



WX-5803

User's Guide

54Mbps/11Mbps Wireless ADSL Router

Regulatory Information

FCC Statement

FCC Part 68

This equipment complies with Part 68 of FCC Rules. On the base unit of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. IF REQUESTED, THIS INFORMATION MUST BE GIVEN TO THE TELEPHONE COMPANY.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those entire devices ring when your telephone number is called. In most, but not all areas, the sum of the REN of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

If your equipment causes harm to the telephone network, the

telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, Please contact the following address and phone number for information on obtaining service or repairs.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

COMPANY: Gemtech Wireless Inc.

ADDRESS: 44790 S. GRIMMER BLVD., SUITE 100, FREMONT, CA 94538

TEL NO: 949-357-3207

Registration Number: US: GEMDL02BWX5803

Equipment Code: DL

Ringer Equivalence: 0.2B

THIS PRODUCT COMPLIES WITH 47CFR PART 68.

THIS PRODUCT HAS BEEN CERTIFIED BY A TCB.

Use Standard Jack: RJ11C

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by

turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Table of Contents

Introduction

- Features

A Look at the Hardware

- Front Panel

- Back Panel

Hardware Installation

Configure the Router for the first time

- Configuring IP Settings on Your Computer

- Configuring with Web Browser

Appendix A: Specifications

Introduction

WX-5803 Wireless ADSL Router allows you to share the single account of Internet Access. With build-in NAT, this Router allows up to 253 users on the Ethernet LAN simultaneously and up to 16 users on the 802.11g/b Wireless LAN simultaneously. WX-5803 has the throughput speeds of up to 54Mbps and advanced Orthogonal Frequency Division Multiplexing (OFDM).

In case of home usage, WX-5803 acts as a gateway for Internet connection sharing. You can connect the Wireless ADSL Router to your Internet connection directly, and use the wireless LAN to connect your computers to the Internet.

Features

- Fully compliant with ANSI T1.413 Issue 2, ITU G.992.1, ITU G.992.2, and ITU G.994.1
- Fully compliant with Wi-Fi / 802.11b Client Devices
- Delivering the fastest possible data rate defined by IEEE 802.11g standard
- Support 802.1x enhanced security with EAP-MD5 and

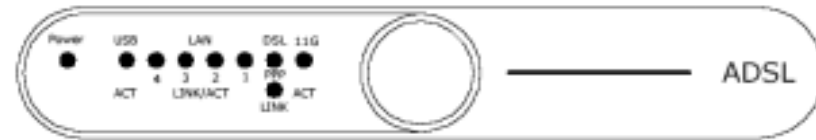
EAP-TLS framework

- IP sharing feature allows multiple stations to access the internet using a single broadband
- System configuration and firmware upgrades

A Look at the Hardware

Front Panel

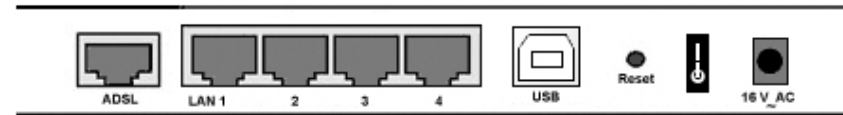
The WX-5803 Wireless ADSL Router has nine Light Emitting Diodes (LEDs), or link lights, on its front panel. The following table defines the behavior for each LED:



LED	Represents	Activity / Status
Power	Power	The Power LED will light up when the device is powered on.
USB	USB	- Sold On – USB is connected to a host

	Connection	PC. - Blinking – Data is being transferred over the USB connection.
1, 2, 3, 4	LAN Connection	Steady on when there is a link connecting to the unit. Blinking – Data is being transferred.
Link	DSL Connection	- Off - ADSL link is not connected. - Blinking - ADSL is handshaking and receiving signaling. - Solid On - ADSL link is connected.
PPP	PPP Connection	Solid On – PPP is connected.
11G	Wireless LAN	- Solid On – When connected a client - Blinking – Data is being transferred over the Wireless LAN connection. - Off – When there is no connected client

