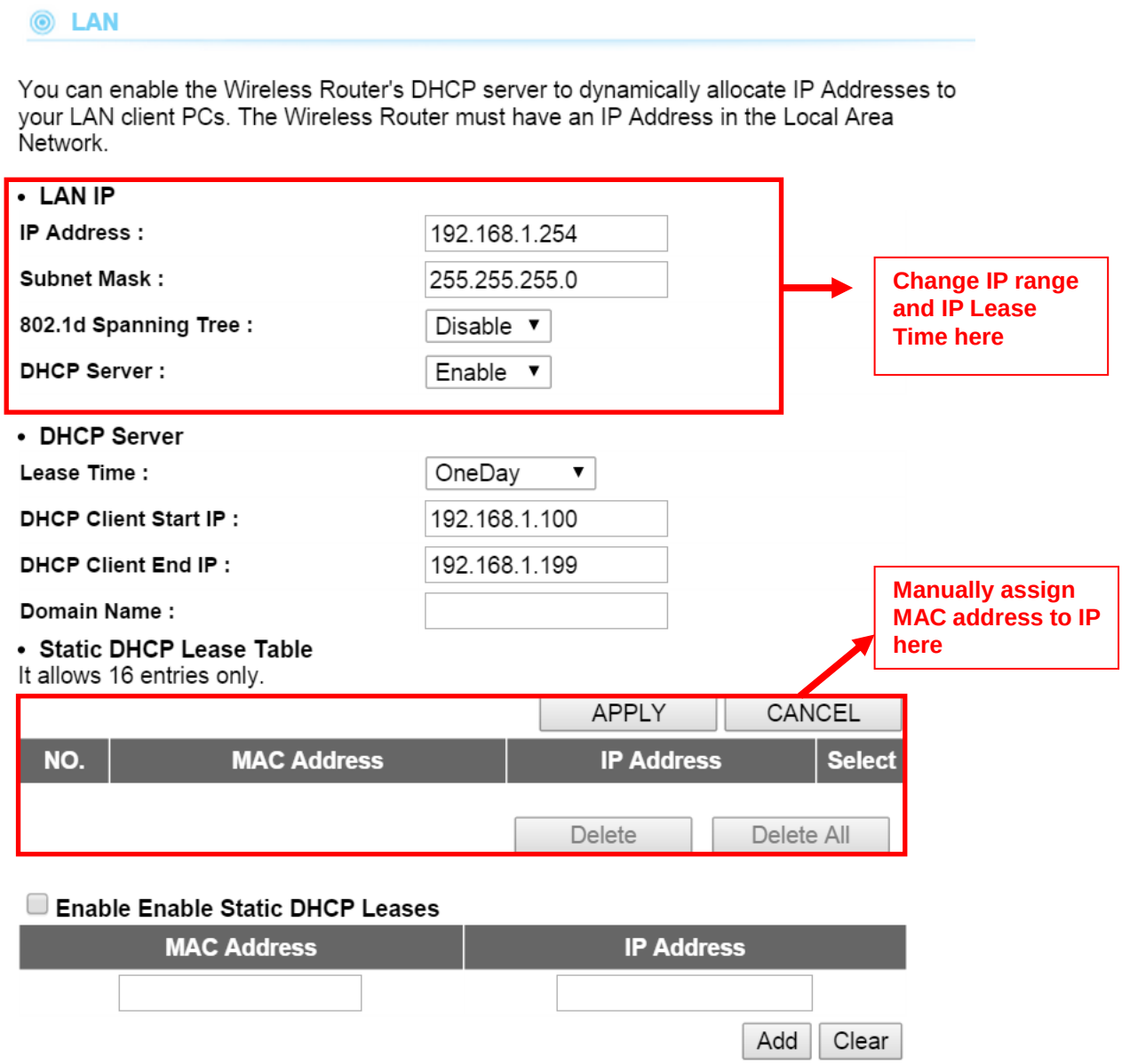

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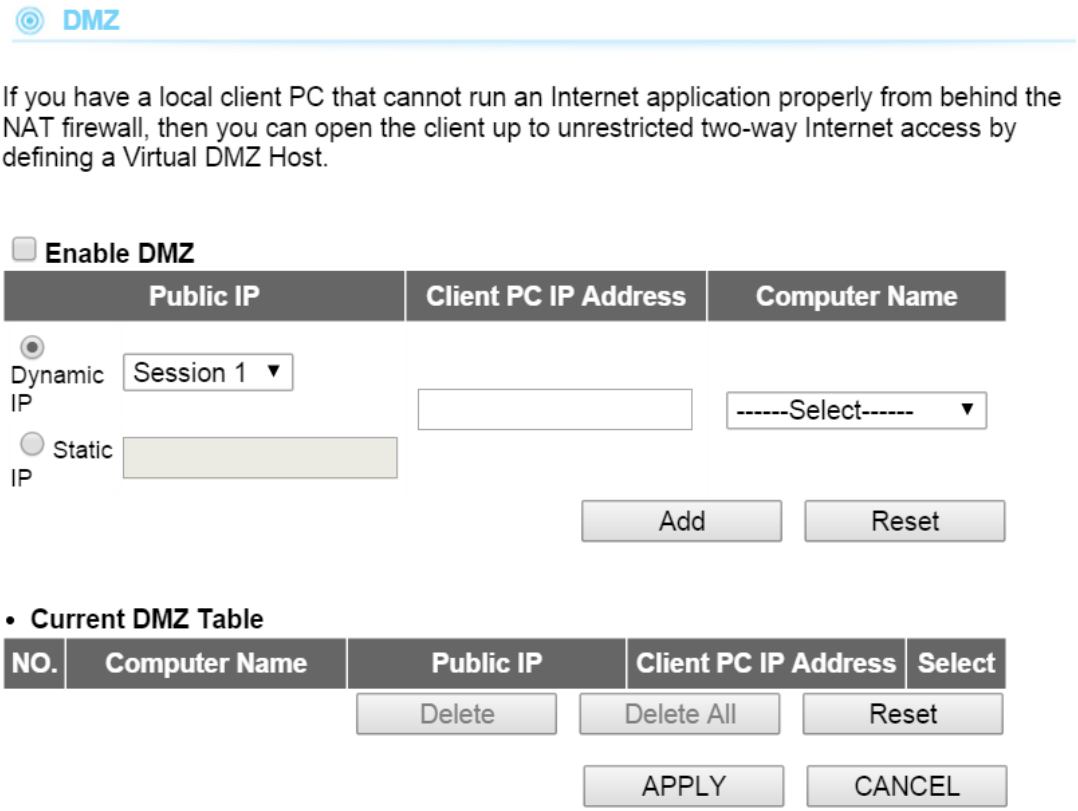

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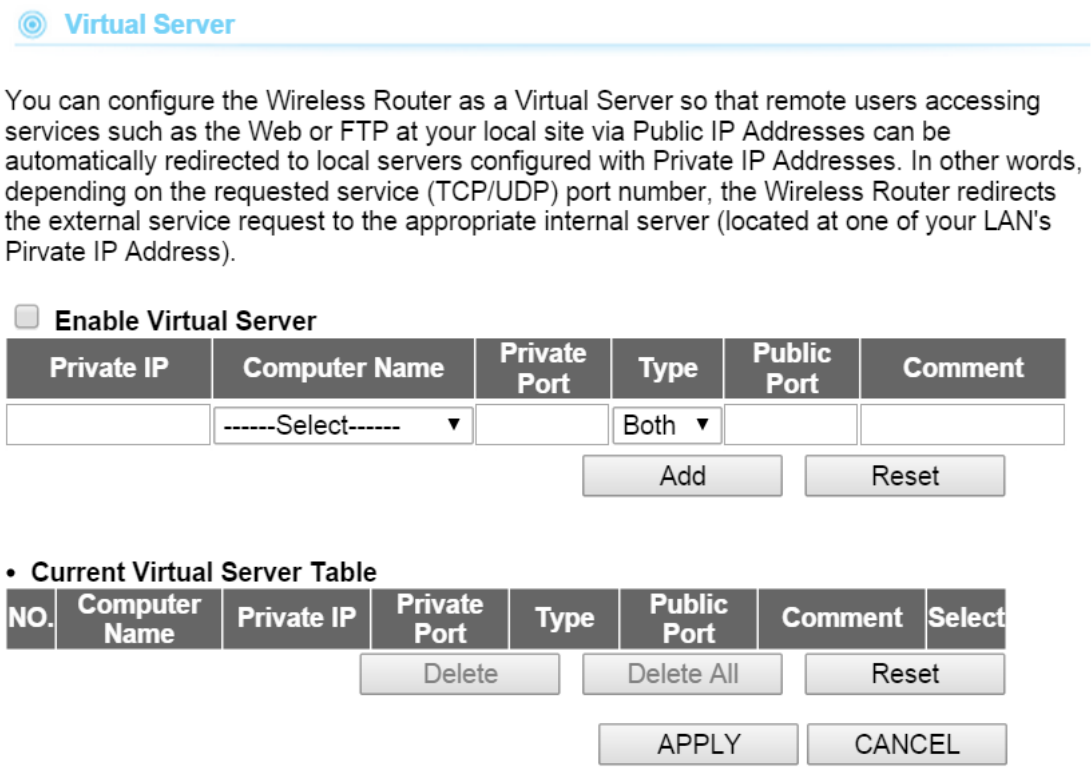

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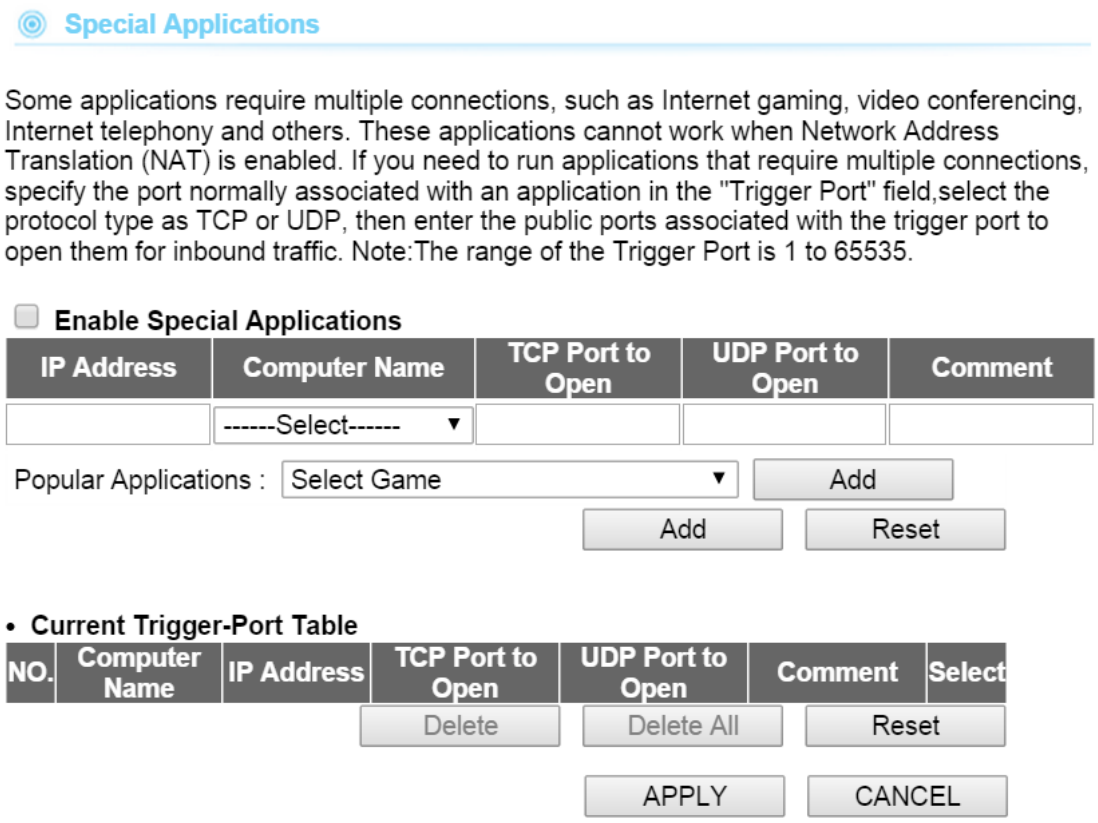

