Wireless Broadband Router

User Manual

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May 26, 2004 Rev.10

Safety Instructions

For Installation

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

For Using

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

For Service

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

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

Federal Communication Commission Interference Statement

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

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

"Belkin declare that F5D7230-4 (11g DSL/Cable Router) is limited in CH1~CH11 by specified firmware controlled in USA."

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.

INFORMATION TO USER:

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

About This User Manual

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

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

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

Note

Contains **related information** text that corresponds to a topic.

Caution

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

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

Contents

List of Figures

1 Introduction

1.1 Overview

Thank you for choosing this Wireless Broadband Router. This Wireless Broadband Router is a multi-function device featuring a wireless Access Point, 4-port LAN switch and a WAN port, which extends the existing broadband Cable/ADSL connection. It allows the Internet connection to be shared through either the 54Mbps Access Point feature or the 10/100Base-TX Ethernet switch, which also eliminates the purchase of additional hub or switch. Now the wired and wireless networks are integrated to enjoy various bandwidth-consuming applications over the Internet.

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

This router has a DHCP server that automatically assigns IP addresses to your LAN or WLAN devices. With the built-in Network Address Translation (NAT) function, your LAN/WLAN can access the Internet through a single external IP address and at the same time that is protected against outside intruders. The router can also be configured to filter internal access to the Internet. It is designed to provide a reliable Internet access solution for the corporate environment as well as the small office home office (SOHO).

1.2 Features

WAN Port Features

- PPPoE (PPP over Ethernet) Client with Keep Alive/Connect On Demand Support
- PAP and CHAP Authentication
- DHCP Client
- Static IP Connection
- PPTP Connection (Europe)
- MAC Address Cloning
- Settable and Changeable IP Address

LAN Port Features

- DHCP Server
- Settable and Changeable IP Address

Router Features

- NAT
- Firewall Support
- Bridge Mode Support
- 802.1D Bridging
- IP Filtering, IP Forwarding
- DMZ Hosting
- DNS Forwarding
- UPnP Support
- Microsoft NetMeeting Passthrough Support
- Microsoft XP Messenger Passthrough Support

Security Features

- PAP and CHAP Authentication
- ASCII/HEX Format 64/128 Bit WEP Key for Wireless LAN
- Supports IP packets filtering based on IP address, Port

number, and Protocol

- VPN Support (IPSec Passthrough, and PPTP Passthrough)

Wireless LAN Features

- Fully compatible with 802.11g standard
- Wi-Fi WPA Support
- Direct Sequence Spread Spectrum (DSSS) technology exploitation
- Seamless roaming within wireless LAN infrastructure
- Low power consumption for wireless clients via efficient power management

Configuration and Management Features

- Configurable through Web Browser via WAN/LAN
- Software Upgrade
- DHCP Server function for IP distribution to local network users
- NTP/Manual System Clock
- Configuration Saving/Retrieving
- Event Log

1.3 Package Contents

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

- Wireless Broadband Router x1
- Power Adapter x1
- CD-ROM x1
- RJ-45 Ethernet Cable x1

1.4 System Requirements

- Cable/ADSL modem and an Internet access account for Internet connection
- One computer with 10/100Base-T Ethernet card and TCP/IP protocol installed for initial setup
- Internet Explorer 5.0 or higher for Web configuration
- 802.11g or 802.11b compliant wireless adapters (for wireless connection)

2 Hardware Description & Installation

2.1 Physical Outlook

Front Panel

The following illustration shows the front panel of the Wireless Broadband Router:

Figure 2-1 LED Indicator

LED Indicator

The Wireless Broadband Router is equipped with eight LEDs on the front panel as described in the table below (from left to right):

LEDs	Status	Description
PWR	Off	No power is supplied to the unit.
	Solid	Power is connected to the unit.
CONNECT	Off	Both WAN and ISP are not connected at the same time.
	Solid	Both WAN and ISP are connected.
WLAN	Off	WLAN interface is not initialized properly.
	On	WLAN interface is initialized properly and ready.

LEDs	Status	Description
	Blinking	Transmitting/receiving packets wirelessly.
WAN	Off	No broadband device is connected.
	On	Broadband device is connected.
	Blinking	Transmitting/receiving packets on the WAN port.
LAN 1-4	Off	No Ethernet device is connected.
	Solid	Ethernet connection is established.
	Blinking	Transmitting/receiving packets on the LAN port.

Rear Panel and Connector

The following illustration shows the rear panel of the Wireless Broadband Router.

Figure 2-2 Rear Panel and Connector

- **12VAC**: Power jack
- **LAN Ports 1-4**: RJ-45 Connector. Integrated 4-port 10/100BaseT switch. Connects to a hub, switch or NIC-equipped PC in your network. The LAN ports has Auto-MDI/MDIX feature that supports either crossover or straight-through cables.
- **Internet/WAN**: RJ-45 connector. Connects to the Cable/ADSL Modem. The WAN port also has Auto-MDIX feature that supports either crossover or straight-trough cables.
- **LOAD DEFAULT**: To restore to the factory default settings insert a straightened paperclip into the hole to press the button. Keep pressing and power cycle (off and on) the device. Wait for at least 5 seconds to release the button. Then wait for the device to finish booting. This operation erases all previous settings entered by the administrator.

