

User Guide

WAP220N



FCC 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 or more of the following measures:

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

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.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

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

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

“To comply with FCC RF exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.”

CE Mark Warning



This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

National restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/remark
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Note: Please don't use the product outdoors in France.

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Package Contents

The following items should be found in your package:

- WAP220N
- Power Adapter
- Ethernet Cable
- 2 x 5dB detachable antenna

 **Note:**

If any of the listed items are damaged or missing, please contact your distributor.

Chapter 1. Introduction

Thank you for choosing the WAP220N.

1.1 Overview

The WAP220N integrates 4-port Switch, Firewall, NAT-Router and Wireless AP. This AP delivers exceptional range and speed, which can fully meet the need of Small Office/Home Office (SOHO) networks and users that demand higher networking performance.

Incredible Speed

The WAP220N provides up to 300M wireless connection with other 802.11n wireless clients. The speed makes it ideal for handling multiple data streams at the same time ensuring your network stability. It is compatible with all IEEE 802.11g and IEEE 802.11b products.

Multiple Security Protections

The multiple protection measures include SSID broadcast control and wireless LAN 64/128-bit WEP encryption, Wi-Fi protected Access (WPA2- PSK, WPA- PSK), as well as advanced Firewall protections. The WAP220N provides complete data privacy.

Flexible Access Control

The WAP220N provides flexible access control for parents and network administrators to establish restricted access policies for children or staff members. It also supports Virtual Server and DMZ host. The network administrators can manage and monitor the network in real time with the remote management function.

Simple Installation

Since the AP/Router functions are compatible with virtually all the major operating systems, it is easy to manage and operate. The Quick Setup Wizard is supported and detailed step by step instructions are in this user guide. If you choose to use the AP as a router, please look through the user guide to know all the router's functions.

1.2 Main Features

- IEEE 802.11n wireless technology to provide a wireless data rate of up to 300Mbps.
- One 10/100M Auto-Negotiation RJ45 WAN port, four 10/100M Auto-Negotiation RJ45 LAN ports, supporting Auto MDI/MDIX.
- Provides WPA/WPA2, WPA-PSK/WPA2-PSK authentication, TKIP/AES encryption security.
- Shares data and Internet access for users, supporting Dynamic IP/Static IP/PPPoE Internet access.
- Supports Virtual Server, Special Application and DMZ host.
- Supports UPnP, Dynamic DNS, Static Routing.
- Provides Automatic-connection and Scheduled Connection to the Internet on specified times.
- Connects Internet on demand and disconnects from the Internet when idle for PPPoE.
- Built-in NAT and DHCP server supporting static IP address distribution.
- Supports Stateful Packet Inspection.
- Supports VPN Passthrough.
- Supports Parental Control and Access Control.
- Provides 64/128-bit WEP encryption security and wireless LAN ACL (Access Control List).
- Supports Flow Statistics.
- Supports firmware upgrade and Web management.

1.3 Panel Layout

1.3.1 The Front Panel

The Access Point's LEDs and the WPS/Reset Button are located on the side panel (View from left to right).

Name	Status	Indication
PWR	Off	Power is off.
	On	Power is on.
SYS	On	Push the Reset button
WLAN	Off	The Wireless function is disabled or not active
	Flashing	The Wireless active
WAN, 1,2,3,4 (LAN)	Off	There is no device linked to the corresponding port.
	On	There is a device linked to the corresponding port but there is no activity.
	Flashing	There is an active device linked to the corresponding port.
WPS	Slow Flash	A wireless device is connected to the network by WPS function. This process will last for about 2 minutes.
	On	A wireless device has been successfully added to the network by WPS function. The LED will light up for about 2 minutes.
	Quick Flash	A wireless device failed to be added to the network by WPS function.

Table 1-1 The LEDs Description

Note:

1. After the device has been successfully added to the network by the WPS function, the WPS LED will light up for about 2 minutes and then turn off.
2. To reset the AP, press the Reset Button and hold for more than five seconds.

1.3.2 The Rear Panel

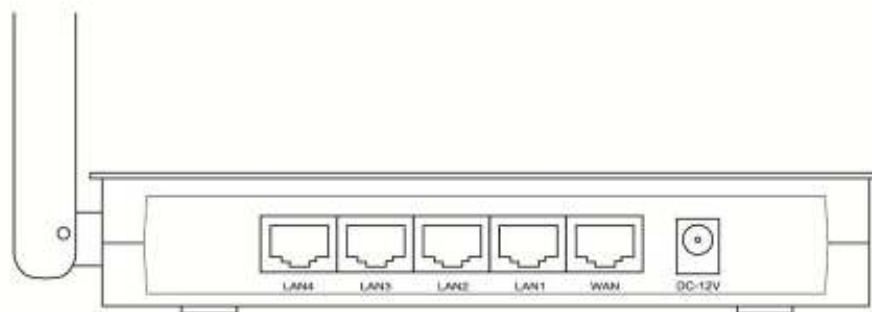


Figure 1-2 Rear Panel sketch

The following parts are located on the rear panel (View from left to right).

- **POWER:** The Power socket is where you will connect the power adapter. Please use the power adapter provided with the WAP220N.
- **WAN:** The WAN port is where you will connect the DSL/cable Modem, or Ethernet.
- **1,2,3,4 (LAN):** Ports (1, 2, 3, and 4) to connect the unit to the local PC(s).
- **Wireless antenna:** To receive and transmit the wireless data.

Chapter 2. Connecting the Access Point

2.1 System Requirements

- Broadband Internet Access Service (DSL/Cable/Ethernet)
- One DSL/Cable Modem that has an RJ45 connector (which is not necessary if the Router is connected directly to the Ethernet.)
- PCs with a working Ethernet Adapter and an Ethernet cable with RJ45 connectors
- TCP/IP protocol on each PC
- Web browser, such as Microsoft Internet Explorer, Mozilla Firefox or Apple Safari

2.2 Installation Environment Requirements

- Place the AP in a well-ventilated place away from any heater or heating vent
- Avoid direct irradiation of any strong light (such as sunlight)
- Keep at least 2 inches (5 cm) of clear space around the AP
- Operating Temperature: 0°C~50°C
- Operating Humidity: 10%~90%RH, Non-condensing

2.3 Connecting the Access Point

Before installing the AP/Router, make sure your PC is connected to the Internet through the broadband service successfully. If there are any problems, please contact your ISP. Install the AP/Router according to the following steps. Don't forget to pull out the power plug and keep your hands dry.

1. Turn the power off on your PC, Cable/DSL Modem, and the AP.
2. Locate an optimum location for the AP. The best place is usually at the center of your wireless network environment.
3. Adjust the direction of the antenna. Normally, upright is a good direction.
4. Connect the PC(s) and each Switch/Hub in your LAN to the LAN Ports on the AP, shown in Figure 2-1. (If you have the wireless NIC and want to use the wireless function, you can skip this step.)
5. Connect the DSL/Cable Modem to the WAN port on the AP/Router, shown in Figure 2-1.

6. Connect the power adapter to the power socket on the AP/Router, and the other end into an electrical outlet. Press the power switch, and then the AP will start to work.
7. Turn the power on for your PC and Cable/DSL Modem.

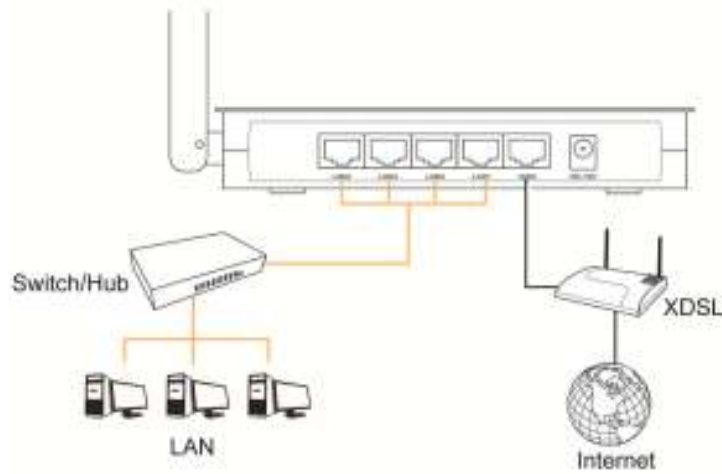


Figure 2-1 Hardware Installation of the WAP220N

Chapter 3. Quick Installation Guide

This chapter will show you how to configure the basic functions of your WAP220N using **Quick Setup Wizard** within minutes.

3.1 TCP/IP Configuration

The default IP address for the WAP220N is 192.168.2.1 (Subnet Mask is 255.255.255.0). These values can be changed to your preference.

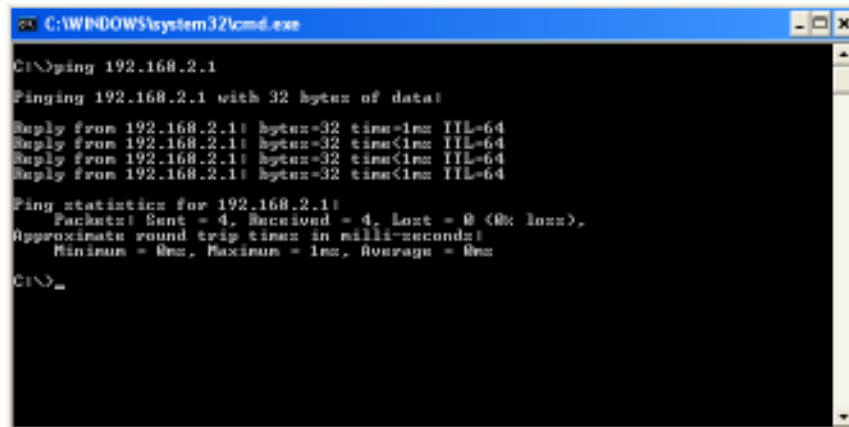
Connect the local PC to any of the AP's LAN ports. You can configure the IP address for your PC with the following options.

- Configure the IP address manually
 - 1) Set up the TCP/IP Protocol for your PC. If you need instructions as to how to do this, please refer to [Appendix B: Configuring the PC](#).
 - 2) Configure the network parameters. The IP address is 192.168.2.xxx ("xxx" represents any number from 2 to 254), Subnet Mask is 255.255.255.0, and Gateway is 192.168.2.1 (The AP's default IP address).
- Obtain an IP address automatically
 - 1) Set up the TCP/IP Protocol in "**Obtain an IP address automatically**" mode on your PC. If you need instructions as to how to do this, please refer to [Appendix B: Configuring the PC](#).
 - 2) The built-in DHCP server will assign an IP address for the PC.

