

BROADBAND ROUTER

4 Port 10/100 Mbits/sec DSL/Cable router

BR4100DC

Instruction Guide



* Actual product may vary from photo

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FCC COMPLIANCE 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 or more of the following measures:

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

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Chapter 1: Introduction

Thank you for purchasing a StarTech.com four-port Ethernet broadband router. Now you can configure multiple users to share one high-speed xDSL or cable Internet connection. With 20 Mbits/sec LAN-to-WAN throughput and the ability to add hubs or switches to expand your network, this router is ideal for small or home offices (SOHOs) or medium-sized businesses.

Features

- Allows multiple users to share a single Internet line
- Supports up to 253 users (through switches and hubs)
- Provides LAN-to-WAN throughput of up to 20 Mbits/sec
- Works with Cable or xDSL modems
- Allows you to access private LAN servers from a public network
- Supports DHCP Server/Client for easy setup
- Supports advanced features such as: DMZ, Virtual Servers, Access Control, Firewall, and Bridge Mode
- Allows you to monitor the router through DHCP Client Log, Security Log, and Device/Connection Status
- Allows configuration and upgrades from remote site over the Internet
- Backed by StarTech.com's two-year warranty

Before You Begin

To ensure a quick and easy router installation, please read through this section carefully before attempting to install your router.

Minimum Requirements

- An external xDSL or cable modem with an RJ-45 Ethernet port
- **Each** of the computers you want to connect to the router must be equipped with a 10 or 100 Mbits/sec Ethernet NIC and a web browser (Internet Explorer 4.0 or higher, or Netscape Navigator 4.7 or higher)
- StarTech.com does **not** provide Internet access with this product. Internet access must be purchased separately through an Internet Service Provider.

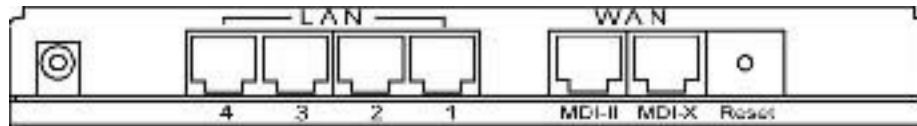
Contents

This package should contain:

- 1 x four-port Ethernet broadband router unit
- 1 x straight-through UTP cable
- 1 x power adapter
- Wall-mount accessories

Router Basics

Back Panel



The back panel is divided into three sections: LAN, WAN, and Reset.

- The four Local Area Network (LAN) ports are where you connect your LAN computers, print servers, hubs/switches, etc.
- The Wide Area Network (WAN) ports are where you connect your cable/xDSL modem. You will only use **one** WAN port at a time.
- The Reset button can be used to reboot the router if it is experiencing problems. If you press and hold the reset button for **less** than four seconds, the router will reboot with your settings and configurations intact. If you hold the reset button for **more** than four seconds, the router will reset itself to the factory default settings and you will lose all your settings and configurations.

The Front Panel

The front panel LEDs are your best indication of the router's activities.

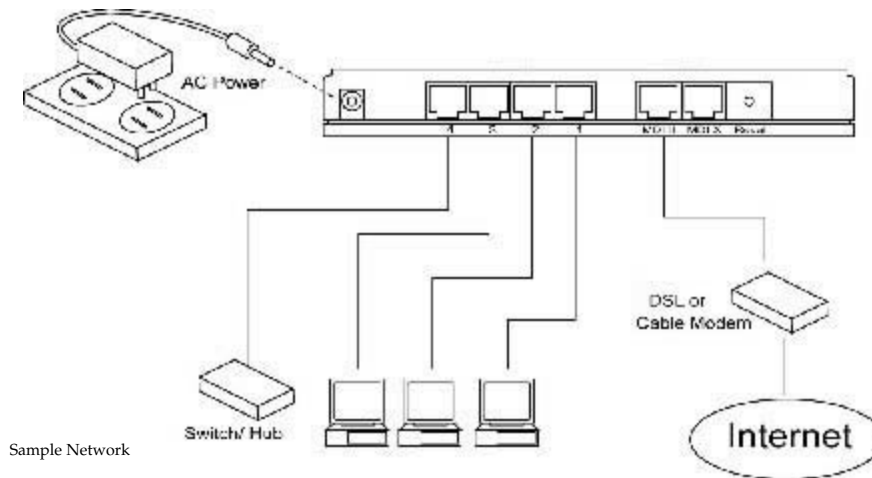


LED	Status	Description
PWR	On Off	Router has power Router has no power
WAN 10/100M	On Off	WAN port is connected at 100Mbps/sec WAN port is connected at 10Mbps/sec
WAN LNK/ACT	On Off Flashing	WAN port is connected WAN port has no connection WAN port has activity, data being sent
LAN 10/100M	On Off	LAN port is connected at 100Mbps/sec LAN port is connected at 10Mbps/sec
LAN LNK/ACT	On Off Flashing	LAN port is connected LAN port has no connection LAN port has activity, data being sent

Getting Started

NOTE: The information in the following section as well as the information in Chapter 2: Quick Setup is covered on the Quick Installation Guide that accompanies this manual. If you have already performed the steps in the Quick Installation Guide, you can proceed to Chapter 3: General Settings.

Setting Up Your LAN



Sample Network

1. Make sure all network devices are turned off.
2. Plug the power adapter into the 12VDC port on the back of the router. Plug the other end into an available power source. The green PWR LED on the router should now be lit.
3. Using an RJ-45 Ethernet cable, connect each of your network devices to one of the four LAN ports (labeled 1 through 4) on the router.
4. Using an RJ-45 Ethernet cable, connect your xDSL or Cable modem to **one** of the router's WAN ports (labeled MDI-II and MDI-X). You need to know what type of modem port and connection cable you are using.

	Modem port is regular	Modem port is uplink
Straight-Through	Use MDI-X	Use MDI-II
Cross-Over	Use MDI-II	Use MDI-X

NOTE: After connecting your modem to your WAN port, check the WAN LNK/ACT LED on the front of the router. If the LED is lit, you have selected the proper WAN port. If the WAN LNK/ACT LED is not lit, try plugging your cable into the other WAN port.

Configuring Your PCs

Each of your LAN PC clients must be set up to obtain IP addresses automatically. If you are running an OS that is different than those listed below, please consult your OS manufacturer for details.

Windows XP

- a. From your Control Panel, double-click the **Network Connections** icon.
- b. Right-click on "Local Area Connection" and select Properties.
- c. Select "Internet Protocol [TCP/IP]" and click the **Properties** button.
- d. Select "Obtain an IP address automatically" and "Obtain DNS server address automatically" and click **OK**.

Windows 2000

- a. From your Control Panel, double-click on the **Network and Dialup Connection** icon.
- b. Double-click the **Local Area Connection** icon.
- c. Click the **Properties** button.
- d. Check your "Network Components" list. You should see "Internet Protocol [TCP/IP]". Select it and click the **Properties** button.
- e. Select "Obtain an IP address automatically" and "Obtain DNS server address automatically" and click **OK**.
- f. Reboot your PC. Your PC will now obtain an IP address automatically from your router's DHCP server.

Windows Me/98/95

- a. Go to your Control Panel and double-click the **Network** icon.
- b. Check the list of network components. If TCP/IP is not installed, click **Add** to install it now. If TCP/IP is installed, go to step e.
- c. In the "Network Component Type" box, select "Protocol" and click **Add**.
- d. In the "Select Network Protocol" box, select "Microsoft" and "TCP/IP" and click **OK**. You may need your Windows installation CD for this step.
- e. After installing TCP/IP, go back to the Network dialog box. Select "TCP/IP" from the list of network components and click **Properties**.

- f. Check each of the tabs and verify the following settings:
 - Bindings: Check "Client for Microsoft Networks" and "File and printer sharing for Microsoft Networks"
 - Gateway: All fields are blank
 - DNS Configuration: Select "Disable DNS"
 - WINS Configuration: Select "Disable WINS Resolution"
 - IP Address: Select "Obtain IP address automatically"
- g. Reboot your PC. Your PC will now obtain an IP address automatically from your router's DHCP server.

