Multi-Function 802.11b+g Wireless Router

802.11g/802.11b Wireless Access Point Broadband Internet Access 4-Port Switching Hub

User's Manual

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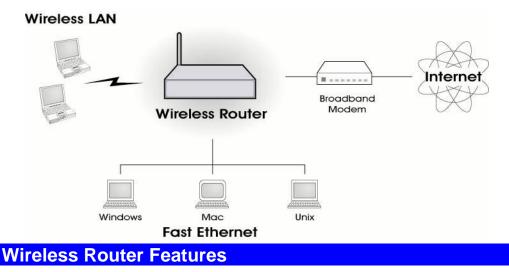
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Chapter 1: Introduction

This Chapter provides an overview of the Wireless Router's features and capabilities.

Congratulations on the purchase of your new Wireless Router. The Wireless Router is a multifunction device providing the following services:

- Shared Broadband Internet Access for all LAN users.
- 4-Port Switching Hub for 10BaseT or 100BaseT connections.
- Wireless Access Point for 802.11b and 802.11g Wireless Stations.



The Wireless Router incorporates many advanced features, carefully designed to provide sophisticated functions while being easy to use.

Internet Access Features

- *Shared Internet Access.* All users on the LAN or WLAN can access the Internet through the Wireless Router, using only a single external IP Address. The local (invalid) IP Addresses are hidden from external sources. This process is called NAT (Network Address Translation).
- **DSL & Cable Modem Support.** The Wireless Router has a 10/100BaseT Ethernet port for connecting a DSL or Cable Modem. All popular DSL and Cable Modems are supported. SingTel RAS and Big Pond (Australia) login support is also included.
- **PPPoE**, and **PPTP**. The Internet (WAN port) connection supports PPPoE (PPP over Ethernet), PPTP (Peer-to-Peer Tunneling Protocol), as well as "Direct Connection" type services. Unnumbered IP with PPPoE is also supported.
- *Fixed or Dynamic IP Address.* On the Internet (WAN port) connection, the Wireless Router supports both Dynamic IP Address (IP Address is allocated on connection) and Fixed IP Address.

Advanced Internet Functions

• *Communication Applications*. Support for Internet communication applications, such as interactive Games, Telephony, and Conferencing applications, which are often difficult to use when behind a Firewall, is included.

- *Special Internet Applications.* Applications which use non-standard connections or port numbers are normally blocked by the Firewall. The ability to define and allow such applications is provided, to enable such applications to be used normally.
- *Virtual Servers.* This feature allows Internet users to access Internet servers on your LAN. The required setup is quick and easy.
- **DDNS Support.** DDNS (Dynamic DNS) allows Internet users to connect to Virtual Servers on your LAN using a domain name, even if your IP address is not fixed.
- **DMZ.** For each WAN (Internet) IP address allocated to you, only one (1) PC on your local LAN can be configured to allow unrestricted 2-way communication with Servers or individual users on the Internet. This provides the ability to run programs which are incompatible with Firewalls.
- URL Filter. Use the URL Filter to block access to undesirable Web sites by LAN users.
- Internet Access Log. See which Internet connections have been made.
- Access Control. Using the Access Control feature, you can assign LAN users to different groups, and determine which Internet services are available to each group.
- *VPN Pass through Support.* PCs with VPN (Virtual Private Networking) software using PPTP, L2TP and IPSec are transparently supported no configuration is required.

Wireless Features

- *Standards Compliant.* The Wireless Router complies with the IEEE802.11g (DSSS) specifications for Wireless LANs.
- *Supports both 802.11b and 802.11g Wireless Stations.* The 802.11g standard provides for backward compatibility with the 802.11b standard, so both 802.11b and 802.11g Wireless stations can be used simultaneously.
- Speeds to 54Mbps. All speeds up to the 802.11g maximum of 54Mbps are supported.
- *WEP support.* Support for WEP (Wired Equivalent Privacy) is included. Key sizes of 64 Bit and 128 Bit are supported.
- *Wireless MAC Access Control.* The Wireless Access Control feature can check the the MAC address (hardware address) of Wireless stations to ensure that only trusted Wireless Stations can access your LAN.
- *Simple Configuration.* If the default settings are unsuitable, they can be changed quickly and easily.

LAN Features

- **4-Port Switching Hub.** The Wireless Router incorporates a 4-port 10/100BaseT switching hub, making it easy to create or extend your LAN.
- *DHCP Server Support.* Dynamic Host Configuration Protocol provides a dynamic IP address to PCs and other devices upon request. The Wireless Router can act as a **DHCP Server** for devices on your local LAN and WLAN.

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Configuration & Management

- *Easy Setup.* Use your WEB browser from anywhere on the LAN or WLAN for configuration.
- *Configuration File Upload/Download.* Save (download) the configuration data from the Wireless Router to your PC, and restore (upload) a previously-saved configuration file to the Wireless Router.

- *Remote Management.* The Wireless Router can be managed from any PC on your LAN. And, if the Internet connection exists, it can also (optionally) be configured via the Internet.
- *Network Diagnostics.* You can use the Wireless Router to perform a *Ping* or *DNS lookup*.
- **UPnP Support.** UPnP (Universal Plug and Play) allows automatic discovery and configuration of the Wireless Router. UPnP is by supported by Windows ME, XP, or later.

Security Features

- **Password protected Configuration**. Optional password protection is provided to prevent unauthorized users from modifying the configuration data and settings.
- *Wireless LAN Security*. WEP (Wired Equivalent Privacy) is supported, as well as Wireless access control to prevent unknown wireless stations from accessing your LAN.
- *NAT Protection.* An intrinsic side effect of NAT (Network Address Translation) technology is that by allowing all LAN users to share a single IP address, the location and even the existence of each PC is hidden. From the external viewpoint, there is no network, only a single device the Wireless Router.
- **Protection against DoS attacks.** DoS (Denial of Service) attacks can flood your Internet connection with invalid packets and connection requests, using so much bandwidth and so many resources that Internet access becomes unavailable. The Wireless Router incorporates protection against DoS attacks.

Package Contents

The following items should be included:

- The Wireless Router Unit
- Power Adapter
- Quick Installation Guide
- CD-ROM containing the on-line manual.

If any of the above items are damaged or missing, please contact your dealer immediately.

Physical Details

Front-mounted LEDs

Figure 1: Front Panel

Power LED On - Power on.

Off - No power.

Internet LED On - Connection to the Broadband Modem attached to the WAN (Internet) port is established.

Off - No connection to the Broadband Modem.

Flashing - Data is being transmitted or received via the WAN port.

WLAN LED On - Wireless connection available; Wireless Access Point is ready for use.

Off - No Wireless connection available.

Flashing - Data is being transmitted or received via the Wireless access point. Data includes "network traffic" as well as user data.

- LAN LEDs For each port, there are 2 LEDs
 - Link/Act
 - **On** Corresponding LAN (hub) port is active.
 - Off No active connection on the corresponding LAN (hub) port.
 - **Flashing** Data is being transmitted or received via the corresponding LAN (hub) port.
 - 100
 - **On** Corresponding LAN (hub) port is using 100BaseT.
 - **Off** Corresponding LAN (hub) port connection is using 10BaseT, or no active connection.

Rear Panel

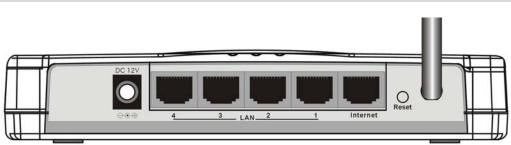


Figure 2: Rear Panel

Power port	Connect the supplied power adapter here.
10/100BaseT LAN port	Use standard LAN cables (RJ45 connectors) to connect your PCs to these ports.
	If required, any port can be connected to another hub. Any LAN port will automatically function as an "Uplink" port when necessary.
Internet port (10/100BaseT)	Connect the DSL or Cable Modem here. If your modem came with a cable, use the supplied cable. Otherwise, use a standard LAN cable.
Reset Button	 This button has two (2) functions: Reboot. When pressed within 3~5 seconds, the power LED lights amber then released, the Wireless Router will reboot (restart). Clear All Data. This button can also be used to clear ALL data and restore ALL settings to the factory default values. To Clear All Data and restore the factory default values: After Power On. Hold the Reset Button down. Keep holding the Reset Button more than 5 seconds, until the Amber LED has flashed. Release the Reset Button. The Wireless Router is now using the
	4. Release the Reset Button. The Wireless Router is now using the factory default values.