Now, you can run the Ping command in the **command prompt** to verify the network connection between your PC and the AP. The following example is in Windows XP OS.

Open a command prompt, and type *ping 192.168.2.1*, and then press **Enter**.

- If the result displayed is similar to the Figure 3-1, it means the connection between your PC and the AP has been established well.



```

C:\WINDOWS\system32\cmd.exe
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64

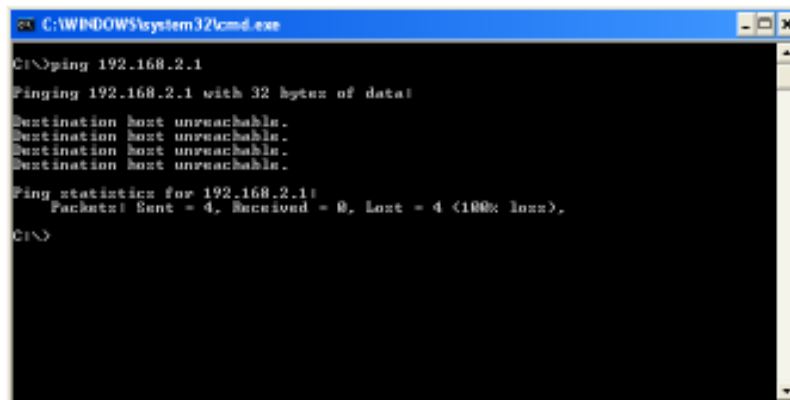
Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>_

```

Figure 3-1 Success result of Ping command

- If the result displayed is similar to the Figure 3-2, it means the connection between your PC and the AP has failed.



```

C:\WINDOWS\system32\cmd.exe
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Destination host unreachable.
Destination host unreachable.
Destination host unreachable.
Destination host unreachable.

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>

```

Figure 3-2 Failure result of Ping command

To check the connection follow these steps:

1. Is the connection between your PC and the AP correct?

Note:

The 1/2/3/4 LEDs of LAN ports which you link to on the AP and LEDs on your PC's adapter should be lit.

2. Is the TCP/IP configuration for your PC correct?

Note:

The AP's IP address is 192.168.2.1. Your PC's IP address must be within the range of 192.168.2.2 ~ 192.168.2.254.

3.2 Quick Installation Guide

With a Web-based utility, it is easy to configure and manage WAP220N. The Web-based utility can be used on any Windows, Macintosh or UNIX OS with a Web browser, such as Microsoft Internet Explorer, Mozilla Firefox or Apple Safari.

1. To access the configuration utility, open a web-browser and type in the default address <http://192.168.2.1> in the address field of the browser.



Figure 3-3 Logging into the WAP220N

A login window may pop up; leave the **User Name** and **Password** blank. Then click **OK** or press **Enter**.

2. After successfully logging in, click the **Quick Setup** menu to quickly configure your device.

Setup Wizard

The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.

Welcome to Setup Wizard.

The Wizard will guide you the through following steps. Begin by clicking on Next.

1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Time Zone
5. Wireless LAN Setting
6. Wireless Security Setting

Next >>

Figure 3-4 Quick Setup

3. Click **Next**, and then **Operation Mode** page will appear, shown in Figure 3-5.

Operation Mode

You can setup different modes to LAN and WLAN interface for NAT and bridging function.

- Router:** In this mode, the device will provide internet connection with an ADSL/Cable modem connected through the WAN port of the unit. The WAN port supports PPPOE, DHCP client, PPTP client, L2TP client or static IP. NAT (Network Address Translation) will be enabled for all devices connected through the LAN ports for access to the WAN.
- AP:** In this mode, all Ethernet LAN ports and wireless connections are bridged together. The firewall, NAT and WAN related functions will not be supported.
- Wireless ISP:** (WISP) In this mode, the wireless interface is used to connect to an ISP's access point. This allows a broadband connection to a Wireless ISP. All LAN ports are bridged together and NAT will be enabled for the Ethernet ports for access to the WISP. To enable this mode the wireless interface must be set to client mode first and connected to the ISP's AP in Site-Survey page. The connection type can be setup in the WAN page with PPPOE, DHCP client, PPTP client, L2TP client or static IP.
- Repeater:** In this mode, the device extends the wireless coverage from a main Wi-Fi Router. All Ethernet ports and the wireless interface are bridged together. NAT, firewall and WAN related functions would be disabled.
- Client:** In this mode, the product allows devices connected through its LAN ports to join an existing wireless network. Any devices like Internet TV, video game hardware, printers or PC's can that are wired to the product would now gain wireless access seamlessly through the AP in client mode. NAT, firewall and WAN related functions would not be supported in this mode.

Figure 3-5 Quick Setup - WAN Connection Type

The device provides three standard ways (**Gateway**, **Bridge** and **Wireless ISP**) to connect to the Internet. It's recommended that you make use of the **Gateway** function. If you are sure of what kind of connection type your ISP provides, select the type and click **Next**.

You can select the type of NTP server and click **Next** to go on configuring as shown in Figure 3-6.

Time Zone Setting

You can maintain the system time by synchronizing with a public time server over the Internet.

- Enable NTP client update**
- Automatically Adjust Daylight Saving**

Time Zone Select :

NTP server :

Figure 3-6 Quick Setup - Time Zone Setting

4. Confirm the IP address for your device and click **Next** to continue configuration.

LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP address, subnet mask, DHCP, etc..

IP Address:

Subnet Mask:

Figure 3-7 Quick Setup - LAN Interface Setting

5. If you select **Gateway**, the device provides six connection types for your ISP provides. Make sure the cable is securely plugged into the WAN port before continuing.
- a) If the connection type is **PPPoE**, then select it from drop down menu as shown below. Enter the **User Name** and **Password** provided by your ISP, and click **Next**.

WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.

WAN Access Type:

User Name:

Password:

Figure 3-8 Quick Setup - WAN Interface Setting

- **User Name/Password** - Enter the **User Name** and **Password** provided by your ISP. These fields are case sensitive. If you have difficulty with this process, please contact your ISP.

- b) If the connection type detected is **DHCP Client**, the next screen will appear as shown in Figure 3-9. You can then proceed with the wireless configuration.

WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.

WAN Access Type:

Figure 3-9 Quick Setup - DHCP

- c) If the connection type detected is **Static IP**, the next screen will appear as shown in Figure 3-10.

WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Access type.

WAN Access Type:

IP Address:

Subnet Mask:

Default Gateway:

DNS :

Figure 3-10 Quick Setup - Static IP

- **IP Address** - This is the WAN IP address as seen by external users on the Internet (including your ISP). Enter the IP address into the field.
- **Subnet Mask** - The Subnet Mask is used for the WAN IP address, usually 255.255.255.0.
- **Default Gateway** - Enter the gateway IP address into the box if required.
- **Primary DNS** - Enter the DNS Server IP address into the box if required.

6. Click **Next** to continue, the Wireless settings page will appear as shown in Figure 3-11.

Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.

Disable Wireless LAN Interface

Country: UNITED KINGDOM

Band: 2.4 GHz (B+G+N)

Mode: AP

Network Type: Infrastructure

SSID: RTK 11n AP

Channel Width: 40MHz

Control Sideband: Upper

Channel Number: 11

Broadcast SSID: Enabled

WMM: Enabled

Data Rate: Auto

Associated Clients:

Enable Mac Clone (Single Ethernet Client)

Enable Universal Repeater Mode (Acting as AP and client simultaneously)

SSID of Extended Interface:

Figure 3-11 Quick Setup – Wireless

- **Band:** Keep the default setting: **2.4GHz (B+G+N)**. If you want to use a specific protocol, please use the drop down menu to select it.
- **Mode:** This field determines the wireless mode which the WAP220N works on.
- **Network Type:** Keep the default setting: **Infrastructure**. If you want to use another operation mode, please use the drop down menu to select it.
- **SSID:** Create a unique and easy way to remember the name of your wireless network. You can also keep default settings without the device being affected.
- **Channel Width** - Select any channel width from the pull-down list. The default setting is automatic therefore it can adjust the channel width for your clients automatically.
- **Channel Number**- This field determines which operating frequency will be used. The default channel is set to Auto allowing the WAP220N to choose the best channel automatically. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.

7. Set your security preference then click the **Finished** button.

Wireless Security: Recommend to choose **WPA-PSK/WPA2-PSK** and enter a Security Key using ASCII characters between 8 and 63 characters or 64 hexadecimal characters in the **PSK Password** field. For advanced settings, please refer to [Section 4.6: "Wireless"](#).

- **WPA-PSK/WPA2-PSK** - Select WPA based on pre-shared passphrase.
 - **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters.

For **ASCII**, the key can be made up of any numbers from 0 to 9 and any letters from A to Z, the length should be between 8 and 63 characters.

For **Hexadecimal**, the key can be made up of any numbers 0 to 9 and letters A to F, the length should be between 8 and 64 characters.

Please note the key is case sensitive, therefore the upper and lower case keys will affect the outcome. It is highly recommended to write down the key and all related wireless security settings.

Wireless Security Setup

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:

Figure 3-12 Quick Setup - Finish

Chapter 4. Configuring the Router

This chapter will show each Web page's key functions and configuration.

4.1 Login

After successfully logging in, you will see the seven main menus on the left hand-side of the Web-based utility. On the right, there are corresponding explanations and instructions.

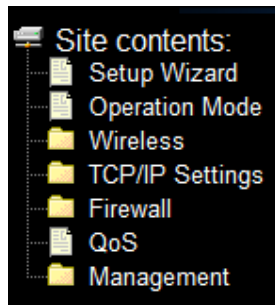


Figure 4-1 the main menu

The detailed explanations for each Web page's key function are listed below.

4.2 Status

The Status page provides the current status information about the Router. All information is read-only.

Select Language: ▼

System	
Uptime	0day:0h:6m:35s
Firmware Version	v2.5.2.a1
Build Time	Tue Feb 7 15:53:23 CST 2012
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G+N)
SSID	RTK 11n AP
Channel Number	11
Encryption	Disabled
BSSID	00:c0:ca:68:e2:3d
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.2.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DHCP Server	Enabled
MAC Address	00:c0:ca:68:e2:3b
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:c0:ca:68:e2:3c

Figure 4-2 Router Status

4.3 Quick Setup

Please refer to [Section 3.2: "Quick Installation Guide"](#).