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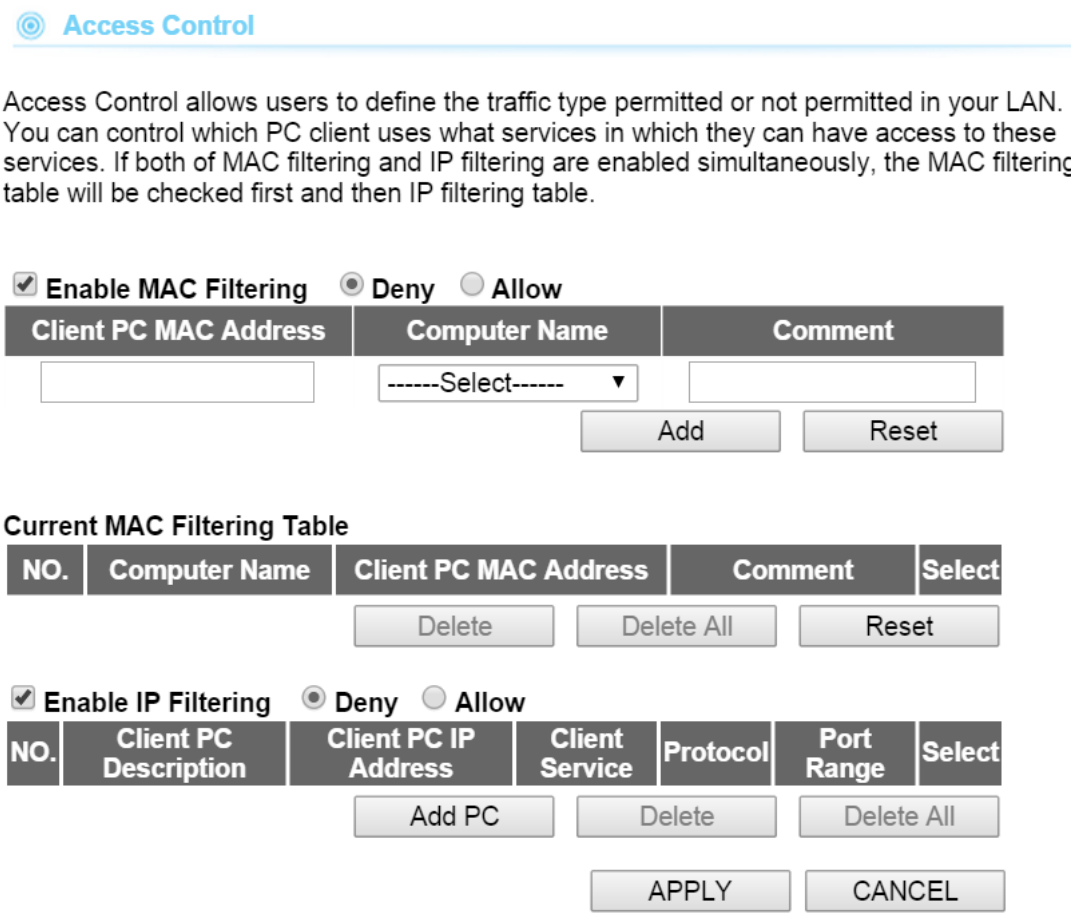

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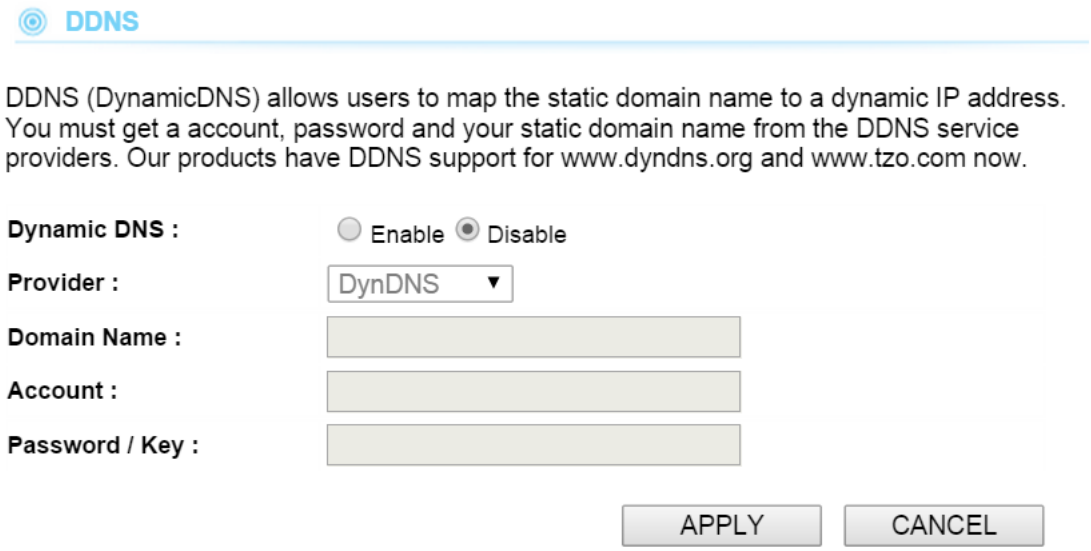

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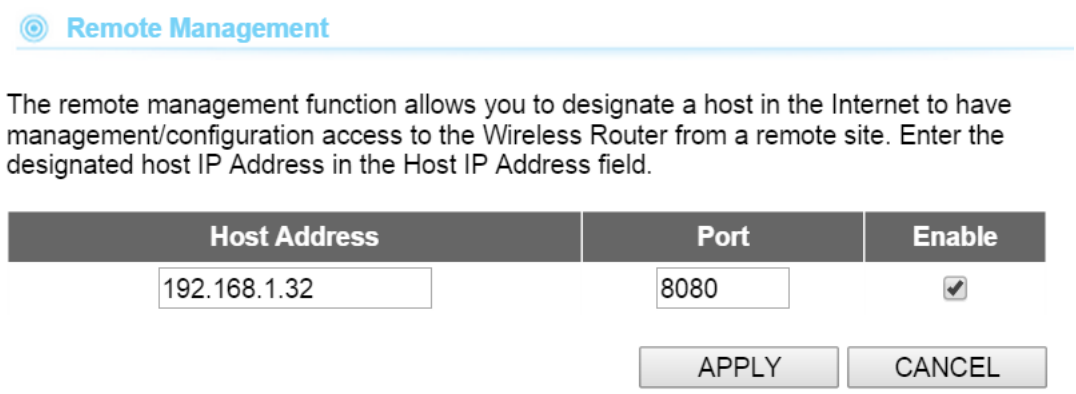


5 System Configuration

In this chapter, we will explain about General Setup in web management interface. Please be sure to read through Chapter 3's "Introduction to Web Management" and "Initial Configurations" first.

5.1 System Configuration

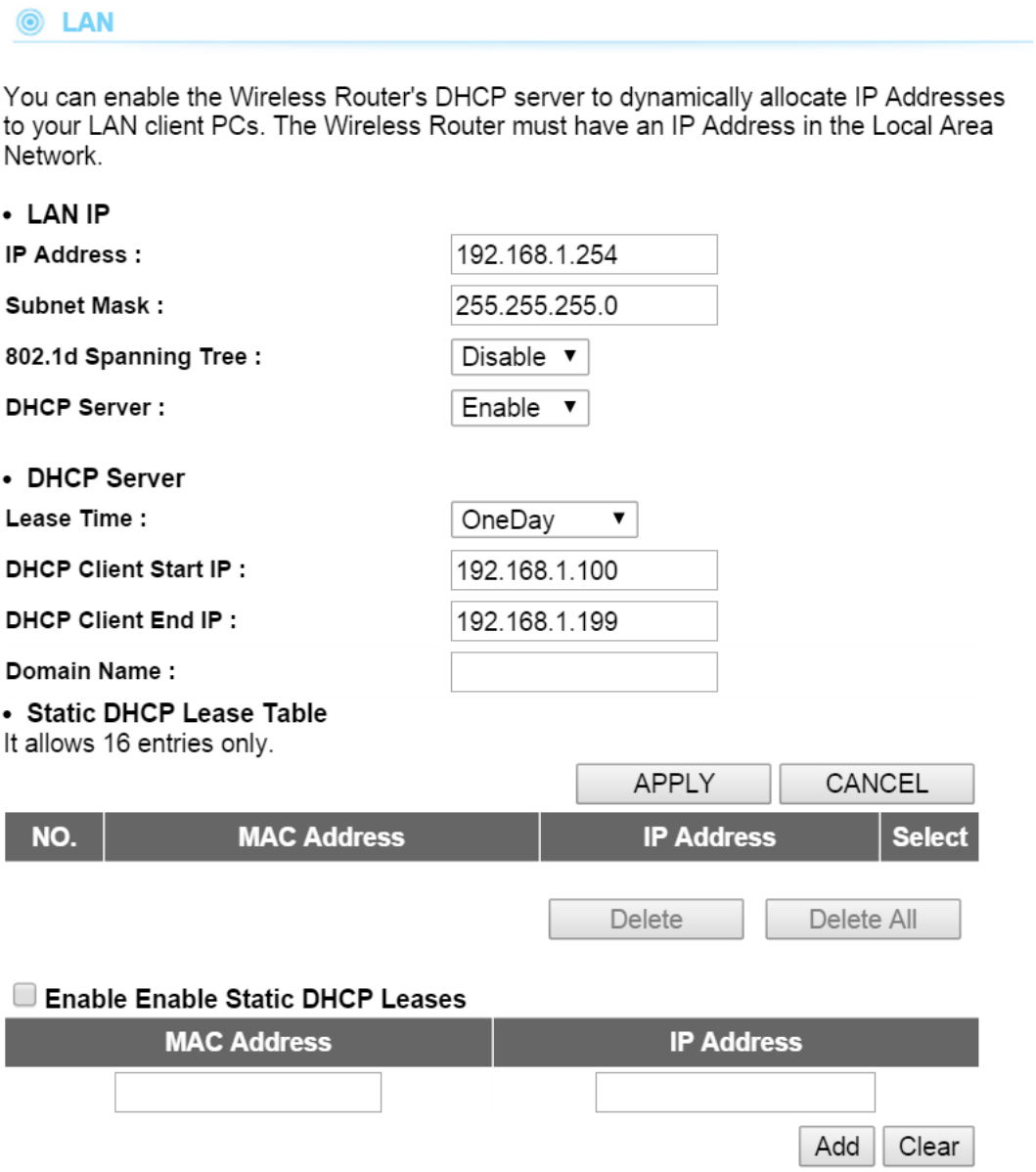
When you click on the "General Setup" menu on the top menu bar, the following screen will appear. The system configuration includes all non-wireless settings. We will explain their functions here.

5.1.1 Device IP Settings

General Setup >> *LAN*

The LAN Settings screen allows you to configure the IP address and subnet of the device. You also can enable or disable the DHCP server in this page. If AC-1200R is working in client mode or AP mode, please disable the DHCP server.