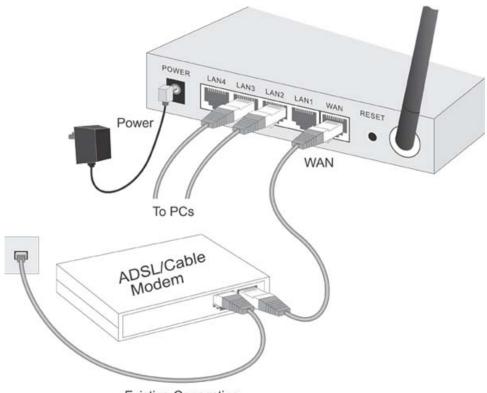
Chapter 2: Installation

This Chapter covers the physical installation of the Wireless Router.

Requirements

- Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors.
- TCP/IP protocol must be installed on all PCs.
- For Internet Access, an Internet Access account with an ISP, and either of a DSL or Cable modem (for WAN port usage)
- To use the Wireless Access Point, all Wireless devices must be compliant with the IEEE802.11b or IEEE802.11g specifications.

Procedure



Existing Connection

1. Choose an Installation Site

Select a suitable place on the network to install the Wireless Router. Ensure the Wireless Router and the DSL/Cable modem are powered OFF.

2. Connect LAN Cables

Use standard LAN cables to connect PCs to the Switching Hub ports on the Wireless Router. Both 10BaseT and 100BaseT connections can be used simultaneously.

If required, connect any port to a normal port on another Hub, using a standard LAN cable. Any LAN port on the Wireless Router will automatically function as an "Uplink" port when required.

3. Connect WAN Cable

Connect the DSL or Cable modem to the WAN port on the Wireless Router. Use the cable supplied with your DSL/Cable modem. If no cable was supplied, use a standard cable.

4. Power Up

- Power on the Cable or DSL modem.
- Connect the supplied power adapter to the Wireless Router and power up. Use only the power adapter provided. Using a different one may cause hardware damage

5. Check the LEDs

- The *Power* LED should be ON.
- The Status LED should flash, then turn Off. If it stays on, there is a hardware error.
- For each LAN (PC) connection, the LAN *Link/Act* LED should be ON (provided the PC is also ON.)
- The WAN LED should be ON.
- The WLAN LED should be ON

For more information, refer to Front-mounted LEDs in Chapter 1.

Chapter 3: Setup

This Chapter provides Setup details of the Wireless Router.

Overview

This chapter describes the setup procedure for:

- Internet Access
- LAN configuration
- Wireless setup
- Assigning a Password to protect the configuration data.

PCs on your local LAN may also require configuration. For details, see *Chapter 4 - PC Configuration*.

Other configuration may also be required, depending on which features and functions of the Wireless Router you wish to use. Use the table below to locate detailed instructions for the required functions.

Configuration Program

The Wireless Router contains an HTTP server. This enables you to connect to it, and configure it, using your Web Browser. **Your Browser must support JavaScript**.

The configuration program has been tested on the following browsers:

- Netscape V4.08 or later
- Internet Explorer V4 or later

Preparation

Before attempting to configure the Wireless Router, please ensure that:

- Your PC can establish a physical connection to the Wireless Router. The PC and the Wireless Router must be directly connected (using the Hub ports on the Wireless Router) or on the same LAN segment.
- The Wireless Router must be installed and powered ON.
- If the Wireless Router's default IP Address (192.168.1.254) is already used by another device, the other device must be turned OFF until the Wireless Router is allocated a new IP Address during configuration.

Using UPnP

If your Windows system supports UPnP, an icon for the Wireless Router will appear in the system tray, notifying you that a new network device has been found, and offering to create a new desktop shortcut to the newly-discovered device.

- Unless you intend to change the IP Address of the Wireless Router, you can accept the desktop shortcut.
- Whether you accept the desktop shortcut or not, you can always find UPnP devices in *My Network Places* (previously called *Network Neighborhood*).

• Double - click the icon for the Wireless Router (either on the Desktop, or in *My Network Places*) to start the configuration. Refer to the following section *Setup Wizard* for details of the initial configuration process.

Using your Web Browser

To establish a connection from your PC to the Wireless Router:

- 1. After installing the Wireless Router in your LAN, start your PC. If your PC is already running, restart it.
- 2. Start your WEB browser.
- In the Address box, enter "HTTP://" and the IP Address of the Wireless Router, as in this example, which uses the Wireless Router's default IP Address: HTTP://192.168.1.254

Because the default password is blank, you will not be prompted for a password. However, you should assign a password. See the *Password Setup* section later in this chapter for details.

If you can't connect

If the Wireless Router does not respond, check the following:

- The Wireless Router is properly installed, LAN connection is OK, and it is powered ON. You can test the connection by using the "Ping" command:
 - Open the MS-DOS window or command prompt window.
 - Enter the command: ping 192.168.1.254 If no response is received, either the connection is not working, or your PC's IP address is not compatible with the Wireless Router's IP Address. (See next item.)
- If your PC is using a fixed IP Address, its IP Address must be within the range 192.168.1.1 to 192.168.1.253 to be compatible with the Wireless Router's default IP Address of 192.168.1.254. Also, the *Network Mask* must be set to 255.255.255.0. See *Chapter 4 PC Configuration* for details on checking your PC's TCP/IP settings.
- Ensure that your PC and the Wireless Router are on the same network segment. (If you don't have a router, this must be the case.)
- Ensure you are using the wired LAN interface. The Wireless interface can only be used if its configuration matches your PC's wireless settings.

Setup Wizard

The Setup Wizard provides brief and basic configuration of this device, you may enter each screen to change the default settings. For more detailed settings, you may refer to the "Configuration via Web" section.

1. View the listed configuration items and click **Next** to continue.

Setup W	izard
Setup Wizard LAN Password Status	The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step. 1. Choose your Time Zone 2. Setup LAN Interface 3. Setup WAN Interface 4. Wireless LAN Setting 5. Wireless Security Setting
 ▼ Wireless ▼ Advanced ▼ Administration 	Cancel Next >>
Log Out	

2. Configure Time Zone and NTP server by enabling NTP client update. Click **Next** to continue.

	Setup Wizard - Time Zone Setting
	You can maintain the system time by synchronizing with a public time server over the Internet.
Setup Wizard	📕 Enable NTP dient update
LAN	Time Zone Select:
Password	(GMT+08:00)Taipei
Status	NTP server:
▼ Wireless	192.5.41.41 - North America 💌
▼ Advanced	Cancel << Back Next >>
▼ Administration	
Log Out	

3. Configure the parameters for area network (If you want to change the default parameter) by entering New IP Address and Subnet Mask.

	Setup Wizard - L	AN Interface Setup			
	This page is used to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP addresss, subnet mask, DHCP, etc				
Setup Wizard LAN	IP Address:	192.168.1.254			
Password	Subnet Mask:	255.255.255.0			
Status			Cancel	<< Back	Next >>
▼ Wireless					
▼ Advanced					
▼ Administration					
Log Out					

4. Change the access method (Static IP, DHCP, PPPoE or PPTP) by selecting for the pulldown menu. Click **Next** to continue.

	Setup Wizard - WAN Interface Setup				
Setup Wizard	This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE or PPTP by click the Item value of WAN Access type.				
LAN	WAN Access Type: DHCP Client 💌				
Password			Cancel	<< Back	Next >>
Status					
▼ Wireless					
▼ Advanced					
▼ Administration					
Log Out					

5. Configure the parameters for wireless LAN clients. Check the Disable Access Point to disable the settings of this screen. Click **Next** to continue.

	Setup Wizard - Wireless Basic Settings				
Setup Wizard	This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point.				
LAN	🔲 Disable Access Point				
Password	Band:	2.4 GHz (B+G) 💌			
Status		Untitled			
▼ Wireless	Channel Number:	11 💌	Cancel	<< Back	Next >>
▼ Advanced			Cancer	CC DOCK	Honeyy
▼ Administration					
Log Out					

6. To manage your wireless network security by selecting the encryption type (None, WEP and WPA (TKIP)) from the pull-down menu. Click **Finish** to exit Set Wizard screen.

	Setup Wizard - \	Nireless	Security Setur)		
	This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys or prevent any unauthorized access to your wireless network.		Keys could			
Setup Wizard LAN	Encryption:	None				
Password				Cancel	<< Back	Finished
Status						
▼ Wireless						
▼ Advanced						
▼ Administration						
Log Out						

Common Connection Types

Cable Modems

Туре	Details	ISP Data required
Dynamic	Your IP Address is allocated	Usually, none.
IP Address	automatically, when you	However, some ISP's may
	connect to you ISP.	require you to use a particular
		Hostname, Domain name, or
		MAC (physical) address.
Static (Fixed)	Your ISP allocates a	IP Address allocated to you.
IP Address	permanent IP Address to you.	Some ISP's may also require
		you to use a particular
		Hostname, Domain name, or
		MAC (physical) address.