Back Panel



Connector	Description
ADSL	Connect one end of the RJ-11 telephone cord to ADSL port and connect the other end to the ADSL line outlet that your ISP has installed.
LAN 1-4	Accept a RJ-45 Ethernet cable for connecting up to 4 PCs. Or external Ethernet switch/hub.
USB	For USB connection (optional), connect the USB cable to the USB port and connect the other end to the computer.
Reset	Use an object, such as a stretched paper clip, to press the button for less than 5 seconds. LAN1, 2, 3, 4 LED will light up for a short time and then be off. You can release the button now to reset the device. Or press the button for at least 8 seconds to reset the device to its factory-default settings.
On/Off	Turn on the router by pressing up the power switch to the “ ” position.

Power	Connect the power adapter to this Power port, and then plug the other end of the power cable into a power outlet.
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Hardware Installation

Thank you for purchasing the 54Mbps/11Mbps Wireless ADSL Router WX-5803. The following instructions will walk you through installation of the router.

Step 1. Connect the DSL port of the router into your ADSL jackpoint (telephone wall socket) with the provided line cord.

Step 2. Connect the LAN port of the router to the Ethernet port of your computer with the Ethernet cable provided.

Step 3. Connect the 16V AC power adapter to the Power jack of router, and plug the adapter into a mains power outlet. Switch on the router. If the power is turned on, the PWR LED on the front panel will illuminate.

Configure the Router for the first time

Configuring IP Settings on Your Computer

To configure WX-5803 Wireless ADSL Router for the first time, the configuration PC must have a static IP address. Use 192.168.1.x (x is any number between 2 and 254) and subnet mask 255.255.255.0. Specify gateway as 192.168.1.1 and enter DNS server IP.

For Windows 2000

1. Right-click on **My Network Places** icon on the desktop and then click **Properties** in menu.



2. Double-click **Local Area Connection** icon  and then click **Properties** button.



3. Scroll down to highlight **TCP/IP (your network card)** and then click **Properties** button.
4. Check the radio button for **Specify an IP address**. In the IP address box, type the assigned IP address 192.168.1.x (x is any number between 2 and 254).
5. In the Subnet mask box, type the subnet mask 255.255.255.0.

6. In the default gateway box, type the default gateway IP address. For example, 192.168.1.1.
7. Click **OK** button in the TCP/IP Properties window to complete the PC configuration, and click **Close** or the **OK** button to close the Network window.


Configuring with Web Browser

Before you begin

Make sure that you get setup information you need (for example, VPI, VCI, and type of encapsulation) from your Internet Service Provider (ISP).

The ADSL Router can be configured with your Web browser. The product provides a very easy and user-friendly interface for configuration.

1. Open your web browser. Enter http://192.168.1.1 in the web browser's Address field, and press the Enter key.

Address  http://192.168.1.1

2. A Login window will appear. Enter admin in the User Name field and enter admin in the Password field.



The dialog box titled "Enter Network Password" contains the following fields and options:

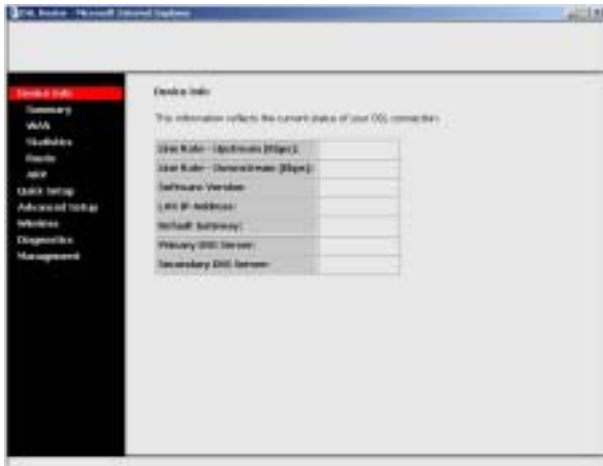
- Site: 192.168.1.1
- Realm: DSL Router
- User Name: admin
- Password: [masked]
- Save this password in your password list
- Buttons: OK, Cancel

3. After login, WX-5803 Web UI screen will appear.



I. Device Info

The *Device Info* page contains information of the software version of your device and some settings, such as IP Address and gateway.



