



# **Internet Broadband Router**

**XRT-401A**

User's Guide

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# Chapter 1

## Introduction

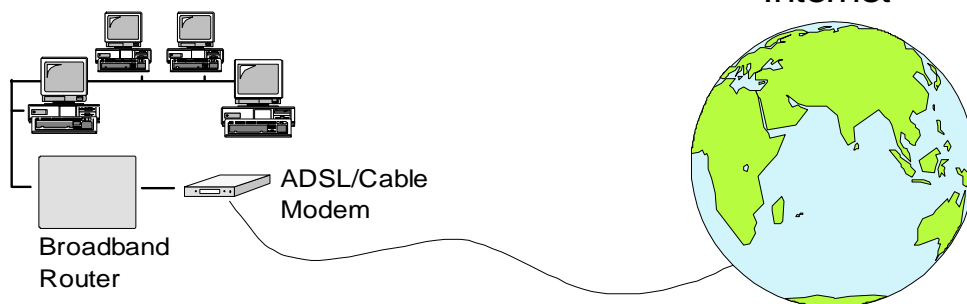
# 1

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

Congratulations on the purchase of your new Broadband Router. The Broadband Router is a multi-function device providing the following services:

- **Shared Broadband Internet Access** for all LAN users.
- **4-Port Switching Hub** for 10BaseT or 100BaseT connections.

### 10/100BaseT LAN



**Figure 1: Broadband Router**

## Broadband Router Features

The Broadband 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 Broadband 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 Broadband Router has a 10BaseT Ethernet port for connecting a DSL or Cable Modem. All popular DSL and Cable Modems are supported.
- **PPPoE and PPTP Support.** The Internet (WAN port) connection supports PPPoE (PPP over Ethernet) and PPTP (Peer-to-Peer Tunneling Protocol), as well as "Direct Connection" type services.
- **Fixed or Dynamic IP Address.** On the Internet (WAN port) connection, the Broadband Router supports both Dynamic IP Address (IP Address is allocated on connection) and Fixed IP Address.

## Advanced Internet Functions

- **Conferencing & Telephony Applications.** Internet Telephony and Conferencing applications, which are often difficult to use when behind a Firewall, are supported.
- **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.
- **DMZ.** 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.

## LAN Features

- **4-Port Switching Hub.** The Broadband 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 Broadband Router can act as a **DHCP Server** for devices on your local LAN and WLAN.
- **Multi Segment LAN Support.** LANs containing one or more segments are supported, via the Broadband Router's RIP (Routing Information Protocol) support and built-in static routing table.

## Configuration & Management

- **Easy Setup.** Use your WEB browser from anywhere on the LAN for configuration.
- **Remote Management.** The Broadband 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.
- **UPnP Support.** UPnP (Universal Plug and Play) allows automatic discovery and configuration of the Broadband 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.
- ***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 Broadband Router.
- ***Stateful Inspection Firewall.*** All incoming data packets are monitored and all incoming server requests are filtered, thus protecting your network from malicious attacks from external sources.
- ***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 Broadband Router incorporates protection against DoS attacks.

## Package Contents

The following items should be included:

- The Broadband 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

### Top - Mounted LEDs

There are 2 LEDs on the top of the unit. The "DATA STATUS LAN" LED has 2 colors - Green and Orange. Operation of these LEDs is as follows:

#### DATA STATUS LAN (Green/Orange)

**On (Green)** - Normal start up/power on sequence, or idle.

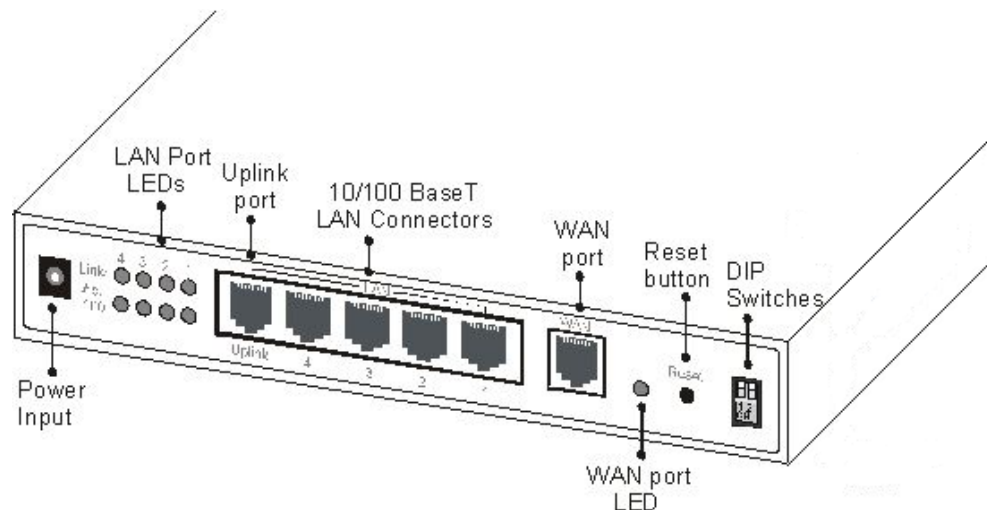
The *Data/Status* LED will flash under the following conditions:

- **Flashing (Green)** - The *Data/Status* LED will flash when data is transmitted or received through the *LAN* ports.
- **Flashing (Orange, Green, Orange,...)** - Hardware error. Contact your dealer for technical support.

#### DATA WAN (Green)

**Flashing** - The *Data* LED will flash when data is transmitted or received through the *WAN* port.

### Rear Panel



**Figure 2: Rear Panel**

#### Power port (12V)

Connect the supplied power adapter here.

#### LAN Port LEDs - Link/Act

**On** - The Router is successfully connected to a device through the corresponding port (1, 2, 3, or 4).

**Flashing** - Transmitting or receiving data over that port.

#### LAN Port LEDs - 100

**On** - LAN port connection is using a 100BaseT connection.

**Off** - If the port is being used, OFF indicates a 10BaseT connection.

#### Uplink Port





Use the "Uplink" port **ONLY** to connect to a normal port on another hub.

**If Port 4 is used, the "Uplink" port can NOT be used.**



<b>10/100BaseT LAN connectors</b>	<p>Use standard LAN cables (RJ45 connectors) to connect this port to your PCs. Both 10BaseT and 100BaseT connections can be used simultaneously.</p> <p><b>If the "Uplink" port is used, port 4 can NOT be used.</b></p>
<b>WAN port (10BaseT)</b>	<p>Connect the DSL or Cable Modem here. If your modem came with a cable, use the supplied cable. Otherwise, use a standard LAN cable.</p>
<b>WAN Port LED</b>	<p>On - While connection to DSL/Cable modem is built</p> <p>OFF - No connection to DSL/Cable modem.</p>
<b>Reset Button</b>	<p>This button has two (2) functions:</p> <ul style="list-style-type: none"><li>• When pressed and released, the Broadband Router will reboot (restart).</li><li>• This button can also be used to clear ALL data and restore ALL settings to the factory default values.</li></ul> <p><b>To restore the factory default values:</b></p> <ol style="list-style-type: none"><li>1. Power Off.</li><li>2. Hold the Reset Button down while you Power On.</li><li>3. Continue holding the Reset Button until the Status (Red) LED blinks TWICE.</li><li>4. Release the Reset Button. The factory default configuration has now been restored, and the Broadband Router is ready for use.</li></ol>
<b>DIP switches</b>	<p>Refer to the following table.</p>

## DIP Switches

DIP Switch Setting	Description
 1=off 2=off	Normal Operation.
 1=off 2=on	DHCP Server function disabled.
 1=on 2=off	Used to restore Default IP Address and clear Password (See below).
 1=on 2=on	Normal Operation.

### Restore Default IP Address and Clear Password

If the Broadband Router's IP Address or password is lost, the following procedure can be used to recover from this situation.

1. Turn the power to the Broadband Router OFF.
2. Set DIP switch 1 ON.
3. Turn the power to the Broadband Router ON.
4. Operate DIP switch 1 in the following sequence (you have 15 seconds to complete the sequence):
  - OFF
  - ON
  - OFF
5. The Broadband Router will now reset, and the Red Status LED flash. The following changes will have been made. (Other configuration data is unchanged.)
  - *IP Address* set to its default value of 192.168.0.1
  - *Network Mask* set to 255.255.255.0
  - *DHCP Server* is enabled, and will allocate IP Addresses in the range 192.168.0.2 to 192.168.0.51.
  - The password cleared (no password).
6. You can now connect to the Broadband Router and make any configuration changes required.

## Chapter 2

# Installation

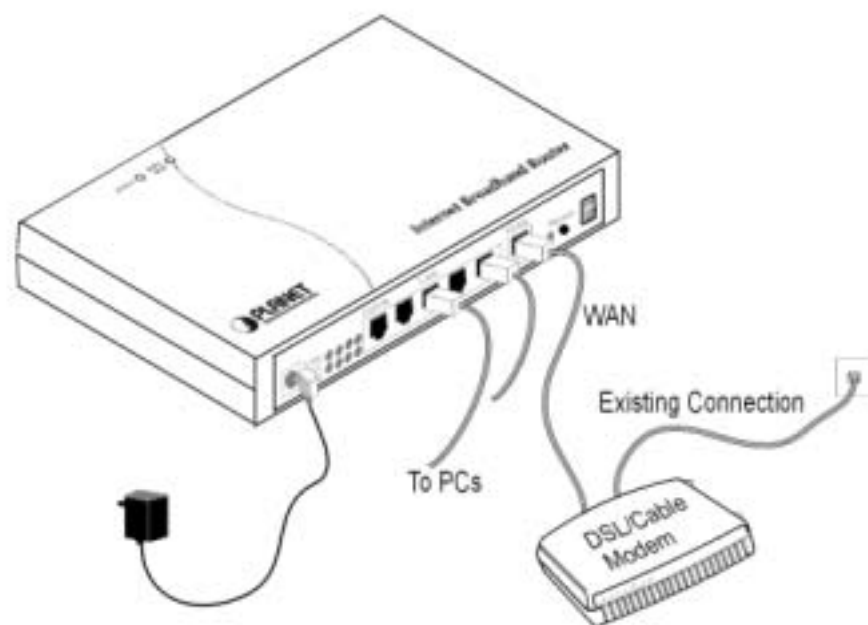
# 2

*This Chapter covers the physical installation of the Broadband Router.*

### Requirements

- DSL or Cable modem, and an Internet Access account with an ISP, for shared Internet access.
- Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors
- TCP/IP network protocol must be installed on all PCs.

### Procedure



**Figure 3: Installation Diagram**

#### 1. Choose an Installation Site

Select a suitable place on the network to install the Broadband Router.  
Ensure the Broadband 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 Broadband Router. Both 10BaseT and 100BaseT connections can be used simultaneously.

- If required, use a standard LAN cable to connect the "Uplink" port to a standard port on another hub.

**Note:** If the "Uplink" port is used, port 4 can NOT be used.

### 3. Connect WAN Cable

Connect the DSL or Cable modem to the WAN port on the Broadband 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 Broadband Router and power up.  
Use only the power adapter provided. Using a different one may cause hardware damage

### 5. Check the LEDs

- The *Data/Status LAN* LED should flash in Orange, then turn Off. If it stays Orange, 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.

For more information, refer to Top - Mounted LEDs in Chapter 1.