WinNT

- a. Go to your Control Panel and double-click the **Network** icon. Select the Protocol tab.
- b. Check the list of network components. If TCP/IP is not installed, click **Add** to install it now. If TCP/IP is installed, go to step d.
- c. In the "Select Network Protocol" window, select the "TCP/IP Protocol" and click **OK** to start installing the protocol. You may need your Windows CD to complete this installation.
- d. Once TCP/IP is installed, go back to the "Network" window. Select "TCP/IP" from the list of "Network Protocols" and click the **Properties** button.
- e. Check each of the tabs and verify the following settings:
 - IP Address: Select "Obtain an IP address from a DHCP server"
 - DNS: All fields are blank
 - WINS Address: All fields are blank
 - Routing: All fields are blank

Accessing the Router Home Page

Once your PCs have been properly configured, the router's DHCP server will automatically provide your LAN clients with an IP address.

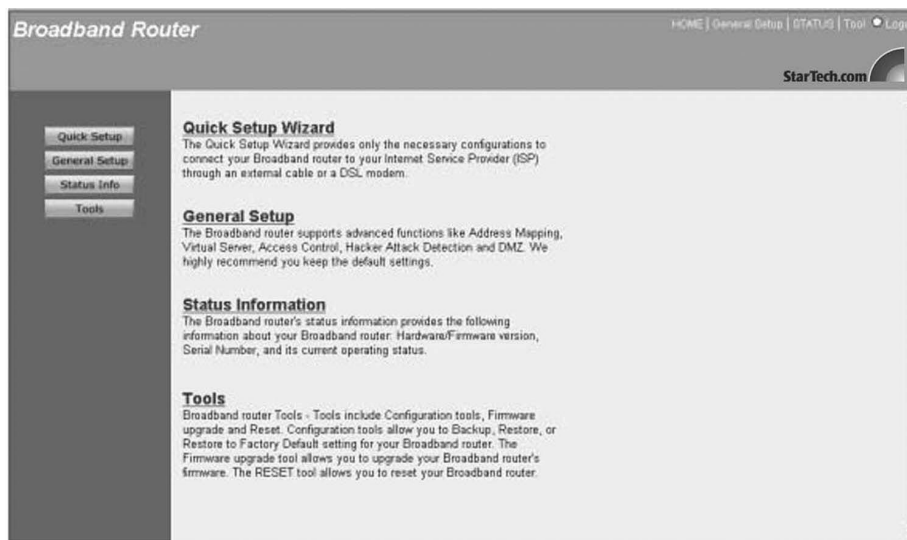
NOTE: Please make sure that the DHCP server on the router is the only DHCP server available on your LAN. If necessary, you can turn off the router's DHCP server. See **LAN** on **page 25** for details.

1. On one of your connected PCs, open your web browser. In the address field, enter the router's default IP address (192.168.2.1) and press Enter.



NOTE: Your default home page may not load properly since the router has not been configured. Enter the router's IP address regardless of what appears on your screen.

2. Once the website has loaded, click the Login button. By default, there is NO password. You should, however, input a password as soon as possible (see **Password Settings** on **page 19** for details). You will now be on the router's web-based management home page.
3. From the homepage, click on the Quick Setup Wizard link. The other sections (General Setup, Status Information, and Tools) do NOT need to be configured to access the Internet. For more information on these advanced features and settings, see the appropriate section in the manual.



Navigate the Router Management Interface

To leave the router's web-based management interface, use the **Logout** button at the top right of the screen. You can also use this shortcut bar to move between pages when configuring the router.



HOME | General Setup | STATUS | Tool | Logout

When applicable, you can click on the question icon that appears to the right of the page heading for a further definition or description of the information on the page.



3.IP Address Info ?

Modem

Chapter 2: Quick Setup

The Quick Setup feature will allow you to start sharing your Internet connection as quickly as possible. Advanced features such as passwords or firewalls can **not** be configured through Quick Setup.

BEFORE YOU BEGIN: Make sure that you know what type of Internet connection your ISP uses: Cable Modem, Fixed-IP xDSL, Point-To-Point Protocol over Ethernet (PPPoE), or Point-to-Point Tunneling Protocol (PPTP). Then see **Broadband Type** on **page 12** to find out the information that you will need to know about your specific connection. Make sure that you have this information onhand **prior** to running Quick Setup. See **Appendix A** for suggestions on how to find some of this information. Contact your Internet Service Provider if you encounter difficulties finding this information.

From the router homepage, select **Quick Setup**.

Time Zone

The Time Zone screen allows you to set the time zone you are operating in, as well as set up daylight savings time (optional). The time zone information will affect router functions such as log entries and firewall settings.

The screenshot shows the 'Broadband Router' configuration interface. The page title is 'Broadband Router' and the breadcrumb trail is 'HOME | General Setup | STATUS | Tools | Logout'. The 'StarTech.com' logo is visible in the top right. On the left, a navigation menu shows three items: '1. Time Zone' (checked), '2. Broadband Type', and '3. IP Address Info'. The main content area is titled '1. Time Zone' and contains the following settings:

- Set Time Zone:** A dropdown menu showing '(GMT-05:00)Eastern Time (US & Canada)'.
- Enable Daylight Savings:** A checked checkbox.
- Start Daylight Savings Time:** A date selector set to 'April 8'.
- End Daylight Savings Time:** A date selector set to 'October 26'.
- Next:** A button to proceed to the next step.

At the bottom of the browser window, the status bar shows 'Done' and 'Internet'.

<i>Parameter</i>	<i>Description</i>
Set Time Zone	Select the time zone of the country you are in.
Enable Daylight Savings	If enabled, the router will take daylight savings into effect.
Start Daylight Savings Time	The date daylight savings begins (if enabled).
End Daylight Savings Time	The date daylight savings ends (if enabled).

When you are satisfied with your Time Zone settings, click **Next** to proceed to the Broadband Type page.

Broadband Type

The Broadband Type page requires you to select the method your ISP uses to connect you to the Internet.

For tips on where to find the information required by the router, see Appendix A. **If you are unsure of what type of connection you are using or of where to find any of the information required by the router, contact your ISP.**

The screenshot shows a web browser window displaying the 'Broadband Router' configuration page. The page title is 'Broadband Router' and the URL is 'StarTech.com'. The page is divided into a left sidebar and a main content area. The sidebar contains a list of steps: '1. Time Zone', '2. Broadband Type', and '3. IP Address Info'. The main content area is titled '2. Broadband Type' and contains the following text: 'Specify the WAN connection type required by your Internet Service Provider. Specify a Cable modem, Fixed-IP xDSL, PPPoE xDSL or PPTP xDSL connection.' Below this text are four radio button options: 'Cable Modem', 'Fixed-IP xDSL', 'PPPoE xDSL', and 'PPTP xDSL'. Each option has a brief description of the connection type. A 'Back' button is located at the bottom right of the main content area. The browser's address bar shows 'Done' and 'Internet'.

Broadband Router HOME | General Setup | STATUS | Tool | Logout
StarTech.com

✓ 1. Time Zone
✓ 2. Broadband Type
● 3. IP Address Info

2. Broadband Type
Specify the WAN connection type required by your Internet Service Provider. Specify a Cable modem, Fixed-IP xDSL, PPPoE xDSL or PPTP xDSL connection.

Cable Modem
A connection through a cable modem requires minimal configuration. When you set up an account with your Cable provider, the Cable provider and your Broadband router will automatically establish a connection, so you probably do not need to enter anything more.

Fixed-IP xDSL
Some xDSL Internet Service Providers may assign a Fixed IP Address for your Broadband router. If you have been provided with this information, choose this option and enter the assigned IP Address, Subnet Mask, Gateway IP Address and DNS IP Address for your Broadband router.