2.2 Hardware Connection

Choosing a Place for the Wireless Broadband Router

- Place the device close to the power outlet for the cable to reach it easily.
- Avoid placing the device in places where people may walk on the cables.
- Keep the device away from direct sunshine or heat sources.
- Place the device on a flat and stable stand.

Connecting the Wireless Broadband Router

Prior to connecting the hardware, make sure to power off your Ethernet device, Cable/ADSL modem and Wireless Broadband Router. Then follow the steps below to connect the related devices.

Step 1 **Connecting wired device to the LAN port.**

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

Step 2 **Connecting Cable/ADSL Modem to the WAN port.**

Connect the Ethernet cable attaching to your Cable/ADSL modem to the **WAN** port of your Wireless Broadband Router.

Step 3 **Connecting the power adapter.**

Connect one end to the power jack of the Wireless Broadband Router and the other end to an AC outlet.

Caution Only use the adapter supplied with the Wireless Broadband Router. Connecting another adapter may cause permanent damage to the device.

The illustration below specifies a connection diagram example:

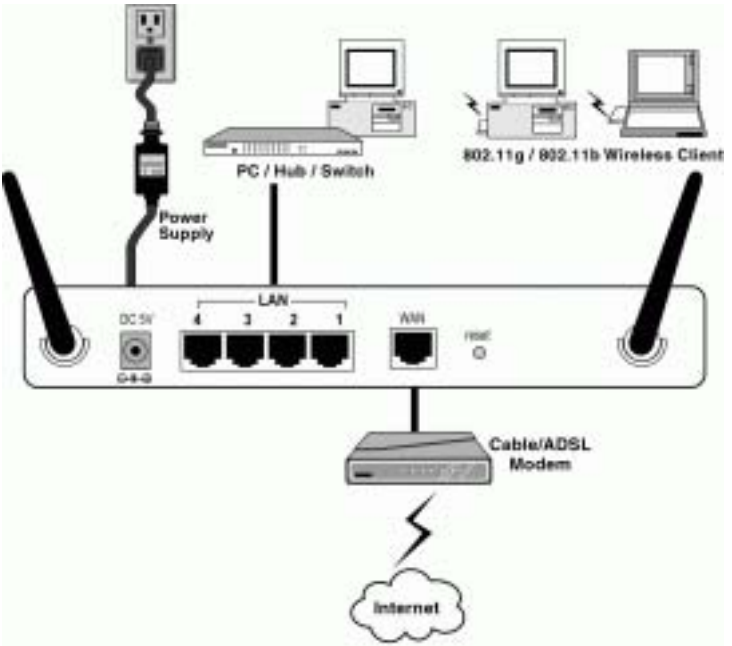


Figure 2-3 Typical Connection Diagram

3 Configuring Local Computer to Access the Wireless Router

This chapter describes how to configure a computer for initial connection to the device.

3.1 Overview

To access the Wireless Broadband Router's Web-based Configuration Utility, at least one properly configured PC must be connected to the device and resided on the same subnet with the Wireless Broadband Router. The easiest way to make the connection is attaching your host computer's NIC directly to the LAN port of the device, though it is also allowed to configure the device via a wireless client.

Whatever your connection method is, the computer's Ethernet /wireless interface must be on the same subnet as the router. As the Wireless Broadband Router is configured with these default values:

- **IP address**: 192.168.2.1
- **Subnet mask**: 255.255.255.0
- **DHCP server**: Enabled with the IP address pool from 192.168.2.2 to 192.168.2.100.

So you should set up your NIC or wireless adapter's TCP/IP settings as one of the following:

1. To use dynamic IP: Set your PC to be DHCP client to accept the dynamic IP from the router's DHCP server.
2. To use static IP: Set the IP address as **192.168.2.x** (x is between 2 and 254), subnet mask as **255.255.255.0** and the gateway as **192.168.2.1**

The default TCP/IP setting for Windows is acting as a DHCP client. Please proceed to the next section to verify or, if necessary, to configure the TCP/IP settings.

3.2 Setting up TCP/IP

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

Note

1. If TCP/IP protocol is not installed on your PC, refer to Windows documentations for installation instructions.
2. For initial configuration, it's recommended to connect only one PC directly to the LAN port on the Wireless Broadband Router.

For Windows 98/ME

Step 1 Click on the **Start** menu, point to **Settings** and click on **Control Panel**.

Step 2 Double-click the **Network** icon.

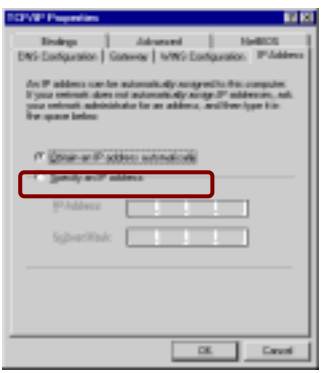
Step 3 In the **Network** window, highlight **TCP/IP** protocol for your NIC or wireless adapter and click **Properties**.