4.4 WPS

This section will help guide you into adding a new wireless device to an existing network quickly with the **WPS (Wi-Fi Protect Setup)** function.

- a) Choose **WPS** from the **Security** menu in the next screen (shown in Figure 4-3).

Wi-Fi Protected Setup

This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automatically synchronize its setting and connect to the Access Point in a minute without any hassle.

Disable WPS

WPS Status: Configured UnConfigured

Self-PIN Number: 27559789

Push Button Configuration:

Client PIN Number:

Current Key Info:

Authentication	Encryption	Key
Open	None	N/A

Figure 4-3 WPS

- **WPS Status** - Configure or Unconfigure the WPS function here.
- **Self-PIN Number** - The current value of the Router's PIN is displayed here.
- **Push Button Configuration** – Push this button to synchronize the Router and your Wi-Fi adapter
- **Client PIN Number** – To synchronize the Wi-Fi adapter by entering adapter's PIN.

b) To add a new device:

If the wireless adapter supports Wi-Fi Protected Setup (WPS), you can establish a wireless connection between the wireless adapter and Router using either Push Button Configuration (PBC) method or PIN method.

Note:

To build a successful connection by WPS, you should also do the corresponding configuration of the new device for WPS function.

Configuring a new device, please follow the steps below.

Step 1: Press **PBC** button from the Wireless LAN Utility then the **Wi-Fi Protected Setup – PBC method** will pop up and wait for an authentication.



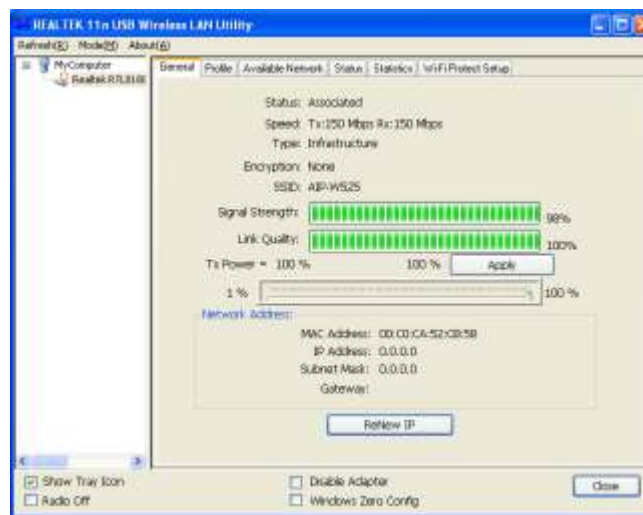
Step 2: Press **Start PBC** button on your Router for authentication.

Start PBC successfully!

You have to run Wi-Fi Protected Setup in client within 2 minutes.

OK

Step 3: Wait for a minute then you'll discover your wifi adapter is connected to WAP220N automatically.



4.5 TCP/IP Settings

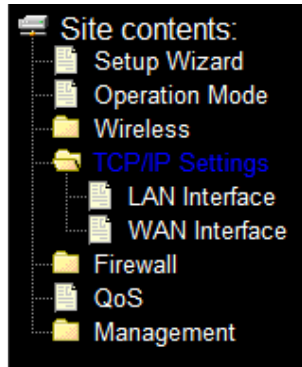


Figure 4-5 The Network Menu

There are two submenus under the TCP/IP Settings menu (shown in Figure 4-5): **LAN Interface**, and **WAN Interface**. Click any of them, and you will be able to configure the corresponding function.

4.5.1 LAN

Choose menu “**TCP/IP Settings** → **LAN**”, to configure the IP parameters of the LAN on the screen as shown below.

LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP address, subnet mask, DHCP, etc..

IP Address:	<input type="text" value="192.168.2.1"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="0.0.0.0"/>
DHCP:	<input type="text" value="Server"/>
DHCP Client Range:	<input type="text" value="192.168.2.100"/> - <input type="text" value="192.168.2.200"/> <input type="button" value="Show Client"/>
DHCP Lease Time:	<input type="text" value="480"/> (1 ~ 10080 minutes)
Static DHCP:	<input type="button" value="Set Static DHCP"/>
Domain Name:	<input type="text" value="Realek"/>
802.1d Spanning Tree:	<input type="text" value="Disabled"/>
Clone MAC Address:	<input type="text" value="000000000000"/>
<input type="button" value="Apply Changes"/> <input type="button" value="Reset"/>	

Figure 4-6 LAN Interface

- **IP Address** - Enter the IP address of your Router or reset it in dotted-decimal notation (factory default: 192.168.2.1).
- **Subnet Mask** - An address code that determines the size of the network. Normally used, 255.255.255.0 as the subnet mask.

 **Note:**

1. If you change the IP Address of LAN, you must use the new IP Address to log into the Router.
 2. If the new LAN IP Address you set is not in the same subnet, the IP Address pool of the DHCP server will change accordingly at the same time, while the Virtual Server and DMZ Host will not take effect until they have been re-configured.
- **Default Gateway** - Enter the gateway IP address in dotted-decimal notation provided by your system administrator.
 - **DHCP** – Select Disabled, Client or Server in different operation mode for WAP220N
 - **DHCP Client Range** - Fill in the start IP address and end IP address to allocate a range of IP addresses; client with DHCP function set will be assigned an IP address automatically.
 - **Show Client** – Press open to active the DHCP Client Table window that shows the active clients with their assigned IP address, MAC address and time expired information. [Server mode only]
 - **DHCP Lease Time** – Amount of time the IP address is leased for.
 - **Set Static DHCP** - Manual setup Static DHCP IP address for specific MAC address. [Server mode only]
 - **Domain Name** - Assign Domain Name and dispatch to DHCP clients [optional]
 - **802.1d Spanning Tree** - Enable or disable the IEEE 802.1d Spanning Tree function from pull-down menu.
 - **Clone MAC Address** - Fill in the MAC address for the MAC address to be cloned.

4.5.2 WAN Interface

Choose menu “**TCP/IP Settings → WAN**”, you can configure the IP parameters of the WAN on the screen shown below.

This page is used to configure the parameters for Internet access which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, or L2TP by clicking on the item value for the WAN access type.

WAN Access Type:	Static IP
IP Address:	172.1.1.1
Subnet Mask:	255.255.255.0
Default Gateway:	172.1.1.254
MTU Size:	1500 (1400-1500 bytes)
DNS 1:	
DNS 2:	
DNS 3:	
Clone MAC Address:	000000000000
<input type="checkbox"/>	Enable uPNP
<input checked="" type="checkbox"/>	Enable IGMP Proxy
<input type="checkbox"/>	Enable Ping Access on WAN
<input type="checkbox"/>	Enable Web Server Access on WAN
<input checked="" type="checkbox"/>	Enable IPsec pass through on VPN connection
<input checked="" type="checkbox"/>	Enable PPTP pass through on VPN connection
<input checked="" type="checkbox"/>	Enable L2TP pass through on VPN connection
<input type="checkbox"/>	Enable IPv6 pass through on VPN connection

Figure 4-7 WAN – Static IP

- **Clone MAC Address** - Fill in the MAC address for the MAC address to be cloned
- **Enable uPNP** - Click the checkbox to enable uPNP function.
- **Enable IGMP Proxy** - Click the checkbox to enable IGMP proxy
- **Enable Ping Access on WAN** - Click the checkbox to enable WAN IGMP response.
- **Enable Web server Access on WAN** - Click the checkbox to enable web configuration from
- **Enable IPsec pass through on VPN connection** - Click the checkbox to enable IPsec packet pass through
- **Enable PPTP pass through on VPN connection** - Click the checkbox to enable PPTP packet pass through
- **Enable L2TP pass through on VPN connection** - Click the checkbox to enable L2TP packet pass through

1. If your ISP provides a static or fixed IP Address, Subnet Mask, Gateway and DNS setting, select **Static IP**. The Static IP settings page will appear, shown in Figure 4-7.

- **IP Address** - Enter the IP address in dotted-decimal notation provided by your ISP.
- **Subnet Mask** - Enter the subnet Mask in dotted-decimal notation provided by your ISP, usually 255.255.255.0.
- **Default Gateway** - (Optional) Enter the gateway IP address in dotted-decimal notation provided by your ISP.
- **MTU Size** - The normal **MTU** (Maximum Transmission Unit) value for most Ethernet networks is 1500 Bytes. It is not recommended that you change the default **MTU Size** unless required by your ISP.
- **DNS 1 / DNS 2 / DNS 3** - (Optional) Enter one or two DNS addresses in dotted-decimal notation provided by your ISP.

Click the **Apply Changes** button to save your settings.

2. If your ISP provides the DHCP service, please choose **DHCP Client** type, and the Router will automatically get IP parameters from your ISP (shown in Figure 4-8).

This page is used to configure the parameters for Internet access which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, or L2TP by clicking on the item value for the WAN access type.

WAN Access Type:

Host Name:

MTU Size: (1400-1492 bytes)

Attain DNS Automatically

Set DNS Manually

DNS 1:

DNS 2:

DNS 3:

Figure 4-8 WAN – Dynamic IP

- **Host Name** – Enter the host name provided by your ISP, default value is blank.
- **MTU Size** - The normal **MTU** (Maximum Transmission Unit) value for most Ethernet networks is 1500 Bytes. It is not recommended that you change the default **MTU Size** unless required by your ISP.
- **Attain DNS Automatically** – Receives DNS address automatically from the ISP.
- **Set DNS Manually** - If your ISP gives you one or two DNS addresses, select **Set DNS Manually** and enter the primary and secondary addresses into the correct fields. Otherwise, the DNS servers will be assigned dynamically from your ISP.

 **Note:**

If you find an error message on the website after entering the DNS addresses, it is likely that your DNS server has been set up improperly. You should contact your ISP to get DNS server addresses.

- If your ISP provides a PPPoE connection, select **PPPoE** option and enter the following parameters (Figure 4-9):

WAN Interface Setup

This page is used to configure the parameters for Internet access which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, or L2TP by clicking on the item value for the WAN access type.