II. Quick Setup

The Quick Setup will guide you through the steps necessary to configure your DSL Router.

DSL Auto-connect

If you want your router automatically detect PVC and connect to the network, check the box *Auto-connect*.

The WX-5803 has OAM (Operation, Administration and Management) for network administration and support. It scans PVC (Permanent Virtual Circuits) using OAM F5 cell starting from 0/32 to 0/60, then 1/32 to 1/60, until the last PVC 8/60 or until it receives OAM response. It skips over established PVCs.

When an OAM response is received, WX-5803 will try to establish a connection. The following sequence is typical of a network protocol and encapsulation your router will try to use:

- PPPoE with LLC encapsulation

- PPPoA with VC-MUX encapsulation
- PPPoA with LLC encapsulation

If one fails, the router will try the next. If all these connections fail, it will try next PVC. If the responding PVC is not PPPoE or PPPoA, it will choose the first responding PVC and run in Bridging connection type with LLC encapsulation.

If no PVC responds to OAM, the router will use the default settings 0/35 and run in Bridging connection type with LLC encapsulation.



Setup DSL Connection Manually

If the ISP doesn't support the Auto-connect, you have to setup the DSL connection manually.



Specify the values for VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier). For the following steps to create a DSL connection, please refer to the next section **Advanced Setup**.

After you complete the DSL connection settings, a *Wireless – Setup* page will appear. Enter a desired name in *SSID* field. This

SSID is a network name that identifies the wireless devices in the network. The default value is *WX5803*. All workstations and access points must use the same SSID to be able to communicate with one another. The SSID is a 32-character field, and the value is case sensitive.



Click *Next* button.

The *WAN Setup – Summary* page will appear. It displays a summary of all WAN setting profiles. Click *Save/Reboot* button to save all the settings and reboot the router.



Close your Web UI window and wait for about 2 minutes before reopening your web browser.



III. Advanced Setup


1. Click the *Advanced Setup* tab on the left frame.
2. Click the *WAN* tab on the left frame. A *WAN Setup* page will appear on the right frame. Click *Add* button.



3. The *ATM PVC Configuration* page will appear. Enter the appropriate VPI and VCI values. Select appropriate Service Category. Click *Next*.

 PVC is identified by the VPI (Virtual Path Identifier) and VCI

(Virtual Channel Identifier). Consult your ISP to get the numbers. The valid range for the VPI number is from 0 to 255 (The default value is 0.). The valid range for the VCI number is from 32 to 65535 (The default value is 35).

 There are five service categories provided: UBR Without PCR, UBR With PCR, CBR, Non Realtime VBR, and Realtime VBR.



4. The *Connection Type* page will appear. There are several ways for the device to have a public IP address and then to access Internet. You have to check with your ISP about

which way is adopted. Check the radio button of your connection type.

5. Scroll down to select the appropriate Encapsulation Type.

WX-5803 ADSL router supports the following five network operating modes over an ATM PVC WAN interface:

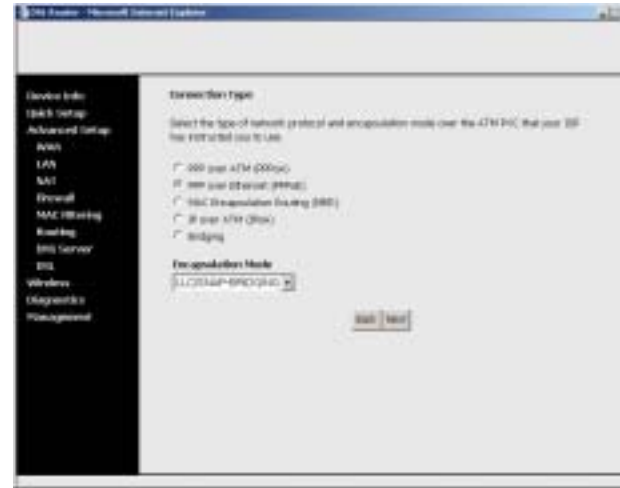
- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulated Routing (MER)
- IP over ATM (IPoA)
- Bridging

 The steps to configure **PPP over ATM (PPPoA)** are similar to PPPoE.