# Chapter 3

## Setup



*This Chapter provides details of the Setup process.*

### Overview

This chapter describes the setup procedure for:

- Internet Access
- LAN configuration
- 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 Broadband Router you wish to use. Use the table below to locate detailed instructions for the required functions.

To Do this:	Refer to:
Configure PCs on your LAN.	Chapter 4: PC Configuration
Check Broadband Router operation and Status.	Chapter 5: Operation and Status
Use any of the following Internet features: <ul style="list-style-type: none"><li>• Special Applications</li><li>• DMZ</li><li>• Virtual Servers</li><li>• Dynamic DNS</li><li>• Remote Management</li></ul>	Chapter 6: Advanced Features
Use any of the following Advanced Configuration settings: <ul style="list-style-type: none"><li>• PC Database</li><li>• Options (Backup DNS, TFTP, UPnP, Firewall)</li><li>• Routing (RIP and static Routing)</li></ul>	Chapter 7 Advanced Configuration



**Note!**

**Where use of a certain feature requires that PCs or other LAN devices be configured, this is also explained in the relevant chapter.**

## Configuration Program

The Broadband 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 Broadband Router, please ensure that:

- Your PC can establish a physical connection to the Broadband Router. The PC and the Broadband Router must be directly connected (using the Hub ports on the Broadband Router) or on the same LAN segment.
- The Broadband Router must be installed and powered ON.
- If the Broadband Router's default IP Address (192.168.0.1) is already used by another device, the other device must be turned OFF until the Broadband Router is allocated a new IP Address during configuration.

## Connecting to the Broadband Router

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

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

HTTP://192.168.0.1

### If you can't connect

If XRT-401A does not respond, check the following:

- The Broadband 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 192.168.0.1`  
If no response is received, either the connection is not working, or your PC's IP address is not compatible with the Broadband Router's IP Address. (See next item.)
- If your PC is using a fixed IP Address, its IP Address must be within the range 192.168.0.2 to 192.168.0.254 to be compatible with the Broadband Router's default IP Address of 192.168.0.1. 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 Broadband Router are on the same network segment. (If you don't have a router, this must be the case.)

## Setup Wizard

The first time you connect to the Broadband Router, the Setup Wizard will run automatically. (The Setup Wizard will also run if the Broadband Router's default settings are restored.)

1. Ensure the Cable/DSL modem is connected and powered ON.  
Also, you need the data provided by your ISP.
2. Start the Wizard, and step through it until finished.  
You will need to know the type of Internet connection service used by your ISP. The common types are explained in the tables below.

### Cable Modems

Type	Details	ISP Data required
Dynamic IP Address	Your IP Address is allocated automatically, while connecting to your ISP.	None.
Static (Fixed) IP Address	Your ISP allocates a permanent IP Address to you.	IP Address allocated to you.
@Home type service.	The IP Address is allocated automatically, but a "Host Name" and "Domain Name" are allocated to you. Sometimes, the ISP will record the MAC (Hardware) address of your PC.	Host Name and Domain Name; sometimes the MAC (hardware) address.

### DSL Modems

Type	Details	ISP Data required
Dynamic IP Address	Your IP Address is allocated automatically, while connecting 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 allocated automatically.	User name and password.
PPTP	Mainly used in Europe.  You connect to the ISP only when required. The IP address is usually allocated automatically, but may be Static (Fixed).	<ul style="list-style-type: none"> <li>• PPTP Server IP Address.</li> <li>• User name and password.</li> <li>• IP Address allocated to you, if Static (Fixed).</li> </ul>

### Other Modems (e.g. Broadband Wireless)

Type	Details	ISP Data required
Dynamic IP Address	Your IP Address is allocated automatically, while connecting to your ISP.	None.
Static (Fixed) IP Address	Your ISP allocates a permanent IP Address to you.	IP Address allocated to you.

3. On the final screen of the Wizard, run the test and check that an Internet connection can be established.
  - If the connection fails, check your data, the Cable/DSL modem, and all connections.
  - If your ISP has recorded your MAC (hardware) address, exit the Wizard and select *MAC Address* on the *Advanced* menu. Change the MAC address to match the value expected by your ISP.

## Home Screen

After finishing the Setup Wizard, you will see the *Home* screen. When you connect in future, you will see this screen when you connect. An example screen is shown below.

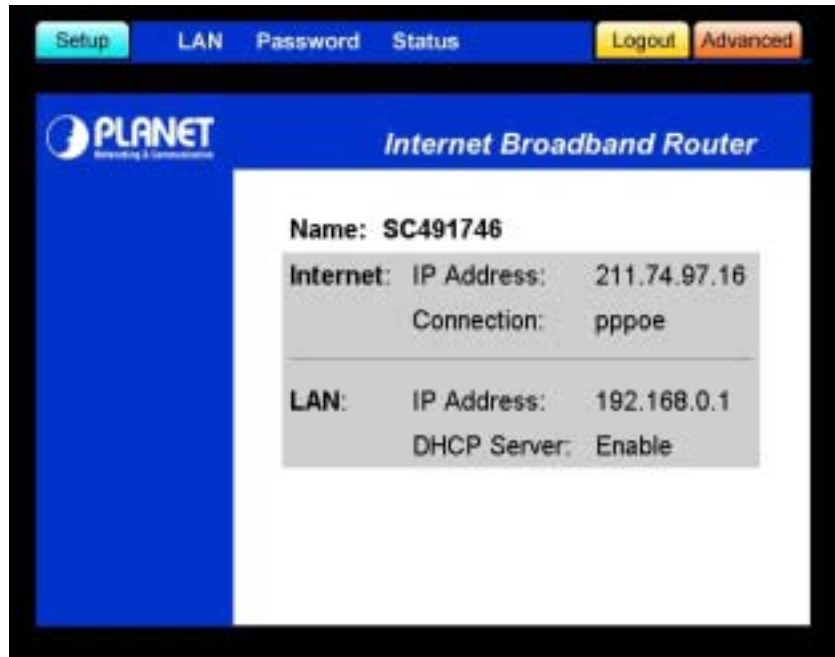


Figure 4: Home Screen

## Navigation & Data Input

- Use the menu bar on the top 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.



On each screen, clicking the "Help" button will display help for that screen.

From any help screen, you can access the list of all help files (help index).



## LAN Screen

Use the *LAN* link on the main menu to reach the *LAN* screen. An example screen is shown below.

Figure 5: LAN Screen

### Data - LAN Screen

TCP/IP	
<b>IP Address</b>	IP address for the Broadband Router, as seen from the local LAN. Use the default value unless the address is already in use or your LAN is using a different IP address range. In the latter case, enter an unused IP Address from within the range used by your LAN.
<b>Subnet Mask</b>	The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Subnet Mask for the LAN segment to which the Broadband Router is attached (the same value as the PCs on that LAN segment).
<b>DHCP Server</b>	<ul style="list-style-type: none"> <li>If Enabled, the Broadband Router will allocate IP Addresses to PCs (DHCP clients) on your LAN when they start up. The default (and recommended) value is Enabled.</li> <li>If you are already using a DHCP Server, this setting must be Disabled, and the existing DHCP server must be re-configured to treat the Broadband Router as the Gateway. See the following section for further details.</li> <li>The <b>Start IP Address</b> and <b>Finish IP Address</b> fields set the values used by the DHCP server when allocating IP Addresses to DHCP clients. This range also determines the number of DHCP clients supported.</li> </ul> <p>See the following section for further details on using DHCP.</p>
Buttons	
<b>Save</b>	Save the data on screen.
<b>Cancel</b>	The "Cancel" button will discard any data you have entered and reload the file from the Broadband Router.

## DHCP

### What DHCP Does

A DHCP (Dynamic Host Configuration Protocol) **server** allocates a valid IP address to a DHCP **client** (PC or device) upon request.

- The client request is made when the client device starts up (boots).
- The DHCP Server provides the *Gateway* and *DNS* addresses to the client, as well as allocating an IP Address.
- The Broadband Router can act as a **DHCP server**.
- Windows 95/98/ME and other non-Server versions of Windows will act as a DHCP **client**. This is the default Windows setting for the TCP/IP network protocol. However, Windows uses the term *Obtain an IP Address automatically* instead of "DHCP Client".
- You must NOT have two (2) or more DHCP Servers on the same LAN segment. (If your LAN does not have other Routers, this means there must only be one (1) DHCP Server on your LAN.)

### Using the Broadband Router's DHCP Server

This is the default setting. The DHCP Server settings are on the **LAN** screen. On this screen, you can:

- Enable or Disable the Broadband Router's *DHCP Server* function.
- Set the range of IP Addresses allocated to PCs by the DHCP Server function.



**You can assign Fixed IP Addresses to some devices while using DHCP, provided that the Fixed IP Addresses are NOT within the range used by the DHCP Server.**

### Using another DHCP Server

You can only use one (1) DHCP Server per LAN segment. If you wish to use another DHCP Server, rather than the Broadband Router's, the following procedure is required.

1. Disable the DHCP Server feature in the Broadband Router. This setting is on the LAN screen.
2. Configure the DHCP Server to provide the Broadband Router's IP Address as the *Default Gateway*.

### To Configure your PCs to use DHCP

This is the default setting for TCP/IP under Windows 95/98/ME. See *Chapter 4 - Client Configuration* for the procedure to check these settings.

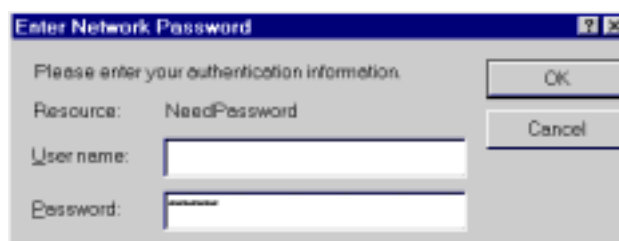
## Password Screen

The password screen allows you to assign a password to the Broadband Router.



**Figure 6: Password Screen**

Once you have assigned a password to the Broadband Router (on the *Password* screen above) you will be prompted for the password when you connect, as shown below. (If no password has been set, this dialog will not appear.)



**Figure 7: Password Dialog**

- Leave the "User Name" blank.
- Enter the password for the Broadband Router, as set on the *Password* screen above.

# Chapter 4

## PC Configuration



*This Chapter details the PC Configuration required on the local ("Internal") LAN.*

### Overview

For each PC, the following may to be configured:

- TCP/IP network settings
- Internet Access configuration

### Windows Clients

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

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

The Broadband 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.

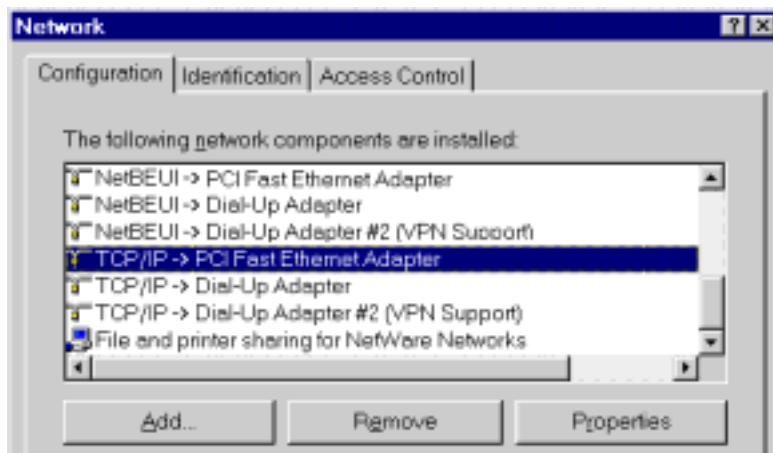
### TCP/IP Settings

**If using the default Broadband Router settings, and the default Windows 95/98/ME/2000 TCP/IP settings, no changes need to be made.**

- By default, the Broadband 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 you wish to check your TCP/IP settings, the procedure is described in the following sections.