PPPoE xDSL
If you connect to the Internet using an xDSL Modem and your ISP has provided you with a Password and a Service Name, then your ISP uses PPPoE to establish a connection. You must choose this option and enter the required information.

PPTP xDSL
If you connect to the Internet using an xDSL Modem and your ISP has provided you with a Password, Local IP Address, Remote IP Address and a Connection ID, then your ISP uses PPTP to establish a connection. You must choose this option and enter the required information.

Back

Done Internet

Select your connection type and proceed to the appropriate IP Address Info page.

Cable Modem

If you are using a cable modem, your ISP will automatically provide you with an IP address. Some ISPs may require that you fill in additional information, such as the Host Name and MAC Address. If your ISP does not require this information, click **OK** to complete the configuration.

The screenshot shows the 'Broadband Router' configuration interface. At the top, there are navigation links: 'HOME | General Setup | STATUS | Tool | Logout'. The 'StarTech.com' logo is in the top right. On the left, a sidebar shows a progress list: '1. Time Zone', '2. Broadband Type', and '3. IP Address Info' (which is selected). The main content area is titled '3.IP Address Info' and 'Cable Modem'. It contains a 'Host Name' text input field. Below it is a 'MAC Address' section with a pre-filled address 'FF-40-xx-B8-A3-xx' and three buttons: 'Clone Mac Address', 'Release', and 'Renew'. At the bottom right of the main area are 'Back' and 'OK' buttons. The bottom status bar shows 'Done' on the left and 'Internet' on the right.

<i>Parameter</i>	<i>Description</i>
Host Name	Enter the Host Name (if required).
MAC Address	Your ISP may be expecting the MAC address of the adapter you were using when you initially signed up with them. You can use the Clone button to copy the MAC address from the adapter and apply it to the router so that the ISP sees the MAC address it is expecting when you connect to the Internet. (You must be using the computer with the initial adapter for this to work) You should record this information so that you will not lose your ability to connect to the Internet if you lose your settings or no longer have the adapter. You can also use the Release and Renew buttons to apply your WAN IP address to the router. Press Release to clear the old IP address and press Renew to request a new address from your ISP.

When you are satisfied with your IP address settings, click the **OK** button.

Congratulations! You have completed the basic router configuration required for a Cable Modem connection. You will be taken to the router's **Status** page. You can click **Logout** to begin accessing the Internet.

Fixed-IP xDSL

If you are using a Fixed-IP xDSL connection, your ISP has provided you with a specific IP address for you to use. Your ISP can provide all the information required in this section.

Broadband Router

HOME | General Setup | STATUS | Tool | Logout

StarTech.com

✓ 1. Time Zone
✓ 2. Broadband Type
✓ 3. IP Address Info

3.IP Address Info ?

Fixed-IP xDSL

IP	192	168	169	254
Gateway IP	192	168	169	254
DNS	192	168	169	254
Subnet Mask	255	255	255	0

Enter the IP Address, Subnet Mask, Gateway IP Address and DNS IP Address provided to you by your ISP in the appropriate fields.

Back OK

Done Internet

<i>Parameter</i>	<i>Description</i>
IP	Enter your IP address.
Gateway IP	Enter your ISP's gateway IP address.
DNS	Enter your ISP's DNS (Domain Name System) server IP address.
Subnet Mask	Enter the subnet mask provided by your ISP.

When you are satisfied with your IP address settings, click the **OK** button.

Congratulations! You have completed the basic router configuration required for a Fixed-IP xDSL connection. You will be taken to the router's **Status** page. You can click **Logout** to begin accessing the Internet.

PPPoE

If your ISP uses the Point-to-Point over Ethernet (PPPoE) protocol to connect you to the Internet, you will be required to fill in the information below.

The screenshot shows the 'Broadband Router' configuration interface. The page title is 'Broadband Router' and the navigation menu includes 'HOME | General Setup | STATUS | Tool | Logout'. The 'StarTech.com' logo is visible in the top right. On the left, a sidebar shows a progress indicator with three steps: '1. Time Zone', '2. Broadband Type', and '3. IP Address Info', with the third step being active. The main content area is titled '3.IP Address Info' and contains a 'PPPoE' section. This section has a sub-header 'Use PPPoE Authentication' and several input fields: 'User Name' (with a placeholder 'Username'), 'Password' (masked with dots), 'Please retype your password' (also masked), 'Service Name', 'MTU' (set to 1450, with a note '(1440 <= MTU Value <= 1492)'), and 'Maximum Idle Time' (set to 30). There is a checked checkbox for 'Auto-reconnect'. Below the fields, a note reads: 'Enter the User Name and Password required by your ISP in the appropriate fields. If your ISP has provided you with a "Service Name" enter it in the Service Name field, otherwise, leave it blank.' At the bottom right of the form are 'Back' and 'OK' buttons. The browser window title is 'Done' and the address bar shows 'Internet'.

<i>Parameter</i>	<i>Description</i>
User Name	Enter your user name.
Password	Enter your password.
Please retype your password	Enter your password again for confirmation.
Service Name	Enter the service name (if required).
MTU	As an option, you can specify the maximum size of your transmission packet to the Internet. Leave this field blank if you do not wish to set a maximum packet size.
Maximum Idle Time	As an option, you can specify the idle time threshold (in minutes) for your WAN port. If the time period expires with no Internet activity, the router will automatically disconnect you from your ISP. Setting this value to "0" means that the router will never time out.
Auto-reconnect	When enabled, the router will reconnect a timed-out Internet connection when there is a request by the user to access the Internet.

When you are satisfied with your IP address settings, click the **OK** button.

Congratulations! You have completed the basic router configuration required for a PPPoE connection. You will be taken to the router's **Status** page. You can click **Logout** to begin accessing the Internet.

PPTP

If your ISP uses the Point-to-Point Tunneling Protocol (PPTP) to connect to the Internet, you will be required to fill in the information below.

The screenshot shows the 'Broadband Router' configuration interface. The page title is 'Broadband Router' and the StarTech.com logo is in the top right. A navigation menu on the left includes '1. Time Zone', '2. Broadband Type', and '3. IP Address Info'. The main content area is titled '3. IP Address Info' and 'PPTP'. It contains a form with the following fields:

IP Address:	192	168	169	254
Subnet Mask:	255	255	255	0
Default Gateway:	192	168	169	254
User ID:	Username			
Password:	••••••••			
PPTP Gateway:	0	0	0	0
Idle Time Out:	30	(min)		

Below the form, it states: 'Point-to-Point Protocol is a common connection method used in xDSL connections.' There are 'Back' and 'OK' buttons at the bottom right of the form area.

<i>Parameter</i>	<i>Description</i>
IP Address	Enter your IP address.
Subnet Mask	Enter the subnet mask.
Default Gateway	Enter the IP address of the ISP Gateway.
User ID	Enter your User ID (also known as a connection ID).
Password	Enter your password.
PPTP Gateway	If your LAN has a PPTP gateway, enter the gateway IP address here.
Idle Time Out	As an option, you can specify the idle time threshold (in minutes) for your WAN port. If the time period expires with no Internet activity, the router will automatically disconnect you from your ISP. Setting this value to "0" means that the router will never time out.

When you are satisfied with your IP address settings, click the **OK** button.

Congratulations! You have completed the basic router configuration required for a PPTP connection. You will be taken to the router's **Status** page. You can click **Logout** to begin accessing the Internet.

Chapter 3: General Settings

The General Setup section contains advanced features that allow you to configure your router to meet your network's needs. From here you can: assign passwords, set up remote management access, configure your LAN and WAN settings, or set up a firewall, DMZ, or many other functions.

Remember, if you have already used the Quick Setup Wizard, you do not need to alter any of the General Settings in order to share the Internet.

