

**RAVO 54G**  
**Wireless Access Point**  
**User Manual**

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November 3, 2003

# Safety Instructions

## For Installation

- Use only the type of power source indicated on the marking labels.
- Use only the power adapter supplied with the product.
- Do not overload wall outlet or extension cords as this may increase the risk of electric shock or fire. If the power cord is frayed, replace it with a new one.
- Proper ventilation is necessary to prevent the product overheating. Do not block or cover the slots and openings on the device, which are intended for ventilation and proper operation. It is recommended to mount the product with a stack.
- Do not place the product near any source of heat or expose it to direct sunshine.
- Do not expose the product to moisture. Never spill any liquid on the product.
- Do not attempt to connect with any computer accessory or electronic product without instructions from qualified service personnel. This may result in risk of electronic shock or fire.
- Do not place this product on an unstable stand or table.

## For Using

- Power off and unplug this product from the wall outlet when it is not in use or before cleaning. Pay attention to the temperature of the power adapter. The temperature might be high.
- After powering off the product, power on the product at least 15 seconds later.
- Do not block the ventilating openings of this product.
- When the product is expected to be not in use for a period of time, unplug the power cord of the product to prevent it from the damage of storm or sudden increases in rating.

## **For Service**

Do not attempt to disassemble or open covers of this unit. Nor attempt to service the product, which may void the user's authority to operate it. Contact qualified service personnel under the following conditions:

- If the power cord or plug is damaged or frayed.
- If liquid has been spilled into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally when the operating instructions are followed.
- If the product has been dropped or the cabinet has been damaged.
- If the product exhibits a distinct change in performance.

# FCC Information

## 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 communication. 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.

## FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

## FCC Radiation Exposure Statement

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

# About This User Manual

For brevity, throughout this manual the “Wireless Broadband Router” is referred to as “the router” or “the device” and following terms or abbreviations are used interchangeably:

- Access Point – AP
- Wireless LAN – WLAN
- Ethernet network – LAN – network

**Note** and **Caution** in this manual are highlighted with graphics as below to indicate important information.



**Note**

Contains related information that corresponds to a topic.



**Caution**

Represents essential steps, actions, or messages that should not be ignored.

This User Manual contains information on how to install and configure your Wireless Broadband Router to get your network started accessing the Internet. From now on, we will guide you through the correct configuration steps to get your device up and run.

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# 1 Introduction

## 1.1 Overview

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Thank you for choosing RAVO 54G Wireless Access Point. The W54-AP is device that provides mobile wireless clients the connectivity to a wired network. This enables the wireless clients to access all available resources and peripherals on the wired network. In addition, multiple Access Points can be installed to extend the wireless service coverage area for seamless wireless access.

With the support of new emerged 802.11g standard, the Access Point provides data transfer of up to 54 Mbps, up to 5 times faster than 802.11b. Since 802.11g operates on the same frequency of 2.4 GHz as 802.11b, it is backwards compatible with existing 802.11b devices. The benefit is that you can preserve the existing 802.11b infrastructure while migrating to the new screaming fast 802.11g.

In addition, this Access Point implements a built-in Web server for easy configuration.

## 1.2 Package Contents

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Check the contents of the package against the pack contents checklist below. If any of the items is missing, then contact the dealer from whom the equipment was purchased.

- 54Mbps Wireless Access Point x1
- Power Adapter and Cord x1
- RAVO CD-ROM x1
- RJ-45 Ethernet Cable x1
- RAVO Quick-Start Guide x1

## 1.3 Wireless Network Scenarios

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An AP is used as a bridge linking the wireless station to a wired LAN and thus creating an Infrastructure network. According to the scale of your network, you can install a single AP or multiple APs to create a roaming wireless network.

The simplest Infrastructure network is depicted as the figure below where a group of wireless clients and an AP composes a Basic Service Set (BSS). As this 54Mbps AP is 802.11g and 802.11b compliant, it is capable of linking both the 802.11g and 802.11b wireless clients to your wired network.

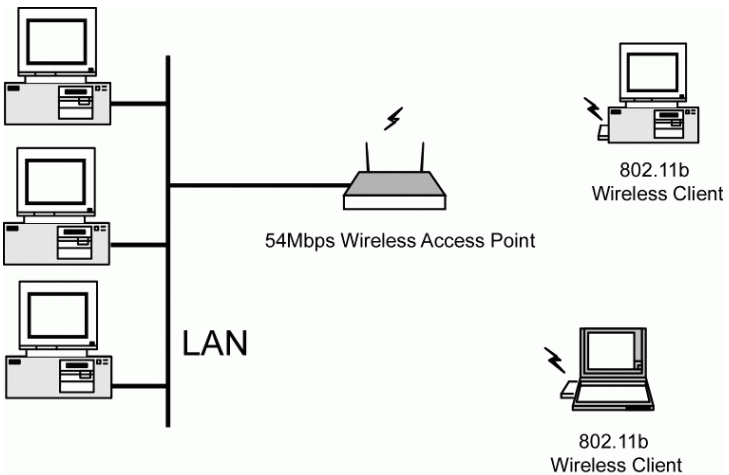


Figure 1-1 Connecting to a single AP

For larger area, you can also choose to implement multiple APs to extend the wireless service coverage area for seamless wireless access. A group of wireless clients and multiple APs using the same SSID form an Extended Service Set (ESS). The figure below shows a typical roaming wireless network within which each AP operates in an independent channel. But all the APs use an identical SSID and security settings (if enabled).