DSL Modems

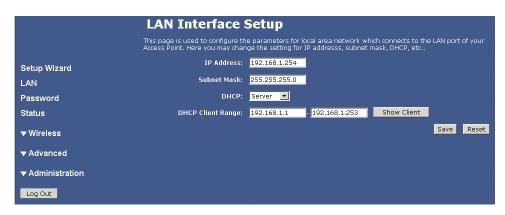
Туре	Details	ISP Data required	
Dynamic IP Address	Your IP Address is allocated automatically, when you connect to you ISP.	None.	
Static (Fixed) IP Address	Your ISP allocates a permanent IP Address to you.	IP Address allocated to you.	
PPPoE	You connect to the ISP only when required. The IP address is usually allocated automatically.	User name and password.	
РРТР	Mainly used in Europe. You connect to the ISP only when required. The IP address is usually allocated automatically, but may be Static (Fixed).	 PPTP Server IP Address. User name and password. IP Address allocated to you, if Static (Fixed). 	

Other Modems (e.g. Broadband Wireless)

Туре	Details	ISP Data required
Dynamic IP Address	Your IP Address is allocated automatically, when you connect to you ISP.	None.
Static (Fixed) IP Address	Your ISP allocates a permanent IP Address to you.	IP Address allocated to you.

Configuration via Web

LAN Interface Setup



IP Address	Default: 192.168.1.254 (this is the local address of this Router)
Subnet Mask	Default: 255.255.255.0
DHCP	Disable : Select to disable this Router to distribute IP Addresses (Disabled)
	Server : Select to enable this Router to distribute IP Addresses (DHCP Server). And the following field will be activated for you to enter the starting IP Address
DHCP Client Range	The starting address of this local IP network address pool. The pool is a piece of continuous IP address segment. Keep the default value 192.168.1.1 should work for most cases.
	• Maximum: 253 . Default value 253 should work for most cases.
	Note: If "Continuous IP address poll starts" is set at 192.168.1.1 and the "Number of IP address in pool" is 253, the device will distribute IP addresses from 192.168.1.1 to 192.168.1.253 to all the computers in the network that request IP addresses from DHCP server (Router)
Show Client	Click to show Active DHCP Client table.
Save	After completing the settings on this page, click Save to save the settings.
Reset	Click Reset to restore to default values.

Password Setup

Password Se	e account to access the web server of Access Point. Empty use	er name and password will disable the
	Passward:	Save Reset
▼ Wireless ▼ Advanced ▼ Administration		
Log Out		
User Name	Enter the user name in this	
New Password	Maximum input is 36 alph	nanumeric characters (ca

New Password	Maximum input is 36 alphanumeric characters (case sensitive)	
Confirmed Password	Key in the password again to confirm.	
Save	After completing the settings on this page, click Save to save the settings.	
Reset	Click Reset to clear settings.	

Status

	Status		
	Internet	Connection Method:	Getting IP from DHCP server
- · · · · ·		Internet IP Address:	0.0.0.0
Setup Wizard			Connection Details
LAN			
Password	LAN	IP Address:	192.168.1.254
Status		Network Mask:	255.255.255.0
▼ Wireless		DHCP Server:	ON
▼ Advanced	System	Firmware Version:	v4.2.1.0.4e
✓ Administration Log Out			System Data
	Shows the in	ternet connecti	Refresh Screen
Log Out			Refresh Screen
Log Out Internet	Shows the Lo	ocal area netwo	Refresh Screen
Log Out Internet LAN	Shows the Lo Briefly show	ocal area netwo	Refresh Screen on status
Log Out Internet LAN System	Shows the Lo Briefly show Click to show	ocal area netwo s the device na v more details o	Refresh Screen on status ork information me and firmware informat

Wireless Basic Settings

	Wireless Basic Settings	
	This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.	
Setup Wizard	Disable Access Point	
LAN	Band: 2.4 GHz (B+G) 💌	
Password	Mode: AP 🔽	
Status	Network Type: Infrastructure 🗹	
▲ Wireless	SSID: Untitled	
Basic Settings Advanced Settings	Region Domain: Canada ,USA :(1~11)	
► Site Survey ► Security	Channel 11 👻	
Trusted Stations	Associated Clients: Show Active Clients	
▼ Advanced	Save	
- Administration		
Disable Access Point	Check to disable the AP function.	
	The wireless (WLAN) LED on front panel will remain OFF if the Wireless interface is disabled.	
Band	You can choose one mode of the following you need.	

	⊙ 2.4GHz (B): 802.11b supported rate only.
	⊙ 2.4GHz (G): 802.11g supported rate only.
	⊙ 2.4GHz (B + G): 802.11b supported rate and 802.11g supported rate.
	The default is 2.4GHz (B + G) mode.
Network Type	Infrastructure : If set to Client (Infrastructure) mode, this device can work like a wireless station when it's connected to a computer so that the computer can send packets from wired end to wireless interface.
	Ad hoc: If set to the Client (Ad-hoc) mode, this device can work like a wireless station when it is connected to a computer so that the computer can send packets from wired end to wireless interface. You can share files and printers between wireless stations (PC and laptop with wireless network adapter installed).
SSID	Shows the SSID name.
Channel Number	Select which channel to be located (from 1 to 11).
Associated Clients	Click to show all the listed active clients.
Save	After completing the settings on this page, click Save to save the settings.
Reset	Click Reset to restore to default values.

Wireless Advanced Settings

	Wireless Advanced Settings
Setup Wizard LAN Password Status Mireless Basic Settings Advanced Settings Site Survey Security Trusted Stations	These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access point. Authentication Type: • Open System • Shared Key • Auto • Preamble Type: • Long Preamble • Short Preamble Broadcast SSID: • Enabled • Disabled IAPP: • Enabled • Disabled Save Reset
▼ Advanced	
Authentication Type	Open System : If your access point/wireless router is using "Open " authentication, then the wireless adapter will need to be set to the same authentication type. Shared Key: Shared Key is when both the sender and the recipient

recinient

	share a secret key.
	Auto: Select Auto Switch for the adapter to automatically select the appropriate
Preamble Type	A preamble is a signal used in wireless environment to synchronize the transmitting timing including Synchronization and Start frame delimiter. (Note : If you want to change the Preamble type into Long or Short , please check the setting of AP.)
Broadcast SSID	Enable: This wireless AP will broadcast its SSID to stations.
	Disable : This wireless AP will not broadcast its SSID to stations. If stations want to connect to this wireless AP, this AP's SSID should be known in advance to make a connection.
IAPP	IAPP (Inter Access Point Protocol) is designed for the enforcement of unique association throughout a ESS (Extended Service Set) and a secure exchange of station's security context between current access point (AP) and new AP during handoff period.
	Enable: Clcik to enable the function.
	Disable: Click to disable the function.
Save	After completing the settings on this page, click Save to save the settings.
Reset	Click Reset to restore to default values.

Site Survey

Site survey displays all the active Access Points and IBSS in the neighborhood. When you are in the client mode, you can select one AP to associate.

Click **Refresh** to get the latest information.

	Wireless Site Survey	
	This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled.	
Setup Wizard	SSID BSSID Channel Type Encrypt Signal	
LAN	Refresh Connect	
Password		
Status		

Security

Here you can configure the security of your wireless network. Selecting different method will enable you to have different level of security. Please note that by using any encryption, by which data packet is encrypted before transmission to prevent data packets from being eavesdropped by unrelated people, there may be a significant degradation of the data throughput on the wireless link.

Encryption: None (Encryption is set to None by default)

If **Use 802.1x Authentication** is selected, the RADIUS Server will proceed to check the 802.1x Authentication.

î	Wireless Security	Setup		
	This page allows you setup the wireles access to your wireless network.			
Setup Wizard LAN	Encryption:	WPA2(AES) Note: When encryption WEP is selected	Set WEP Key 1, you must set WEP key value.	
Password Status	WPA Authentication Mode:	Use 802.1x Authentication • WEP 64bits • WEP 128bits • Enterprise (RADIUS) • Personal		
▲ Wireless ▶ Basic Settings ▶ Advanced Settings		Passphrase	(ele-silaleu key)	
Site Survey Security Trusted Stations	Group Key Life Time:	86400 sec		
Advanced Access Control Dynamic DNS Environ	Authentication RADIUS Server:	Port 1912 IP address	Password Save Reset	t _

Encryption: WEP

If **WEP** is selected, users will have to **Set WEP keys** either manually, or select to **Use 802.1x Authentication** to make the RADIUS server to issue the WEP key dynamically.