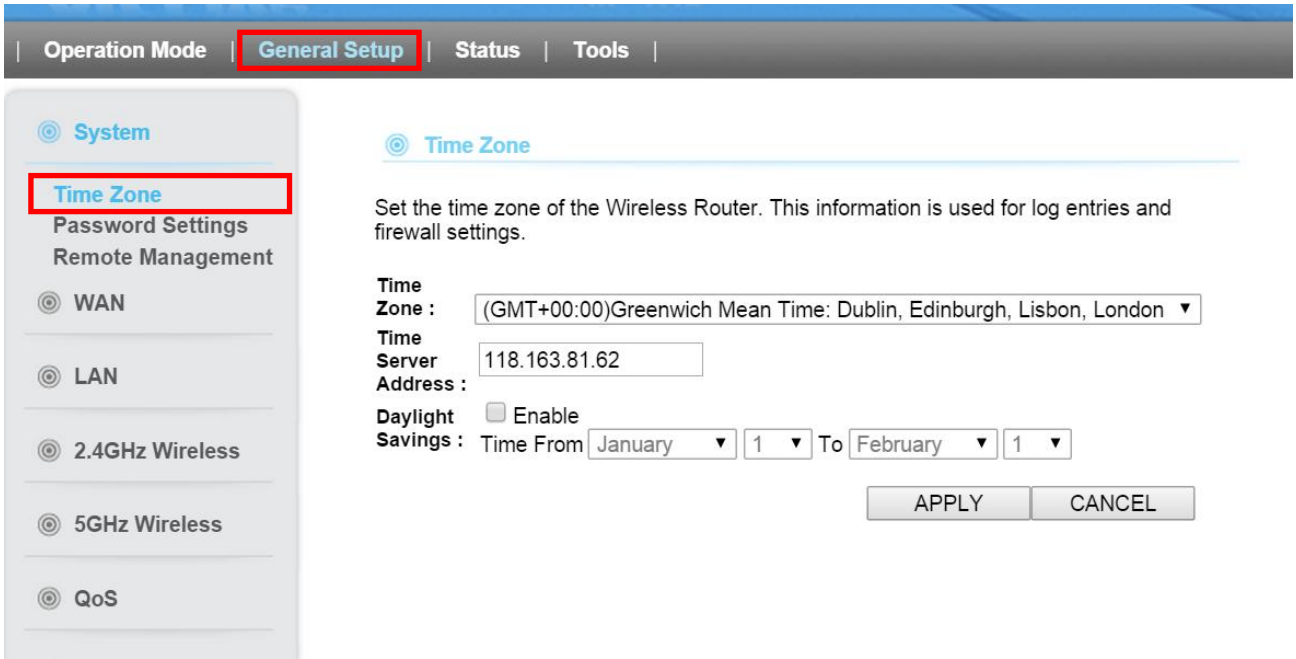
The DHCP server setting, please refer the chapter 4.6.3



5.1.2 Time Settings

General Setup >>*System ->Time Zone*

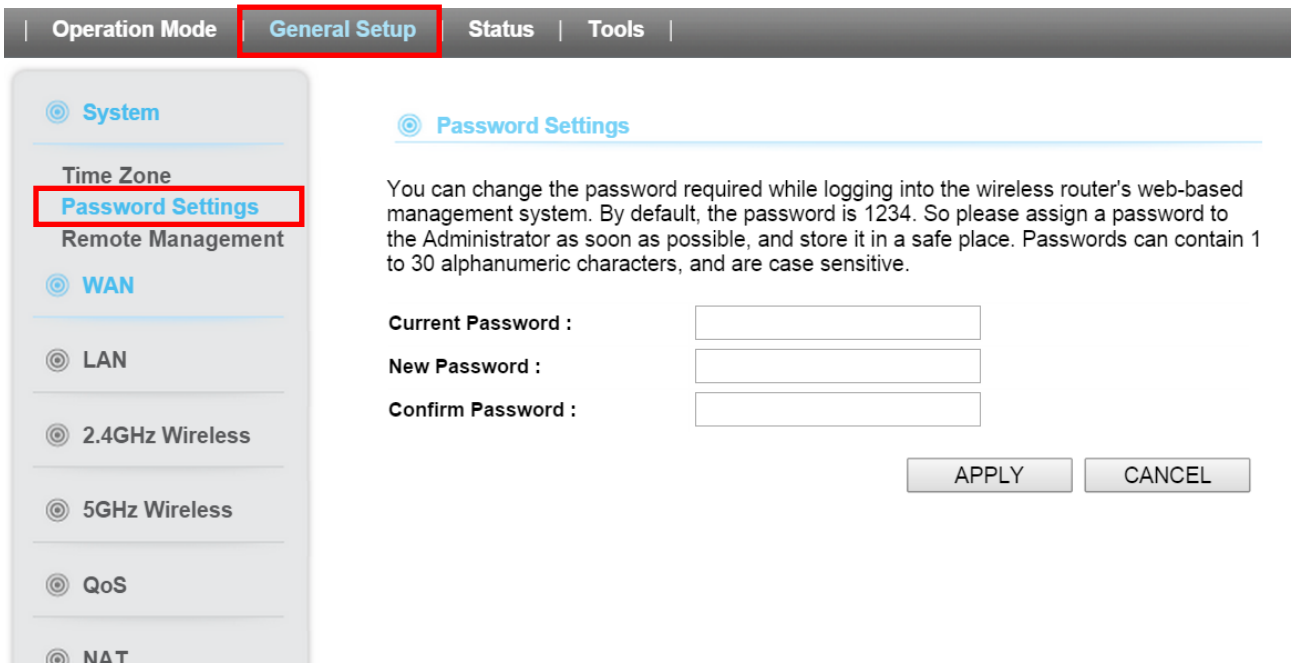
It is important that you set the date and time for your AC-1200R so that the system log will record the correct date and time information. We recommend you choose “Enable NTP” so the time will be keep even after reboot. If your AC-1200R is not connected to Internet, please enter the time manually. Please remember to select your local time zone and click “Apply” to finish.



5.1.3 Password Settings

General Setup ->*System* ->*Password Settings*

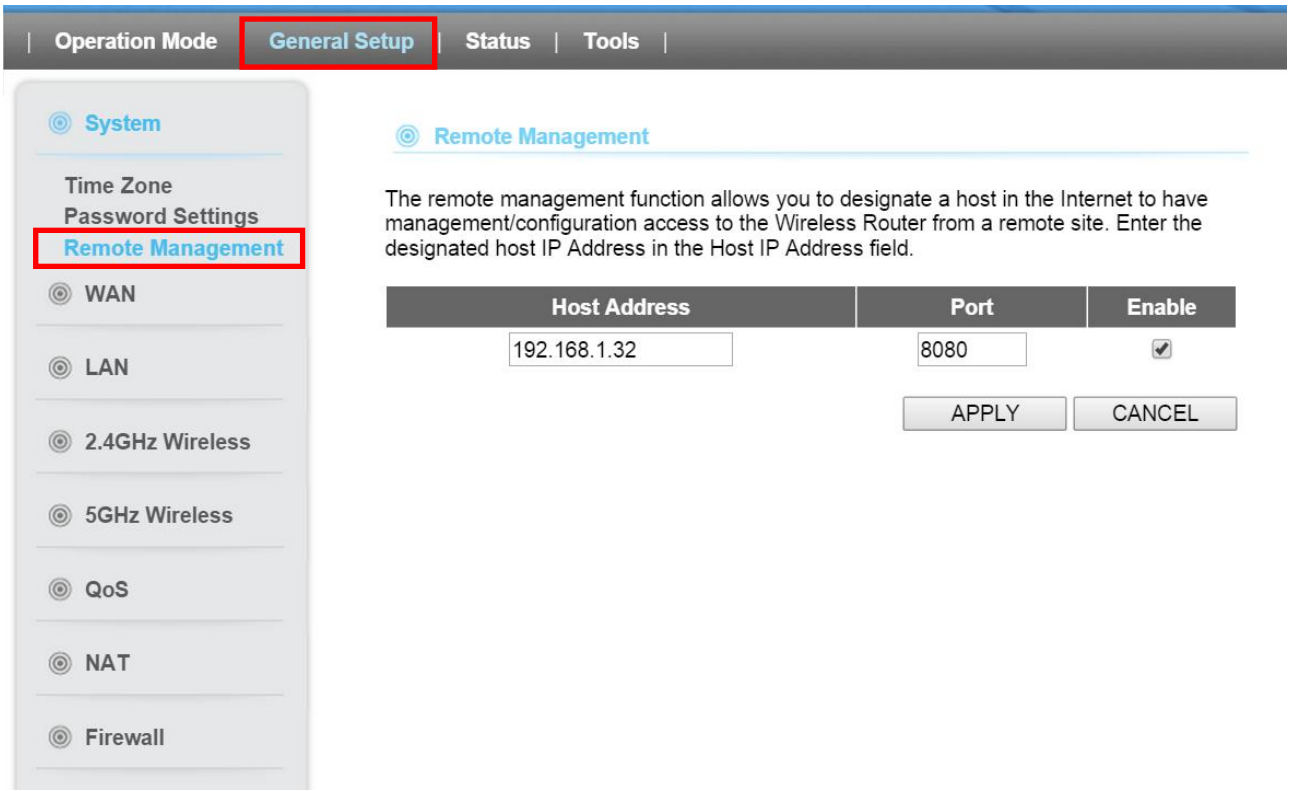
To change password, please go to “System Configuration” -> “Password Settings” menu.



5.1.4 System Management

General Setup ->System -> Remote Management

In this page, administrator can change the management parameters and disable/enable management interface.



- **Host Address:** To set up the IP address which allow the user to management AC-1200R via Internet
- **HTTP Port No**: The port number for remote management.The default port for HTTP is Port 8080, you can change the value here. Please donot set the 80
- **Enable**: You can enable or disable HTTP service from WAN side
- **Response to WAN ping**: You can disable or enable whether AC-1200R will response to PING command.

5.1.5 WAN

General Setup -> WAN

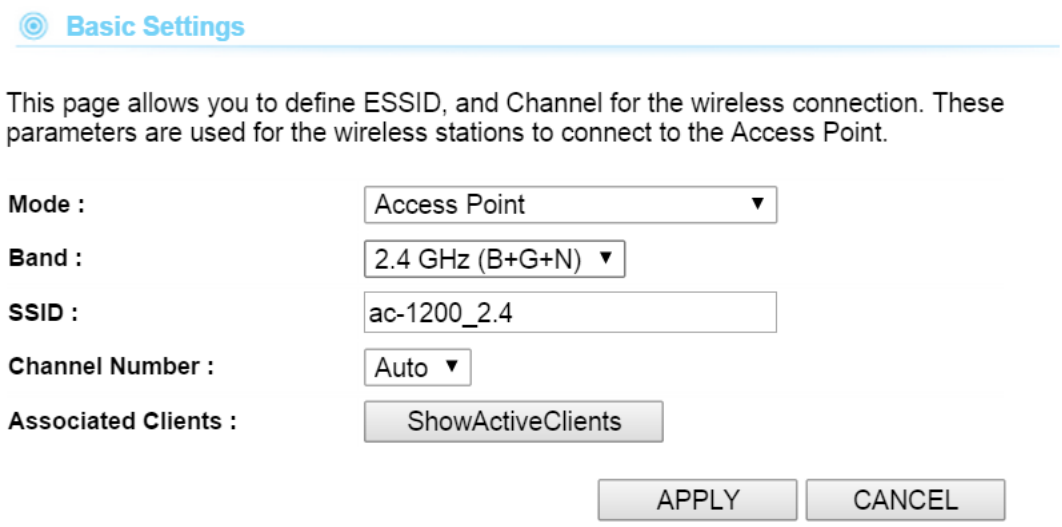
If AC-1200R is working in router mode, WAN setting is appear. When can setup the WAN in operation -> setup or in here

5.1.6 2.4G Wireless

AC-1200R supports multiple operations for 2.4G and 5G radio and each radio can work in difference mode. You can setup the operation mode, channel , SSID in operation setup or you can setup in here if you want to have specific operation in each mode. When you setup in Operation Mode, the parameter in here will change as well

5.1.6.1 Basic Setting

This page allows you to define ESSID, and Channel for the wireless connection. These parameters are used for the wireless stations to connect to the Access Point. You also can figure out who are connecting to the AC-1200R via 2.4G band



5.1.6.2 Guess

This page allows you to define the ESSID (Guess) and wireless security. These parameters are used by wireless stations to connect to this router. Turn on WEP or WPA by using encryption keys in order to prevent unauthorized access to your wireless network.

The wireless stations which connect to the Guess SSID cannot access AC-1200R and it can have difference wireless encryption from the main SSID

Guest

This page allows you to define the ESSID and wireless security. These parameters are used by wireless stations to connect to this router. Turn on WEP or WPA by using encryption keys in order to prevent unauthorized access to your wireless network.

☐ **Enable Guest SSID**

Wireless Guest Name :	Airlive.guest
Hidden SSID :	☐
Enable Wireless Clients Isolation :	☐
Band :	2.4 GHz (B+G+N) (Same as main SSID)
Channel Number :	0 ▼ (Same as main SSID)

Security Settings

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

Encryption : Disable ▼

☐ **Enable 802.1x Authentication**

APPLY CANCEL

5.1.6.3 Advance Setting

This page is to set the advance setting for wireless parameter. You can refer the chapter 4.2.8 for the detail.

Advanced Settings

Set the time zone of the Wireless Router. This information is used for log entries and firewall settings.