For the mobile clients that want to wander across the different APs but maintain the network connectivity at all times, they must operate in Infrastructure mode and use the same SSID and

security settings (if enabled) with the APs. If the APs are “open”, that is, periodically broadcast their SSIDs to allow the wireless clients to recognize their presence, then wireless clients can use the special SSID “any” to associate with these “open” APs.

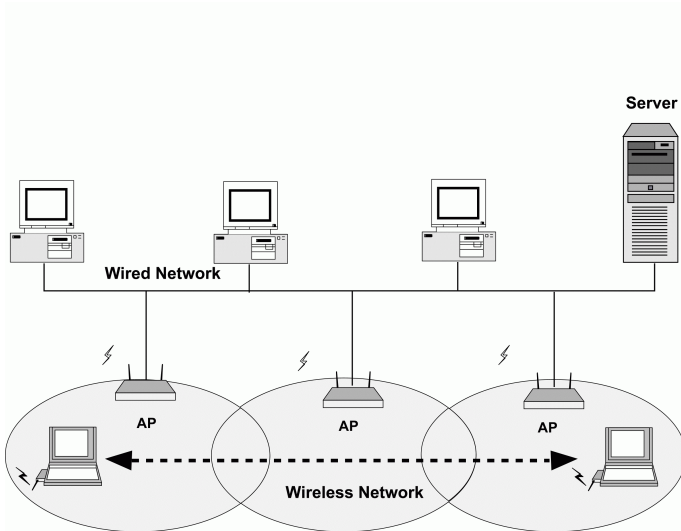


Figure 1-2 Extending Wireless Coverage

# 2 Hardware Description & Installation

## 2.1 Physical Outlook

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### Front Panel

The following illustration shows the front panel of the Access Point:

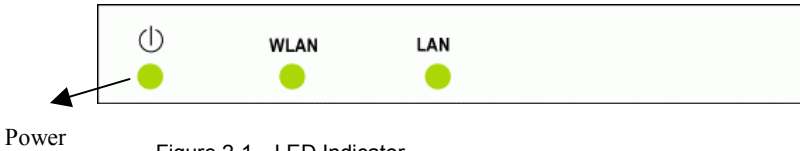


Figure 2-1 LED Indicator

### LED Indicator

The Access Point is equipped with three LEDs on the front panel as described in the table below:

LED	Color	Status	Description
⏻	Green	Off	No power is supplied to the unit.
		Solid	Power is connected to the unit.
WLAN	Green	Off	WLAN interface is not initialized properly.
		On	WLAN interface is initialized properly and ready.
		Blinking	Transmitting/receiving packets on the WLAN port.
LAN	Amber/Green	Off	No Ethernet device is connected.

LED	Color	Status	Description
		Solid	Ethernet connection is established. Amber - 100 Mbps Ethernet connection. Green - 10 Mbps Ethernet connection.
		Blinking	Transmitting/receiving packets on the LAN port.

## Rear Panel and Connector

The following figure illustrates the rear panel of your 54Mbps Wireless Access Point.

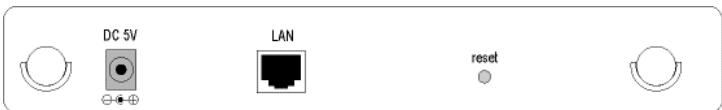


Figure 2-2 Rear Panel and Connector

- **DC 5V:** Power connector
- **LAN:** 10/100BaseT LAN port of RJ-45 connector. Connects to a hub, switch or NIC-equipped PC in your network. The LAN port supports Auto-MDIX feature; it works with either a straight-through or crossover cable.
- **reset:** Dual-function button
  - *Reboot.* Insert a straightened paperclip into the **reset** hole to press the button. This will reboot the Wireless Broadband Router.
  - *Restore to the factory defaults.* Insert a straightened paperclip into the **reset** hole to press the button. Keep pressing and power cycle (off and on) the device. Wait for at least 5 seconds to release the button. Then wait for the device to finish booting. This operation erases all previous settings entered by the administrator.

## 2.2 Hardware Connection

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### Choosing a Place for the Access Point

- Place the device close to the power outlet for the cable to reach it easily.
- Locate an optimum location for the AP, usually at the center of your wireless network to provide best coverage for wireless stations.
- Adjust the direction of the antennas to enhance the receiving sensitivity.

### Connecting the AP

Follow the steps below to connect the related devices.

#### **Step 1 Connecting the power adapter.**

Connect the single DC output connector of the power adapter to the power jack on the back of the AP. Then connect the supplied power cord to the power adapter and the other end to an AC outlet.