PPP over Ethernet (PPPoE)

1. Select the *PPP over Ethernet (PPPoE)* radio button and scroll down to select the appropriate *Encapsulation Mode*. There are two encapsulation types available: LLC/SNAP-BRIDGING and VC/MUX. Then click *Next*


button.



2. In the PPP Username and Password page, enter the user name and password supplied by your ISP in *PPP Username* and *PPP Password* fields.



3. Check the box *Disconnect if no activity* if you want to enable the function of automatic disconnection. It will auto-disconnect the ADSL Router when there is no activity on the line for a period of time.

 **PPP IP Extension** is a special feature deployed by some service providers. Unless your ISP specifically requires this setup, do **NOT** select it.

The PPP IP Extension supports the following conditions:

- Allows only one PC on the LAN
- The public IP address assigned by the remote using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the PC's LAN interface through DHCP. Only one PC on the LAN can be connected to the remote since the DHCP server within the ADSL router has only a single IP address to assign to a LAN device.
- NAPT and firewall are disabled when this option is selected.
- The ADSL router becomes the default gateway and DNS server to the PC through DHCP using the LAN interface IP address.
- The ADSL router extends the IP subnet at the remote service provider to the LAN PC. That is, the PC becomes a host belonging to the same IP subnet.
- The ADSL router bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the router's LAN IP address.

4. Click *Next* button.

5. Check the box *Enable IGMP Multicast* if you want to enable IGMP multicast. Check the box *Enable WAN Service* if you

want to enable WAN Service. Click **Next**.



6. The WAN Setup – Summary page displays a summary of all WAN setting profiles. Click Save button to save all the settings.



7. The WAN Setup page will appear. Click *Save/Reboot* button. The router will reboot automatically with the new settings in effect.



- Close your Web UI window and wait for about 2 minutes before reopening your web browser.

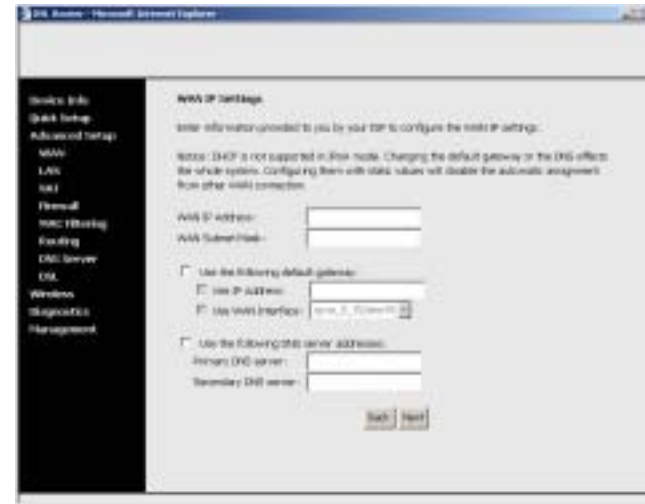


IP over ATM (IPoA)


- Select the *IP over ATM (IPoA)* radio button and scroll down to select the appropriate *Encapsulation Mode*. There are two encapsulation types available: LLC/Snap-Routing and VC/MUX. Then click *Next* button.



2. DHCP is not supported over IpoA. Enter your WAN IP address, WAN Subnet Mask, gateway IP address and DNS server IP address provided by your ISP to configure the WAN IP settings. Then click *Next* button.



3. The Network Address Translation Settings page will appear. If you want to enable NAT function, check the box *Enable NAT*. If NAT is enabled, it will display a NAT submenu on the left panel after reboot.