Fragment Threshold :	2346	(256-2346)
RTS Threshold :	2347	(0-2347)
Beacon Interval :	100	(20-1024 ms)
DTIM Period :	3	(1-10)
Data Rate :	Auto	
N Data Rate :	Auto	
Channel Width :	◉ Auto 20/40 MHZ ○ 20 MHZ	
Preamble Type :	◉ Short Preamble ○ Long Preamble	
Broadcast Essid :	◉ Enable ○ Disable	
CTS Protect :	◉ Auto ○ Always ○ None	
Tx Power:	100	
WMM :	◉ Enable ○ Disable	
Multicast to Unicast :	○ Enable ◉ Disable	

APPLY CANCEL

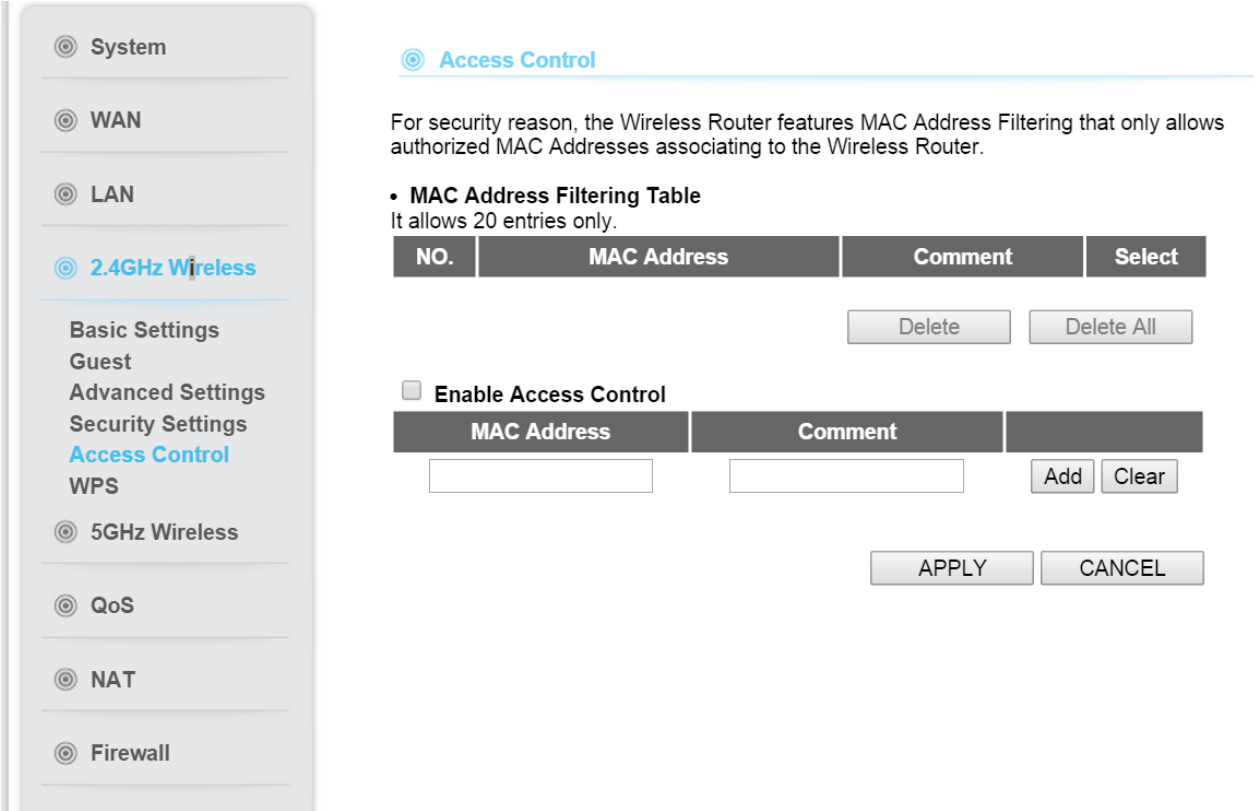
5.1.6.4 Security Setting

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

You can refer the 4.2.7 for detail setting, each radio has its own security setting.

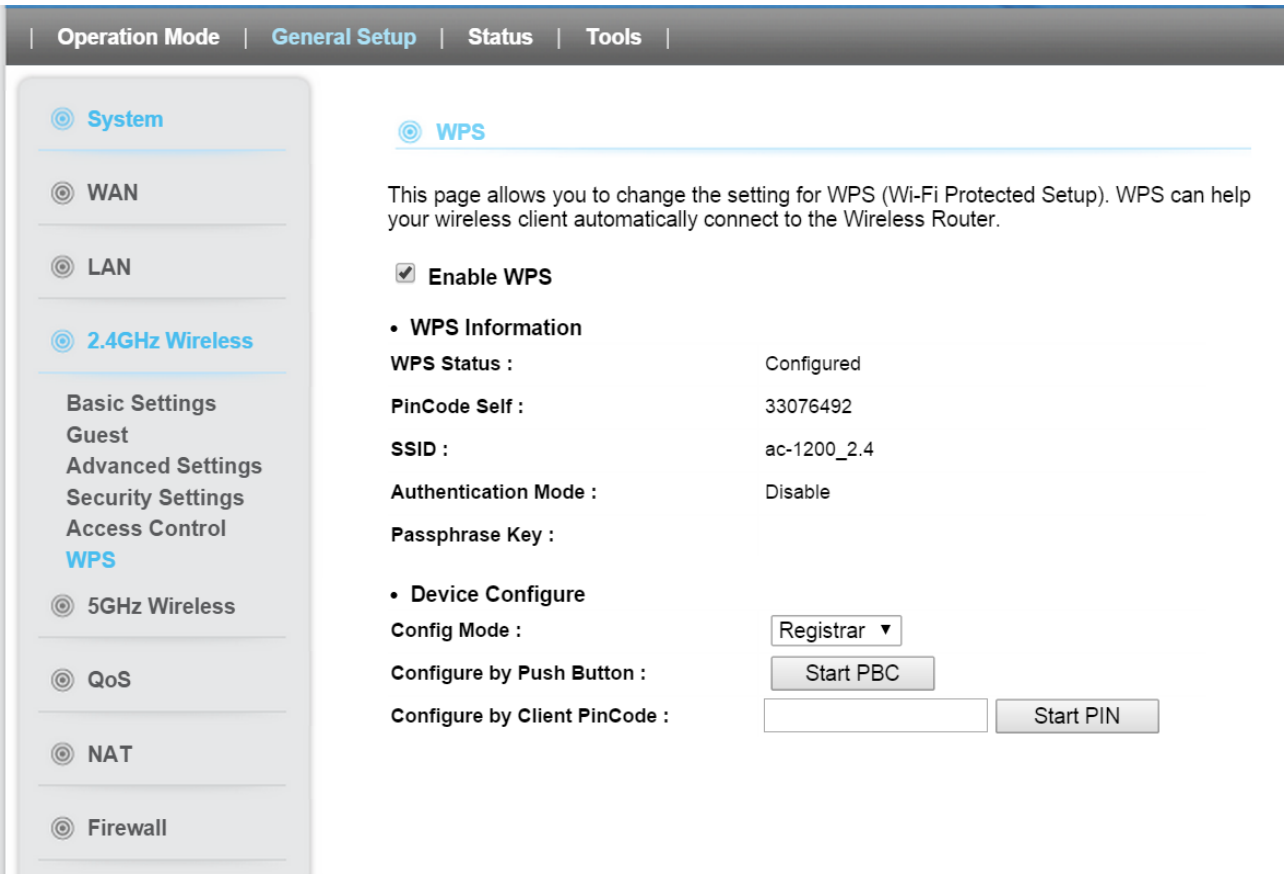
5.1.6.5 Access Control

For security reason, the Wireless Router features MAC Address Filtering that only allows authorized MAC Addresses associating to the Router via 2.4G radio.



5.1.6.6 WPS

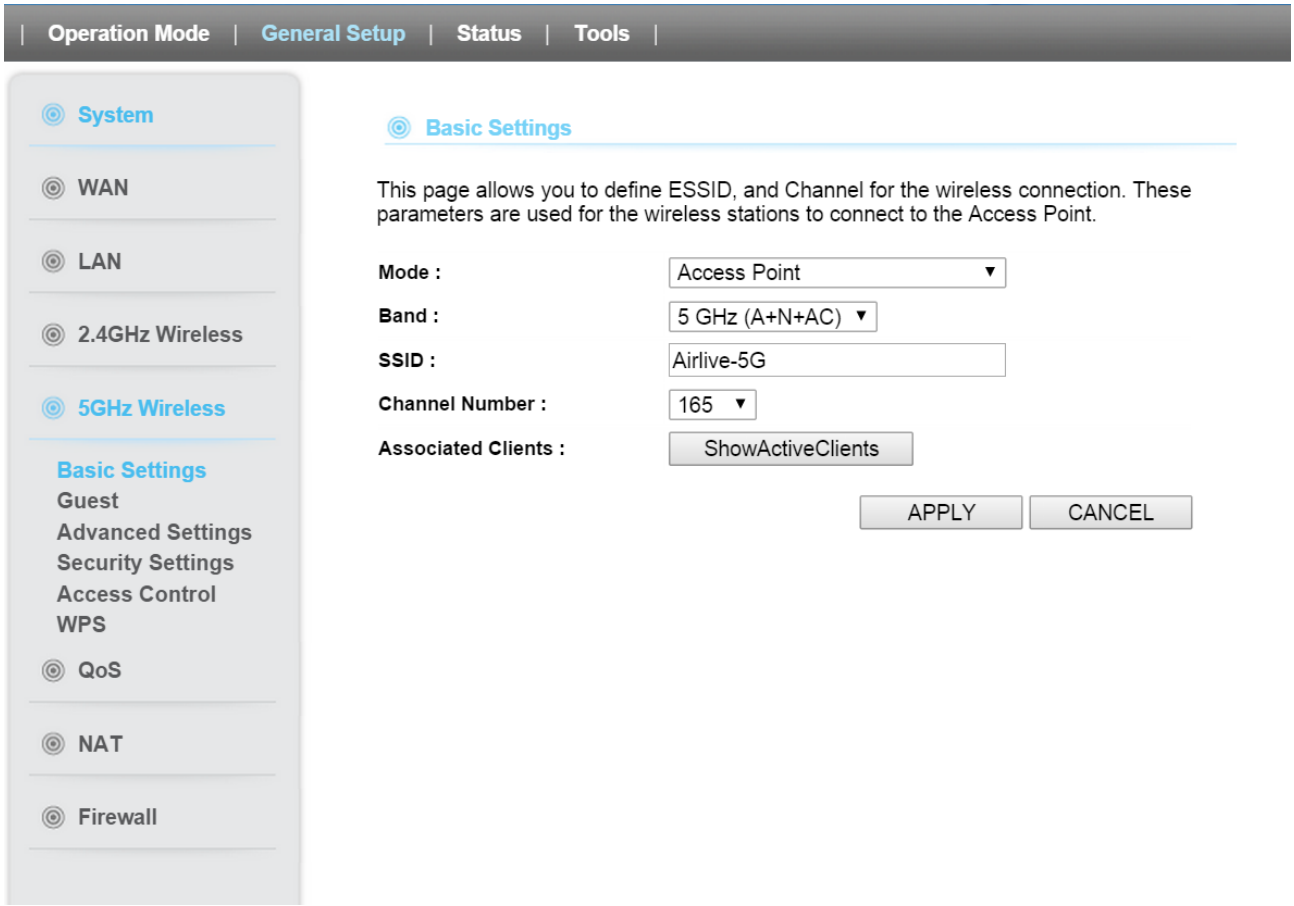
This page allows you to change the setting for WPS (Wi-Fi Protected Setup). WPS can help your wireless client automatically connect to the Wireless Router.