#### **Step 2 Connecting to Ethernet network.**

Attach one end of the Ethernet cable with RJ-45 connectors to your hub, switch or a PC's Ethernet port, and the other end to the **LAN** port of your AP.

The figure below illustrates a connection diagram example:

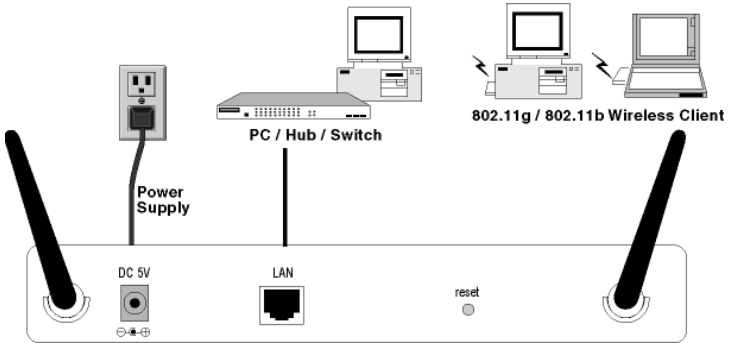


Figure 2-3 Typical Connection Diagram



# 3 Setting Up Ethernet / WLAN Client

This chapter describes how to configure an Ethernet or wireless station to access the AP's built-in Web server for initial configuration.

You can choose to access the AP's Web interface via Ethernet or wireless network. Whatever your choice, you must properly configure the network settings of your PC to be on the same subnet with the AP. As the AP is shipped with these defaults:

- **IP address:** 192.168.1.1
- **Subnet mask:** 255.255.255.0

Therefore, you should configure your PC's TCP/IP settings to use a static IP as below:

- **IP address:** 192.168.1.x (x is between 2 and 254)
- **Subnet mask:** 255.255.255.0

The ensuing sections will guide you through the static IP configurations.

## 3.1 Setting up TCP/IP

---

Before proceeding, make sure your computer is equipped with Ethernet network card or wireless adapter and has appropriate network card driver and TCP/IP installed.



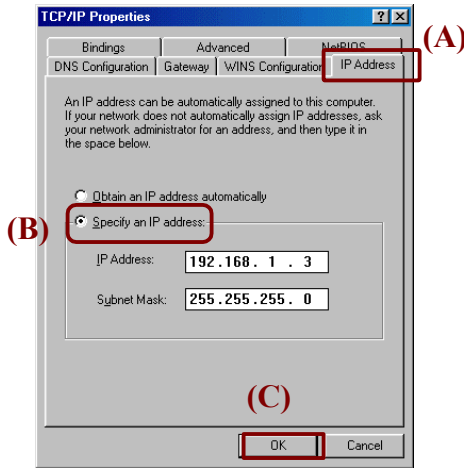
### Note

If TCP/IP protocol is not installed on your PC, refer to Windows documentations for installation instructions.

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## For Windows 98/ME

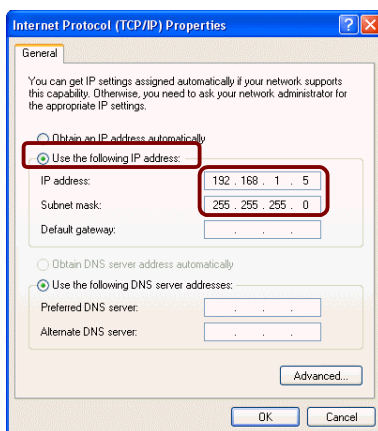
- Step 1 Click on the **Start** menu, point to **Settings** and click on **Control Panel**.
- Step 2 Double-click the **Network** icon.
- Step 3 In the **Network** window, highlight **TCP/IP** protocol for your NIC or wireless adapter and click **Properties**.
- Step 4 (A) Click the **IP Address** tab  
(B) select **Specify an IP address**. Then set the IP address as **192.168.1.x** (x is between 2 and 254), subnet mask as **255.255.255.0**.  
(C) Click **OK**.



- Step 5 Click **OK** to finish the configuration. If prompted to restart your computer, click **Yes**.

## For Windows 2000/XP

- Step 1 Click on the **Start** menu, point to **Settings** and click on **Control Panel**.
- Step 2 Double-click the **Network and Dial-up Connections** or **Network Connections** icon.
- Step 3 Right-click the **Local Area Connection** icon for your NIC or wireless adapter and then click **Properties**.
- Step 4 On the **General** tab, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.
- Step 5 When the following screen appears, select **Use the following IP address** and enter these settings:
  - **IP address:** 192.168.1.x (x is between 2 and 254)
  - **Subnet mask:** 255.255.255.0



## 3.2 Additional Settings for Wireless Client

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If you choose to access the router via a wireless client, also verify the following:

1. Make sure your PC is equipped with 802.11g or 802.11b wireless adapter and has appropriate WLAN card driver/utility and TCP/IP installed.
2. Set the wireless adapter to use appropriate TCP/IP settings as described in previous section.
3. Launch the wireless adapter's provided utility and verify that your wireless client is configured with these settings:
  - **Operation Mode:** Infrastructure
  - **SSID:** wireless
  - **Authentication:** Open
  - **WEP Mode:** Disabled



**Note**

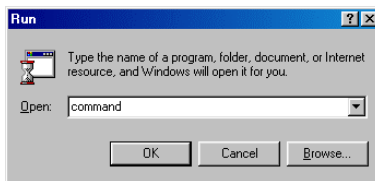
If you only finished the wireless settings and didn't configure the wireless adapter's TCP/IP settings, even your link status indicates a successful connection with the AP, this connection applies to the "physical" network layer only. Your wireless adapter cannot communicate with the AP. Make sure to set the TCP/IP properties as described in this previous section.

