

User Guide

PW-RN401M

150Mbps Wireless N Nano Router



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:

This device may not cause harmful interference.

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:

- One PW-RN401M 150Mbps Wireless N Nano Router
- Quick Installation Guide
- One Power Adapter
- One USB Cable
- One Resource CD for PW-RN401M 150Mbps Wireless N Nano Router, including:
 - User Guide
 - Other Helpful Information

 **Note:**

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

Chapter 1. Introduction

Thank you for choosing the PW-RN401M 150Mbps Wireless N Nano Router.

1.1 Overview of the Router

Small enough to fit in the average pocket, the PW-RN401M 150Mbps Wireless N Nano Router is uniquely suited to provide robust wireless networking to travelers, students, or anyone else for work or play.

Incredible Speed

PW-RN401M supports the newest 802.11n standards, and provides backward compatibility with older 802.11b/g standards as well. The up-to-150Mbps wireless speed makes it ideal for handling multiple data streams at the same time, which ensures your network stable and smooth.

Multiple Operation Modes

The PW-RN401M 150Mbps Wireless N Nano Router supports five operation modes. The AP mode enables the wired LAN to connect to the Internet wirelessly. The Router mode enables the PW-RN401M to work as a router for network sharing with high speed. The functions of Repeater mode and AP Bridge mode are similar, for they both make the PW-RN401M able to extend the existing wireless network. In Client mode, PW-RN401M acts as a wireless station to enable the wired host(s) to access AP.

Reliable Security Protections

With multiple protection measures, including SSID broadcast control and wireless LAN 64/128/152-bit WEP encryption, WiFi protected Access (WPA2-PSK, WPA-PSK), as well as advanced Firewall protections, the PW-RN401M 150Mbps Wireless N Nano Router provides complete data privacy.

Flexible Access Control

The PW-RN401M 150Mbps Wireless N Nano Router supports Virtual Server and DMZ host for Port Triggering, and then the network administrators can manage and monitor the network in real time with the remote management function.

Since the Router is compatible with virtually all the major operating systems, it is very easy to manage. Quick Setup Wizard is supported and detailed instructions are provided step by step in

this user guide. Before installing the Router, please look through this guide to know all the Router's functions.

1.2 Conventions

The Router or PW-RN401M mentioned in this guide stands for PW-RN401M 150Mbps Wireless N Nano Router without any explanation.

Parameters provided in the pictures are just references for setting up the product, which may differ from the actual situation.

You can set the parameters according to your demand.

1.3 Main Features

- Complies with IEEE 802.11n/g/b
- Wireless speed up to 150Mbps
- Powered by external power adapter or USB connection to computer
- Travel size design, ideal for home or travel use
- Compact and portable, powerful wireless signal as well
- Perfectly compatible with almost all the 2.4GHz Wi-Fi devices
- Supports AP, Router, Repeater, Bridge, and Client modes
- Supports WEP, WPA/WPA2, WPA-PSK/WPA2-PSK encryptions

1.4 Panel Layout



Figure 1-1 PW-RN401M sketch

➤ LED

Status	Indication
Solid	It's powered on but the LAN/WAN port is not connected.
Flashing Slowly	The LAN/WAN cable is connected but there is no data being transmitted or received.
Flashing Quickly	The LAN/WAN cable is connected and there is data being transmitted or received.

Table 1-1 The LED Description

- **LAN/WAN:** This LAN/WAN port works as LAN in AP/Repeater/ Bridge/Client mode and as WAN in Router mode. As LAN, it connects the Router to the local PC; as WAN, it enables you to connect the DSL/cable Modem, or Ethernet.
- **Power:** This port is used to connect the provided power adapter.
- **Reset:** It is used to reset the Router to its factory defaults. With the Router powered on, use a pin to press and hold the **Reset** button (about 5 seconds) until the SYS LED becomes quick-flash from slow-flash. And then release the button and wait the Router to reboot to its factory default settings.

Chapter 2. Connecting the Router

2.1 System Requirements

- Each PC in the LAN needs a working Ethernet Adapter
- TCP/IP protocol must be installed on each PC
- Web browser, such as Microsoft Internet Explorer 5.0 or later, Mozilla Firefox, Apple Safari
- If the device is configured to AP router mode, you also need Broadband Internet Access Service (DSL/Cable/Ethernet)
- One DSL/Cable Modem that has a RJ45 connector (which is not necessary if the Router is connected directly to the Ethernet.)

2.2 Installation Environment Requirements

- Place the Router in a well ventilated place far from any heater or heating vent
- Place the Router in a location where it can be connected to the various devices as well as to a power source
- Avoid direct irradiation of any strong light (such as sunlight)
- Keep at least 2 inches (5 cm) of clear space around the Router
- Operating Temperature: 0°C~40°C (32°F ~ 104°F)
- Operating Humidity: 10%~90%RH, Non-condensing

2.3 Connecting the Router

Before installing the Router, please make sure your broadband service provided by your ISP is available. If there is any problem, please contact with your ISP. To connect the Router, please follow the steps below:

1. Power off your PC, Cable/DSL Modem, and the Router.
2. Locate an optimum location for the Router. The best place is usually at the center of your wireless network. The place must accord with the [Installation Environment Requirements](#).
3. Plug the power plug in the electrical wall socket. The Router will start to work automatically.

After finishing the steps above, please choose the operation mode you need and carry out the corresponding steps. There are five operation modes supported by this router: **AP, Router, Repeater, Bridge** and **Client**.

2.3.1 AP Mode

As the supplement of wired LAN, PW-RN401M enables the wired LAN to connect to the Internet wirelessly.

The default mode of PW-RN401M is AP. Plug the power plug of PW-RN401M in electrical wall socket and connect the Ethernet cable correctly, you can surf the Internet by connecting your PC(s) to the Router wirelessly.

On this mode, the only wired port works as LAN. Computer could connect to the device by either wired or wireless way. The Pre-encryption function is opened by default and the default password is the last unique eight numbers of each Router's MAC address. To avoid the conflict of DHCP service with front-end devices, the DHCP server is default to be closed on this mode. If you want to login in the management page, please set your computer's IP address manually.

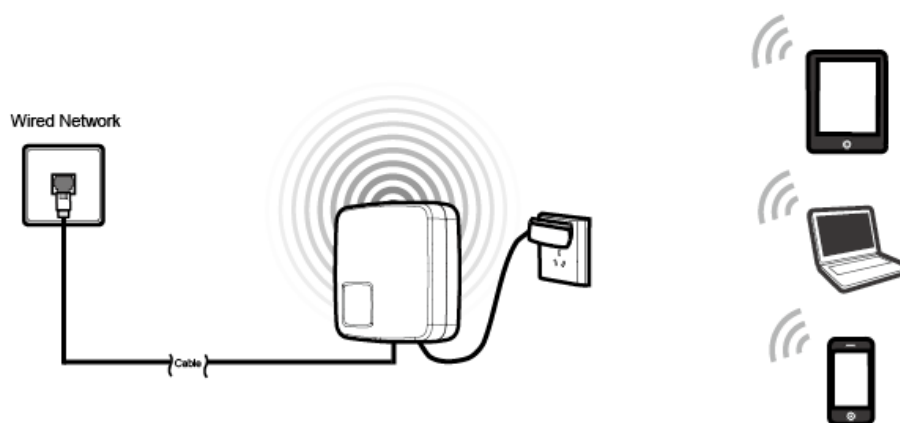


Figure 2-1 Hardware Installation of the PW-RN401M in AP Mode

1. Connect the LAN port of PW-RN401M to the wired network port with an Ethernet cable.
2. Plug the power plug of PW-RN401M in electrical wall socket.
3. Power on the PC(s) and notebook(s).

2.3.2 Router Mode

As a wireless router, PW-RN401M enables multi-user to share Internet via DSL/Cable Modem.

On this mode, the only wired port works as WAN, which can be connected to DSL Modem with an Ethernet cable. Computers could connect to the device by only wireless way. DHCP server is default opened and it is recommended that the IP address and DNS server address obtained automatically.

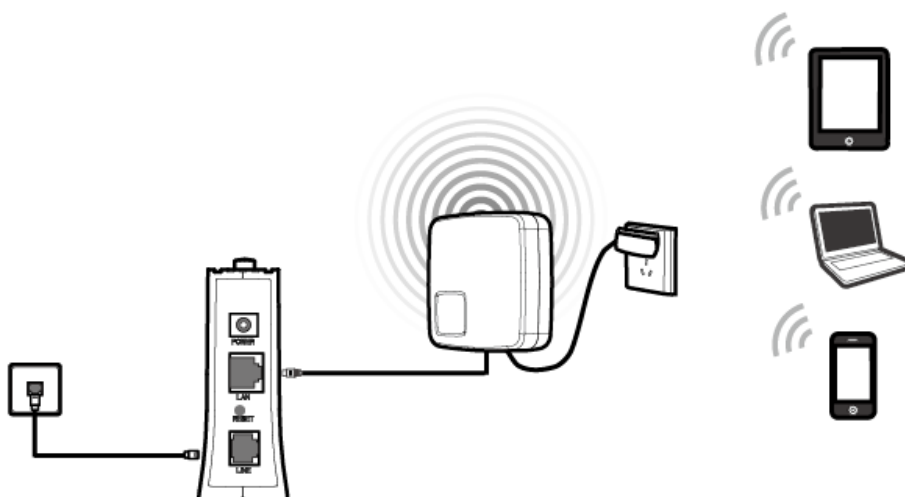


Figure 2-2 Hardware Installation of the PW-RN401M in Router Mode

1. Connect the WAN port of PW-RN401M to the LAN Port on the DSL/Cable Modem.
2. Connect the WAN port on the DSL/Cable Modem to the wired Internet.
3. Plug the power plug of PW-RN401M in electrical wall socket.
4. Power on the DSL/Cable Modem, PC(s) and notebook(s).

2.3.3 Repeater Mode

PW-RN401M is used to extend the range of wireless signal of the existing AP or wireless router.

On this mode, the only wired port works as LAN. Computer could connect to the device by either wired or wireless way. The SSID of PW-RN401M should be the same as that of the device you repeat. To avoid the conflict of DHCP service with front-end devices, the DHCP server is default to be closed on this mode. If you want to log in the management page, please set your computer's IP address manually.

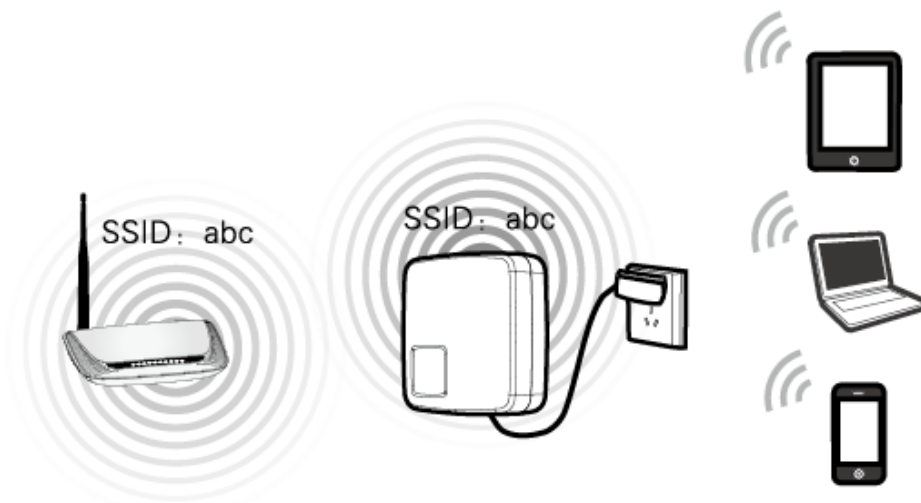


Figure 2-3 Hardware Installation of the PW-RN401M in Repeater Mode

1. Plug the power plug of PW-RN401M in electrical wall socket.
2. Power on the notebook(s).

Note:

It is recommended that you connect a PC/notebook to the LAN port of the Router with an Ethernet cable, and then login the Router from the PC/notebook to set the Router in AP Repeater mode.

2.3.4 Bridge Mode

Similar to the Bridge mode, PW-RN401M in Bridge mode is also used to extend the range of wireless signal of the existing AP or wireless router.

On this mode, the only wired port works as LAN. Computer could connect to the device by either wired or wireless way. To avoid the conflict of DHCP service with front-end devices, the DHCP server is default to be closed on this mode. If you want to log in the management page, please set your computer's IP address manually.

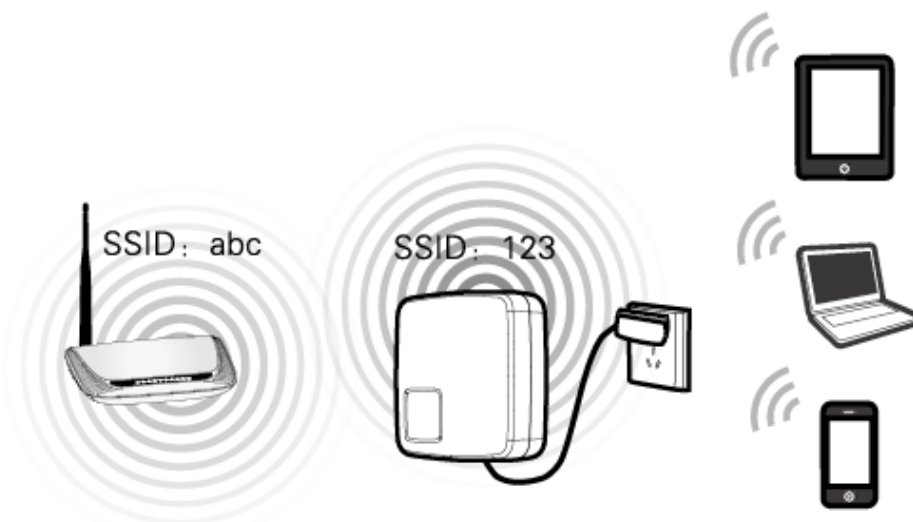


Figure 2-4 Hardware Installation of the PW-RN401M in Bridge Mode

1. Plug the power plug of PW-RN401M in electrical wall socket.
2. Power on the notebook(s).

Note:

It is recommended that you connect a PC/notebook to the LAN port of the Router with an Ethernet cable, and then login the Router from the PC/notebook to set the Router in Bridge mode.

2.3.5 Client Mode

PW-RN401M is used as a wireless network card to connect the wireless network signal or wireless router.

On this mode, the only wired port works as LAN. Computer could connect to the device by either wired or wireless way. To avoid the conflict of DHCP service with front-end devices, the DHCP server is default to be closed on this mode. If you want to log in the management page, please set your computer's IP address manually.

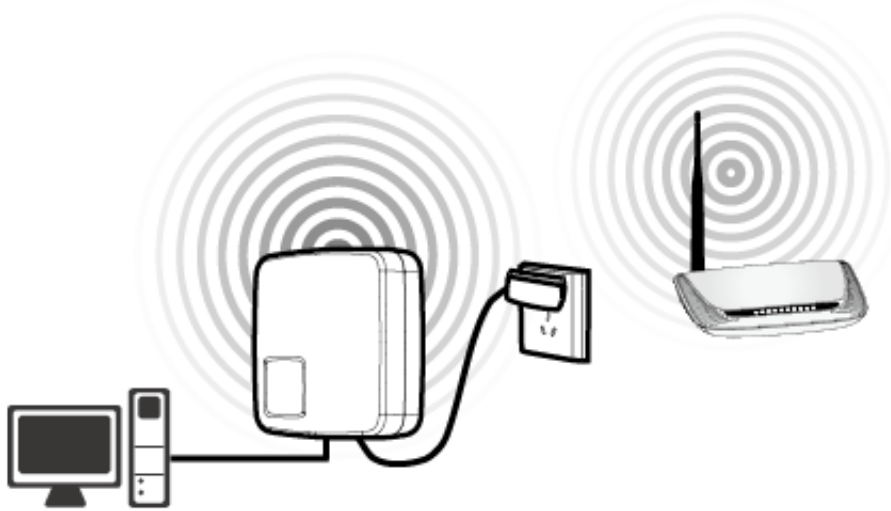


Figure 2-5 Hardware Installation of the PW-RN401M in Client Mode

1. Connect the PC to the LAN/WAN port of PW-RN401M router with an Ethernet cable.
2. Plug the power plug of PW-RN401M in electrical wall socket.
3. Power on the PC(s).

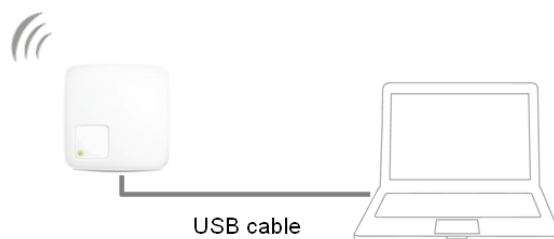
Note:

PW-RN401M can be powered by external power adapter or USB connection to computer.

Powered by Adapter



Powered by Computer



Chapter 3. Quick Installation Guide


This chapter will show you how to configure the basic functions of your PW-RN401M 150Mbps Wireless N Nano Router using **Quick Setup Wizard** within minutes.

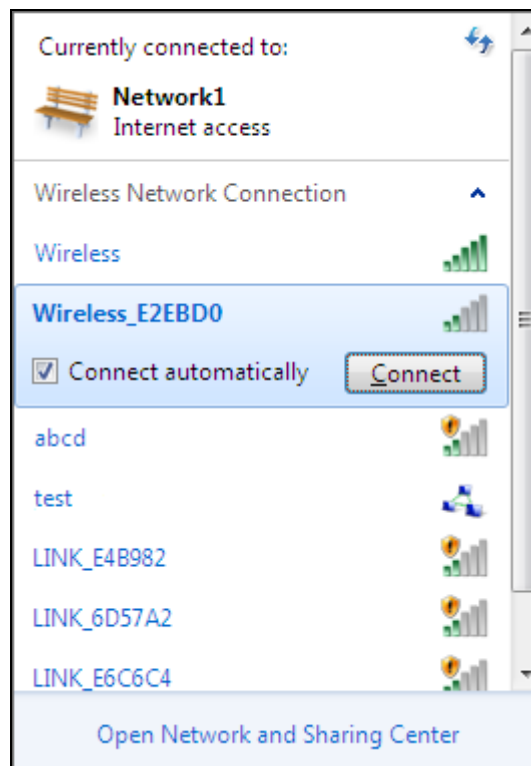
3.1 TCP/IP Configuration

The default IP address of the PW-RN401M 150Mbps Wireless N Nano Router is 192.168.1.254. And the default Subnet Mask is 255.255.255.0. These values can be changed as you desire. In this guide, we use all the default values for description. You can configure the IP address manually for your PC as the following steps:

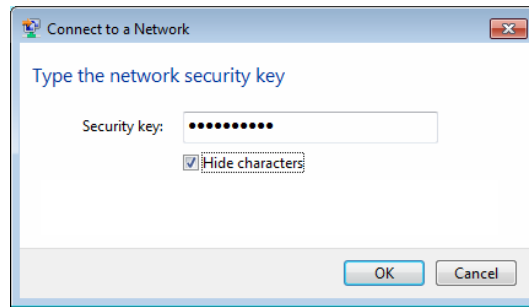
- 1) Set up the TCP/IP Protocol for your PC. If you need instructions as to how to do this, please refer to [Appendix B: "Configuring the PC"](#).
- 2) Configure the network parameters. The IP address is 192.168.1.x ("x" is any number from 1 to 253), Subnet Mask is 255.255.255.0, and Gateway is 192.168.1.254 (The Router's default IP address).

Then connect to the Router through wireless connection following the steps below:

- 1) Click the icon  at the bottom of your desktop. Click refresh button, and then select the default SSID of the Router. Click **Connect**.



- 2) Enter the **Security key**. Click **OK**.



- 3) If you can see **Connected** after the default SSID, you've successfully connected to the wireless network..



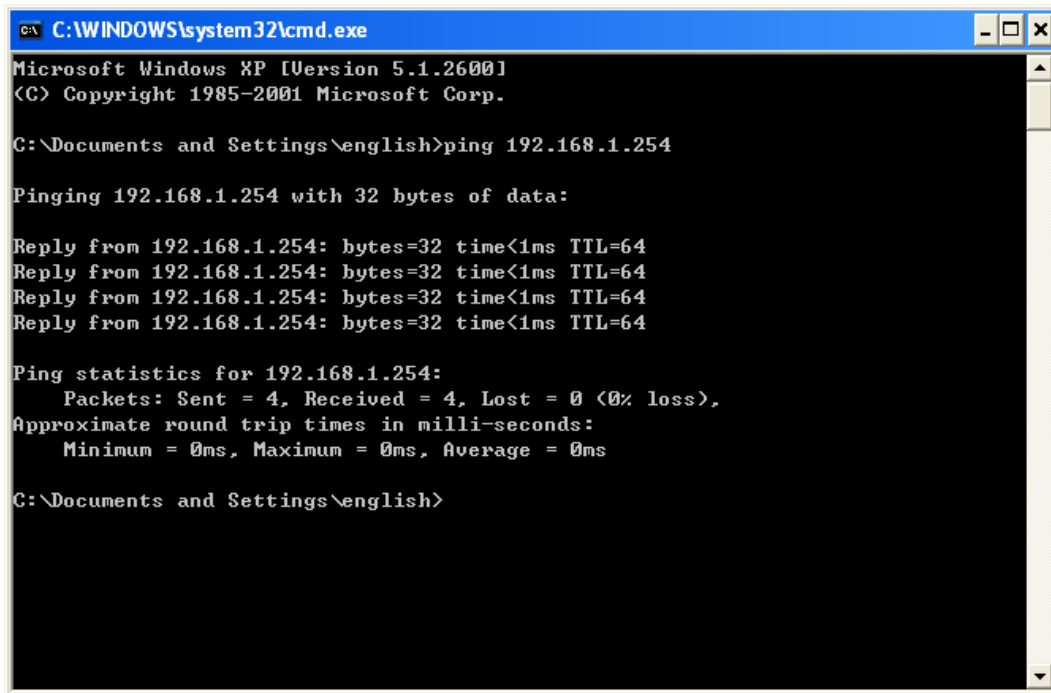
 **Note:**

The default **SSID** and **Password** of your Router are on the label. Both are **case-sensitive**. The pre-encryption function is enabled by default and the default **Network key/Security key** is the **Password** on the label.

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

Open a command prompt, and type *ping 192.168.1.254*, and then press **Enter**.

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



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\english>ping 192.168.1.254

Pinging 192.168.1.254 with 32 bytes of data:

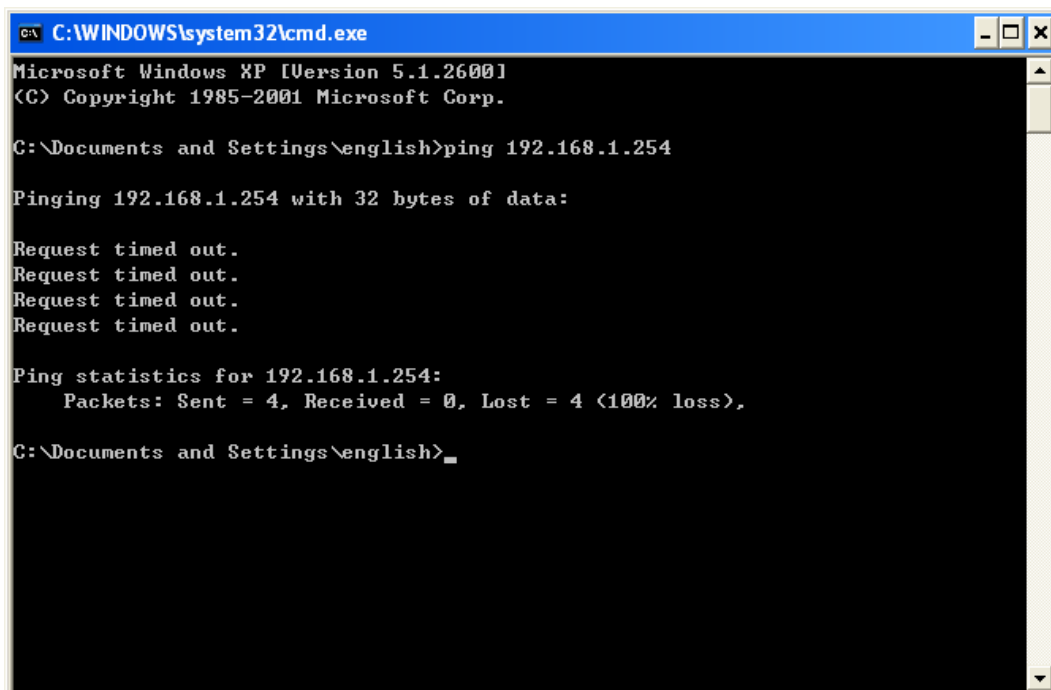
Reply from 192.168.1.254: bytes=32 time<1ms TTL=64
Reply from 192.168.1.254: bytes=32 time<1ms TTL=64
Reply from 192.168.1.254: bytes=32 time<1ms TTL=64
Reply from 192.168.1.254: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\english>
```

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 Router has failed.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\english>ping 192.168.1.254

Pinging 192.168.1.254 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.254:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Documents and Settings\english>
```

Figure 3-2 Failure result of Ping command

Please check the connection following these steps:

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

Note:

The LED of LAN/WAN ports which you link to on the Router should be lit.

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

 **Note:**

If the Router's IP address is 192.168.1.254, your PC's IP address must be within the range of 192.168.1.1 ~ 192.168.1.253.

3.2 Quick Installation Guide

With a Web-based utility, it is easy to configure and manage the PW-RN401M 150Mbps Wireless N Nano Router. 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://192.168.1.254> in the address field of the browser.

After a moment, a login window will appear, similar to the Figure 3-3. Enter **admin** for the User Name and Password, both in lower case letters. Then click the **OK** button or press the **Enter** key.

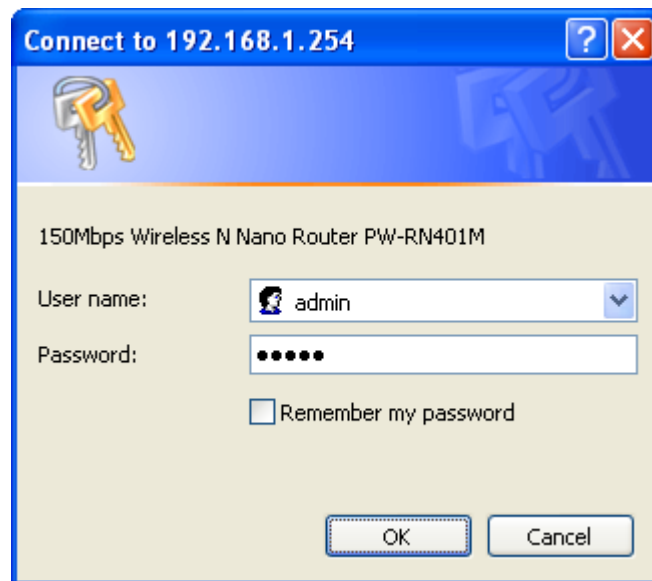


Figure 3-3 Login Windows

 **Note:**

If the above screen does not pop-up, it means that your Web-browser has been set to a proxy. Go to Tools menu>Internet Options>Connections>LAN Settings, in the screen that appears, cancel the Using Proxy checkbox, and click **OK** to finish it.

- After a successfully login, you can click the **Quick Setup** menu to quickly configure your Router.

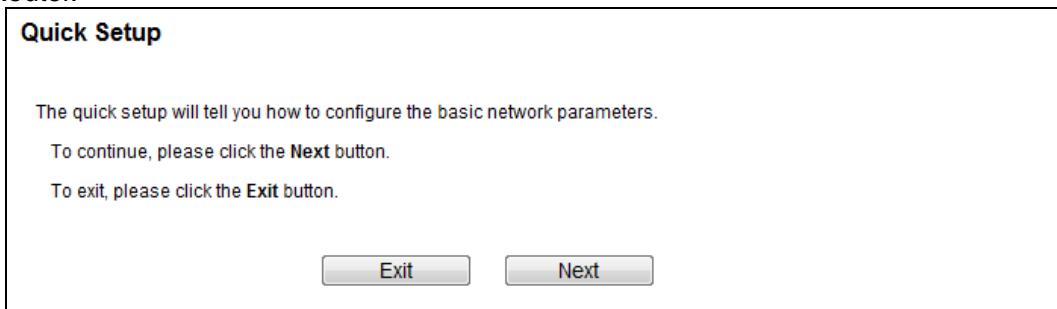


Figure 3-4 Quick Setup

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

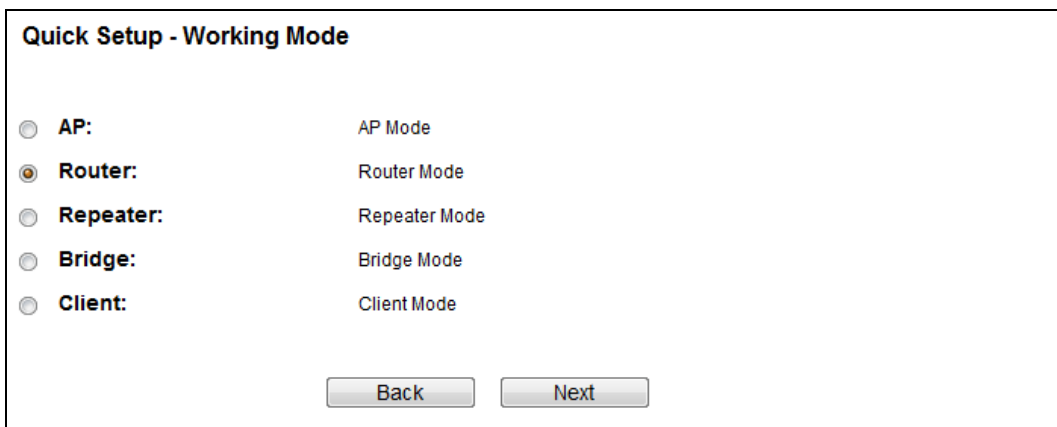


Figure 3-5 Quick Setup - Working Mode

Note:

The Router supports five working modes for multi-user to access the Internet: AP, Router, Repeater, Bridge and Client. In AP mode, PW-RN401M enables the wired LAN to connect to the Internet wirelessly. In Router mode, it can access the Internet via DSL/Cable Modem. In Repeater mode, the device will relay data to an associated root AP. In Bridge mode, the device bridges to another AP. In Client mode, the device will act as a wireless station to enable wired host(s) to access AP. You can configure your device quickly by the following steps in different modes.

3.2.1 AP Mode

When you choose **AP** on **Working Mode** page in Figure 3-5 , take the following steps:

- Click **Next** in Figure 3-5, and then **Wireless AP** page will appear as shown in Figure 3-6.

Quick Setup - Wireless AP

Wireless Radio:

SSID:

Region:

Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference.

Channel:

Mode:

Channel Width:

Security Options:

Disable Security

WPA-PSK/WPA2-PSK

PSK Password:

(You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64.)

Figure 3-6 Quick Setup - Wireless AP

- **Wireless Radio** - Enable or disable the wireless radio choosing from the pull-down list.
- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your networks name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Channel** - This field determines which operating frequency will be used. The default channel is set to **Auto**. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
- **Mode** - Select the desired mode. The default setting is 11bgn mixed.
 - **11b only** - Select if all of your wireless clients are 802.11b.
 - **11g only** - Select if all of your wireless clients are 802.11g.
 - **11n only** - Select only if all of your wireless clients are 802.11n.
 - **11bg mixed** - Select if you are using both 802.11b and 802.11g wireless clients.

- **11bgn mixed** - Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.

Select the desired wireless mode. 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 **802.11b/g/n**, and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.

- **Channel Width** - Select any channel width from the pull-down list. The default setting is automatic, which can automatically adjust the channel width for your clients.
- **Disable Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the Router without encryption. It is recommended strongly that you choose one of following options to enable security.
- **WPA-PSK/WPA2-PSK** - Select WPA based on pre-shared passphrase.
 - **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters. The default password is the last unique eight numbers of each Router's MAC address

For **ASCII**, the key can be made up of any numbers 0 to 9 and any letters 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 also note the key is case sensitive, this means that upper and lower case keys will affect the outcome. It would also be a good idea to write down the key and all related wireless security settings.

2. Click the **Next** button. You will then see the **Finish** page.

If you don't make any change on the **Wireless** page, you will see the **Finish** page as shown in Figure 3-7. Click the **Finish** button to finish the **Quick Setup**.

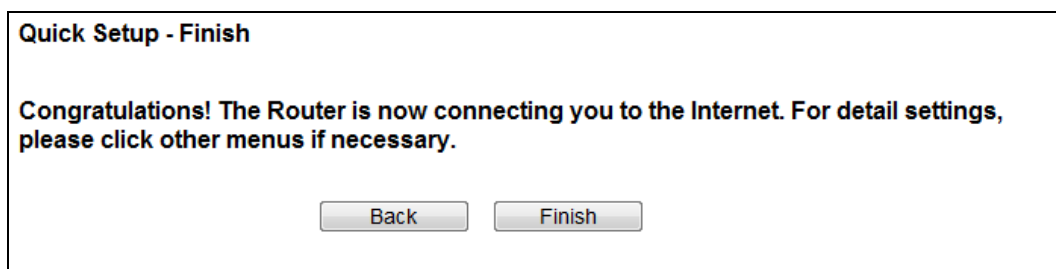
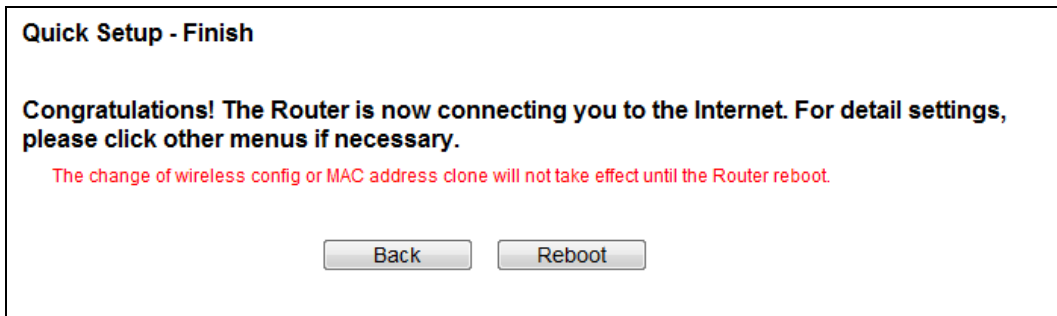


Figure 3-7 Quick Setup - Finish

If there is something changed on the **Wireless** page, you will see the **Finish** page as shown in Figure 3-8. Click the **Reboot** button to make your wireless configuration take effect and finish the Quick Setup.