WAN Access Type:

User Name:

Password:

Service Name:

Connection Type:

Idle Time: (1-1000 minutes)

MTU Size: (1360-1492 bytes)

Attain DNS Automatically

Set DNS Manually

DNS 1:

DNS 2:

DNS 3:

Figure 4-9 WAN - PPPoE

- **User Name/Password** - Enter the User Name and Password provided by your ISP. These fields are case-sensitive.
- **Service Name** - The service name should not be configured unless you are sure it is necessary for your ISP. In most cases, leaving these fields blank.
- **Connection Type**
 - **Continuous** – Continuous connection type means to setup the connection through PPPoE protocol whenever this WLAN Broadband Router is powered on.
 - **Connect on Demand** – In this mode, the Internet connection can be terminated automatically after a specified inactivity period (**Max Idle Time**) and be re-established when you attempt to access the Internet again.
 - **Manual** - You can click the **Connect/Disconnect** button to connect/disconnect immediately. This mode also supports the **Max Idle Time** function as **Connect on Demand** mode. The Internet connection can be disconnected automatically after a

specified inactivity period and re-established when you attempt to access the Internet again.

Caution: Sometimes the connection cannot be terminated although you specify a time to Max Idle Time because some applications are visiting the Internet continually in the background.

- **Idle Time** - If you want your Internet connection to be active constantly, please enter “0” in the **Max Idle Time** field. Otherwise, enter the number of minutes you want to have elapsed before your Internet access disconnects.
- **MTU Size** - The default MTU size is “1480” bytes. It is not recommended that you change the default **MTU Size** unless required by your ISP.
- **Attain DNS Automatically** – Receives DNS address automatically from the ISP.
- **Set DNS Manually** - If your ISP gives you one or two DNS address, select **Set DNS Manually** and enter the primary and secondary addresses into the correct fields. Otherwise, the DNS servers will be assigned dynamically from your ISP.

Note:

If you find an error on the website after entering the DNS addresses, it is likely that your DNS server has been set up improperly. You should contact your ISP to get DNS server addresses.

Click the **Apply Changes** button to save your settings.

4. If your ISP provides PPTP connection, please select **PPTP** option and enter the following parameters (Figure 4-11):

The screenshot shows the 'WAN Interface Setup' configuration page. At the top, it states: 'This page is used to configure the parameters for Internet access which connects to the WAN part of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, or L2TP by clicking at the above value for the WAN access type.' Below this, the 'WAN Access Type' is set to 'PPTP'. The configuration fields are as follows:

- WAN Access Type:** PPTP (dropdown menu)
- IP Address:** 172.1.1.1
- Subnet Mask:** 255.255.255.0
- Server IP Address:** 172.1.1.1
- User Name:** (empty field)
- Password:** (empty field)
- Connection Type:** Connected (dropdown menu) with 'Create' and 'Disconnect' buttons
- Idle Time:** 0 (1-3000 minutes)
- MTU Size:** 1480 (1400-1480 bytes)
- Request MPPE Encryption
- Request MPPE Compression
- Attain DNS Automatically
- Set DNS Manually
- DNS 1:** (empty field)
- DNS 2:** (empty field)
- DNS 3:** (empty field)

Figure 4-11 L2TP Settings

- **User Name/Password** - Enter the User Name and Password provided by your ISP. These fields are case-sensitive.
- **Dynamic IP/ Static IP** - Choose either as you are given by your ISP and enter the ISP's IP address or the domain name.

If you choose static IP, enter the domain name and enter the DNS assigned by your ISP. Click the **Save** button.

Click the **Connect** button to connect immediately. Click the **Disconnect** button to disconnect immediately.

- **Connection Type –**
 - **Connect on Demand** - You can configure the Router to disconnect from your Internet connection after a specified period of inactivity (**Max Idle Time**). If your Internet connection has been terminated due to inactivity, **Connect on Demand** enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate **Connect on Demand**, check the radio button. If you want your Internet connection to remain active at all times, enter "0" in the **Max Idle Time** field. Otherwise, enter the number of minutes you want to have elapsed before your Internet connection terminates.
 - **Continuous** - Connect automatically after the Router is disconnected. To use this option, check the radio button.
 - **Connect Manually** - You can configure the Router to connect or disconnect manually. After a specified period of inactivity (**Max Idle Time**), the Router will disconnect from your Internet connection. You will not be able to re-establish your connection automatically when attempting to access the Internet again. To use this option, click the radio button. If you want your Internet connection to remain active at all times, enter "0" in the **Max Idle Time** field. Otherwise, enter the number in minutes that you wish to have the Internet connecting last unless a new link is requested.

Caution: Sometimes the connection cannot be disconnected although you specify a time to **Max Idle Time** because some applications are visiting the Internet continually in the background.

Click the **Save** button to save your settings.

5. If your ISP provides L2TP connection, please select **L2TP** option. Enter the following parameters (Figure 4-12):

WAN Interface Setup

This page is used to configure the parameters for Internet access which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE, or L2TP by clicking on the item value for the WAN access type.

WAN Access Type:	<input type="text" value="L2TP"/>
IP Address:	<input type="text" value="172.1.1.2"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Server IP Address:	<input type="text" value="172.1.1.1"/>
User Name:	<input type="text"/>
Password:	<input type="text"/>
Connection Type:	<input type="text" value="Continuous"/> <input type="button" value="Connect"/> <input type="button" value="Disconnect"/>
Idle Time:	<input type="text" value="5"/> (1-1000 minutes)
MTU Size:	<input type="text" value="1460"/> (1400-1460 bytes)
<input checked="" type="radio"/> Attain DNS Automatically <input type="radio"/> Set DNS Manually	
DNS 1:	<input type="text"/>
DNS 2:	<input type="text"/>
DNS 3:	<input type="text"/>

Figure 4-12 L2TP Settings

- **User Name/Password** - Enter the User Name and Password provided by your ISP. These fields are case-sensitive.
- **Dynamic IP/ Static IP** - Choose either as you are given by your ISP. Click the **Connect** button to connect immediately. Click the **Disconnect** button to disconnect immediately.
- **Connection Type** –
 - **Connect on Demand** - You can configure the Router to disconnect from your Internet connection after a specified period of inactivity (**Max Idle Time**). If your Internet connection has been terminated due to inactivity, **Connect on Demand** enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate **Connect on Demand**, check the radio button. If you want your Internet connection to remain active at all times, enter 0 in the **Max Idle Time** field. Otherwise, enter the number of minutes you want to have elapsed before your Internet connection terminates.

- **Continuous** - Connect automatically after the Router is disconnected. To use this option, check the radio button.
- **Connect Manually** - You can configure the Router to connect or disconnect manually. After a specified period of inactivity (**Max Idle Time**), the Router will disconnect from your Internet connection, and you will not be able to re-establish your connection automatically when attempting to access the Internet again. To use this option, check the radio button. If you want your Internet connection to remain active at all times, enter "0" in the **Max Idle Time** field. Otherwise, enter the number of minutes that you wish to have the Internet connecting last unless a new link is requested.

Caution: Sometimes the connection cannot be disconnected although you specify a time to **Max Idle Time**, because some applications are visiting the Internet continually in the background.

Click the **Save** button to save your settings.

4.6 Wireless

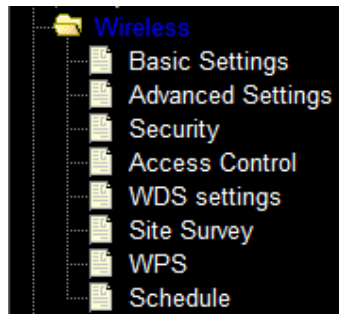


Figure 4-15 Wireless menu

There are eight submenus under the Wireless menu (shown in Figure 4-15): **Basic Settings**, **Advanced Settings**, **Security**, **Access Control**, **WDS Setting**, **Site Survey**, **WPS**, and **Schedule**. Click any of them, and you will be able to configure the corresponding function.

4.6.1 Basic Settings

Choose menu "**Wireless** → **Basic Settings**", you can configure the basic settings for the wireless network on this page.

Wireless Basic Settings

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.

Disable Wireless LAN Interface

Country:

Band:

Mode:

Network Type:

SSID:

Channel Width:

Control Sideband:

Channel Number:

Broadcast SSID:

WMM:

Data Rate:


Associated Clients:

Enable Mac Clone (Single Ethernet Client)

Enable Universal Repeater Mode (Acting as AP and client simultaneously)

SSID of Extended Interface:

Figure 4-16 Wireless Settings

- **Band** - Select the desired protocol. The default setting is 2.4GHz (B+G+N).
 - 2.4GHz (B)** - Select if all of your wireless clients are 802.11b.
 - 2.4GHz (G)** - Select if all of your wireless clients are 802.11g.
 - 2.4GHz (N)** - Select if all of your wireless clients are 802.11n.
 - 2.4GHz (B+G)** - Select if you are using both 802.11b and 802.11g wireless clients.
 - 2.4GHz (G+N)** - Select if you are using both 802.11g and 802.11n wireless clients.
 - 2.4GHz (B+G+N)** – Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.
 - **Mode** - Select the desired wireless mode. WAP220N offers AP, Client, WDS, and AP + WDS. When 802.11g mode is selected, only 802.11g wireless stations can connect to the Router. When 802.11n mode is selected, only 802.11n wireless stations can connect to the AP. It is strongly recommended that you set the Mode to **2.4GHz (B+G+N)** and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.
 - **Network Type** - After network mode is selected to “Client” set network type as infrastructure or Ad-Hoc.
 - **SSID** - Enter a value of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. Considering your wireless network security.
 - **Channel width** - Select the channel width from the pull-down list. The default setting is 40MHz.
-  **Note:**
- If **2.4GHz (B)**, **2.4GHz (G)**, or **2.4GHz (B+G)** is selected in the **Mode** field, the **Channel Width** selecting field will disappear and the value will become 20M, which is unable to be changed.
- **Control Sideband** – Select the sideband with upper or lower for channel width 40MHz.
 - **Channel Number**- This field determines which operating frequency will be used. The default channel is CH11. You can set to Auto where the AP will choose the best channel automatically, it is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
 - **Broadcast SSID** - When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. If you select **Enable** for **Broadcast SSID** then Router will broadcast its name (SSID) on the air.
 - **WMM** – Click on Enable or Disable Wireless Multimedia (WMM).
 - **Data Rate** - Select transmission data rate from pull-down menu. Data rate can be auto select, 1M to 54Mbps or MCS. The default option is AUTO.

- **Associate Clients** – Click **Show Active Clients** button to open Active Wireless Client Table that shows the MAC address, transmit-packet, receive-packet and transmission-rate for each associated wireless client.
- **Enable Mac Clone (Single Ethernet Client)** – Copy your system’s NIC MAC address as wireless client’s MAC address, this function only works if **Client** mode is selected.
- **Enable Universal Repeater Mode** – Check to enable Universal Repeater Mode where Router acts as AP and client simultaneously in this mode).
- **SSID for Extended Interface** – Assign a SSID when Universal Repeater Mode is enabled.