SET WEP KEY	 Click the Set WEP Keys will prompt you a window to set 64bit or 128bit Encryption.
	 Select HEX if you are using hexadecimal numbers (0-9, or A-F). Select ASCII if you are using ASCII characters (case-sensitive). Ten hexadecimal digits or five ASCII characters are needed if 64-bit WEP is used; 26 hexadecimal digits or 13 ASCII characters are needed if 128-bit WEP is used.

Encryption: WPA (TKIP)

WPA (TKIP): If WPA is selected, users will have to select the Authentication modes between Enterprise (RADIUS) and Personal (Pre-shared Key).

Pre-shared Key	Pre-Shared-Key serves as a password. Users may key in a 1 to 63 characters string to set the password or leave it blank, in which the 802.1x Authentication will be activated. Make sure the same password is used on client's end. There are two formats for choice to set the Pre-shared key, i.e. Passphrase and Hex . If Hex is selected, users will have to enter a 64 characters string. For easier configuration, the Passphrase (at least 8 characters) format is recommended.
Group Key Life Time	Enter the number of seconds that will elapse before the group key change automatically. The default is 86400 seconds.
Enable Pre-	The two most important features beyond WPA to become

Authentication	standardized through 802.11i/WPA2 are: pre-authentication, which enables secure fast roaming without noticeable signal latency. Preauthentication provides a way to establish a PMK security association before a client associates. The advantage is that the client reduces the time that it's disconnected to the network.	
Authentication RADIUS Server	Port : Enter the RADIUS Server's port number provided by your ISP. The default is 1812 .	
	IP Address: Enter the RADIUS Server's IP Address provided by your ISP.	
	Password: Enter the password that the AP shares with the RADIUS Server.	
Save	Press to save the new settings on the screen.	
Reset	Press to discard the current settings.	

Wireless Trusted Stations

Setup Wizard LAN Password Status ▲ Wireless ▶ Basic Settings ▶ Advanced Settings ▶ Site Survey ▶ Security ▶ Trusted Stations	Wireless Trusted Stations If you choose 'Allow Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. Wireless Access Control Mode: Disable MAC Address: Description: Save Reset Current Access Control List: MAC Address Description Select Delete Selected Delete All Reset		
Wireless Access Control Mode	Select the Access Control Mode from the pull-down menu. Disable : Select to disable Wireless Access Control Mode. Allow Listed : Only the stations shown in the table can associate with the AP.		
MAC Address	The Mac address of the station associated with the AP.		
Description	You may key in a description for the MAC Address		
Current Access Control List	Shows the current access control list.		
Delete Selected	Select the MAC Address (es) you want to delete and then click the Delete Selected button to delete the selected items.		
Delete All	Click to delete all the MAC Address (es) listed.		
Save	After completing the settings on this page, click Save to save the settings.		

Access Cont	rol		
Setup Wizard LAN Password Status Mireless Mireless Marice Settings Advanced Stations Advanced Advanced Advanced	can be helpful in securing Select Servic	est do restrict: certain types of data packets from your local network to Internet through the Router. I VAI derive to access internet application/services which use certain port to work. Use of such filters or restricting your local network. Enable Access Control Rest to Block RAL(1CD/UOP1.05335) Prof Range: Profaccal: Both W Description: Enable Access Control Reset	
Enable Access C	Control Select to enable Access Control function.		
Select Services to	to BlockThis lists all defined Services. Select the Services you wish to block.		
Port Range	For TCP and UDP Services, enter the beginning of the range of port numbers used by the service. If the service uses a single port number, enter it in both the start and finish fields.		
Protocol	Select the protocol (TCP, UDP or Both) used to the remote system or service.		
Description	You may key in a description for port range.		
Save	After completing the settings on this page, click Save to save the settings.		
Reset		Click Reset to restore to default values.	

Dynamic DNS

Setup Wizard LAN Password Status Mireless Basic Settings Basic Settings Advanced Settings Site Survey Security Trusted Stations Advanced Access Control Dynamic DNS DMZ Virtual Servers Special Applications	Oynamic DNS is a service that provides you with a valid, unchanging, internet domain name (an URL) to go with that (possibly everchanging) IP-address. Enable DDNS Service Provider: DynDNS * Domain Name: host.dyndns.org User Name/Email: Password/Key: Result: Note: For T2O, you can have a 30 days free trial items or manage your T2O account in control used, For DynDNS, you can create your DynDNS account items.		
Enable DDNS Service Provider	 Select to enable DDNS function. This free service is very useful when combined with the Virtual Server feature. It allows Internet users to connect to your Virtual Servers using a URL, rather than an IP Address. This also solves the problem of having a dynamic IP address. With a dynamic IP address, your IP address may change whenever you connect, which makes it difficult to connect to you. Select the desired DDNS Service Provider from the list. 		
	 Details of your DDNS account (Name, password, Domain name) must then be entered and saved on this screen. This device will then automatically ensure that your current IP Address is recorded by the DDNS Service Provider. From the Internet, users will now be able to connect to your Virtual Servers (or DMZ PC) using your Domain name. 		
Domain Name	• Apply for a Domain Name, and ensure it is allocated to you.		
User Name/Email	Enter your Username for the DDNS Service.		
Password/key	Enter your current password for the DDNS Service.		
Save	After completing the settings on this page, click Save to save the settings.		
Reset	Click Reset to restore to default values.		

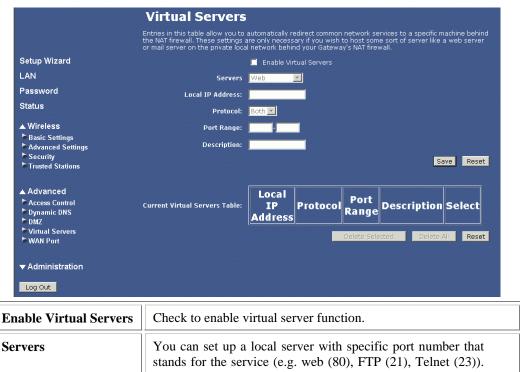
• Normally, this message should be "Update successful"

• If the message is "No host" or some other error message, you need to connect to the DDNS Service provider and correct the problem.

DMZ

Typically, the DM servers and DNS Setup Wizard	DMZ A Demilarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, its UMX host contains devices accessible to intermet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DMS servers. Enable DMZ DMZ Host IP Address:			
Enable DMZ	If the DMZ Host Function is enabled, it means that you set up DMZ host at a particular computer to be exposed to the Internet so that some applications/software, especially Internet / online game can have two-way connections.			
DMZ Host IP Address	Enter the IP address of a particular host in your LAN which will receive all the packets originally going to the WAN port/Public IP address above. Note: You need to give your LAN PC clients a fixed/static IP			
address for DMZ to work properly. Save After completing the settings on this page, click Save to settings.				
Reset	Click Reset to restore to default values.			

Virtual Server



	numbers or by names. Maximum 24 Server entries are allowed and each port number can only be assigned to one IP address.		
Local IP Address	Enter the Local Server's IP address.		
Protocol	Select the protocol (TCP, UDP or Both) used to the remote system or service.		
Port Range	For TCP and UDP Services, enter the beginning of the range of port numbers used by the service. If the service uses a single port number, enter it in both the start and finish fields.		
Description	You may key in a description for the local IP address.		
Save	After completing the settings on this page, click Save to save the settings.		
Reset	Click Reset to restore to default values.		

Special Application

If you use Internet applications that use non-standard connections or port numbers, you may find that they do not function correctly because they are blocked by the Wireless Router's firewall. In this case, you can define those applications as "**Special Application**" so that they can function properly.

You can define your Special Applications. You will need detailed information about the application such as number of port required; this is normally available from the supplier of the application.

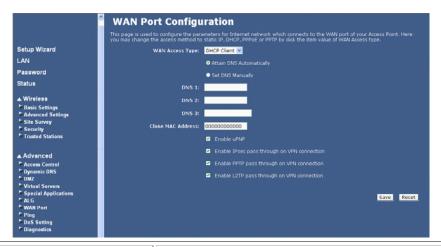
Also, note that "Incoming" on this screen refer to traffic from the client (PC) viewpoint.

You have to firstly check Enable before you can add/edit an application.