Quick Setup - Finish

Congratulations! The Router is now connecting you to the Internet. For detail settings, please click other menus if necessary.

The change of wireless config or MAC address clone will not take effect until the Router reboot.

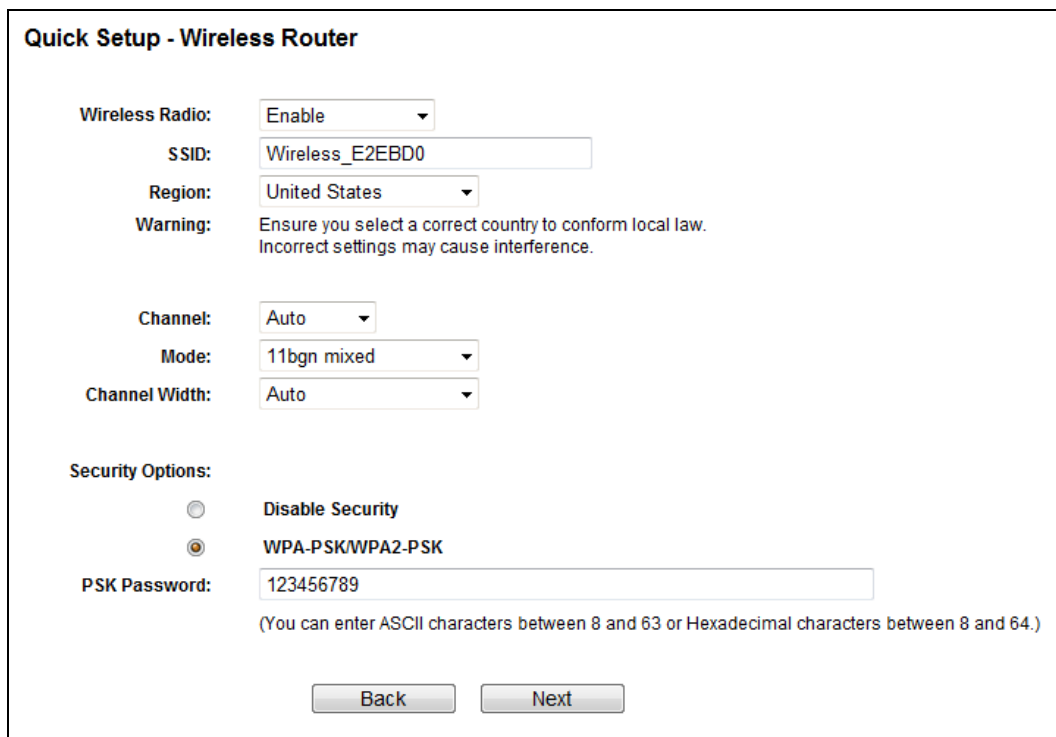
Back Reboot

Figure 3-8 Quick Setup – Finish

3.2.2 Router Mode

When you choose **Router** on **Working Mode** page in Figure 3-5 , take the following steps:

1. Click **Next** in Figure 3-5, and you will see the following screen. The wireless settings on Router mode are the same as that on AP mode.



Quick Setup - Wireless Router

Wireless Radio: Enable

SSID: Wireless_E2EBD0

Region: United States

Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference.

Channel: Auto

Mode: 11bgn mixed

Channel Width: Auto

Security Options:

Disable Security

WPA-PSK/WPA2-PSK

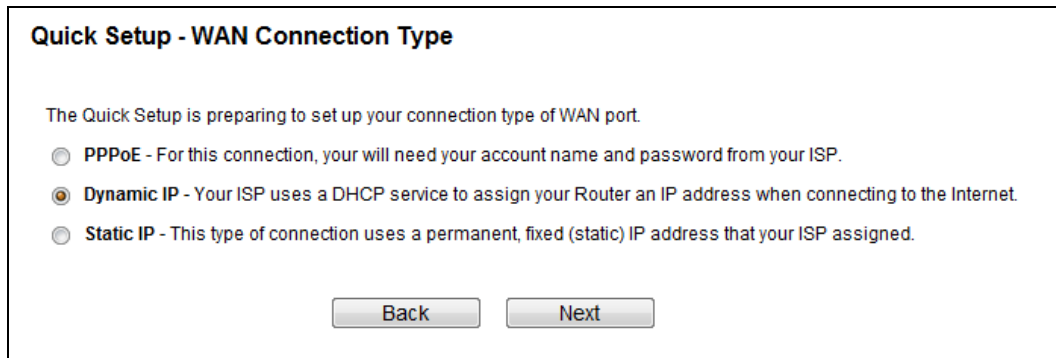
PSK Password: 123456789

(You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64.)

Back Next

Figure 3-9 Quick Setup - Wireless Router

2. Click **Next** in Figure 3-9, and then **WAN Connection Type** page will appear as shown in Figure 3-10.



Quick Setup - WAN Connection Type

The Quick Setup is preparing to set up your connection type of WAN port.

PPPoE - For this connection, you will need your account name and password from your ISP.

Dynamic IP - Your ISP uses a DHCP service to assign your Router an IP address when connecting to the Internet.

Static IP - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.


Back Next

Figure 3-10 Quick Setup - WAN Connection Type

The Router supports three popular ways **PPPoE**, **Dynamic IP** and **Static IP** to connect to the Internet. To make sure the connection type your ISP provides, please refer to the ISP. Make sure the cable is securely plugged into the WAN port before detection.

- **PPPoE** - For this connection, you will need your account name and password from your ISP.

If you have applied ADSL to realize Dial-up service, you should choose this type. Under this condition, you should fill in both the User Name and Password that the ISP supplied. Please note that these fields are case-sensitive.



Quick Setup - PPPoE

User Name:

Password:

Back Next

Figure 3-11 Quick Setup - PPPoE

- **Dynamic IP** - Your ISP uses a DHCP service to assign your Router an IP address when connecting to the Internet.

When the Router connects to a DHCP server, or the ISP supplies you with DHCP connection, please choose this type. The Router gets the IP address automatically from the DHCP server or the ISP if you choose **Dynamic IP**, and then the next screen will appear as shown in Figure 3-16. Then you can go on with the wireless configuration.

- **Static IP** - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.

In this type, you should fill in the IP address, Subnet Mask, Default Gateway, and DNS IP address manually, which are specified by your ISP.

Quick Setup - Static IP

IP Address:	<input type="text" value="0.0.0.0"/>	
Subnet Mask:	<input type="text" value="0.0.0.0"/>	
Default Gateway:	<input type="text" value="0.0.0.0"/>	(Optional)
Primary DNS:	<input type="text" value="0.0.0.0"/>	(Optional)
Secondary DNS:	<input type="text" value="0.0.0.0"/>	(Optional)

Figure 3-12 Quick Setup - Static IP

3. Click **Next**, you will see the **Finish** page as shown in Figure 3-13. Click the **Reboot** button to make your wireless configuration take effect and finish the Quick Setup.

Quick Setup - Finish

Congratulations! The Router is now connecting you to the Internet. For detail settings, please click other menus if necessary.

The change of wireless config or MAC address clone will not take effect until the Router reboot.

Figure 3-13 Quick Setup – Finish

3.2.3 Repeater Mode

When you choose **Repeater Mode** on **Working Mode** page in Figure 3-5 , take the following steps:

1. Click **Next**, and then **Wireless Repeater** page will appear as shown in Figure 3-14.

Quick Setup - Wireless Repeater

SSID:

MAC of AP: Example:00-1D-0F-11-22-33

Region:

Warning: Ensure you select a correct country to conform local law.
Incorrect settings may cause interference.

(Please choose Main AP's type of encryption, and input the wireless password)

Security Options:

WEP Key Index:

Authentication Type:

PassWord:

Figure 3-14 Quick Setup - Wireless Repeater

- **SSID** - The SSID of AP that you want to access.
- **MAC of AP** - The MAC address of AP that you want to access.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Survey** - Click this button, you can search the AP which runs in the environment.
- **Security Options** - This option should be chosen according to the security configuration of the AP you want to access. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authentication type of the Root AP.
- **Password** - If the AP your router is going to connect need password, you need to fill the password in this blank.

Click **Survey** button on the Wireless page as shown in Figure 3-14, and then AP List page will appear as shown in Figure 3-15. Find the SSID of the Access Point you want to access, and click **Connect** in the corresponding row. For example, the third item is selected. The target network's SSID will be automatically filled into the corresponding box which is shown as the Figure 3-14.

AP List

AP count: 17

ID	BSSID	SSID	Signal	Channel	Security	Choose
1	94-0C-6D-2F-3C-BE	Network1	59dB	4	ON	Connect
2	00-0A-EB-11-07-04	CUSYS_110704	47dB	6	OFF	Connect
3	00-0A-EB-13-09-18	2.4GHz_130918	45dB	1	OFF	Connect
4	14-E6-E4-E3-87-6A		16dB	1	ON	Connect
5	F8-D1-11-42-34-CC	LINK_4234CC	14dB	11	ON	Connect
6	00-0C-43-53-70-0C	test	13dB	1	ON	Connect
7	74-EA-3A-78-A2-36	LINK_78A236	12dB	9	OFF	Connect
8	B0-48-7A-6D-47-5C	LINK_6D475C	10dB	1	OFF	Connect
9	B0-48-7A-6D-57-A2	LINK_6D57A2	6dB	1	OFF	Connect
10	B0-48-7A-6D-4E-70	dddd	5dB	6	ON	Connect
11	00-27-19-C4-BC-58	LINK_C4BC58	4dB	7	OFF	Connect
12	00-0A-EB-88-43-A4	LINK_8843A4	4dB	5	ON	Connect
13	B0-48-7A-36-4E-5C	LINK_364E5C	4dB	1	OFF	Connect
14	F4-EC-38-EB-7D-32	LINK_EB7D32	3dB	5	OFF	Connect
15	94-0C-6D-34-20-6F	LINK_34206F	3dB	5	ON	Connect
16	94-DB-C9-65-85-AD	TR950_85ad	1dB	9	ON	Connect
17	B0-48-7A-19-EA-D8	LINK_19EAD8	1dB	1	OFF	Connect

Figure 3-15 AP List

 **Note:**

If you know the SSID of the desired AP, you can also input it into the field "SSID" manually.

2. Click the **Next** button in Figure 3-14. You will then see the **Finish** page.

Because something has changed on the **Wireless Repeater** page, you will see the **Finish** page as shown in Figure 3-16. Click the **Reboot** button to make your wireless configuration take effect and finish the **Quick Setup**.

Quick Setup - Finish

Congratulations! The Router is now connecting you to the Internet. For detail settings, please click other menus if necessary.

The change of wireless config or MAC address clone will not take effect until the Router reboot.

Figure 3-16 Quick Setup - Finish

3.2.4 Bridge Mode

When you choose **Bridge** on **Working Mode** page in Figure 3-5 , take the following steps:

1. Click **Next**, and then **Wireless Repeater** page will appear as shown in Figure 3-17.

Quick Setup - Wireless Bridge

SSID:

Region:

Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference.

Channel:

Mode:

Channel Width:

SSID(to be bridged):

BSSID(to be bridged): Example:00-1D-0F-11-22-33

Security Options:

WEP Key Index:

Authentication Type:

PassWord:

Figure 3-17 Quick Setup - Wireless Bridge

- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your networks name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Channel** - This field determines which operating frequency will be used. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point. If you select auto, then AP will choose the best channel automatically.
- **Mode** - Select the desired mode. The default setting is 11bgn mixed.
- 11b only** - Select if all of your wireless clients are 802.11b.

11g only - Select if all of your wireless clients are 802.11g.

11n only- Select only if all of your wireless clients are 802.11n.

11bg mixed - Select if you are using both 802.11b and 802.11g wireless clients.

11bgn mixed - Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.

Select the desired wireless mode. 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 **802.11b/g/n**, and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.

- **Channel width** - Select the channel width from the pull-down list. The default setting is **auto**, which can automatically adjust the channel width for your clients.

 **Note:**

If **11b only**, **11g only**, or **11bg mixed** is selected in the **Mode** field, the **Channel Width** selecting field will turn grey and the value will become 20MHz, which is unable to be changed.

- **SSID (to be bridged)** - 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 bridged)** - 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.
- **Survey** - Click this button, you can survey the AP which runs in the environment.
- **Security Options** - This option should be chosen according to the AP's security configuration. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **PassWord** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

Click **Survey** button on the Wireless page as shown in Figure 3-17, and then AP List page will appear as shown in Figure 3-18. Find the SSID of the Access Point you want to access, and click **Connect** in the corresponding row. For example, the third item is selected. The target network's SSID will be automatically filled into the corresponding box which is shown as the Figure 3-17.

AP List

AP count: 17

ID	BSSID	SSID	Signal	Channel	Security	Choose
1	94-0C-6D-2F-3C-BE	Network1	59dB	4	ON	Connect
2	00-0A-EB-11-07-04	CUSYS_110704	47dB	6	OFF	Connect
3	00-0A-EB-13-09-18	2.4GHz_130918	45dB	1	OFF	Connect
4	14-E6-E4-E3-87-6A		16dB	1	ON	Connect
5	F8-D1-11-42-34-CC	LINK_4234CC	14dB	11	ON	Connect
6	00-0C-43-53-70-0C	test	13dB	1	ON	Connect
7	74-EA-3A-78-A2-36	LINK_78A236	12dB	9	OFF	Connect
8	B0-48-7A-6D-47-5C	LINK_6D475C	10dB	1	OFF	Connect
9	B0-48-7A-6D-57-A2	LINK_6D57A2	6dB	1	OFF	Connect
10	B0-48-7A-6D-4E-70	dddd	5dB	6	ON	Connect
11	00-27-19-C4-BC-58	LINK_C4BC58	4dB	7	OFF	Connect
12	00-0A-EB-88-43-A4	LINK_8843A4	4dB	5	ON	Connect
13	B0-48-7A-36-4E-5C	LINK_364E5C	4dB	1	OFF	Connect
14	F4-EC-38-EB-7D-32	LINK_EB7D32	3dB	5	OFF	Connect
15	94-0C-6D-34-20-6F	LINK_34206F	3dB	5	ON	Connect
16	94-DB-C9-65-85-AD	TR950_85ad	1dB	9	ON	Connect
17	B0-48-7A-19-EA-D8	LINK_19EAD8	1dB	1	OFF	Connect

Figure 3-18 AP List

- Click **Next** in Figure 3-17, and then **Wireless Security Settings** page will appear as shown in Figure 3-19.

Quick Setup - Wireless Security Settings

Disable Security
 Enable Security

PSK Password:

(You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64)

Figure 3-19 Quick Setup - Wireless Security Settings

This page is for setting wireless security of **your own AP**. When computers and mobile phones are connected to the AP, they should input the same password.

- **Disable Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the Router without encryption. It is recommended strongly to enable security.
- **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters. The default password is the last unique eight numbers of each Router's MAC address

For **ASCII**, the key can be made up of any numbers 0 to 9 and any letters 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 also note the key is case sensitive, this means that upper and lower case keys will affect the outcome. It would also be a good idea to write down the key and all related wireless security settings.

3. Click the **Next** button in Figure 3-20. You will then see the **Finish** page. Click the **Reboot** button to make your wireless configuration take effect and finish the Quick Setup.

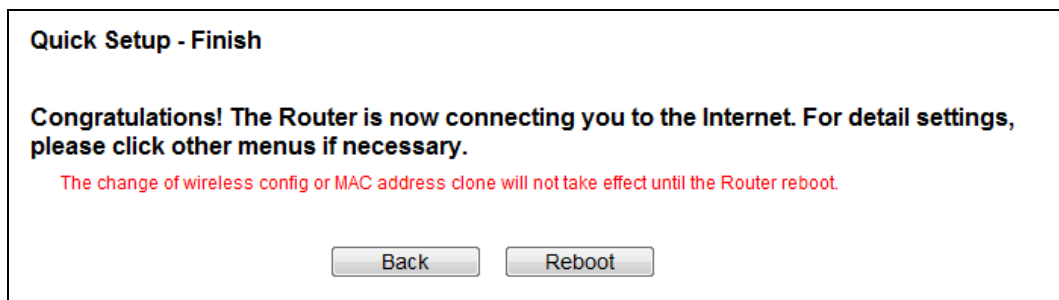


Figure 3-20 Quick Setup - Finish

3.2.5 Client Mode

When you choose **Client** on **Working Mode** page in Figure 3-5, take the following steps:

1. Click **Next** in Figure 3-5, and then **Wireless Client** page will appear as shown in Figure 3-21.

Quick Setup - Wireless Client

SSID:

MAC of AP: Example:00-1D-0F-11-22-33

Region: ▼

Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference.

(Please choose Main AP's type of encryption, and input the wireless password)

Security Options: ▼

WEP Key Index: ▼

Authentication Type: ▼

PassWord:

Figure 3-21 Quick Setup - Wireless Client

- **SSID** - Enter the SSID that you want to access.
- **MAC of AP** - Enter the MAC address of AP that you want to access.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.

 **Note:**

Limited by the local law regulations, version for North America does not have region selection option.

- **Survey** - Click this button, you can survey the AP which runs in the environment.
- **Security Options** - This option should be chosen according to the security configuration of the AP you want to access. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **PassWord** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

- Click **Survey** button on the Wireless page as shown in Figure 3-21, and then AP List page will appear as shown in Figure 3-22. Find the SSID of the Access Point you want to access, and click **Connect** in the corresponding row. For example, the third item is selected. The target network's SSID will be automatically filled into the corresponding box which is shown as the Figure 3-21.

AP List

AP count: 17

ID	BSSID	SSID	Signal	Channel	Security	Choose
1	94-0C-6D-2F-3C-BE	Network1	59dB	4	ON	Connect
2	00-0A-EB-11-07-04	CUSYS_110704	47dB	6	OFF	Connect
3	00-0A-EB-13-09-18	2.4GHz_130918	45dB	1	OFF	Connect
4	14-E6-E4-E3-87-6A		16dB	1	ON	Connect
5	F8-D1-11-42-34-CC	LINK_4234CC	14dB	11	ON	Connect
6	00-0C-43-53-70-0C	test	13dB	1	ON	Connect
7	74-EA-3A-78-A2-36	LINK_78A236	12dB	9	OFF	Connect
8	B0-48-7A-6D-47-5C	LINK_6D475C	10dB	1	OFF	Connect
9	B0-48-7A-6D-57-A2	LINK_6D57A2	6dB	1	OFF	Connect
10	B0-48-7A-6D-4E-70	dddd	5dB	6	ON	Connect
11	00-27-19-C4-BC-58	LINK_C4BC58	4dB	7	OFF	Connect
12	00-0A-EB-88-43-A4	LINK_8843A4	4dB	5	ON	Connect
13	B0-48-7A-36-4E-5C	LINK_364E5C	4dB	1	OFF	Connect
14	F4-EC-38-EB-7D-32	LINK_EB7D32	3dB	5	OFF	Connect
15	94-0C-6D-34-20-6F	LINK_34206F	3dB	5	ON	Connect
16	94-DB-C9-65-85-AD	TR950_85ad	1dB	9	ON	Connect
17	B0-48-7A-19-EA-D8	LINK_19EAD8	1dB	1	OFF	Connect

Figure 3-22 AP List

- Click the **Next** button in Figure 3-23. You will then see the **Finish** page. Click the **Reboot** button to make your wireless configuration take effect and finish the Quick Setup.

Quick Setup - Finish

Congratulations! The Router is now connecting you to the Internet. For detail settings, please click other menus if necessary.

The change of wireless config or MAC address clone will not take effect until the Router reboot.

Figure 3-23 Quick Setup - Finish

Note:

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.
 - In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.

Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

Chapter 4. Configuration for AP Mode

This chapter will show each Web page's key functions and the configuration way for AP Mode of PW-RN401M.

4.1 Login

After your successful login, you can configure and manage the device. There are main menus on the left of the web-based utility. Submenus will be available after you click one of the main menus. On the right, there are the corresponding explanations and instructions.



Figure 4-1

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 on AP Mode. All information is read-only.

Status	
Firmware Version:	4.18.77 Build 120518 Rel.35024n
Hardware Version:	PW-RN401M 1.0 00000000
LAN	
MAC Address:	14-E6-E4-E2-EB-D0
IP Address:	192.168.1.254
Subnet Mask:	255.255.255.0
Wireless	
Wireless Mode:	AP Mode
Wireless Radio:	Enable
Name (SSID):	Wireless_E2EBD0
Channel:	Auto(Current Channel 6)
Mode:	11bgn mixed
Channel Width:	Auto
MAC Address:	14-E6-E4-E2-EB-D0
WDS Status:	Disable
System Up Time:	0 day(s) 00:26:03
	<input type="button" value="Refresh"/>

Figure 4-2 Status

- **Firmware Version** - The version information of the Router's firmware.
- **Hardware Version** - The version information of the Router's hardware.
- **LAN** - This field displays the current settings or information for the LAN, you can configure them in the **Network > LAN** page.
 - **MAC address** - The physical address of the Router, as seen from the LAN.
 - **IP address** - The LAN IP address of the Router.
 - **Subnet Mask** - The subnet mask associated with LAN IP address.
- **Wireless** - This field displays basic information or status for wireless function, you can configure them in the **Wireless > Wireless Settings** page.
 - **Wireless Mode** - The current wireless working mode in use.
 - **Wireless Radio** - Indicates whether the wireless radio feature of the AP is enabled or disabled.
 - **Name (SSID)** - The SSID of the AP.
 - **Channel** - The current wireless channel in use.
 - **Mode** - The current wireless mode which the Router works on.

- **Channel Width** - The current wireless channel width in use.
 - **MAC address** - The physical address of the Router, as seen from the WLAN.
 - **WDS Status** - The status of WDS connection.
- **System Up Time** - The length of the time since the Router was last powered on or reset.

Click the **Refresh** button to get the latest status and settings of the Router.

4.3 Quick Setup

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

4.4 Working Mode

The Router supports five operation mode types: **AP**, **Router**, **Repeater**, **Bridge** and **Client**. Please select one you want. Click **Save** to save your choice, which is shown as Figure 4-3.

Wireless Working Mode Settings	
<input checked="" type="radio"/> AP:	AP mode.
<input type="radio"/> Router:	Wireless router mode
<input type="radio"/> Repeater:	Repeater mode
<input type="radio"/> Bridge:	Bridge mode
<input type="radio"/> Client:	Client mode

Figure 4-3 Wireless Working Mode Settings

- **AP** - The wireless access point mode.
- **Router** - The wireless Router Mode. In this mode, the device enables multi-user to share Internet via DSL/Cable Modem. The only wired port works as WAN.
- **Repeater** - The wireless Repeater Mode. It could extend the range of wireless network.
- **Bridge** - The wireless Bridge Mode. It could communicate with another wireless network.
- **Client** - The Client Mode. The computer connected by Ethernet could get access to an AP by Client mode.

Click **OK** in the following screen and then the Router will reboot and to work on AP Mode.

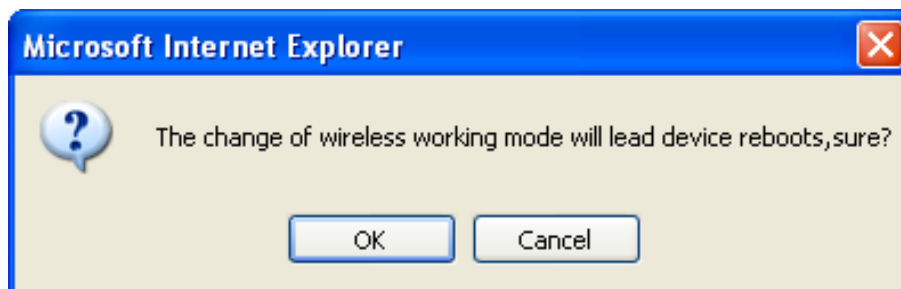


Figure 4-4

4.5 Network



Figure 4-5 the Network menu

There is only one submenu under the Network menu (shown in Figure 4-5): **LAN**.

4.5.1 LAN

Choose menu "**Network** → **LAN**", and then you can configure the IP parameters of the LAN on the screen as below.

Figure 4-6 LAN

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value can't be changed.
- **IP Address** - Enter the IP address of your Router in dotted-decimal notation (factory default: 192.168.1.254).
- **Subnet Mask** - An address code that determines the size of the network. Normally use 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 login to the Router.
2. If the new LAN IP Address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, while the Virtual Server and DMZ Host will not take effect until they are re-configured.

4.6 Wireless

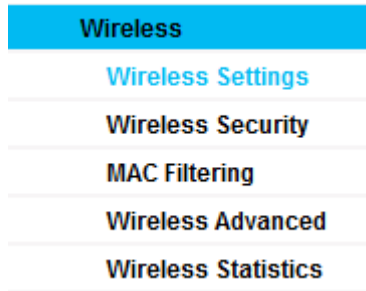


Figure 4-7 Wireless menu

There are five submenus under the Wireless menu (shown in Figure 4-7): **Wireless Settings**, **Wireless Security**, **MAC Filtering**, **Wireless Advanced** and **Wireless Statistics**. Click any of them, and you will be able to configure the corresponding function.

4.6.1 Wireless Settings

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

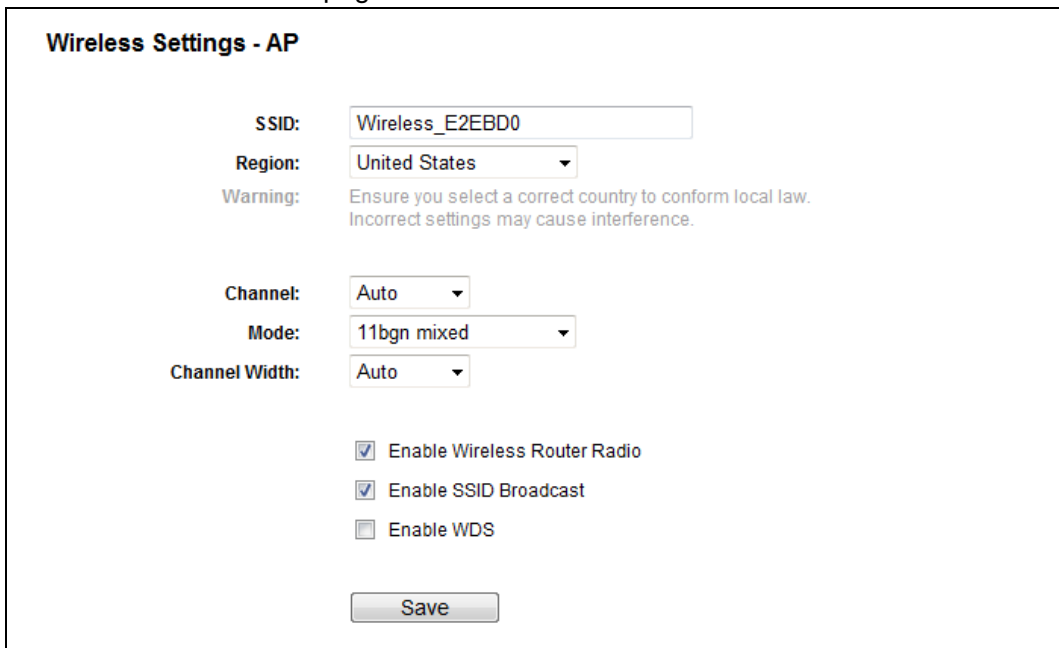
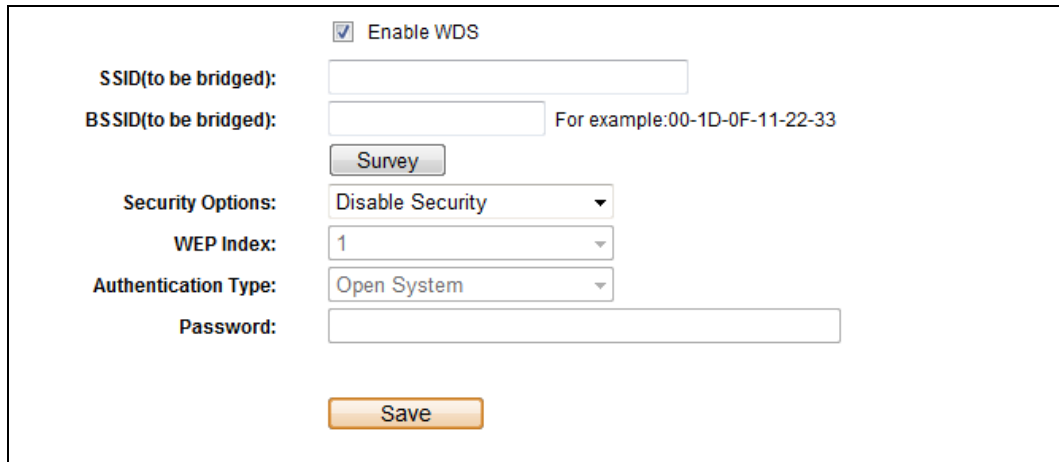
A screenshot of the "Wireless Settings - AP" configuration page. It features several input fields and checkboxes. The "SSID" field contains "Wireless_E2EBD0". The "Region" dropdown is set to "United States". A warning message states: "Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference." The "Channel" dropdown is set to "Auto", the "Mode" dropdown is set to "11bgn mixed", and the "Channel Width" dropdown is set to "Auto". There are three checkboxes: "Enable Wireless Router Radio" (checked), "Enable SSID Broadcast" (checked), and "Enable WDS" (unchecked). A "Save" button is located at the bottom.

Figure 4-8 Wireless Settings - AP

- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your network's name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.

- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Channel** - This field determines which operating frequency will be used. The default channel is set to **Auto**. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
- **Mode** - Select the desired mode. The default setting is 11bgn mixed.
 - **11b only** - Select if all of your wireless clients are 802.11b.
 - **11g only** - Select if all of your wireless clients are 802.11g.
 - **11n only** - Select only if all of your wireless clients are 802.11n.
 - **11bg mixed** - Select if you are using both 802.11b and 802.11g wireless clients.
 - **11bgn mixed** - Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.

Select the desired wireless mode. 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 **802.11b/g/n**, and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.
- **Channel Width** - Select any channel width from the pull-down list. The default setting is automatic, which can automatically adjust the channel width for your clients.
- **Enable Wireless Router Radio** - The wireless radio of the Router can be enabled or disabled to allow wireless stations access. If enabled, the wireless stations will be able to access the Router. Otherwise, wireless stations will not be able to access the Router.
- **Enable SSID Broadcast** - If you select the **Enable SSID Broadcast** checkbox, the wireless router will broadcast its name (SSID) on the air.
- **Enable WDS** - You can select to enable WDS. With this function, the Router can bridge two or more WLANs. If this checkbox is selected, you will have to set the following parameters as shown below. Make sure the following settings are correct.



Enable WDS

SSID(to be bridged):

BSSID(to be bridged): For example:00-1D-0F-11-22-33

Security Options:

WEP Index:

Authentication Type:

Password:

- **SSID (to be bridged)** - 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 bridged)** - 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.
- **Survey** - Click this button, you can survey the AP which runs in the current channel.
- **Security Options** - This option should be chosen according to the AP's security configuration. It is recommended that the security type is the same as your AP's security type.
- **WEP Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **Password** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

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

 **Note:**

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.
 - In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.

2. Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

4.6.2 Wireless Security

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

There are three wireless security modes supported by the Router: WEP (Wired Equivalent Privacy), WPA/WPA2 and WPA-PSK/WPA2-PSK.

Figure 4-9 Wireless Security

- **Disable Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the Router without encryption. But it's strongly recommended to choose one of the following modes to enable security.
- **WEP** - It is based on the IEEE 802.11 standard.
 - **Type** - you can choose the type for the WEP security on the pull-down list. The default setting is **Automatic**, which can select **Shared Key** or **Open System** authentication type automatically based on the wireless station's capability and request.

- **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.
- **WEP Key (Password)** - 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 network.
- **Key Type** - You can select the WEP key length (64-bit, or 128-bit, or 152-bit.) for encryption. "Disabled" means this WEP key entry is invalid.
 - 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.
 - 152-bit** - You can enter 32 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not promoted) or 16 ASCII characters.

 **Note:**

If you do not set the key, the wireless security function is still disabled even if you have selected Shared Key as Authentication Type.

➤ **WPA /WPA2**

- **Version** - you can choose the version of the WPA security from the pull-down list. The default setting is **Automatic**, which can select **WPA** (Wi-Fi Protected Access) or **WPA2** (WPA version 2) automatically based on the wireless station's capability and request.
- **Encryption** - You can select **Automatic**, **TKIP** or **AES**.
- **Radius Server IP** - Enter the IP address of the Radius server.
- **Radius Port** - Enter the port that Radius server used.
- **Radius Password** - Enter the password for the Radius server.
- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

➤ **WPA-PSK/WPA2-PSK-** It's the WPA/WPA2 authentication type based on pre-shared passphrase.

- **Version** - you can choose the version of the WPA-PSK security on the drop-down list. The default setting is **Automatic (Recommended)**, which can select **WPA-PSK** (Pre-shared key of WPA) or **WPA2-PSK** (Pre-shared key of WPA) automatically based on the wireless station's capability and request.

- **Encryption** - When **WPA-PSK** or **WPA** is set as the Authentication Type, you can select **Automatic (Recommended)**, **TKIP** or **AES** as Encryption.
- **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters. The default password is the last unique eight numbers of each Router's MAC address.

For **ASCII**, the key can be made up of any numbers 0 to 9 and any letters 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 also note the key is case sensitive, this means that upper and lower case keys will affect the outcome. It would also be a good idea to write down the key and all related wireless security settings.

- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

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

4.6.3 MAC Filtering

Choose menu "**Wireless** → **MAC Filtering**", and then you can control the wireless access by configuring the **Wireless MAC Filtering** function, as shown in Figure 4-10.

Wireless MAC Filtering

Wireless MAC Filtering: **Disabled**

Filtering Rules

Deny the stations specified by any enabled entries in the list to access.

Allow the stations specified by any enabled entries in the list to access.

ID	MAC Address	Status	Description	Modify
1	00-0A-EB-B0-00-0B	Enabled		Modify Delete

Figure 4-10 Wireless MAC Filtering

To filter wireless users by MAC Address, click **Enable**. The default setting is **Disabled**.

- **MAC Address** - The wireless station's MAC address that you want to access.
- **Status** - The status of this entry, either **Enabled** or **Disabled**.
- **Description** - A simple description of the wireless station.