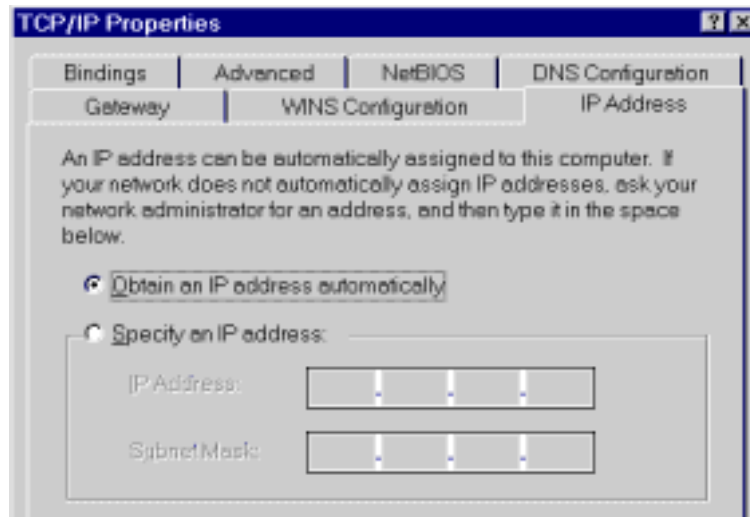
## Checking TCP/IP Settings - Windows 9x/ME:

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



**Figure 8: Network Configuration**

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.



**Figure 9: IP Address (Win 95)**

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

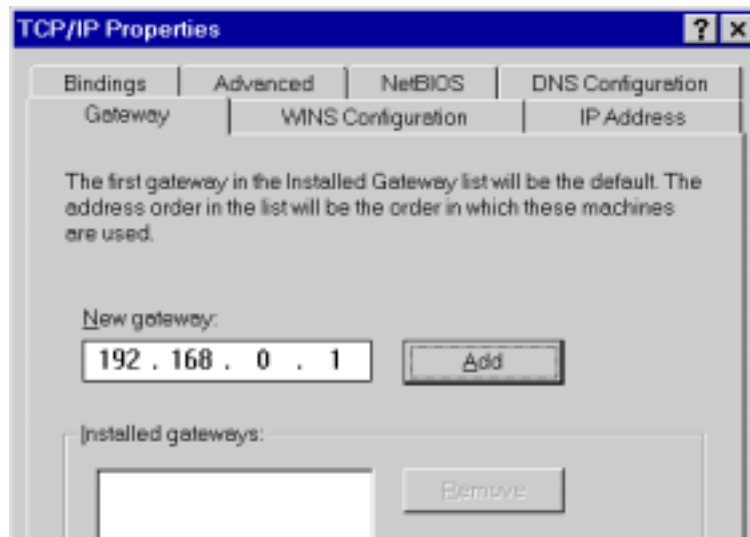
### Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows settings.

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

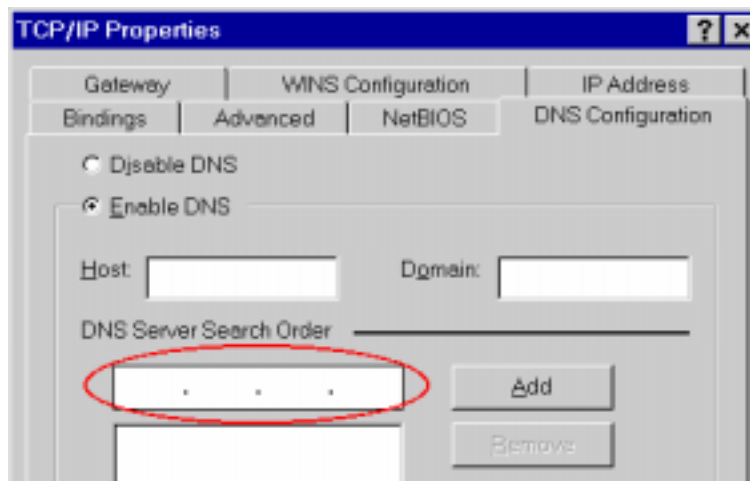
### Using "Specify an IP Address"

- If your PC is already configured, do NOT change the settings on the IP Address tab shown in Figure 9 above.
- On the *Gateway* tab, enter the Broadband 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 Broadband Router.



**Figure 10: Gateway Tab (Win 95/98)**

- 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*.



**Figure 11: DNS Tab (Win 95/98)**

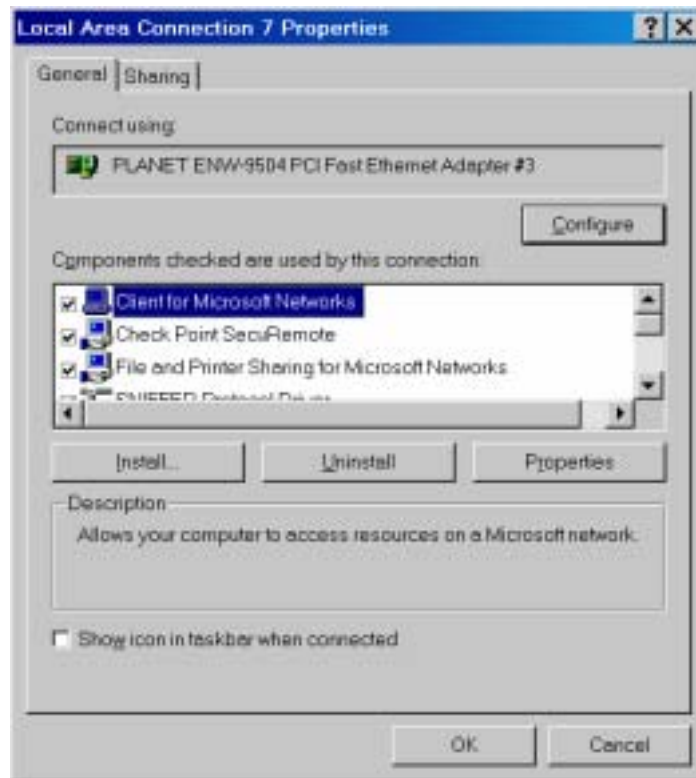


**Note!**

If your LAN has a Router, the LAN Administrator must re-configure the Router itself. Refer to *Chapter 7 - Routing* for details.

### 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:



**Figure 12: Network Configuration (Win 2000)**

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.



**Figure 13: TCP/IP Properties (Win 2000)**

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 settings.

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

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

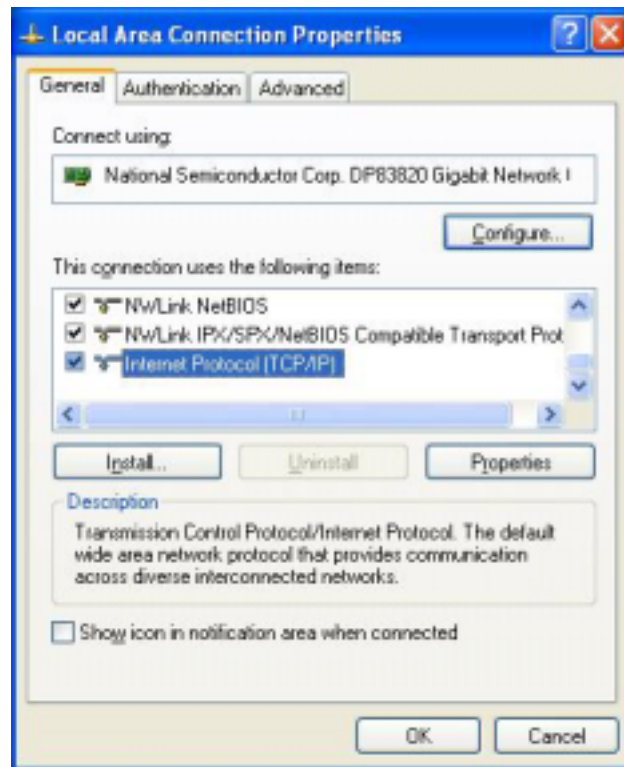
If your PC is already configured, check with your network administrator before making the following changes.

- Enter the Broadband 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 Broadband 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*.



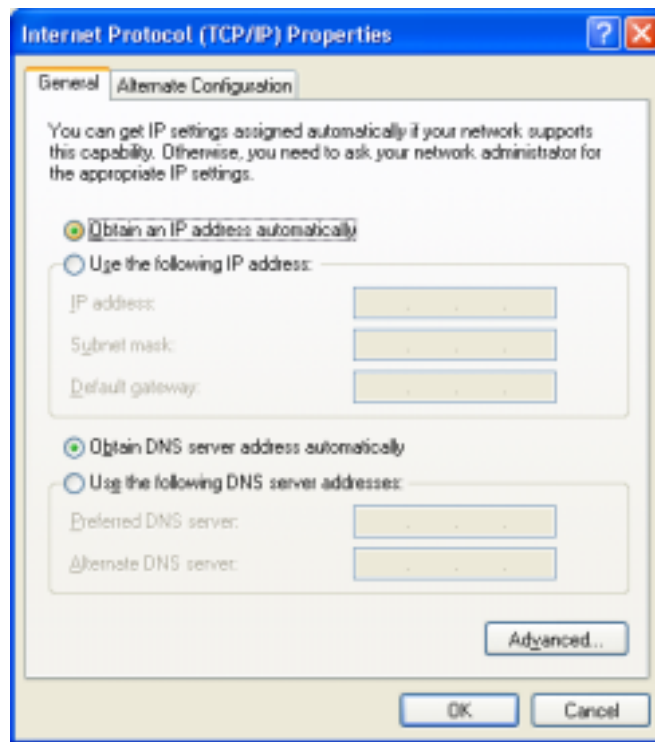
### Checking TCP/IP Settings - Windows XP:

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



**Figure 14: Network Configuration (Windows XP)**

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.



**Figure 15: TCP/IP Properties (Windows XP)**

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 settings.

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

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

- If your PC is already configured, do NOT change the settings on the screen shown in Figure 15 above, unless advised to do so by your network administrator.
- You can enter the Broadband 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 Broadband 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 Broadband 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/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 Broadband 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 "Broadband 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 "Broadband Router" location.

## Macintosh Clients

From your Macintosh, you can access the Internet via the Broadband 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 only change required is to set the *Router Address* field to the Broadband Router's IP Address.

## Linux Clients

To access the Internet via the Broadband Router, it is only necessary to set the Broadband 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 Broadband 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.

# Operation and Status

*This Chapter details the operation of the Broadband Router and the status screens.*

## Operation

Once both the Broadband Router and the PCs are configured, operation is automatic.

However, there are some situations where additional Internet configuration may be required:

- If using Internet-based **Conferencing & Telephony** applications, it may be necessary to specify which PC receives an incoming connection.
- Applications which use non-standard connections or port numbers may be blocked by the Broadband Router's built-in firewall. You can define such applications as **Special Applications** to allow them to function normally.
- Some non-standard applications may require use of the **DMZ** feature.