<u> </u>	Special Appli	ications							
ag 00	me applications require m plications cannot work wh nections, specify the por an enter the public ports	hen Network Addres t normally associate	is Translation (M id with an appli	AT) is enabled. I cabon in the "Tri	f you need to oper Port" field	run applications I	that require mu	tiple	
Password									
Status	Name	Incoming Type	Incoming Start Port	Incoming Finish Port	Trigger Type	Trigger Start Port	Trigger Finish Port	Enable	
Wireless Uasic Settings Advanced Settings	uick Time 4	вотн 💌	6970	6999	BOTH	394	554	•	
Site Survey	alpad	BOTH 2	51200	51201	BOTH 35	7175	7175		
Trusted Stations	itali:	BOTH M	2090	2091	BOTH 32	8200	8700		
		TCP 🛩	0	0	TCP N	6	0		
Advanced		TCP . TT	0	0	TCP Y	0	0	•	
Access Control Dynamic DNS		TCP	0	0	TCP M	0	0	-	
► DMZ ► Virtual Servers		TCP	0	0	TCP V	0	0	a	
Special Applications		TCP -	0	0	TCP: IN	0	0	-	
ALG WAN Port Ping DoS Setting							Save	Reset	
Diagnostics	· · ·								
Name	Enter the	applicat	ion nai	ne.					
ncoming Type	Click the down arrow \checkmark to select the incoming application type (TCF or UDP)								
Incoming Port	Enter one	or more	e set(s)	of port	numb	er rang	e as th	e inco	ming port

Range	Once the trigger port is detected, the incoming packets are allowed pass the firewall to these already specified Incoming Ports.		
Trigger Type	Click the down arrow \checkmark to select the trigger type (TCP or UDP)		
Trigger Start Port	Enter a port number as the starting outbound port for the special application defined in the preceding field.		
Trigger Finish Port	Enter a port number as the ending outbound port for the special application defined in the preceding field.		
Save	Press to save the new settings on the screen.		
Undo	Press to discard the data you have entered since last time you press Save .		

WAN Port



WAN Access Type	Select the WAN access type (Static IP, DHCP, PPPoE and PPTP) from the pull-down menu.
DNS 1-3	Enter the DNS server IP address(es) provided by your ISP, or you can specify your own preferred DNS server IP address(es). DNS 1 and DNS 2 servers are optional. You can enter another DNS server's IP address as a backup. DNS 1 and DNS 2 servers will be used when the DNS 1 server fails.
Clone MAC Address	Your ISP may require a particular MAC address in order for you to connect to the Internet. This MAC address is the PC's MAC address that your ISP had originally connected your Internet connection to. Type in this Clone MAC address in this section to replace the WAN MAC address with the MAC address of that PC.
Enable uPNP	Check to enable the listed functions.
Enable Ipsec pass through on VPN connection	

Enable L2TP pass through on VPN conenction	
Save	After completing the settings on this page, click Save to save the settings.
Reset	Click Reset to restore to default values.

Ping

This screen allows you to perform a "**Ping**". The **response** messages that will appear below can be useful in diagnosing network problems.

	Ping Toolkit		
	This page can be used to run ping corr		
Setup Wizard	IP Address / Host Name		Run Reset
LAN	Response		Tran Preser
Password	Kesponse	<empcy></empcy>	
Status			
▲ Wireless			
Basic Settings			
Advanced Settings Site Survey			
Security Trusted Stations			
Thated Stationa			
IP Address/ Host	Enter the IP address or d	lomain name that y	ou want to pir
name			
name			
Run	Click to start pinging.		
Reset	Click to clear the current	t IP address /Host n	ame.

DoS Setting

A **DoS** (Denial of Service) attack does not attempt to steal data or damage your PCs, but overloads your Internet connection so you cannot use it - the service is therefore unavailable.

If DoS function is enabled, DoS attacks will be detected and blocked. The default is **unabled**. It is strongly recommended that this setting be left enabled.

	Denial of Service				
	A "denial-of-service" (DoS) attack is characterized by a using that service.	an explicit attempt by hackers to prevent legitimate users of a service	e from		
Setup Wizard	Enable DoS Prevention				
LAN	Whole System Flood: SYN	50 Packets/Second			
Password	Whole System Flood: FIN	50 Packets/Second			
Status	Whole System Flood: UDP	50 Packets/Second			
▲ Wireless	Whole System Flood: ICMP	50 Packets/Second			
Basic Settings Advanced Settings	Per-Source IP Flood: SYN	50 Packets/Second			
Site Survey	Per-Source IP Flood: SIN	50 Packets/Second			
Security Trusted Stations					
	Per-Source IP Flood: UDP	50 Packets/Second			
Advanced	Per-Source IP Flood: ICMP	50 Packets/Second			
Dynamic DNS	TCP/UDP PortScan	Low Y Sensitivity			
DMZ Virtual Servers	ICMP Smurf				
Special Applications	IP Land				
► ALG ► WAN Port	IP Spoof				
► Ping ► DoS Setting	IP TearDrop				
Diagnostics	PingOfDeath				
	TCP Scan				
▼ Administration	TCP SynWithData				
Log Out	UDP Bomb				
Diagnostics	UDP EchoChargen				
▼ Administration		Select All	ar All		
	Enable Source IP Blocking 30 Block time (sec)				
Log Out	 ✓ 	Apply Change	es		
□ Enable DoS	Check to enable the DoS pr	evention function. Select the item	listed to		
Prevention	enable.				
Prevention					
Enable Source IP	Set the threshold for the fre	quency of packets that are allowe	d to pass		
Blocking 🗆 Block	through. The default value is 50 packets per seconds. You can adjust the value according to your need. It is recommended that you set a practical				
time (sec)					
time (sec)	number so that your network performance won't be hampered.				
	Click to selct all listed items.				
Selct All					
Clear All	Click to clear all listed items.				
Apply Changes	Click to save the current settings.				

Diagnostics

4	Network Diagnostics - D	NS Lookup
Setup Wizard	Domain name/URL:	Start Lookup
LAN		
Password		
Status		
▲ Wireless ▶ Basic Settings ▶ Advanced Settings		×
 Site Survey Security Trusted Stations 		

Remote management

The Wireless Router can be managed from any PC on your LAN. And, if the Internet connection exists, it can also (optionally) be configured via the Internet.

P Basic Settings ► Advanced Settings Enal ► Site Survey	d via the internet, using your Web Browser with desired port number. ble Web Server Access via WAN - Number <mark>8080</mark>
□ Enable web Server Access via WAN	Check to enable the function.
Port number	
Save	Click to save the current settings.
Reset	Click to clear the current settings.

Config File

This feature allows you to download the current settings from the Wireless Router, and save them to a file on your PC.

You can restore a previously downloaded configuration file to the Wireless Router, by uploading it to the Wireless Router.

This screen also allows you to set the Wireless Router back to its factory default configuration. Any existing settings will be deleted.

An example *Config File* screen is shown below.

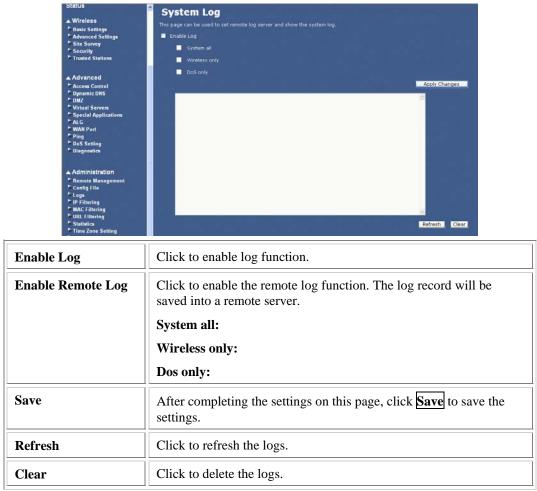
Status	^	Config File
▲ Wireless ► Basic Settings		This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.
Advanced Settings Site Survey		Backup Config: Download
Security Trusted Stations		Restore Config: Browse Restore
		Default Config: Restore Defaults
▲ Advanced		

Backup Config	Use this to download a copy of the current configuration, and store the file on your PC. Click Download to start the download.				
Restore Config	This allows you to restore a previously saved configuration file back to the Wireless Router.				
	Click Browse to select the configuration file, then click Restore to upload the configuration file.				
	WARNING !				
	Uploading a configuration file will destroy (overwrite) ALL of the existing settings.				
Default Config	Clicking the Restore Defaults button will reset the Wireless Router to its factory default settings.				
	WARNING !				

	This will delete ALL of the existing settings.
J.	

Log

The Logs record various types of activity on the Wireless Router. This data is useful for troubleshooting, but enabling all logs will generate a large amount of data and adversely affect performance.