To Add a Wireless MAC Address filtering entry, click the **Add New...** button. The "**Add or Modify Wireless MAC Address Filtering entry**" page will appear, shown in Figure 4-11:

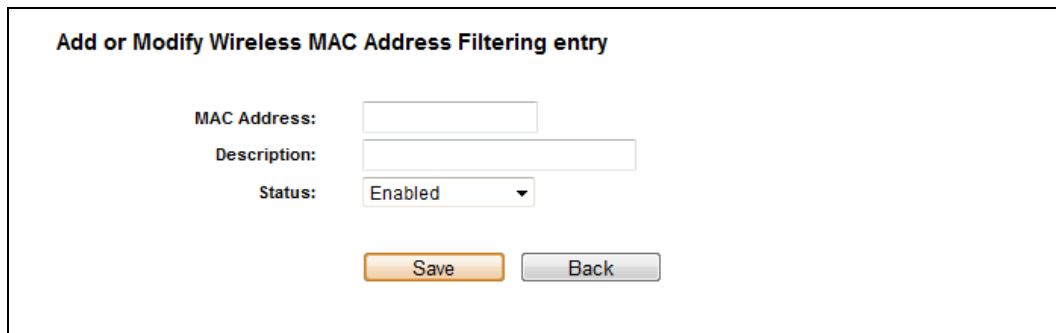


Figure 4-11 Add or Modify Wireless MAC Address Filtering entry

To add or modify a MAC Address Filtering entry, follow these instructions:

1. Enter the appropriate MAC Address into the **MAC Address** field. The format of the MAC Address is XX-XX-XX-XX-XX-XX (X is any hexadecimal digit). For example: 00-0A-EB-B0-00-0B.
2. Give a simple description for the wireless station in the **Description** field. For example: Wireless station A.
3. Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save this entry.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page.

Click the **Previous** button to return to the previous page.

For example: If you desire that the wireless station A with MAC address 00-0A-EB-B0-00-0B and the wireless station B with MAC address 00-0A-EB-00-07-5F are able to access the Router, but all the other wireless stations cannot access the Router, you can configure the **Wireless MAC Address Filtering** list by following these steps:

1. Click the **Enable** button to enable this function.

2. Select the radio button “Allow the stations specified by any enabled entries in the list to access” for **Filtering Rules**.
3. Delete all or disable all entries if there are any entries already.
4. Click the **Add New...** button.
 - Enter the MAC address 00-0A-EB-B0-00-0B/00-0A-EB-00-07-5F in the **MAC Address** field.
 - Enter wireless station A/B in the **Description** field.
 - Select **Enabled** in the **Status** pull-down list.
 - Click the **Save** button.
 - Click the **Back** button.

The filtering rules that configured should be similar to the following list:

Filtering Rules				
<input type="radio"/> Deny the stations specified by any enabled entries in the list to access. <input checked="" type="radio"/> Allow the stations specified by any enabled entries in the list to access.				
ID	MAC Address	Status	Description	Modify
1	00-0A-EB-B0-00-0B	Enabled		Modify Delete
2	00-0A-EB-00-07-5F	Enabled		Modify Delete

Figure 4-12 Filtering Rules

4.6.4 Wireless Advanced

Choose menu “**Wireless** → **Wireless Advanced**”, and then you can configure the advanced settings of your wireless network.

Wireless Advanced

Transmit Power:

Beacon Interval : (40-1000)

RTS Threshold: (1-2346)

Fragmentation Threshold: (256-2346)

DTIM Interval: (1-255)

Enable WMM
 Enable Short GI
 Enable AP Isolation

Figure 4-13 Wireless Advanced

- **Transmit Power** - Here you can specify the transmit power of Router. You can select High, Middle or Low which you would like. High is the default setting and is recommended.
- **Beacon Interval** - Enter a value between 20-1000 milliseconds for Beacon Interval here. 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.
- **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.
- **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 because of excessive packets. 2346 is the default setting and is recommended.
- **DTIM Interval** - This value determines the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. You can specify the value between 1-255 Beacon Intervals. The default value is 1, which indicates the DTIM Interval is the same as Beacon Interval.
- **Enable WMM - WMM** function can guarantee the packets with high-priority messages being transmitted preferentially. It is strongly recommended enabled.
- **Enable Short GI** - This function is recommended for it will increase the data capacity by reducing the guard interval time.
- **Enabled AP Isolation** - This function isolate all connected wireless stations so that wireless stations cannot access each other through WLAN. This function will be disabled if WDS/Bridge is enabled.

 **Note:**

If you are not familiar with the setting items in this page, it's strongly recommended to keep the provided default values; otherwise it may result in lower wireless network performance.

4.6.5 Wireless Statistics

Choose menu “**Wireless** → **Wireless Statistics**”, and then you can see the MAC Address, Current Status, Received Packets and Sent Packets for each connected wireless station.

Wireless Statistics				
Current Connected Wireless Stations numbers: 1 <input type="button" value="Refresh"/>				
ID	MAC Address	Current Status	Received Packets	Sent Packets
1	E0-05-C5-30-20-60	WPA2-PSK	1813	1986
<input type="button" value="Previous"/> <input type="button" value="Next"/>				

Figure 4-14 Wireless Statistics

- **MAC Address** - The connected wireless station's MAC address
- **Current Status** - The connected wireless station's running status, one of **STA-AUTH / STA-ASSOC / STA-JOINED / WPA / WPA-PSK / WPA2 / WPA2-PSK / AP-UP / AP-DOWN / Disconnected**
- **Received Packets** - Packets received by the station
- **Sent Packets** - Packets sent by the station

You cannot change any of the values on this page. To update this page and to show the current connected wireless stations, click on the **Refresh** button.

If the numbers of connected wireless stations go beyond one page, click the **Next** button to go to the next page and click the **Previous** button to return the previous page.

 **Note:**

This page will be refreshed automatically every 5 seconds.

4.7 DHCP

DHCP
DHCP Settings
DHCP Clients List
Address Reservation

Figure 4-15 The DHCP menu

There are three submenus under the DHCP menu (shown in Figure 4-15), **DHCP Settings**, **DHCP Clients List** and **Address Reservation**. Click any of them, and you will be able to configure the corresponding function.

4.7.1 DHCP Settings

Choose menu “**DHCP → DHCP Settings**”, and then you can configure the DHCP Server on the page as shown in Figure 4-16. The Router is set up by default as a DHCP (Dynamic Host

Configuration Protocol) server, which provides the TCP/IP configuration for all the PC(s) that are connected to the Router in the LAN.

DHCP Settings

DHCP Server: Disable Enable

Start IP Address:

End IP Address:

Address Lease Time: minutes (1~2880 minutes, the default value is 120)

Default Gateway: (optional)

Default Domain: (optional)

Primary DNS: (optional)

Secondary DNS: (optional)

Figure 4-16 DHCP Settings

- **DHCP Server - Enable or Disable** the DHCP server. If you disable the Server, you must have another DHCP server within your network or else you must configure the computer manually.
- **Start IP Address** - Specify an IP address for the DHCP Server to start with when assigning IP addresses. 192.168.1.100 is the default start address.
- **End IP Address** - Specify an IP address for the DHCP Server to end with when assigning IP addresses. 192.168.1.199 is the default end address.
- **Address Lease Time** - The **Address Lease Time** is the amount of time a network user will be allowed connection to the Router with their current dynamic IP Address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP Address. After the time is up, the user will be automatically assigned a new dynamic IP address. The range of the time is 1 ~ 2880 minutes. The default value is 120 minutes.
- **Default Gateway (Optional)** - It is suggested to input the IP address of the LAN port of the Router. The default value is 192.168.1.254.
- **Default Domain (Optional)** - Input the domain name of your network.
- **Primary DNS** - (Optional) Input the DNS IP address provided by your ISP or consult your ISP.
- **Secondary DNS (Optional)** - Input the IP address of another DNS server if your ISP provides two DNS servers.

 **Note:**

To use the DHCP server function of the Router, you must configure all computers on the LAN as "Obtain an IP Address automatically".

4.7.2 DHCP Clients List

Choose menu “**DHCP → DHCP Clients List**”, and then you can view the information about the clients attached to the Router in the screen as shown in Figure 4-17.

DHCP Clients List				
ID	Client Name	MAC Address	Assigned IP	Lease Time
1	none	98-D6-BB-47-4F-5D	192.168.1.102	01:59:51

Figure 4-17 DHCP Clients List

- **Client Name** - The name of the DHCP client
- **MAC Address** - The MAC address of the DHCP client
- **Assigned IP** - The IP address that the Router has allocated to the DHCP client
- **Lease Time** - The time of the DHCP client leased. After the dynamic IP address has expired, a new dynamic IP address will be automatically assigned to the user.

You cannot change any of the values on this page. To update this page and to show the current attached devices, click the **Refresh** button.

4.7.3 Address Reservation

Choose menu “**DHCP → Address Reservation**”, and then you can view and add a reserved address for clients via the next screen (shown in Figure 4-18). When you specify a reserved IP address for a PC on the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to the servers that require permanent IP settings.

Address Reservation				
ID	MAC Address	Reserved IP Address	Status	Modify
1	00-0A-EB-B0-00-0B	192.168.1.25	Enabled	Modify Delete

Figure 4-18 Address Reservation

- **MAC Address** - The MAC address of the PC for which you want to reserve an IP address.
- **Reserved IP Address** - The IP address reserved for the PC by the Router.
- **Status** - The status of this entry either **Enabled** or **Disabled**.

To Reserve an IP address:

1. Click the **Add New...** button. Then Figure 4-19 will pop-up.
2. Enter the MAC address (in XX-XX-XX-XX-XX-XX format.) and IP address (in dotted-decimal notation) of the computer for which you want to reserve an IP address.
3. Click the **Save** button.

The screenshot shows a web form titled "Add or Modify an Address Reservation Entry". It contains three input fields: "MAC Address:", "Reserved IP Address:", and "Status:". The "Status" dropdown menu is currently set to "Enabled". Below the fields are two buttons: "Save" and "Back".

Figure 4-19 Add or Modify an Address Reservation Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and Click the **Previous** button to return the previous page.

4.8 System Tools



Figure 4-20 The System Tools menu

Choose menu "**System Tools**", and then you can see the submenus under the main menu: **Diagnostic, Firmware, Factory Defaults, Backup & Restore, Reboot, Password, and System**

Log. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

4.8.1 Diagnostic

Choose menu “**System Tools** → **Diagnostic**”, and then you can transact Ping or Traceroute function to check connectivity of your network in the following screen.

Figure 4-21 Diagnostic Tools

- **Diagnostic Tool** - Check the radio button to select one diagnostic tool.
 - **Ping** - This diagnostic tool troubleshoots connectivity, reachability, and name resolution to a given host or gateway.
 - **Traceroute** - This diagnostic tool tests the performance of a connection.

 **Note:**

You can use ping/traceroute to test both numeric IP address or domain name. If pinging/tracerouting the IP address is successful, but pinging/tracerouting the domain name is not, you might have a name resolution problem. In this case, ensure that the domain name you are specifying can be resolved by using Domain Name System (DNS) queries.

- **IP Address/Domain Name** - Type the destination IP address (e.g.192.168.1254) or Domain name
- **Pings Count** - The number of Ping packets for a Ping connection. The default is 4.
- **Ping Packet Size** - The size of Ping packet. The default is 64.

- **Ping Timeout** - Set the waiting time for the reply of each Ping packet. If there is no reply in the specified time, the connection is overtime. The default is 800.
- **Traceroute Max TTL** - The max number of hops for a Traceroute connection. The default is 20.

Click **Start** to check the connectivity of the Internet.

The **Diagnostic Results** page displays the result of diagnosis.

If the result is similar to the following screen, the connectivity of the Internet is fine.

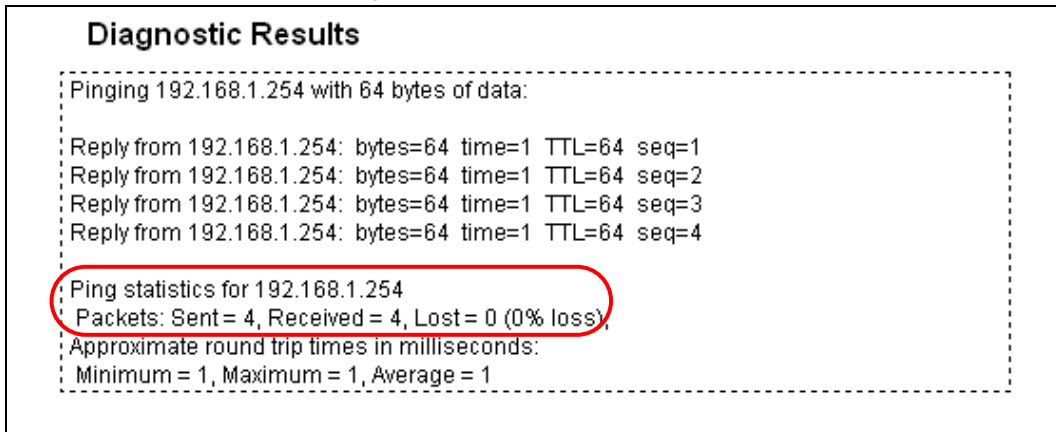


Figure 4-22 Diagnostic Results

Note:

Only one user can use this tool at one time. Options “Number of Pings”, “Ping Size” and “Ping Timeout” are used for **Ping** function. Option “Tracert Hops” are used for **Tracert** function.

4.8.2 Firmware

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

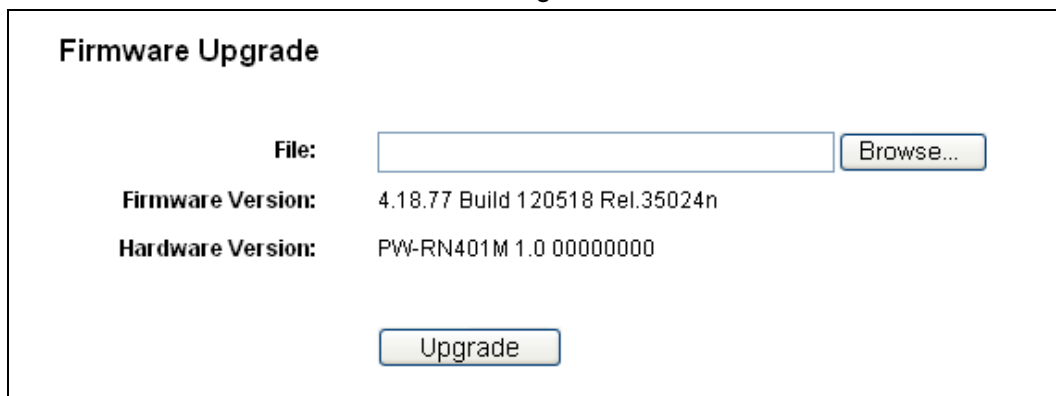


Figure 4-23 Firmware Upgrade

- **Firmware Version** - This displays the current firmware version.
- **Hardware Version** - This displays the current hardware version. The hardware version of the upgrade file must accord with the Router’s current hardware 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.

4.8.3 Factory Defaults

Choose menu “**System Tools** → **Factory Defaults**”, and you can restore the configurations of the Router to factory defaults on the following screen.

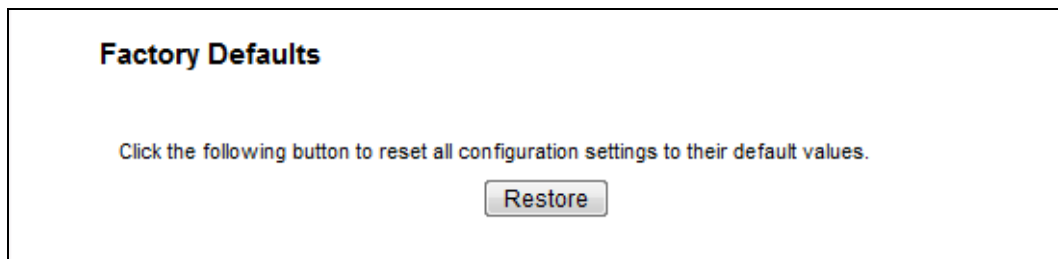


Figure 4-24 Restore Factory Default

Click the **Restore** button to reset all configuration settings to their default values.

- The default **User Name**: admin
- The default **Password**: admin
- The default **IP Address**: 192.168.1.254
- The default **Subnet Mask**: 255.255.255.0

 **Note:**

All changed settings will be lost when defaults are restored.

4.8.4 Backup & Restore

Choose menu “**System Tools** → **Backup & Restore**”, and then 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 4-25.

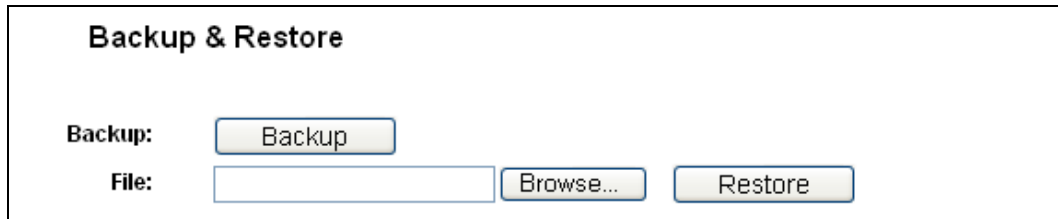


Figure 4-25 Backup & Restore Configuration

- Click the **Backup** 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 **Restore** button.

 **Note:**

The current configuration will be covered by the uploading configuration file. The upgrade process lasts for 20 seconds and the Router will restart automatically. Keep the Router on during the upgrading process to prevent any damage.

4.8.5 Reboot

Choose menu “**System Tools** → **Reboot**”, and then you can click the **Reboot** button to reboot the Router via the next screen.

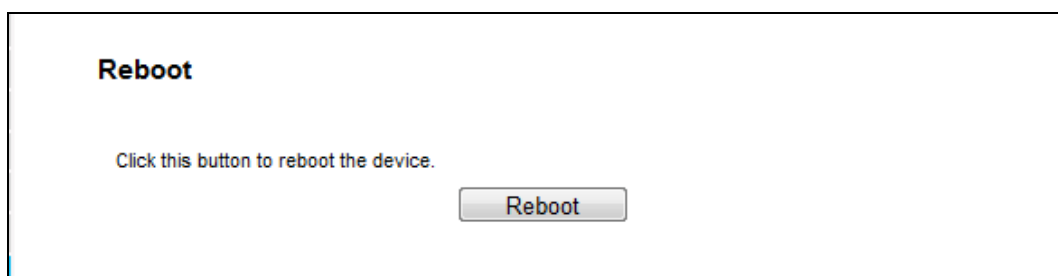


Figure 4-26 Reboot the Router

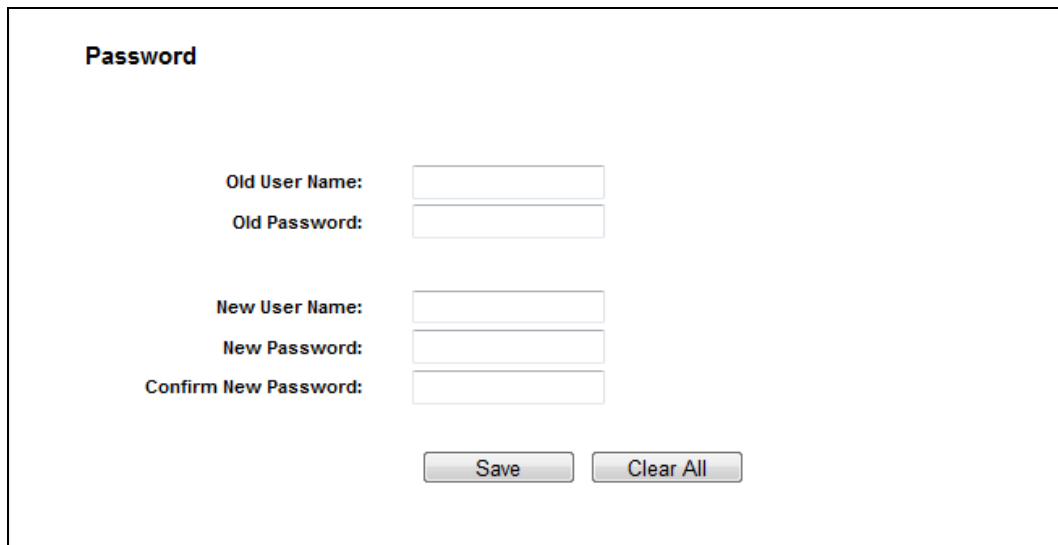
Some settings of the Router will take effect only after rebooting, which include:

- Change the LAN IP Address (system will reboot automatically).
- Change the DHCP Settings.
- Change the Wireless configurations.

- Change the Web Management Port.
- Upgrade the firmware of the Router (system will reboot automatically).
- Restore the Router's settings to factory defaults (system will reboot automatically).
- Update the configuration with the file (system will reboot automatically).

4.8.6 Password

Choose menu “**System Tools** → **Password**”, and then you can change the factory default user name and password of the Router in the next screen as shown in Figure 4-27.



The screenshot shows a web form titled "Password" with the following fields and buttons:

- Old User Name:
- Old Password:
- New User Name:
- New Password:
- Confirm New Password:
- Save button
- Clear All button

Figure 4-27 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.

 **Note:**

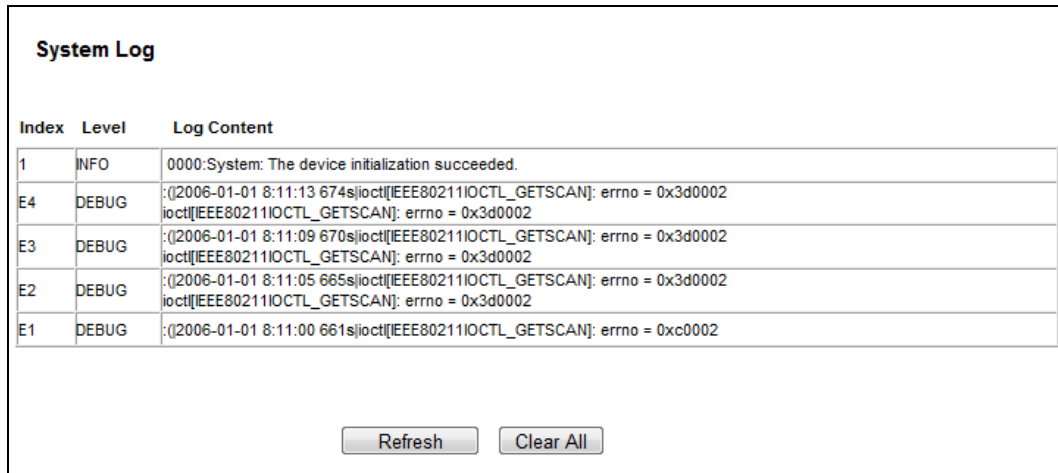
The new user name and password must not exceed 14 characters in length and not include any spaces. Enter the new Password twice to confirm.

Click the **Save** button when finished.

Click the **Clear All** button to clear all.

4.8.7 System Log

Choose menu “**System Tools** → **System Log**”, and then you can view the logs of the Router.



Index	Level	Log Content
1	INFO	0000:System: The device initialization succeeded.
E4	DEBUG	;(2006-01-01 8:11:13 674s)ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002 ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002
E3	DEBUG	;(2006-01-01 8:11:09 670s)ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002 ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002
E2	DEBUG	;(2006-01-01 8:11:05 665s)ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002 ioct[IEEE80211IOCTL_GETSCAN]: errno = 0x3d0002
E1	DEBUG	;(2006-01-01 8:11:00 661s)ioct[IEEE80211IOCTL_GETSCAN]: errno = 0xc0002

Figure 4-28 System Log

- **Refresh** - Refresh the page to show the latest log list.
- **Clear All** - All the logs will be deleted from the Router permanently, not just from the page.

Chapter 5. Configuration for Router Mode

This chapter will show each Web page's key functions and the configuration way for Router Mode of PW-RN401M.

5.1 Login

After your successful login, you can configure and manage the device. There are main menus on the left of the web-based utility. Submenus will be available after you click one of the main menus. On the right, there are the corresponding explanations and instructions.



Status
Quick Setup
Working Mode
Network
Wireless
DHCP
Forwarding
Security
Static Routing
IP QoS
IP & MAC Binding
Dynamic DNS
System Tools

Figure 5-1

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

5.2 Status

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

Status		
Firmware Version:	4.18.77 Build 120518 Rel.35024n	
Hardware Version:	PW-RN401M 1.0 00000000	
LAN		
MAC Address:	14-E6-E4-E2-EB-D0	
IP Address:	192.168.1.254	
Subnet Mask:	255.255.255.0	
Wireless		
Wireless Mode:	Router Mode	
Wireless Radio:	Enable	
Name (SSID):	Wireless_E2EBD0	
Channel:	Auto(Current Channel 6)	
Mode:	11bgn mixed	
Channel Width:	Auto	
MAC Address:	14-E6-E4-E2-EB-D0	
WDS Status:	Disable	
WAN		
MAC Address:	14-E6-E4-E2-EB-D1	
IP Address:	0.0.0.0	Dynamic IP
Subnet Mask:	0.0.0.0	
Default Gateway:	0.0.0.0	WAN port is unplugged!
DNS Server:	0.0.0.0 , 0.0.0.0	
Traffic Statistics		
	Received	Sent
Bytes:	0	9164
Packets:	0	136
System Up Time:	0 day(s) 00:08:12	
		<input type="button" value="Refresh"/>

Figure 5-2

- **Firmware Version** - The version information of the Router's firmware.
- **Hardware Version** - The version information of the Router's hardware.
- **LAN** - This field displays the current settings or information for the LAN, you can configure them in the **Network > LAN** page.
 - **MAC Address** - The physical address of the Router, as seen from the LAN.
 - **IP Address** - The LAN IP address of the Router.
 - **Subnet Mask** - The subnet mask associated with LAN IP address.

- **Wireless** - This field displays basic information or status for wireless function, you can configure them in the **Wireless > Wireless Settings** page.
 - **Wireless Mode** - The current wireless working mode in use.
 - **Wireless Radio** - Indicates whether the wireless radio feature of the AP is enabled or disabled.
 - **Name (SSID)** - The SSID of the AP.
 - **Channel** - The current wireless channel in use.
 - **Mode** - The current wireless mode which the Router works on.
 - **Channel Width** - The current wireless channel width in use.
 - **MAC address** - The physical address of the Router, as seen from the WLAN.
 - **WDS Status** - The status of WDS connection.
- **WAN** - This field displays the current settings or information for the WAN, you can configure them in the **Network > WAN** page.
 - **MAC Address** - The physical address of the WAN port, as seen from the Internet.
 - **IP Address** - The current WAN (Internet) IP Address. This field will be blank or 0.0.0.0 if the IP Address is assigned dynamically and there is no connection to the Internet.
 - **Subnet Mask** - The subnet mask associated with the WAN IP Address.
 - **Default Gateway** - The Gateway currently used by the Router is shown here. When you use **Dynamic IP** as the connection Internet type, the **Renew** button will be displayed here. Click the **Renew** Button to obtain new IP parameters dynamically from the ISP. And if you have got an IP address, **Release** button will be displayed here. Click the **Release** button to release the IP address the Router has obtained from the ISP.
- **DNS Server** - The DNS (Domain Name System) server IP addresses currently used by the Router.
- **Traffic Statistics** - The Router's traffic statistics.
 - **Sent (Bytes)** - Traffic that counted in bytes has been sent out from the WAN port.
 - **Sent (Packets)** - Traffic that counted in packets has been sent out from the WAN port.
 - **Received (Bytes)** - Traffic that counted in bytes has been received out from the WAN port.
 - **Received (Packets)** - Traffic that counted in packets has been received out from the WAN port.
- **System Up Time** - The length of the time since the Router was last powered on or reset.

Click the **Refresh** button to get the latest status and settings of the Router.

5.3 Quick Setup

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

5.4 Working Mode

The Router supports five operation mode types: **AP**, **Router**, **Repeater**, **Bridge** and **Client**. Please select one you want. Click **Save** to save your choice, which is shown as Figure 5-3.

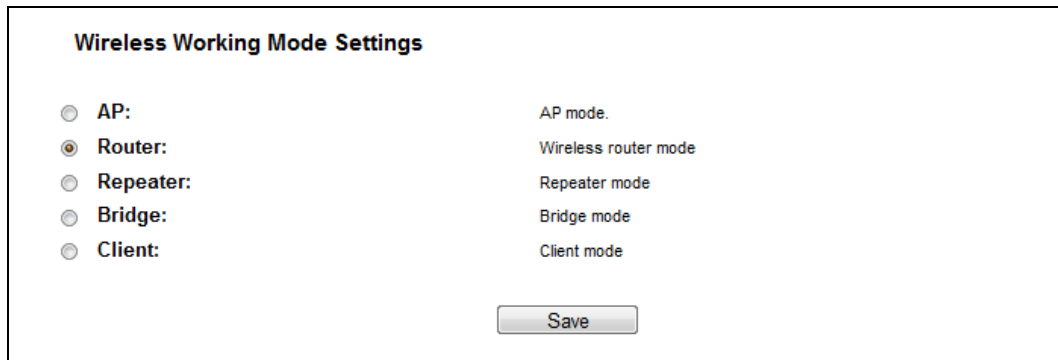


Figure 5-3 Wireless Working Mode Settings

- **AP** - The wireless access point mode.
- **Router** - The wireless Router Mode. In this mode, the device enables multi-user to share Internet via DSL/Cable Modem. The only wired port works as WAN.
- **Repeater** - The wireless Repeater Mode. It could extend the range of wireless network.
- **Bridge** - The wireless Bridge Mode. It could communicate with another wireless network.
- **Client** - The Client Mode. The computer connected by Ethernet could get access to an AP by Client mode.

Click **OK** in the following screen and then the Router will reboot and to work on Router Mode.

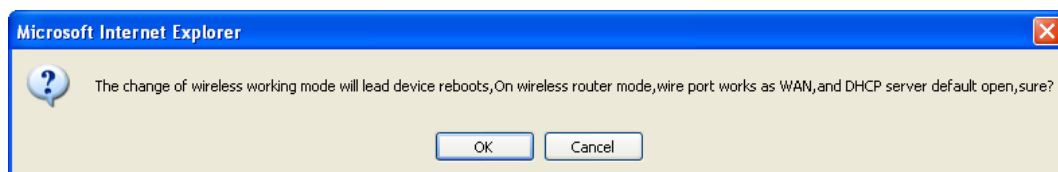


Figure 5-4

5.5 Network

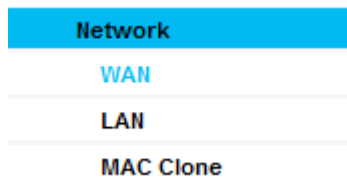


Figure 5-5 the Network menu

There are three submenus under the Network menu (shown in Figure 5-5): **WAN**, **LAN** and **MAC Clone**. Click any of them, and you will be able to configure the corresponding function.

5.5.1 WAN

Choose menu “**Network** → **WAN**”, and then you can configure the IP parameters of the WAN on the screen below.

1. If your ISP provides the DHCP service, please choose **Dynamic IP** type, and the Router will automatically get IP parameters from your ISP. You can see the page as follow (Figure 5-6):

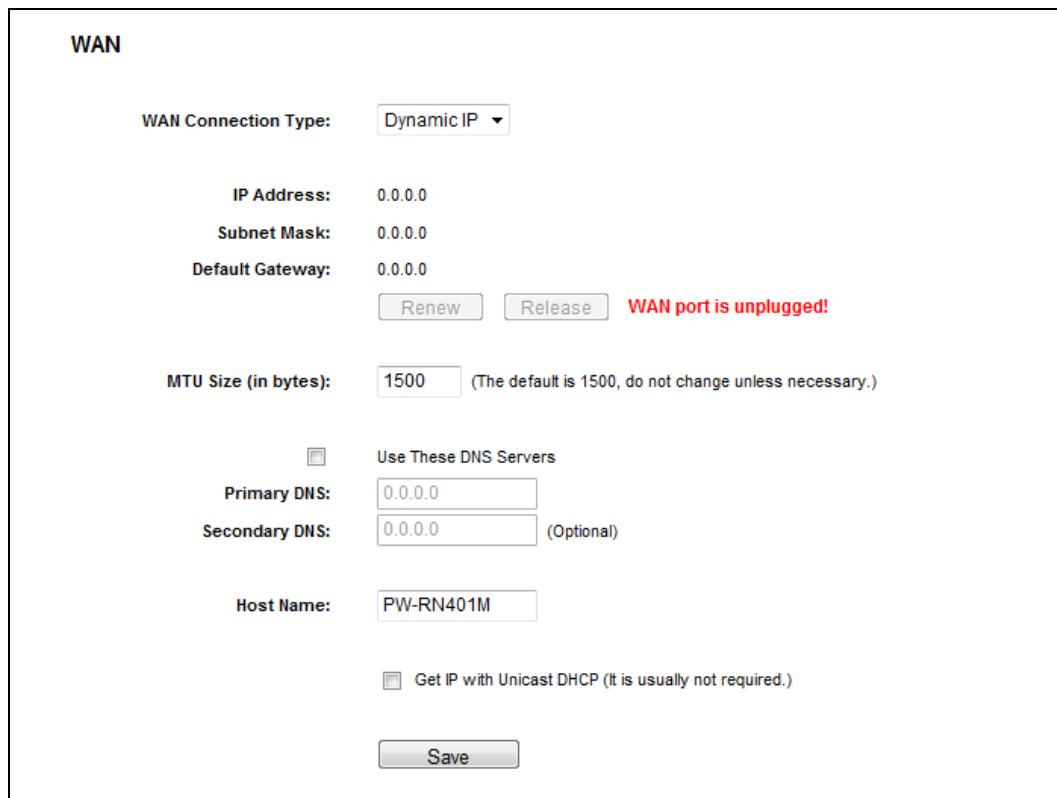
A screenshot of the WAN configuration page for Dynamic IP. The page title is 'WAN'. The 'WAN Connection Type' is set to 'Dynamic IP'. The 'IP Address', 'Subnet Mask', and 'Default Gateway' are all set to '0.0.0.0'. There are 'Renew' and 'Release' buttons. A red message says 'WAN port is unplugged!'. The 'MTU Size (in bytes)' is set to '1500' with a note '(The default is 1500, do not change unless necessary.)'. There is a checkbox for 'Use These DNS Servers' which is unchecked. The 'Primary DNS' and 'Secondary DNS' are both set to '0.0.0.0' with a note '(Optional)'. The 'Host Name' is set to 'PW-RN401M'. There is a checkbox for 'Get IP with Unicast DHCP (it is usually not required.)' which is unchecked. A 'Save' button is at the bottom.