5.1.7 5G Wireless

AC-1200R supports multiple operations for 2.4G and 5G radio and each radio can work in difference mode. You can setup the operation mode, channel, SSID in *Operation Mode* or you can setup in here if you want to have specific operation in each mode. When you setup in *Operation Mode*, the parameter in here will change as well

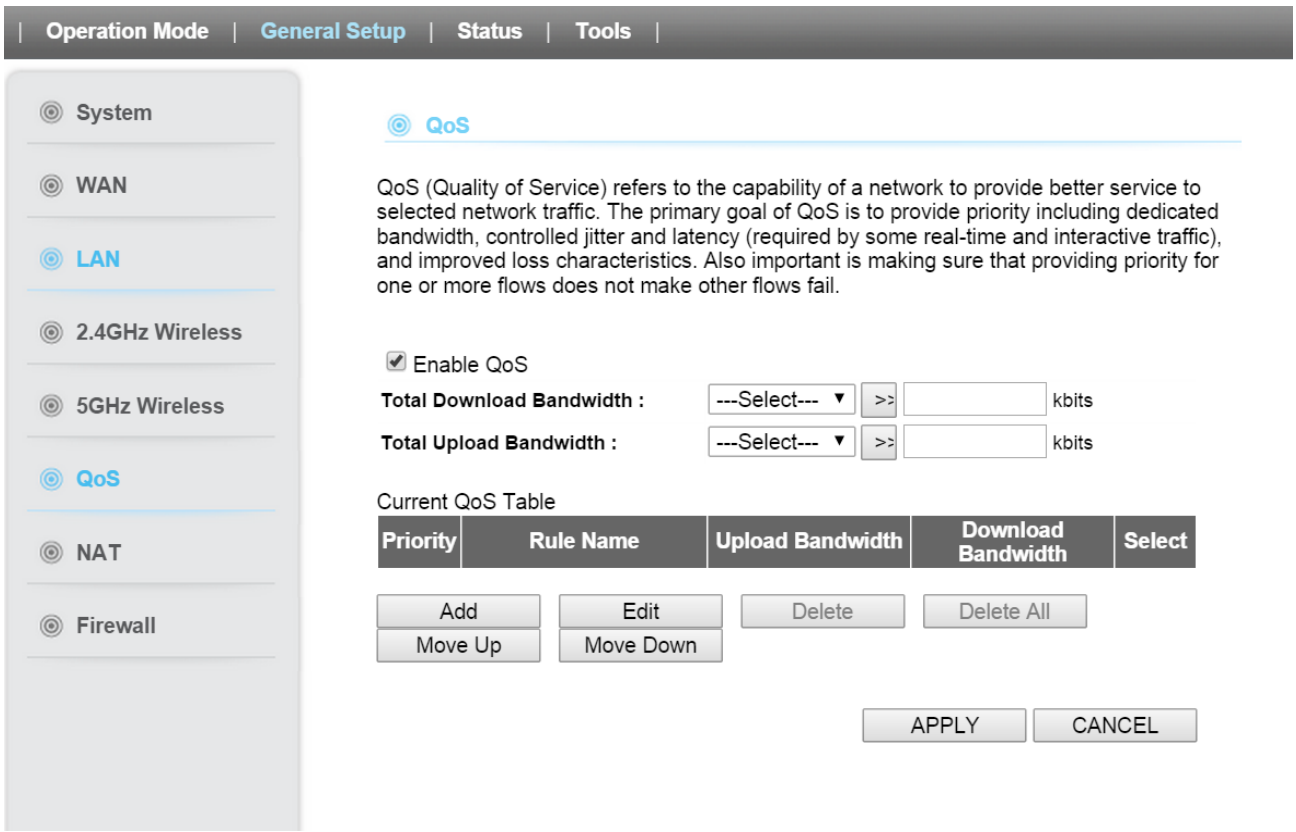
AC-1200R 2.4G/5G can work individually. You can refer the 5.1.6 for the detail setting.



5.1.8 QoS

QoS (Quality of Service) 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.

You can refer chapter 4.2.11 for the detail setting.

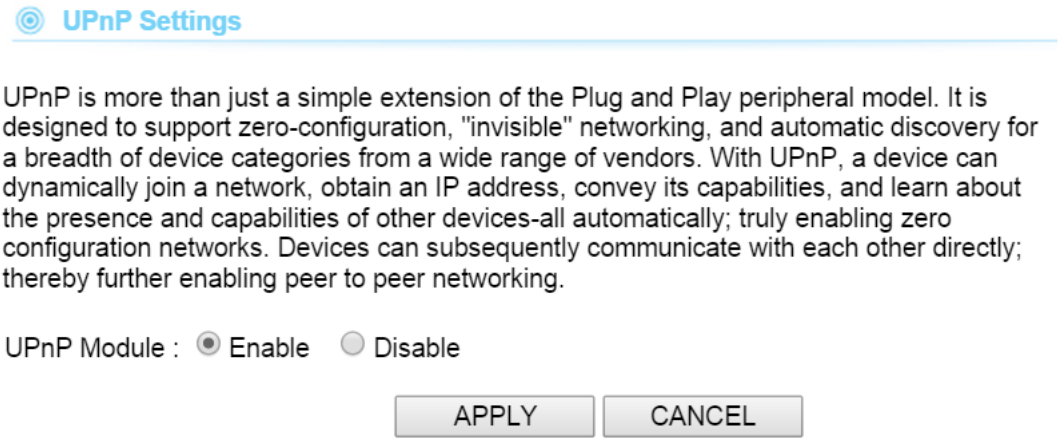


5.1.9 NAT

NAT (Network Address Translation) 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 hacker attacks 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.
You can refer chapter 4.6.4 ,4.6.5, 4.6.6 for the Port Forwarding, Virtual Server, Special applications.

5.1.9.1 UPNP

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.
Select Enable to enable the UPNP function



5.1.9.2 ALG Setting

Some applications that need router's special support to make them work under the NAT. You can select applications that you are using.

ALG Settings

Below are applications that need router's special support to make them work under the NAT. You can select applications that you are using.

Enable	Name	Comment
☑	Amanda	Support for Amanda backup tool protocol.
☑	FTP	Support for FTP.
☑	H323	Support for H323/netmeeting.
☑	IRC	Allows DCC to work though NAT and connection tracking.
☑	SIP	Support for SIP.
☑	TFTP	Support for TFTP.
☑	IPsec	Support for IPsec passthrough
☑	PPTP	Support for PPTP passthrough.
☑	L2TP	Support for L2TP passthrough.

APPLY CANCEL

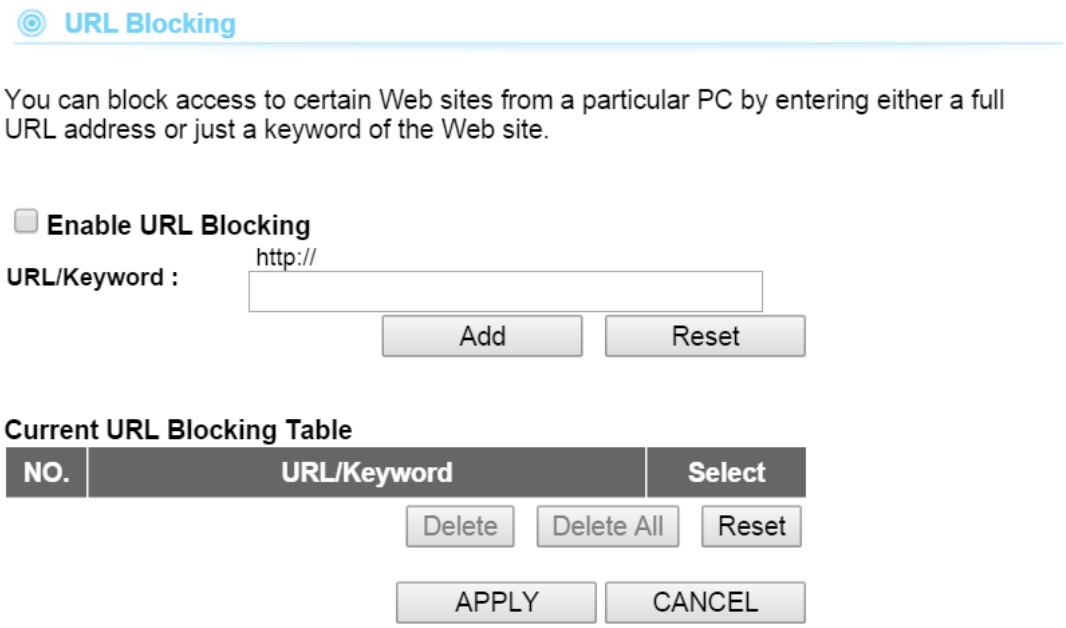
5.1.10 Firewall

AC-1200R Router provides extensive firewall protection by restricting connection parameters, thus limiting the risk of hacker attack, and defending against a wide array of common attacks. However, for applications that require unrestricted access to the Internet, you can configure a specific client/server as a Demilitarized Zone (DMZ).

You can refer the chapter 4.6.4 and 4.6.7 for the DMZ and IP Filtering Setting

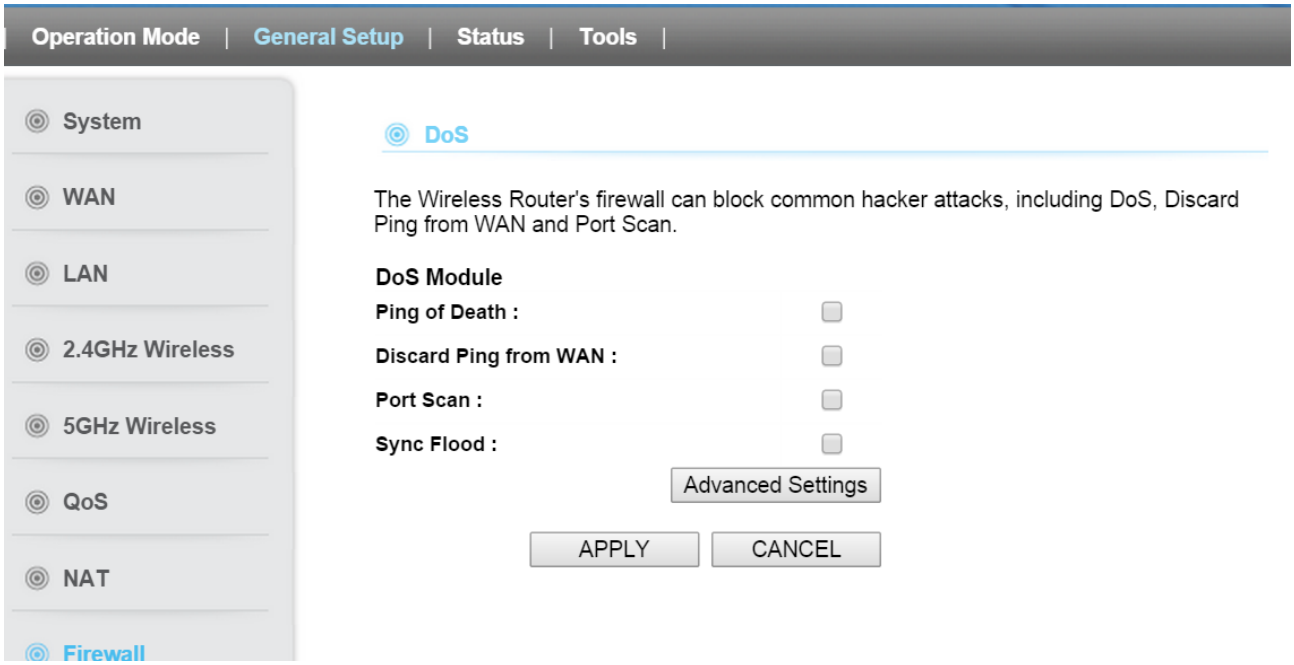
5.1.10.1 URL Blocking

URL Blocking allow user to block access to certain Web sites from a particular PC by entering either a full URL address or just a keyword of the Web site



5.1.10.2 DoS

AC-1200R can block common hacker attacks, including DoS, Discard Ping from WAN and Port Scan.



6 Device Status & Tools

6.1 Status

When you click on the “Status” on the top menu bar, the sub menu for device status will appear.

6.1.1 Status

This page provides the following information about your Wireless Router: Hardware/Firmware version, Serial Number, and its current operating status.

Status

The Wireless Router's status information provides the following information about your Wireless Router: Hardware/Firmware version, Serial Number, and its current operating status.

System

Model :	Wireless Router
Up Time :	0day:5h:15m:54s
Hardware Version :	Rev. A
Boot Code Version :	4.1.2.0.1
Runtime Code Version :	1.09

6.1.2 Internet Connection

This page displays the current internet connection status and related information.

Internet Connection

View the current internet connection status and related information.

Attain IP Protocol :	DHCP
IP Address :	192.168.0.90
Subnet Mask :	255.255.255.0
Default Gateway :	192.168.0.254
MAC Address :	00:0a:8a:cb:0f:04
Primary DNS :	168.95.1.1
Secondary DNS :	8.8.8.8

6.1.3 Device Status

This page shows the general information about AC-1200R such as , device IP/MAC Wireless Encryption, SSID…etc. Below are some additional explanations on some status information of this page:

Device Status

View the current setting status of this device.