4.6.2 Advanced Settings

Choose menu “**Wireless** → **Security**”, you can configure the security settings of your wireless network.

Wireless Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access Point.

Fragment Threshold:	<input type="text" value="2346"/> (256-2346)
RTS Threshold:	<input type="text" value="2347"/> (0-2347)
Beacon Interval:	<input type="text" value="100"/> (20-1024 ms)
Preamble Type:	<input checked="" type="radio"/> Long Preamble <input type="radio"/> Short Preamble
IAPP:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Protection:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Aggregation:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Short GI:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
WLAN Partition:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
STBC:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
20/40MHz Coexist:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
RF Output Power:	<input checked="" type="radio"/> 100% <input type="radio"/> 70% <input type="radio"/> 50% <input type="radio"/> 35% <input type="radio"/> 15%

- **Fragmentation Threshold** - This value is the maximum size determining whether packets will be fragmented. Setting the Fragmentation Threshold too low may result in poor network performance due to excessive packets, 2346 is the recommended default setting.
- **RTS Threshold** - Here you can specify the RTS (Request to Send) Threshold. If the packet is larger than the specified RTS Threshold size, the Router will send RTS frames to a particular receiving station and negotiate the sending of a data frame. The default value is 2346.

- **Beacon Interval** - Enter a value between 20-1000 milliseconds for the Beacon Interval. The beacons are the packets sent by the Router to synchronize a wireless network. Beacon Interval value determines the time interval of the beacons. The default value is 100.

4.6.3 Security

Choose menu “**Wireless** → **Security**”, you can configure the security settings of your wireless network.

There are four wireless security modes supported by the Router: WEP (Wired Equivalent Privacy), WPA (Wi-Fi Protected Access), WPA2 (Wi-Fi Protected Access 2), WPA-Mixed (Pre-Shared Key or Enterprise).

Wireless Security Setup

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.

Select SSID:

Encryption:

802.1x Authentication:

WPA
WPA2
WPA-Mixed

Figure 4-18 Wireless Security

- **Disable** - If you do not want to use wireless security, check this radio button. It's strongly recommended to choose one of the following modes to enable security.
- **WEP** - It is based on the IEEE 802.11 standard. If you check this radio button, you will find a notice in red as shown in Figure 4-19.

Wireless Security Setup

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.

Select SSID:

Encryption:

802.1x Authentication:


Authentication: Open System Shared Key Auto

Key Length:

Key Format:

Encryption Key:

Figure 4-19

- **802.1x Authentication** – Check to enable 802.1x authentication via RADIUS server.
 - **Authentication** - You can choose the type for the WEP security on the pull-down list. The default setting is **Auto**, which can select **Shared Key** or **Open System** authentication type automatically based on the wireless station's capability and request.
 - **Key Length** - You can select the WEP key length (64-bit, or 128-bit) for encryption.
 - 64-bit** - You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not recommended) or 5 ASCII characters.
 - 128-bit** - You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not recommended) or 13 ASCII characters.
-  **Note:**
If you do not set the key, the wireless security function will still be disabled even if you have selected Shared Key as Authentication Type.
- **Key Format** - **Hexadecimal** and **ASCII** formats are provided here. **Hexadecimal** format stands for any combination of hexadecimal digits (0-9, a-f, A-F) in the specified length. **ASCII** format stands for any combination of keyboard characters in the specified length.
 - **Encryption Key** - Select which of the four keys will be used and enter the matching WEP key you have created. Make sure these values are identical on all the wireless stations in your network.
 - **Radius Server IP Address** - Enter the IP address of the Radius server, if **802.1x Authentication** is selected.
 - **Radius Server Port** - Enter the port number of the Radius server, if **802.1x Authentication** is selected.
 - **Radius Server Password** - Enter the password for the Radius server, if **802.1x Authentication** is selected.

Be sure to click the **Apply Changes** button to save your settings on this page

- **WPA** - It's the WPA authentication type based on pre-shared passphrase or RADIUS server.

Wireless Security Setup

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.

Select SSID:

Encryption:

Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

WPA Cipher Suite: TKIP AES

Pre-Shared Key Format:

Pre-Shared Key:

Figure 4-20

- **Authentication Mode** - You can choose either **Enterprise (RADIUS)** or **Personal (Pre-Shared Key)**. The default setting is **Personal (Pre-Share Key)**, it's a passphrase between 8 and 63 characters. **Enterprise (RADIUS)**, is an authentication via RADIUS server.
- **WPA Cipher Suite** - When **WPA** is set as the Authentication Type, you can select **TKIP** or **AES** or **AUTO** if both encryptions are checked.
- **Pre-Shared Key Format** - You can enter chose either **Passphrase** (8 ~ 63 characters) or **HEX(64 Characters)**.
- **Pre-Shared Key** - Enter the matching WEP key you created. Make sure these values are identical on all the wireless stations in your network.
- **Radius Server IP Address** - Enter the IP address of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Port** - Enter the port number of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Password** - Enter the password for the Radius server, if **Enterprise (RADIUS)** is selected.

Be sure to click the **Apply Changes** button to save your settings on this page.

- **WPA2** - Authentication type based on pre-shared passphrase or RADIUS server.

Wireless Security Setup

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.

Select SSID:

Encryption:

Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

WPA2 Cipher Suite: TKIP AES

Pre-Shared Key Format:

Pre-Shared Key:

Figure 4-21

- **Authentication Mode** - You can choose either **Enterprise (RADIUS)** or **Personal (Pre-Shared Key)**. The default setting is **Personal (Pre-Share Key)**, it's a passphrase between 8 and 63 characters. **Enterprise (RADIUS)**, is an authentication via RADIUS server.
- **WPA2 Cipher Suite** - When **WPA2** is set as the Authentication Type, you can select **TKIP** or **AES** or **AUTO** if both encryption is checked..
- **Pre-Shared Key Format** - You can enter either **Passphrase** (8 ~ 63 characters) or **HEX (64 Characters)**.
- **Pre-Shared Key** - Enter the matching WEP key that you've create. Make sure these values are identical on all the wireless stations in your network.
- **Radius Server IP Address** - Enter the IP address of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Port** - Enter the port number of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Password** - Enter the password for the Radius server, if **Enterprise (RADIUS)** is selected.

Be sure to click the **Apply Changes** button to save your settings on this page.

- **WPA-Mixed** - Authentication type based on pre-shared passphrase or RADIUS server.

Wireless Security Setup

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.

Select SSID:

Encryption:

Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

WPA Cipher Suite: TKIP AES

WPA2 Cipher Suite: TKIP AES

Pre-Shared Key Format:

Pre-Shared Key:

Figure 4-22

- **Authentication Mode** - You can choose either **Enterprise (RADIUS)** or **Personal (Pre-Shared Key)**. The default setting is **Personal (Pre-Share Key)**, it is a passphrase between 8 and 63 characters. **Enterprise (RADIUS)** is an authentication via RADIUS server.
- **WPA Cipher Suite** - When **WPA** is set as the Authentication Type, you can select either **TKIP** or **AES** as Encryption.
- **WPA2 Cipher Suite** - When **WPA2** is set as the Authentication Type, you can select either **TKIP** or **AES** as Encryption.
- **Pre-Shared Key Format** - You can enter either **Passphrase** (8 ~ 63 characters) or **HEX (64 Characters)**.
- **Pre-Shared Key** - Enter the matching WEP key that you have create. Make sure these values are identical on all the wireless stations in your network.
- **Radius Server IP Address** - Enter the IP address of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Port** - Enter the port number of the Radius server, if **Enterprise (RADIUS)** is selected.
- **Radius Server Password** - Enter the password for the Radius server, if **Enterprise (RADIUS)** is selected.

Be sure to click the **Apply Changes** button to save your settings on this page.

4.6.4 Access Control

Choose menu “**Wireless** → **Access Control**”, you can control the wireless access by configuring the **Wireless Access Control** function, shown in Figure 4-23.

Wireless Access Control

If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point.

Wireless Access Control Mode:

MAC Address: Comment:

Current Access Control List:

MAC Address	Comment	Select
<input type="button" value="Delete Selected"/> <input type="button" value="Delete All"/> <input type="button" value="Reset"/>		

Figure 4-23 Wireless Access Control

To allow wireless users by MAC Address, click **Allow Listed**, or prohibited wireless users by MAC Address by click **Deny Listed**. The default setting is **Disable**.

- **MAC Address** - The wireless station's MAC address that you want to filter.
- **Comment** - A simple description of the wireless station.

Be sure to click the **Apply Changes** button to save your settings on this page

- **Current Access Control List** - Displays the registered clients that are allowed to link to this WLAN Broadband Router.

4.6.5 WDS Settings

Choose menu “**Wireless** → **WDS Settings**”, you can configure the advanced settings of your wireless network.

WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.

Enable WDS

MAC Address:

Data Rate:

Comment:

Current WDS AP List:

MAC Address	Tx Rate (Mbps)	Comment	Select

Figure 4-24 Wireless Advanced

To add wireless AP by MAC Address, click **Enable WDS**.

- **MAC Address** - The wireless station's MAC address that you want to add.
- **Data Rate** - Select transmission data rate from the drop down menu. Data rate can be auto-selected, 1Mbps to 54Mbps or MCS.
- **Set Security** - There are two wireless security modes supported by the WDS: WEP (Wired Equivalent Privacy), and WPA2 (Wi-Fi Protected Access 2).

WDS Security Setup

This page allows you setup the wireless security for WDS. When enabled, you must make sure each WDS device has adopted the same encryption algorithm and Key.

Encryption:

WEP Key Format:

WEP Key:

Pre-Shared Key Format:

Pre-Shared Key:

- Encryption – Use drop down menu to configure WDS security, you can select it from **None**, **WEP 64-bits**, **WEP 128-bits**, or **WPA2 (AES)**.