Step 4 Choose one of the methods as required:

Option A: Using DHCP

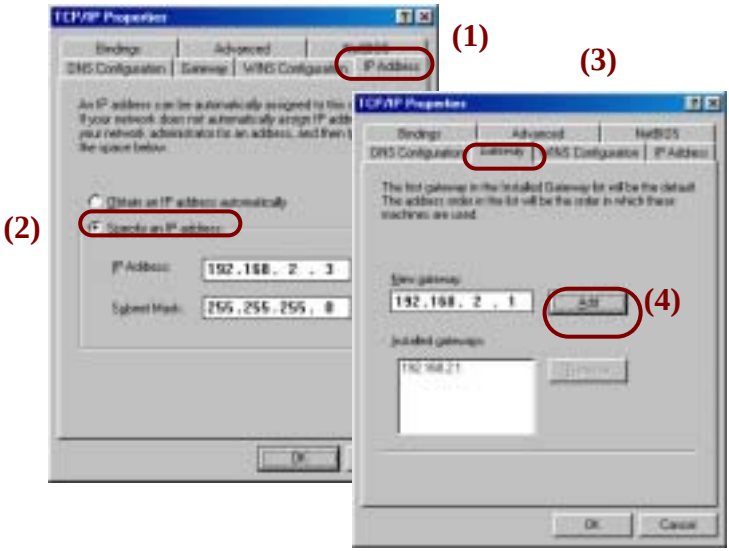
On the **IP Address** tab, select **Obtain an IP address automatically**.

Then an IP address will be automatically assigned to your computer.



Option B: Using Fixed IP Address

- On the **IP Address** tab, select **Specify an IP address**.
- Then set the IP address as **192.168.2.x** (x is between 2 and 254), subnet mask as **255.255.255.0**.
- Select the **Gateway** tab and set the gateway to **192.168.2.1**.



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

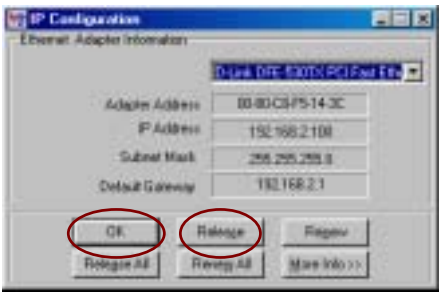
Check/Renew IP Address under Windows 98/ME

The following steps help you to verify if your network adapter gets an IP address within the DHCP IP pool range (192.168.2.2 ~ 192.168.2.100 by default) of the router. If not, you may need to renew the IP information.

Step 1 From the **Start** menu, click **Run** to open the **Run** dialog box.

Step 2 Enter **winipcfg** in the dialog box and then click **OK**.

Step 3 Select the Ethernet or WLAN adapter from the drop-down list to show the IP address. If necessary, click **Release** and then **Renew** to get a new IP address.



For Windows 2000/XP

Step 1 Click on the **Start** menu, point to **Settings** and click on **Control Panel**.

Step 2 Double-click the **Network and Dial-up Connections** or **Network Connections** icon.

Step 3 Right-click the **Local Area Connection** icon for your NIC or wireless adapter and then click **Properties**.

Step 4 On the **General** tab, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.

Step 5 Choose one of the methods as required:

Option A: Using DHCP

On the **IP Address** tab, enable **Obtain an IP address automatically** and then click **OK**.

Then an IP address will be automatically assigned to your computer.

Option B: Using Fixed IP Address

Select **Use the following IP address** and enter these settings:

- **IP address**: 192.168.2.x (x is between 2 and 254)
- **Subnet mask**: 255.255.255.0
- **Default Gateway**: 192.168.2.1

Check/Renew IP Address under Windows 2000/XP

The following steps help you to verify whether the network adapter gets an IP address within the DHCP IP pool range (192.168.2.2 ~ 192.168.2.100 by default) of the router. If not, you may need to renew the IP information.

Step 1 Click **Run** from the **Start** menu to open the **Run** dialog box.

Step 2 Type **cmd** in the dialog box and then click **OK**.

Step 3 At DOS command prompt, type **ipconfig** to see the IP information from DHCP server.

Step 4 If you want to get a new IP address, type **ipconfig /release** to release the previous IP address and then type **ipconfig /renew** to get a new one.

3.2 Additional Settings for Wireless Client

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

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

3.3 Checking Connection with the Wireless Broadband Router

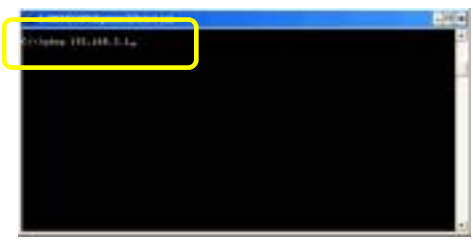
You can use the PING command to verify whether or not the Ethernet/Wireless client can communicate with the device.

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

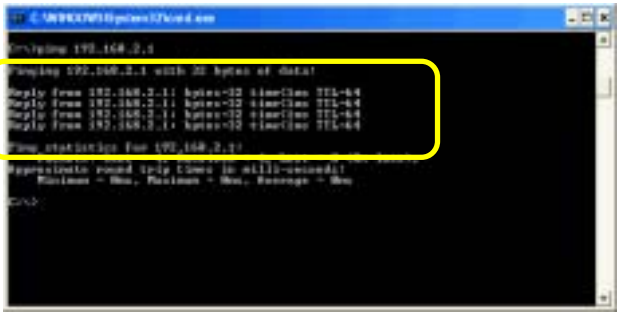
   - For Windows 2000/XP: **Start** > **Run**. Type ***cmd*** and click **OK**.