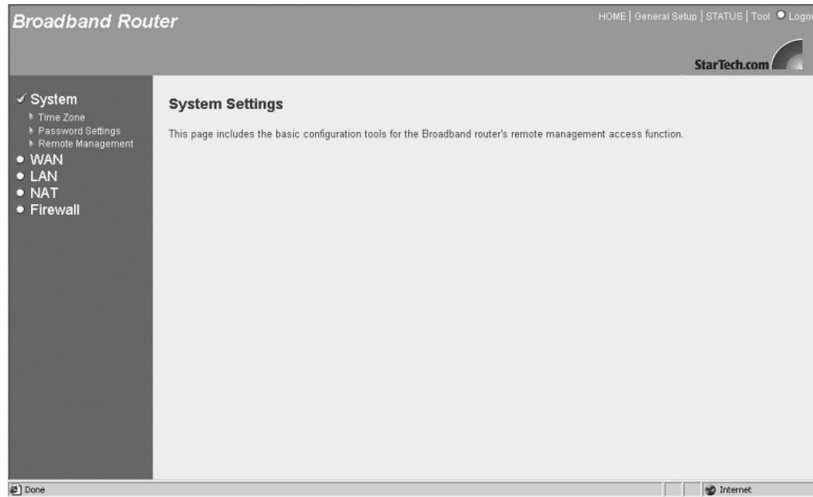
From the router homepage, click on **General Setup**.

You are given five options:

- **System:** Allows you to set the router's time zone, password, and remote management settings.
- **WAN:** Allows you to change your Internet connection type.
- **LAN:** Allows you to specify the LAN's IP address and subnet mask, enable or disable DHCP, and select an IP range for your LAN.
- **NAT:** Allows you to configure the Address Mapping, Virtual Server, and Special Application settings to specify the users/packets that can pass through your router's NAT.
- **Firewall:** Allows you to configure access control, hacker prevention, and DMZ settings.

System

The system screen allows you to specify a time zone, change the system password, and specify a remote management user for the router.



Time Zone

The time zone screen lets you specify the time zone you are in, as well as choose if and when you want daylight savings enabled. To change the time zone, follow the procedure outlined in **Quick Setup** on **page 11**.

Password Settings

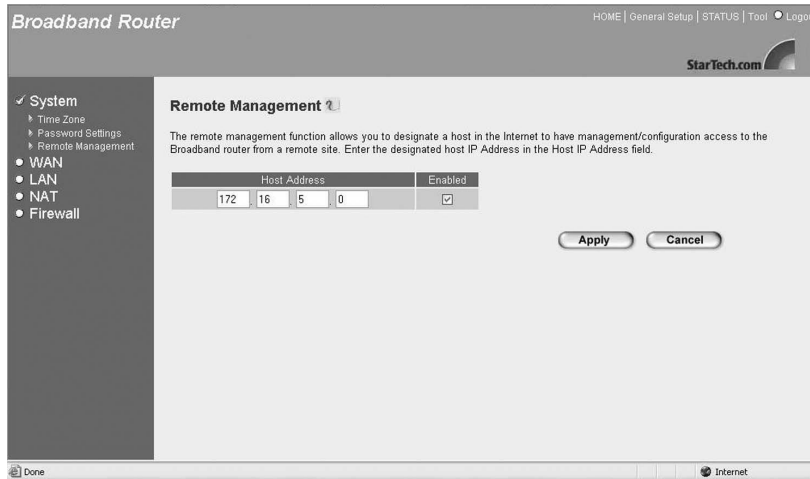
The Password Settings screen allows you to change the password required to access the broadband router's web-based management interface. By default, there is no password. It is recommended that you assign a password as soon as possible.

<i>Parameter</i>	<i>Description</i>
Current Password	Enter your router's current password. (By default there is no password)
New Password	Enter your new password.
Re-Enter Password...	Enter your new password again for confirmation. WARNING! If you forget your password, you will have to reset the router, which will erase all of your router configurations.
Idle Time Out	As an option, you can specify the idle time threshold (in minutes) for your web-based router management. If the time period expires with no activity, the router will automatically disconnect you from your web-based management session. Setting this value to "0" means that the router will never time out.

When you are satisfied with your password settings, click **Apply**.

Remote Management

The remote management function allows you to designate an Internet host who can access and configure the broadband router from a remote location.



Parameter

Host Address

Description

Enter the IP address of the host that will have remote management/configuration access. The person at this IP address will be able to configure the router from their remote location. Check the **Enabled** box to allow Remote Management.

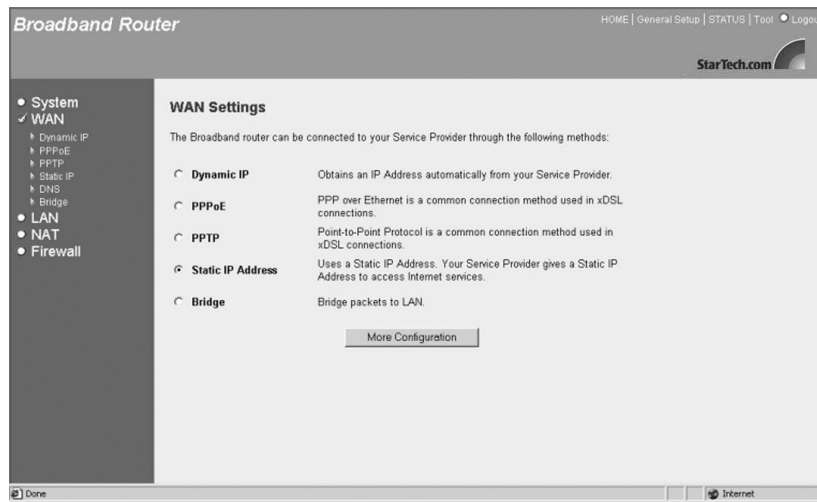
If you enter a host address of 0.0.0.0 and check the **Enabled** box, **anyone** can access and alter the router configurations if they know the router password.

NOTE: To access the web-based management interface from a remote site, enter the router's WAN IP address followed by port number 8080 (i.e., 192.168.2.1:8080). The remote user will need to know the password, if applicable.

When you are satisfied with your remote management settings, click **Apply**.

WAN

Most of the WAN settings are identical to the Broadband Type selection process you went through in the Quick Setup Wizard. You also have the option of choosing your DNS server or setting the router to bridge mode.



To change your WAN connection to Cable Modem, PPPoE, PPTP, or Fixed-IP xDSL, turn to **Broadband Type** on **page 12**.

DNS

If there is a Domain Name System (DNS) server that you would prefer to use instead of the DNS server provided by your ISP, you can specify it here.

The screenshot shows the 'Broadband Router' configuration interface. The left sidebar contains a menu with 'System' selected, and 'WAN' expanded to show 'Dynamic IP', 'PPPoE', 'PPTP', 'Static IP', 'DNS', and 'Bridge'. The main content area is titled 'DNS' and includes a help icon. Below the title is a paragraph explaining DNS servers. A question asks if the ISP provides a DNS address. Two IP address input fields are shown: 'Domain Name Server (DNS) Address' with values 192, 168, 169, 254 and 'Secondary DNS Address (optional)' with values 192, 168, 45, 2. 'Apply' and 'Cancel' buttons are at the bottom.

<i>Parameter</i>	<i>Description</i>
Domain Name Server (DNS) Address	Enter the IP address of the DNS server you wish to use. The default is your ISP's DNS server.
Secondary DNS Address	As an option, you can enter the IP address of a second DNS server. If the primary DNS server fails, this secondary DNS server will be used.

When you are satisfied with your DNS settings, click **Apply**.