Wireless Configuration

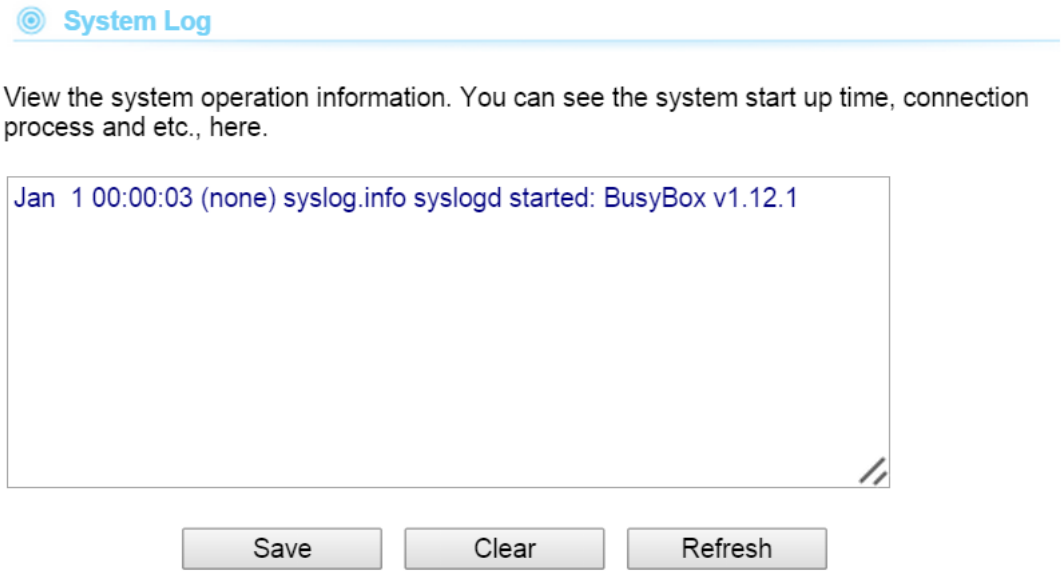
2.4GHz Wireless :	Enable
Mode :	AccessPoint
ESSID :	ac-1200_2.4
Channel Number :	0
Security :	Disable
MAC Address :	00:0a:8a:cb:0f:01
5GHz Wireless :	Enable
Mode :	AccessPoint
ESSID :	Airlive-5G
Channel Number :	165
Security :	WPAPSK
MAC Address :	00:0a:8a:cb:0f:02

LAN Configuration

IP Address :	192.168.1.254
Subnet Mask :	255.255.255.0
DHCP Server :	Enable
MAC Address :	00:0a:8a:cb:0f:03

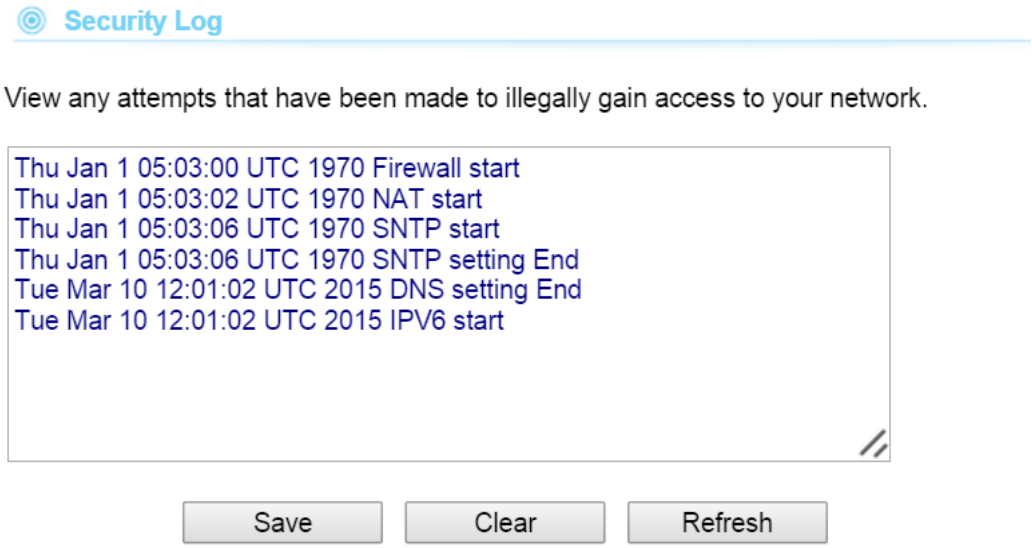
6.1.4 System Log

The System Log displays the system activities, login, and system error report. If you need to report a problem to Air Live, please be sure to send us the System Log information also.



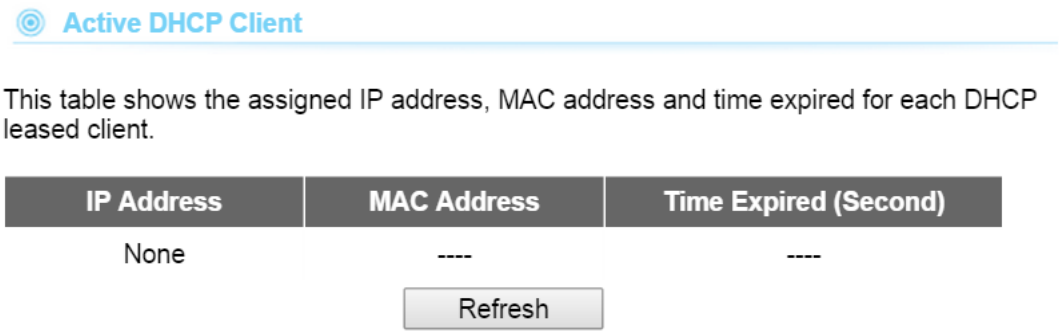
6.1.5 Security Log

The Security Log displays any attempts that have been made to illegally gain access to your network.



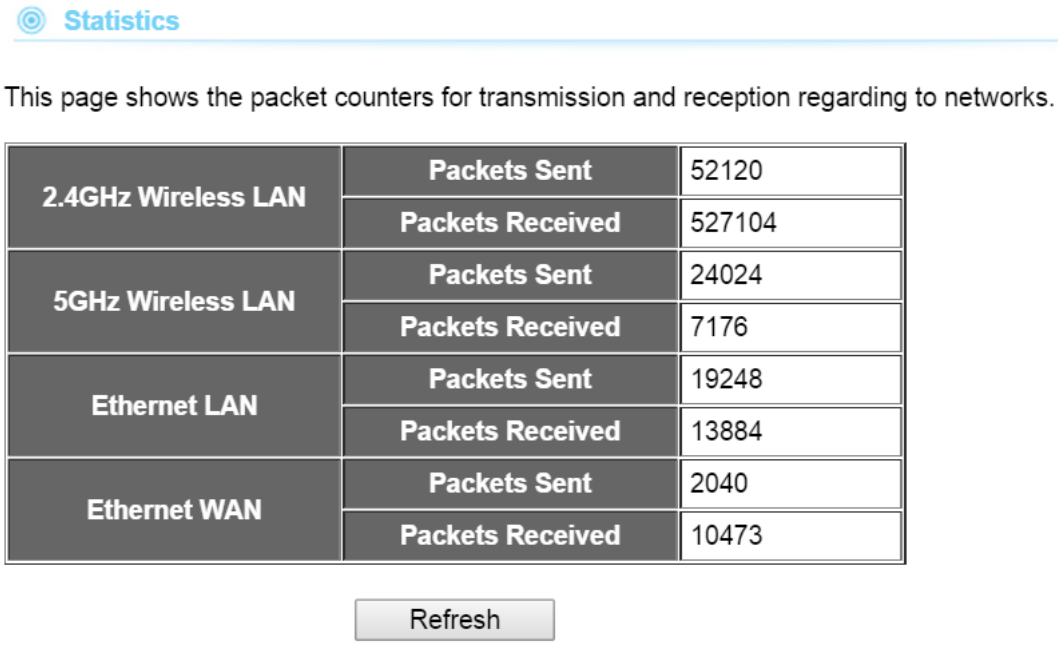
6.1.6 Active DHCP Client

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



6.1.7 Statistics

This page shows the packet counters for transmission and reception regarding to networks including 2.4G/5G Wireless, LAN and WAN Port

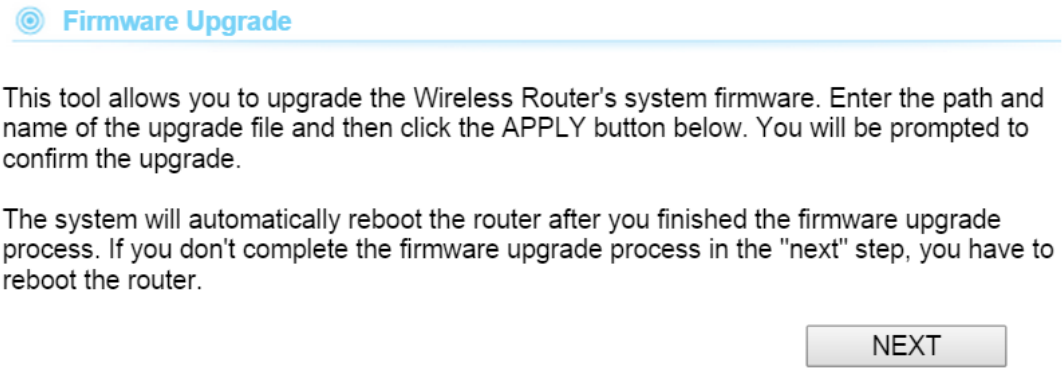


6.1.8 Configuration Tools

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

6.1.9 Firmware Upgrade

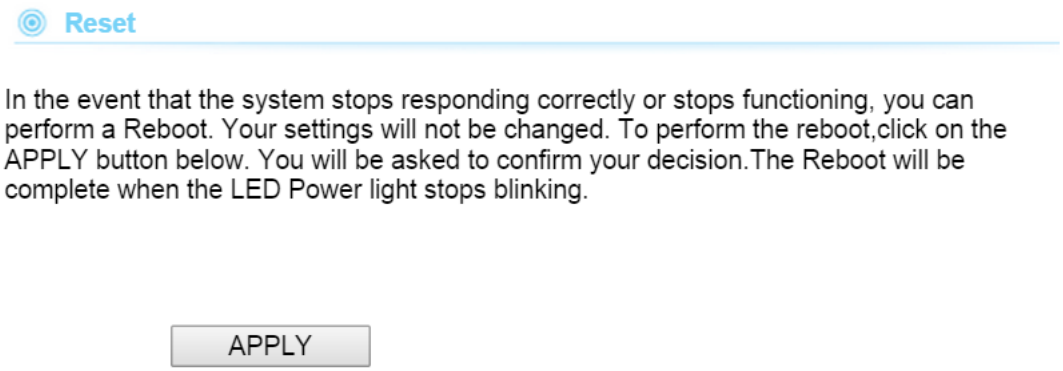
This page allows you to upgrade the Wireless Router's system firmware. Enter the path and name of the upgrade file and then click the APPLY button below. You will be prompted to confirm the upgrade.



> ⚠ Do not power off the device while upgrading the firmware.
> It is recommended that you do not upgrade your AC-1200R unless the new firmware has new features you need or if it has a fix to a problem that you've encountered.

6.1.10 Reset

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 APPLY button below. You will be asked to confirm your decision.The Reboot will be complete when the LED Power light stops blinking.



7 Frequent Asked Questions

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Question: I heard AC-1200R can limit the bandwidth of BitTorrent and eDonkey traffic. But I don't see the option on the Bandwidth Control.

Answer: The option to limit bandwidth by application or port is available only on WISP and Router modes.

==========

Question: When do I use Per-User Bandwidth Control by IP, MAC, or IP segment?

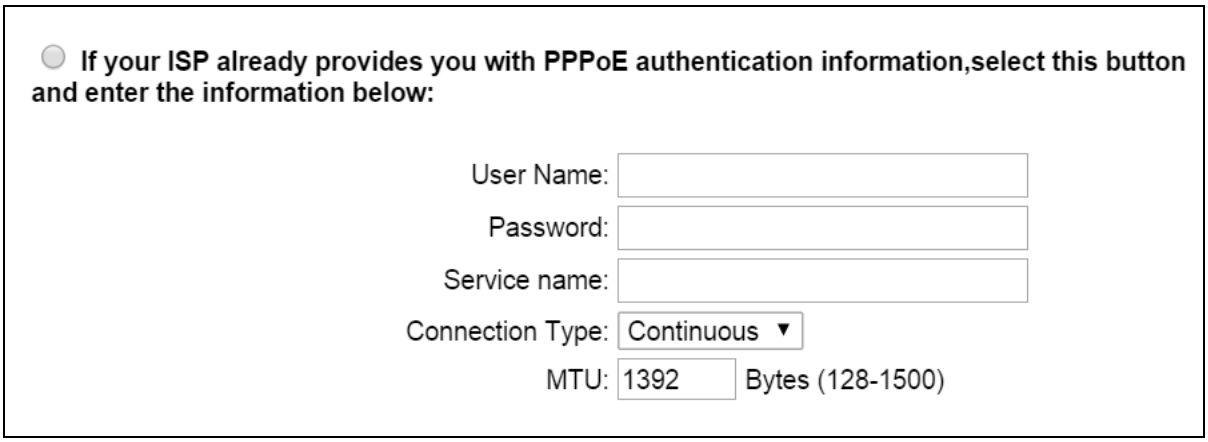
Answer: In general, IP address control limits the devices on the end node (i.e. PC and WISP router). MAC address control can limit the traffic of a AP/CPE in wireless client mode.