2. Type the ping command and enter the IP address of the Wireless Broadband Router. The factory default value is: 192.168.2.1. If you have changed the IP of the device, then type the new IP address of the Wireless Broadband Router.

   For example: **C:\ping 192.168.2.1**



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



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

Request time out
Request time out
Request time out
Request time out

or

Destination host unreachable
Destination host unreachable
Destination host unreachable
Destination host unreachable

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

4 Web Configuration

4.1 Accessing Web-Based Configuration Utility

Once your PC is properly configured as described in "3.Configuring Local Computer to Access the Wireless Router", you can proceed as follows for initial configuration:

1. Start your Web browser and type **http://192.168.2.1** in the Address field. This address is the default private IP of your router.

Note

If the router's LAN port has been changed with a new IP address, enter the new IP instead.

2. After enter the configuration screen, the **Status** home page will appear below. At the top of the screen, there are three tabs: **Home, Help** and **Login/Logout** to specify that get back to home page (**Status** page), glossary of terms and login/logout the configuration. And the **Internet Status** at the near location will also show you the connection situation.

Figure 4-1 Status

3. When select any main tab at the left of the screen will be prompted with the following screen, leave the password **empty**, and then click **Submit**.

Figure 4-2 Login

After successful login, you will be able to see the Wireless Broadband Router's web-based configuration utility. From now on the Wireless Broadband Router acts as a Web server sending HTML pages/forms on your request. You can click the item you need to start the configuration screen.

4.2 LAN Setup

The Router is equipped with a DHCP server that will automatically assign IP addresses to each computer on your network, If you want to changes the default values, please click **"LAN Settings"** on the LAN tab to the left of the screen. Or you can also click **"DHCP Client List"** on the LAN tab to the left of the screen to review the list of all client computers connected to the network.

LAN Settings

This page allows you to make changes to the LAN, after the changes you have configured, click **Apply Changes** to take effect or click **Clear Changes** to erase the changes. During the configuration, you can also click **More Info** to get more detail information relates to the item or sentence indicated.

Figure 4-3 LAN Settings

The **LAN Settings** interface includes the items configuration described below:

▶ ***IP Address/Subnet Mask***

Enter the IP address and subnet mask for the Wireless Broadband Router LAN port. All local wired/wireless devices communicate with

the device through this port. It is also the IP address of the Web-based Configuration Utility. By default, the IP address and subnet mask of the LAN port is 192.168.2.1 and 255.255.255.0 respectively. Note that if you change the private IP address and apply the changes, the PC from which you configure the router will lose the communication to the router. To reconnect, you will need to renew the IP address of the PC or change to an IP address compatible with the new LAN port IP address.

▶ ***DHCP Server (Router Mode Only)***

Select whether to enable DHPC service for LAN and WLAN. The Wireless Broadband Router implements a built-in DHCP (Dynamic Host Configuration Protocol) server on its LAN and WLAN interface, which dynamically assigns IP addresses to the DHCP clients on the LAN / WLAN. The DHCP server also provides a default gateway (the router's LAN IP address) and DNS addresses for DHCP clients to access the Internet. DHCP function spares you the hassle of manually assigning a fixed IP address to each PC on the LAN / WLAN. If you already have a DHCP server on your network you should disable this function. DHCP server is enabled by default.

IP Pool Starting/Ending Address: Specify the starting and ending IP address of the IP address pool. Whenever a network device requests an Internet session, the router will allocate an unused IP address from this pool and lease them to the device for a specified amount of time.

▶ ***Lease Time***

Specify the length of time that the DHCP server will reserve the IP address for each computer.

▶ ***Local Domain Name (Optional)***

A feature that allows you can assign a name to your network.

DHCP Client List

This page can show you the IP address, Host Name and MAC address of each computer connected to your network. You can click **Refresh** to update the latest list.

Figure 4-4 DHCP Client List

4.3 Internet WAN

This tab allows you to set up your Router to connect to your Internet Service Provider. The Router is capable of connecting to virtually any Internet Service Provider's system provided that you have correctly configured the Router's settings for your ISP's connection type. You can click **"Connection Type"** on the Internet WAN tab on the left of the screen to configure the Router to connect to your ISP.

Connection Type

There are five connection types supported by this Router: Dynamic, Static, PPPoE, PPTP and Telstra BigPond. Each of them is described as below, after selecting the connection type you want to use, click **Next** to next related configuration page. After finishing the configuration, you must click **Apply Changes** to take effect or click **Clear Changes** to erase the settings. During the configuration, you can also click **More Info** to get more detail information relates to the item or sentence indicated.