- **WEP Key Format – Hexadecimal and ASCII** formats are provided here. **Hexadecimal** format stands for any combination of hexadecimal digits (0-9, a-f, A-F) in the specified length. **ASCII** format stands for any combination of keyboard characters in the specified length. **64-bit** - You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not promoted) or 5 ASCII characters. **128-bit** - You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not promoted) or 13 ASCII characters.
- **Encryption Key** - Select which of the four keys will be used and enter the matching WEP key that you create. Make sure these values are identical on all wireless stations in your WDS network
- **Pre-Shared Key Format** - You can enter chose either **Passphrase** (8 ~ 63 characters) or **HEX(64 Characters)**.
- **Pre-Shared Key** - Enter the matching WEP key that you create. Make sure these values are identical on all wireless stations in your WDS network

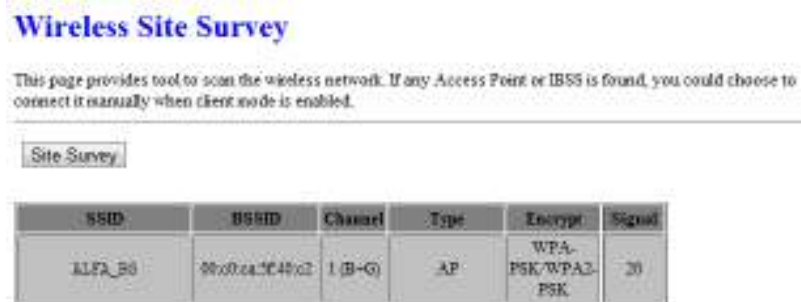
Comment - A simple description of the wireless station.

Be sure to click the **Apply Changes** button to save your settings on this page

Current WDS AP List - Displays the registered APs that are allowed to link to this WLAN Broadband Router.

4.6.6 Site Survey

Choose menu “**Wireless** → **Site Survey**”, you scan and connect nearby APs when operate at client mode.



- **SSID(to be WDS)** - The SSID of the AP your Router is going to connect to as a client. You can also use the search function to select the SSID to join.
- **BSSID(to be WDS)** - The BSSID of the AP your Router is going to connect to as a client. You can also use the search function to select the BSSID to join.
- **Channel** - This field displayed operating frequency of the AP your Router is going to connect to as a client.
- **Type** – Type of the AP your Router is going to connect to as a client, AP or AD-HOC.
- **Encryption** – Shows encryption type of the AP your Router is going to connect to as a client.
- **Signal** – Shows the signal strength of the AP your Router is going to connect to as a client.

4.6.7 WPS

Choose menu “**Wireless** → **WPS**”, where you to add a new wireless device to an existing network quickly.

Wi-Fi Protected Setup

This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automatically synchronize its setting and connect to the Access Point in a minute without any hassle.

Disable WPS

Apply Changes

Reset

Self-PIN Number: 27559789

PIN Configuration:

Push Button Configuration:

- **Self-PIN Number** - The current value of the Router's PIN is displayed here.
- **PIN Configuration** - You will need to enter **Self-PIN Number** into adapter's configuration utility or on the adapter itself. Press the **Start PIN** button on the router and on the adapter.
Note: You will have two minutes to push the PIN button on the router and device(s) you want to connect.
- **Push Button Configuration** - You will need an adapter that supports it via a utility or on the adapter itself. Press the **Start PBC** button on the router and on the adapter.
Note: You will have two minutes to push the PIN button on the router and device(s) you want to connect.

4.6.8 Schedule

Choose menu “Wireless → Schedule”, time period allowed for the PC controlled to access the Internet.

Wireless Schedule

This page allows you setup the wireless schedule rule. Please do not forget to configure system time before enable this feature.

Enable Wireless Schedule

Enable	Day	From		To	
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)
<input type="checkbox"/>	Sun	00 (hour)	00 (min)	00 (hour)	00 (min)

Apply Changes Reset

Figure 4-25 Schedule

4.7 Firewall

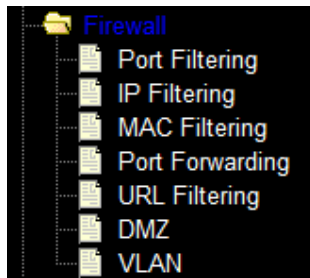


Figure 4-26 The Firewall menu

There are seven submenus under the Firewall menu (shown in Figure 4-26), **Port Filtering**, **IP Filtering**, **MAC Filtering**, **Port Forwarding**, **URL Filtering**, **DMZ**, and **VLAN**. Click any of them, and you will be able to configure the corresponding function.

4.7.1 Port Filtering

Choose menu “**Firewall** → **Port Filtering**”, you can control the wireless access by configuring the **Port Filtering** function as shown in Figure 4-27.

Port Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

Enable Port Filtering

Port Range: - Protocol: Comment:

Current Filter Table:

Port Range	Protocol	Comment	Select

Figure 4-27 Port Filtering

- **Enable Port Filtering** – Check to **Enable** port filtering feature.
- **Port Range / Protocol / Comment** - Specify the port range from start-port to end-port and put your comment to remind you why you have restriction on these ports. You can restricted TCP, UDP, or both protocol.

Be sure to click the **Apply Changes** button to save your settings on this page

4.7.2 IP Filtering

Choose menu “**Firewall → IP Filtering**”, you can control the wireless access by configuring the **IP Filtering** function as shown in Figure 4-28.

IP Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

Enable IP Filtering

Local IP Address: Protocol: Comment:

Current Filter Table:

Local IP Address	Protocol	Comment	Select
<input type="button" value="Delete Selected"/> <input type="button" value="Delete All"/> <input type="button" value="Reset"/>			

Figure 4-28 IP Filtering

- **Enable IP Filtering** – Check to **Enable** IP filtering feature.
- **Local IP Address / Protocol / Comment** - Specify the local IP address that you wish to put restriction and mark your comment to remind you why you have restriction on this IP address. You can restrict the traffic from TCP, UDP, or both protocol.

Be sure to click the **Apply Changes** button to save your settings on this page

4.7.3 MAC Filtering

Choose menu “**Firewall → MAC Filtering**”, you can control the wireless access by configuring the **MAC Filtering** function as shown in Figure 4-29.

MAC Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

Enable MAC Filtering

MAC Address: Comment:

Current Filter Table:

MAC Address	Comment	Select
<input type="button" value="Delete Selected"/> <input type="button" value="Delete All"/> <input type="button" value="Reset"/>		

Figure 4-29 MAC Filtering

- **Enable MAC Filtering** – Check to **Enable** MAC filtering feature.

- **MAC Address** - The wireless station's MAC address that you want to filter.

Be sure to click the **Apply Changes** button to save your settings on this page.

4.7.4 Port Forwarding

Choose menu “**Firewall → Port Forwarding**”, you can redirect the network traffic by configuring the **Port Forwarding** function as shown in Figure 4-30.

Port Forwarding

Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.

Enable Port Forwarding

IP Address: Protocol: Port Range: - Comment:

Current Port Forwarding Table:

Local IP Address	Protocol	Port Range	Comment	Select
<input type="button" value="Delete Selected"/> <input type="button" value="Delete All"/> <input type="button" value="Reset"/>				

Figure 4-30 MAC Filtering

- **Enable Port Forwarding** – Check to **Enable** port forwarding feature.
- **IP Address** – Forward data packets to specific IP address in your local area network.
- **Protocol** - The protocol used for forwarding data packets, either **TCP** or **UDP**, or **BOTH**
- **Port Range** - The port range used by the remote system when it responds to the forwarding request. A response using one of these ports will be forwarded to the PC that triggered this rule.

Be sure to click the **Apply Changes** button to save your settings on this page.

4.7.5 URL Filtering

Choose menu “**Firewall → URL Filtering**”, you can restrict user to access specific web page by configuring the **URL Filtering** function as shown in Figure 4-31.

URL Filtering

URL filter is used to deny LAN users from accessing the internet. Block those URLs which contain keywords listed below.

Enable URL Filtering

URL Address:

Current Filter Table:

URL Address	Select

Figure 4-31 URL Filtering

- **Enable URL Filtering** – Check to **Enable** URL filtering feature.
- **URL Address** - The address that you want to restrict user to access.

Be sure to click the **Apply Changes** button to save your settings on this page.

4.7.6 DMZ

Choose menu “**Firewall → DMZ**”, you can view and configure DMZ host in the screen as shown in Figure 4-32. The DMZ host feature allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing. DMZ host forwards all the ports at the same time. Any PC whose port is being forwarded must have its DHCP client function disabled and should have a new static IP Address assigned to it because its IP Address may be changed when using the DHCP function.

DMZ

A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.

Enable DMZ

DMZ Host IP Address:

Figure 4-32 DMZ

To assign a computer or server to be a DMZ server:

1. Check the **Enable DMZ** checkbox.
2. Enter the IP Address of a local host in the **DMZ Host IP Address** field.
3. Click the **Apply Changes** button.

 **Note:**

After you set the DMZ host, the firewall related to the host will not work.

4.7.7 VLAN

Choose menu **Firewall → VLAN**, if you want to configure the Guest and Internal networks on VLAN, the switch you are using must support VLAN. As a prerequisite step, configure a port on the switch for handling VLAN tagged packets as described in the IEEE802.1Q standard, and enable this field as shown in Figure 4-33.

VLAN Settings

Entries in below table are used to config vlan settings. VLANs are created to provide the segmentation services traditionally provided by routers. VLANs address issues such as scalability, security, and network management.

Enable VLAN

Enable	Ethernet/Wireless	WAN/LAN	Tag	VID(1~4090)	Priority	CFI
<input type="checkbox"/>	Ethernet Port1	LAN	<input type="checkbox"/>	3022	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Ethernet Port2	LAN	<input type="checkbox"/>	3030	7 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Ethernet Port3	LAN	<input type="checkbox"/>	500	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Ethernet Port4	LAN	<input type="checkbox"/>	1	3 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Wireless 1 Primary AP	LAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Wireless 1 Virtual AP1	LAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Wireless 1 Virtual AP2	LAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Wireless 1 Virtual AP3	LAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Wireless 1 Virtual AP4	LAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>
<input type="checkbox"/>	Ethernet Port5	WAN	<input type="checkbox"/>	1	0 ▾	<input type="checkbox"/>

Apply Changes

Reset

Figure 4-33 VLAN

- Be sure to click the **Apply Changes** button to save your settings on this page.

4.8 QoS

QoS

Entries in this table improve your online gaming experience by ensuring that your game traffic is prioritized over other network traffic, such as FTP or Web.