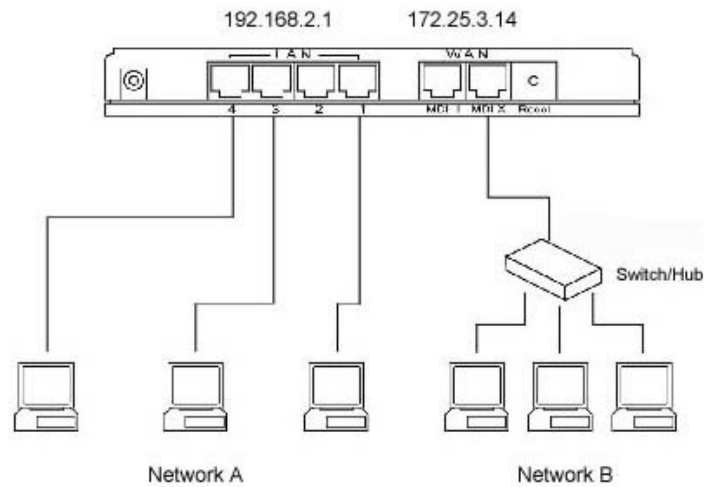
Bridge

From this screen you can set your broadband router to bridge mode and assign an IP address for management purposes. When bridge mode is selected, the router essentially connects and enables packet forwarding between homogenous networks. When the router is in bridge mode, the original WAN MAC address is ignored and the original LAN MAC address will be used as the MAC address. These values will be restored when you set the device to any mode other than bridge mode.

The screenshot shows the 'Broadband Router' configuration page for 'Bridge Mode'. The left sidebar has a tree view with 'WAN' selected. The main area has the title 'Bridge Mode' and instructions: 'Enter the assigned IP Address, Subnet Mask for the Bridge Mode management.' Below this is a question: 'Has your network administrator given you an IP Address for this device?'. There are two input fields: 'IP address' with the value '192.168.2.1' and 'Subnet Mask' with the value '255.255.255.0'. At the bottom right are 'Apply' and 'Cancel' buttons.

<i>Parameter</i>	<i>Description</i>
IP Address	Enter the IP address.
Subnet Mask	Enter the subnet mask for bridge mode.

When you are satisfied with your bridge mode settings, click **Apply**.

Example: Bridge Mode

In this example of a bridged network, a computer on Network A is able to communicate with a computer on Network B by sending a message to IP address 192.168.2.1, which in turn sends a message to 172.25.3.14, which in turn sends the message to the computer on Network B.

LAN

The LAN port settings page allows you to specify a private IP address for your router's LAN port and specify a range of IP addresses for your DHCP server to issue to your LAN clients.

The screenshot shows the 'LAN Settings' page of a Broadband Router. The page title is 'Broadband Router' and it includes navigation links for 'HOME | General Setup | STATUS | Tool | Logout'. The 'LAN Settings' section is active, showing a sidebar with 'System', 'WAN', 'LAN', 'NAT', and 'Firewall' options. The main content area includes a 'LAN IP' section with fields for 'IP address' (192.168.2.1), 'IP Subnet Mask' (255.255.255.0), and 'DHCP Server' (Enabled). Below this is a 'Lease Time' dropdown set to 'One Week'. The 'IP Address Pool' section has fields for 'Start IP' (192.168.2.100), 'End IP' (192.168.2.199), and 'Domain Name'.

Parameter	Default	Description
IP Address	192.168.2.1	This is the router's LAN port IP address. (Your LAN clients' default gateway IP address.)
IP Subnet Mask	255.255.255.0	Enter the subnet mask for your LAN segment.
DHCP Server	Enabled	With the DHCP server enabled , the router will automatically give your LAN clients an IP address. If this feature is disabled you will have to manually set your LAN clients' IP addresses. (Make sure that your LAN client is in the same subnet as the router if you want the router to be your LAN client's default gateway.)
Lease Time		When the DHCP server is enabled, the DHCP server will temporarily give your LAN clients an IP address. If you specify a time period in this field, the DHCP server will refresh your IP addresses once that time period has expired.
IP Address Pool		Enter a Start IP and End IP address. Your DHCP server will assign your LAN clients IP addresses from this range. (If you want to assign a static/fixed IP address to one of your LAN PCs, you will have to choose an IP address from outside this pool.)
Domain Name		As an option, enter a Domain Name for your LAN.

When you are satisfied with your LAN settings, click **Apply**.

NAT

Network Address Translation (NAT) helps you conserve IP addresses by allowing many multiple local users to access the Internet through far fewer public IP addresses. NAT also provides firewall protection from hacker attacks and allows you to map private IP addresses to public IP addresses for key services such as websites or FTP.

Address Mapping

Address Mapping allows you to map or translate your private LAN IP addresses to different public IP addresses used for the Internet. This allows you to limit the number of Public IP addresses purchased from your ISP and maintains the privacy and security of the LAN. The router essentially allows a pool of local Private IP addresses to be mapped to one or more Public IP addresses.

Parameter

Address Mapping

Description

Enter your Public IP address that exists on the Internet. On the line below, enter the range of virtual, Private IP addresses (LAN PC clients) that will share the designated Public IP address when accessing the Internet.

NOTE: You will need to give your LAN PC client(s) a fixed/static IP address for Address Mapping to work.

When you are satisfied with your Address Mapping settings, click **Apply**.

Virtual Server

Use the Virtual Server function when you want different servers/clients in your LAN to handle specific applications (e.g., email, FTP, web server). Using different port numbers, computers can recognize a particular application process or network service. The Virtual Server function allows you to re-direct a remote request to a particular LAN private IP address.

Broadband Router HOME | General Setup | STATUS | Tool | Logout

StarTech.com

- System
- WAN
- LAN
- ✓ NAT
 - Address Mapping
 - Virtual Server
 - Special Applications
- Firewall

Virtual Server

You can configure the Broadband router as a Virtual Server so that remote users accessing services such as the Web or FTP at your local site via Public IP Addresses can be automatically redirected to local servers configured with Private IP Addresses. In other words, depending on the requested service (TCP/UDP) port number, the Broadband router redirects the external service request to the appropriate internal server (located at one of your LAN's Private IP Address).

	Private IP	Private Port	Type	Public Port
1.	192.168.2.2	80	<input checked="" type="radio"/> TCP <input type="radio"/> UDP	80
2.	192.168.2.3	110	<input type="radio"/> TCP <input checked="" type="radio"/> UDP	110
3.	192.168.2.		<input checked="" type="radio"/> TCP <input type="radio"/> UDP	
4.	192.168.2.		<input checked="" type="radio"/> TCP <input type="radio"/> UDP	
5.	192.168.2.		<input checked="" type="radio"/> TCP <input type="radio"/> UDP	
6.	192.168.2.		<input checked="" type="radio"/> TCP <input type="radio"/> UDP	
7.	192.168.2.		<input checked="" type="radio"/> TCP <input type="radio"/> UDP	

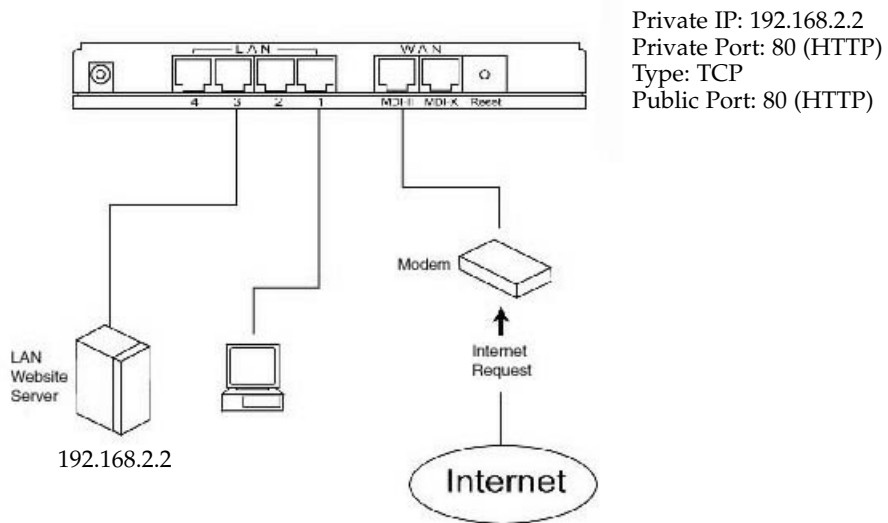
Internet

<i>Parameter</i>	<i>Description</i>
Private IP	Enter the private LAN client/host IP address that the packet will be sent to. NOTE: You need to give your LAN PC clients a fixed/static IP address outside the specified pool (see page 25) for Virtual Server to work properly.
Private Port	Enter the port number of the private client/host that the Public Port will be mapped to.
Type	Select the port's protocol type (TCP or UDP). If you are unsure of the type, leave it as the default TCP protocol.
Public Port	Enter the service (Internet application) port number from the Internet that will be re-directed to the above Private IP address on your LAN.