Figure 5-6 WAN – Dynamic IP

This page displays the WAN IP parameters assigned dynamically by your ISP, including IP address, Subnet Mask, Default Gateway, etc. Click the **Renew** button to renew the IP parameters from your ISP. Click the **Release** button to release the IP parameters.

- **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.
- **Use These DNS Servers** - If your ISP gives you one or two DNS addresses, select **Use These DNS Servers** 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 error when you go to a website after entering the DNS addresses, it is likely that your DNS servers are set up improperly. You should contact your ISP to get DNS server addresses.

- **Host Name** - This option specifies the Host Name of the Router.
- **Get IP with Unicast DHCP** - A few ISPs' DHCP servers do not support the broadcast applications. If you cannot get the IP Address normally, you can choose this option. (It is rarely required.)

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

2. 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 as shown in Figure 5-7.

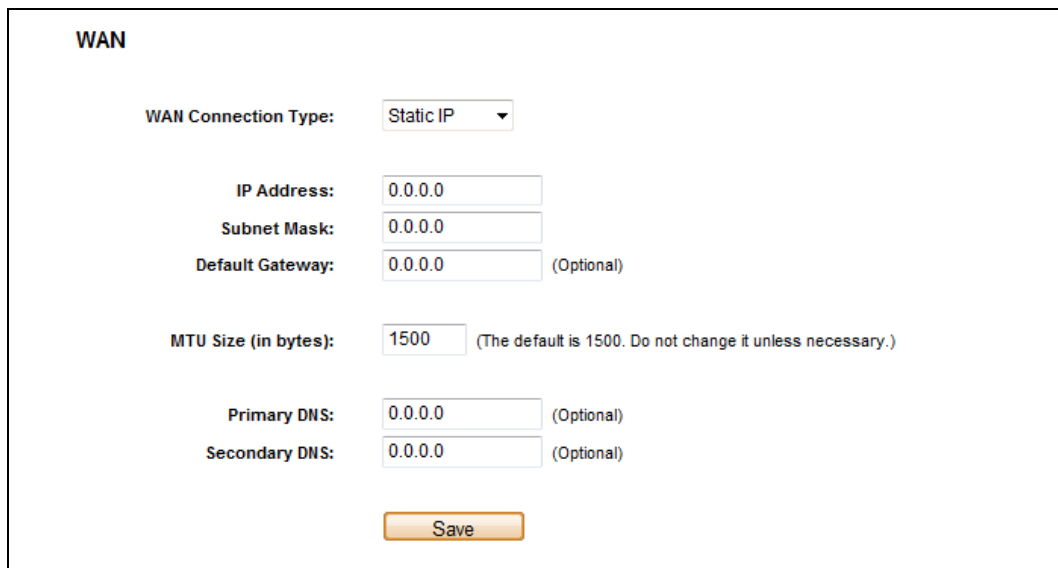


Figure 5-7 WAN - Static IP

- **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 is 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.
- **Primary/Secondary DNS** - (Optional) Enter one or two DNS addresses in dotted-decimal notation provided by your ISP.

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

3. If your ISP provides a PPPoE connection, select **PPPoE** option. Then you should enter the following parameters (Figure 5-8):

WAN

WAN Connection Type:

PPPoE Connection:

User Name:

Password:

Secondary Connection: Disabled Dynamic IP Static IP (For Dual Access)

Wan Connection Mode:

Connect on Demand
 Max Idle Time: minutes (0 means remaining active all the time.)

Connect Automatically

Time-based Connecting
 Period of Time: from : (HH:MM) to : (HH:MM)

Connect Manually
 Max Idle Time: minutes (0 means remaining active all the time.)

WAN port is unplugged!

Figure 5-8 WAN – PPPoE

- **User Name/Password** - Enter the User Name and Password provided by your ISP. These fields are case-sensitive.
- **Confirm Password** - Enter again the Password provided by your ISP to ensure the password you entered is correct.
- **Secondary Connection** - It's available only for PPPoE Connection. If your ISP provides an extra Connection type such as Dynamic/Static IP to connect to a local area network, then you can check the radio button of Dynamic/Static IP to activate this secondary connection.
 - **Disabled** - The Secondary Connection is disabled by default, so there is PPPoE connection only. This is recommended.

- **Dynamic IP** - You can check this radio button to use Dynamic IP as the secondary connection to connect to the local area network provided by ISP.
- **Static IP** - You can check this radio button to use Static IP as the secondary connection to connect to the local area network provided by ISP.
- **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. If you want your Internet connection keeps active all the time, 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.
- **Connect Automatically** - The connection can be re-established automatically when it was down.
- **Time-based Connecting** - The connection will only be established in the period from the start time to the end time (both are in HH:MM format).

 **Note:**

Only when you have configured the system time on "**System Tools** → **Time**" page, will the **Time-based Connecting** function can take effect.

- **Connect Manually** - 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.

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

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.

If you want to do some advanced configurations, please click the **Advanced** button, and the page shown in Figure 5-9 will then appear:

PPPoE Advanced Settings

MTU Size (in bytes): (The default is 1480, do not change unless necessary.)

Service Name:

AC Name:

Use IP address specified by ISP

ISP Specified IP Address:

Detect Online Interval: Seconds (0 ~ 120 seconds, the default is 0, 0 means not detecting.)

Use the following DNS Servers

Primary DNS:

Secondary DNS: (Optional)

Figure 5-9 PPPoE Advanced Settings

- **MTU Size** - The default MTU size is “1480” bytes, which is usually fine. It is not recommended that you change the default **MTU Size** unless required by your ISP.
- **Service Name/AC Name** - The service name and AC (Access Concentrator) name should not be configured unless you are sure it is necessary for your ISP. In most cases, leaving these fields blank will work.
- **ISP Specified IP Address** - If your ISP does not automatically assign IP addresses to the Router during login, please click “**Use IP address specified by ISP**” check box and enter the IP address provided by your ISP in dotted-decimal notation.
- **Detect Online Interval** - The Router will detect Access Concentrator online at every interval. The default value is “0”. You can input the value between “0” and “120”. The value “0” means no detect.
- **Primary DNS/Secondary DNS** - If your ISP does not automatically assign DNS addresses to the Router during login, please click “**Use the following DNS servers**” check box and enter the IP address in dotted-decimal notation of your ISP’s primary DNS server. If a secondary DNS server address is available, enter it as well.

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

4. If your ISP provides L2TP connection, please select **L2TP** option. Then you should enter the following parameters (Figure 5-10):

WAN

WAN Connection Type:

User Name:

Password:

WAN port is unplugged!

Dynamic IP Static IP

Server IP Address/Name:

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

Default Gateway: 0.0.0.0

DNS: 0.0.0.0 , 0.0.0.0

Internet IP Address: 0.0.0.0

Internet DNS: 0.0.0.0 , 0.0.0.0

MTU Size (in bytes): (The default is 1460. Do not change it unless necessary.)

Max Idle Time: minutes (0 means remaining active all the time.)

WAN Connection Mode: Connect on Demand
 Connect Automatically
 Connect Manually

Figure 5-10 WAN – L2TP

- **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.
- **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.
- **Connect Automatically** - Connect automatically after the Router is disconnected. To use this option, check the radio button.
- **Connect Manually** - You can configure the Router to make it 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 as soon as you attempt 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.

5. If your ISP provides PPTP connection, please select **PPTP** option. And you should enter the following parameters (Figure 5-11):

The screenshot shows the WAN configuration interface for a PPTP connection. The 'WAN Connection Type' is set to 'PPTP'. There are input fields for 'User Name' and 'Password'. Below these are 'Connect' and 'Disconnect' buttons, with a red warning message 'WAN port is unplugged!' next to the 'Disconnect' button. There are radio buttons for 'Dynamic IP' (selected) and 'Static IP'. Below these are input fields for 'Server IP Address/Name', 'IP Address', 'Subnet Mask', 'Default Gateway', and 'DNS'. There are also input fields for 'Internet IP Address' and 'Internet DNS'. At the bottom, there are input fields for 'MTU Size (in bytes)' (set to 1420) and 'Max Idle Time' (set to 15 minutes). There are radio buttons for 'WAN Connection Mode' with 'Connect on Demand' selected. A 'Save' button is located at the bottom of the form.

Figure 5-11 WAN – PPTP

- **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 and enter the domain name, you should also enter the DNS assigned by your ISP. And click the **Save** button.

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

- **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.
- **Connect Automatically** - Connect automatically after the Router is disconnected. To use this option, check the radio button.
- **Connect Manually** - You can configure the Router to make it 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 as soon as you attempt 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.

5.5.2 LAN

Choose menu "**Network** → **LAN**", and then you can configure the IP parameters of the LAN on the screen as below.

The screenshot shows a configuration window titled "LAN". It contains three input fields: "MAC Address" with the value "14-E6-E4-E2-EB-D0", "IP Address" with the value "192.168.1.254", and "Subnet Mask" with the value "255.255.255.0" and a dropdown arrow. Below these fields is a "Save" button.

Figure 5-12 LAN

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value can't be changed.
- **IP Address** - Enter the IP address of your Router in dotted-decimal notation (factory default: 192.168.1.254).

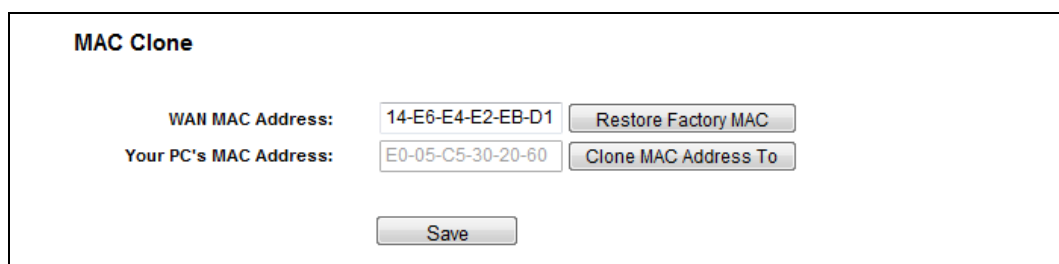
- **Subnet Mask** - An address code that determines the size of the network. Normally use 255.255.255.0 as the subnet mask.

 **Note:**

1. If you change the IP Address of LAN, you must use the new IP Address to login to the Router.
2. If the new LAN IP Address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, while the Virtual Server and DMZ Host will not take effect until they are re-configured.

5.5.3 MAC Clone

Choose menu “**Network** → **MAC Clone**”, and then you can configure the WAN MAC address on the screen below, as shown in Figure 5-13:



MAC Clone	
WAN MAC Address:	14-E6-E4-E2-EB-D1 <input type="button" value="Restore Factory MAC"/>
Your PC's MAC Address:	E0-05-C5-30-20-60 <input type="button" value="Clone MAC Address To"/>
<input type="button" value="Save"/>	

Figure 5-13 MAC Address Clone

Some ISPs require that you register the MAC Address of your adapter. Changes are rarely needed here.

- **WAN MAC Address** - This field displays the current MAC address of the WAN port. If your ISP requires you to register the MAC address, please enter the correct MAC address into this field in XX-XX-XX-XX-XX-XX format (X is any hexadecimal digit).
- **Your PC's MAC Address** - This field displays the MAC address of the PC that is managing the Router. If the MAC address is required, you can click the **Clone MAC Address To** button and this MAC address will fill in the **WAN MAC Address** field.

Click **Restore Factory MAC** to restore the MAC address of WAN port to the factory default value.

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

 **Note:**

1. Only the PC on your LAN can use the **MAC Address Clone** function.
2. If you change WAN MAC Address when the WAN connection is PPPoE, it will not take effect until the connection is re-established.

5.6 Wireless

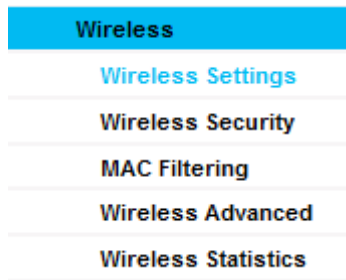


Figure 5-14 Wireless menu

There are five submenus under the Wireless menu (shown in Figure 5-14): **Wireless Settings**, **Wireless Security**, **MAC Filtering**, **Wireless Advanced** and **Wireless Statistics**. Click any of them, and you will be able to configure the corresponding function.

5.6.1 Wireless Settings

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

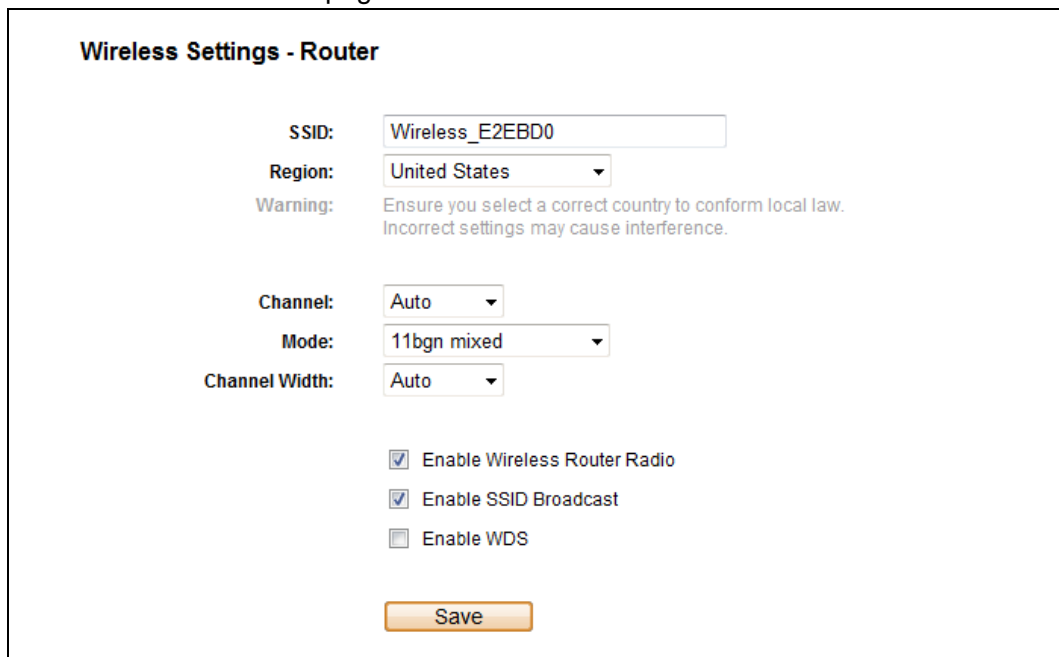
A screenshot of the "Wireless Settings - Router" configuration page. The page has a white background with a black border. At the top, the title "Wireless Settings - Router" is displayed. Below the title, there are several configuration fields: "SSID:" with a text input field containing "Wireless_E2EBD0"; "Region:" with a dropdown menu set to "United States"; a "Warning:" message: "Ensure you select a correct country to conform local law. Incorrect settings may cause interference."; "Channel:" with a dropdown menu set to "Auto"; "Mode:" with a dropdown menu set to "11bgn mixed"; and "Channel Width:" with a dropdown menu set to "Auto". Below these fields are three checkboxes: "Enable Wireless Router Radio" (checked), "Enable SSID Broadcast" (checked), and "Enable WDS" (unchecked). At the bottom center, there is a "Save" button.

Figure 5-15 Wireless Settings - Router

- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your networks name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.

- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Channel** - This field determines which operating frequency will be used. The default channel is set to **Auto**. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
- **Mode** - Select the desired mode. The default setting is 11bgn mixed.

- **11b only** - Select if all of your wireless clients are 802.11b.
- **11g only** - Select if all of your wireless clients are 802.11g.
- **11n only** - Select only if all of your wireless clients are 802.11n.
- **11bg mixed** - Select if you are using both 802.11b and 802.11g wireless clients.
- **11bgn mixed** - Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.

Select the desired wireless mode. 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 **802.11b/g/n**, and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.

- **Channel Width** - Select any channel width from the pull-down list. The default setting is automatic, which can automatically adjust the channel width for your clients.
- **Enable Wireless Router Radio** - The wireless radio of the Router can be enabled or disabled to allow wireless stations access. If enabled, the wireless stations will be able to access the Router. Otherwise, wireless stations will not be able to access the Router.
- **Enable SSID Broadcast** - If you select the **Enable SSID Broadcast** checkbox, the wireless router will broadcast its name (SSID) on the air.
- **Enable WDS** - You can select to enable WDS. With this function, the Router can bridge two or more WLANs. If this checkbox is selected, you will have to set the following parameters as shown below. Make sure the following settings are correct.

Enable WDS
 SSID(to be bridged):
 BSSID(to be bridged): Example:00-1D-0F-11-22-33

 Security Options:
 WEP Index:
 Authentication type:
 Password:

- **SSID (to be bridged)** - 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 bridged)** - 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.
- **Survey** - Click this button, you can survey the AP which runs in the current channel.
- **Security Options** - This option should be chosen according to the AP's security configuration. It is recommended that the security type is the same as your AP's security type.
- **WEP Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **Password** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

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

 **Note:**

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.
 - In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.
2. Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

5.6.2 Wireless Security

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

There are three wireless security modes supported by the Router: WEP (Wired Equivalent Privacy), WPA/WPA2 and WPA-PSK/WPA2-PSK.

Wireless Security

Disable Security

WEP

Type:

WEP Key Format:

Key Selected	WEP Key	Key Type
Key 1: <input checked="" type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 2: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 3: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 4: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>

WPA/WPA2

Version:

Encryption:

Radius Server IP:

Radius Port: (1-65535, 0 stands for default port 1812)

Radius Password:

Group Key Update Period: (in second, minimum is 30, 0 means no update)

WPA-PSK/WPA2-PSK

Version:

Encryption:

PSK Password:
(You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64.)

Group Key Update Period: (in second, minimum is 30, 0 means no update)

Figure 5-16 Wireless Security

- **Disable Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the Router without encryption. But it's strongly recommended to choose one of the following modes to enable security.
- **WEP** - It is based on the IEEE 802.11 standard.
 - **Type** - you can choose the type for the WEP security on the pull-down list. The default setting is **Automatic**, which can select **Shared Key** or **Open System** authentication type automatically based on the wireless station's capability and request.
 - **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.

- **WEP Key (Password)** - 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 network.
- **Key Type** - You can select the WEP key length (64-bit, or 128-bit, or 152-bit.) for encryption. "Disabled" means this WEP key entry is invalid.

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.

152-bit - You can enter 32 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not promoted) or 16 ASCII characters.

 **Note:**

If you do not set the key, the wireless security function is still disabled even if you have selected Shared Key as Authentication Type.

➤ **WPA /WPA2**

- **Version** - you can choose the version of the WPA security from the pull-down list. The default setting is **Automatic**, which can select **WPA** (Wi-Fi Protected Access) or **WPA2** (WPA version 2) automatically based on the wireless station's capability and request.
- **Encryption** - You can select **Automatic**, **TKIP** or **AES**.
- **Radius Server IP** - Enter the IP address of the Radius server.
- **Radius Port** - Enter the port that Radius server used.
- **Radius Password** - Enter the password for the Radius server.
- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

➤ **WPA-PSK/WPA2-PSK**- It's the WPA/WPA2 authentication type based on pre-shared passphrase.

- **Version** - you can choose the version of the WPA-PSK security on the drop-down list. The default setting is **Automatic (Recommended)**, which can select **WPA-PSK** (Pre-shared key of WPA) or **WPA2-PSK** (Pre-shared key of WPA) automatically based on the wireless station's capability and request.
- **Encryption** - When **WPA-PSK** or **WPA** is set as the Authentication Type, you can select **Automatic (Recommended)**, **TKIP** or **AES** as Encryption.

- **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters. The default password is the last unique eight numbers of each Router's MAC address

For **ASCII**, the key can be made up of any numbers 0 to 9 and any letters 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 also note the key is case sensitive, this means that upper and lower case keys will affect the outcome. It would also be a good idea to write down the key and all related wireless security settings.

- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

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

5.6.3 MAC Filtering

Choose menu "**Wireless** → **MAC Filtering**", and then you can control the wireless access by configuring the **Wireless MAC Filtering** function, as shown in Figure 5-17.

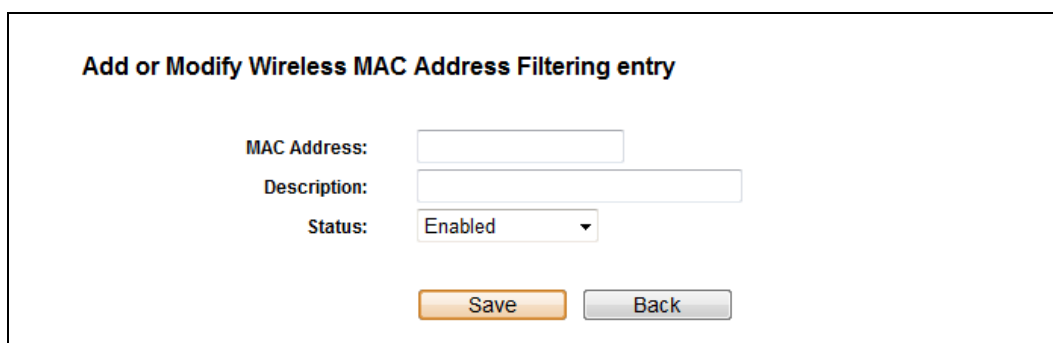


Figure 5-17 Wireless MAC Filtering

To filter wireless users by MAC Address, click **Enable**. The default setting is **Disabled**.

- **MAC Address** - The wireless station's MAC address that you want to access.
- **Status** - The status of this entry, either **Enabled** or **Disabled**.
- **Description** - A simple description of the wireless station.

To Add a Wireless MAC Address filtering entry, click the **Add New...** button. The "**Add or Modify Wireless MAC Address Filtering entry**" page will appear, shown in Figure 5-18:



Add or Modify Wireless MAC Address Filtering entry

MAC Address:

Description:

Status:

Figure 5-18 Add or Modify Wireless MAC Address Filtering entry

To add or modify a MAC Address Filtering entry, follow these instructions:

1. Enter the appropriate MAC Address into the **MAC Address** field. The format of the MAC Address is XX-XX-XX-XX-XX-XX (X is any hexadecimal digit). For example: 00-0A-EB-B0-00-0B.
2. Give a simple description for the wireless station in the **Description** field. For example: Wireless station A.
3. Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save this entry.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page.

Click the **Previous** button to return to the previous page.

For example: If you desire that the wireless station A with MAC address 00-0A-EB-B0-00-0B and the wireless station B with MAC address 00-0A-EB-00-07-5F are able to access the Router, but all the other wireless stations cannot access the Router, you can configure the **Wireless MAC Address Filtering** list by following these steps:

1. Click the **Enable** button to enable this function.
2. Select the radio button "Allow the stations specified by any enabled entries in the list to access" for **Filtering Rules**.

3. Delete all or disable all entries if there are any entries already.
4. Click the **Add New...** button.
 - 1) Enter the MAC address 00-0A-EB-B0-00-0B/00-0A-EB-00-07-5F in the **MAC Address** field.
 - 2) Enter wireless station A/B in the **Description** field.
 - 3) Select **Enabled** in the **Status** pull-down list.
 - 4) Click the **Save** button.
 - 5) Click the **Back** button.

The filtering rules that configured should be similar to the following list:

Filtering Rules				
<input type="radio"/> Deny the stations specified by any enabled entries in the list to access.				
<input checked="" type="radio"/> Allow the stations specified by any enabled entries in the list to access.				
ID	MAC Address	Status	Description	Modify
1	00-0A-EB-B0-00-0B	Enabled	wireless station A	Modify Delete
2	00-0A-EB-00-07-5F	Enabled	wireless station B	Modify Delete

5.6.4 Wireless Advanced

Choose menu “**Wireless** → **Wireless Advanced**”, and then you can configure the advanced settings of your wireless network.

Wireless Advanced

Transmit Power:

Beacon Interval: (40-1000)

RTS Threshold: (1-2346)

Fragmentation Threshold: (256-2346)

DTIM Interval: (1-255)

Enable WMM

Enable Short GI

Enable AP Isolation

Figure 5-19 Wireless Advanced

- **Transmit Power** - Here you can specify the transmit power of Router. You can select High, Middle or Low which you would like. High is the default setting and is recommended.
- **Beacon Interval** - Enter a value between 20-1000 milliseconds for Beacon Interval here. 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.

- **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.
- **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 because of excessive packets. 2346 is the default setting and is recommended.
- **DTIM Interval** - This value determines the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. You can specify the value between 1-255 Beacon Intervals. The default value is 1, which indicates the DTIM Interval is the same as Beacon Interval.
- **Enable WMM** - WMM function can guarantee the packets with high-priority messages being transmitted preferentially. It is strongly recommended enabled.
- **Enable Short GI** - This function is recommended for it will increase the data capacity by reducing the guard interval time.
- **Enabled AP Isolation** - This function isolate all connected wireless stations so that wireless stations cannot access each other through WLAN. This function will be disabled if WDS/Bridge is enabled.

 **Note:**

If you are not familiar with the setting items in this page, it's strongly recommended to keep the provided default values; otherwise it may result in lower wireless network performance.

5.6.5 Wireless Statistics

Choose menu “**Wireless** → **Wireless Statistics**”, and then you can see the MAC Address, Current Status, Received Packets and Sent Packets for each connected wireless station.

Wireless Statistics				
Current Connected Wireless Stations numbers: 1 <input type="button" value="Refresh"/>				
ID	MAC Address	Current Status	Received Packets	Sent Packets
1	E0-05-C5-30-20-60	WPA2-PSK	12028	15318
<input type="button" value="Previous"/>		<input type="button" value="Next"/>		

Figure 5-20 Wireless Statistics

- **MAC Address** - The connected wireless station's MAC address
- **Current Status** - The connected wireless station's running status, one of **STA-AUTH / STA-ASSOC / STA-JOINED / WPA / WPA-PSK / WPA2 / WPA2-PSK / AP-UP / AP-DOWN / Disconnected**
- **Received Packets** - Packets received by the station
- **Sent Packets** - Packets sent by the station

You cannot change any of the values on this page. To update this page and to show the current connected wireless stations, click on the **Refresh** button.

If the numbers of connected wireless stations go beyond one page, click the **Next** button to go to the next page and click the **Previous** button to return the previous page.

 **Note:**

This page will be refreshed automatically every 5 seconds.

5.7 DHCP

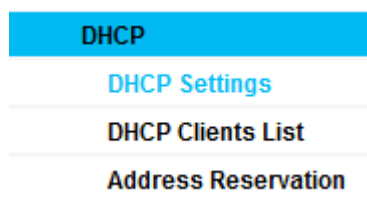


Figure 5-21 The DHCP menu

There are three submenus under the DHCP menu (shown in), **DHCP Settings**, **DHCP Clients List** and **Address Reservation**. Click any of them, and you will be able to configure the corresponding function.

5.7.1 DHCP Settings

Choose menu "**DHCP → DHCP Settings**", and then you can configure the DHCP Server on the page as shown in Figure 5-22. The Router is set up by default as a DHCP (Dynamic Host Configuration Protocol) server, which provides the TCP/IP configuration for all the PC(s) that are connected to the Router on the LAN.

DHCP Settings

DHCP Server: Disable Enable

Start IP Address:

End IP Address:

Address Lease Time: minutes (1~2880 minutes, the default value is 120)

Default Gateway: (optional)

Default Domain: (optional)

Primary DNS: (optional)

Secondary DNS: (optional)

Figure 5-22 DHCP Settings

- **DHCP Server - Enable or Disable** the DHCP server. If you disable the Server, you must have another DHCP server within your network or else you must configure the computer manually.
- **Start IP Address** - Specify an IP address for the DHCP Server to start with when assigning IP addresses. 192.168.1.100 is the default start address.
- **End IP Address** - Specify an IP address for the DHCP Server to end with when assigning IP addresses. 192.168.1.199 is the default end address.
- **Address Lease Time** - The **Address Lease Time** is the amount of time a network user will be allowed connection to the Router with their current dynamic IP Address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP Address. After the time is up, the user will be automatically assigned a new dynamic IP address. The range of the time is 1 ~ 2880 minutes. The default value is 120 minutes.
- **Default Gateway** (Optional) - It is suggested to input the IP address of the LAN port of the Router. The default value is 192.168.1.254.
- **Default Domain** (Optional) - Input the domain name of your network.
- **Primary DNS** - (Optional) Input the DNS IP address provided by your ISP or consult your ISP. Or consult your ISP.
- **Secondary DNS** (Optional) - Input the IP address of another DNS server if your ISP provides two DNS servers.

 **Note:**

To use the DHCP server function of the Router, you must configure all computers on the LAN as "Obtain an IP Address automatically".

5.7.2 DHCP Clients List

Choose menu “**DHCP** → **DHCP Clients List**”, and then you can view the information about the clients attached to the Router in the screen as shown in Figure 5-23.

DHCP Clients List				
ID	Client Name	MAC Address	Assigned IP	Lease Time
1	WIN-E7J65J1V3C0	6C-62-6D-F7-31-8D	192.168.1.100	01:38:01

[Refresh](#)

Figure 5-23 DHCP Clients List

- **Client Name** - The name of the DHCP client
- **MAC Address** - The MAC address of the DHCP client
- **Assigned IP** - The IP address that the Router has allocated to the DHCP client
- **Lease Time** - The time of the DHCP client leased. After the dynamic IP address has expired, a new dynamic IP address will be automatically assigned to the user.

You cannot change any of the values on this page. To update this page and to show the current attached devices, click the **Refresh** button.

5.7.3 Address Reservation

Choose menu “**DHCP** → **Address Reservation**”, and then you can view and add a reserved address for clients via the next screen (shown in Figure 5-24). When you specify a reserved IP address for a PC on the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to the servers that require permanent IP settings.

Address Reservation				
ID	MAC Address	Reserved IP Address	Status	Modify
1	00-0A-EB-B0-00-0B	192.168.1.25	Enabled	Modify Delete

[Add New...](#)
[Enable All](#)
[Disable All](#)
[Delete All](#)

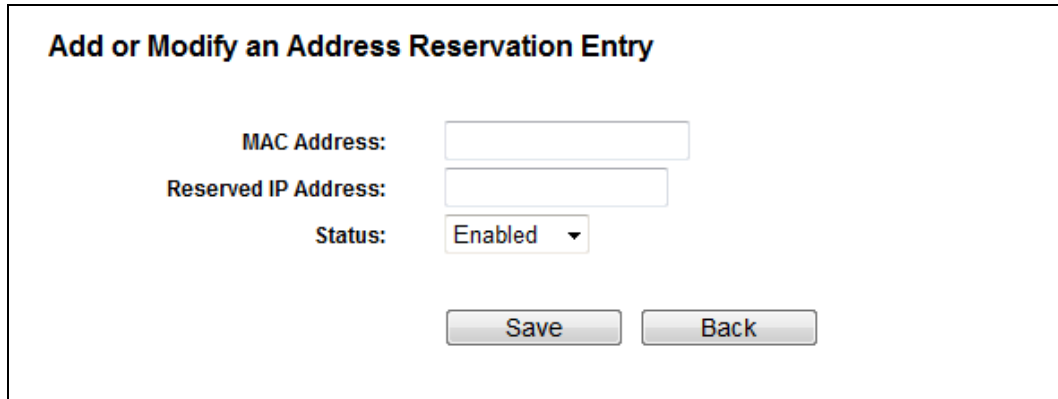
[Previous](#)
[Next](#)

Figure 5-24 Address Reservation

- **MAC Address** - The MAC address of the PC for which you want to reserve an IP address.
- **Reserved IP Address** - The IP address reserved for the PC by the Router.
- **Status** - The status of this entry, either **Enabled** or **Disabled**.

To Reserve an IP address:

1. Click the **Add New...** button. Then will pop-up.
2. Enter the MAC address (in XX-XX-XX-XX-XX-XX format.) and IP address (in dotted-decimal notation) of the computer for which you want to reserve an IP address.
3. Click the **Save** button.



Add or Modify an Address Reservation Entry

MAC Address:

Reserved IP Address:

Status:

Figure 5-25 Add or Modify an Address Reservation Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and Click the **Previous** button to return the previous page.

5.8 Forwarding

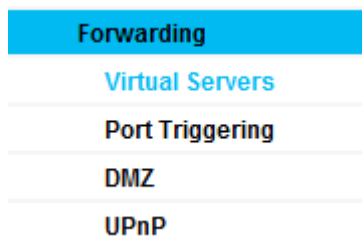


Figure 5-26 The Forwarding menu

There are four submenus under the Forwarding menu (shown in Figure 5-26): **Virtual Servers**, **Port Triggering**, **DMZ** and **UPnP**. Click any of them, and you will be able to configure the corresponding function.

5.8.1 Virtual Servers

Choose menu “**Forwarding** → **Virtual Servers**”, and then you can view and add virtual servers in the screen as shown in Figure 5-27. Virtual servers can be used for setting up public services on your LAN, such as DNS, Email and FTP. A virtual server is defined as a service port, and all requests from the Internet to this service port will be redirected to the computer specified by the server IP. Any PC that was used for a virtual server must have a static or reserved IP Address because its IP Address may be changed when using the DHCP function.

ID	Service Ports	IP Address	Protocol	Status	Modify
1	21	192.168.1.169	ALL	Enabled	Modify Delete

Figure 5-27 Virtual Servers

- **Service Port** - The numbers of External Ports. You can type a service port or a range of service ports (in XXX – YYY format, XXX is the start port number, YYY is the end port number).
- **IP Address** - The IP Address of the PC providing the service application.
- **Protocol** - The protocol used for this application, either **TCP**, **UDP**, or **All** (all protocols supported by the Router).
- **Status** - The status of this entry, either **Enabled** or **Disabled**.

To setup a virtual server entry:

1. Click the **Add New...** button, the next screen will pop-up as shown in Figure 5-28.
2. Select the service port you want to use from the **Common Service Port** list. If the **Common Service Port** list does not have the service that you want to use, type the service port number or service port range in the **Service Port** box.
3. Type the IP Address of the computer in the **IP Address** box.
4. Select the protocol used for this application, either **TCP**, **UDP**, or **All**.
5. Select the **Enable** to enable the virtual server.
6. Click the **Save** button.

The screenshot shows a web form titled "Add or Modify a Virtual Server Entry". The form contains the following fields and controls:

- Service Port:** A text input field with a placeholder "(XX-XX or XX)".
- IP Address:** A text input field.
- Protocol:** A dropdown menu with "ALL" selected.
- Status:** A dropdown menu with "Enabled" selected.
- Common Service Port:** A dropdown menu with "--Select One--" selected.
- Buttons:** "Save" and "Back" buttons at the bottom.