For all of these situations, refer to *Chapter 6 - Advanced Features* for further details.

## Status Screen

Use the **Status** link on the main menu to view this screen.

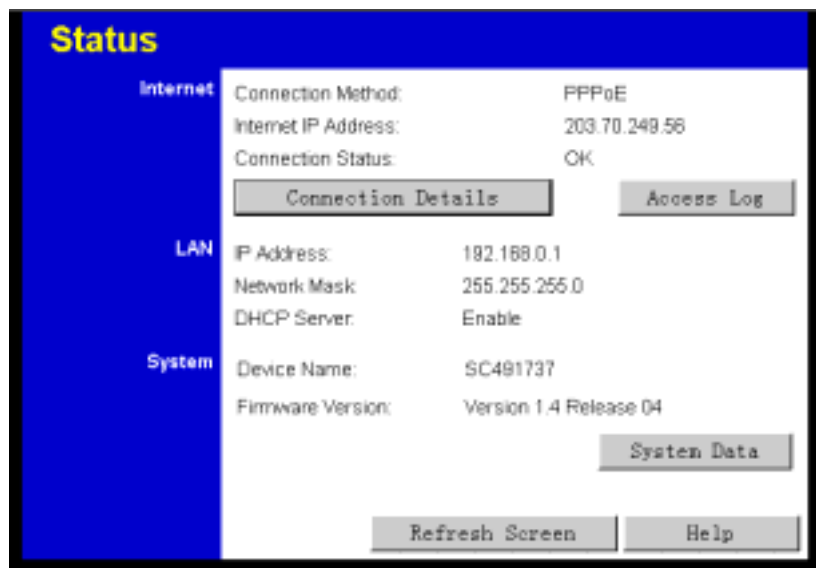


Figure 16: Status Screen

**Data - Status Screen**

<b>Internet</b>	
<b>Internet IP Address</b>	This IP Address is allocated by the ISP (Internet Service Provider).
<b>Connection Status</b>	<p>Current connection status:</p> <ul style="list-style-type: none"> <li>• OK</li> <li>• No connection</li> <li>• Error</li> </ul> <p>If there is an error, you can click the "Connection Details" button to find out more information.</p>
<b>Connection Details Button</b>	Click this button to open a sub-window and view a detailed description of the current connection. Depending on the type of connection, a "log" may also be available.
<b>Access Log Button</b>	<p>Click this button to open a sub-window and view details of outgoing connections to the Internet. The log contains the following data:</p> <ul style="list-style-type: none"> <li>• <b>Source IP Address</b> - The IP Address of the local PC requesting the Internet connection.</li> <li>• <b>Destination</b> - The Internet address which was requested. If the <i>URL Filter</i> is enabled, this address will be shown as a URL. Otherwise, the IP address will be displayed.</li> <li>• <b>Blocked</b> - If the request was blocked by the <i>URL Filter</i> function, this will display "Yes". Otherwise, it will be blank.</li> </ul>
<b>LAN</b>	
<b>IP Address</b>	The IP Address of the Broadband Router.
<b>Network Mask</b>	The Network Mask (Subnet Mask) for the IP Address above.
<b>DHCP Server</b>	<p>This shows the status of the DHCP Server function - either "Enabled" or "Disabled".</p> <p>For additional information about the PCs on your LAN, and the IP addresses allocated to them, use the <i>PC Database</i> option on the <i>Advanced</i> menu.</p>
<b>System</b>	
<b>Device Name</b>	This displays the current name of the Broadband Router.
<b>Firmware Version</b>	The current version of the firmware installed in the Broadband Router.
<b>System Data Button</b>	Clicking this button will open a Window which lists all system details and settings.
<b>Buttons</b>	
<b>Connection Details</b>	View the details of the current Internet connection. The sub-screen displayed will depend on the connection method used. See the following sections for details of each sub-screen.
<b>Access Log</b>	View details of outgoing connections to the internet.
<b>System Data</b>	Display all system information in a sub-window.
<b>Refresh Screen</b>	Update the data displayed on screen.

## Connection Status - PPPoE

If using PPPoE (PPP over Ethernet), a screen like the following example will be displayed when the "Connection Details" button is clicked.

**Connection Status - PPPoE**

**Connection**

Physical Address: 00-c0-02-0f-fa-15  
 IP Address: 0.0.0.0  
 Network Mask:  
 PPPoE Link Status: OFF

**Connection Log**

068:Reset physical connection  
 067:stop PPP  
 066:try to hang up  
 065>Error: Connection to Server lost.  
 064>Error: PPP connection failed.  
 063:Send 0:c0:2:f:fa:15 ff:ff:ff:ff:ff:ff

Clear Log

Connect and Disconnect buttons should only be needed if the setting  
 "Connect automatically, as required" is Disabled.

Connect Disconnect Refresh

Help Close

Figure 17: PPPoE Status Screen

### Data - PPPoE Status Screen

Connection	
Physical Address	The hardware address of this device, as seen by remote devices on the Internet. (This is different to the hardware address seen by devices on the local LAN.)
IP Address	The IP Address of this device, as seen by Internet users. This address is allocated by your ISP (Internet Service Provider).
Network Mask	The Network Mask associated with the IP Address above.
PPPoE Link Status	<p>This indicates whether or not the connection is currently established.</p> <ul style="list-style-type: none"> <li>If the connection does not exist, the "Connect" button can be used to establish a connection.</li> <li>If the connection currently exists, the "Disconnect" button can be used to break the connection.</li> </ul>
Connection Log	
Connection Log	<ul style="list-style-type: none"> <li>The Connection Log shows status messages relating to the</li> </ul>

	<p>existing connection.</p> <ul style="list-style-type: none"> <li>• The most common messages are listed in the table below.</li> <li>• The "Clear Log" button will restart the Log, while the Refresh button will update the messages shown on screen.</li> </ul>
<b>Buttons</b>	
<b>Connect</b>	If not connected, establish a connection to your ISP.
<b>Disconnect</b>	If connected to your ISP, hang up the connection.
<b>Clear Log</b>	Delete all data currently in the Log. This will make it easier to read new messages.
<b>Refresh</b>	Update the data on screen.

## Connection Log Messages

Message	Description
Connect on Demand	Connection attempt has been triggered by the "Connect automatically, as required" setting.
Manual connection	Connection attempt started by the "Connect" button.
Reset physical connection	Preparing line for connection attempt.
Connecting to remote server	Attempting to connect to the ISP's server.
Remote Server located	ISP's Server has responded to connection attempt.
Start PPP	Attempting to login to ISP's Server and establish a PPP connection.
PPP up successfully	Able to login to ISP's Server and establish a PPP connection.
Idle time-out reached	The connection has been idle for the time period specified in the "Idle Time-out" field. The connection will now be terminated.
Disconnecting	The current connection is being terminated, due to either the "Idle Time-out" above, or "Disconnect" button being clicked.
Error: Remote Server not found	ISP's Server did not respond. This could be a Server problem, or a problem with the link to the Server.
Error: PPP Connection failed	Unable to establish a PPP connection with the ISP's Server. This could be a login problem (name or password) or a Server problem.
Error: Connection to Server lost	The existing connection has been lost. This could be caused by a power failure, a link failure, or Server failure.
Error: Invalid or unknown packet type	The data received from the ISP's Server could not be processed. This could be caused by data corruption (from a bad link), or the Server using a protocol which is not supported by this device.



## Connection Status - PPTP

If using PPTP (Peer-to-Peer Tunneling Protocol), a screen like the following example will be displayed when the "Connection Details" button is clicked.



Figure 18: PPTP Status Screen

### Data - PPTP Status Screen

Connection	
Physical Address	The hardware address of this device, as seen by remote devices on the Internet. (This is different to the hardware address seen by devices on the local LAN.)
IP Address	The IP Address of this device, as seen by Internet users. This address is allocated by your ISP (Internet Service Provider).
PPTP Status	<p>This indicates whether or not the connection is currently established.</p> <ul style="list-style-type: none"> <li>• If the connection does not exist, the "Connect" button can be used to establish a connection.</li> <li>• If the connection currently exists, the "Disconnect" button can be used to break the connection.</li> </ul>
Connection Log	
Connection Log	<ul style="list-style-type: none"> <li>• The Connection Log shows status messages relating to the existing connection.</li> <li>• The "Clear Log" button will restart the Log, while the Refresh button will update the messages shown on screen.</li> </ul>

<b>Buttons</b>	
<b>Connect</b>	If not connected, establish a connection to your ISP.
<b>Disconnect</b>	If connected to your ISP, hang up the connection.
<b>Clear Log</b>	Delete all data currently in the Log. This will make it easier to read new messages.
<b>Refresh</b>	Update the data on screen.

## Connection Details - Fixed/Dynamic IP Address

If your access method is neither PPPoE nor PPTP, a screen like the following example will be displayed when the "Connection Details" button is clicked.

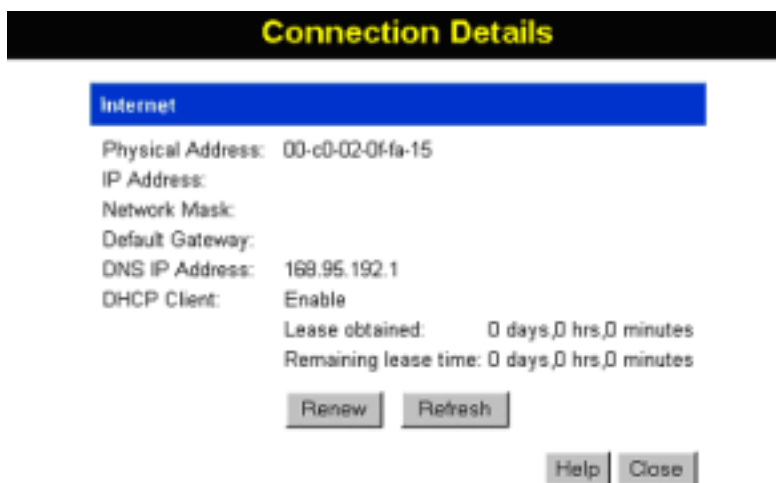


Figure 19: Connection Details Screen

### Data - Connection Details Screen

Internet	
<b>Physical Address</b>	The hardware address of this device, as seen by remote devices on the Internet. (This is different to the hardware address seen by devices on the local LAN.)
<b>IP Address</b>	The IP Address of this device, as seen by Internet users. This address is allocated by your ISP (Internet Service Provider).
<b>Network Mask</b>	The Network Mask associated with the IP Address above.
<b>Default Gateway</b>	The IP Address of the remote Gateway or Router associated with the IP Address above.
<b>DNS IP Address</b>	The IP Address of the Domain Name Server which is currently used.
<b>DHCP Client</b>	<p>This will show "Enabled" or "Disabled", depending on whether or not this device is functioning as a DHCP client.</p> <p>If "Enabled" and currently connected, the "Remaining lease time" field indicates when the IP Address allocated by the DHCP Server will expire. The lease is automatically renewed on expiry; use the "Renew" button if you wish to manually renew the lease immediately.</p>

Buttons	
<b>Release/Renew</b> <b>Button will display</b> <b>EITHER</b> <b>"Release"</b> <b>OR</b> <b>"Renew"</b>	<p>This button is only useful if the IP address shown above is allocated automatically on connection. (Dynamic IP address). Otherwise, it has no effect.</p> <ul style="list-style-type: none"><li>• If the ISP's DHCP Server has NOT allocated an IP Address for the Broadband Router, this button will say "Renew". Clicking the "Renew" button will attempt to re-establish the connection and obtain an IP Address from the ISP's DHCP Server.</li><li>• If an IP Address has been allocated to the Broadband Router (by the ISP's DHCP Server), this button will say "Release". Clicking the "Release" button will break the connection and release the IP Address.</li></ul>
<b>Refresh</b>	Update the data shown on screen.