 NAT occurs when multiple IP addresses on a private LAN are converted to one public address. This public address is sent out to the Internet. NAT increases security because the IP address for a PC connected to the private LAN is never transmitted to the Internet. NAT also allows xDSL/cable routers to be used with low-cost Internet accounts, where only one TCP/IP address is

provided by the ISP. The user may have many private addresses masked by the single address provided by the ISP.

4. If you want to enable Firewall function, check the box *Enable Firewall*. If Firewall is enabled, it will display a Firewall submenu on the left panel after reboot.

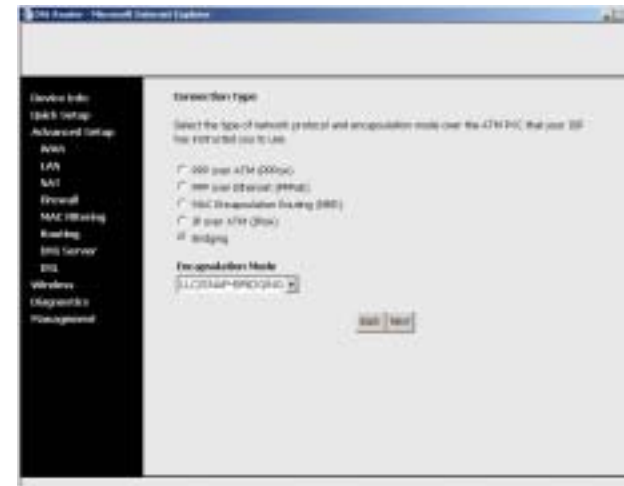


Firewall will reject any unsolicited data from the Internet to access the computer on your LAN. Basically, if you do not request data, the data will not be allowed by the firewall to pass.

5. If you want to enable IGMP Multicast, check the box *Enable IGMP Multicast*. If you want to disable it, uncheck the box.
6. The default of WAN service is Enable. If you want to disable WAN service, uncheck the box *Enable WAN Service*.
7. Enter a desired name in *Service Name* field. It is used to identify the service.
8. Click *Next* button.



8. The WAN Setup – Summary page displays a summary of all WAN setting profiles. Click *Save* button to save all the settings.
9. The WAN Setup page will appear. Click *Save/Reboot* button. The router will reboot automatically with the new settings in effect.




Bridging

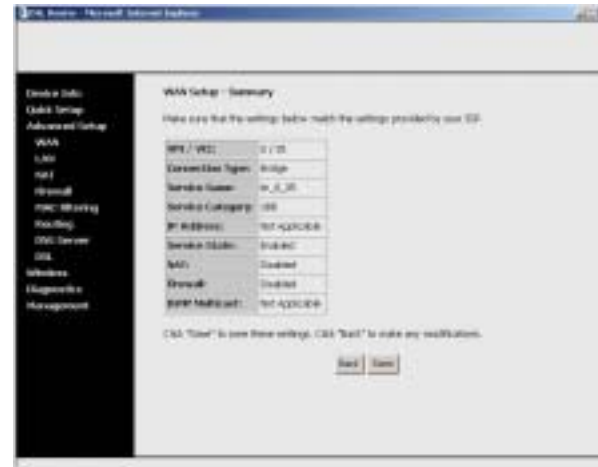
1. Select the *Bridging* radio button and scroll down to select the appropriate *Encapsulation Mode*. There are two encapsulation types available: LLC/Snap-Bridging and VC/MUX. Then click *Next* button.

2. Check the box *Enable Bridge Service*. Enter a desired name in *Service Name* field. It is used to identify the service. Then click *Next* button.



 The LAN IP in bridge operating mode is needed for local users to manage the ADSL router. And no IP address is needed for the WAN in bridge mode.

3. The WAN Setup – Summary page displays a summary of all WAN setting profiles. Click Save button to save all the settings.



4. The WAN Setup page will appear. Click *Save/Reboot* button. The router will reboot automatically with the new settings in effect.