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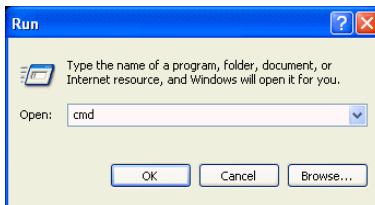
## 3.3 Checking Connection with the Access Point

You can use the PING command to verify whether or not the Ethernet/Wireless client can communicate with the device.

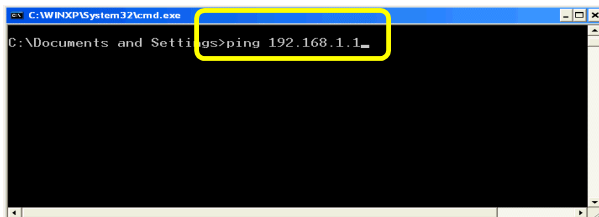
1. Open the DOS command window.
  - For Windows 98/Me: **Start > Run**. Type *command* and click **OK**.



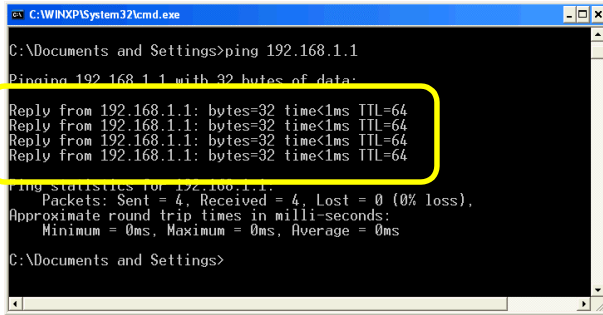
- For Windows 2000/XP: **Start > Run**. Type *cmd* and click **OK**.



2. Type the ping command and enter the IP address of the Wireless Broadband Router. The factory default value is: 192.168.1.1. If you have changed the IP of the device, then type the new IP address of the Wireless Broadband Router. For example: **C:\ping 192.168.1.1**



3. The Wireless Broadband Router shall reply and a similar screen as below is shown.



This indicates the Wireless Broadband Router and the wired/wireless host can communicate. If you get a failed ping response such as:

**Request time out**

**Request time out**

**Request time out**

**Request time out**

or

**Destination host unreachable**

**Destination host unreachable**

**Destination host unreachable**

**Destination host unreachable**

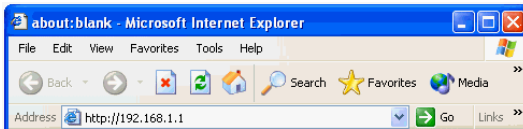
Then the connection has failed. Verify whether the network setting is correct. For Ethernet client, also check the cable between the router and the PC. Restart the computer if necessary.

# 4 Web Configuration

## 4.1 Accessing Web-Based Configuration Utility

Once your PC is properly configured as described in "3. Setting Up Ethernet / WLAN Client", you can proceed as follows for initial configuration:

1. Start your Web browser and type **http://192.168.1.1** in the URL field. This address is the default private IP of your AP.



2. After connecting to the device, you will be prompted to enter the username and password. Leave the username empty and enter the default password of **admin**.



After you login, the **System Overview** page of the 54Mbps Wireless Access Point displays. From now on the Access Point acts as a Web server sending HTML pages/forms on your request.

You can click the menu options at the top to start your configuration task.

While working with this Web Configuration Utility, corresponding configuration fields are displayed according to your specific selection to avoid any possible conflicting setting. In addition, should you input invalid values, the utility provides instant prompt to help you recover from error inputs.

## To enable Your Settings

After you have customized the settings and then click the **Apply** button, the device will begin registering your settings. You will be prompted to wait for a few seconds for the AP to commit changes to permanent storage. During this process, it is important not to switch on or off the AP otherwise damage may be caused to the device.

After the settings have been registered, the screen will return to previous page and the settings are effective. You may then proceed with other configuration tasks.

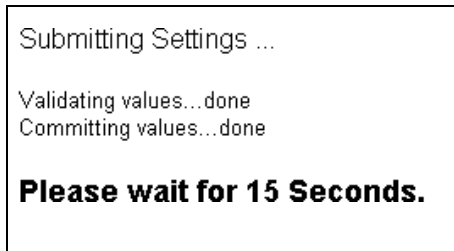


Figure 4-1 Apply Changes



## 4.2 Viewing System Status

Clicking **System Overview** in the menu bar will display the **System Overview** page that shows basic information about the 54Mbps Wireless Access Point, including the system, LAN and Wireless LAN interface information. You may click the **Update** button to update the overall status.