## Chapter 6

# Advanced Features



*This Chapter explains when and how to use the Broadband Router's "Advanced" Features.*

### Overview

The following advanced features are provided.

- Access Control
- Special Applications
- DMZ
- Virtual Servers
- Dynamic DNS
- Remote Management

This chapter contains details of the configuration and use of each of these features.

### Advanced Menu Screen

This screen provides access to the advanced features. An example screen is shown below.

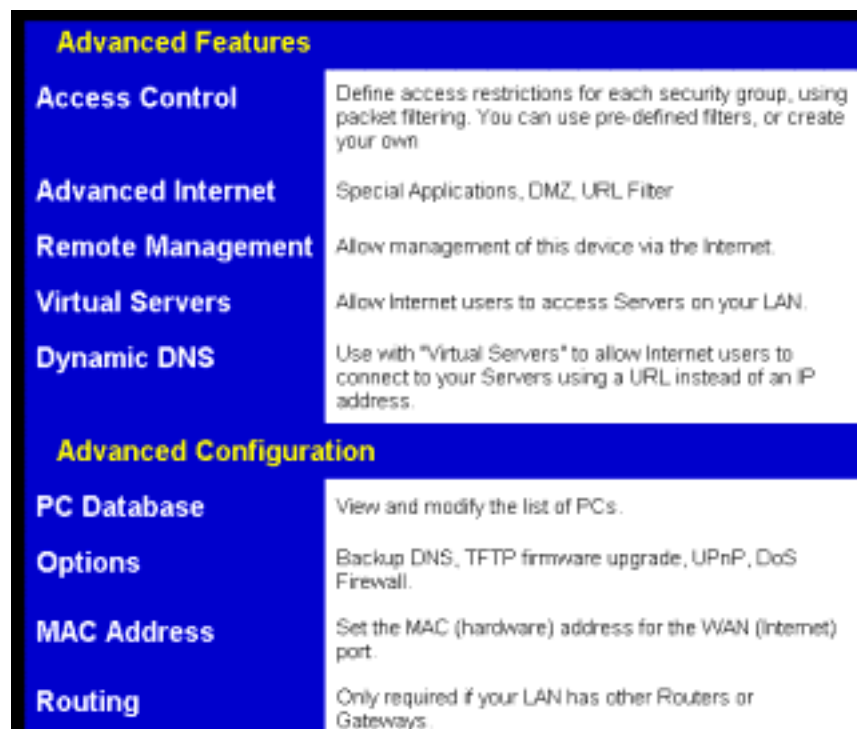


Figure 20: Advanced Menu

## Access Control

### Overview

The Access Control feature allows administrators to restrict Internet Access by individual PCs. The process uses "Packet Filtering" to block or discard data packets. By default, no packets are blocked or discarded.

The system works as follows:

- Access restrictions are imposed on "Groups" (of PCs), not on individual users.
- Groups are pre-named "Default", "Group 1", "Group 2", "Group 3", and "Group 4". These names can not be changed.
- All PCs are in the "Default" Group, unless explicitly moved to another group.
- Access restrictions may be imposed on any Group, including the "Default" group.

### Access Control Screen

The screen is reached by the *Access Control* link on the *Advanced* menu. An example screen is shown below.

The screenshot shows the "Access Control" web interface. On the left is a blue sidebar with three main sections: "Group", "Access Rights", and "Packet Filter Table".

- Group:** Includes a "Select Group" dropdown menu currently set to "Group 1" and a "Members" button.
- Access Rights:** Titled "Internet Access for this Group:", it contains three radio buttons:
  - ☒ No restrictions
  - ☐ Block all Access
  - ☐ Use Packet Filter Table below
- Packet Filter Table:** Titled "Check the items you wish to block (discard).", it contains two main sections:
  - Applications to Block:** A list of checkboxes for various protocols: Archie, DNS, E-Mail, FTP, Gopher, News, SNMP, Telnet, TFTP, and WWW.
  - TCP Packets to Discard:** Includes a text input field with the placeholder "Select items to block.", a "Define TCP Filters" button, and a sub-section for "UDP Packets to Discard" with another text input field and a "Define UDP Filters" button.

At the bottom right of the form are three buttons: "Save", "Cancel", and "Help".

Figure 21: Access Control Screen

#### To Assign restrictions to a Group

6. Select the desired Group. The screen will update with the data for the selected Group.
7. Select the appropriate radio button for "Access Rights". See below for further details.
8. If the selected Radio button is "Use Packet Filter Table Below":
  - Check the items you wish to block (discard) in the "Applications to Block" list.
  - Enter the items you wish to block in the "TCP Packets to Discard" and "UDP Packets to Discard" fields.

- Check the desired items in the "Packet Filter Table". Checked items will be blocked for this Group.
- If you have defined some filters, the "TCP Packets to Discard" or "UDP Packets to Discard" will not be empty, and you can select the desired filters. Connections using the selected filters will be blocked.

### To Assign PCs (users) to a Group

Click the "Members" button to view the "Members" screen. See the following section for details.

### To Create your own Filters

Click the button "Define TCP Filters" or "Define UDP Filters" to view the required filter screen. See the following section for details.

### Data - Access Control Screen

Group	
Select Group	Select the desired group. The screen will update will data for the selected group
Access Rights	
No restrictions	No packets are blocked. Use this to create an "Unlimited Access" group, or to temporarily remove restrictions.
Block all Access	Group members cannot access the Internet at all. Use this to create the most restrictive group.
Use Packet Filter Table below	Use this to define intermediate levels of access. Using the Packet Filter table gives you fine control over Internet access.
Packet Filter Table	
Applications to Block	Any items checked will be blocked. Users will not be able to use the application.
TCP Packets to Discard	<ul style="list-style-type: none"> <li>• This lists any TCP filters you have defined. If no filters have been defined, this list will be empty.</li> <li>• Selected items can NOT be accessed by members of this group</li> <li>• Multiple items can be selected (or deselected) by holding down the Ctrl key while selecting items..</li> </ul>
UDP Packets to Discard	<ul style="list-style-type: none"> <li>• This lists any UDP filters you have defined. If no filters have been defined, this list will be empty.</li> <li>• Selected items can NOT be accessed by members of this group</li> <li>• Multiple items can be selected (or deselected) by holding down the Ctrl key while selecting items..</li> </ul>
Buttons	
Members	Click this to add or remove members from the selected group. (You can not add or remove members from the "Default" Group, since it contains all PCs not assigned to another Group.)

<b>Define TCP Filters</b>	Use this if you wish to define you own TCP filers. It does not mater which Group is selected; any filters you define can be applied to any Group.
<b>Define UDP Filters</b>	Use this if you wish to define you own UDP filers. It does not mater which Group is selected; any filters you define can be applied to any Group.

## Members

The *Members* screen is reached by clicking the *Members* button on the *Access Control* screen. An example screen is shown below.



**Figure 22: Members Screen**

- The name of the current Groups is displayed, with members of that Group listed on the left, and other PCs listed on the right.
- To Add a PC to the current Group, select the desired PC or PCs in the "Other PCs" list, the click the "<< Add " button.
- To Remove a PC from the current Group, select the desired PC or PCs in the "Members (PCs)" list, the click the " Del >> " button. These PCs will then become members of the "Default" Group.
- If the desired PC is not listed, you can use the *PC Database* link on the *Advanced* menu to add PCs to the PC list.

## Filters

The *Filters* screens are reached by clicking the *Define TCP Filters* button or *Define UDP Filters* on the *Access Control* screen.

- It does not matter which Group is selected.
- Both the *TCP* and *UDP* screens work the same way.
- An example *TCP* screen is shown below.



TCP Filters

Name

Port No.

1.

2.

3.

4.

5.

Name

Port No.

6.

7.

8.

9.

10.

Save

Cancel

Help

Close

Figure 23: Filters Screen

These screens allow you to define packet filters, to determine **which ports can be blocked**. (You can not define ports which are allowed. Ports not blocked are allowed.)

Once defined, a filter may be used with any Group.

Data - Filters

Name	Enter a descriptive name for this filter.
Port No.	Enter an integer representing the Port Number for this type of packet. This information can normally be provided by the service provider. Otherwise, a Network Analyzer or Packet Sniffer can be used to determine the correct port number.

## Advanced Internet Screen

This screen allows configuration of all advanced features relating to Internet access.

- Conferencing and Telephony
- Special Applications
- DMZ
- URL filter

An example screen is shown below.

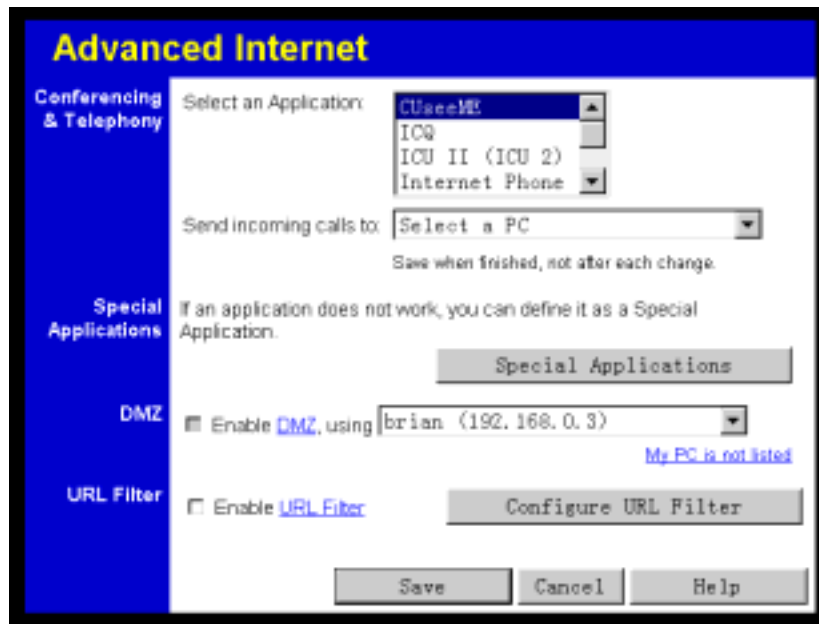


Figure 24: Internet Screen

## Conferencing & Telephony

Most applications are supported transparently by the Broadband Router. But sometimes it is not clear which PC should receive an incoming connection. This problem could arise with the following *Conferencing & Telephony* applications:

- CUseeME
- ICQ
- ICU II (ICU 2)
- Internet Phone
- mIRC
- MS NetMeeting
- Yahoo Messenger

If this problem arises, you can use this screen to set which PC should receive an incoming connection, as described below.