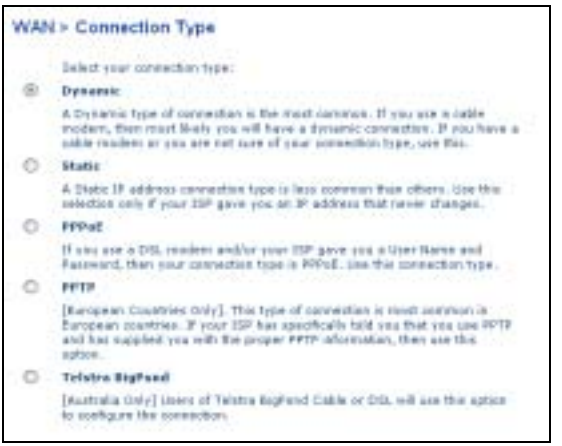


Figure 4-5 Connection Type

▶ ***Dynamic***

This connection type is the most common method. If you are using a cable modem for connection or not sure what your connection type is, please select this type to obtain the IP automatically.

Click **Next** to enter **Dynamic IP** configuration page, type in the host name that is connected to the Internet Service Providers to the **Host Name** field.

Figure 4-6 Dynamic IP

▶ ***Static***

This connection type is less common than others. Only under the ISP give you an IP address that is fixed and never be changed, please select this type.

Click **Next** to enter **Static IP** configuration page, type in the static IP address, subnet mask and ISP gateway address to the related fields. You can also select the **"My ISP Provides more than one Static IP address?"** checkbox to add another static IP address.

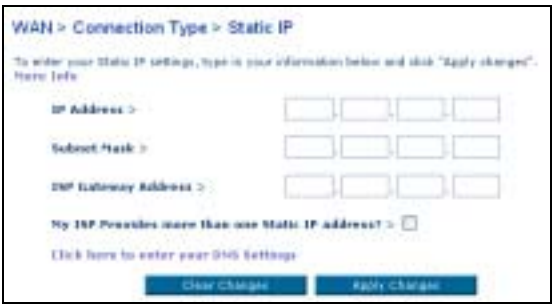


Figure 4-7 Static IP

▶ ***PPPoE***

When you use a DSL modem and/or your ISP give you a User Name and Password, then your connection type is PPPoE, please select this type.

Click **Next** to enter **PPPoE** configuration page, type in the user name and password supplied by your ISP to the **User Name** and **Password** fields. Retype in the password to the **Retype Password** field. If you do not have a service name or do not know it, please leave the **Service Name** field blank. About **MTU** field, please do not make any change unless your ISP specifically requires a different setting that 1454. You can also select the **"Disconnect after x minutes of no activity."** checkbox to set the idle time for disconnection.

Figure 4-8 PPPoE

▶ ***PPTP (Only for Europe)***

In Europe, this connection type is the most common method. If you ISP has specified you to use PPTP and supplied you with the proper PPTP information, please select this type.

Click **Next** to enter **PPTP** configuration page, type in the information supplied by your ISP to the related fields. Retype in the password to the **Retype Password** field. You can also select the

“Disconnect after x minutes of no activity.” checkbox to set the idle time for disconnection.

Figure 4-9 PPTP

▶ ***Telstra BigPond (Only for Australia)***

In Australia, users of Telstra BigPond Cable or DSL will use this type to configure the connection.

After selecting this type and click **Next** to enter **Telstra BigPond** configuration page, type in the information supplied by Telstra BigPond to the related fields. The **Login Server** IP address will be filled in automatically according to what state you choose. If your Login Server address is different than one provided here, please select the **“User decide login server manually”** checkbox to enter the **Login Server** IP address manually.

Figure 4-10 Telstra BigPond

DNS

If your ISP provides you a specific DNS address to use (using a Static IP connection type), in this page, enter the specific DNS address and secondary DNS address for your connection to work properly. On the other hand, if your connection type is Dynamic or PPPoE that mean your ISP will not provide you a specific DNS address to use, please select the **"Automatic from ISP"** checkbox.

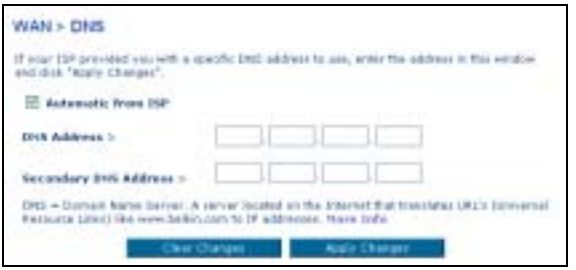


Figure 4-11 DNS

MAC Address

In this page, if you are not sure whether your ISP needs to see the original MAC address, simply copy the MAC address of the computer that was originally connected to the modem. Copying the address will not cause any problems with your network. Click the **Clone** to copy your MAC address, make sure that you are using the computer that was **ORIGINALLY CONNECTED** to your modem before the Router was installed.

Figure 4-12 MAC address

4.4 Wireless

In this tab, you can adjust **Channel and SSID, Security, USE as Access Point** and **Wireless Bridge** to the wireless section of the Router.

Channel and SSID

▶ ***Wireless Channel/SSID/Wireless Mode***

Select the desired channel from the drop-down list attached to the **Wireless Channel**. The **SSID** is the equivalent to the wireless network's name; you can also name the **SSID**. If there are other wireless networks in your area, you should give your wireless network a unique name. The default is **belkin54g**.