System Overview	LAN	Wireless LAN (2.4G)	Wireless LAN Security	Administration
This page displays summary for the router status. Click the button to update				<input type="button" value="Update"/>
<b>System</b>	<b>Firmware Version:</b>	3.XX.XX		
<b>WAN Interface</b>	<b>WAN/LAN Relation:</b>	Bridging		
<b>LAN Interface</b>	<b>MAC Address:</b>	00:90:96:2C:6C:F1		
	<b>IP Address/Subnet Mask:</b>	192.168.1.1 / 255.255.255.0		
<b>Wireless LAN (2.4G) Interface</b>	<b>SSID:</b>	wireless		
	<b>Channel ID:</b>	11		

Figure 4-2 System Overview

## 4.3 LAN Configuration

The LAN configuration page allows you to define the IP address of the LAN port.

### ► **General**

**MAC Address.** Displays the MAC address of the LAN port.

### ► **Manual Config**

**IP Address/Subnet Mask.** Enter the IP address and subnet mask for the Access Point LAN port. All local wired/wireless devices communicate with the device through this port. It is also the IP address of the Web-based Configuration Utility. By default, the IP address and subnet mask of the LAN port is **192.168.1.1** and **255.255.255.0** respectively. Note that if you change the private IP address and apply the changes, the PC from which you configure the router will lose the communication to the router. To reconnect,

you will need to renew the IP address of the PC or change to an IP address compatible with the new LAN port IP address.

System Overview	LAN	Wireless LAN (2.4G)	Wireless LAN Security	Administration
This page configures the LAN interface. It also applies on Wireless LAN interface.				
General	MAC Address:	00:90:96:2C:6C:F1		
Manual Config	IP Address:	<input type="text" value="192.168.1.1"/>		
	Subnet Mask:	<input type="text" value="255.255.255.0"/>		
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>				

Figure 4-3 LAN Configuration

## 4.4 Wireless LAN (2.4G)

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This page configures the AP wireless settings

► **Wireless Interface**

Displays the MAC address of the wireless interface.

► **Basic Configuration**

**SSID:** Service Set ID. It uniquely identifies a logical network domain name of your WLAN. The default value is **wireless**.

**Network Type:** An **Open** AP will periodically broadcast its SSID to inform the wireless clients of its presence. When set to **Closed**, the Access Point does not broadcast its presence. Wireless clients must know in advance the SSID of the AP in order to establish the connection.

**Country:** Select the country where this device is operating. The AP uses only the legal frequency channels allowed in that regulatory domain.

**► Wireless Bridge**

**AP Mode:** Select wireless operating mode of the Wireless Broadband Router. The Wireless Broadband Router can work as Access Point or Wireless Bridge.

- **Access Point.** When operating as an access point, provides connection between the wired and the 802.11b/g wireless network. This is the default mode.

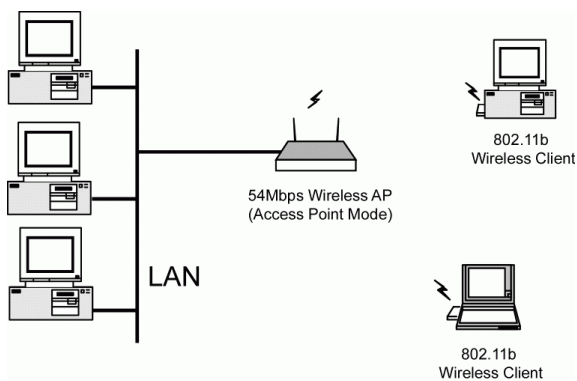


Figure 4-4 Access Point Mode

- **Wireless Bridge.** Provides wireless connectivity between two or more wired segment. When operating as Wireless Bridge, the device does not accept association request from wireless stations. All bridging devices must use the same channel in order to communicate with each other.

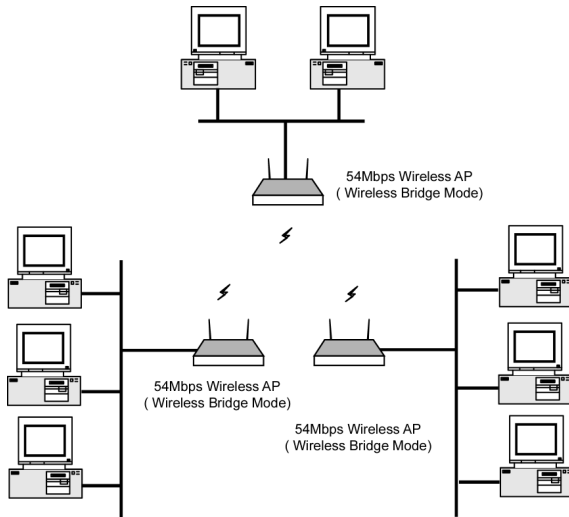


Figure 4-5 Wireless Bridge Mode

**Bridge Restrict:** Select whether to enable or disable this function. When set to enabled, all devices operating in Wireless Bridge mode must have others' Wireless Interface MAC addresses in their respective **Remote Bridges** table in order to establish the connection with each other (more secure). When set to disabled, only one device is required to have the **Remote Bridges** table filled with the Wireless Interface MAC address of other device in order to establish the connection.