NOTE: The Virtual Server function has priority over the DMZ function (see page 35) if there is a conflict between the two.

Example: Virtual Server

The diagram below demonstrates one of the ways you can use the Virtual Server.



In this example, the user wants the web server on their private LAN to be accessible to Internet users. Any request from the Internet to access the web server is forwarded to the LAN's web server.

Special Applications

Some applications (like Internet games, video conferencing, Internet telephony and others) require multiple connections. The Special Applications function allows you to configure the router to support multiple connections for these types of applications.

Broadband Router HOME | General Setup | STATUS | Tool | Logout

StarTech.com

System
WAN
LAN
NAT
Address Mapping
Virtual Server
Special Applications
Firewall

Special Applications

Some applications require multiple connections, such as Internet gaming, video conferencing, Internet telephony and others. These applications cannot work when Network Address Translation (NAT) is enabled. If you need to run applications that require multiple connections, specify the port normally associated with an application in the "Trigger Port" field, select the protocol type as TCP or UDP, then enter the public ports associated with the trigger port to open them for inbound traffic. Note: The range of the Trigger Port is 0 to 65535.

	Trigger Port	Trigger Type	Public Port	Public Type	Enabled
1.	28800	<input type="radio"/> TCP <input type="radio"/> UDP	2300-2400,47624	<input type="radio"/> TCP <input type="radio"/> UDP	<input checked="" type="checkbox"/>
2.	6112	<input type="radio"/> TCP <input type="radio"/> UDP	6112	<input type="radio"/> TCP <input type="radio"/> UDP	<input checked="" type="checkbox"/>
3.	7773	<input type="radio"/> TCP <input type="radio"/> UDP	7773	<input type="radio"/> TCP <input type="radio"/> UDP	<input checked="" type="checkbox"/>
4.		<input type="radio"/> TCP <input type="radio"/> UDP		<input type="radio"/> TCP <input type="radio"/> UDP	<input type="checkbox"/>
5.		<input type="radio"/> TCP <input type="radio"/> UDP		<input type="radio"/> TCP <input type="radio"/> UDP	<input type="checkbox"/>

Done Internet

Parameter	Description
Trigger Port	Enter the outgoing (Outbound) port number for this particular application. The Trigger Port range is between 0 and 65535 .
Trigger Type	Select whether the Outbound port protocol is TCP or UDP.
Public Port	Enter the incoming (Inbound) port number for this type of application. NOTE: Individual port numbers should be separated by a comma. Use a hyphen to indicate a port range. (e.g. , 47624, 2300-2400)
Public Type	Select whether the Inbound port protocol is TCP or UDP.
Enabled	Check this box to enable the special application. Only one LAN client can use a special application at a time.
Popular Applications	This section lists some popular applications that require multiple connections. Select an application from the list, select a location (1-10) in the Copy To selection box and click Copy . If your application is not on this list, check with the application manufacturer for the port numbers they require.

Example: Special Applications

To run special applications, you need to know the port (outbound) information associated with that application. In the example on the previous page, there are three special application rules enabled. The first rule states that when a user triggers port number 28800 (outbound), the router will open ports 2300-2400 and 47624 to allow incoming packets to be directed to the user.

Firewall

The router can provide extensive firewall protection. You can restrict certain users/hosts from using certain applications, block common hacker attacks, and be informed by email if an attack on your network occurs. You can also configure a specific client/server as a DMZ (Demilitarized Zone) for applications that require unrestricted access to the Internet.

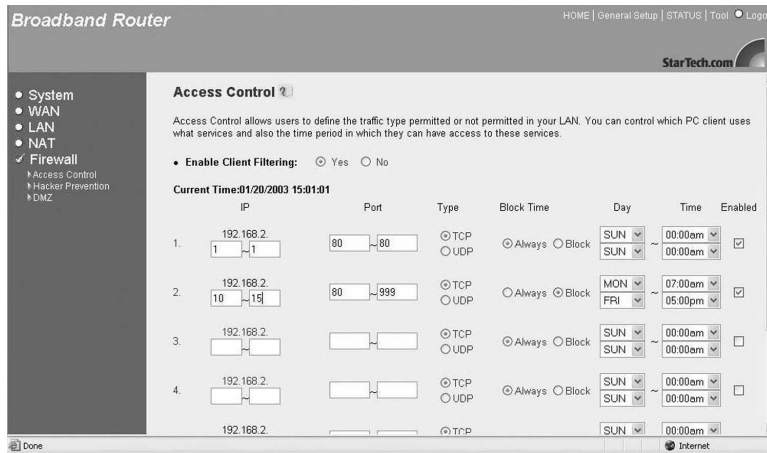
To enable the firewall settings, check the **Enable** box and click **Apply**.



NOTE: You need to check the enable box **AND** configure the Access Control, Hacker Prevention, and DMZ features in order to properly configure the firewall. Checking the enable box alone does not offer any additional firewall protection.

Access Control

The Access Control feature allows you to restrict users from accessing specific Internet applications and services (e.g., email, FTP, Internet websites). You can also set time restrictions on users and applications so that certain users can only access certain applications during specified times.



Parameter	Description
Enable Client Filtering	Select Yes to enable client filtering. If you select No , none of the filters you enter below will be applied.
IP	Enter the IP address that you wish to apply the rule to. You can select a range of users by inputting the starting user's last digit (octet) IP address and the last user's last octet IP address in the appropriate boxes. If you want to select only one user then input the user's last digit IP address in both boxes. Note: You will need to give your LAN clients a fixed/static IP address outside the specified pool (see page 25) for this feature.
Port	Select the range of port numbers that the rule will apply to. To restrict only one port, enter the same port number in both fields.
Type	Select the transport protocol type (TCP or UDP) for the port number.
Block Time	If you select Always , the user will never be able to access the application. If you select Block , the user will be restricted from using the application during the date and time you enter in the next set of fields.
Day, Time	Select a beginning and ending date and time in which the rule will be in effect.
Enabled	Check the Enabled box to apply the rule.

Example: Access Control

In the screen shot on the previous page, there are two access control restrictions in place. The client at IP address 192.168.2.1 is restricted from using port 80 (HTTP) at all times. The clients with IP addresses between 192.168.2.10 and 192.168.2.15 are restricted from using any activity that requires ports 80 through 999 between Monday at 7:00AM to Friday at 5:00PM.

Hacker Prevention

The router's firewall can block common hacker attacks (including Denial of Service, Ping of Death, and RIP defect) and can alert you by email if your network is under attack.

<i>Parameter</i>	<i>Description</i>
DoS Protection	Check this box to protect your network from Denial of Service (DoS) attacks.
Discard Ping from WAN	Check this box and the router's WAN port will not respond to any ping requests, protecting your network from Ping of Death attacks.
RIP Defect	Check this box to protect your network from RIP attacks.
Your E-mail Address	If your network is under attack, the router will email you at the address you enter here.
SMTP Server Address	Enter the IP address of the email's SMTP server.
POP3 Server Address	Enter the IP address of the email's POP3 server.
User Name	Enter the User Name of the POP3 server.
Password	Enter the Password of the POP3 server.
	Note: Contact your email provider if you can not locate the above information.

When you are satisfied with your Hacker Prevention settings, click **Apply**.