Figure 5-28 Add or Modify a Virtual Server Entry

 **Note:**

If your computer or server has more than one type of available service, please select another service, and enter the same IP Address for that computer or server.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and click the **Previous** button to return the previous page.

 **Note:**

If you set the service port of the virtual server as 80, you must set the Web management port on "**Security → Remote Management**" page to be any other value except 80 such as 8080. Otherwise there will be a conflict to disable the virtual server.

5.8.2 Port Triggering

Choose menu "**Forwarding → Port Triggering**", and then you can view and add port triggering in the screen as shown in Figure 5-29. Some applications require multiple connections, like Internet games, video conferencing, Internet calling and so on. These applications cannot work with a pure NAT Router. Port Triggering is used for some of these applications that can work with an NAT Router.

Port Triggering						
ID	Trigger Port	Trigger Protocol	Incoming Ports	Incoming Protocol	Status	Modify
1	47624	ALL	2300-2400	ALL	Enabled	Modify Delete

Figure 5-29 Port Triggering

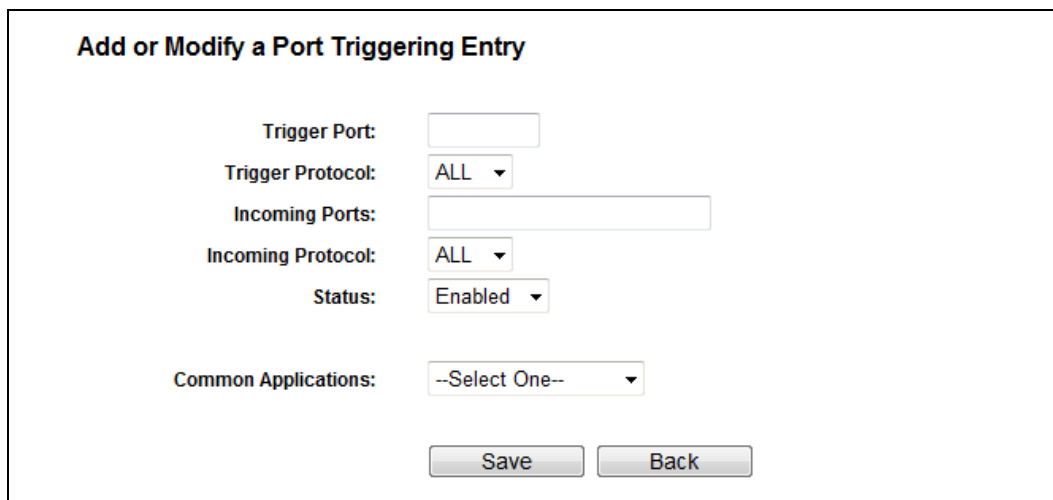
Once the Router is configured, the operation is as follows:

1. A local host makes an outgoing connection using a destination port number defined in the Trigger Port field.
 2. The Router records this connection, opens the incoming port or ports associated with this entry in the Port Triggering table, and associates them with the local host.
 3. When necessary, the external host will be able to connect to the local host using one of the ports defined in the **Incoming Ports** field.
- **Trigger Port** - The port for outgoing traffic. An outgoing connection using this port will trigger this rule.
 - **Trigger Protocol** - The protocol used for Trigger Ports, either **TCP**, **UDP**, or **All** (all protocols supported by the Router).
 - **Incoming Ports Range** - The port or port range used by the remote system when it responds to the outgoing request. A response using one of these ports will be forwarded to the PC that triggered this rule. You can input at most 5 groups of ports (or port sections). Every group of ports must be set apart with ",". For example, 2000-2038, 2050-2051, 2085, 3010-3030.
 - **Incoming Protocol** - The protocol used for Incoming Ports Range, either **TCP** or **UDP**, or **ALL** (all protocols supported by the Router).
 - **Status** - The status of this entry, either **Enabled** or **Disabled**.

To add a new rule, follow the steps below:

1. Click the **Add New...** button, the next screen will pop-up as shown in Figure 5-30.
2. Select a common application from the **Common Applications** drop-down list, then the **Trigger Port** field and the **Incoming Ports** field will be automatically filled. If the **Common Applications** do not have the application you need, enter the **Trigger Port** and the **Incoming Ports** manually.
3. Select the protocol used for Trigger Port from the **Trigger Protocol** drop-down list, either **TCP**, **UDP**, or **All**.
4. Select the protocol used for Incoming Ports from the **Incoming Protocol** drop-down list, either **TCP** or **UDP**, or **All**.

5. Select **Enable** in **Status** field.
6. Click the **Save** button to save the new rule.



Add or Modify a Port Triggering Entry

Trigger Port:

Trigger Protocol: ALL ▾

Incoming Ports:

Incoming Protocol: ALL ▾

Status: Enabled ▾

Common Applications: --Select One-- ▾

Save Back

Figure 5-30 Add or Modify a Port Triggering Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled.

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries.

Note:

1. When the trigger connection is released, the corresponding opening ports will be closed.
2. Each rule is allowed to be used only by one host on LAN synchronously. The trigger connection of other hosts on LAN will be refused.
3. Incoming Port Range cannot overlap each other.

5.8.3 DMZ

Choose menu "**Forwarding** → **DMZ**", and then you can view and configure DMZ host in the screen as shown in Figure 5-31. 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

Current DMZ Status: Enable Disable

DMZ Host IP Address:

Figure 5-31 DMZ

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

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

Note:

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

5.8.4 UPnP

Choose menu **“Forwarding → UPnP”**, and then you can view the information about **UPnP** (Universal Plug and Play) in the screen as shown in Figure 5-32. The UPnP feature allows the devices, such as Internet computers, to access the local host resources or devices as needed. UPnP devices can be automatically discovered by the UPnP service application on the LAN.

UPnP

Current UPnP Status: **Enabled**

Current UPnP Settings List

ID	App Description	External Port	Protocol	Internal Port	IP Address	Status
<input type="button" value="Refresh"/>						

Figure 5-32 UPnP

- **Current UPnP Status** - UPnP can be enabled or disabled by clicking the **Enable** or **Disable** button.
- **Current UPnP Settings List** - This table displays the current UPnP information.
 - **App Description** - The description provided by the application in the UPnP request.
 - **External Port** - The external port the Router opens for the application.
 - **Protocol** - The type of protocol the Router opens for the application.
 - **Internal Port** - The Internal port the Router opens for local host.
 - **IP Address** - The IP address of the UPnP device that is currently accessing the Router.

- **Status** - The status of the port is displayed here. "Enabled" means that the port is still active. Otherwise, the port is inactive.

Click **Refresh** to update the Current UPnP Settings List.

5.9 Security

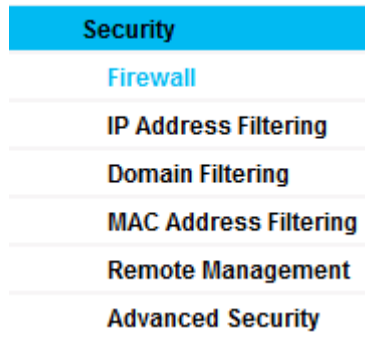


Figure 5-33 The Security menu

There are six submenus under the Security menu as shown in Figure 5-33: **Firewall**, **IP Address Filtering**, **Domain Filtering**, **MAC Address Filtering**, **Remote Management**, and **Advanced Security**. Click any of them, and you will be able to configure the corresponding function.

5.9.1 Firewall

Using the Firewall page, you can turn the general firewall switch on or off. The default setting for the switch is off. If the general firewall switch is off, even if IP Address Filtering, DNS Filtering and MAC Filtering are enabled, their settings are ineffective.

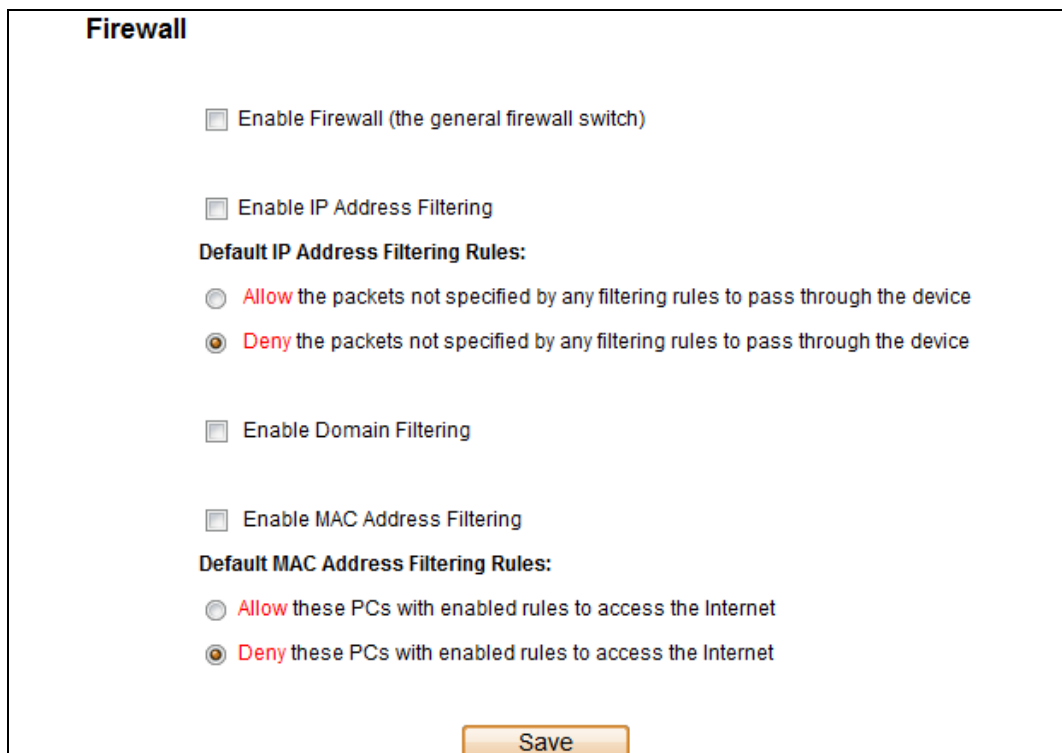
A screenshot of the 'Firewall' configuration page. The title 'Firewall' is at the top left. Below it are several settings: 'Enable Firewall (the general firewall switch)' with an unchecked checkbox; 'Enable IP Address Filtering' with an unchecked checkbox; 'Default IP Address Filtering Rules:' with two radio button options: 'Allow the packets not specified by any filtering rules to pass through the device' (unchecked) and 'Deny the packets not specified by any filtering rules to pass through the device' (checked); 'Enable Domain Filtering' with an unchecked checkbox; 'Enable MAC Address Filtering' with an unchecked checkbox; 'Default MAC Address Filtering Rules:' with two radio button options: 'Allow these PCs with enabled rules to access the Internet' (unchecked) and 'Deny these PCs with enabled rules to access the Internet' (checked). At the bottom center is a 'Save' button.

Figure 5-34 Firewall Settings

- **Enable Firewall** - the general firewall switch is on or off.
- **Enable IP Address Filtering** - set IP Address Filtering is enabled or disabled. There are two default filtering rules of IP Address Filtering, either Allow or Deny passing through the router.
- **Enable Domain Filtering** - set Domain Filtering is enabled or disabled.
- **Enable MAC Filtering** - set MAC Address Filtering is enabled or disabled. You can select the default filtering rules of MAC Address Filtering, either Allow or Deny accessing the router.

5.9.2 IP Address Filtering

The IP address Filtering feature allows you to control Internet Access by specific users on your LAN based on their IP addresses. The IP address filtering is set on this page:

Figure 5-35 IP address Filtering

To disable the IP Address Filtering feature, keep the default setting, **Disabled**. To set up an IP Address Filtering entry, click **Enable** Firewall and **Enable** IP Address Filtering on the Firewall page, and click the **Add New...** button. The page "**Add or Modify an IP Address Filtering entry**" will appear shown in Figure 5-36:

Figure 5-36 Add or Modify an IP Address Filtering Entry

To create or modify an IP Address Filtering entry, please follow these instructions:

1. **Effective Time** - Enter a range of time in HHMM format, which point to the range time for the entry to take effect. For example, 0803 - 1705, the entry will take effect from 08:03 to 17:05.
2. **LAN IP Address** - Enter a LAN IP Address or a range of LAN IP addresses in the field, in dotted-decimal notation format. For example, 192.168.1.20 - 192.168.1.30. Keep the field open, which means all LAN IP Addresses have been put into the field.
3. **LAN Port** - Enter a LAN Port or a range of LAN ports in the field. For example, 1030 - 2000. Keep the field open, which means all LAN ports have been put into the field.
4. **WAN IP Address** - Enter a WAN IP Address or a range of WAN IP Addresses in the field, in dotted-decimal notation format. For example, 61.145.238.6 – 61.145.238.47. Keep the field open, which means all WAN IP Addresses have been put into the field.
5. **WAN Port** - Enter a WAN Port or a range of WAN Ports in the field. For example, 25 – 110. Keep the field open, which means all WAN Ports have been put into the field.
6. **Protocol** - Select which protocol is to be used, either **TCP**, **UDP**, or **All** (all protocols supported by the router).
7. **Action** - Select either **Allow** or **Deny** through the router.
8. **Status** - Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
9. Click the **Save** button to save this entry.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled.

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries.

You can change the entry's order as desired. Fore entries are before hind entries. Enter the ID number in the first box you want to move and another ID number in second box you want to move to, and then click the **Move** button to change the entry's order.

Click the **Next** button to the next page and click the **Previous** button to return to the previous page.

For example: If you desire to block E-mail received and sent by the IP Address 192.168.1.7 on your local network, and to make the PC with IP Address 192.168.1.8 unable to visit the website of IP Address 202.96.134.12, while other PC(s) have no limit you should specify the following IP address filtering list:

ID	Effective time	LAN IP Address	LAN Port	WAN IP Address	WAN Port	Protocol	Action	Status	Modify
1	0000-2400	192.168.1.7-	25-	-	-	ALL	Deny	Enabled	Modify Delete
2	0000-2400	192.168.1.7-	110-	-	-	ALL	Deny	Enabled	Modify Delete
3	0000-2400	192.168.1.8-	-	202.96.134.12-	-	ALL	Deny	Enabled	Modify Delete

5.9.3 Domain Filtering

The Domain Filtering page allows you to control access to certain websites on the Internet by specifying their domains or key words.

Domain Filtering

Firewall Settings (You can change them on Firewall page)

Enable Firewall: **Disabled**

Enable Domain Filtering: **Disabled**

ID	Effective time	Domain Name	Status	Modify
<input type="button" value="Add New..."/> <input type="button" value="Enable All"/> <input type="button" value="Disable All"/> <input type="button" value="Delete All"/>				
<input type="button" value="Previous"/> <input type="button" value="Next"/>				

Figure 5-37 Domain Filtering

Before adding a Domain Filtering entry, you must ensure that **Enable** Firewall and **Enable** Domain Filtering have been selected on the Firewall page. To Add a Domain filtering entry, click the **Add New...** button. The page "**Add or Modify a Domain Filtering entry**" will appear, shown in Figure 5-38:

Add or Modify a Domain Filtering Entry

Effective Time: -

Domain Name:

Status: ▼

Figure 5-38 Add or Modify a Domain Filtering entry

To add or modify a Domain Filtering entry, follow these instructions:

1. **Effective Time** - Enter a range of time in HHMM format specifying the time for the entry to take effect. For example, if you enter: 0803 - 1705, than the entry will take effect from 08:03 to 17:05.
2. **Domain Name** - Type the domain or key word as desired in the field. A blank in the domain field means all websites on the Internet. For example: www.xxyy.com.cn, .net.
3. **Status** - Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save this entry.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enabled All** button to make all entries enabled.

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries

Click the **Next** button to go to the next page and the **Previous** button to return to the previous page.

For example: if you want to block the PC(s) on your LAN to access websites www.xxyy.com.cn, www.aabbcc.com and websites with .net in the end on the Internet while no limit for other websites, you should specify the following Domain filtering list:

ID	Effective time	Domain Name	Status	Modify
1	0000-2400	www.xxyy.com.cn	Enabled	Modify Delete
2	0000-2400	www.aabbcc.com.cn	Enabled	Modify Delete

5.9.4 MAC Address Filtering

Like the IP Address Filtering page, the MAC Address Filtering page allows you to control access to the Internet by users on your local network based on their MAC Address.

MAC Address Filtering

Firewall Settings (You can change them on Firewall page)

Enable Firewall: Disabled

Enable MAC Address Filtering: Disabled

Default Filtering Rules: Deny these PCs with the enabled rules to access the Internet.

ID	MAC Address	Description	Status	Modify
<div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> Add New... Enable All Disable All Delete All </div> <div style="display: flex; justify-content: center;"> Previous Next </div>				

Figure 5-39 MAC address Filtering

Before setting up MAC Filtering entries, you must ensure that **Enable Firewall** and **Enable MAC Filtering** have been selected on the Firewall page. To Add a MAC Address filtering entry, clicking

the **Add New...** button. The page "**Add or Modify a MAC Address Filtering entry**" will appear, shown in Figure 5-40:

The screenshot shows a web form titled "Add or Modify a MAC Address Filtering Entry". It contains three input fields: "MAC Address:" with an empty text box, "Description:" with an empty text box, and "Status:" with a dropdown menu currently showing "Enabled". At the bottom of the form are two buttons: "Save" and "Back".

Figure 5-40 Add or Modify a MAC Address Filtering entry

To add or modify a MAC Address Filtering entry, follow these instructions:

1. Enter the appropriate MAC Address into the **MAC Address** field. The format of the MAC Address is XX-XX-XX-XX-XX-XX (X is any hexadecimal digit). For example: 00-0E-AE-B0-00-0B.
2. Type the description of the PC in the **Description** field. For example: John's PC.
3. **Status** - Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save this entry.

To add additional entries, repeat steps 1-4.

When finished, click the **Return** button to return to the **MAC Address Filtering** page.

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled.

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries

Click the **Next** button to go to the next page and click the **Previous** button to return to the previous page.

Fox example: If you want to block the PC with MAC addresses 00-0A-EB-00-07-BE and 00-0A-EB-00-07-5F to access the Internet, first, enable the **Firewall** and **MAC Address Filtering** on the **Firewall** page, then, you should specify the Default MAC Address Filtering Rule "**Deny these PC(s) with effective rules to access the Internet**" on the Firewall page and the following MAC address filtering list on this page:

ID	MAC Address	Description	Status	Modify
1	00-0A-EB-00-07-BE	John's Computer	Enabled	Modify Delete
2	00-0A-EB-00-07-5F	Alice's Computer	Enabled	Modify Delete

5.9.5 Remote Management

You can configure the Remote Management function on this page. This feature allows you to manage your Router from a remote location, via the Internet.

Remote Management

Web Management Port:

Remote Management IP Address: (Enter 255.255.255.255 for all)

Figure 5-41 Remote Management

- **Web Management Port** - Web browser access normally uses the standard HTTP service port 80. This router's default remote management Web port number is 80. For greater security, you can change the remote management Web interface to a custom port by entering that number in this box provided. Choose a number between 1024 and 65534, but do not use the number of any common service port.
- **Remote Management IP Address** - This is the current address you will use when accessing your router from the Internet. The default IP Address is 0.0.0.0. It means this function is disabled. To enable this function, change the default IP Address to another IP Address as desired.

To access the router, you will type your router's WAN IP Address into your browser's Address (in IE) or Location (in Navigator) box, followed by a colon and the custom port number. For example, if your Router's WAN address is 202.96.12.8 and you use port number 8080, enter in your browser: `http://202.96.12.8:8080`. You will be asked for the router's password. After successfully entering the password, you will be able to access the router's Web-based utility.

 **Note:**

Be sure to change the router's default password to a very secure password.

5.9.6 Advanced Security

Using Advanced Security page, you can protect the router from being attacked by TCP-SYN Flood, UDP Flood and ICMP-Flood from LAN.

Advanced Security

Packets Statistics Interval (5 ~ 60): Seconds

DoS Protection: Disable Enable

Enable ICMP-FLOOD Attack Filtering

ICMP-FLOOD Packets Threshold (5 ~ 3600): Packets/s

Enable UDP-FLOOD Filtering

UDP-FLOOD Packets Threshold (5 ~ 3600): Packets/s

Enable TCP-SYN-FLOOD Attack Filtering

TCP-SYN-FLOOD Packets Threshold (5 ~ 3600): Packets/s

Ignore Ping Packet From WAN Port

Forbid Ping Packet From LAN Port

Figure 5-42 Advanced Security settings

- **Packets Statistic interval (5 ~ 60)** - The default value is 10. Select a value between 5 and 60 seconds in the pull-down list. The **Packets Statistic interval** value indicates the time section of the packets statistic. The result of the statistic used for analysis by **SYN Flood**, **UDP Flood** and **ICMP-Flood**.
- **DoS protection - Enable** or **Disable** the DoS protection function. Only when it is enabled, will the flood filters be effective.
- **Enable ICMP-FLOOD Attack Filtering - Enable** or **Disable** the **ICMP-FLOOD** Attack Filtering.
- **ICMP-FLOOD Packets threshold: (5 ~ 3600)** - The default value is 50. Enter a value between 5 ~ 3600 packets. When the current **ICMP-FLOOD** Packets numbers is beyond the set value, the router will start up the blocking function immediately.
- **Enable UDP-FLOOD Filtering - Enable** or **Disable** the **UDP-FLOOD** Filtering.
- **UDP-FLOOD Packets threshold: (5 ~ 3600)** - The default value is 50. Enter a value between 5 ~ 3600 packets. When the current **UPD-FLOOD** Packets numbers is beyond the set value, the router will start up the blocking function immediately.
- **Enable TCP-SYN-FLOOD Attack Filtering - Enable** or **Disable** the **TCP-SYN- FLOOD** Attack Filtering.

- **TCP-SYN-FLOOD Packets threshold: (5 ~ 3600)** - The default value is 50. Enter a value between 5 ~ 3600 packets. When the current **TCP-SYN-FLOOD** Packets numbers is beyond the set value, the router will start up the blocking function immediately.
- **Ignore Ping Packet from WAN Port - Enable or Disable** ignore ping packet from WAN port. The default is disabled. If enabled, the ping packet from the Internet cannot access the router.
- **Forbid Ping Packet from LAN Port - Enable or Disable** forbidding Ping Packet to access the router from the LAN port. The default value is disabled. If enabled, the ping packet from the LAN port cannot access the router. (Defends against some viruses)

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

Click the **Blocked DoS Host Table** button to display the DoS host table by blocking. The page will appear:

Blocked DoS Host List			
ID	Host IP Address	Host MAC Address	Modify
1	192.168.1.25	00-0A-EB-B0-00-0B	Delete

Figure 5-43 Blocked DoS Host Table

This page shows **Host IP Address** and **Host MAC Address** for each host blocked by the router.

- **Host IP Address-** The IP address that blocked by DoS are displayed here.
- **Host MAC Address -** The MAC address that blocked by DoS are displayed here.

To update this page and to show the current blocked host, click on the **Refresh** button.

Click the **Clear All** button to clear all displayed entries. After the table is empty the blocked host will regain the capability to access Internet.

Click the **Return** button to return to the **Advanced Security** page.

5.10 Static Routing

A static route is a pre-determined path that network information must travel to reach a specific host or network. To add or delete a route, work in the area under the Static Routing page.

Static Routing List					
ID	Destination IP Address	Subnet Mask	Default Gateway	Status	Modify
1	202.108.37.42	255.255.255.255	202.108.36.1	Disabled	Modify Delete

Figure 5-44 Static Routing

To add static routing entries:

1. Click the **Add New** button.
2. Enter the following data:
 - **Destination IP Address** - The **Destination IP Address** is the address of the network or host that you want to assign to a static route.
 - **Subnet Mask** - The **Subnet Mask** determines which portion of an IP Address is the network portion, and which portion is the host portion.
 - **Gateway** - This is the IP Address of the gateway device that allows for contact between the router and the network or host.
3. Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save it.

Add or Modify a Static Route Entry	
Destination IP Address:	<input type="text"/>
Subnet Mask:	<input type="text"/>
Default Gateway:	<input type="text"/>
Status:	Enabled ▾
<input type="button" value="Save"/> <input type="button" value="Back"/>	

Figure 5-45 Add or Modify a Static Route Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable All** button to make all entries enabled.

Click the **Disabled All** button to make all entries disabled.

Click the **Delete All** button to delete all entries

5.11 IP QoS

You can configure the IP QoS function on this page.

IP QoS

Enable IP QoS

Choose BandWidth Type:

Bandwidth Apply: Kbps

ID	IP Range	Mode	Bandwidth	Description	Enable	Clear
1	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
2	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
3	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
4	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
5	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
6	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
7	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>
8	192.168.1. - 192.168.1.	Minimum Bandwidth Guarantee			<input type="checkbox"/>	<input type="button" value="Clear"/>

Figure 5-46 IP QoS

- **Enable IP QoS** - Enable or disable the function of IP QoS.
- **Choose BandWidth Type** - Select the network connection type from the drop-down list.
- **Bandwidth Apply** - The bandwidth you get. If you are not clear about that, please contact with your ISP for help.
- **IP Range** - IP range of this entry.
- **Mode** - There are two types of mode: Minimum Bandwidth Guarantee and Maximum Bandwidth Limit.
- **Bandwidth** - The bandwidth you supply to this entry.
- **Description** - The description for this entry.

Click **Enable** to enable this entry.

Click the **Clear** button to clear a single entry.

Click the **Clear All** button to clear all entries.

Click the **Save** button to save all configurations.

 **Note:**

1. The conversion relation of bandwidth: 1Mbps = 1000Kbps.
2. Please choose the Network Connection Type and set the bandwidth according to your Network. If you are not clear about that, please contact with your ISP for help.
3. If no IP QoS item is enabled, the Bandwidth Apply won't be effective.
4. IP address range for different entries could not have intersection with each other.
5. After the configurations, click the **Save** button for the change to take effect.

5.12 IP & MAC Binding Setting

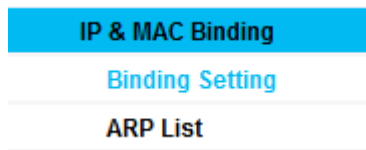


Figure 5-47 the IP & MAC Binding menu

There are two submenus under the IP & MAC Binding menu: **Binding Setting** and **ARP List**. Click any of them, and you will be able to scan or configure the corresponding function. The detailed explanations for each submenu are provided below.

5.12.1 Binding Setting

This page displays the IP & MAC Binding Setting table; you can operate it in accord with your desire.

Binding Settings

ARP Binding: Disable Enable

ID	MAC Address	IP Address	Bind	Modify
1	00-E0-4C-00-07-BE	192.168.1.4	<input checked="" type="checkbox"/>	Modify Delete

Current No. 1 Page

Figure 5-48 IP & MAC Binding Setting

- **MAC Address** - The MAC address of the controlled computer in the LAN.
- **IP Address** - The assigned IP address of the controlled computer in the LAN.
- **Bind** - Whether or not enable the ARP binding.
- **Modify** - Edit or delete item.

When you want to add or modify an IP & MAC Binding entry, you can click the **Add New** button or **Modify** button, and then you will go to the next page. This page is used for adding or modifying an IP & MAC Binding entry.

IP & MAC Binding Settings

Bind:

MAC Address:

IP Address:

Save Back

Figure 5-49 IP & MAC Binding Setting (Add & Modify)

To add IP & MAC Binding entries:

1. Click the **Add New..** button.
2. Enter the MAC Address and IP Address.
3. Select the Bind checkbox.
4. Click the **Save** button to save it.

To modify or delete an existing entry:

1. Find the desired entry in the table.
2. Click **Modify** or **Delete** as desired on the **Modify** column.

To find an existing entry:

1. Click the **Find** button (shown in Figure 5-48).
2. Enter the MAC Address or IP Address.
3. Enter the **Find** button in the next page (shown in Figure 5-50).

Find IP & MAC Binding Entry

MAC Address:

IP Address:

ID	MAC Address:	IP Address:	Bind	Link
1	00-E0-4C-00-07-BE	192.168.1.4	<input checked="" type="checkbox"/>	To page

Find Back

Figure 5-50 Find IP & MAC Binding Entry

Click the **Enable All** button to make all entries enabled.

Click the **Delete All** button to delete all entries.

5.12.2 ARP List

To manage the computer, you could observe the computers in the LAN by checking the relationship of MAC address and IP address on the ARP list, and you could configure the items on the ARP list also. This page displays the ARP List; it shows all the existing IP & MAC Binding entries.

ARP List				
ID	MAC Address	IP Address	Status	Configure
1	00-E0-4C-00-07-BE	192.168.1.4	Bound	Load Delete

Figure 5-51 ARP List

- **MAC Address** - The MAC address of the controlled computer in the LAN.
 - **IP Address** - The assigned IP address of the controlled computer in the LAN.
 - **Status** - Enabled or Disabled of the MAC address and IP address binding.
 - **Configure** - Load or delete item.
 - **Load** - Load the item to the IP & MAC Binding list.
 - **Delete** - Delete the item.
1. Click the **Bind All** button to bind all the current items, available after enable.
 2. Click the **Load All** button to load all items to the IP & MAC Binding list.
 3. Click the **Refresh** button to refresh all items.

Note:

An item could not be loaded to the IP & MAC Binding list if the IP address of the item has been loaded before. Error warning will prompt as well. Likewise, "Load All" only loads the items without interference to the IP & MAC Binding list.

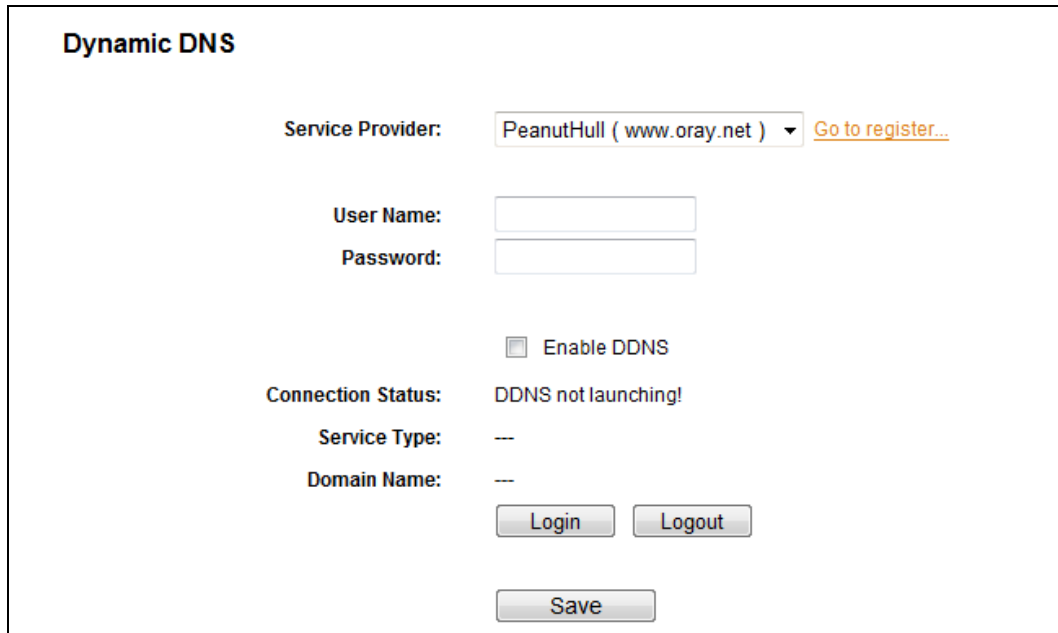
5.13 Dynamic DNS

The router offers a Dynamic Domain Name System (**DDNS**) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP Address. It is useful when you are hosting your own website, FTP server, or other server behind the router. Before using this feature, you need to

sign up for DDNS service providers such as www.dyndns.org, www.oray.net or www.comexe.cn. The Dynamic DNS client service provider will give you a password or key.

5.13.1 Oray.net DDNS

If your selected dynamic DNS **Service Provider** is www.oray.net, the page will appear as shown in Figure 5-52:



Dynamic DNS

Service Provider: PeanutHull (www.oray.net) [Go to register...](#)

User Name:

Password:

Enable DDNS

Connection Status: DDNS not launching!

Service Type: --

Domain Name: --

Figure 5-52 Oray.net 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. Click the **Login** button to login the DDNS service.
 - **Connection Status** - The status of the DDNS service connection is displayed here.
 - **Domain Name** - The domain names are displayed here.

Click **Logout** to logout the DDNS service.

5.14 System Tools

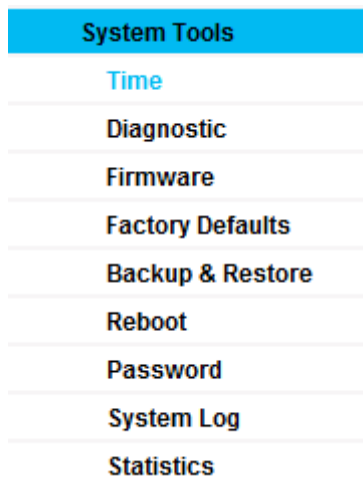


Figure 5-53 The System Tools menu

There are nine submenus under the System Tools menu: **Time**, **Diagnostic**, **Firmware**, **Factory Defaults**, **Backup and Restore**, **Reboot**, **Password**, **System Log** and **Statistics**. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

5.14.1 Time

You can set time manually or get GMT from the Internet for the router on this page:

Time Settings

Time zone:

Date: (MM/DD/YY)

Time: (HH/MM/SS)

NTP Server I: (Optional)

NTP Server II: (Optional)

Note: Click the "GET GMT" to update the time from the internet with the pre-defined servers or entering the customized server(IP Address or Domain Name) in the above frames.

Figure 5-54 Time settings

- **Time Zone** - Select your local time zone from this pull-down list.
- **Date** - Enter your local date in MM/DD/YY into the right blanks.
- **Time** - Enter your local time in HH/MM/SS into the right blanks.

To set time manually, follow the steps below:

1. Select your local time zone.

2. Enter the **Date** in Month/Day/Year format.
3. Enter the **Time** in Hour/Minute/Second format.
4. Click **Save**.

For automatic time synchronization:

1. Enter the address of the **NTP Server I** or **NTP Server II**.
2. Click the **Get GMT** button to get GMT time from Internet if you have connected to Internet.

 **Note:**

This setting will be used for some time-based functions such as firewall. You must specify your time zone once you login to the router successfully, if not, the time limited on these functions will not take effect.

- The time will be lost if the router is turned off.
- The router will obtain GMT automatically from Internet if it has already connected to Internet.

5.14.2 Diagnostic

Choose menu “**System Tools** → **Diagnostic**”, you can transact Ping or Traceroute function to check connectivity of your network in the following screen.