- **IP address**: When you want to limit the bandwidth of a single notebook computer, PC, or WISP router.
- **MAC address**: When you want to limit the bandwidth of a remote AP/CPE in Client mode. For example, another AC-1200R in client mode
- **IP Segment**: When you want to limit the bandwidth of an entire IP range. For example, all the PCs using the DHCP server to get IP addresses.

==========

Question: I thought AC-1200R has PPPoE server function, where can I find it?

Answer: The AC-1200R PPPoE function is available only in "Dual Band Router Mode". The PPPoE function is inside the "Wireless Settings"->WAN Settings. Please see graphics below:


If your ISP already provides you with PPPoE authentication information,select this button and enter the information below:
User Name:
Password:
Service name:
Connection Type:
Continuous
MTU:
1392
Bytes (128-1500)

==========

8 Specifications

The specification of AC-1200R is subject to change without notice. Please use the information with caution.

Hardware

- MedeaTek CPU
- High power design, up to 23dBm with included antennas (20dBm in EU)
- 5 x 10/100/1000Mbps LAN Ports
- 2.4G/5G Dual Band Technology
- MIMO Technology
- 8MB Flash, 32MB SDRAM

Antenna

- 2 x R-SMA antenna connectors

Frequency Range

- WLAN1(Radio 1)
  - 802.11ac : 5.15 to 5.825 GHz
- WLAN2 (Radio 2)
  - 802.11b/g/n : 2.412 to 2.472 GHz

Frequency Band

- **5.15 to 5.25GHz**: U-NII Low and ETSI Band1
- **5.25 to 5.35GHz**: U-NII Mid and ETSI Band2
- **5.47 to 5.725GHz**: U-NII World Wide and ETSI Band3
- **5.745 to 5.825GHz**, U-NII Upper Band

Frequency Channel

- WLAN1(Radio 1)
  - 802.11ac
    - USA (FCC) : 12
    - Europe (ETSI) : 4
- WLAN2(Radio 2)
  - 802.11b/g
    - USA (FCC) : 11
    - Europe (ETSI) : 13

Power Supply

- 12V at 1.5A DC Power Adapter

Supported WLAN Mode

- 11ac mode
- 11 b/g/n

Output Power (without antennas)

- 2.4GHz
  - 11b(11M): 16±1.5 dBm
  - 11g(54M): 14±1.5 dBm
  - 11n(20MHz, MCS7): 14±1.5 dBm
  - 11n(40MHz, MCS7): 14±1.5 dBm
- 5GHz
  - 11a(54M): 13±1.5 dBm
  - 11n(20MHz, MCS7): 13±1.5 dBm
  - 11n(40MHz, MCS7): 13±1.5 dBm

Receive Sensitivity

- 2.4GHz
  - 11b(11M): -76±2dBm
  - 11g(54M): -65±2dBm
  - 11n(20MHz, MCS7):-64±2dBm
  - 11n(40MHz, MCS7):-61±2dBm
- 5GHz
  - 11a(54M): -65±2dBm
  - 11n(20MHz, MCS7): -64±2dBm
  - 11n(40MHz, MCS7): -61±2dBm

Software

- Wi-Fi, WPA compatible interoperability
- Support WDS Bridge Mode, Client Mode, AP Mode on interface under each predefined operational mode
- Client Isolation supported
- 5/10/20/40/80 MHz Variable Channel Width
- Support adjustable output power
- User Limitation
- Multiple SSID, VLAN, QoS, WPA with PSK/TKIP/AES support ,WPA2 support
- Radius Support
- QoS
- Bandwidth Control

Product Weight (g)

- 305 g

Product Size (L x W x H mm)

- 173 x 130 x 33 mm

9 Wireless Network Glossary

The wireless network glossary contains explanation or information about common terms used in wireless networking products. Some of information in this glossary might be outdated, please use with caution.

802.11a

An IEEE specification for wireless networking that operates in the 5 GHz frequency range (5.15 GHz to 5.850 GHz) with a maximum of 54 Mbps data transfer rate. The 5 GHz frequency band is not as crowded as the 2.4 GHz band. In addition, the 802.11a have 12 non-overlapping channels, comparing to 802.11b/g's 3 non-overlapping channels. This means the possibility to build larger non-interfering networks. However, the 802.11a deliver shorter distance at the same output power when comparing to 802.11g.

802.3ad

802.3ad is an IEEE standard for bonding or aggregating multiple Ethernet ports into one virtual port (also known as trunking) to increase the bandwidth.

802.3af

This is the PoE (Power over Ethernet) standard by IEEE committee. 802.3af uses 48V POE standard that can deliver up to 100 meter distance over Ethernet cable.

802.11b

International standard for wireless networking that operates in the 2.4 GHz frequency band (2.4 GHz to 2.4835 GHz) and provides a throughput up to 11 Mbps.

802.1d STP

Spanning Tree Protocol. It is an algorithm to prevent network from forming. The STP protocol allows net work to provide a redundant link in the event of a link failure. It is advise to turn on this option for multi-link bridge network.

802.11d

Also known as “Global Roaming”. 802.11d is a standard for use in countries where systems using other standards in the 802.11 family are not allowed to operate.

802.11e

The IEEE QoS standard for prioritizing traffic of the VoIP and multimedia applications.
The WMM is based on a subset of the 802.11e.

802.11g

A standard provides a throughput up to 54 Mbps using OFDM technology. It also operates in the 2.4 GHz frequency band as 802.11b. 802.11g devices are backward compatible with 802.11b devices.

802.11h

This IEEE standard define the TPC (transmission power control) and DFS(dynamic frequency selection) required to operate WiFi devices in 5GHz for EU.

802.11i

The IEEE standard for wireless security. 802.11i standard includes TKIP, CCMP, and AES encryption to improve wireless security. It is also known as WPA2.

802.1Q Tag VLAN

In 802.1Q VLAN, the VLAN information is written into the Ethernet packet itself. Each packet carries a VLAN ID(called Tag) as it traveled across the network. Therefore, the VLAN configuration can be configured across multiple switches. In 802.1Q spec, possible 4096 VLAN ID can be created. Although for some devices, they can only view in frames of 256 ID at a time.

802.1x

802.1x is a security standard for wired and wireless LANs. In the 802.1x parlance, there are usually supplicants (client), authenticator (switch or AP), and authentication server (radius server) in the network. When a supplicants request a service, the authenticator will pass the request and wait for the authentication server to grant access and register accounting.
The 802.1x is the most widely used method of authentication by WISP.

Adhoc

A Peer-to-Peer wireless network. An Adhoc wireless network do not use wireless AP or router as the central hub of the network. Instead, wireless client are connected directly to each other. The disadvantage of Adhoc network is the lack of wired interface to Internet connections. It is not recommended for network more than 2 nodes.

Access Point (AP)

The central hub of a wireless LAN network. Access Points have one or more Ethernet ports that can connect devices (such as Internet connection) for sharing. Multi-function Access Point can also function as an Ethernet client, wireless bridge, or repeat signals from other AP. Access Points typically have more wireless functions comparing to wireless routers.

ACK Timeout

Acknowledgement Timeout Windows. When a packet is sent out from one wireless station to the other, it will waits for an Acknowledgement frame from the remote station. The station will only wait for a certain amount of time; this time is called the ACK timeout. If the ACK is NOT received within that timeout period then the packet will be re-transmitted resulting in reduced throughput. If the ACK setting is too high then throughput will be lost due to waiting for the Ack Window to timeout on lost packets. If the ACK setting is too low then the ACK window will have expired and the returning packet will be dropped, greatly lowering throughput. By having the ability to adjust the ACK setting we can effectively optimize the throughput over long distance links. This is especially true for 802.11a and 802.11g networks. Setting the correct ACK timeout value needs to consider 3 factors: distance, AP response time, and interference. The AC-1200R provides ACK adjustment capability in form of either distance or direct input. When you enter the distance parameter, the AC-1200R will automatically calculate the correct ACK timeout value.

Bandwidth Management

Bandwidth Management controls the transmission speed of a port, user, IP address, and application. Router can use bandwidth control to limit the Internet connection speed of individual IP or Application. It can also guarantee the speed of certain special application or privileged IP address - a crucial feature of QoS (Quality of Service) function. The AC-1200R's features both "Per-user Bandwidth Control" and "Total Bandwidth Control". "Per-user Bandwidth Control" allow administrator to define the maximum bandwidth of each user by IP, IP Group, or MAC address. Total Bandwidth defines the maximum bandwidth of wireless or Ethernet interface.

Bootloader

Bootloader is the under layering program that will start at the power-up before the device loads firmware. It is similar to BIOS on a personal computer. When a firmware crashed, you might be able to recover your device from bootloader.

Bridge

A product that connects 2 different networks that uses the same protocol. Wireless bridges are commonly used to link network across remote buildings. For wireless application, there are 2 types of Bridges. WDS Bridge can be used in Point-to-Point or Point-to-Multipoint topology. Bridge Infrastructure works with AP mode to form a star topology.

Cable and Connector Loss

During wireless design and deployment, it is important to factor in the cable and connector loss. Cable and connector loss will reduce the output power and receiver sensitivity of the radio at connector end. The longer the cable length is, the more the cable loss. Cable loss should be subtracted from the total output power during distance calculation. For example, if the cable and connector loss is 3dBm and the output power is 20dBm; the output power at the cable end is only 17dBm.

Client

Client means a network device or utility that receives service from host or server. A client device means end user device such as wireless cards or wireless CPE.

CPE Devices

CPE stands for Customer Premises Equipment. A CPE is a device installed on the end user's side to receive network services. For example, on an ADSL network, the ADSL modem/router on the subscriber's home is the CPE device. Wireless CPE means a complete Wireless (usually an AP with built-in Antenna) that receive wireless broadband access from the WISP. The opposite of CPE is CO.

CTS

Clear To Send. A signal sent by a device to indicate that it is ready to receive data.

DDNS

Dynamic Domain Name System. An algorithm that allows the use of dynamic IP address for hosting Internet Server. A DDNS service provides each user account with a domain name. A router with DDNS capability has a built-in DDNS client that updates the IP address information to DDNS service provider whenever there is a change. Therefore, users can build website or other Internet servers even if they don't have fixed IP connection.

DHCP

Dynamic Hosting Configuration Protocol. A protocol that enables a server to dynamically assign IP addresses. When DHCP is used, whenever a computer logs onto the network, it automatically gets an IP address assigned to it by DHCP server. A DHCP server can either be a designated PC on the network or another network device, such as a router.

DMZ

Demilitarized Zone. When a router opens a DMZ port to an internal network device, it opens all the TCP/UDP service ports to this particular device. The feature is used commonly for setting up H.323 VoIP or Multi-Media servers.

DNS

A program that translates URLs to IP addresses by accessing a database maintained on a collection of Internet servers.

Domain Name

The unique name that identifies an Internet site. Domain Names always have 2 or more parts, separated by dots. In www.airlive.com, the "airlive.com" is the doman name.

DoS Attack

Denial of Service. A type of network attack that floods the network with useless traffic. Many DoS attacks, such as the Ping of Death and Teardrop attacks, exploit limitations in the TCP/IP protocols.

Encryption

Encoding data to prevent it from being read by unauthorized people. The common wireless encryption schemes are WEP, WPA, and WPA2.

ESSID (SSID)

The identification name of an 802.11 wireless network. Since wireless network has no physical boundary liked wired Ethernet network, wireless LAN needs an identifier to distinguish one network from the other. Wireless clients must know the SSID in order to associate with a WLAN network. Hide SSID feature disable SSID broadcast, so users must know the correct SSID in order to join a wireless network.

Firewall

A system that secures a network and prevents access by unauthorized users. Firewalls can be software, router, or gateway. Firewalls can prevent unrestricted access into a network, as well as restricting data from flowing out of a network.

Firmware

The program that runs inside embedded device such as router or AP. Many network devices are firmware upgradeable through web interface or utility program.

FTP

File Transfer Protocol. A standard protocol for sending files between computers over a TCP/IP network and the Internet.