DMZ

The DMZ (DeMilitarized Zone) feature allows a LAN client to have unrestricted two-way access to the Internet by bypassing the router's firewall. Useful for applications like Internet gaming, video conferencing, or VPN connections, a DMZ will redirect all packets going to your WAN port IP address to a specific LAN client/server while allowing the rest of your network to remain protected.

The screenshot shows the 'DMZ(Demilitarized Zone)' configuration page on a StarTech.com router. The page includes a navigation menu on the left with options like System, WAN, LAN, NAT, and Firewall. The main content area has a title 'DMZ(Demilitarized Zone)' and a brief explanation of the feature. Below this, there is a section for 'Enable DMZ' with radio buttons for 'Yes' and 'No'. A note states that multiple PCs can be exposed to the Internet for two-way communications. The core of the page is a table with two columns: 'Public IP Address' and 'Client PC IP Address'. The first row is pre-filled with '24.112.50.165' and '192.168.2.2'. The following seven rows are empty, each with input fields for the IP address components (octets).

Public IP Address	Client PC IP Address
1. 24.112.50.165	192.168.2.2
2. [192] [168] [3] [1]	192.168.2.5
3. [0] [0] [0] [0]	192.168.2.0
4. [0] [0] [0] [0]	192.168.2.0
5. [0] [0] [0] [0]	192.168.2.0
6. [0] [0] [0] [0]	192.168.2.0
7. [0] [0] [0] [0]	192.168.2.0
8. [0] [0] [0] [0]	192.168.2.0

Parameter	Description
Enable DMZ	Select Yes to enable your DMZ. If you select No , none of the rules you enter below will be applied. Note: If there is a conflict between the Virtual Server (see page 27) and the DMZ settings, the Virtual Server will have priority.
Public IP Address	Enter the IP address of your WAN port or a Public IP address given to you by your ISP.
Client IP Address	Enter the IP address of the LAN client/host that will receive all the packets intended for the Public IP address listed above. Note: You need to give your LAN PC clients a fixed/static IP address outside the specified pool (see page 25) for the DMZ to work properly.

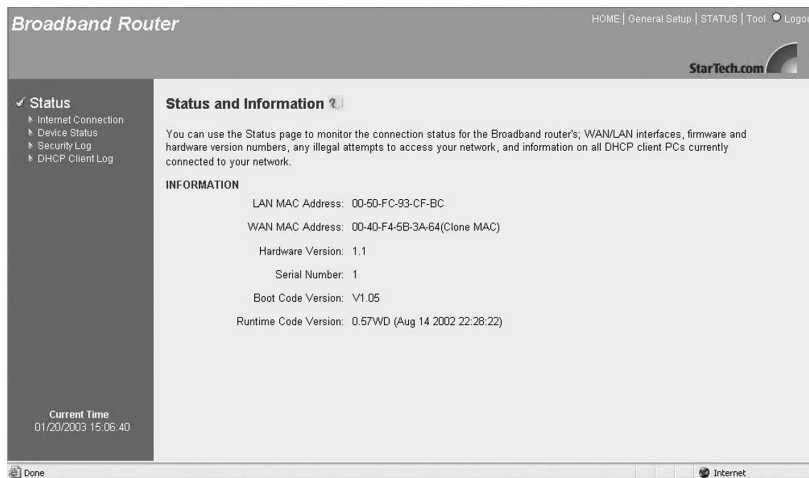
When you are satisfied with your DMZ settings, click **Apply**.

Chapter 4: Status

The Status section allows you to monitor the status of your router. From the Status page you can view your router's system information, Internet connection status, configuration settings, any illegal attempts to enter your network, and information on all DHCP client PCs currently connected to the network.

From the router homepage, click on **Status**.

- **Status and Information:** The Status page gives you information about the router's LAN and WAN MAC addresses, hardware version, serial number, boot code version, and runtime code version.



You are also given four options:

- **Internet Connection:** The Internet Connection page gives you information on your current Internet connection, WAN IP, subnet mask, Gateway, Primary DNS, and Secondary DNS servers.
- **Device Status:** The Device Status page lets you view the router's IP address, subnet mask, DHCP server, and firewall settings.
- **Security Log:** The Security Log lists any illegal attempts to access your network.
- **DHCP Client:** The DHCP Client page gives you information on all the DHCP clients currently linked to your router's DHCP server.

Internet Connection

You can view your current Internet connection status and related information.

Broadband Router HOME | General Setup | STATUS | Tool | Logout

StarTech.com

✓ Status
 ▶ Internet Connection
 ▶ Device Status
 ▶ Security Log
 ▶ DHCP Client Log

Internet Connection ?

View the current internet connection status and related information

Cable/DSL:	CONNECTED	Release Renew
WAN IP:	24.112.50.165	
Subnet Mask:	255.255.248.0	
Gateway:	24.112.48.1	
Primary DNS:	24.153.22.67	
Secondary DNS:	24.153.22.195	

Current Time
01/20/2003 15:06:40

Done Internet

<i>Parameter</i>	<i>Description</i>
Cable/DSL	Displays whether the router's WAN port is connected to a Cable/DSL modem.
WAN IP	Displays the router's WAN IP address.
Subnet Mask	Displays the router's Subnet Mask.
Gateway	Displays your gateway IP address.
Primary DNS	Displays your primary Domain Name System server's IP address.
Secondary DNS	Displays your secondary DNS server's IP address, if configured (See DNS on page 22).

Device Status

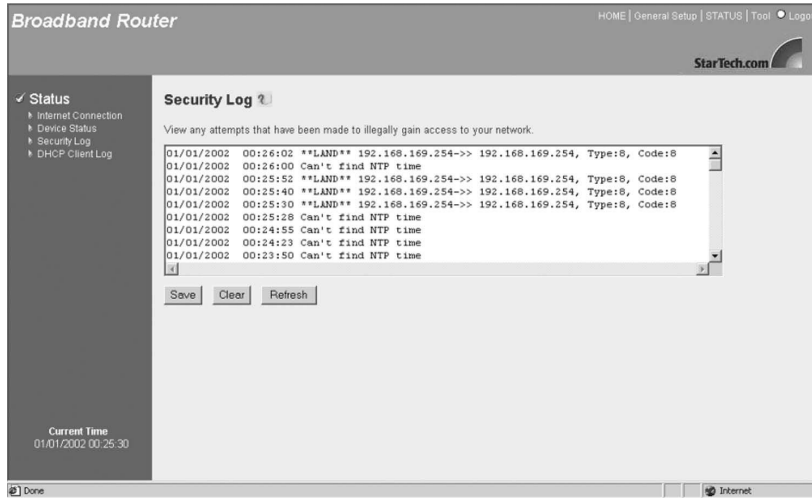
The Device Status page shows you the router's current configuration settings.



<i>Parameter</i>	<i>Description</i>
IP Address	Displays your router's LAN IP address.
Subnet Mask	Displays your router's LAN subnet mask.
DHCP Server	Shows whether the router's DHCP server is enabled or disabled.
Firewall	Shows whether the firewall is enabled or disabled. Note: If you enabled the Firewall but did not configure any settings, this setting will still be shown as enabled (See page 31).

Security Log

This security log shows any attempts to gain illegal access to your network.



Parameter

Security Log

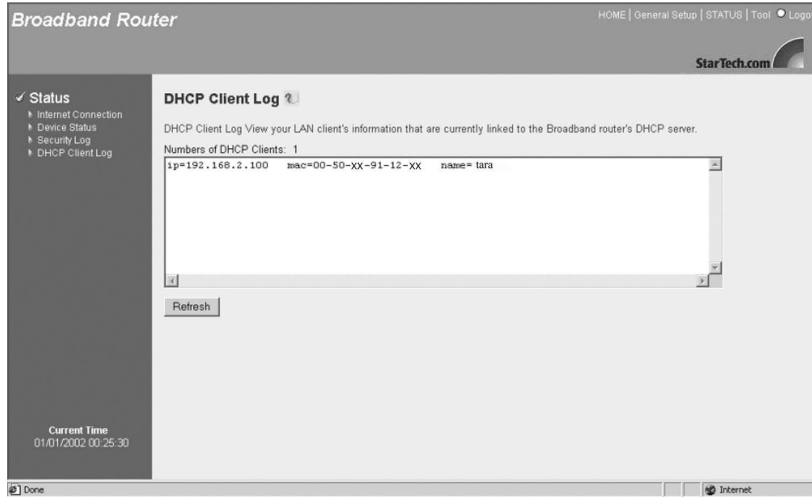
Description

The log lists information about all illegal attempts to access your network. Click the **Save** button to save the log to a local file for further processing. Click **Clear** to clear the security log. Click **Refresh** to get the most updated version of the log.