Conferencing & Telephony	
<b>Select an Application</b>	This lists applications which may generate incoming connections, where the destination (on your local LAN) is unknown.
<b>Send incoming calls to</b>	<p>This lists the PCs on your LAN.</p> <ul style="list-style-type: none"><li>• If necessary, you can add PCs manually, using the <i>PC Database</i> option on the advanced menu.</li><li>• For each application listed above, you can choose a destination PC.</li><li>• There is no need to "Save" after each change; you can set the destination PC for each application, then click "Save".</li></ul>

## Special Applications

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

### Special Applications Screen

This screen can be reached by clicking the *Special Applications* button on the *Internet* screen.

You can then define your Special Applications. You will need detailed information about the application; this is normally available from the supplier of the application.

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

Figure 25: Special Applications Screen

### Data - Special Applications Screen

<b>Checkbox</b>	Use this to Enable or Disable this Special Application as required.
<b>Name</b>	Enter a descriptive name to identify this Special Application.
<b>Incoming Ports</b>	<ul style="list-style-type: none"> <li><b>Type</b> - Select the protocol (TCP or UDP) used when you receive data from the special application or service. (Note: Some applications use different protocols for outgoing and incoming data).</li> <li><b>Start</b> - Enter the beginning of the range of port numbers used by the application server, for data you receive. If the application uses a single port number, enter it in both the "Start" and "Finish" fields.</li> <li><b>Finish</b> - Enter the end of the range of port numbers used by the application server, for data you receive.</li> </ul>
<b>Outgoing Ports</b>	<ul style="list-style-type: none"> <li><b>Type</b> - Select the protocol (TCP or UDP) used when you send data to the remote system or service.</li> <li><b>Start</b> - Enter the beginning of the range of port numbers used by the application server, for data you send to it. If the application uses a single</li> </ul>

	<p>port number, enter it in both the "Start" and "Finish" fields.</p> <ul style="list-style-type: none"><li>• <b>Finish</b> - Enter the end of the range of port numbers used by the application server, for data you send to it. If the application uses a single port number, enter it in both the "Start" and "Finish" fields.</li></ul>
--	---

## Using a Special Application

- Configure the *Special Applications* screen as required.
- On your PC, use the application normally. Remember that only one (1) PC can use each Special application at any time. Also, when 1 PC is finished using a particular Special Application, there may need to be a "Time-out" before another PC can use the same Special Application. The "Time-out" period may be up to 3 minutes.



If an application still cannot function correctly, try using the "DMZ" feature.

## DMZ

This feature, if enabled, allows one (1) computer on your LAN to be exposed to all users on the Internet, allowing unrestricted 2-way communication between the "DMZ PC" and other Internet users or Servers.

- This allows almost any application to be used on the "DMZ PC".
- The "DMZ PC" will receive all "Unknown" connections and data.
- If the DMZ feature is enabled, you must select the PC to be used as the "DMZ PC".
- The DMZ feature can be Enabled and Disabled on the *Advanced Internet* screen.



**The "DMZ PC" is effectively outside the Firewall, making it more vulnerable to attacks. For this reason, you should only enable the DMZ feature when required.**

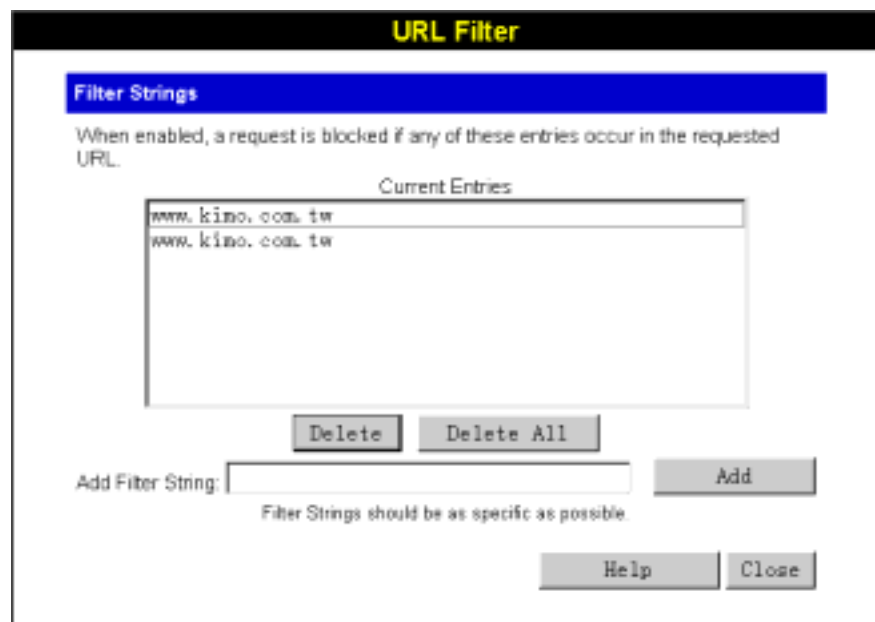
## URL Filter

The URL Filter allows you to block access to undesirable Web site

- To use this feature, you must define "filter strings". If the "filter string" appears in a requested URL, the request is blocked.
- Enabling the *URL Filter* also affects the *Internet Access Log*. If Enabled, the "Destination" field in the log will display the URL. Otherwise, it will display the IP Address.
- The *URL Filter* can be Enabled or Disabled on the *Advanced Internet* screen.

### URL Filter Screen

Click the "Configure URL Filter" button on the *Internet* screen to access the *URL Filter* screen. An example screen is shown below.



**Figure 26: URL Filter Screen**

---

**Data - URL Filter Screen**

Filter Strings	
<b>Current Entries</b>	This lists any existing entries. If you have not entered any values, this list will be empty.
<b>Add Filter String</b>	To add an entry to the list, enter it here, and click the "Add" button. An entry may be a Domain name (e.g. www.trash.com) or simply a string. (e.g. ads/ ) Any URL which contains ANY entry ANYWHERE in the URL will be blocked.
Buttons	
<b>Delete/Delete All</b>	Use these buttons to delete the selected entry or all entries, as required. Multiple entries can be selected by holding down the CTRL key while selecting.(On the Macintosh, hold the SHIFT key while selecting.)
<b>Add</b>	Use this to add the current Filter String to the site list.

## Virtual Servers

This feature allows you to make Servers on your LAN accessible to Internet users. Normally, Internet users would not be able to access a server on your LAN because:

- Your Server does not have a valid external IP Address.
- Attempts to connect to devices on your LAN are blocked by the firewall in this device.

The "Virtual Server" feature solves these problems and allows Internet users to connect to your servers, as illustrated below.

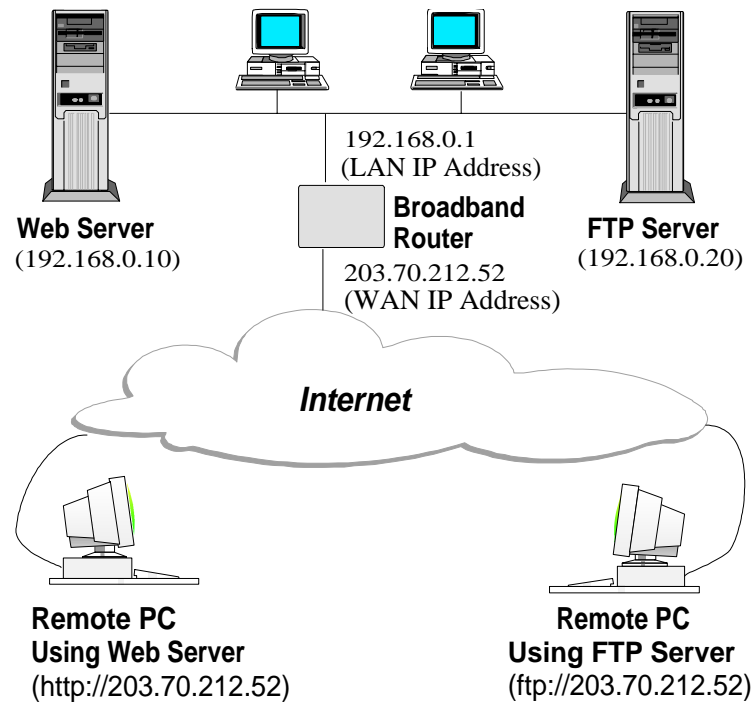


Figure 27: Virtual Servers

### IP Address seen by Internet Users

Note that, in this illustration, both Internet users are connecting to the same IP Address, but using different protocols.

**To Internet users, all virtual Servers on your LAN have the same IP Address. This IP Address is allocated by your ISP.**

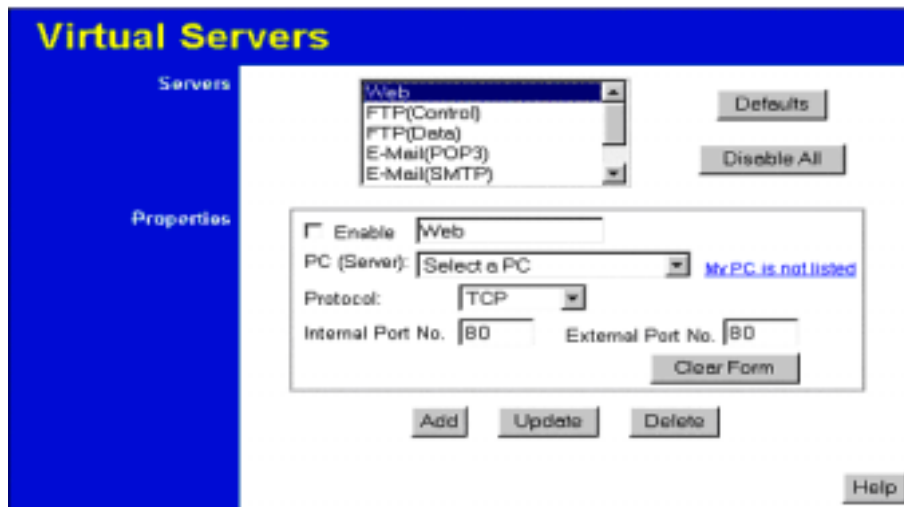
This address should be static, rather than dynamic, to make it easier for Internet users to connect to your Servers.

However, you can use the *DDNS (Dynamic DNS)* feature to allow users to connect to your Virtual Servers using a URL, instead of an IP Address.



## Virtual Servers Screen

The *Virtual Servers* screen is reached by the *Virtual Servers* link on the *Advanced* screen. An example screen is shown below.



**Figure 28: Virtual Servers Screen**

This screen lists a number of pre-defined Servers, and allows you to define your own Servers. Details of the selected Server are shown in the "Properties" area.

### Data - Virtual Servers Screen

Servers	
<b>Servers</b>	This lists a number of pre-defined Servers, plus any Servers you have defined. Details of the selected Server are shown in the "Properties" area.
Properties	
<b>Enable</b>	Use this to Enable or Disable support for this Server, as required. <ul style="list-style-type: none"> <li>If Enabled, any incoming connections will be forwarded to the selected PC.</li> <li>If Disabled, any incoming connection attempts will be blocked.</li> </ul>
<b>PC (Server)</b>	Select the PC for this Server. The PC must be running the appropriate Server software.
<b>Protocol</b>	Select the protocol (TCP or UDP) used by the Server.
<b>Internal Port No.</b>	Enter the port number which the Server software is configured to use.
<b>External Port No.</b>	The port number used by Internet users when connecting to the Server. This is normally the same as the Internal Port Number. If it is different, this device will perform a "mapping" or "translation" function, allowing the server to use one port address, while clients use a different port address.