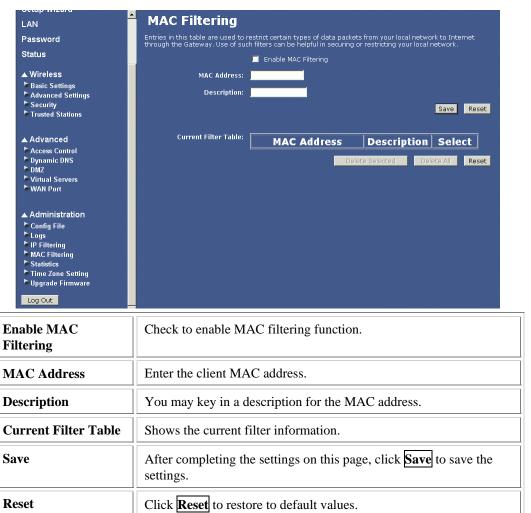


IP Filtering

▲ Wireless	Entries in this table are used to restrict	rentain types of data nad	kets from your local r	aetwork to Internet H	much the Router
Basic Settings	Here you can restrict local LAN clients to	o access Internet applicati	on/services by IP Ad	dress. Use of such filt	ers can be helpful in
Advanced Settings	securing or restricting your local netwo				
Security		Enable IP Filtering			
Trusted Stations	Local IP Address:				
	Protocol:	Both 🔛			
Advanced	Description:				
Access Control					
DMZ					Save Reset
Virtual Servers					
Special Applications	Current Filter Table:	Local IP Address	Protocol	Description	Select
ALG		Local IP Address	Protocol	Description	
WAN Port			De	elete Selected	Delete All Reset
Ping 🗧					

Enable IP Filtering	Check to enable the IP filtering function.	
Local IP Address	Enter the client IP address.	
Protocol	Select the protocol (TCP, UDP or Both) used to the remote system or service.	
Description	You may key in a description for the local IP address	
Current Filter Table	Shows the current filter information.	
Save	After completing the settings on this page, click Save to save the settings.	
Reset	Click Reset to restore to default values.	

MAC Filtering



Statistics

Setup Wizard LAN			and reception regarding to	wireless and Ethernet networks.
Password		Sent Packets	0	
Status	Wireless LAN	Received Packets	4291	
▼ Wireless	Ethernet LAN	Sent Packets	238	
▲ Advanced	Ethernet LAN	Received Packets	295	
Advanced	ol Ethernet WAN	Sent Packets	24	
Dynamic DNS		Received Packets	0	
► DMZ ► Virtual Serve Special Appl ► AL G ► WAN Port ► Ping ► DoS Setting ► Diagnostics				Refresh
efresh	Click to refresh the	statistics table.		

Time Zone Setting

Setup Wizard	Time Zone Setting				
LAN	You can maintain the system time by s				
Password	Current Time:	Year 2000 Month 1 Day 1 Hr 0 Min 8	Sec 43		
Status					
▼ Wireless		Enable NTP client update			
	Time Zone Select:	(GMT+08:00)Taipei	×		
Advanced	NTP server:	• 192.5.41.41 - North America 💌			
Dynamic DNS		(Manual IP Setting)			
DMZ Virtual Servers			Save	Reset	Refresh
Special Applications				Tobacc	Kentesit
ALG					
WAN Port					
DoS Setting					
Diagnostics	4				

Current Time	Enter the current time of this wireless router.		
Enable NTP client update	Check to enable NTP (Network Time Protocol Server) client update function.		
Time Zone Select	Select the time zone from the pull-down menu.		
NTP server	You may choose to select NTP server from the pull-down menu or enter an IP address of a specific server.		
Save	After completing the settings on this page, click Save to save the settings.		
Reset	Click Reset to restore to default values.		
Refresh	Click to refresh the current time.		

Upgrade Firmware

LAN	📩 Upgrade Firmware	
Password	This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.	
Status	Select File: Browse	
 ▲ Wireless > Basic Settings > Advanced Settings > Security > Trusted Stations ▲ Advanced > Access Control > Dynamic DNS > DMZ > Virtual Servers > WAN Port ▲ Administration > Config File > Logs > Time Zone Setting > Upgrade Firmware Log Out 	Start Upgrade Rest	st
Browse	Click the Browse button, find and open the firmware file (the browser will display to correct file path).	
tart Upgrade	Click the Start Upgrade button to perform	
leset	Click Reset to restore to default values.	

Navigation & Data Input

- Use the menu bar on the left of the screen, and the "Back" button on your Browser, for navigation.
- Changing to another screen without clicking "Save" does NOT save any changes you may have made. You must "Save" before changing screens or your data will be ignored.

Chapter 4: PC Configuration

Overview

For each PC, the following may need to be configured:

- TCP/IP network settings
- Internet Access configuration
- Wireless configuration

Windows Clients

This section describes how to configure Windows clients for Internet access via the Wireless Router.

The first step is to check the PC's TCP/IP settings.

The Wireless Router uses the TCP/IP network protocol for all functions, so it is essential that the TCP/IP protocol be installed and configured on each PC.

TCP/IP Settings - Overview

If using the default Wireless Router settings, and the default Windows TCP/IP settings, no changes need to be made.

- By default, the Wireless Router will act as a DHCP Server, automatically providing a suitable IP Address (and related information) to each PC when the PC boots.
- For all non-Server versions of Windows, the default TCP/IP setting is to act as a DHCP client.

If using a Fixed (specified) IP address, the following changes are required:

- The Gateway must be set to the IP address of the Wireless Router
- The DNS should be set to the address provided by your ISP.

Checking TCP/IP Settings - Windows 98/ME:

1. Select Control Panel - Network. You should see a screen like the following:

Network		? ×
Configuration Identification	on Access Control	
The following <u>n</u> etwork of		d:
NetBEUI -> PCI Fas		
NetBEUI -> Dial-Up		
	Adapter #2 (VPN Supp	orti
TCP/IP-> PCI Fast		
🍹 TCP/IP -> Dial-Up A		
	Adapter #2 (VPN Suppo	
📙 File and printer shar	ing for NetWare Networ	ks 🔽
•		•
	1	
<u>A</u> dd	R <u>e</u> move	P <u>r</u> operties

- 2. Select the *TCP/IP* protocol for your network card.
- 3. Click on the *Properties* button. You should then see a screen like the following.

CP/IP Proper	ties		? :			
Bindings	Advanced	NetBIOS	DNS Configuration			
Gateway	WINS	Configuration	IP Address			
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.						
Obtain an IP address automatically						
_ <mark>⊂</mark> O <u>S</u> pecify	an IP address:					
[P Ad	dress:	! !				
S <u>u</u> bn	et Mask:					

Ensure your TCP/IP settings are correct, as follows:

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting. **Using this is recommended**. By default, the Wireless Router will act as a DHCP Server.

Restart your PC to ensure it obtains an IP Address from the Wireless Router.

Using "Specify an IP Address"

If your PC is already configured, check with your network administrator before making the following changes:

• On the *Gateway* tab, enter the Wireless Router's IP address in the *New Gateway* field and click *Add*, as shown below. Your LAN administrator can advise you of the IP Address they assigned to the Wireless Router.

TCP/IP Properties		?×
Bindings	Advanced	NetBIOS
DNS Configuration	Gateway WINS Co	onfiguration IP Address
	n the Installed Gateway in the list will be the ord I.	
<u>N</u> ew gateway:		
192.168.	1.254	dd

• On the *DNS Configuration* tab, ensure *Enable DNS* is selected. If the *DNS Server Search Order* list is empty, enter the DNS address provided by your ISP in the fields beside the *Add* button, then click *Add*.

TCP/IP Proper	ties		? ×
Gateway Bindings) WINS Advanced	Configuration NetBIOS	IP Address DNS Configuration
O D <u>i</u> sable	DNS		
	DNS		
<u>H</u> ost:		D <u>o</u> main:	
DNS Serve	er Search Order		
		\supset \square	Add
			Remove

Checking TCP/IP Settings - Windows NT4.0

1. Select *Control Panel - Network*, and, on the *Protocols* tab, select the TCP/IP protocol, as shown below.

Network ? 🔀
Identification Services Protocols Adapters Bindings
Network Protocols:
 NetBEUI Protocol NwLink IPX/SPX Compatible Transport NwLink NetBIOS TCP/IP Protocol
Add <u>R</u> emove <u>Properties</u> Update
Description:
Transport Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK Cancel

2. Click the *Properties* button to see a screen like the one below.

Microsoft TCP/IP Properties		
IP Address DNS WINS Address DHCP Relay Routing		
An IP address can be automatically assigned to this network card by a DHCP server. If your network does not have a DHCP server, ask your network administrator for an address, and then type it in the space below.		
Ada <u>p</u> ter:		
PCI Fast Ethernet Adapter		
Obtain an IP address from a DHCP server O Specify an IP address		
IP Address:		
Subnet Mask:		
Default <u>G</u> ateway:		
Advanced		
OK Cancel Apply		

- 3. Select the network card for your LAN.
- 4. Select the appropriate radio button *Obtain an IP address from a DHCP Server* or *Specify an IP Address*, as explained below.