Fragment Threshold

Frame Size larger than this will be divided into smaller fragment. If there are interferences in your area, lower this value can improve the performance. If there are not, keep this parameter at higher value. The default size is 2346. You can try 1500, 1000, or 500 when there are interference around your network.

Full Duplex

The ability of a networking device to receive and transmit data simultaneously. In wireless environment, this is usually done with 2 or more radios doing load balancing.

Gateway

In the global Internet network, the gateways are core routers that connect networks in different IP subnet together. In a LAN environment with an IP sharing router, the gateway is the router. In an office environment, gateway typically is a multi-function device that integrates NAT, firewall, bandwidth management, and other security functions.

Hotspot

A place where you can access Wi-Fi service. The term hotspot has two meanings in wireless deployment. One is the wireless infrastructure deployment; the other is the Internet access billing system. In a hotspot system, a service provider typically need an authentication and account system for billing purposes, and a wireless AP network to provide access for customers.

IGMP Snooping

Internet Group Management Protocol (IGMP) is a Layer 3 protocol to report IP multicast memberships to neighboring multicast switches and routers. IGMP snooping is a feature that allows an Ethernet switch to "listen in" on the IGMP conversation between hosts and routers. A switch support IGMP snooping has the possibility to avoid multicast traffic being treated as broadcast traffic; therefore, reducing the overall traffic on the network.

Infrastructure Mode

A wireless network that is built around one or more access points to provide wireless clients access to wired LAN / Internet service. The opposite of Infrastructure mode is Adhoc mode.

IP address

IP (Internet Protocol) is a layer-3 network protocol that is the basis of all Internet communication. An IP address is 32-bit number that identifies each sender or receiver of information that is sent across the Internet. An IP address has two parts: an identifier of a particular network on the Internet and an identifier of the particular device (which can be a server or a workstation) within that network. The new IPv6 specification supports 128-bit IP address format.

IPsec

IP Security. A set of protocols developed by the IETF to support secure exchange of packets at the IP layer. IPsec has been deployed widely to implement Virtual Private Networks (VPNs). IPsec supports two encryption modes: Transport and Tunnel. Transport mode encrypts only the data of each packet, but leaves the header untouched. The more secure Tunnel mode encrypts both the header and the payload. On the receiving side, an IPSec-compliant device decrypts each packet.

LACP (802.3ad) Trunking

The 802.3ad Link Aggregation standard defines how to combine the several Ethernet ports into one high-bandwidth port to increase the transmission speed. It is also known as port trunking. Both devices must set the trunking feature to work.

MAC

Media Access Control. MAC address provides layer-2 identification for Networking Devices. Each Ethernet device has its own unique address. The first 6 digits are unique for each manufacturer. When a network device have MAC access control feature, only the devices with the approved MAC address can connect with the network.

Mbps

Megabits per Second. One million bits per second; a unit of measurement for data transmission

MESH

Mesh is an outdoor wireless technology that uses Spanning Tree Protocol (STP) and Wireless Distribution system to achieve self-forming, self-healing, and self-configuring outdoor network. MESH network are able to take the shortest path to a destination that does not have to be in the line of site.

MIMO

Multi In Multi Out. A Smart Antenna technology designed to increase the coverage and performance of a WLAN network. In a MIMO device, 2 or more antennas are used to increase the receiver sensitivity and to focus available power at intended Rx.

NAT

Network Address Translation. A network algorithm used by Routers to enables several PCs to share single IP address provided by the ISP. The IP that a router gets from the ISP side is called Real IP, the IP assigned to PC under the NAT environment is called Private IP.

Node

A network connection end point, typically a computer.

Packet

A unit of data sent over a network.

Passphrase

Used much like a password, a passphrase simplifies the WEP encryption process by automatically generating the WEP encryption keys for the company products.

POE

Power over Ethernet. A standard to deliver both power and data through one single Ethernet cable (UTP/STP). It allows network device to be installed far away from power ource. A POE system typically compose of 2 main component: DC Injector (Base Unit) and Splitter(Terminal Unit). The DC injector combines the power and data, and the splitter separates the data and power back. A PoE Access Point or CPE has the splitter built-in to the device. The IEEE 802.3af is a POE spec that uses 48 volt to deliver power up to 100 meter distance.

Port

This word has 2 different meaning for networking.

- The hardware connection point on a computer or networking device used for plugging in a cable or an adapter.
- The virtual connection point through which a computer uses a specific application on a server.

PPPoE

Point-to- Point Protocol over Ethernet. PPPoE relies on two widely accepted standards: PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem.

PPTP

Point-to-Point Tunneling Protocol: A VPN protocol developed by PPTP Forum. With PPTP, users can dial in to their corporate network via the Internet. If users require data encryption when using the Windows PPTP client, the remote VPN server must support MPPE (Microsoft Point-To-Point Encryption Protocol) encryption. PPTP is also used by some ISP for user authentication, particularly when pairing with legacy Alcatel / Thomson ADSL modem.

Preamble Type

Preamble are sent with each wireless packet transmit for transmission status. Use the long preamble type for better compatibility. Use the short preamble type for better performance

Rate Control

Ethernet switches' function to control the upstream and downstream speed of an individual port. Rate Control management uses "Flow Control" to limit the speed of a port. Therefore, the Ethernet adapter must also have the flow control enabled. One way to force the adapter's flow control on is to set a port to half-duplex mode.

RADIUS

Remote Authentication Dial-In User Service. An authentication and accounting system used by many Internet Service Providers (ISPs). When you dial in to the ISP, you must enter your username and password. This information is passed to a RADIUS server, which checks that the information is correct, and then authorizes access to the ISP system. Radius typically uses port 1812 and port 1813 for authentication and accounting port. Though not an official standard, the RADIUS specification is maintained by a working group of the IETF.

Receiver Sensitivity

Receiver sensitivity means how sensitive is the radio for receiving signal. In general; the slower the transmission speed, the more sensitive the radio is. The unit for Receiver Sensitivity is in dB; the lower the absolute value is, the higher the signal strength. For example, -50dB is higher than -80dB.

RJ-45

Standard connectors for Twisted Pair copper cable used in Ethernet networks. Although they look similar to standard RJ-11 telephone connectors, RJ-45 connectors can have up to eight wires, whereas telephone connectors have only four.

Router

An IP sharing router is a device that allows multiple PCs to share one single broadband connection using NAT technology. A wireless router is a device that combines the functions of wireless Access Point and the IP sharing router.

RSSI

Receiver Sensitivity Index. RSSI is a value to show the Receiver Sensitivity of the remote wireless device. In general, remote APs with stronger signal will display higher RSSI values. For RSSI value, the smaller the absolute value is, the stronger the signal. For example, “-50db” has stronger signal than “-80dB”. For outdoor connection, signal stronger than -60dB is considered as a good connection.

RTS

Request To Send. A packet sent when a computer has data to transmit. The computer will wait for a CTS (Clear To Send) message before sending data.

RTS Threshold

RTS (Request to Send). The RTS/CTS(clear to send) packet will be send before a frame if the packet frame is larger than this value. Lower this value can improve the performance if there are many clients in your network. You can try 1500, 1000 or 500 when there are many clients in your AP's network.

SNMP

Simple Network Management Protocol. A set of protocols for managing complex networks. The SNMP network contains 3 key elements: managed devices, agents, and network-management systems (NMSs). Managed devices are network devices that content SNMP agents. SNMP agents are programs that reside SNMP capable device's firmware to provide SNMP configuration service. The NMS typically is a PC based software such as HP Openview that can view and manage SNMP network device remotely.

SSH

Developed by SSH Communications Security Ltd., Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.

SSL

Secure Sockets Layer. It is a popular encryption scheme used by many online retail and banking sites to protect the financial integrity of transactions. When an SSL session begins, the server sends its public key to the browser. The browser then sends a randomly generated secret key back to the server in order to have a secret key exchange for that session. SSL VPN is also known as Web VPN. The HTTPS and SSH management interface use SSL for data encryption.

Subnet Mask

An address code mask that determines the size of the network. An IP subnet are determined by performing a BIT-wise AND operation between the IP address and the subnet mask. By changing the subnet mask, you can change the scope and size of a network.

Subnetwork or Subnet

Found in larger networks, these smaller networks are used to simplify addressing between numerous computers. Subnets connect to the central network through a router, hub or gateway. Each individual wireless LAN will probably use the same subnet for all the local computers it talks to.

Super A

Super A is an Atheros proprietary turbo mode to increase speed over standard 802.11a mode. It adds Bursting and Compression to increase the speed. If you live in countries that prohibit the channel binding technology (i.e. Europe), you should choose “Super-A without Turbo) if you need more speed than 11a mode

TCP

A layer-4 protocol used along with the IP to send data between computers over the Internet. While IP takes care of handling the actual delivery of the data, TCP takes care of keeping track of the packets that a message is divided into for efficient routing through the Internet.

Turbo A

Turbo A is an Atheros proprietary turbo mode to increase speed over standard 802.11a mode. It uses channel binding technology to increase speed. There are 2 types of Turbo A modes: Dynamic Turbo and Static Turbo. In Dynamic Turbo, the channel binding will be used only if necessary. In Static Turbo, the channel binding is always on. This protocol may be combined with Super-A model to increase the performance even more. The used of channel binding might be prohibited in EU countries.

TX Output Power

Transmit Output Power. The TX output power means the transmission output power of the radio. Normally, the TX output power level limit for 2.4GHz 11g/b is 20dBm at the antenna end. The output power limit for 5GHz 802.11a is 30dBm at the antenna end.

UDP

User Datagram Protocol. A layer-4 network protocol for transmitting data that does not require acknowledgement from the recipient of the data.

Upgrade

To replace existing software or firmware with a newer version.

Upload

To send a file to the Internet or network device.

URL

Uniform Resource Locator. The address of a file located on the Internet.

VPN

Virtual Private Network. A type of technology designed to increase the security of information transferred over the Internet. VPN creates a private encrypted tunnel from the end user's computer, through the local wireless network, through the Internet, all the way to the corporate network.

Walled Garden

On the Internet, a walled garden refers to a browsing environment that controls the information and Web sites the user is able to access. This is a popular method used by ISPs in order to keep the user navigating only specific areas of the Web

WAN

Wide Area Network. A communication system of connecting PCs and other computing devices across a large local, regional, national or international geographic area. A WAN port on the network device means the port (or wireless connection) that is connected to the Internet side of the network topology.

WEP

Wired Equivalent Privacy. A wireless encryption protocol. WEP is available in 40-bit (64-bit), 108-bit (128-bit) or 152-bit (Atheros proprietary) encryption modes.

Wi-Fi

Wireless Fidelity. An interoperability certification for wireless local area network (LAN) products based on the IEEE 802.11 standards. The governing body for Wi-Fi is called Wi-Fi Alliance (also known as WECA).

WiMAX

Worldwide Interoperability for Microwave Access. A Wireless Metropolitan Network technology that complies with IEEE 802.16 and ETSI Hiperman standards. The orginal 802.16 standard call for operating frequency of 10 to 66Ghz spectrum. The 802.16a amendment extends the original standard into spectrum between 2 and 11 Ghz. 802.16d increase data rates to between 40 and 70 Mbps/s and add support for MIMO antennas, QoS, and multiple polling technologies. 802.16e adds mobility features, narrower bandwidth (a max of 5 mhz), slower speed and smaller antennas. Mobility is allowed up to 40 mph.

WDS

Wireless Distribution System. WDS defines how multiple wireless Access Point or Wireless Router can connect together to form one single wireless network without using wired uplinks. WDS associate each other by MAC address, each device

WLAN

Wireless Local Area Network. A type of local-area network that uses high-frequency radio waves rather than wires to communicate between nodes. The most popular standard for WLAN is the 802.11 standards.

WMM

Wi-Fi Multimedia (WMM) is a standard to prioritize traffic for multimedia applications. The WMM prioritize traffic\ on Voice-over-IP (VoIP), audio, video, and streaming media as well as traditional IP data over the AP.

WMS

Wireless Management System. An utility program to manage multiple wireless AP/Bridges.

WPA

Wi-Fi Protected Access. It is an encryption standard proposed by WiFi for advance protection by utilizing a password key (TKIP) or certificate. It is more secure than WEP encryption. The WPA-PSK utilizes pre-share key for encryption/authentication.

WPA2

Wi-Fi Protected Access 2. WPA2 is also known as 802.11i. It improves on the WPA security with CCMP and AES encryption. The WPA2 is backward compatible with WPA.
WPA2-PSK utilizes pre-share key for encryption/authentication.