Buttons	
<b>Defaults</b>	This will delete any Servers you have defined, and set the pre-defined Servers to use their default port numbers.
<b>Disable All</b>	This will cause the "Enable" setting of all Virtual Servers to be set OFF.
<b>Add</b>	Add a new entry to the Virtual Server list, using the data shown in the "Properties" area on screen. The entry selected in the list is ignored, and has no effect.
<b>Update</b>	Update the current Virtual Server entry, using the data shown in the "Properties" area on screen.
<b>Delete</b>	Delete the current Virtual Server entry. Note that the pre-defined Servers can not be deleted. Only Servers you have defined yourself can be deleted.
<b>Clear Form</b>	Clear all data from the "Properties" area, ready for input of a new Virtual Server entry.



**For each entry, the PC must be running the appropriate Server software.**

## Defining your own Virtual Servers

If the type of Server you wish to use is not listed on the *Virtual Servers* screen, you can define and manage your own Servers:

### Create a new Server:

1. Click "Clear Form"
2. Enter the required data, as described above.
3. Click "Add".
4. The new Server will now appear in the list.

### Modify (Edit) a Server:

1. Select the desired Server from the list
2. Make any desired changes (for example, change the Enable/Disable setting).
3. Click "Update" to save changes to the selected Server.

### Delete a Server:

1. Select the entry from the list.
2. Click "Delete".

**Note:** You can only delete Servers you have defined. Pre-defined Server cannot be deleted.



**From the Internet, ALL Virtual Servers have the IP Address allocated by your ISP.**

## Connecting to the Virtual Servers

Once configured, anyone on the Internet can connect to your Virtual Servers. They must use the Internet IP Address (the IP Address allocated to you by your ISP).

e.g.

`http://203.70.212.52`

`ftp://203.70.212.52`

It is more convenient if you are using a Fixed IP Address from your ISP, rather than Dynamic. However, you can use the *Dynamic DNS* feature, described in the following section, to allow users to connect to your Virtual Servers using a URL, rather than an IP Address.

## Dynamic DNS (Domain Name Server)

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.

The Service works as follows:

- You must register for the service at <http://www.dyndns.org> (Registration is free).
- Your password will be E-mailed to you.
- After registration, enter and save your DDNS username and password on this screen, and also your preferred Domain name.
- If your preferred Domain name is unavailable, a message will be displayed. Enter another name, keep trying until you find some variation which is available.
- The Broadband Router will then automatically ensure that your current IP Address is recorded at <http://www.dyndns.org>
- From the Internet, users will now be able to connect to your Virtual Servers (or DMZ PC) using your Domain name, as shown on this screen.

## Dynamic DNS Screen

Select *Advanced* on the main menu, then *Dynamic DNS*, to see a screen like the following:

Figure 29: DDNS Screen

**Data - Dynamic DNS Screen**

<b>DDNS Service</b>	
<b>DDNS Service</b>	<ul style="list-style-type: none"><li>• You must sign up first to create a new account before using the service. The service is free.</li><li>• Click this link to connect to the <a href="http://www.dyndns.org">www.dyndns.org</a> Web site.</li><li>• Your initial password will be E-mailed to you; you can change this later if you wish.</li></ul>
<b>DDNS Data</b>	
<b>User Name</b>	Enter the "User name" specified at the <a href="http://www.dyndns.org">www.dyndns.org</a> Web site when you registered.
<b>Password</b>	Enter your current password for <a href="http://www.dyndns.org">www.dyndns.org</a>
<b>Desired Domain</b>	<ul style="list-style-type: none"><li>• Enter your the preferred domain name.</li><li>• The name should consist only of letters and the hyphen (dash). Using any other characters may cause problems.</li><li>• The "DDNS Status" area will indicate whether or not your request was successful.</li><li>• Once allocated to you, the Domain name can NOT be changed, nor can you obtain another. If you need to change your Domain name, you must terminate your account at <a href="http://www.dyndns.org">www.dyndns.org</a> (The domain name will be released.) You can then open a new account.</li></ul>
<b>DDNS Status</b>	<p>This message is returned by the DDNS Server at <a href="http://www.dyndns.org">www.dyndns.org</a></p> <p>After you "Save", check here to see if your desired Domain name was successfully allocated to you.</p>

## Remote Management

This feature allows you to manage the Broadband Router via the Internet.

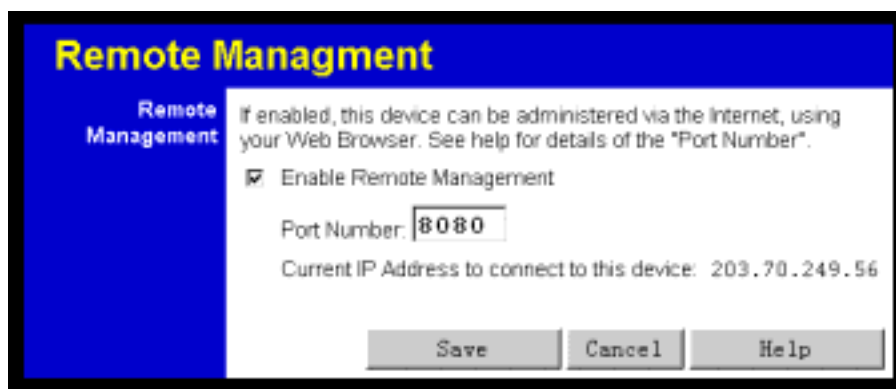


Figure 30: Remote Screen

### Data - Remote Management Screen

Remote Management	
<b>Enable Remote Management</b>	Enable to allow management via the Internet. If Disabled, this device will ignore management connection attempts from the Internet.
<b>Port Number</b>	<p>Enter a port number between 1024 and 65535 (8080 is recommended). This port number must be specified when you connect (see below).</p> <p><b>Note:</b> The default port number for HTTP (Web) connections is port 80, but using port 80 here will prevent the use of a Web "Virtual Server" on your LAN. (See <i>Advanced Internet - Virtual Servers</i>)</p>
<b>Current IP Address</b>	<p>You must use this IP Address to connect (see below).</p> <p>This IP Address is allocated by your ISP. But if using a Dynamic IP Address, this value can change each time you connect to your ISP. So it is better if your ISP allocates you a Fixed IP Address.</p>

### To connect from a remote PC via the Internet

1. Ensure your Internet connection is established, and start your Web Browser.
2. In the "Address" bar, enter "HTTP://" followed by the Internet IP Address of the Broadband Router. If the port number is not 80, the port number is also required. (After the IP Address, enter ":" followed by the port number.)

e.g.

HTTP://123.123.123.123:8080

This example assumes the WAN IP Address is 123.123.123.123, and the port number is 8080.

## Chapter 7

# Advanced Configuration



*This Chapter explains the settings available via the Advanced configuration section of the "Advanced" menu.*

### Overview

Normally, it is not necessary to use these screens, or change any settings. These screens and settings are provided to deal with non-standard situations, or to provide additional options for advanced users.

The settings available are:

<b>PC Database</b>	This is the list of PCs shown when you select the "DMZ PC" or a "Virtual Server". This database is maintained automatically, but you can add and delete entries for PCs which use a Fixed (Static) IP Address.
<b>Options</b>	Enable or Disable various options.
<b>MAC Address</b>	Set the MAC (hardware) address used on the Internet (WAN port) interface. This is required only if your ISP has recorded the MAC (hardware) address you should use.
<b>Routing</b>	Only required if your LAN has other Routers or Gateways.

### PC Database Screen

The PC Database is used whenever you need to select a PC (e.g. for the "DMZ" PC). It eliminates the need to enter IP addresses. An example PC Database screen is shown below.

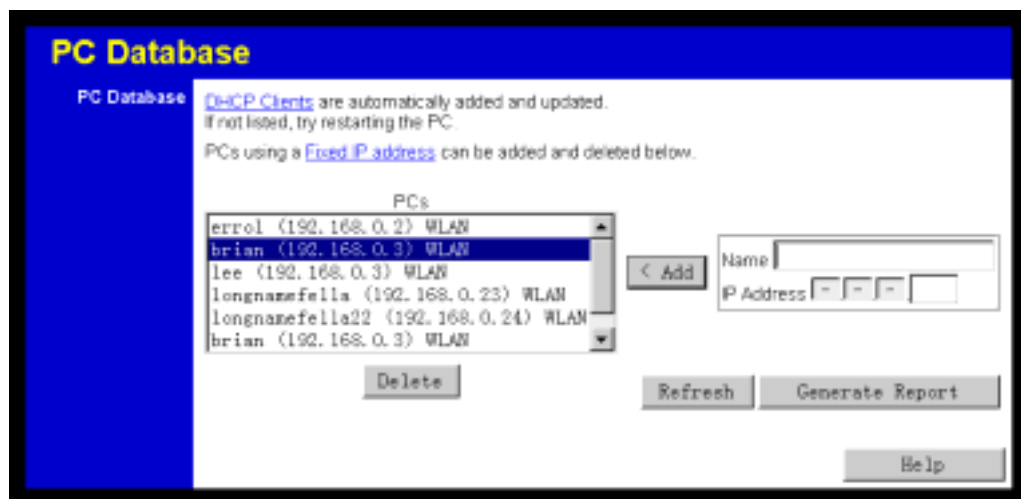


Figure 31: PC Database Screen

- PCs which are "DHCP Clients" are automatically added to the database, and updated as required.

- By default, non-Server versions of Windows act as "DHCP Clients"; this setting is called "Obtain an IP Address automatically".
- The Broadband Router uses the "Hardware Address" to identify each PC, not the name or IP address. The "Hardware Address" can only change if you change the PC's network card or adapter.
- This system means you do NOT need to use Fixed (static) IP addresses on your LAN. However, you can add PCs using Fixed (static) IP Addresses to the PC database if required.

### Data - PC Database Screen

PC Database	
<b>PCs</b>	This lists all current entries. Data displayed is <i>name (IP Address) type</i> . For this model, the "type" will always be "LAN"
<b>Name</b>	If adding a new PC to the list, enter its name here. It is best if this matches the PC's "hostname".
<b>IP Address</b>	Enter the IP Address of the PC. The PC will be sent a "ping" to determine its hardware address. If the PC is not available (not connected, or not powered On) you will not be able to add it.
Buttons	
<b>Add</b>	This will the new PC the list. The PC will be sent a "ping" to determine its hardware address. If the PC is not available (not connected, or not powered On) you will not be able to add it.
<b>Delete</b>	Delete the selected PC from the list. This should be done in 2 situations: <ul style="list-style-type: none"> <li>• The PC has been removed from your LAN.</li> <li>• The entry is incorrect.</li> </ul>
<b>Refresh</b>	Update the data on screen.
<b>Generate Report</b>	Display a read-only list showing full details of all entries in the PC database.

## Options

This screen allows advanced users to enter or change a number of settings. For normal operation, there is no need to use this screen or change any settings.

An example Options screen is shown below.