Obtain an IP address from a DHCP Server

This is the default Windows setting. Using this is recommended. By default, the Wireless Router will act as a DHCP Server.

Restart your PC to ensure it obtains an IP Address from the Wireless Router.

Specify an IP Address

If your PC is already configured, check with your network administrator before making the following changes.

- 1. The Default Gateway must be set to the IP address of the Wireless Router. To set this:
 - Click the *Advanced* button on the screen above.
 - On the following screen, click the *Add* button in the *Gateways* panel, and enter the Wireless Router's IP address.
 - If necessary, use the *Up* button to make the Wireless Router the first entry in the *Gateways* list.

Advanced IP Addressing	? ×
Adagter: PCI Fast Ethernet Adap	oter 💌
-IP TCP/IP Gateway Addres	ss ? 🗙
<u>G</u> ateway Address:	· · ·
Add	Cancel
<u>G</u> ateways	
	<u>⊥</u> p↑ D <u>o</u> wn↓
Add Edjt	Re <u>m</u> ove
Enable PPTP <u>Filtering</u>	
Configure	OK Cancel

- 2. The DNS should be set to the address provided by your ISP, as follows:
 - Click the DNS tab.
 - On the DNS screen, shown below, click the *Add* button (under *DNS Service Search Order*), and enter the DNS provided by your ISP.

Microsoft TCP/IP Properties
IP Address DNS WINS Address DHCP Relay Routing
Domain Name System (DNS) Host Name: D <u>o</u> main:
DNS Service Search Order
Add Edit Remoye
TCP/IP DNS Server
DNS Server: Add Up†
OK Cancel <u>A</u> pply

Checking TCP/IP Settings - Windows 2000:

- 1. Select Control Panel Network and Dial-up Connection.
- 2. Right click the *Local Area Connection* icon and select *Properties*. You should see a screen like the following:

Local Area Connection	Properties	? ×
General		
Connect using:		1
SMC EZ Card 10)/100 (SMC1211TX)	
		Configure
Components checked a	are used by this conne	ection:
✓ ➡ File and Printer ✓ ❤ Internet Protoc		Networks
Install	Uninstall	Properties
Description		
	Protocol/Internet Pro rotocol that provides o connected networks.	
🔲 Show icon in taskb	ar when connected	
		DK Cancel

- 3. Select the *TCP/IP* protocol for your network card.
- 4. Click on the *Properties* button. You should then see a screen like the following.

Internet Protocol (TCP/IP) Propert	ies ? 🗙
General	
You can get IP settings assigned auto this capability. Otherwise, you need to the appropriate IP settings.	
Obtain an IP address automatic.	ally
$\square^{igodoldsymbol{C}}$ Use the following IP address: —	
IP address:	
Subnet mask:	
Default gateway:	· · · · ·
Obtain DNS server address auto	omatically
_⊂ ⊂ Use the following DNS server a	
Preferred DNS server:	
Alternate DNS server:	
	Advanced
	OK Cancel

5. Ensure your TCP/IP settings are correct, as described below.

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting. **Using this is recommended**. By default, the Wireless Router will act as a DHCP Server.

Restart your PC to ensure it obtains an IP Address from the Wireless Router.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes.

- Enter the Wireless Router's IP address in the *Default gateway* field and click *OK*. (Your LAN administrator can advise you of the IP Address they assigned to the Wireless Router.)
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Checking TCP/IP Settings - Windows XP

- 1. Select Control Panel Network Connection.
- 2. Right click the *Local Area Connection* and choose *Properties*. You should see a screen like the following:

🕹 Local Area Connection Properties 🛛 🔹 💽
General Authentication Advanced
Connect using:
D-Link DFE-530TX PCI Fast Ethernet Adapter (rev.B)
<u>C</u> onfigure
This connection uses the following items:
✓ Image: Client for Microsoft Networks ✓ Image: File and Printer Sharing for Microsoft Networks ✓ Image: Client Scheduler ✓ Ima
Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected
OK Cancel

- 3. Select the *TCP/IP* protocol for your network card.
- 4. Click on the *Properties* button. You should then see a screen like the following.

Internet Protocol (TCP/IP) Prop	erties 🔹 🤶 🔀	
General Alternate Configuration		
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.		
OUse the following IP address: —		
IP address:		
S <u>u</u> bnet mask:		
Default gateway:		
⊙ O <u>b</u> tain DNS server address auto	omatically	
OUse the following DNS server ac	ddresses:	
Preferred DNS server:		
Alternate DNS server:	· · · ·	
	Ad <u>v</u> anced	
	OK Cancel	

5. Ensure your TCP/IP settings are correct.

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting. **Using this is recommended**. By default, the Wireless Router will act as a DHCP Server.

Restart your PC to ensure it obtains an IP Address from the Wireless Router.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes.

- In the *Default gateway* field, enter the Wireless Router's IP address and click *OK*. Your LAN administrator can advise you of the IP Address they assigned to the Wireless Router.
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Internet Access

To configure your PCs to use the Wireless Router for Internet access:

- Ensure that the DSL modem, Cable modem, or other permanent connection is functional.
- Use the following procedure to configure your Browser to access the Internet via the LAN, rather than by a Dial-up connection.

For Windows 9x/ME/2000

- 1. Select Start Menu Settings Control Panel Internet Options.
- 2. Select the Connection tab, and click the Setup button.
- 3. Select "I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)" and click *Next*.
- 4. Select "I connect through a local area network (LAN)" and click Next.
- 5. Ensure all of the boxes on the following Local area network Internet Configuration screen are **unchecked**.
- 6. Check the "No" option when prompted "Do you want to set up an Internet mail account now?".
- 7. Click *Finish* to close the Internet Connection Wizard. Setup is now completed.

For Windows XP

- 1. Select Start Menu Control Panel Network and Internet Connections.
- 2. Select Set up or change your Internet Connection.
- 3. Select the *Connection* tab, and click the *Setup* button.
- 4. Cancel the pop-up "Location Information" screen.
- 5. Click *Next* on the "New Connection Wizard" screen.
- 6. Select "Connect to the Internet" and click Next.
- 7. Select "Set up my connection manually" and click Next.
- 8. Check "Connect using a broadband connection that is always on" and click Next.
- 9. Click *Finish* to close the New Connection Wizard. Setup is now completed.

Accessing AOL

To access AOL (America On Line) through the Wireless Router, the *AOL for Windows* software must be configured to use TCP/IP network access, rather than a dial-up connection. The configuration process is as follows:

- Start the *AOL for Windows* communication software. Ensure that it is Version 2.5, 3.0 or later. This procedure will not work with earlier versions.
- Click the *Setup* button.
- Select *Create Location*, and change the location name from "New Locality" to "Wireless Router".
- Click *Edit Location*. Select *TCP/IP* for the *Network* field. (Leave the *Phone Number* blank.)
- Click *Save*, then *OK*. Configuration is now complete.
- Before clicking "Sign On", always ensure that you are using the "Wireless Router" location.

Macintosh Clients

From your Macintosh, you can access the Internet via the Wireless Router. The procedure is as follows.

- 1. Open the TCP/IP Control Panel.
- 2. Select *Ethernet* from the *Connect via* pop-up menu.
- 3. Select *Using DHCP Server* from the *Configure* pop-up menu. The DHCP Client ID field can be left blank.
- 4. Close the TCP/IP panel, saving your settings.

Note:

If using manually assigned IP addresses instead of DHCP, the required changes are:

- Set the Router Address field to the Wireless Router's IP Address.
- Ensure your DNS settings are correct.

Linux Clients

To access the Internet via the Wireless Router, it is only necessary to set the Wireless Router as the "Gateway".

Ensure you are logged in as "root" before attempting any changes.

Fixed IP Address

By default, most Unix installations use a fixed IP Address. If you wish to continue using a fixed IP Address, make the following changes to your configuration.

- Set your "Default Gateway" to the IP Address of the Wireless Router.
- Ensure your DNS (Name server) settings are correct.

To act as a DHCP Client (recommended)

The procedure below may vary according to your version of Linux and X -windows shell.

- 1. Start your X Windows client.
- 2. Select Control Panel Network
- 3. Select the "Interface" entry for your Network card. Normally, this will be called "eth0".
- 4. Click the *Edit* button, set the "protocol" to "DHCP", and save this data.
- 5. To apply your changes
 - Use the "Deactivate" and "Activate" buttons, if available.
 - OR, restart your system.