Enable QoS
 Automatic Uplink Speed
 Manual Uplink Speed (Kbps):

Automatic Downlink Speed
 Manual Downlink Speed (Kbps):

QoS Rule Setting:

Address Type: IP MAC
 Local IP Address: -
 MAC Address:
 Mode: ▾
 Uplink Bandwidth (Kbps):
 Downlink Bandwidth (Kbps):
 Comment:

Figure 4-34 The QoS menu

4.9 Management

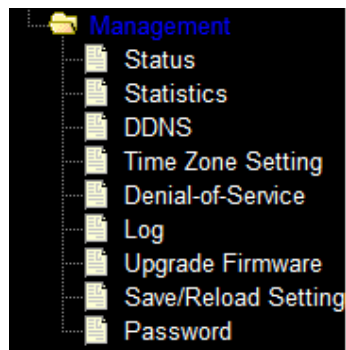


Figure 4-35 The Management menu

There are nine submenus under the Management menu as shown in Figure 4-35: **Status**, **Statists**, **DDNS**, **Time Zone Setting**, **Denial-of-Service**, **Log**, **Upgrade Firmware**, **Save/Reload Setting**, and **Password**. Click any of them, and you will be able to configure the corresponding function.

4.9.1 Status

Choose menu “**Management** → **Status**”, display the current status of WAP220N as shown in Figure 4-39.

Select Language: ▼

System	
Uptime	0day:0h:13m:32s
Firmware Version	v2.5.2.a1
Build Time	Tue Feb 7 15:53:23 CST 2012
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G+N)
SSID	RTK 11n AP
Channel Number	11
Encryption	Disabled
BSSID	00:c0:ca:68:e2:3d
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.2.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DHCP Server	Enabled
MAC Address	00:c0:ca:68:e2:3b
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:c0:ca:68:e2:3c

Figure 4-35 Status

4.9.2 Statistics

Choose menu “**Management** → **Statistics**”, you can view the network traffic on the Router as shown in Figure 4-36.

Statistics

This page shows the packet counters for transmission and reception regarding to wireless and Ethernet networks.

Wireless LAN	<i>Sent Packets</i>	128374
	<i>Received Packets</i>	48342
Ethernet LAN	<i>Sent Packets</i>	824
	<i>Received Packets</i>	5884
Ethernet WAN	<i>Sent Packets</i>	0
	<i>Received Packets</i>	0

Figure 4-36 Advanced Security

4.9.3 DDNS

Choose menu “**Management -> DDNS**”, you can configure the Dynamic DNS function.

The Router offers the **DDNS** (Dynamic Domain Name System) feature, which allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (named by yourself) and a dynamic IP address, and then your friends can connect to your server by entering your domain name no matter what your IP address is. Before using this feature, you need to sign up for DDNS service providers such as www.dyndns.org, or [TZO](http://tzo.com). The Dynamic DNS client service provider will give you a password or key.

If the dynamic DNS **Service Provider** your select is www.dyndns.org, the page will appear as shown in Figure 4-41.

Dynamic DNS Setting

Dynamic DNS is a service, that provides you with a valid, unchanging, internet domain name (an URL) to go with that (possibly everchanging) IP-address.

Enable DDNS

Service Provider : DynDNS ▾

Domain Name :

User Name/Email:

Password/Key:

Note:
 For TZO, you can have a 30 days free trial [here](#) or manage your TZO account in [control panel](#)
 For DynDNS, you can create your DynDNS account [here](#)

Figure 4-41 Dyndns.org DDNS Settings

To set up for DDNS, follow these instructions:

1. Type the **User Name** for your DDNS account.
2. Type the **Password** for your DDNS account.
3. Type the **Domain Name** you received from dynamic DNS service provider here.
4. Click the **Apply Change** button to log in to the DDNS service.

4.9.4 Time Zone Setting

Choose menu “**Management** → **Time Zone Settings**”, you can configure the time on the following screen.

Figure 4-42 Time settings

- **Current Time** – Type in the current time into the blanks or click “Copy Computer Time” to get the current time from computer.
- **Time Zone Select** – select the time zone.
- **Enable NTP client update** – click to enable the NTP client update.

Note:

1. This setting will be used for some time-based functions such as firewall. You must specify your time zone once you log in to the WAP220N successfully, otherwise, these functions will not take effect.
2. The time will be lost if the WAP220N is turned off.
3. The WAP220N will obtain GMT automatically from Internet if it has already connected to Internet.

4.9.5 Denial-of-Service

DoS Protection will take effect only when the **Enable DoS Prevention** in “**Management → DoS**” is enabled as shown in Figure 4-43.

Denial of Service

A “denial-of-service” (DoS) attack is characterized by an explicit attempt by hackers to prevent legitimate users of a service from using that service.

Enable DoS Prevention

<input type="checkbox"/> Whole System Flood: SYN	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Whole System Flood: FIN	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Whole System Flood: UDP	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Whole System Flood: ICMP	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Per-Source IP Flood: SYN	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Per-Source IP Flood: FIN	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Per-Source IP Flood: UDP	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> Per-Source IP Flood: ICMP	<input type="text" value="0"/> Packets/Second
<input type="checkbox"/> TCP/UDP PortScan	<input type="text" value="Low"/> Sensitivity
<input type="checkbox"/> ICMP Smurf	
<input type="checkbox"/> IP Land	
<input type="checkbox"/> IP Spoof	
<input type="checkbox"/> IP TearDrop	
<input type="checkbox"/> PingOfDeath	
<input type="checkbox"/> TCP Scan	
<input type="checkbox"/> TCP SynWithData	
<input type="checkbox"/> UDP Bomb	
<input type="checkbox"/> UDP EchoChargen	

Enable Source IP Blocking **Block time (sec)**

Figure 4-43 DoS

Denial of Service protection. Check the Enable or Disable button to enable or disable the DoS protection function. Only when it is enabled, will the flood filters be enabled.

4.9.6 Log

Choose menu “**Management** → **Log**”, you can view the logs of the WAP220N.

System Log

This page can be used to set remote log server and show the system log.

Enable Log

 system all

 wireless

 DoS

Enable Remote Log

 Log Server IP Address:

Figure 4-44 System Log

- **System all** – Display all the log file on the Router .
- **Wireless** – Display just the wireless log on the Router.
- **DoS** – Display just Denial-of-Service log on the Router.
- **Enable Remote Log** - Click to enable remote log service.
- **Log Server IP Address** – Please enter the IP address to store your log file when **Enable Remote Log** is enabled.

4.9.7 Upgrade Firmware

Choose menu “**Management** → **Upgrade Firmware**”, you can update the latest version of firmware for the Router on the following screen.

Upgrade Firmware

This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.

Firmware Version:	v2.5.1 (3G)USB+LNA
Select File:	<input type="text"/> <input type="button" value="Browse_"/>
<input type="button" value="Upload"/> <input type="button" value="Reset"/>	

Figure 4-45 Firmware Upgrade

- **Firmware Version** - This displays the current firmware version.

To upgrade the Router's firmware, follow these instructions below:

1. Download a more recent firmware upgrade file from our website.
2. Type the path and file name of the update file into the **File** field. Or click the **Browse** button to locate the update file.
3. Click the **Upgrade** button.

Note:

1. New firmware versions are posted at our website and can be downloaded for free. There is no need to upgrade the firmware unless the new firmware has a new feature you want to use. However, when experiencing problems caused by the Router rather than the configuration, you can try to upgrade the firmware.
2. When you upgrade the Router's firmware, you may lose its current configurations, so before upgrading the firmware please write down some of your customized settings to avoid losing important settings.
3. Do not turn off the Router or press the Reset button while the firmware is being upgraded, otherwise, the Router may be damaged.
4. The Router will reboot after the upgrading has been finished.

4.9.8 Save/Reload Setting

Choose menu “**Management** → **Save/Reload Setting**”, you can save the current configuration of the Router as a backup file and restore the configuration via a backup file as shown in Figure 4-46.

Save/Reload Settings

This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.

Save Settings to File:

Load Settings from File:

Reset Settings to Default:

Figure 4-46 Backup & Restore Configuration

- Click the **Save** button to save all configuration settings as a backup file in your local computer.
- To upgrade the Router's configuration, follow these instructions.
 - Click the **Browse...** button to locate the update file for the Router, or enter the exact path to the Setting file in the text box.
 - Click the **Upload** button.
- Click the **Reset** button restore the configurations of the Router to factory defaults.

4.9.9 Password

Choose menu “**Management** → **Password**”, you can change the factory default user name and password of the Router in the next screen as shown in Figure 4-47.

Password Setup

This page is used to set the account to access the web server of Access Point. Empty user name and password will disable the protection.

User Name:

New Password:

Confirmed Password:

Figure 4-47 Password

It is strongly recommended that you should change the factory default user name and password of the Router, because all users who try to access the Router's Web-based utility or Quick Setup will be prompted for the Router's default user name and password.

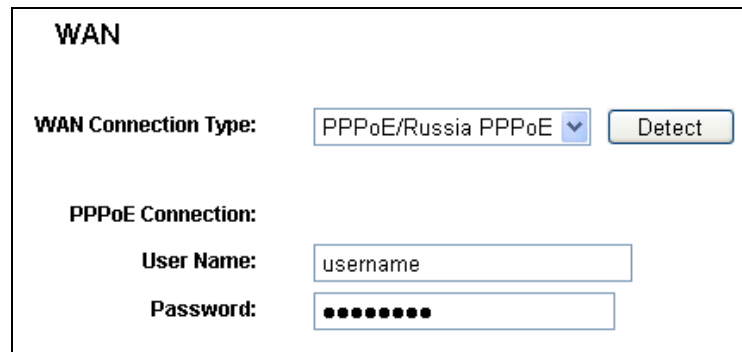
Click the **Apply Change** button when finished.

Click the **Reset** button to clear all.

Appendix A: FAQ

1. How do I configure the Router to access the Internet by ADSL users?

- 1) First, configure the ADSL Modem configured in RFC1483 bridge model.
- 2) Connect the Ethernet cable from your ADSL Modem to the WAN port on the Router. The telephone cord plugs into the Line port of the ADSL Modem.
- 3) Log in to the Router, click the **"TCP/IP Settings"** menu on the left of your browser, and click **"WAN"** submenu. On the **WAN** page, select **"PPPoE"** for WAN Connection Type. Type user name in the **"User Name"** field and password in the **"Password"** field, finish by clicking **Connect**.



The screenshot shows the WAN configuration interface. At the top, the word "WAN" is displayed. Below it, the "WAN Connection Type" is set to "PPPoE/Russia PPPoE" in a dropdown menu, with a "Detect" button to its right. Underneath, the "PPPoE Connection" section contains two fields: "User Name" with the text "username" and "Password" with a masked field of ten dots.

Figure A-1 PPPoE Connection Type

2. How do I configure the Router to access the Internet by Ethernet users?

- 1) Log in to the Router, click the **"TCP/IP Settings"** menu on the left of your browser, and click **"WAN"** submenu. On the **WAN** page, select **"DHCP Client"** for "WAN Connection Type", finish by clicking **Save**.