Figure 32: Options Screen

### Data - Options Screen

Backup DNS	
IP Address	Enter the IP Address of the DNS (Domain Name Servers) here. These DNS will be used only if the primary DNS is unavailable.
TFTP	
Enable Firmware Upgrade using TFTP	<ul style="list-style-type: none"> <li>If enabled, TFTP (Trivial FTP) can be used to upgrade the firmware in this device. This is normally not required; a Windows utility is available for this purpose.</li> <li>You must obtain the firmware upgrade file first; instructions for using TFTP will be available with the upgrade.</li> </ul>
UPnP	
Enable UPnP Services	<ul style="list-style-type: none"> <li>UPnP (Universal Plug and Play) allows automatic discovery and configuration of equipment attached to your LAN. UPnP is by supported by Windows ME, XP, or later.</li> <li>If Enabled, this device will be visible via UPnP.</li> <li>If Disabled, this device will not be visible via UPnP.</li> </ul>



<b>Allow Configuration...</b>	<ul style="list-style-type: none"> <li>• If checked, then UPnP users can change the configuration.</li> <li>• If Disabled, UPnP users can only view the configuration.</li> </ul>
<b>Allow Internet access to be disabled</b>	<ul style="list-style-type: none"> <li>• If checked, then UPnP users can disable Internet access via this device.</li> <li>• If Disabled, UPnP users can NOT disable Internet access via this device.</li> </ul>
<b>Firewall</b>	
<b>Enable DoS Firewall</b>	<p>If enabled, DoS (Denial of Service) attacks will be detected and blocked. The default is enabled. It is strongly recommended that this setting be left enabled.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• A DoS attack does not attempt to steal data or damage your PCs, but overloads your Internet connection so you can not use it - the service is unavailable.</li> <li>• The Broadband Router uses "Stateful Inspection" technology. This system can detect situations where individual TCP/IP packets are valid, but collectively they become a DoS attack.</li> </ul>
<b>Threshold</b>	<p>This setting affects the number of "half-open" connections allowed.</p> <ul style="list-style-type: none"> <li>• A "half-open" connection arises when a remote client contacts the Server with a connection request, but then does not reply to the Server's response.</li> <li>• While the optimum number of "half-open" connections allowed (the "Threshold") depends on many factors, the most important factor is the available bandwidth of your Internet connection.</li> <li>• Select the setting to match the bandwidth of your Internet connection.</li> </ul>

## MAC Address

The MAC (hardware) address is a low-level network identifier. It may be called "MAC Address", "Hardware Address", or "Physical Address". On a PC, this address is associated with the Network card or adapter. The address on the *MAC Address* screen is the address on the Internet (WAN port) interface, and has no effect on the LAN interface.

- If your ISP asks for the "Network Adapter Address", "Physical Address", "Hardware Address", or "MAC Address" for the PC the DSL/Cable modem is connected to, provide this value.
- If your ISP has already recorded a MAC address, you can change the address used by the Broadband Router to match the address recorded by your ISP.

### MAC Address Screen

Select *MAC Address* from the *Advanced* menu to reach a screen like the example below.

Figure 33: MAC address screen

### Data - MAC address Screen

<b>MAC (hardware) Address</b>	<p>The current MAC (hardware) address is displayed.</p> <p>If your ISP has recorded a Hardware Address, you can "spoof" that address by entering it in the address field. The hardware address consists of 12 characters, where each character is a digit (0..9) or a character between A and F.</p>
<b>Buttons</b>	
<b>Default</b>	Inserts the default MAC address into the MAC address field. You must click "Save" to actually change the address used.
<b>Copy from PC</b>	Inserts the MAC address from your PC into the MAC address field. You must click "Save" to actually change the address used.
<b>Save</b>	Save your changes to the Broadband Router.
<b>Cancel</b>	Reverse any changes made since the last "Save".



**If the MAC address is changed, the Broadband Router must restart.**

## Routing

### Overview

- If you don't have other Routers or Gateways on your LAN, you can ignore the "Routing" page completely.
- If the Broadband Router is only acting as a Gateway for the local LAN segment, ignore the "Routing" page even if your LAN has other Routers.
- If your LAN has a standard Router (e.g. Cisco) on your LAN, and the Broadband Router is to act as a Gateway for all LAN segments, enable RIP (Routing Information Protocol) and ignore the Static Routing table.
- If your LAN has other Gateways and Routers, and you wish to control which LAN segments use each Gateway, do NOT enable RIP (Routing Information Protocol). Configure the Static Routing table instead. (You also need to configure the other Routers.)
- If using Windows 2000 Data center Server as a software Router, enable RIP on the Broadband Router, and ensure the following Windows 2000 settings are correct:
  - Open *Routing and Remote Access*
  - In the console tree, select *Routing and Remote Access*, [server name], *IP Routing*, *RIP*
  - In the "Details" pane, right-click the interface you want to configure for RIP version 2, and then click "Properties".
  - On the "General" tab, set *Outgoing packet protocol* to "RIP version 2 broadcast", and *Incoming packet protocol* to "RIP version 1 and 2".

### Routing Screen

The routing table is accessed by the *Routing* link on the *Advanced* screen.

### Using this Screen

Generally, you will use either RIP (Routing Information Protocol) OR the Static Routing Table, as explained above, it is possible to use both methods simultaneously.

### Static Routing Table

- If RIP is not used, an entry in the routing table is required for each LAN segment on your Network, other than the segment to which this device is attached.
- The other Routers must also be configured. See *Configuring Other Routers on your LAN* later in this chapter for further details and an example.

**Routing**

RIP ☒ Enable RIP (Routing Information Protocol) V1

**Static Routing**

**Static Routing Table Entries**

**Properties**

Destination Network: 192 168 0 1  
 Network Mask: 255 255 255 0  
 Gateway IP Address: 0 0 0 0  
 Metric: 1

Figure 34: Routing Screen

## Data - Routing Screen

RIP	
<b>Enable RIP</b>	<p>Check this to enable the RIP (Routing Information Protocol) feature of the Broadband Router.</p> <p>The Broadband Router supports RIP 1 only.</p>
Static Routing	
<b>Static Routing Table Entries</b>	<p>This list shows all entries in the Routing Table.</p> <ul style="list-style-type: none"> <li>The "Properties" area shows details of the selected item in the list.</li> <li>Change any the properties as required, then click the "Update" button to save the changes to the selected entry.</li> </ul>
<b>Properties</b>	<ul style="list-style-type: none"> <li><b>Destination Network</b> - The network address of the remote LAN segment. For standard class "C" LANs, the network address is the first 3 fields of the Destination IP Address. The 4th (last) field can be left at 0.</li> <li><b>Network Mask</b> - The Network Mask for the remote LAN segment. For class "C" networks, the default mask is 255.255.255.0</li> <li><b>Gateway IP Address</b> - The IP Address of the Gateway or Router which the Broadband Router must use to communicate with the destination above. (NOT the router attached to the remote segment.)</li> <li><b>Metric</b> - The number of "hops" (routers) to pass through to reach the remote LAN segment. The shortest path will be used. The default value is 1.</li> </ul>

Buttons	
<b>Save</b>	Save the RIP setting. This has no effect on the Static Routing Table.
<b>Add</b>	Add a new entry to the Static Routing table, using the data shown in the "Properties" area on screen. The entry selected in the list is ignored, and has no effect.
<b>Update</b>	Update the current Static Routing Table entry, using the data shown in the "Properties" area on screen.
<b>Delete</b>	Delete the current Static Routing Table entry.
<b>Clear Form</b>	Clear all data from the "Properties" area, ready for input of a new entry for the Static Routing table.
<b>Generate Report</b>	Generate a read-only list of all entries in the Static Routing table.

## Configuring Other Routers on your LAN

It is essential that all IP packets for devices not on the local LAN be passed to the Broadband Router, so that they can be forwarded to the external LAN, WAN, or Internet. To achieve this, the local LAN must be configured to use the Broadband Router as the *Default Route* or *Default Gateway*.

### Local Router

The local router is the Router installed on the same LAN segment as the Broadband Router. This router requires that the *Default Route* is the Broadband Router itself. Typically, routers have a special entry for the *Default Route*. It should be configured as follows.

<b>Destination IP Address</b>	Normally 0.0.0.0, but check your router documentation.
<b>Network Mask</b>	Normally 0.0.0.0, but check your router documentation.
<b>Gateway IP Address</b>	The IP Address of the Broadband Router.
<b>Metric</b>	1

### Other Routers on the Local LAN

Other routers on the local LAN must use the Broadband Router's *Local Router* as the *Default Route*. The entries will be the same as the Broadband Router's local router, with the exception of the *Gateway IP Address*.

- For a router with a direct connection to the Broadband Router's local Router, the *Gateway IP Address* is the address of the Broadband Router's local router.
- For routers which must forward packets to another router before reaching the Broadband Router's local router, the *Gateway IP Address* is the address of the intermediate router.

## Static Routing - Example

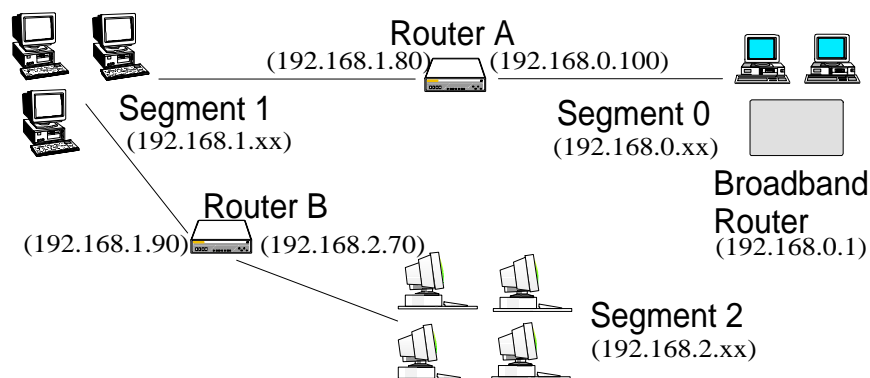


Figure 35: Routing Example

### For the Broadband Router's Routing Table

For the LAN shown above, with 2 routers and 3 LAN segments, the Broadband Router requires 2 entries as follows.

Entry 1 (Segment 1)	
Destination IP Address	192.168.1.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.0.100 (Broadband Router's local Router)
Metric	1
Entry 2 (Segment 2)	
Destination IP Address	192.168.2.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.0.100
Metric	2

### For Router A's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.0.1 (Broadband Router's IP Address)

### For Router B's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.1.80 (Broadband Router's local router)

# 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 Broadband Router and some possible solutions to them. If you follow the suggested steps and the Broadband Router still does not function properly, contact your dealer for further advice.

### General Problems

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

**Solution 1:** Check the following:

- The Broadband Router is properly installed, LAN connections are OK, and it is powered ON.
- Ensure that your PC and the Broadband 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 192.168.0.2 to 192.168.0.254 and thus compatible with the Broadband Router's default IP Address of 192.168.0.1.

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

**Solution 2:**    The Broadband 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 for the *DMZ* PC.
- Only one (1) PC can use this feature.



## Appendix B

# Specifications



### XRT-401A

Model	XRT-401A
Dimensions	204mm(W) * 127mm(D) * 29mm(H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	NAT, PPPoE, HTTP, DHCP client/server, TCP/IP
Network Interface:	6 Ethernet: 4 * 10/100BaseT (RJ45) auto-Switching Hub ports for LAN devices 1 * 10/100BaseT (RJ45) "uplink" port 1 * 10BaseT (RJ45) for WAN
LEDs	11
External Power Adapter	12 V DC

#### FCC Statement:

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

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

#### 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.