5. Close your Web UI window and wait for about 2 minutes before reopening your web browser.



IV. Configure Wireless Connectivity

Basic

1. Click the *Wireless* tab on the left frame. Click the *Basic* tab. A *Wireless - Basic* page will appear on the right frame. Check the box *Enable Wireless*.



2. Check the box *Hide Access Point* and then your router will not be "ping"ed by any user on the Internet. This feature is helpful if you do not want to let other Internet users to check the status of your router. However, the station will not be able to find your router.

3. Enter a desired name in *SSID* field.
4. Click *Apply* button.

Security

The WX-5803 provides advanced mechanism for wireless security. If you want to enable the security mechanism, click the *Security* tab.

■ Network Authentication

Without implementing security, it is possible for an unauthorized person to intercept your data. It will ensure only authorized users can access the network.

Use *Network Authentication* drop-down list to select the method of wireless security. There are three methods provided: 802.1X, WPA and WPA-PSK.

(1) 802.1X

802.1X is an IEEE standard for authenticated network access to


wired networks and wireless 802.11 networks. It provides a framework for centralized user identification and authentication, and a key distribution management method. Clients authorized by RADIUS servers can access this WX-5803. To use 802.1X, enter the required values on *RADIUS Server IP Address*, *RADIUS Port* and *RADIUS Key* fields.




(2) WPA

WPA also adopts an authentication scheme -- via 802.1X. It consists of three main elements: an Authentication Server (typically a RADIUS server), WPA-enabled router or AP (called "Authenticator"), and a WPA-enabled client (called "Supplicant").

To use WPA authentication, enter the required values on *WPA Group Rekey Interval*, *RADIUS Server IP Address*, *RADIUS Port* and *RADIUS Key* fields.

 **WPA Group Rekey Interval** is used to specify the frequency of encryption key rotations. The lower the number, the faster your encryption key will rotate, however, setting this number too low may cause your wireless network to slow down.

In WPA, you can select *TKIP*, or *AES* or *TKIP+AES* as data encryption method.

 **TKIP** (Temporal Key Integrity Protocol) includes four algorithms: MIC (message integrity check), to protect packets from tampering; PPK (Per-Packet Key) hashing, to prevent weak key attacks; extended IV (initialization vector), to reduce IV reuse and the possibility that a hacker will collect sufficient packets to crack the encryption; and a re-keying mechanism, to change the temporal key dynamically. TKIP is the most commonly used encryption method; however, if your wireless clients do not support TKIP, the WX-5803 also supports AES (Advanced Encryption Security) encryption. AES will replace 802.11's RC4-based encryption under 802.11i specification.



(3) WPA-PSK

In enterprises, WPA will be used in conjunction with both wireless router and authentication server. In Small Office/ Home Office (SOHO) environment, where there are no authentication servers, user can use pre-shared key (PSK) mode in place of the authentication server. WX-5803 provides WPA running in PSK mode.

Enter the following field with the required values.

WPA Pre-shared Key

WPA Pre-Shared Key (PSK) is a field where the password is entered. All wireless clients must also use this password to

gain access to the network. Note that the Key format must also match the setting for the wireless clients.

WPA Group Rekey Interval

WPA Group Rekey Interval is used to specify the frequency of encryption key rotations.

Data Encryption

WPA Encryption has 3 choices: *TKIP*, or *AES* or *TKIP+AES*.