Diagnostic Tools

Diagnostic Parameters

Diagnostic Tool: Ping Traceroute

IP Address/ Domain Name:

Ping Count: (1-50)

Ping Packet Size: (4-1472 Bytes)

Ping Timeout: (100-2000 Milliseconds)

Traceroute Max TTL: (1-30)

Diagnostic Results

The Router is ready.

Figure 5-55 Diagnostic Tools

- **Diagnostic Tool** - Check the radio button to select one diagnostic tool.
 - **Ping** - This diagnostic tool troubleshoots connectivity, reachability, and name resolution to a given host or gateway.
 - **Traceroute** - This diagnostic tool tests the performance of a connection.

 **Note:**

You can use ping/traceroute to test both numeric IP address or domain name. If pinging/tracerouting the IP address is successful, but pinging/tracerouting the domain name is not, you might have a name resolution problem. In this case, ensure that the domain name you are specifying can be resolved by using Domain Name System (DNS) queries.

- **IP Address/Domain Name** - Type the destination IP address (such as 192.168.1.254) or Domain name (such as www.baidu.com).
- **Pings Count** - The number of Ping packets for a Ping connection.
- **Ping Packet Size** - The size of Ping packet.
- **Ping Timeout** - Set the waiting time for the reply of each Ping packet. If there is no reply in the specified time, the connection is overtime.
- **Traceroute Max TTL** - The max number of hops for a Traceroute connection.

Click **Start** to check the connectivity of the Internet.

The **Diagnostic Results** page displays the result of diagnosis.

If the result is similar to the following screen, the connectivity of the Internet is fine.

```
Diagnostic Results
-----
Pinging 192.168.1.254 with 64 bytes of data:
: Reply from 192.168.1.254: bytes=64 time=1 TTL=64 seq=1
: Reply from 192.168.1.254: bytes=64 time=1 TTL=64 seq=2
: Reply from 192.168.1.254: bytes=64 time=1 TTL=64 seq=3
: Reply from 192.168.1.254: bytes=64 time=1 TTL=64 seq=4
: Ping statistics for 192.168.1.254
: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
: Approximate round trip times in milliseconds:
: Minimum = 1, Maximum = 1, Average = 1
```

Figure 5-56 Diagnostic Results

 **Note:**

Only one user can use this tool at one time. "Ping Count", "Ping Packet Size" and "Ping Timeout" are Ping Parameters. "Traceroute Max TTL" is Traceroute Parameter.

5.14.3 Firmware

The page allows you to upgrade the latest version firmware to keep your router up-to-date.

Firmware Upgrade

File:

Firmware Version: 4.18.77 Build 120518 Rel.35024n

Hardware Version: PW-RN401M 1.0 00000000

Figure 5-57 Firmware Upgrade

New firmware is posted at our website and can be downloaded for free. If the router is not experiencing difficulties, there is no need to upgrade firmware, unless the new firmware supports a new feature you need.

 **Note:**

1. When you upgrade the router's firmware, you will lose current configuration settings, so make sure you backup the router's settings before you upgrade its firmware.
2. Make sure that your computer is connected to the Internet through the cable when you upgrade the firmware. To upgrade through wireless connection is not allowed.
3. Set your IP address as static IP before upgrading.

To upgrade the router's firmware, follow these instructions:

1. Download the latest firmware upgrade file from our website.
 2. Enter or select the path name where you save the downloaded file on the computer into the **File** blank.
 3. Click the **Upgrade** button.
- **Firmware Version** - Displays the current firmware version.
 - **Hardware Version** - Displays the current hardware version. The hardware version of the upgrade file must accord with the current hardware version.

 **Note:**

The firmware version must correspond to the hardware. The upgrade process takes a few minutes and the Router will restart automatically when the upgrade is completed. It is important to keep power on during the entire process. Loss of power during the upgrade could damage the Router.

5.14.4 Factory Defaults

This page allows you to restore the factory default settings for the router.

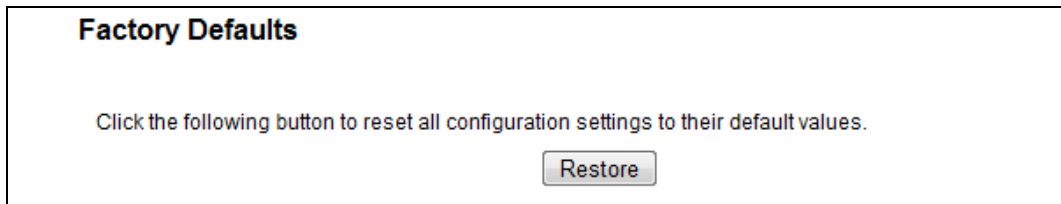


Figure 5-58 Restore Factory Default

Click the **Restore** button to reset all configuration settings to their default values.

- The default User Name: admin
- The default Password: admin

 **Note:**

Any settings you have saved will be lost when the default settings are restored.

5.14.5 Backup & Restore

This page allows you to save current configuration of router as backup or restore the configuration file you saved before.

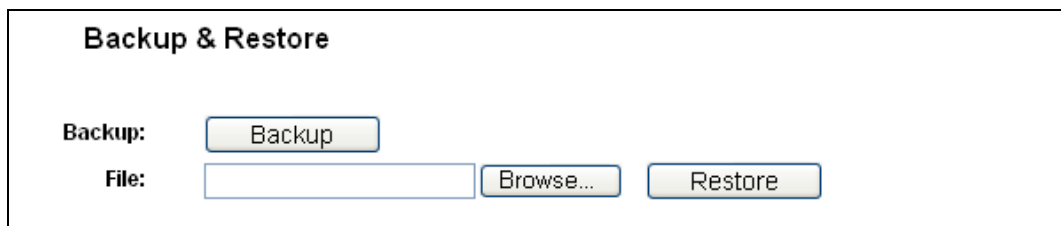


Figure 5-59 Backup & Restore Configuration

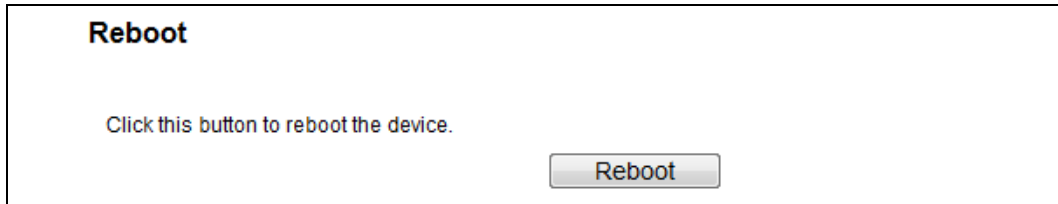
- Click the **Backup** button to save all configuration settings as a backup file in your local computer.
- To restore the router's configuration, follow these instructions:
 - Click the **Browse** button to select the backup file which you want to restore.
 - Click the **Restore** button.

 **Note:**

The current configuration will be covered with the uploading configuration file. The restoration process lasts for 20 seconds and the router will restart automatically. Keep the router on during the restoring process to prevent any damage.

5.14.6 Reboot

This page allows you to reboot the router.



The screenshot shows a web interface titled "Reboot". Below the title, there is a text instruction: "Click this button to reboot the device." To the right of this text is a button labeled "Reboot".

Figure 5-60 Reboot the router

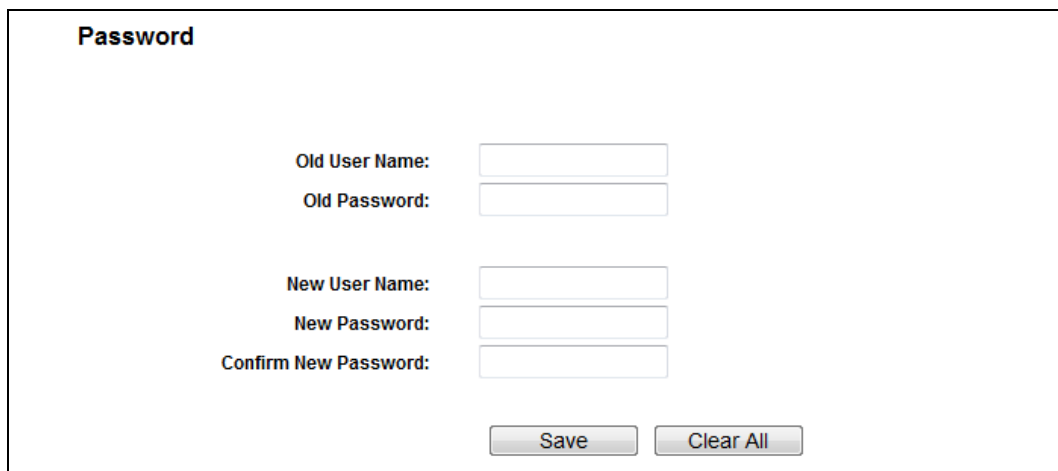
Click the **Reboot** button to reboot the router.

Some settings of the router will take effect only after rebooting, which include:

- Change LAN IP Address. (System will reboot automatically)
- MAC Clone (system will reboot automatically)
- DHCP service function.
- Static address assignment of DHCP server.
- Web Service Port of the router.
- Upgrade the firmware of the router (system will reboot automatically).
- Restore the router's settings to factory default (system will reboot automatically).

5.14.7 Password

This page allows you to change the factory default user name and password of the router.



The screenshot shows a web interface titled "Password". It contains several input fields and two buttons. The fields are labeled: "Old User Name:", "Old Password:", "New User Name:", "New Password:", and "Confirm New Password:". Below the fields are two buttons: "Save" and "Clear All".

Figure 5-61 Password

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

 **Note:**

The new user name and password must not exceed 14 characters in length and must not include any spaces. Enter the new Password twice to confirm it.

Click the **Save** button when finished.

Click the **Clear All** button to clear all.

5.14.8 System Log

This page allows you to query the logs of the router.

System Log		
Index	Level	Log Content
2	INFO	15091:DHCP: 1.0x98d6bb474f5d, 192.168.1.102, ACK in request.
1	INFO	15055:System: Logs were cleared.

Figure 5-62 System Log

The router can keep logs of all traffic. You can query the logs to find what happened to the router.

Click the **Refresh** button to refresh the logs.

Click the **Clear All** button to clear all the logs.

5.14.9 Statistics

The Statistics page displays the network traffic of each PC in LAN, including total traffic and traffic of the last **Packets Statistic interval** seconds.

Statistics							
Current Statistics Status:		Disabled		<input type="button" value="Enable"/>			
Packets Statistics Interval(5-60):		10		Seconds			
		<input type="checkbox"/> Auto-refresh		<input type="button" value="Refresh"/>			
Sorted Rules:		Sorted by IP Address		<input type="button" value="Reset All"/> <input type="button" value="Delete All"/>			
IP Address/ MAC Address	Total		Current			Modify	
	Packets	Bytes	Packets	Bytes	ICMP Tx		UDP Tx
The current list is empty.							
5		entries per page.		Current No. 1		page	
		<input type="button" value="Previous"/>		<input type="button" value="Next"/>			

Figure 5-63 Statistics

- **Current Statistics Status** - Enable or Disable. The default value is disabled. To enable, click the **Enable** button. If disabled, the function of DoS protection in Security settings will be ineffective.
- **Packets Statistics Interval** - The default value is 10. Select a value between 5 and 60 seconds in the pull-down list. The Packets Statistic interval indicates the time section of the packets statistic.
- **Sorted Rules** - Here displays sort as desired.

Statistics Table:

IP Address		The IP Address displayed with statistics
Total	Packets	The total amount of packets received and transmitted by the router.
	Bytes	The total amount of bytes received and transmitted by the router.
Current	Packets	The total amount of packets received and transmitted in the last Packets Statistic interval seconds.
	Bytes	The total amount of bytes received and transmitted in the last Packets Statistic interval seconds.
	ICMP Tx	The total amount of the ICMP packets transmitted to WAN in the last Packets Statistic interval seconds.
	UDP Tx	The total amount of the UDP packets transmitted to WAN in the last Packets Statistic interval seconds.
	TCP SYN Tx	The total amount of the TCP SYN packets transmitted to WAN in the last Packets Statistic interval seconds.

Click the **Save** button to save the **Packets Statistic interval** value.

Click the **Auto-refresh** checkbox to refresh automatically.

Click the **Refresh** button to refresh immediately.

Chapter 6. Configuration for Repeater Mode

This chapter will show each Web page's key functions and the configuration way for Repeater Mode of PW-RN401M.

6.1 Login

After your successful login, you can configure and manage the device. There are main menus on the left of the web-based utility. Submenus will be available after you click one of the main menus. On the right, there are the corresponding explanations and instructions.



Status
Quick Setup
Working Mode
Network
Wireless
DHCP
System Tools

Figure 6-1

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

6.2 Status

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

Status	
Firmware Version:	4.18.77 Build 120518 Rel.35024n
Hardware Version:	PW-RN401M 1.0 00000000
LAN	
MAC Address:	14-E6-E4-E2-EB-D0
IP Address:	192.168.1.254
Subnet Mask:	255.255.255.0
Wireless	
Wireless Mode:	Repeater Mode
Name (SSID):	Network1
MAC Address:	14-E6-E4-E2-EB-D0
System Up Time:	0 day(s) 00:00:14
	<input type="button" value="Refresh"/>

Figure 6-2 Status

- **Firmware Version** - The version information of the Router's firmware.
- **Hardware Version** - The version information of the Router's hardware.
- **LAN** - This field displays the current settings or information for the LAN, you can configure them in the **Network > LAN** page.
 - **MAC address** - The physical address of the Router, as seen from the LAN.
 - **IP address** - The LAN IP address of the Router.
 - **Subnet Mask** - The subnet mask associated with LAN IP address.
- **Wireless** - This field displays basic information or status for wireless function, you can configure them in the **Wireless > Wireless Settings** page.
 - **Wireless Mode** - The current wireless working mode in use.
 - **Name (SSID)** - The SSID of Root AP.
 - **MAC address** - The physical address of the Router, as seen from the WLAN.
- **System Up Time** - The length of the time since the Router was last powered on or reset.

Click the **Refresh** button to get the latest status and settings of the Router.

6.3 Quick Setup

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

6.4 Working Mode

The Router supports five operation mode types: **AP**, **Router**, **Repeater**, **Bridge** and **Client**. Please select one you want. Click **Save** to save your choice, which is shown as Figure 4-3.

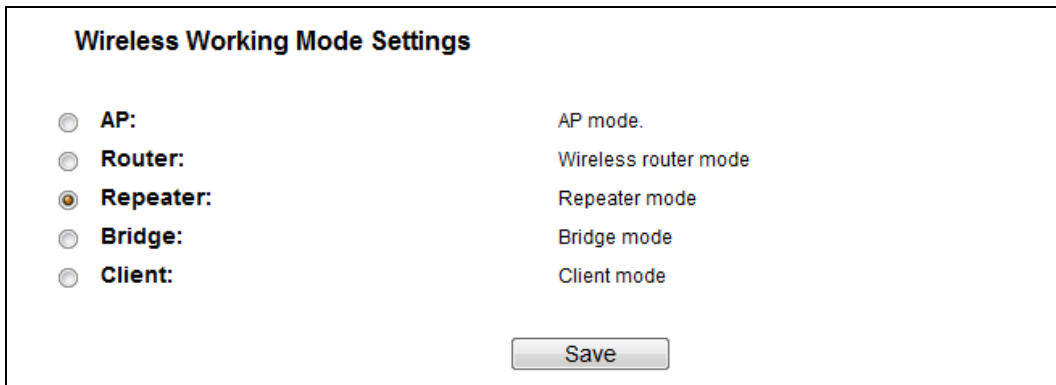


Figure 6-3 Working Mode

- **AP** - The wireless access point mode.
- **Router** - The wireless Router Mode. In this mode, the device enables multi-user to share Internet via DSL/Cable Modem. The only wired port works as WAN.
- **Repeater** - The wireless Repeater Mode. It could extend the range of wireless network.
- **Bridge** - The wireless Bridge Mode. It could communicate with another wireless network.
- **Client** - The Client Mode. The computer connected by Ethernet could get access to an AP by Client mode.

Click **OK** in the following screen and then the Router will reboot and to work on Repeater Mode.

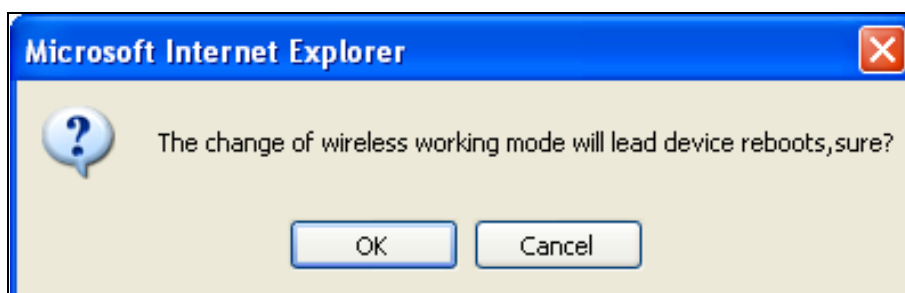


Figure 6-4

6.5 Network

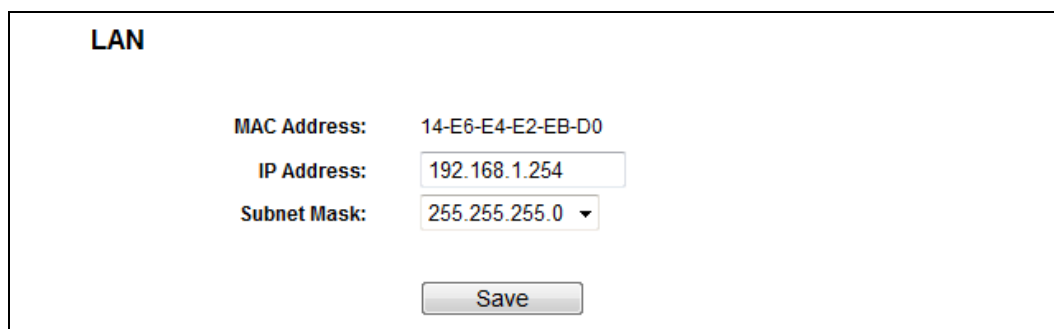


Figure 6-5 the Network menu

There is only one submenu under the Network menu (shown in Figure 6-5): **LAN**.

6.5.1 LAN

Choose menu “**Network** → **LAN**”, and then you can configure the IP parameters of the LAN on the screen as below.



LAN

MAC Address: 14-E6-E4-E2-EB-D0

IP Address: 192.168.1.254

Subnet Mask: 255.255.255.0

Save

Figure 6-6 LAN

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value can't be changed.
- **IP Address** - Enter the IP address of your Router in dotted-decimal notation (factory default: 192.168.1.254).
- **Subnet Mask** - An address code that determines the size of the network. Normally use 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 login to the Router.
2. If the new LAN IP Address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, while the Virtual Server and DMZ Host will not take effect until they are re-configured.

6.6 Wireless

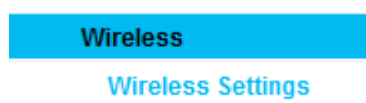


Figure 6-7 Wireless menu

There is one submenu under the Wireless menu (shown in Figure 6-7): **Wireless Settings**. Click it, and you will be able to configure the corresponding function.

6.6.1 Wireless Settings

Choose menu “**Wireless** → **Wireless Settings**”, and then you can configure the basic settings for the wireless network on this page.

Wireless Settings - Repeater

SSID:

MAC of AP: Example:00-1D-0F-11-22-33

Region:

Warning: Ensure you select a correct country to conform local law.
Incorrect settings may cause interference.

(Please choose Main AP's type of encryption, and input the wireless password)

Security Options:

WEP Key Index:

Authentication Type:

PassWord:

Figure 6-8 Wireless Settings - Repeater

- **SSID** - The SSID of AP that you want to access.
- **MAC of AP** - The MAC address of AP that you want to access.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Survey** - Click this button, you can search the AP which runs in the environment.
- **Security Options** - This option should be chosen according to the security configuration of the AP you want to access. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authentication type of the Root AP.
- **Password** - If the AP your router is going to connect need password, you need to fill the password in this blank.

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

 **Note:**

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.

- In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.
2. Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

6.7 DHCP

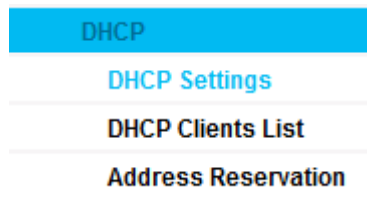


Figure 6-9 The DHCP menu

There are three submenus under the DHCP menu (shown in Figure 6-9), **DHCP Settings**, **DHCP Clients List** and **Address Reservation**. Click any of them, and you will be able to configure the corresponding function.

6.7.1 DHCP Settings

Choose menu “**DHCP** → **DHCP Settings**”, and then you can configure the DHCP Server on the page as shown in Figure 6-10. The Router is set up by default as a DHCP (Dynamic Host Configuration Protocol) server, which provides the TCP/IP configuration for all the PC(s) that are connected to the Router in the LAN.

DHCP Settings

DHCP Server: Disable Enable

Start IP Address:

End IP Address:

Address Lease Time: minutes (1~2880 minutes, the default value is 120)

Default Gateway: (optional)

Default Domain: (optional)

Primary DNS: (optional)

Secondary DNS: (optional)

Figure 6-10 DHCP Settings

- **DHCP Server - Enable or Disable** the DHCP server. If you disable the Server, you must have another DHCP server within your network or else you must configure the computer manually.
- **Start IP Address** - Specify an IP address for the DHCP Server to start with when assigning IP addresses. 192.168.1.100 is the default start address.
- **End IP Address** - Specify an IP address for the DHCP Server to end with when assigning IP addresses. 192.168.1.199 is the default end address.
- **Address Lease Time** - The **Address Lease Time** is the amount of time a network user will be allowed connection to the Router with their current dynamic IP Address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP Address. After the time is up, the user will be automatically assigned a new dynamic IP address. The range of the time is 1 ~ 2880 minutes. The default value is 120 minutes.
- **Default Gateway (Optional)** - It is suggested to input the IP address of the LAN port of the Router. The default value is 192.168.1.254.
- **Default Domain (Optional)** - Input the domain name of your network.
- **Primary DNS** - (Optional) Input the DNS IP address provided by your ISP or consult your ISP.
- **Secondary DNS (Optional)** - Input the IP address of another DNS server if your ISP provides two DNS servers.

 **Note:**

To use the DHCP server function of the Router, you must configure all computers on the LAN as "Obtain an IP Address automatically".

6.7.2 DHCP Clients List

Choose menu "DHCP → DHCP Clients List", and then you can view the information about the clients attached to the Router in the screen as shown in Figure 6-11.

DHCP Clients List				
ID	Client Name	MAC Address	Assigned IP	Lease Time
1	113ea910272d	8C-89-A5-6F-B3-AD	192.168.1.103	01:58:24
2	---	00-0A-EB-B0-00-0B	192.168.1.100	Permanent

Figure 6-11 DHCP Clients List

- **Client Name** - The name of the DHCP client
- **MAC Address** - The MAC address of the DHCP client

- **Assigned IP** - The IP address that the Router has allocated to the DHCP client
- **Lease Time** - The time of the DHCP client leased. After the dynamic IP address has expired, a new dynamic IP address will be automatically assigned to the user.

You cannot change any of the values on this page. To update this page and to show the current attached devices, click the **Refresh** button.

6.7.3 Address Reservation

Choose menu “**DHCP → Address Reservation**”, and then you can view and add a reserved address for clients via the next screen (shown in Figure 6-12).When you specify a reserved IP address for a PC on the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to the servers that require permanent IP settings.



Figure 6-12 Address Reservation

- **MAC Address** - The MAC address of the PC for which you want to reserve an IP address.
- **Reserved IP Address** - The IP address reserved for the PC by the Router.
- **Status** - The status of this entry either **Enabled** or **Disabled**.

To Reserve an IP address:

1. Click the **Add New...** button. Then Figure 4-19 will pop-up.
2. Enter the MAC address (in XX-XX-XX-XX-XX-XX format) and IP address (in dotted-decimal notation) of the computer for which you want to reserve an IP address.
3. Click the **Save** button.

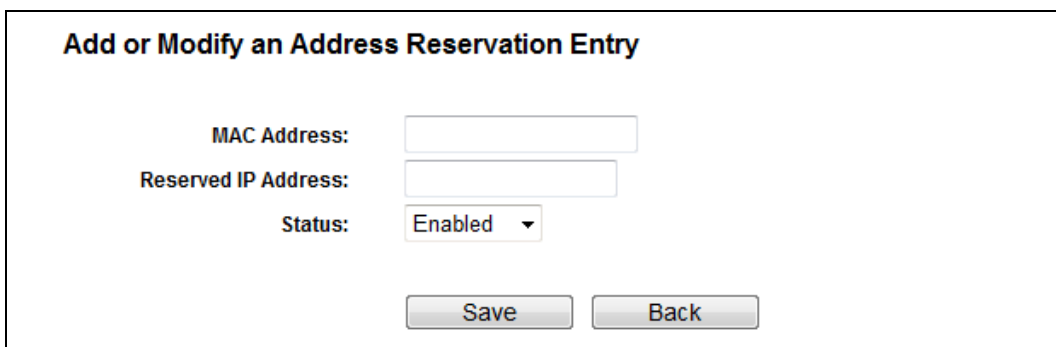


Figure 6-13 Add or Modify an Address Reservation Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and Click the **Previous** button to return the previous page.

6.8 System Tools



Figure 6-14 The System Tools menu

Choose menu "**System Tools**", and then you can see the submenus under the main menu: **Diagnostic, Firmware, Factory Defaults, Backup & Restore, Reboot, Password, and System Log**. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

6.8.1 Diagnostic

Choose menu "**System Tools → Diagnostic**", and then you can transact Ping or Traceroute function to check connectivity of your network in the following screen.

Diagnostic Tools

Diagnostic Parameters

Diagnostic Tool: Ping Traceroute

IP Address/ Domain Name:

Ping Count: (1-50)

Ping Packet Size: (4-1472 Bytes)

Ping Timeout: (100-2000 Milliseconds)

Traceroute Max TTL: (1-30)

Diagnostic Results

The Router is ready.

Figure 6-15 Diagnostic Tools

- **Diagnostic Tool** - Check the radio button to select one diagnostic tool.
 - **Ping** - This diagnostic tool troubleshoots connectivity, reachability, and name resolution to a given host or gateway.
 - **Traceroute** - This diagnostic tool tests the performance of a connection.

 **Note:**

You can use ping/traceroute to test both numeric IP address or domain name. If pinging/tracerouting the IP address is successful, but pinging/tracerouting the domain name is not, you might have a name resolution problem. In this case, ensure that the domain name you are specifying can be resolved by using Domain Name System (DNS) queries.

- **IP Address/Domain Name** - Type the destination IP address (e.g. 192.168.1.254) or Domain name (e.g. our website).
- **Pings Count** - The number of Ping packets for a Ping connection. The default is 4.
- **Ping Packet Size** - The size of Ping packet. The default is 64.
- **Ping Timeout** - Set the waiting time for the reply of each Ping packet. If there is no reply in the specified time, the connection is overtime. The default is 800.

- **Traceroute Max TTL** - The max number of hops for a Traceroute connection. The default is 20.

Click **Start** to check the connectivity of the Internet.

The **Diagnostic Results** page displays the result of diagnosis.

If the result is similar to the following screen, the connectivity of the Internet is fine.

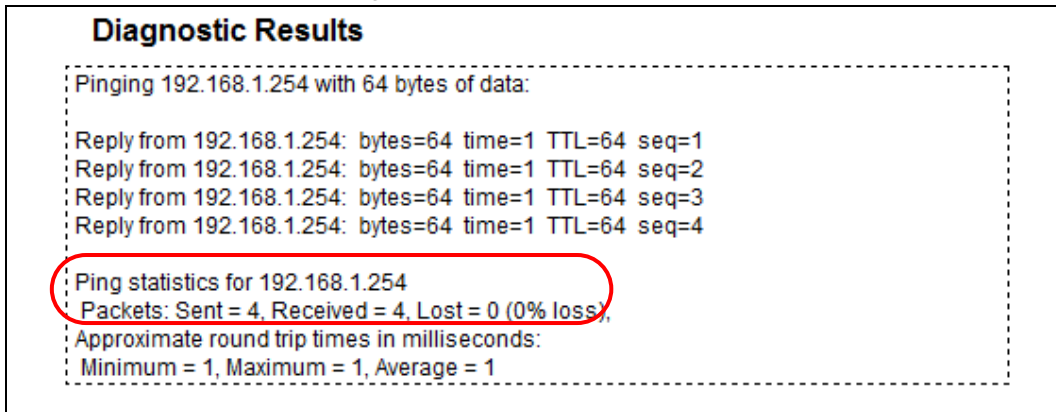


Figure 6-16 Diagnostic Results

Note:

Only one user can use this tool at one time. Options “Number of Pings”, “Ping Size” and “Ping Timeout” are used for **Ping** function. Option “Tracert Hops” are used for **Tracert** function.

6.8.2 Firmware

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

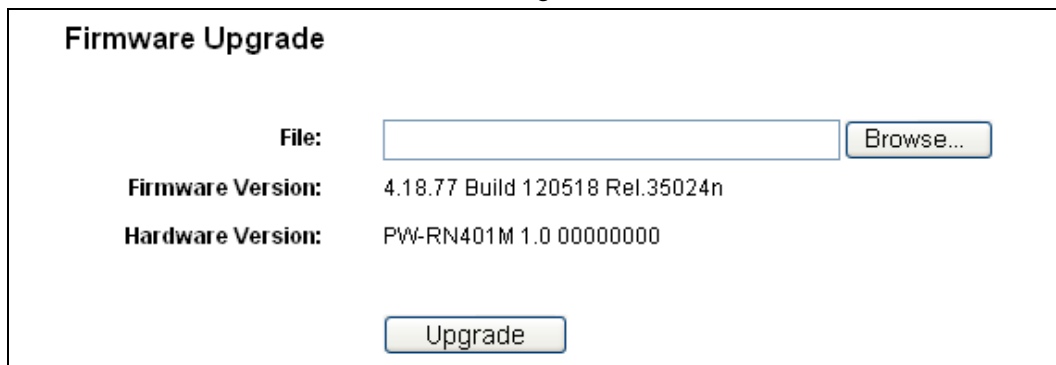


Figure 6-17 Firmware Upgrade

- **Firmware Version** - This displays the current firmware version.
- **Hardware Version** - This displays the current hardware version. The hardware version of the upgrade file must accord with the Router’s current hardware version.

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

1. Download a more recent firmware upgrade file from the 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.

6.8.3 Factory Defaults

Choose menu "**System Tools** → **Factory Defaults**", and you can restore the configurations of the Router to factory defaults on the following screen.

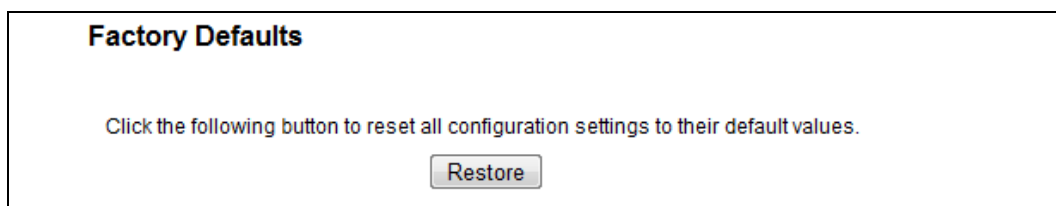


Figure 6-18 Restore Factory Default

Click the **Restore** button to reset all configuration settings to their default values.

- The default **User Name**: admin
- The default **Password**: admin
- The default **IP Address**: 192.168.1.254
- The default **Subnet Mask**: 255.255.255.0

 **Note:**

All changed settings will be lost when defaults are restored.

6.8.4 Backup & Restore

Choose menu "**System Tools** → **Backup & Restore**", and then 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 6-19.

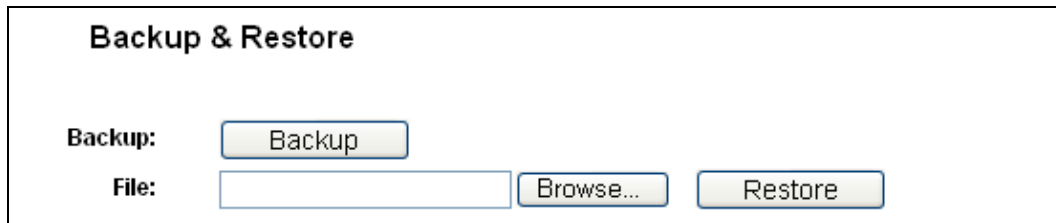


Figure 6-19 Backup & Restore Configuration

- Click the **Backup** 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 **Restore** button.

 **Note:**

The current configuration will be covered by the uploading configuration file. The upgrade process lasts for 20 seconds and the Router will restart automatically. Keep the Router on during the upgrading process to prevent any damage.

6.8.5 Reboot

Choose menu “**System Tools** → **Reboot**”, and then you can click the **Reboot** button to reboot the Router via the next screen.



Figure 6-20 Reboot the Router

Some settings of the Router will take effect only after rebooting, including:

- Change the LAN IP Address (system will reboot automatically).
- Change the DHCP Settings.
- Change the Wireless configurations.
- Change the Web Management Port.
- Upgrade the firmware of the Router (system will reboot automatically).
- Restore the Router's settings to factory defaults (system will reboot automatically).
- Update the configuration with the file (system will reboot automatically).

6.8.6 Password

Choose menu “**System Tools** → **Password**”, and then you can change the factory default user name and password of the Router in the next screen as shown in Figure 6-21.



Password

Old User Name:

Old Password:

New User Name:

New Password:

Confirm New Password:

Figure 6-21 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.

Note:

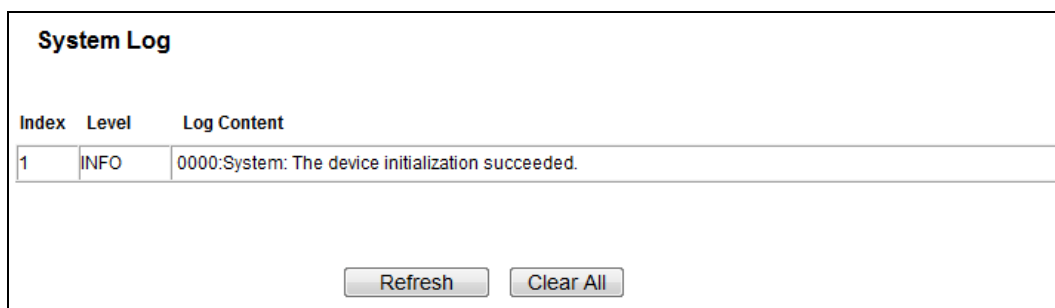
The new user name and password must not exceed 14 characters in length and not include any spaces. Enter the new Password twice to confirm.