▶ ***Broadcast SSID***

Select this item's checkbox can show your SSID to the network. If you don't want your network to appear in a site survey, please don't select this item's checkbox for increasing security.

▶ ***Protected Mode***

In most situations, best performance (throughput) is achieved with **Protected Mode OFF**. If you are operating in an environment with HEAVY 802.11b traffic or interference, best performance may be achieved with **Protected Mode ON**.

▶ ***Turbo Mode***

This router supports 1 mode:

- **Frame Bursting mode:** Frame Bursting mode is based on the unreleased 802.11e specification for supporting both Frame Bursting enabled devices and non Frame Bursting enabled devices simultaneously. Select this mode will make all devices capable of Frame Bursting to

function in frame bursting mode, and all clients not capable to operate in normal 802.11g modes.

Figure 4-13 Channel and SSID

Security

Security page allows you to configure wireless security/encryption settings for the wireless. Select the security mode you need from the drop-down list, than click **Apply Changes** to enter next related configuration page.

Figure 4-14 Security

▶ ***Disabled***

Select this mode to disable any encryption.

▶ ***WPA-PSK (no server)***

WPA-PSK is for home and small business users who don't have a server. And the encryption technique includes TKIP and AES. The default value is TKIP.

- **TKIP:** This encryption technique can provide better compatibility between wireless products from different vendors since many wireless products will never be upgraded to AES.
- **AES:** AES is a new encryption technique based on the un-ratified 802.11i standard. New WPA standard are being considered using AES. Although AES is not as popular, some users may prefer to use this technique.

Note

No matter what encryption technique you use, all networks devices must use the same technique.

After selecting the Encryption Technique you want to use, type in the password to the “Pre-shared Key (PSK)” field.

Format	Minimum Characters	Maximum Characters
ASCII	8	63
Hexadecimal	8	64

Note

1. The password is distinction between uppercase and lowercase.
2. The same PSK must also be used for every other wireless network device on the network.

Figure 4-15 WPA-PSK

▶ ***WEP***

This mode includes 128bit WEP and 64bit WEP described as below:

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

Note

1. If you have defined a WEP key on the router, you have to make this key known to the network adapters on the PCs that are to be logged on your router. Otherwise it will not be possible to set up a connection between the PC and your router.
2. The encryption depth (64 or 128 bits) must be the same on the router and on the wireless network adapters of the PCs.

Figure 4-16 WEP 64bit and 128bit

▶ ***WPA***

Encryption Technique: Include TKIP and AES; both of them are Only for **WPA** and **WPA-PSK**. Please refer to WPA-PSK for more information.

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

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

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

Re-Key Interval: Specify the timer the WPA key must changes. The change is done automatically between the server and the client.

Figure 4-17 WAP

Use as Access Point

When using the router as an Access Point, you must specify an IP address for the Access Point. To do this, please select **Enable** item to enter the IP address and Subnetmask configuration page. Type in the IP address and Subnetmask that must suit to the same range as the network that you will connect to.

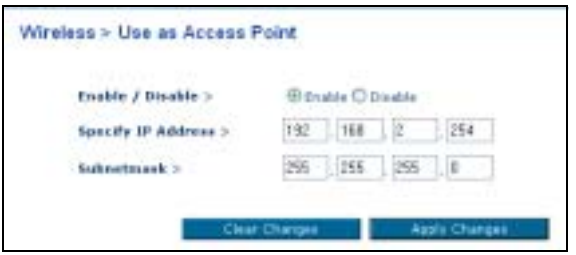


Figure 4-18 User as Access Point

Wireless Birdge

Wireless Bridging or wireless Distribution System (WDS) is used to connect Wireless Routers and Access points together to extend a network. There are three settings in this page:

Enable Wireless Bridging checkbox: Enabling the wireless bridge feature to allow other Access Points to connect to your device.

Enable ONLY specific Access Point to connect checkbox: Select this item so that you can type the specific Access Point's MAC address in the related fields for limiting specific Access Point connected by you.

Note

This item can be selected only under the **Enable Wireless Bridging** checkbox is enabled.

Disable ability for Wireless CLIENTS to connect checkbox: When the AP is used exclusively to connect wirelessly to other APs, please select this item.

Note

Bridging mode cannot be enabled when using 125 High-speed Mode. To enable bridging, first go to **"Channel and SSID"** and select another Turbo mode.

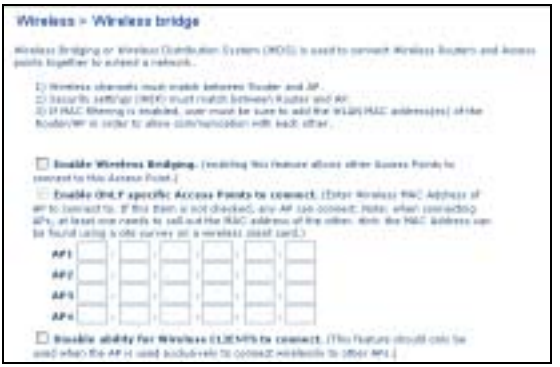


Figure 4-19 Wireless Bridge

4.5 Firewall

This Router is equipped with a firewall to protect your network from some hacker attacks. For protection you network, we suggest you it is better to enable this function.