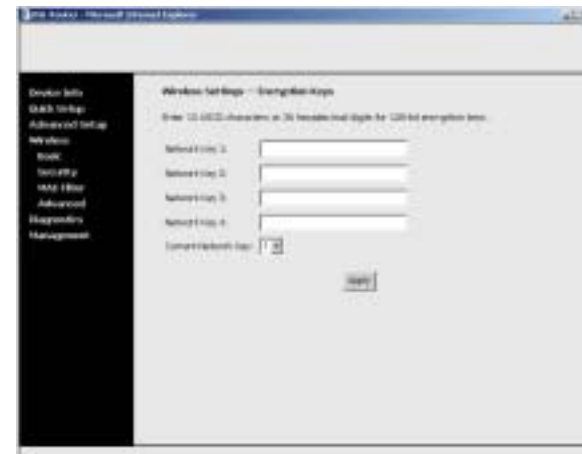


■ Data Encryption - WEP

You can use WEP (Wired Equivalent Privacy) encryption to

protect wireless communications. WEP provides a way of creating an encrypted key that is shared between a wireless client and the router. This key encrypts data before it is transmitted. WEP can be implemented with 64-bit or 128-bit key. 128-bit key is relatively securer than 64-bit key.

1. In *Data Encryption*, select *WEP* if you want to enable WEP.
2. Click on the *Encryption Strength* drop-down list to select appropriate encryption strength.
3. Click on *Set Encryption Keys* button, and the *Wireless Settings - Encryption Keys* page will appear.



4. It is possible to enter up to 4 different WEP Keys. The WEP key must match between two parties for secure communications. Enter four different keys in the *Network Key* fields provided. If you choose 64-bit encryption, enter 5 ASCII characters (or 10 hexadecimal digits). If you choose 128-bit encryption, enter a 13-character (or 26 hexadecimal digits) WEP key.
5. Select only one key out of the four provided in the *Current Network Key* drop-down list.
6. Click *Apply* button. Then, the page will return to *Wireless – Security* page.
7. Click *Apply* button to apply the settings.



3. Click *Add* button. The *Wireless – MAC Filter* page will appear.
4. Enter the hexadecimal MAC address (for example, 00:11:22:33:44:55) that you allow or deny access in the MAC Address box.

MAC Filter

This feature prevents specific computers within the LAN from accessing the Internet. To use MAC filter, perform the following steps:

1. Click the *MAC Filter* tab on the left frame.
2. If you want to grant the computer specified to access the network, check the radio button *Allow*. If you want to restrict the access, check the radio button *Deny*.





The steps below show how to find the MAC address of the computer in Windows 2000 and XP.

1. Click the *Start* button, and then click *Run*.
2. In the *Open* field, type the following text: **cmd**
3. Click the *OK* button.
4. At the command prompt, type the following text to obtain the Physical Address (MAC address): **ipconfig/all**

5. Click *Apply* button. The page will return to the *Wireless – MAC Filter* page.

Appendix A: Specifications

Product Name 54 Mbps/ 11Mbps Wireless ADSL Router	Gateway NAT, DHCP server, Port forwarding, Firewall
Model Number WX-5803	802.1d Spanning Tree Protocol (STP)
Spreading 802.11b : DSSS, 802.11g : OFDM	Security 64/128-bit WEP 802.1x (port-based security with RADIUS)
Frequency Range 2.4GHz	MAC address filtering
Data Rate 802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps	Number of Channels USA – 11
Transmit Power +17dBm (Maximum) for WLAN +14dBm (Maximum) for ADSL	Antenna 2dBi gain
Standards IEEE 802.11b for Wireless LAN IEEE 802.3 for Wired LAN ANSI T1.413 Issue II for ADSL ITU G.992.1 (G.DMT) for ADSL ITU G.992.2 (G.lite) for ADSL ITU G.994.1 (G.HS) for ADSL	Dimension 176 mm x 137 mm x 27 mm
Network Protocol TCP/IP, IPX/SPX, NetBEUI, DHCP Client RFC1483 Bridged IP over ATM RFC1483 Routed IP over ATM RFC1577 Classical IP over ATM RFC2364 PPP over ATM AAL5 RFC2516 PPP over Ethernet AAL5 UBR & CBR	Weight 525 g (Router only)
	Ports RJ-11 /45 ADSL WAN Port 10/100 Mbps wired LAN * 4 (Auto-Cross over) USB Port
	Temperature Range 0~40°C(operating), -20~65°C (storing)
	Humidity 15%~95%
	Power Adapter Input: AC 120/240V, 0.35A, 50/60Hz Output AC 16V, 1A