**Remote Bridges:** Enter the Wireless Interface's MAC address of the remote Wireless Broadband Router in this field. The remote device should also enter this Access Point's MAC address in its **Remote Bridges** table if the **Bridge Restrict** is enabled. To find the MAC address of this device, see **Wireless Interface**, in the beginning of this section.

### ► Access Control

**MAC Address Access Control:** This AP has the capability to control the wireless client access based on the MAC address of the wireless client. The user has the flexibility to customize your own control policy based on these options:

- **Allow:** If selected, only the wireless client whose MAC address is in the **Allow List** is allowed to access this AP.
- **Deny:** If selected, only the wireless client whose MAC address is in the **Allow List** is NOT allowed to access this AP. Others clients are granted access.
- **Disable:** No access control. All the clients are allowed to access this AP.

When entering MAC address in the list, up to 16 MAC entries are allowed.

### ► Advanced

It's not recommended to modify the **Advanced** parameters unless specific requirement is demanded. The parameters are described as below:

**Radio:** Choose whether to enable or disable the RF (Radio Frequency) of the AP.

**Band:** Select the operating frequency of the AP (currently only supports 2.4GHz).

**Channel:** Varies according to the specified **Country**.

**Rate:** The default setting, **Auto**, allows the AP to automatically use the fastest possible data rate. Selecting a specific rate forces the AP to transmit at a particular speed.

**Basic Rate Set:** The **Default** option uses 1 or 2 Mbps for 802.11b and 6, 12 or 24Mbps for 802.11g as the basic rate of your wireless network. The **All** option uses 1, 2, 5.5, 6, 9,11, 12, 18, 24, 36, 48, or 54Mbps. The wireless clients must support the basic rate to successfully associate with the AP.

**Fragment Threshold:** It determines whether packets will be fragmented and at what size. On an 802.11 wireless LAN, packets exceed the fragmentation threshold are fragmented, i.e., split into, smaller units suitable for the circuit size. On the other hand, packets smaller than the specified fragmentation threshold value are not fragmented.

**RTS Threshold:** Request to send threshold. It specifies the packet size beyond which the AP invokes its RTS/CTS mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism.

**DTIM:** Specifies the Deferred Traffic Indicator Map (DTIM) period. This value determines at which interval the AP will send its broadcast traffic. The default value is 3.

**Beacon Interval:** Defines the periodic interval at which the Access Point sends out a beacon.

**54g™ Mode:** This item allows you to choose from these communication options:

- **54g Auto:** Both 802.11g and 802.11b clients can communicate with this AP. The data rate will be automatically adjusted.
- **54g Performance:** Only 802.11g wireless clients can communicate with the AP.
- **54g LRS:** LRS stands for Limited Rate Support. This option is intended to support "legacy" clients. Select this option if wireless clients can't connect in the other two modes previously described. Both 802.11g and 802.11b clients can communicate with this AP.
- **802.11b Only:** Both 802.11g and 802.11b clients can communicate with this AP. The data rate will be automatically adjusted to the one supported by the 802.11b standard.

**54g Protection:** Select Off or Auto. The default value is set to Off. When set to Auto, a protection mechanism will ensure that 802.11b devices will connect to the Access Point when many 802.11g devices are present. However, performance of your 802.11g devices may be decreased.

**Enable Xpress™ Technology:** Select Off or Auto. When set to Auto, increases the bandwidth availability that enables more wireless clients to share the network. In other words, it improves wireless network efficiency and boosts throughput.

System Overview	LAN	Wireless LAN (2.4G)	Wireless LAN Security	Administration
This page configures the IEEE 802.11g(2.4GHz) Wireless LAN interface.				
Wireless Interface:		wireless (00:90:96:3D:B3:EC) ▼	Select	
<b>Basic</b>				
SSID:		wireless		
Network Type:		Open ▼		
Country:		USA ▼		
<b>Wireless Bridge</b>				
AP Mode:		Access Point ▼		
Bridge Restrict:		Disabled ▼		
Remote Bridges:		(e.g. 00:90:96:12:13:14)		
		<input type="text"/>		
		<input type="text"/>		
<b>Access Control</b>				
MAC Address Access Control:		<input type="radio"/> Allow <input type="radio"/> Deny <input checked="" type="radio"/> Disable		
Allow List:		(e.g. 00:90:96:12:13:14)		
		<input type="text"/>		
		<input type="text"/>		
		<input type="text"/>		
		<input type="text"/>		
		<input type="text"/>		
		<input type="text"/>		
		<input type="text"/>		
<b>Advanced</b>				
Radio:		Enabled ▼		
Band:		802.11g (2.4 GHz) ▼		
Channel:		11 ▼		
Rate:		Auto ▼		
Basic Rate Set:		Default ▼		
Fragmentation Threshold:		2346		
RTS Threshold:		2347		
DTIM Interval:		3		
Beacon Interval:		100		
Preamble Type:		Long ▼		
54g™ Mode:		54g Auto ▼		
54g Protection:		Off ▼		
Enable XPress (tm) Technology:		Off ▼		
		<input type="button" value="Apply"/> <input type="button" value="Cancel"/>		

Figure 4-6 Wireless LAN Configuration

## 4.5 Wireless LAN Security

---

This page configures the wireless LAN security mode.