Figure 4-20 Firewall

Virtual Servers

This function allows you to route external (Internet) calls for services such as a web server (port 80), FTP server (Port 21), or other applications through your Router to your internal Network. If you want to configure the Virtual Server function for a specific application, you can select your application from the drop-down list and then click **Add**. Or contact the application vendor to find out which port settings you need when the application is not listed. You can also clear the designate entry from the related drop-down list and click **Clear**.

Figure 4-21 Virtual Servers

Client IP Filters

No matter a single PC, a range of PCs, or multiple PCs can be configured to restrict access to the Internet. This page allows you to restrict which PCs can access the Internet including e-mail or other network services at specific days and times.

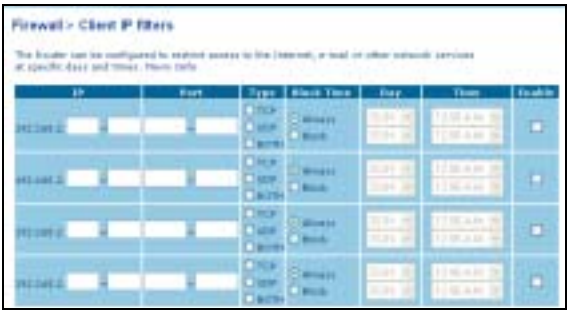


Figure 4-22 Client IP Filters

MAC Address Filtering

This page allows you to specify which PCs are allowed to access the network. Any PC is not specified in the filter list will be denied access. Using this function, you have to select the **"Enable MAC Address Filtering"** checkbox. The **"Block"** feature allows you to turn on and off access between PC and network easily.

Figure 4-23 MAC Address Filtering

DMZ

In the **IP address of Virtual DMZ Host** configuration box, enter the last digits of the specific IP address in the **Private IP** field. Then, select **Enable** checkbox for enabling the DMZ host computer to send all traffic from all ports.

Note

The PC in the DMZ is not protected from hacker attacks.

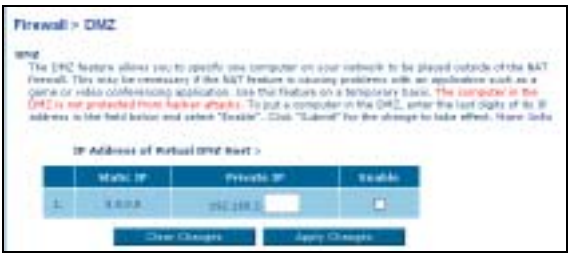


Figure 4-24 DMZ

WAN Ping Blocking

For a heightened level of security, you can configure the Router not to respond to an ICMP Ping (ping to the WAN port). Select **"Block ICMP Ping"** checkbox to turn off the ping response.

Figure 4-25 WAN Ping Blocking

Security log

This page will list a log of all activity kept in the router, including computer log in, log out and any attempts from the Internet to access the router logs. Click **Refresh** to renew the logs; click **Clear** to erase all the logs or **Save** to keep the logs in the router.

Figure 4-26 Security Log

4.6 Utilities

This tab includes **Parental control, Restart Router, Restore Factory Defaults, Save/Backup Current Settings, Restore Previous Saved Settings, Firmware Update** and **System Settings** functions.

Parental Control

The Router supports Parental Control function to protect you and your children/employees from objectionable content on the web.

Figure 4-27 Parental Control

Restart Router

Whenever you want to Restart or Reboot the Router if it works improperly, you can go to this page to click the **Restart Router** button to restart the router. Using this function will not erase any configurations that you have made.

Figure 4-28 Restart Router

Restore Factory Default

Click **Restore Defaults** button to restore all the configurations that you have made to the factory default. After using this function, all the settings you made will be erased. Therefore, we suggest you to backup your settings before you restore all of the defaults.

Figure 4-29 Restore Factory Defaults

Save/Backup Settings

Before you make any change about settings, we suggest you to backup your current configurations. Saving your configurations can help you to restore the previous settings when your settings are lost or changed. Click **Save** button to save the configurations.

Figure 4-30 Save/Backup Current Settings

Restore Previous Settings

This page allows you to restore a previously saved configuration. Click **Browse** button to load the file, then click **Restore** button to activity this function.

Figure 4-31 Restore Previous Saved Settings

Firmware Update

If you want to update your firmware version, please click the **Check Firmware** button to search for new firmware version. Then, click **Browse** to load the firmware version that you have downloaded and saved in your hardware. Click **Update** button to activity firmware update function.

Figure 4-32 Firmware Update

System Settings

This page includes some management settings:

▶ *Administrator Password*

There is **NO** any password entered when the Router is shipped. You can add a password for more security. The **Login Timeout** allows you to set the period of time that you can be logged into the Router's advanced setup interface.

Figure 4-33 Administrator Password

▶ *Time and Time Zone*

The router is connected to a Simple Network Time Protocol (SNTP) server for keeping time so that it can synchronize the system cock to the global Internet. Select the time zone that you reside in from the **Time Zone** drop-down list. If your residence zone observes Daylight Saving, please also select the **"Automatically Adjust Daylight Saving"** checkbox.