Click the **Save** button when finished.

Click the **Clear All** button to clear all.

6.8.7 System Log

Choose menu “**System Tools** → **System Log**”, and then you can view the logs of the Router.



System Log

Index	Level	Log Content
1	INFO	0000:System: The device initialization succeeded.

Figure 6-22 System Log

- **Refresh** - Refresh the page to show the latest log list.
- **Clear All** - All the logs will be deleted from the Router permanently, not just from the page.

Chapter 7. Configuration for Bridge Mode

This chapter will show each Web page's key functions and the configuration way for Bridge Mode of PW-RN401M.

7.1 Login

After your successful login, you can configure and manage the device. There are main menus on the left of the web-based utility. Submenus will be available after you click one of the main menus. On the right, there are the corresponding explanations and instructions.



Figure 7-1

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

7.2 Status

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

Status	
Firmware Version:	4.18.77 Build 120518 Rel.35024n
Hardware Version:	PW-RN401M 1.0 00000000
LAN	
MAC Address:	14-E6-E4-E2-EB-D0
IP Address:	192.168.1.254
Subnet Mask:	255.255.255.0
Wireless	
Wireless Mode:	Bridge Mode
Wireless Radio:	Enable
Name (SSID):	Wireless_E2EBD0
Channel:	4
Mode:	11bgn mixed
Channel Width:	Auto
MAC Address:	14-E6-E4-E2-EB-D0
WDS Status:	Run
System Up Time:	0 day(s) 00:19:32
	<input type="button" value="Refresh"/>

Figure 7-2 Status

- **Firmware Version** - The version information of the Router's firmware.
- **Hardware Version** - The version information of the Router's hardware.
- **LAN** - This field displays the current settings or information for the LAN, you can configure them in the **Network > LAN** page.
 - **MAC address** - The physical address of the Router, as seen from the LAN.
 - **IP address** - The LAN IP address of the Router.
 - **Subnet Mask** - The subnet mask associated with LAN IP address.
- **Wireless** - This field displays basic information or status for wireless function, you can configure them in the **Wireless > Wireless Settings** page.
 - **Wireless Mode** - The current wireless working mode in use.
 - **Wireless Radio** - Indicates whether the wireless radio feature of the AP is enabled or disabled.
 - **Name (SSID)** - The SSID of the AP.
 - **Channel** - The current wireless channel in use.
 - **Mode** - The current wireless mode which the Router works on.

- **Channel Width** - The current wireless channel width in use.
 - **MAC address** - The physical address of the Router, as seen from the WLAN.
 - **WDS Status** - The status of WDS connection.
- **System Up Time** - The length of the time since the Router was last powered on or reset.

Click the **Refresh** button to get the latest status and settings of the Router.

7.3 Quick Setup

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

7.4 Working Mode

The Router supports five operation mode types: **AP**, **Router**, **Repeater**, **Bridge** and **Client**. Please select one you want. Click **Save** to save your choice, which is shown as Figure 7-3.

Wireless Working Mode Settings

<input type="radio"/>	AP:	AP mode.
<input type="radio"/>	Router:	Wireless router mode
<input type="radio"/>	Repeater:	Repeater mode
<input checked="" type="radio"/>	Bridge:	Bridge mode
<input type="radio"/>	Client:	Client mode

Figure 7-3 Working Mode

- **AP** - The wireless access point mode.
- **Router** - The wireless Router Mode. In this mode, the device enables multi-user to share Internet via DSL/Cable Modem. The only wired port works as WAN.
- **Repeater** - The wireless Repeater Mode. It could extend the range of wireless network.
- **Bridge** - The wireless Bridge Mode. It could communicate with another wireless network.
- **Client** - The Client Mode. The computer connected by Ethernet could get access to an AP by Client mode.

Click **OK** in the following screen and then the Router will reboot and to work on Bridge Mode.

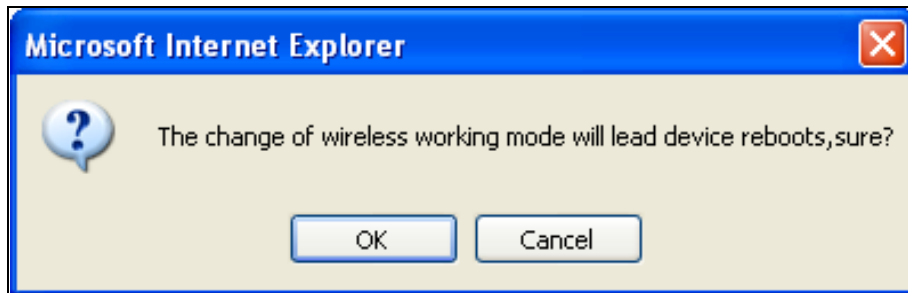


Figure 7-4

7.5 Network



Figure 7-5 the Network menu

There is only one submenu under the Network menu (shown in Figure 7-5): **LAN**.

7.5.1 LAN

Choose menu "**Network** → **LAN**", and then you can configure the IP parameters of the LAN on the screen as below.

A screenshot of the LAN configuration screen. It has a title "LAN" and three fields: "MAC Address:" with the value "14-E6-E4-E2-EB-D0", "IP Address:" with the value "192.168.1.254", and "Subnet Mask:" with the value "255.255.255.0" and a dropdown arrow. There is a "Save" button at the bottom.

Figure 7-6 LAN

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value can't be changed.
- **IP Address** - Enter the IP address of your Router in dotted-decimal notation (factory default: 192.168.1.254).
- **Subnet Mask** - An address code that determines the size of the network. Normally use 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 login to the Router.
2. If the new LAN IP Address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, while the Virtual Server and DMZ Host will not take effect until they are re-configured.

7.6 Wireless



Figure 7-7 Wireless menu

There are two submenus under the Wireless menu (shown in Figure 7-7): **Wireless Settings** and **Wireless Security**. Click any of them, and you will be able to configure the corresponding function.

7.6.1 Wireless Settings

Choose menu “**Wireless** → **Wireless Settings**”, and then you can configure the basic settings for the wireless network on this page.

Wireless Setting - Bridge

SSID:	<input type="text" value="Wireless_E2EBD0"/>
Region:	<input type="text" value="United States"/>
Warning:	Ensure you select a correct country to conform local law. Incorrect settings may cause interference.
Channel:	<input type="text" value="4"/>
Mode:	<input type="text" value="11bgn mixed"/>
Channel Width:	<input type="text" value="Auto"/>
	<input checked="" type="checkbox"/> Enable SSID Broadcast
SSID(to be bridged):	<input type="text" value="Network1"/>
BSSID(to be bridged):	<input type="text" value="94-0C-6D-2F-3C-BE"/> Example:00-1D-0F-11-22-33
	<input type="button" value="Survey"/>
Security Options:	<input type="text" value="WPA-PSK/WPA2-PSK"/>
WEP Index:	<input type="text"/>
Authentication Type	<input type="text"/>
Password:	<input type="text" value="1234567890"/>
<input type="button" value="Save"/>	

Figure 7-8 Wireless Settings - Bridge

- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your networks

name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.

- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Channel** - This field determines which operating frequency will be used. The default channel is set to **Auto**. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
- **Mode** - Select the desired mode. The default setting is 11bgn mixed.
 - **11b only** - Select if all of your wireless clients are 802.11b.
 - **11g only** - Select if all of your wireless clients are 802.11g.
 - **11n only** - Select only if all of your wireless clients are 802.11n.
 - **11bg mixed** - Select if you are using both 802.11b and 802.11g wireless clients.
 - **11bgn mixed** - Select if you are using a mix of 802.11b, 11g, and 11n wireless clients.

Select the desired wireless mode. 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 **802.11b/g/n**, and all of 802.11b, 802.11g, and 802.11n wireless stations can connect to the Router.

- **Channel Width** - Select any channel width from the pull-down list. The default setting is automatic, which can automatically adjust the channel width for your clients.
- **Enable SSID Broadcast** - It is default enabled, so that the wireless router will broadcast its name (SSID) on the air.
- **SSID (to be bridged)** - 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 bridged)** - 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.
- **Survey** - Click this button, you can survey the AP which runs in the current channel.
- **Security Type** - This option should be chosen according to the AP's security configuration. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.

- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **Password** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

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

 **Note:**

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.
 - In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.
2. Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

7.6.2 Wireless Security

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

There are three wireless security modes supported by the Router: WEP (Wired Equivalent Privacy), WPA/WPA2 and WPA-PSK/WPA2-PSK.

Wireless Security

Disable Security

WEP

Type:

WEP Key Format:

Key Selected	WEP Key	Key Type
Key 1: <input checked="" type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 2: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 3: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>
Key 4: <input type="radio"/>	<input type="text"/>	<input type="text" value="Disabled"/>

WPA/WPA2

Version:

Encryption:

Radius Server IP:

Radius Port: (1-65535, 0 stands for default port 1812)

Radius Password:

Group Key Update Period: (in second, minimum is 30, 0 means no update)

WPA-PSK/WPA2-PSK

Version:

Encryption:

PSK Password:

(You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64.)

Group Key Update Period: (in second, minimum is 30, 0 means no update)

Figure 7-9 Wireless Security

- **Disable Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the Router without encryption. But it's strongly recommended to choose one of the following modes to enable security.
- **WEP** - It is based on the IEEE 802.11 standard.
 - **Type** - you can choose the type for the WEP security on the pull-down list. The default setting is **Automatic**, which can select **Shared Key** or **Open System** authentication type automatically based on the wireless station's capability and request.
 - **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.

- **WEP Key (Password)** - 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 network.
- **Key Type** - You can select the WEP key length (64-bit, or 128-bit, or 152-bit.) for encryption. "Disabled" means this WEP key entry is invalid.
 - 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.
 - 152-bit** - You can enter 32 hexadecimal digits (any combination of 0-9, a-f, A-F, zero key is not promoted) or 16 ASCII characters.

 **Note:**

If you do not set the key, the wireless security function is still disabled even if you have selected Shared Key as Authentication Type.

➤ **WPA /WPA2**

- **Version** - you can choose the version of the WPA security from the pull-down list. The default setting is **Automatic**, which can select **WPA** (Wi-Fi Protected Access) or **WPA2** (WPA version 2) automatically based on the wireless station's capability and request.
- **Encryption** - You can select **Automatic**, **TKIP** or **AES**.
- **Radius Server IP** - Enter the IP address of the Radius server.
- **Radius Port** - Enter the port that Radius server used.
- **Radius Password** - Enter the password for the Radius server.
- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

➤ **WPA-PSK/WPA2-PSK-** It's the WPA/WPA2 authentication type based on pre-shared passphrase.

- **Version** - you can choose the version of the WPA-PSK security on the drop-down list. The default setting is **Automatic (Recommended)**, which can select **WPA-PSK** (Pre-shared key of WPA) or **WPA2-PSK** (Pre-shared key of WPA) automatically based on the wireless station's capability and request.
- **Encryption** - When **WPA-PSK** or **WPA** is set as the Authentication Type, you can select **Automatic (Recommended)**, **TKIP** or **AES** as Encryption.
- **PSK Password** - You can enter **ASCII** or **Hexadecimal** characters. The default password is the last unique eight numbers of each Router's MAC address

For **ASCII**, the key can be made up of any numbers 0 to 9 and any letters 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 also note the key is case sensitive, this means that upper and lower case keys will affect the outcome. It would also be a good idea to write down the key and all related wireless security settings.

- **Group Key Update Period** - Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.

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

7.7 DHCP



Figure 7-10 The DHCP menu

There are three submenus under the DHCP menu (shown in Figure 7-10): **DHCP Settings**, **DHCP Clients List** and **Address Reservation**. Click any of them, and you will be able to configure the corresponding function.

7.7.1 DHCP Settings

Choose menu "**DHCP** → **DHCP Settings**", and then you can configure the DHCP Server on the page as shown in Figure 7-11. The Router is set up by default as a DHCP (Dynamic Host Configuration Protocol) server, which provides the TCP/IP configuration for all the PC(s) that are connected to the Router in the LAN.

DHCP Settings

DHCP Server: Disable Enable

Start IP Address:

End IP Address:

Address Lease Time: minutes (1~2880 minutes, the default value is 120)

Default Gateway: (optional)

Default Domain: (optional)

Primary DNS: (optional)

Secondary DNS: (optional)

Figure 7-11 DHCP Settings

- **DHCP Server - Enable or Disable** the DHCP server. If you disable the Server, you must have another DHCP server within your network or else you must configure the computer manually.
- **Start IP Address** - Specify an IP address for the DHCP Server to start with when assigning IP addresses. 192.168.1.100 is the default start address.
- **End IP Address** - Specify an IP address for the DHCP Server to end with when assigning IP addresses. 192.168.1.199 is the default end address.
- **Address Lease Time** - The **Address Lease Time** is the amount of time a network user will be allowed connection to the Router with their current dynamic IP Address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP Address. After the time is up, the user will be automatically assigned a new dynamic IP address. The range of the time is 1 ~ 2880 minutes. The default value is 120 minutes.
- **Default Gateway (Optional)** - It is suggested to input the IP address of the LAN port of the Router. The default value is 192.168.1.254.
- **Default Domain (Optional)** - Input the domain name of your network.
- **Primary DNS** - (Optional) Input the DNS IP address provided by your ISP or consult your ISP.
- **Secondary DNS (Optional)** - Input the IP address of another DNS server if your ISP provides two DNS servers.

 **Note:**

To use the DHCP server function of the Router, you must configure all computers on the LAN as "Obtain an IP Address automatically".

7.7.2 DHCP Clients List

Choose menu “**DHCP → DHCP Clients List**”, and then you can view the information about the clients attached to the Router in the screen as shown in Figure 7-12.

DHCP Clients List				
ID	Client Name	MAC Address	Assigned IP	Lease Time
1	WIN-E7J65J1V3C0	6C-62-6D-F7-31-8D	192.168.1.101	01:59:40
2	---	00-0A-EB-B0-00-0B	192.168.1.100	Permanent

Figure 7-12 DHCP Clients List

- **Client Name** - The name of the DHCP client
- **MAC Address** - The MAC address of the DHCP client
- **Assigned IP** - The IP address that the Router has allocated to the DHCP client
- **Lease Time** - The time of the DHCP client leased. After the dynamic IP address has expired, a new dynamic IP address will be automatically assigned to the user.

You cannot change any of the values on this page. To update this page and to show the current attached devices, click the **Refresh** button.

7.7.3 Address Reservation

Choose menu “**DHCP → Address Reservation**”, and then you can view and add a reserved address for clients via the next screen (shown in Figure 7-13). When you specify a reserved IP address for a PC on the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to the servers that require permanent IP settings.

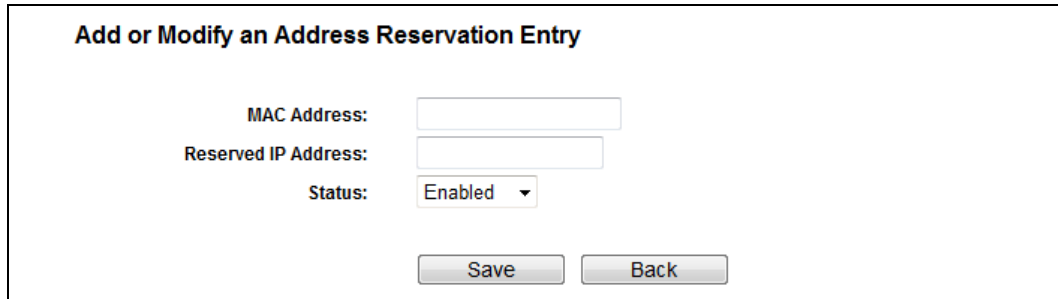
Address Reservation				
ID	MAC Address	Reserved IP Address	Status	Modify
1	00-0A-EB-B0-00-0B	192.168.1.100	Enabled	Modify Delete

Figure 7-13 Address Reservation

- **MAC Address** - The MAC address of the PC for which you want to reserve an IP address.
- **Reserved IP Address** - The IP address reserved for the PC by the Router.
- **Status** - The status of this entry either **Enabled** or **Disabled**.

To Reserve an IP address:

1. Click the **Add New...** button. Then Figure 4-19 will pop-up.
2. Enter the MAC address (in XX-XX-XX-XX-XX-XX format) and IP address (in dotted-decimal notation) of the computer for which you want to reserve an IP address.
3. Click the **Save** button.



Add or Modify an Address Reservation Entry

MAC Address:

Reserved IP Address:

Status:

Figure 7-14 Add or Modify an Address Reservation Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled.

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and Click the **Previous** button to return the previous page.

7.8 System Tools



Figure 7-15 The System Tools menu

Choose menu "**System Tools**", and then you can see the submenus under the main menu: **Diagnostic**, **Firmware**, **Factory Defaults**, **Backup & Restore**, **Reboot**, **Password**, and **System Log**. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

7.8.1 Diagnostic

Choose menu “**System Tools** → **Diagnostic**”, and then you can transact Ping or Traceroute function to check connectivity of your network in the following screen.

Diagnostic Tools

Diagnostic Parameters

Diagnostic Tool: Ping Traceroute

IP Address/ Domain Name:

Ping Count: (1-50)

Ping Packet Size: (4-1472 Bytes)

Ping Timeout: (100-2000 Milliseconds)

Traceroute Max TTL: (1-30)

Diagnostic Results

The Router is ready.

Figure 7-16 Diagnostic Tools

- **Diagnostic Tool** - Check the radio button to select one diagnostic tool.
 - **Ping** - This diagnostic tool troubleshoots connectivity, reachability, and name resolution to a given host or gateway.
 - **Traceroute** - This diagnostic tool tests the performance of a connection.

 **Note:**

You can use ping/traceroute to test both numeric IP address or domain name. If pinging/tracerouting the IP address is successful, but pinging/tracerouting the domain name is not, you might have a name resolution problem. In this case, ensure that the domain name you are specifying can be resolved by using Domain Name System (DNS) queries.

- **IP Address/Domain Name** - Type the destination IP address (e.g. 192.168.1.254) or Domain name (e.g.our website).
- **Pings Count** - The number of Ping packets for a Ping connection. The default is 4.

- **Ping Packet Size** - The size of Ping packet. The default is 64.
- **Ping Timeout** - Set the waiting time for the reply of each Ping packet. If there is no reply in the specified time, the connection is overtime. The default is 800.
- **Traceroute Max TTL** - The max number of hops for a Traceroute connection. The default is 20.

Click **Start** to check the connectivity of the Internet.

The **Diagnostic Results** page displays the result of diagnosis.

If the result is similar to the following screen, the connectivity of the Internet is fine.

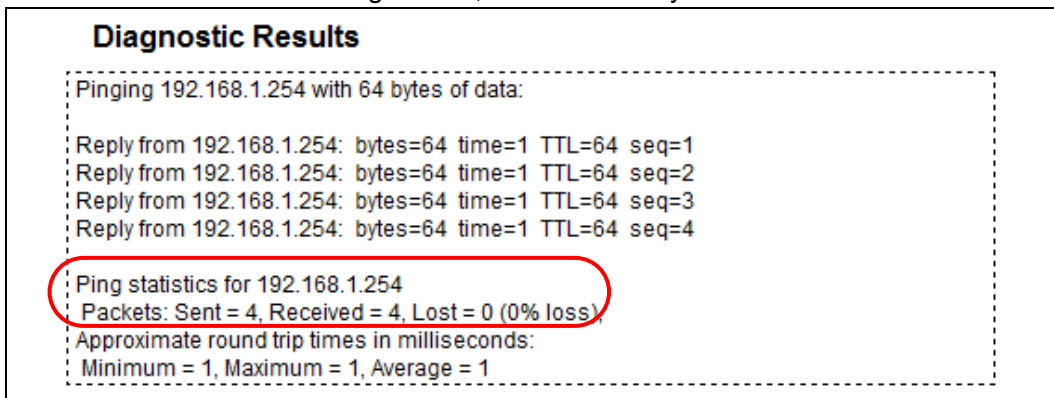


Figure 7-17 Diagnostic Results

Note:

Only one user can use this tool at one time. Options “Number of Pings”, “Ping Size” and “Ping Timeout” are used for **Ping** function. Option “Tracert Hops” are used for **Tracert** function.

7.8.2 Firmware

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

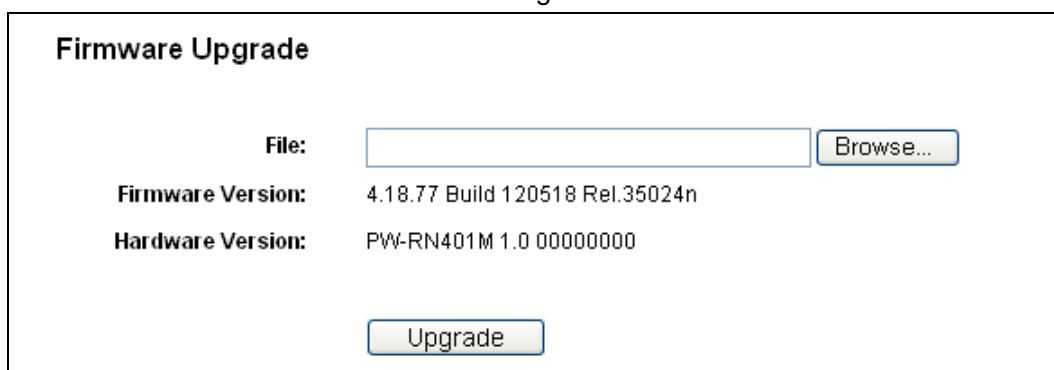


Figure 7-18 Firmware Upgrade

- **Firmware Version** - This displays the current firmware version.
- **Hardware Version** - This displays the current hardware version. The hardware version of the upgrade file must accord with the Router’s current hardware version.

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

1. Download a more recent firmware upgrade file from the 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.

7.8.3 Factory Defaults

Choose menu “**System Tools** → **Factory Defaults**”, and you can restore the configurations of the Router to factory defaults on the following screen.

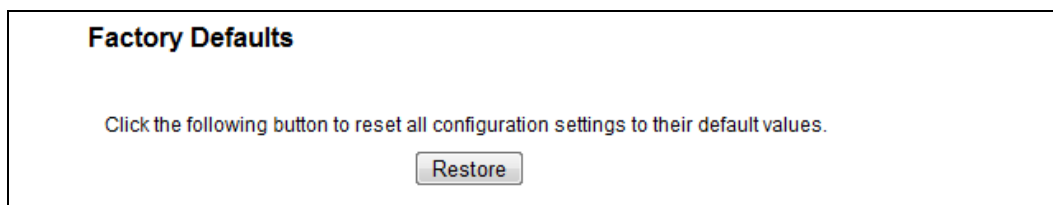


Figure 7-19 Restore Factory Default

Click the **Restore** button to reset all configuration settings to their default values.

- The default **User Name**: admin
- The default **Password**: admin
- The default **IP Address**: 192.168.1.254
- The default **Subnet Mask**: 255.255.255.0

 **Note:**

All changed settings will be lost when defaults are restored.

7.8.4 Backup & Restore

Choose menu “**System Tools** → **Backup & Restore**”, and then 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 7-20.

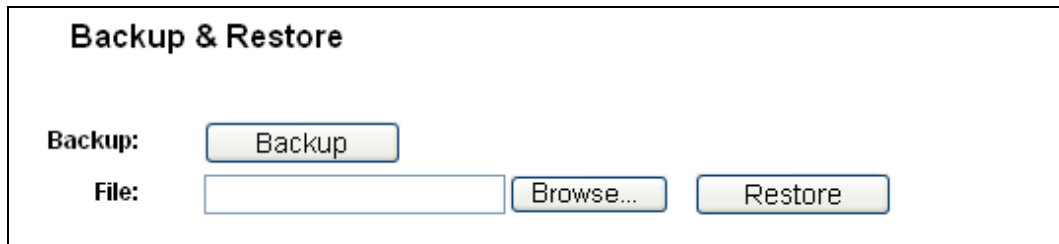


Figure 7-20 Backup & Restore Configuration

- Click the **Backup** 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 **Restore** button.

 **Note:**

The current configuration will be covered by the uploading configuration file. The upgrade process lasts for 20 seconds and the Router will restart automatically. Keep the Router on during the upgrading process to prevent any damage.

7.8.5 Reboot

Choose menu “**System Tools** → **Reboot**”, and then you can click the **Reboot** button to reboot the Router via the next screen.



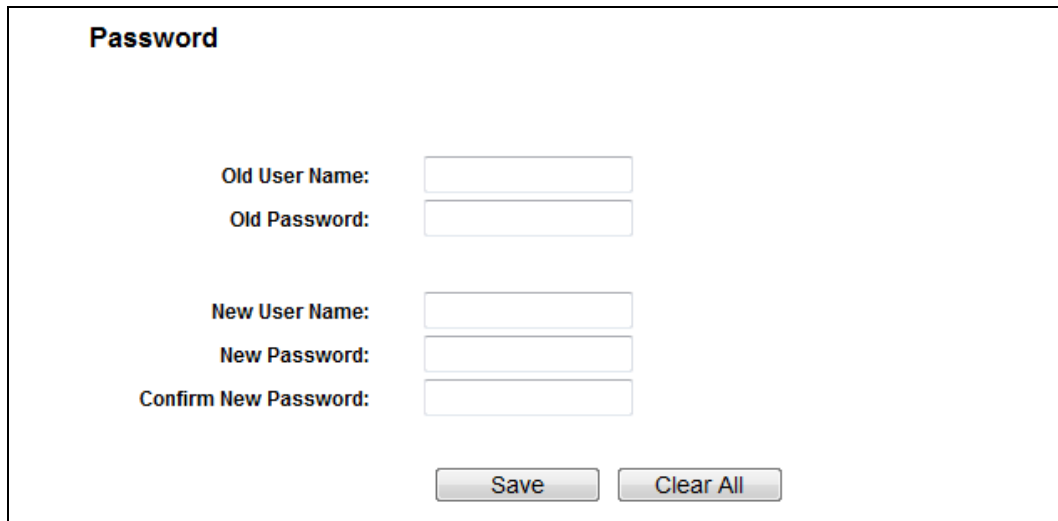
Figure 7-21 Reboot the Router

Some settings of the Router will take effect only after rebooting, which include:

- Change the LAN IP Address (system will reboot automatically).
- Change the DHCP Settings.
- Change the Wireless configurations.
- Change the Web Management Port.
- Upgrade the firmware of the Router (system will reboot automatically).
- Restore the Router's settings to factory defaults (system will reboot automatically).
- Update the configuration with the file (system will reboot automatically).

7.8.6 Password

Choose menu “**System Tools** → **Password**”, and then you can change the factory default user name and password of the Router in the next screen as shown in Figure 7-22.



Password

Old User Name:

Old Password:

New User Name:

New Password:

Confirm New Password:

Figure 7-22 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.

Note:

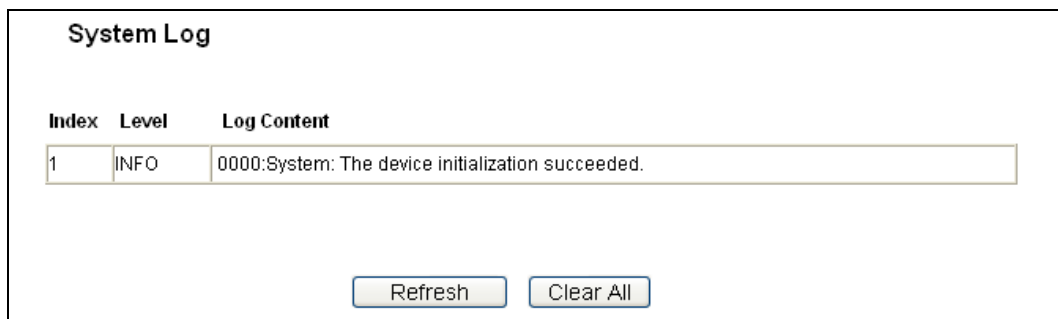
The new user name and password must not exceed 14 characters in length and not include any spaces. Enter the new Password twice to confirm.

Click the **Save** button when finished.

Click the **Clear All** button to clear all.

7.8.7 System Log

Choose menu “**System Tools** → **System Log**”, and then you can view the logs of the Router.



System Log

Index	Level	Log Content
1	INFO	0000:System: The device initialization succeeded.

Figure 7-23 System Log

- **Refresh** - Refresh the page to show the latest log list.
- **Clear All** - All the logs will be deleted from the Router permanently, not just from the page.

Chapter 8. Configuration for Client Mode

This chapter will show each Web page's key functions and the configuration way for Client Mode of PW-RN401M.

8.1 Login

After your successful login, you can configure and manage the device. There are main menus on the left of the web-based utility. Submenus will be available after you click one of the main menus. On the right, there are the corresponding explanations and instructions.



Figure 8-1

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

8.2 Status

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

Status	
Firmware Version:	4.18.77 Build 120518 Rel.35024n
Hardware Version:	PW-RN401M 1.0 00000000
LAN	
MAC Address:	14-E6-E4-E2-EB-D0
IP Address:	192.168.1.254
Subnet Mask:	255.255.255.0
Wireless	
Wireless Mode:	Client Mode
Name (SSID):	
MAC Address:	14-E6-E4-E2-EB-D0
System Up Time:	0 day(s) 00:00:37
	<input type="button" value="Refresh"/>

Figure 8-2 Status

- **Firmware Version** - The version information of the Router's firmware.
- **Hardware Version** - The version information of the Router's hardware.
- **LAN** - This field displays the current settings or information for the LAN, you can configure them in the **Network > LAN** page.
 - **MAC address** - The physical address of the Router, as seen from the LAN.
 - **IP address** - The LAN IP address of the Router.
 - **Subnet Mask** - The subnet mask associated with LAN IP address.
- **Wireless** - This field displays basic information or status for wireless function, you can configure them in the **Wireless > Wireless Settings** page.
 - **Wireless Mode** - The current wireless working mode in use.
 - **Name (SSID)** - The SSID of Root AP.
 - **MAC address** - The physical address of the Router, as seen from the WLAN.
- **System Up Time** - The length of the time since the Router was last powered on or reset.

Click the **Refresh** button to get the latest status and settings of the Router.

8.3 Quick Setup

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

8.4 Working Mode

The Router supports five operation mode types: **AP**, **Router**, **Repeater**, **Bridge** and **Client**. Please select one you want. Click **Save** to save your choice, which is shown as Figure 8-3.

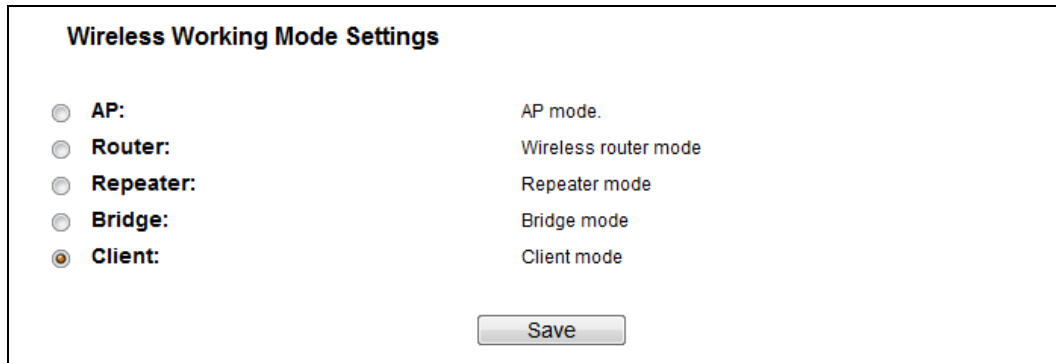


Figure 8-3 Working Mode

- **AP** - The wireless access point mode.
- **Router** - The wireless Router Mode. In this mode, the device enables multi-user to share Internet via DSL/Cable Modem. The only wired port works as WAN.
- **Repeater** - The wireless Repeater Mode. It could extend the range of wireless network.
- **Bridge** - The wireless Bridge Mode. It could communicate with another wireless network.
- **Client** - The Client Mode. The computer connected by Ethernet could get access to an AP by Client mode.

Click **OK** in the following screen and then the Router will reboot and to work on Client Mode.

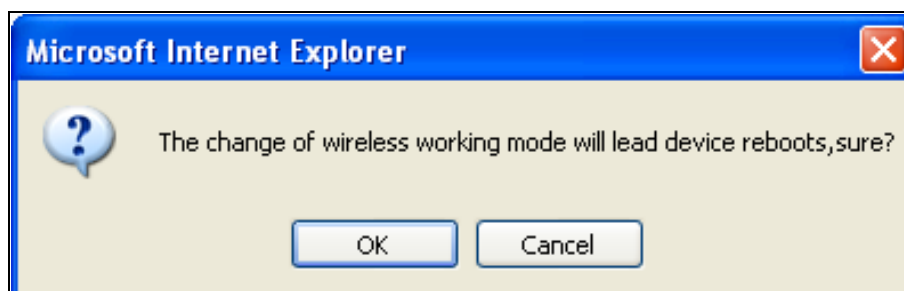


Figure 8-4

8.5 Network

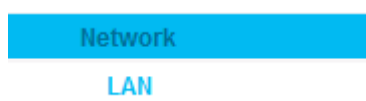
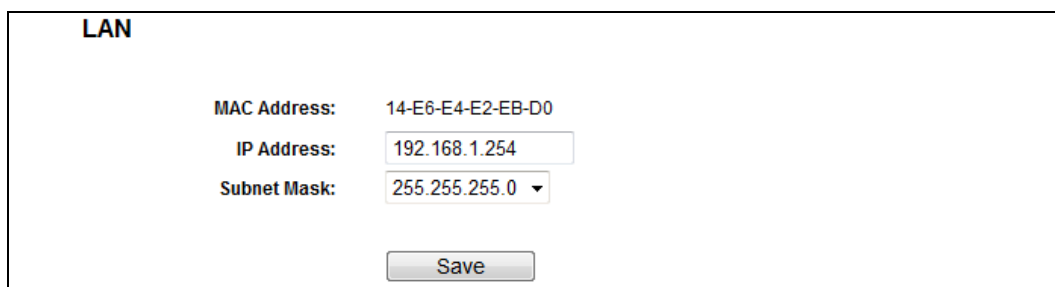


Figure 8-5 the Network menu

There is only one submenu under the Network menu (shown in Figure 8-5): **LAN**.