► **Wireless Interface**

Displays the wireless interface's MAC address.

► **Network Authentication**

**Network Authentication:** Disabled by default. If the local network has an authentication server such as Radius server, the user can enable this function by choosing either **802.1X** or **WPA**. This option fulfills the security that an enterprise needs. If the local network does not have an authentication server, it's recommended to use **WPA-PSK** (Pre-Shared Key). This option is commonly used in small office home office (SOHO) environments.

**WPA Pre-Shared Key:** If WPA-PSK is the network authentication option, enter a secret key. Check the table below for instructions when entering the key.

Format	Minimum Characters	Maximum Characters
ASCII	8	63
Hexadecimal	8	64

**WPA Group ReKey Interval:** For **WPA** and **WPA-PSK** only. Specifies the timer the WPA key must changes. The change is done automatically between the server and the client.

**Radius Server:** For **802.1X** and **WPA** only. Enter the IP Address of the authentication server, commonly the Radius server.

**Radius Port:** Enter the port number of the authentication server. The default port number is 1812.

**Radius Key:** Enter the same key as the Radius server's.



**► WEP**

**Data Encryption:** Specifies the encryption mode that the AP uses to transmit the data. Encryption type changes according to the **Network Authentication** mode. Encryption protects your wireless network against eavesdropping.

- **Off:** The data is not encrypted when it is transferred from one station to another. This is the default option.
- **WEP:** Only for **802.1X** or when authentication is disabled. The data is encrypted with the WEP algorithm before being transmitted. If WEP is selected, enter the values in the **Network Key** fields.
- **TKIP:** Only for **WPA** and **WPA-PSK**. Temporal Key Integrity Protocol (TKIP) utilizes a stronger encryption algorithm and includes Message Integrity Code (MIC) to provide protection against hackers.
- **AES:** Only for **WPA** and **WPA-PSK**. Advanced Encryption System (AES) utilizes a symmetric 128-Bit block data encryption. It's the strongest encryption currently available.

**Shared Key Authentication:** Authentication is a process in which the AP validates whether the wireless client is qualified to access the AP's service. Select **Optional** or **Required**.

- **Optional:** The authentication is done through a pseudo process, accepting all kinds of requests, mainly used in cases where connectivity is more important than security.
- **Required:** Utilizes WEP capability to further verify if a wireless client is authorized to share this AP's resource. If the client has the wrong key or no key, the authentication will fail and will not be allowed to associate with the AP.

If you select **Optional**, wireless stations with or without correct WEP keys can be authenticated by the AP.

Yet if **Required** is selected, you must enable WEP function and define your WEP keys. The keys are used both to authenticate wireless clients and encrypt outgoing data.

**Network Key 1~4:** Enter one to four WEP keys in either ASCII or Hexadecimal format. You can use 64 bits or 128 bits as the encryption algorithm.

Note that when using Hexadecimal format, only digits 0-9 and letters A-F, a-f are allowed. Valid key length for each encryption type is as below:

Key Length	HEX Format	ASCII Format
64 Bit	10 hexadecimal digits	5 ASCII characters
128 Bit	26 hexadecimal digits	13 ASCII characters

**Current Network Key:** Aside from entering the WEP keys, select one of the entered keys to encrypt the data before being transmitted. The AP always transmits data encrypted using the selected WEP Key. The receiving station will use the key number to determine which key to use for decryption. If the key value does not match with the transmitting station, the decryption will fail. To ensure successful decryption, have your wireless stations set identical key tables.



**Note**

All Wireless Stations must use identical encryption/authentication method and Key values (same key position in its key table) to ensure successful data transmission.

System Overview	LAN	Wireless LAN (2.4G)	Wireless LAN Security	Administration
This page configures the Wireless LAN Security interface.				
<b>Wireless Interface:</b>		wireless (00:90:96:3D:B3:EC)	Select	
<b>Network Authentication</b>		<b>Network Authentication:</b> Disabled		
		<b>WPA Pre-Shared Key:</b>	<input type="text"/>	
		<b>WPA Group Rekey Interval:</b>	<input type="text" value="900"/>	
		<b>RADIUS Server:</b>	<input type="text"/>	
		<b>RADIUS Port:</b>	<input type="text" value="1812"/>	
		<b>RADIUS Key:</b>	<input type="text"/>	
<b>WEP</b>		<b>Data Encryption:</b> Off		
		<b>Shared Key Authentication:</b> Optional		
		<b>Network Key 1:</b>	<input type="text"/>	
		<b>Network Key 2:</b>	<input type="text"/>	
		<b>Network Key 3:</b>	<input type="text"/>	
		<b>Network Key 4:</b>	<input type="text"/>	
		<b>Current Network Key:</b>	1	
		<input type="button" value="Apply"/>	<input type="button" value="Cancel"/>	

Figure 4-7 Wireless LAN Security

## 4.6 Administration

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This page allows the administrator to perform the following settings:

### ► **Management Setup**

Specifies the username and password that grant the access to the Wireless Broadband Router' web page. By factory default, the user name is empty and the password is **admin**.