Figure 4-34 Time and Time Zone

▶ ***Remote Management (Advanced Feature)***

This function allows you to make changes to your Router's settings from anywhere on the Internet.

Note

Before you use this function, please make sure you have set the administrator password.

Remote management includes two methods:

Any IP address can remotely mange the router checkbox: Select this item will allow you to access to the router from anywhere on the Internet.

Only this IP address can remotely manage the router fields: Type in the IP address that you want to use to remotely manage the router.

Figure 4-35 Remote Management

▶ ***NAT Enabling (Advanced Feature)***

If you have a single IP address and you turn NAT off, the computers on your network will not be able to access the Internet. Other problems may also occur. Turning off NAT will disable your firewall functions.

Note

Before you use this function, please make sure you have set the administrator password.

Figure 4-36 NAT Enabling

▶ ***UPNP (Advanced Feature)***

If you want to use any applications that are UPnP compliant, and wish to take advantage of the UPnP features, please enable the UPnP function to automatically configure the router.

Figure 4-37 UPNP

▶ ***Auto Update Firmware Enabling (Advanced Feature)***

Enable this function will allow you to automatically check the availability of firmware updates for your router.

Figure 4-38 Auto Update Firmware Enabling

5 Troubleshooting

I cannot access the Web-based Configuration Utility from the Ethernet computer used to configure the router.

- Check that the LAN LED is on. If the LED is not on, check the cable for the LAN connection is firmly connected.
- Check whether the computer resides on the same subnet with the router's LAN IP address.
- If the computer act as a DHCP client, check whether the computer has been assigned an IP address from the DHCP server. If not, you will need to renew the IP address.
- Use the ping command to ping the router's LAN IP address to verify the connection.
- Make sure your browser is not configured to use a proxy server.
- Check that the IP address you entered is correct. If the router's LAN IP address has been changed, you should enter the reassigned IP address instead.

I can browse the router's Web-based Configuration Utility but cannot access the Internet.

- Check the WAN LED is ON. If not, check the physical connection between the router and the DSL/Cable modem is firmly connected. Also ensure the DSL/Cable modem is working properly.
- If WAN LED is ON, open the **System Overview** page of the Web configuration utility and check the status group to see if the router's WAN port has successfully obtained an IP address.
- Make sure you are use the correction method (DHCP client, PPPoE client or Manual Config) as required by the ISP. Also ensure you have entered correct settings provided by the ISP.

- For cable users, if you ISP required a fixed Ethernet card MAC address, make sure you have cloned the network adapter's MAC address to the WAN port of the router. (See the **MAC Address** field in **WAN** page.)

My wireless client cannot communicate with another Ethernet computer.

- Ensure the wireless adapter functions properly. You may open the **Device Manager** in Windows to see if the adapter is proper installed.
- Make sure the wireless client uses the same SSID and security settings (if enabled) as the Wireless Broadband Router.
- Ensure that the wireless adapter's TCP/IP settings are correct as required by your network administrator.
- If you are using a 802.11b wireless adapter, check that the **54g™ Mode** item, in **Wireless LAN (2.4G)** page, is not configured to use **54g Performace**.
- Use the ping command to verify the wireless client's communication with the router's LAN port and with the remote computer. If the wireless client can successfully ping the router's LAN port but fails to ping the opposite computer, then verify the TCP/IP settings of the opposite computer.

6 Specification

6.1 Hardware

- Broadcom BCM4712 CPU
- 8MB SDRAM
- 2MB Flash Memory
- 802.11g: Broadcom (BCM2050)
- Two external antennas
- Modulation Techniques: DBPSK, DQPSK, CCK, 16QAM, 64QAM
- Modulation Technology: OFDM, DSSS
- Wireless Data Rate:

  802.11b: 11, 5.5, 2, 1Mbps

  802.11g: 54, 48, 36, 24, 18, 12, 9, 6Mbps
- RF Operating Frequencies: 2.4-2.4835GHz
- RF Operating Channels:

  802.11b: 11 for North America, 13 for Europe (ETSI), 14 for Japan

  802.11g: 11 for North America, 13 for Europe (ETSI), 13 for Japan
- RF Output Power: 13.5+-2dBm
- RF Receiver sensitivity (PET<10%): -80dBm @ 6Mbps

Interface

- One 10/100 Base-TX RJ-45 WAN port for Broadband connection (Cable/DSL or direct Ethernet) and support HP Auto-MDIX
- Four RJ-45 LAN ports for 10/100Base-TX Ethernet Switch support HP Auto-MDIX

Physical

- Front Panel: 8 LEDs (Power x 1, CONNECTx1, LAN x 4, WAN x 1, Wireless x 1)
- Back Panel: Reset Button, Power Jack, RJ-45 LAN Port x 4, RJ-45 WAN Port x 1
- Dimensions: TBD
- Case types: Support Lay down only

Power Adapter and Environmental Requirement

- DC Adaptor: Input AC100~120VAC Output 5V DC, 2A
- Temperature: 0 to 40°C (operation), -20 to 70 °C (storage)
- Relative Humidity: 5% to 90% (non-condensing)

Electromagnetic Compliance

- FCC Part 15 Class B
- CE