Other Unix Systems

To access the Internet via the Wireless Router:

- Ensure the "Gateway" field for your network card is set to the IP Address of the Wireless Router.
- Ensure your DNS (Name Server) settings are correct.

Wireless Station Configuration

This section applies to all Wireless stations wishing to use the Wireless Router's Access Point, regardless of the operating system which is used on the client.

To use the Wireless Access Point in the Wireless Router, each Wireless Station must have compatible settings, as follows:

Mode	The mode must be set to <i>Infrastructure</i> .
SSID (ESSID)	This must match the value used on the Wireless Router. The default value is Untitled
	Note! The SSID is case sensitive.
WEP	By default, WEP on the Wireless Router is disabled .
	• If WEP remains disabled on the Wireless Router, all stations must have WEP disabled.
	• If WEP is enabled on the Wireless Router, each station must use the same settings as the Wireless Router.

Note:

By default, the Wireless Router will allow both 802.11b and 802.11g connections.

Appendix A Troubleshooting

This Appendix covers the most likely problems and their solutions.

Overview

This chapter covers some common problems that may be encountered while using the Wireless Router and some possible solutions to them. If you follow the suggested steps and the Wireless Router still does not function properly, contact your dealer for further advice.

General Problems

Problem 1: Can't connect to the Wireless Router to configure it.

Solution 1: Check the following:

- The Wireless Router is properly installed, LAN connections are OK, and it is powered ON.
- Ensure that your PC and the Wireless Router are on the same network segment. (If you don't have a router, this must be the case.)
- If your PC is set to "Obtain an IP Address automatically" (DHCP client), restart it.
- If your PC uses a Fixed (Static) IP address, ensure that it is using an IP Address within the range 192.168.1.1 to 192.168.1.253 and thus compatible with the Wireless Router's default IP Address of 192.168.1.254.

Also, the Network Mask should be set to 255.255.255.0 to match the Wireless Router.

In Windows, you can check these settings by using *Control Panel*-*Network* to check the *Properties* for the TCP/IP protocol.

Internet Access

Problem 1: When I enter a URL or IP address I get a time out error.

- **Solution 1:** A number of things could be causing this. Try the following troubleshooting steps.
 - Check if other PCs work. If they do, ensure that your PCs IP settings are correct. If using a Fixed (Static) IP Address, check the Network Mask, Default gateway and DNS as well as the IP Address.
 - If the PCs are configured correctly, but still not working, check the Wireless Router. Ensure that it is connected and ON. Connect to it and check its settings. (If you can't connect to it, check the LAN and power connections.)
 - If the Wireless Router is configured correctly, check your Internet connection (DSL/Cable modem etc) to see that it is working correctly.

Problem 2: Some applications do not run properly when using the Wireless Router.

Solution 2: The Wireless Router processes the data passing through it, so it is not transparent.

Use the *Special Applications* feature to allow the use of Internet applications which do not function correctly.

If this does solve the problem you can use the *DMZ* function. This should work with almost every application, but:

- It is a security risk, since the firewall is disabled.
- Only one (1) PC can use this feature.

Wireless Access

- Problem 1: My PC can't locate the Wireless Access Point.
- **Solution 1:** Check the following.
 - Your PC is set to *Infrastructure Mode*. (Access Points are always in *Infrastructure Mode*)
 - The SSID on your PC and the Wireless Access Point are the same. Remember that the SSID is case-sensitive. So, for example "Workgroup" does NOT match "workgroup".
 - Both your PC and the Wireless Router must have the same setting for WEP. The default setting for the Wireless Router is disabled, so your wireless station should also have WEP disabled.
 - If WEP is enabled on the Wireless Router, your PC must have WEP enabled, and the key must match.
 - If the Wireless Router's *Wireless* screen is set to *Allow LAN access to selected Wireless Stations only*, then each of your Wireless stations must have been selected, or access will be blocked.
 - To see if radio interference is causing a problem, see if connection is possible when close to the Wireless Router. Remember that the connection range can be as little as 100 feet in poor environments.

Problem 2: Wireless connection speed is very slow.

- **Solution 2:** The wireless system will connect at the highest possible speed, depending on the distance and the environment. To obtain the highest possible connection speed, you can experiment with the following:
 - Wireless Router location. Try adjusting the location and orientation of the Wireless Router.
 - Wireless Channel If interference is the problem, changing to another channel may show a marked improvement.
 - Radio Interference Other devices may be causing interference. You can experiment by switching other devices Off, and see if this helps. Any "noisy" devices should be shielded or relocated.
 - RF Shielding

Your environment may tend to block transmission between the wireless stations. This will mean high access speed is only possible when close to the Wireless Router.

Appendix B About Wireless LANs



This Appendix provides some background information about using Wireless LANs (WLANs).

Modes

Wireless LANs can work in either of two (2) modes:

- Ad-hoc
- Infrastructure

Ad-hoc Mode

Ad-hoc mode does not require an Access Point or a wired (Ethernet) LAN. Wireless Stations (e.g. notebook PCs with wireless cards) communicate directly with each other.

Infrastructure Mode

In Infrastructure Mode, one or more Access Points are used to connect Wireless Stations (e.g. Notebook PCs with wireless cards) to a wired (Ethernet) LAN. The Wireless Stations can then access all LAN resources.



Access Points can only function in "Infrastructure" mode, and can communicate only with Wireless Stations which are set to "Infrastructure" mode.

BSS

BSS

A group of Wireless Stations and a single Access Point, all using the same ID (SSID), form a Basic Service Set (BSS).

Using the same SSID is essential. Devices with different SSIDs are unable to communicate with each other.

Channels

The Wireless Channel sets the radio frequency used for communication.

- Access Points use a fixed Channel. You can select the Channel used. This allows you to choose a Channel which provides the least interference and best performance. In the USA and Canada, 11 channel are available. If using multiple Access Points, it is better if adjacent Access Points use different Channels to reduce interference.
- In "Infrastructure" mode, Wireless Stations normally scan all Channels, looking for an Access Point. If more than one Access Point can be used, the one with the strongest signal is used. (This can only happen within an ESS.)

WEP

WEP (Wired Equivalent Privacy) is a standard for encrypting data before it is transmitted.

This is desirable because it is impossible to prevent snoopers from receiving any data which is transmitted by your Wireless Stations. But if the data is encrypted, then it is meaningless unless the receiver can decrypt it.

If WEP is used, the Wireless Stations and the Access Point must have the same settings for each of the following:

WEP	Off, 64 Bit, 128 Bit
Key	For 64 Bit encryption, the Key value must match. For 128 Bit encryption, the Key value must match
WEP Authentication	Open System or Shared Key.

Wireless LAN Configuration

To allow Wireless Stations to use the Access Point, the Wireless Stations and the Access Point must use the same settings, as follows:

- ModeOn client Wireless Stations, the mode must be set to "Infrastructure".
(The Access Point is always in "Infrastructure" mode.)
- **SSID (ESSID)** Wireless Stations should use the same SSID (ESSID) as the Access Point they wish to connect to. Alternatively, the SSID can be set to "any" or null (blank) to allow connection to any Access Point.
- WEP The Wireless Stations and the Access Point must use the same settings for WEP (Off, 64 Bit, 128 Bit).

WEP Key: If WEP is enabled, the Key must be the same on the Wireless Stations and the Access Point.

WEP Authentication: If WEP is enabled, all Wireless Stations must use the same setting as the Access Point (either "Open System" or "Shared Key").

Appendix C Specifications



Multi-Function Wireless Router

Model	Wireless Router
Dimensions	141mm(W) * 100mm(D) * 27mm(H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	TCP/IP
Network Interface:	5 Ethernet: 4 * 10/100BaseT (RJ45) LAN connection 1 * 10/100BaseT (RJ45) for WAN
LEDs	12
Power Adapter	12 V DC External

Wireless Interface

Standards	IEEE802.11g WLAN, JEIDA 4.2, roaming support
Frequency	2.4 to 2.4835GHz (Industrial Scientific Medical Band)
Channels	Maximum 14 Channels, depending on regulatory authorities
Modulation	DSSS BPSK/QPSK/CCK, OFDM/CCK
Data Rate	Up to 54 Mbps
Coverage Area	Indoors : 15m @54Mbps, 120m @6Mbps or lower
	Outdoors : 40m @54Mbps, 300m @6Mbps or lower
WEP	64Bit, 128Bit
Output Power	13dBm (typical)
Receiver Sensitivity	-80dBm Min.

Regulatory Approvals

CE Standards

This product complies with the 99/5/EEC directives, including the following safety and EMC standards:

- EN300328-2
- EN301489-1/-17
- EN60950

CE Marking 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.