**Username:** Enter the username (case sensitive).

**Password/Re-enter Password:** Enter the password (case sensitive).

**UPnP:** Select whether to enable or disable this feature. This function automatically opens the required ports to support voice and video of applications such as Windows Messenger, multi-player games, and real-time communications.

### ► **Firmware Upgrade**

From time to time, the vendor may release new firmware for the Wireless Broadband Router. To upgrade, download required firmware file to your host PC and follow the steps below:

1. In the **Locate New Firmware** field, click **Browse** to locate the firmware file just downloaded.
2. Click the **Upgrade** button to start upgrade and then wait for a few minutes. You will return to the Administration page while the process is complete. After upgrading, your customized configuration will still exist and not reset to the factory defaults.



**Caution**

Do not interrupt the upgrade process; otherwise it might cause permanent damage to the Wireless Broadband Router.

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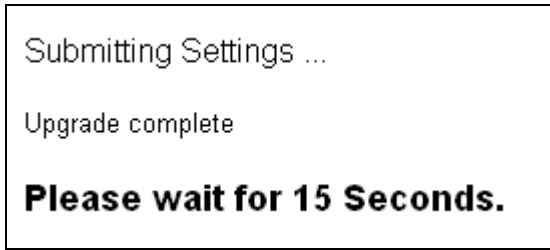


Figure 4-8 Upgrading

After upgrading, the new firmware version number is displayed in **Current Firmware version** field.

► **Restore Factory Defaults**

All settings set by the administrator will be erased. This option restore all the settings back to factory defaults. To perform this operation, click the **Restore** button and then wait for a few seconds. You will return to the Administration page when the process is complete. This feature is basically the same as resetting via the reset button (see “Rear Panel and Connector”) on the device but it allows you to remotely perform the reset task.

► **System**

**Reboot:** Reboot the Wireless Broadband Router. This feature is basically the same as resetting via the reset button (see “Rear Panel and Connector”) on the device but it allows you to remotely perform the reset task.

System Overview	LAN	Wireless LAN (WLAN)	Wireless LAN Security	Administration
This page is for system administration.				
<b>Management Setup</b>				
Username: <input type="text"/>				
Password: <input type="password"/>				
Re-enter Password: <input type="password"/>				
UPnP: <input type="radio"/> Enable <input type="radio"/> Disable				
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>				
<b>Firmware Upgrade</b>				
Current Firmware Version: 3.XX.XX				
Current Bootcode Version: v1.XX.XX				
Locate New Firmware: <input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Upgrade"/>				
<b>Restore Factory Defaults:</b> <input type="button" value="Restore"/>				
<b>System</b> <b>Reboot:</b> <input type="button" value="Reboot"/>				

Figure 4-9 Administration

# 5 Specification

## 5.1 Hardware

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- 125MHz MIPS CPU
- 16MB SDRAM
- 4MB Flash Memory
- 802.11g: Broadcom (BCM4306, BCM2050)
- Two external antennas for wireless technology

### Interface

- One RJ-45 LAN port for 10/100Base-Tx Ethernet; HP Auto-MDIX Support
- 802.11g wireless LAN
- Two external antennas for wireless technology

### Physical

- Front Panel: 3 LEDs ( Power x 1, WLAN x 1, LAN x 1)
- Back Panel: Reset button, Power Jack, RJ-45 LAN Port
- Dimensions: 145 mm(L) x 210 mm(W) x 40 mm(H)
- Case types: Lay down

### Power Adapter and Environmental Requirement

- DC Adaptor: Output 5V DC, 2A
- Temperature: 0 to 40°C (operation), -20 to 70 °C (storage)
- Relative Humidity: 5% to 90% (non-condensing)

### Electromagnetic Compliance

- FCC Part 15 Class B
- CE
- EMI/Immunity: VCCI class B

## 5.2 Software

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### **LAN Port Features**

- Settable and Changeable IP Address

### **Security Features**

- PAP and CHAP Authentication
- ASCII/HEX Format 64/128 Bit WEP Key for Wireless LAN
- Allow/Deny List for Wireless LAN

### **Wireless LAN Features**

- Fully compatible to 802.11g standard
- Direct Sequence Spread Spectrum (DSSS) technology exploitation
- Seamless roaming within wireless LAN infrastructure
- Low power consumption via efficient power management

### **Configuration and Management Features**

- Configurable through Web Browser
- Software Upgrade
- NTP