8.5.1 LAN

Choose menu “**Network** → **LAN**”, and then you can configure the IP parameters of the LAN on the screen as below.



MAC Address:	14-E6-E4-E2-EB-D0
IP Address:	192.168.1.254
Subnet Mask:	255.255.255.0
<input type="button" value="Save"/>	

Figure 8-6 LAN

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value can't be changed.
- **IP Address** - Enter the IP address of your Router in dotted-decimal notation (factory default: 192.168.1.254).
- **Subnet Mask** - An address code that determines the size of the network. Normally use 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 login to the Router.
2. If the new LAN IP Address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, while the Virtual Server and DMZ Host will not take effect until they are re-configured.

8.6 Wireless



Figure 8-7 Wireless menu

There is one submenu under the Wireless menu (shown in Figure 8-7): **Wireless Settings**. Click any of them, and you will be able to configure the corresponding function.

8.6.1 Wireless Settings

Choose menu “**Wireless** → **Wireless Settings**”, and then you can configure the basic settings for the wireless network on this page.

Wireless Settings - Client

SSID:

MAC of AP: Example:00-1D-0F-11-22-33

Region:

Warning: Ensure you select a correct country to conform local law. Incorrect settings may cause interference.

(Please choose Main AP's type of encryption, and input the wireless password)

Security Options:

WEP Key Index:

Authentication Type:

PassWord:

Figure 8-8 Wireless Settings - Client

- **SSID** - Enter a string of up to 32 characters. The same name of SSID (Service Set Identification) must be assigned to all wireless devices in your network. The default SSID is set to be Wireless_XXXXXX (XXXXXX indicates the last unique six numbers of each Router's MAC address). But it is recommended strongly that you change your networks name (SSID) to a different value. This value is case-sensitive. For example, *TEST* is NOT the same as *test*.
- **MAC of AP** - The MAC address of AP that you want to access.
- **Region** - Select your region from the pull-down list. This field specifies the region where the wireless function of the Router can be used. It may be illegal to use the wireless function of the Router in a region other than one of those specified in this field. If your country or region is not listed, please contact your local government agency for assistance.
- **Survey** - Click this button, you can survey the AP which runs in the current channel.
- **Security Type** - This option should be chosen according to the AP's security configuration. It is recommended that the security type is the same as your AP's security type.
- **WEP Key Index** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the index of the WEP key.
- **Authentication Type** - This option should be chosen if the key type is WEP (ASCII) or WEP (HEX). It indicates the authorization type of the Root AP.
- **PassWord** - If the AP your Router is going to connect needs password, you need to fill the password in this blank.

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

Note:

1. The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router.
 - Near the center of the area in which your wireless stations will operate.
 - In an elevated location such as a high shelf.
 - Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
 - Away from large metal surfaces.
2. Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the Router.

8.7 DHCP

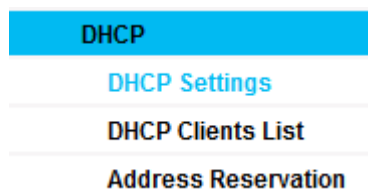


Figure 8-9 The DHCP menu

There are three submenus under the DHCP menu (shown in Figure 8-9), **DHCP Settings**, **DHCP Clients List** and **Address Reservation**. Click any of them, and you will be able to configure the corresponding function.

8.7.1 DHCP Settings

Choose menu “**DHCP** → **DHCP Settings**”, and then you can configure the DHCP Server on the page as shown in Figure 8-10. The Router is set up by default as a DHCP (Dynamic Host Configuration Protocol) server, which provides the TCP/IP configuration for all the PC(s) that are connected to the Router in the LAN.

DHCP Settings

DHCP Server: Disable Enable

Start IP Address:

End IP Address:

Address Lease Time: minutes (1~2880 minutes, the default value is 120)

Default Gateway: (optional)

Default Domain: (optional)

Primary DNS: (optional)

Secondary DNS: (optional)

Figure 8-10 DHCP Settings

- **DHCP Server - Enable or Disable** the DHCP server. If you disable the Server, you must have another DHCP server within your network or else you must configure the computer manually.
- **Start IP Address** - Specify an IP address for the DHCP Server to start with when assigning IP addresses. 192.168.1.100 is the default start address.
- **End IP Address** - Specify an IP address for the DHCP Server to end with when assigning IP addresses. 192.168.1.199 is the default end address.
- **Address Lease Time** - The **Address Lease Time** is the amount of time a network user will be allowed connection to the Router with their current dynamic IP Address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP Address. After the time is up, the user will be automatically assigned a new dynamic IP address. The range of the time is 1 ~ 2880 minutes. The default value is 120 minutes.
- **Default Gateway (Optional)** - It is suggested to input the IP address of the LAN port of the Router. The default value is 192.168.1.254.
- **Default Domain (Optional)** - Input the domain name of your network.
- **Primary DNS (Optional)** - Input the DNS IP address provided by your ISP or consult your ISP.
- **Secondary DNS (Optional)** - Input the IP address of another DNS server if your ISP provides two DNS servers.

 **Note:**

To use the DHCP server function of the Router, you must configure all computers on the LAN as "Obtain an IP Address automatically".

8.7.2 DHCP Clients List

Choose menu “**DHCP → DHCP Clients List**”, and then you can view the information about the clients attached to the Router in the screen as shown in Figure 8-11.

DHCP Clients List				
ID	Client Name	MAC Address	Assigned IP	Lease Time
1	WIN-E7J65J1V3C0	6C-62-6D-F7-31-8D	192.168.1.101	01:59:40
2	---	00-0A-EB-B0-00-0B	192.168.1.100	Permanent

Figure 8-11 DHCP Clients List

- **Client Name** - The name of the DHCP client
- **MAC Address** - The MAC address of the DHCP client
- **Assigned IP** - The IP address that the Router has allocated to the DHCP client
- **Lease Time** - The time of the DHCP client leased. After the dynamic IP address has expired, a new dynamic IP address will be automatically assigned to the user.

You cannot change any of the values on this page. To update this page and to show the current attached devices, click the **Refresh** button.

8.7.3 Address Reservation

Choose menu “**DHCP → Address Reservation**”, and then you can view and add a reserved address for clients via the next screen (shown in Figure 8-12). When you specify a reserved IP address for a PC on the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to the servers that require permanent IP settings.

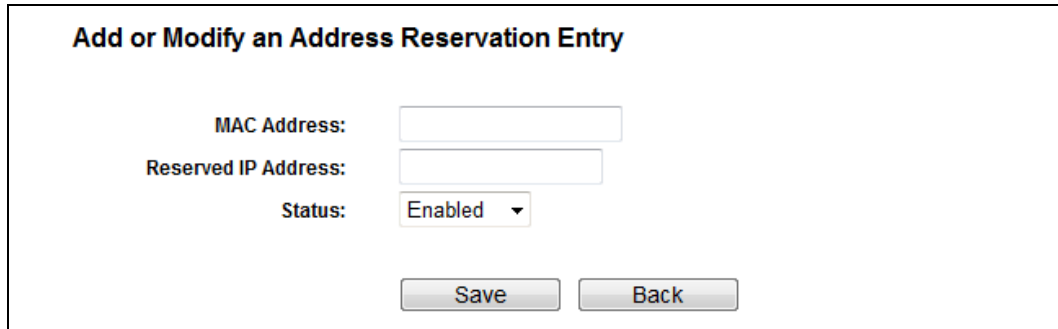
Address Reservation				
ID	MAC Address	Reserved IP Address	Status	Modify
1	00-0A-EB-B0-00-0B	192.168.1.100	Enabled	Modify Delete

Figure 8-12 Address Reservation

- **MAC Address** - The MAC address of the PC for which you want to reserve an IP address.
- **Reserved IP Address** - The IP address reserved for the PC by the Router.
- **Status** - The status of this entry either **Enabled** or **Disabled**.

To Reserve an IP address:

1. Click the **Add New...** button. Then Figure 8-13 will pop-up.
2. Enter the MAC address (in XX-XX-XX-XX-XX-XX format.) and IP address (in dotted-decimal notation) of the computer for which you want to reserve an IP address.
3. Click the **Save** button.



Add or Modify an Address Reservation Entry

MAC Address:

Reserved IP Address:

Status:

Figure 8-13 Add or Modify an Address Reservation Entry

To modify or delete an existing entry:

1. Click the **Modify** in the entry you want to modify. If you want to delete the entry, click the **Delete**.
2. Modify the information.
3. Click the **Save** button.

Click the **Enable/Disabled All** button to make all entries enabled/disabled

Click the **Delete All** button to delete all entries.

Click the **Next** button to go to the next page and Click the **Previous** button to return the previous page.

8.8 System Tools



Figure 8-14 The System Tools menu

Choose menu "**System Tools**", and then you can see the submenus under the main menu: **Diagnostic, Firmware, Factory Defaults, Backup & Restore, Reboot, Password, and System**

Log. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

8.8.1 Diagnostic

Choose menu “**System Tools** → **Diagnostic**”, and then you can transact Ping or Traceroute function to check connectivity of your network in the following screen.

Diagnostic Tools

Diagnostic Parameters

Diagnostic Tool: Ping Traceroute

IP Address/ Domain Name:

Ping Count: (1-50)

Ping Packet Size: (4-1472 Bytes)

Ping Timeout: (100-2000 Milliseconds)

Traceroute Max TTL: (1-30)

Diagnostic Results

The Router is ready.

Figure 8-15 Diagnostic Tools

- **Diagnostic Tool** - Check the radio button to select one diagnostic tool.
 - **Ping** - This diagnostic tool troubleshoots connectivity, reachability, and name resolution to a given host or gateway.
 - **Traceroute** - This diagnostic tool tests the performance of a connection.

Note:

You can use ping/traceroute to test both numeric IP address or domain name. If pinging/tracerouting the IP address is successful, but pinging/tracerouting the domain name is not, you might have a name resolution problem. In this case, ensure that the domain name you are specifying can be resolved by using Domain Name System (DNS) queries.

- **IP Address/Domain Name** - Type the destination IP address (e.g. 192.168.1.254) or Domain name (e.g.our website).
- **Pings Count** - The number of Ping packets for a Ping connection. The default is 4.
- **Ping Packet Size** - The size of Ping packet. The default is 64.
- **Ping Timeout** - Set the waiting time for the reply of each Ping packet. If there is no reply in the specified time, the connection is overtime. The default is 800.
- **Traceroute Max TTL** - The max number of hops for a Traceroute connection. The default is 20.

Click **Start** to check the connectivity of the Internet.

The **Diagnostic Results** page displays the result of diagnosis.

If the result is similar to the following screen, the connectivity of the Internet is fine.

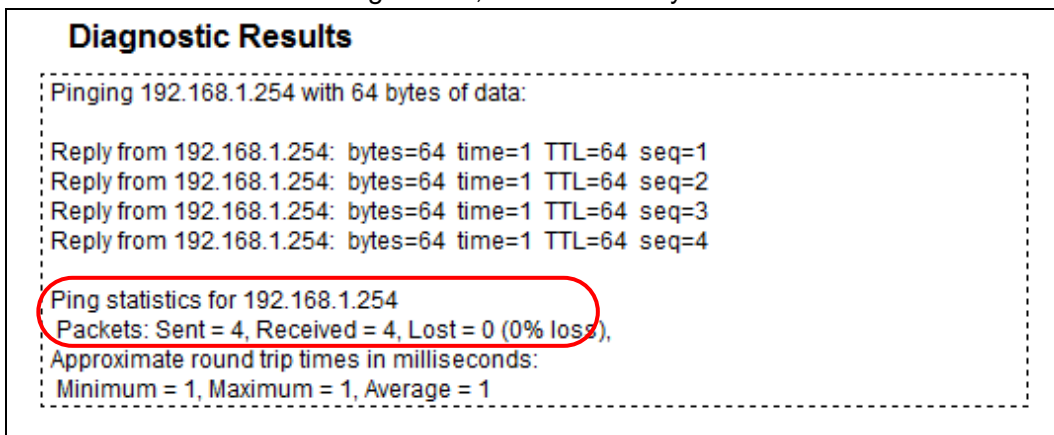


Figure 8-16 Diagnostic Results

Note:

Only one user can use this tool at one time. Options “Number of Pings”, “Ping Size” and “Ping Timeout” are used for **Ping** function. Option “Tracert Hops” are used for **Tracert** function.

8.8.2 Firmware

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

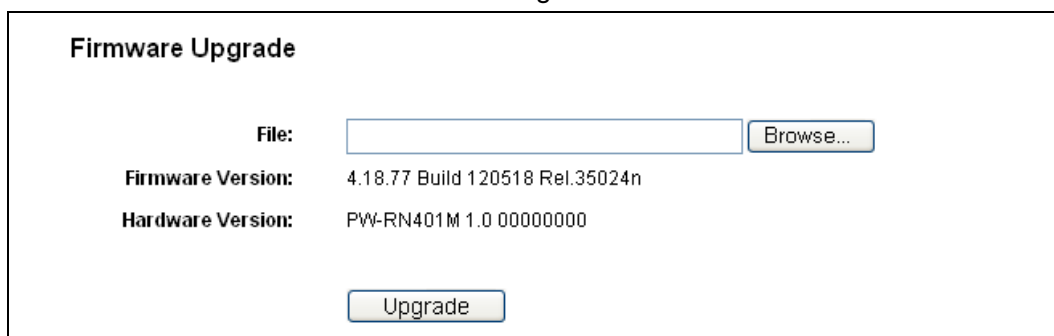


Figure 8-17 Firmware Upgrade

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

- **Hardware Version** - This displays the current hardware version. The hardware version of the upgrade file must accord with the Router's current hardware 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.

8.8.3 Factory Defaults

Choose menu "**System Tools** → **Factory Defaults**", and you can restore the configurations of the Router to factory defaults on the following screen.

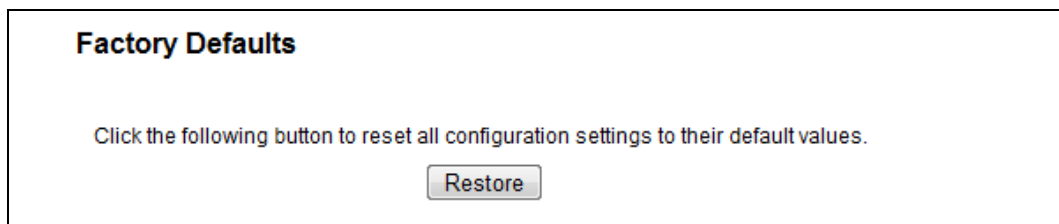


Figure 8-18 Restore Factory Default

Click the **Restore** button to reset all configuration settings to their default values.

- The default **User Name**: admin
- The default **Password**: admin
- The default **IP Address**: 192.168.1.254
- The default **Subnet Mask**: 255.255.255.0

Note:

All changed settings will be lost when defaults are restored.

8.8.4 Backup & Restore

Choose menu “**System Tools** → **Backup & Restore**”, and then 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 8-19.

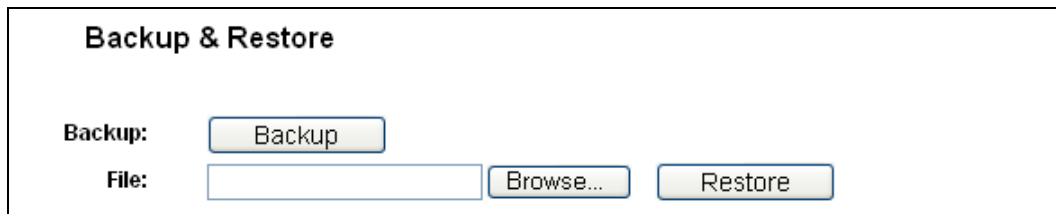


Figure 8-19 Backup & Restore Configuration

- Click the **Backup** 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 **Restore** button.

 **Note:**

The current configuration will be covered by the uploading configuration file. The upgrade process lasts for 20 seconds and the Router will restart automatically. Keep the Router on during the upgrading process to prevent any damage.

8.8.5 Reboot

Choose menu “**System Tools** → **Reboot**”, and then you can click the **Reboot** button to reboot the Router via the next screen.



Figure 8-20 Reboot the Router

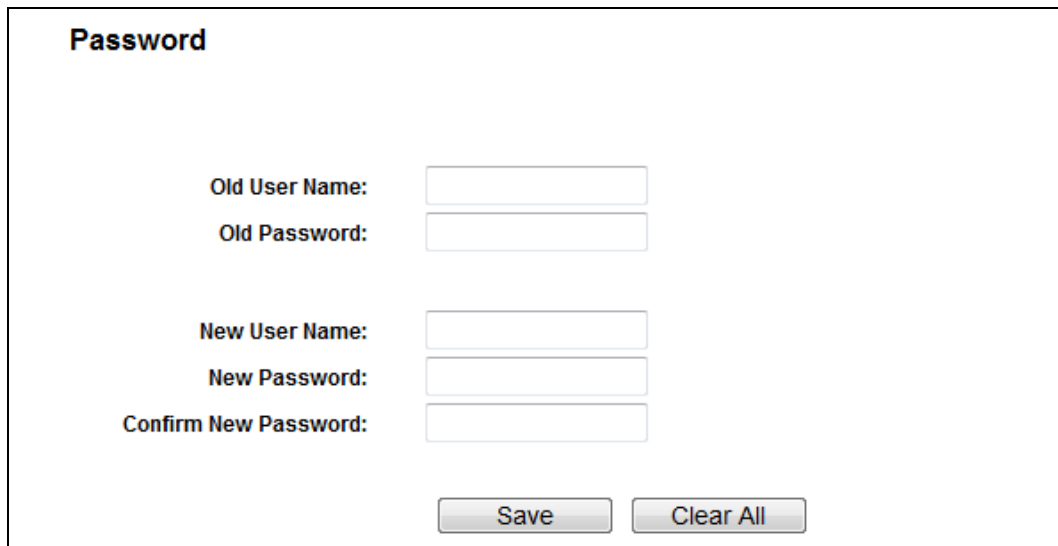
Some settings of the Router will take effect only after rebooting, which include:

- Change the LAN IP Address (system will reboot automatically).
- Change the DHCP Settings.
- Change the Wireless configurations.
- Change the Web Management Port.

- Upgrade the firmware of the Router (system will reboot automatically).
- Restore the Router's settings to factory defaults (system will reboot automatically).
- Update the configuration with the file (system will reboot automatically).

8.8.6 Password

Choose menu “**System Tools** → **Password**”, and then you can change the factory default user name and password of the Router in the next screen as shown in Figure 8-21.



The screenshot shows a web form titled "Password" with the following fields and buttons:

- Old User Name:
- Old Password:
- New User Name:
- New Password:
- Confirm New Password:
- Save button
- Clear All button

Figure 8-21 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.

 **Note:**

The new user name and password must not exceed 14 characters in length and not include any spaces. Enter the new Password twice to confirm.

Click the **Save** button when finished.

Click the **Clear All** button to clear all.

8.8.7 System Log

Choose menu “**System Tools** → **System Log**”, and then you can view the logs of the Router.



The screenshot shows a web interface titled "System Log". It contains a table with three columns: "Index", "Level", and "Log Content". The table has one row with the following data: Index: 1, Level: INFO, Log Content: 0000:System: The device initialization succeeded. Below the table are two buttons: "Refresh" and "Clear All".

Index	Level	Log Content
1	INFO	0000:System: The device initialization succeeded.

Refresh Clear All

Figure 8-22 System Log

- **Refresh** - Refresh the page to show the latest log list.
- **Clear All** - All the logs will be deleted from the Router permanently, not just from the page.

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 **"Network"** 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 and the "Confirm Password" field, and finish it by clicking **Connect**.

The screenshot shows the WAN configuration interface. At the top, it says "WAN". Below that, "WAN Connection Type:" is set to "PPPoE" in a dropdown menu. Under "PPPoE Connection:", there are three fields: "User Name:" with the value "admin", "Password:" with a masked password of "*****", and a "Confirm Password:" field which is empty.

Figure A-1 PPPoE Connection Type

- 4) If your ADSL lease is in "pay-according-time" mode, select "Connect on Demand" or "Connect Manually" for Internet connection mode. Type an appropriate number for "Max Idle Time" to avoid wasting paid time. Otherwise, you can select "Auto-connecting" for Internet connection mode.

The screenshot shows the "Wan Connection Mode:" configuration section. There are four radio button options:

- Connect on Demand: Max Idle Time: 15 minutes (0 means remaining active all the time.)
- Connect Automatically
- Time-based Connecting: Period of Time: from 0 : 0 (HH:MM) to 23 : 59 (HH:MM)
- Connect Manually: Max Idle Time: 15 minutes (0 means remaining active all the time.)

 At the bottom, there are three buttons: "Connect" (highlighted in blue), "Disconnect" (disabled), and "Disconnected" (text label).

Figure A-2 PPPoE Connection Mode

Note:

1. Sometimes the connection cannot be disconnected although you specify a time to Max Idle Time, since some applications is visiting the Internet continually in the background.
2. If you are a Cable user, please configure the Router following the above steps.

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

- 1) Log in to the Router, click the **"Network"** menu on the left of your browser, and click **"WAN"** submenu. On the **WAN** page, select "Dynamic IP" for "WAN Connection Type", finish by clicking **Save**.
- 2) Some ISPs require that you register the MAC Address of your adapter, which is connected to your cable/DSL Modem during installation. If your ISP requires MAC register, log in to the Router and click the **"Network"** menu link on the left of your browser, and then click **"MAC Clone"** submenu link. On the **"MAC Clone"** page, if your PC's MAC address is proper MAC address, click the **Clone MAC Address** button and your PC's MAC address will fill in the "WAN MAC Address" field. Or else, type the MAC Address into the "WAN MAC Address" field. The format for the MAC Address is XX-XX-XX-XX-XX-XX. Then click the **Save** button. It will take effect after rebooting.

MAC Clone

WAN MAC Address:

Your PC's MAC Address:

Figure A-3 MAC Clone

3. I want to use NetMeeting, what do I need to do?

- 1) If you start NetMeeting as a sponsor, you don't need to do anything with the Router.
- 2) If you start as a response, you need to configure Virtual Server or DMZ Host and make sure the H323 ALG is enabled.
- 3) How to configure Virtual Server: Log in to the Router, click the **"Forwarding"** menu on the left of your browser, and click **"Virtual Servers"** submenu. On the **"Virtual Servers"** page, click **Add New....** Then on the **"Add or Modify a Virtual Server Entry"** page, enter "21" for the "Service Port" blank, and your IP address for the "IP Address" blank, taking 192.168.1.169 for an example, remember to **Enable** and **Save**.

Virtual Servers					
ID	Service Ports	IP Address	Protocol	Status	Modify
1	21	192.168.1.169	ALL	Enabled	Modify Delete

Figure A-4 Virtual Servers

Add or Modify a Virtual Server Entry	
Service Port:	<input type="text"/> (XX-XX or XX)
IP Address:	<input type="text"/>
Protocol:	ALL <input type="button" value="v"/>
Status:	Enabled <input type="button" value="v"/>
Common Service Port:	--Select One-- <input type="button" value="v"/>
<input type="button" value="Save"/> <input type="button" value="Back"/>	

Figure A-5 Add or Modify a Virtual server Entry

Note:

Your opposite side should call your WAN IP, which is displayed on the "Status" page.

- 4) How to enable DMZ Host: Log in to the Router, click the "**Forwarding**" menu on the left of your browser, and click "DMZ" submenu. On the "DMZ" page, click **Enable** radio button and type your IP address into the "DMZ Host IP Address" field, using 192.168.1.100 as an example, remember to click the **Save** button.

DMZ	
Current DMZ Status:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
DMZ Host IP Address:	<input type="text" value="192.168.1.100"/>
<input type="button" value="Save"/>	

Figure A-6 DMZ

4. I want to build a WEB Server on the LAN, what should I do?

- 1) Because the WEB Server port 80 will interfere with the WEB management port 80 on the Router, you must change the WEB management port number to avoid interference.

- 2) To change the WEB management port number: Log in to the Router, click the “**Security**” menu on the left of your browser, and click “**Remote Management**” submenu. On the “**Remote Management**” page, type a port number except 80, such as 88, into the “Web Management Port” field. Click **Save** and reboot the Router.

Figure A-7 Remote Management

Note:

If the above configuration takes effect, configure to the Router by typing 192.168.1.188 (the Router’s LAN IP address: Web Management Port) in the address field of the Web browser.

- 3) Log in to the Router, click the “**Forwarding**” menu on the left of your browser, and click the “**Virtual Servers**” submenu. On the “**Virtual Servers**” page, click **Add New...**, then on the “**Add or Modify a Virtual Server**” page, enter “80” into the blank next to the “**Service Port**”, and your IP address next to the “**IP Address**”, assuming 192.168.1.169 for an example, remember to **Enable** and **Save**.

ID	Service Ports	IP Address	Protocol	Status	Modify
1	21	192.168.1.169	ALL	Enabled	Modify Delete

Figure A-8 Virtual Servers

Add or Modify a Virtual Server Entry

Service Port: (XX-XX or XX)

IP Address:

Protocol: ALL ▾

Status: Enabled ▾

Common Service Port: --Select One-- ▾

Figure A-9 Add or Modify a Virtual server Entry

5. 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.

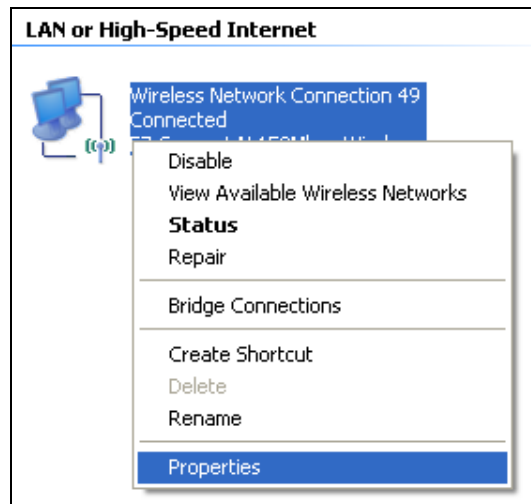


Figure 0-1

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

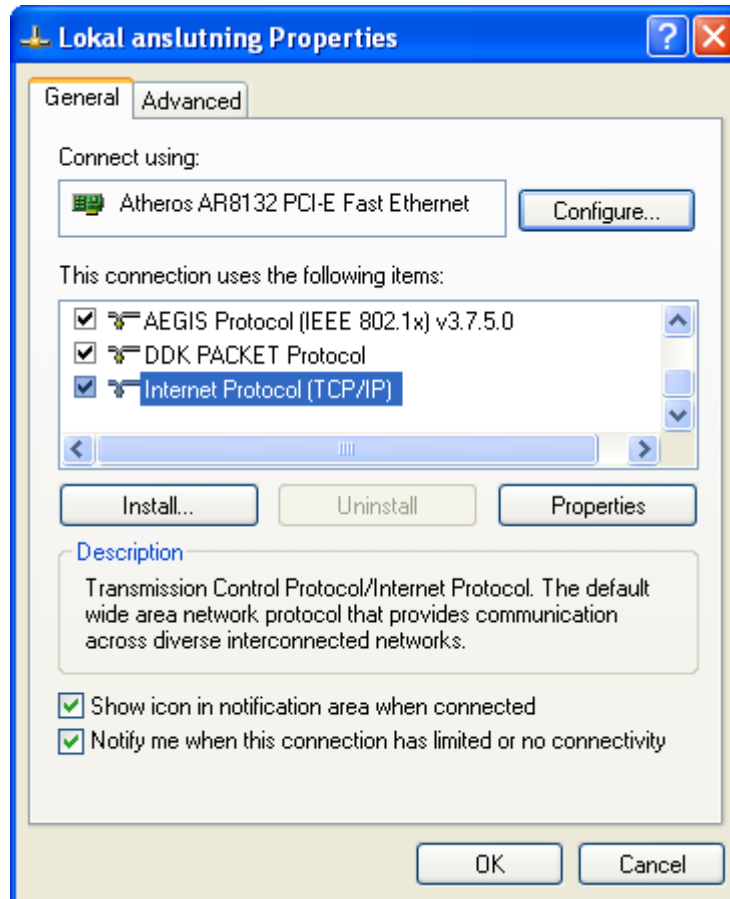


Figure 0-2

- 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:

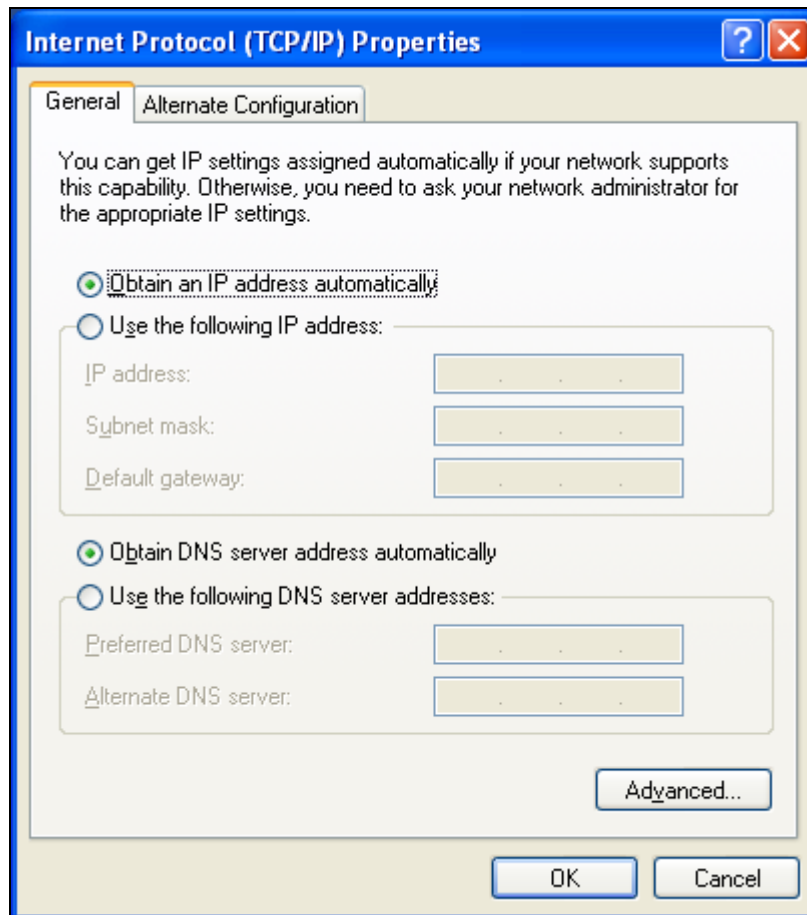


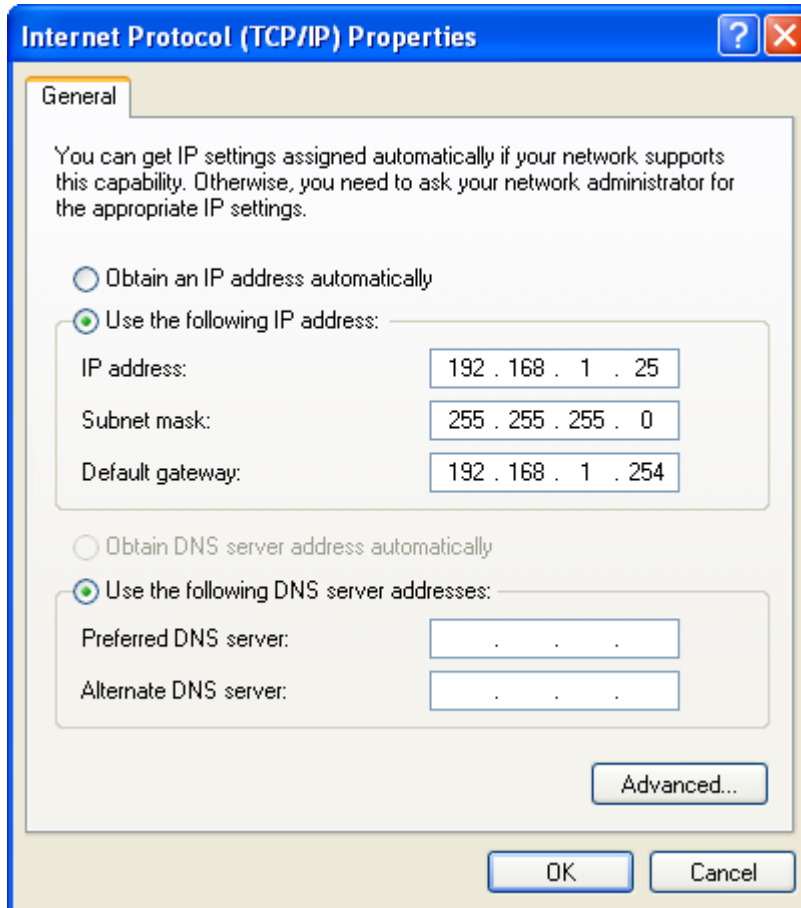
Figure 0-3

 **Note:**

For Windows 98 OS or before, 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 192.168.1.254, specify the **IP address** as 192.168.1.x (x is from 1 to 253), and the **Subnet mask** as 255.255.255.0.
- 3 Type the Router's LAN IP address (the default IP is 192.168.1.254) 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.

**Now:**

Click **OK** to keep your settings.

Appendix C: Specifications

General	
Standards	IEEE 802.11n, 802.11b, 802.11g
Protocols	TCP/IP, PPPoE, DHCP, ICMP, NAT, SNTP
Port	One 10/100Mbps LAN/WAN port, one Micro USB port
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)
LED	SYS
Dimensions (LxWxH)	56mmx56mmx18mm
Safety & Emissions	FCC, CE
Wireless	
Frequency Band	2.4~2.4835GHz
Radio Data Rate	11n: up to 150Mbps (Automatic) 11g: 54/48/36/24/18/12/9/6M (Automatic) 11b: 11/5.5/2/1M (Automatic)
Frequency Expansion	DSSS(Direct Sequence Spread Spectrum)
Modulation	DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, BPSK, QPSK
Security	64/128/152-bit WEP, WPA/WPA2, WPA2-PSK/WPA-PSK
Sensitivity @PER	135M: -70dBm@10% PER 65M: -73dBm@10% PER 54M: -76dBm@10% PER
Mode	AP, Router, Repeater, Bridge, Client
Environmental and Physical	
Temperature	Operating : 0°C~40°C (32°F~104°F)
	Storage: -40°C~70°C(-40°F~158°F)
Humidity	Operating: 10% - 90% RH, Non-condensing
	Storage: 5% - 90% RH, Non-condensing

Appendix D: Glossary

- **802.11n** - 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) [3] was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- **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.
- **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 Service Set Identification** 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.