3. The wireless stations cannot connect to the Router.

- 1) Make sure the **"Enable Wireless Router Radio"** is checked.
- 2) Make sure that the wireless stations' SSID accord with the Router's SSID.
- 3) Make sure the wireless stations have right KEY for encryption when the Router is encrypted.
- 4) If the wireless connection is ready, but you can't access the Router, check the IP Address of your wireless stations.

Appendix B: Configuring the PC

In this section, we'll introduce how to install and configure the TCP/IP correctly in Windows XP. First make sure your Ethernet Adapter is working, refer to the adapter's manual if necessary.

1. Configure TCP/IP component

- 1) On the Windows taskbar, click the **Start** button, and then click **Control Panel**.
- 2) Click the **Network and Internet Connections** icon, and then click on the **Network Connections** tab in the appearing window.
- 3) Right click the icon that showed below, select Properties on the prompt page.

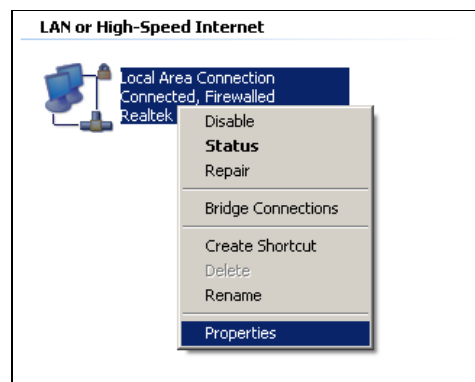


Figure B-1

- 4) In the prompt page that showed below, double click on the **Internet Protocol (TCP/IP)**.

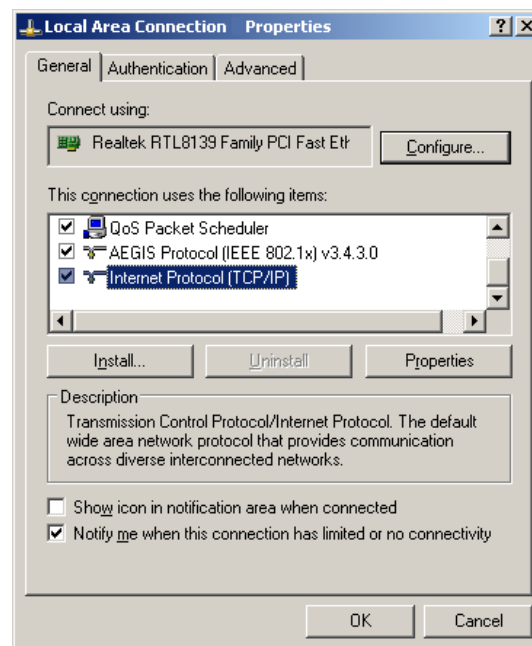


Figure B-2

- 5) The following **TCP/IP Properties** window will display and the **IP Address** tab is open on this window by default.

Now you have two ways to configure the **TCP/IP** protocol below:

➤ **Setting IP address automatically**

Select **Obtain an IP address automatically**, Choose **Obtain DNS server automatically**, as shown in the Figure below:

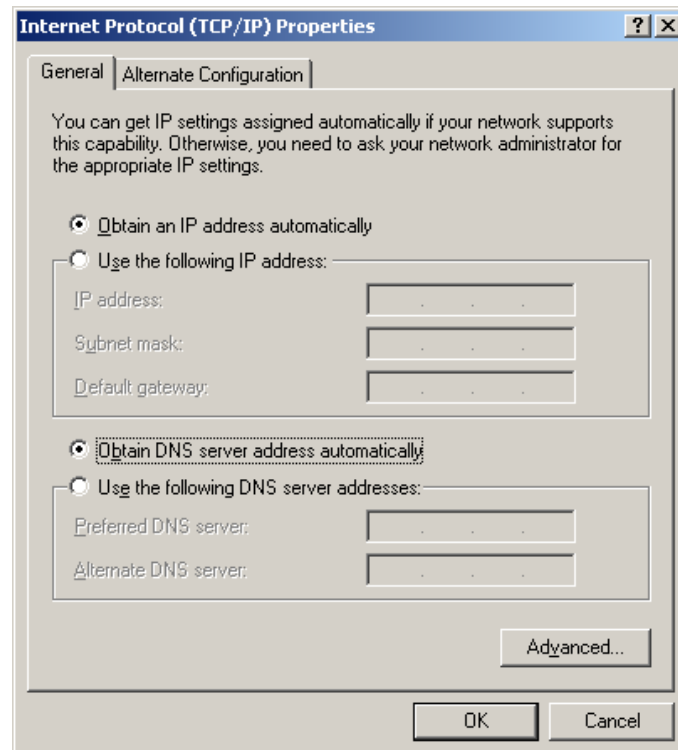


Figure B-3

 **Note:** For Windows 98 OS or earlier, the PC and Router may need to be restarted.

➤ **Setting IP address manually**

- 1 Select **Use the following IP address** radio button. And the following items available.
- 2 If the Router's LAN IP address is 192.168.2.1, specify the **IP address** as 192.168.2.x (x is from 2 to 254), and the **Subnet mask** as 255.255.255.0.
- 3 Type the Router's LAN IP address (the default IP is 192.168.2.1) into the **Default gateway** field.
- 4 Select **Use the following DNS server addresses**. In the **Preferred DNS Server** field you can enter the same value as the **Default gateway** or type the local DNS server IP address.

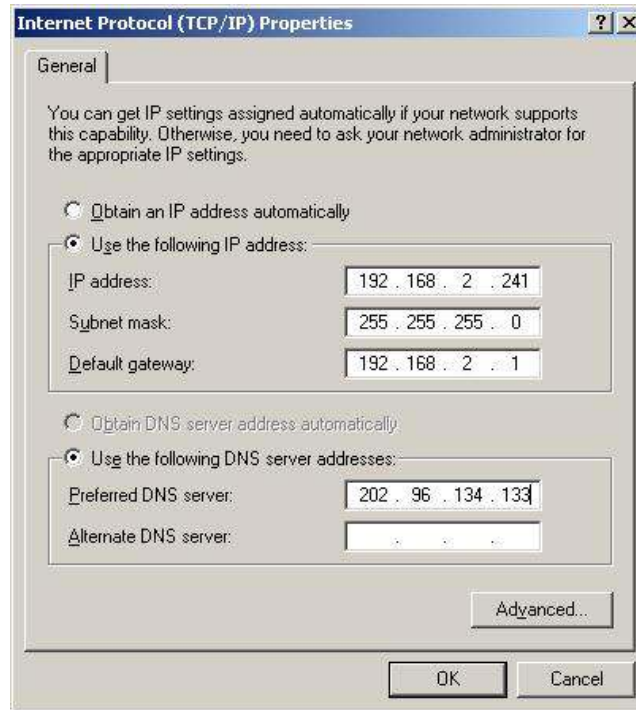


Figure B-4

Now, click **OK** to keep your settings.

Appendix C: Specifications

General	
Standards	IEEE 802.3, 802.3u, 802.11b, 802.11g, 802.11n
Protocols	TCP/IP, PPPoE, DHCP, ICMP, NAT, SNTP
Ports	One 10/100M Auto-Negotiation WAN RJ45 port, Four 10/100M Auto-Negotiation LAN RJ45 ports supporting Auto MDI/MDIX
Cabling Type	10BASE-T: UTP category 3, 4, 5 cable (maximum 100m) EIA/TIA-568 100Ω STP (maximum 100m)
	100BASE-TX: UTP category 5, 5e cable (maximum 100m) EIA/TIA-568 100Ω STP (maximum 100m)
LEDs	PWR, SYS, WLAN, WAN, LAN (1-4), WPS
Safety & Emissions	FCC, CE
Wireless	
Frequency Band	2.4~2.4835GHz
Radio Data Rate	11n: up to 300Mbps (Automatic) 11g: 54/48/36/24/18/12/9/6M (Automatic) 11b: 11/5.5/2/1M (Automatic)
Channels	1~13
Frequency Expansion	DSSS(Direct Sequence Spread Spectrum)
Modulation	DBPSK, DQPSK, CCK, OFDM, 16-QAM, 64-QAM
Security	WEP/WPA/WPA2/WPA2-PSK/WPA-PSK
Sensitivity @PER	130M: -68dBm@10% PER 108M: -68dBm@10% PER; 54M: -68dBm@10% PER 11M: -85dBm@8% PER; 6M: -88dBm@10% PER 1M: -90dBm@8% PER
Antenna Gain	5dBi
Environmental and Physical	
Temperature.	Operating : 0°C~50°C
	Storage: -10°C~70°C
Humidity	Operating: 10% - 90% RH, Non-condensing
	Storage: 5% - 90% RH, Non-condensing

Appendix D: Glossary

- **802.11b** - The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- **802.11g** - specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- **802.11n** is an amendment which improves upon the previous 802.11 standards by adding multiple-input multiple-output antennas (MIMO). 802.11n operates on both the 2.4 GHz and the lesser used 5 GHz bands. Support for 5 GHz bands is optional. It operates at a maximum net data rate from 54 Mbit/s to 600 Mbit/s
- **DDNS (Dynamic Domain Name System)** - The capability of assigning a fixed host and domain name to a dynamic Internet IP Address.
- **DHCP (Dynamic Host Configuration Protocol)** - A protocol that automatically configure the TCP/IP parameters for the all the PC(s) that are connected to a DHCP server.
- **DMZ (Demilitarized Zone)** - A Demilitarized Zone allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing.
- **DNS (Domain Name System)** – An Internet Service that translates the names of websites into IP addresses.
- **Domain Name** - A descriptive name for an address or group of addresses on the Internet.
- **DSL (Digital Subscriber Line)** - A technology that allows data to be sent or received over existing traditional phone lines.
- **ISP (Internet Service Provider)** - A company that provides access to the Internet.
- **MTU (Maximum Transmission Unit)** - The size in bytes of the largest packet that can be transmitted.
- **NAT (Network Address Translation)** - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.
- **PPPoE (Point to Point Protocol over Ethernet)** - PPPoE is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.
- **SSID** - A **S**ervice **S**et **I**dentification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to

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

- **WEP (Wired Equivalent Privacy)** - A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- **Wi-Fi** - A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standards group promoting interoperability among 802.11b devices.
- **WLAN (Wireless Local Area Network)** - A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.