Note: When the system is powered down, the security log will disappear if it has not been saved.

DHCP Client Log

You can view information on the LAN clients that are currently linked to the router's DHCP server.



Parameter
DHCP Client Log

Description
This page shows all the DHCP LAN clients that are currently connected to your network. The DHCP client log displays the number of clients linked to the router's DHCP server, as well as their IP addresses and MAC addresses. Click the **Refresh** button to get the most updated information.

Chapter 5: Tools

From the Tools page, you can save or restore configuration settings, upgrade the system firmware, or reset the router.

From the router homepage, click on **Tools**.

You have three options:

- **Configuration Tools:** You can save the router's current configuration, restore the router's saved configuration files, or restore the router's factory default settings.
- **Firmware Upgrade:** You can upgrade the router's firmware.
- **Reset:** You can reset the router in case of problems.

Configuration Tools

The Configuration Tools page lets you save, restore, or reset your router's configuration settings.

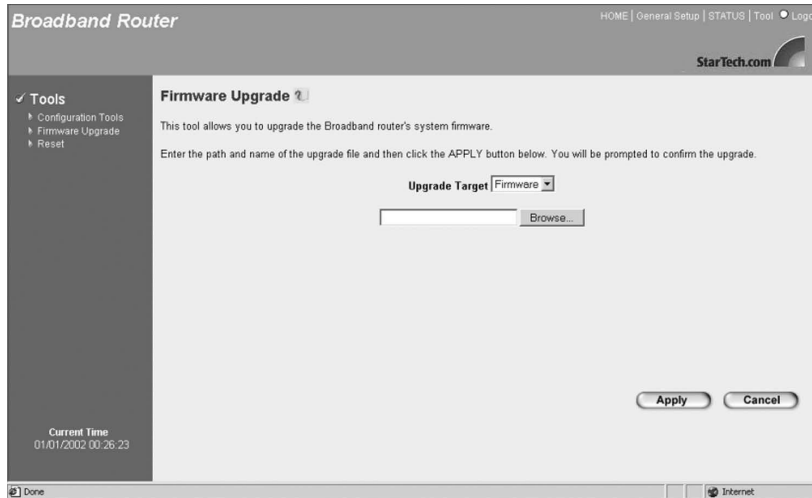


<i>Parameter</i>	<i>Description</i>
Backup	Selecting Backup will save the router's current configuration to a file named "backup_config.exe".
Restore	Selecting Restore will re-load the saved configuration.
Restore to Factory Defaults	You can force the router to do a power reset that will clear all configurations and restore the original factory default settings.

Once you have made your selection, click on **More Configurations** and follow the instructions to complete the process.

Firmware Upgrade

StarTech.com may periodically offer firmware upgrades as a download on our website. Visit www.startech.com and click on the Downloads link to check for possible firmware upgrades for this product. If there is an upgrade available, download the file according to instructions on the website and then proceed with the following steps:

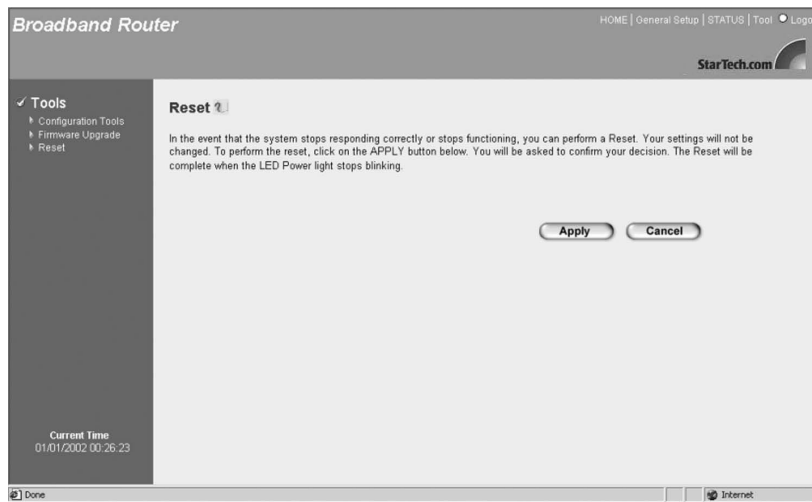


*Parameter***Firmware Upgrade***Description*

Browse to the location of the firmware upgrade and click the **Apply** button. You may have to wait a few minutes for the upgrade to complete.

Reset

You can reset the router if you are experiencing any problems. **Remember**, performing this step will delete all your configurations and requires you to re-configure the router, beginning with the Quick Install.



Click on the **Apply** button to reset the router. You will be asked to confirm your decision. The reset will be complete when the Power LED stops blinking. Once the reset process is complete, you can start using the router again.

Appendix A

Find and record your computer's IP configuration settings

Note: The following instructions are valid for Windows 95/98/Me/2000/XP only. If you are using a different OS, consult your OS manufacturer for details. If after completing this procedure you are still unsure of where to find some of the required information, **contact your ISP** for details.

1. Click on **Start** then **Run**.
2. Type "cmd" (or "command") in the field and click **OK**.



3. At the command prompt, type "ipconfig /all" and press **Enter**. You should see a screen with information similar to the following:

```

C:\WINNT.0\System32\cmd.exe
Windows NT IP Configuration

Host Name . . . . . : pc77
DNS Servers . . . . . : 192.168.0.xx
Node Type . . . . . : Broadcast
NetBIOS Scope ID. . . . . :
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
NetBIOS Resolution Uses DNS : No

Ethernet adapter:

Description . . . . . : NDIS 4.0 driver

Physical Address. . . . . : 00-50-xx-02-48-xx
DHCP Enabled. . . . . : Yes
IP Address. . . . . : 192.168.2.100
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 192.168.2.1
DHCP Server . . . . . : 172.19.0.xx
Lease Obtained. . . . . : Monday, January 20, 2003 8:54:14 AM
Lease Expires . . . . . : Tuesday, January 28, 2003 8:54:14 AM

C:\>

```

You should record the following information prior to connecting the router:

Host Name (if any): _____

MAC/Physical Address: _____

IP Address: _____

Subnet Mask: _____

Default Gateway: _____

Appendix B

Popular Port Numbers

For online games, check with the game manufacturer for details on the specific ports or port ranges need to be opened.

Note: The following list contains a selection of some of the most popular port numbers. A more complete list of port numbers is available on the Internet Assigned Numbers Authority (IANA) website at: <http://www.iana.org/assignments/port-numbers>.

Application	Protocol	Port Number
FTP	TCP	21
Telnet	TCP	23
SMTP	TCP	25
HTTP	TCP	80
POP3	TCP	110
SNMP	UDP	161
SNMP Trap	UDP	162
H.323	TCP	1720
PPTP	TCP	1723
PC Anywhere	TCP	5631
PC Anywhere	UDP	5632

Appendix C

Setting a Static IP Address

By default, the router uses its DHCP server to automatically assign your LAN clients a dynamic IP address in the range of **192.168.2.100 to 192.168.2.199** (You can edit this range. See page 25 for details). To use certain router functions such as address mapping or virtual server, you may need to assign a PC a static/fixed IP address. Remember that each PC that uses TCP/IP must be identified through a unique IP address in the network and that the address you choose is **outside** the range listed above. If the IP address you choose is not unique to the network, Windows will generate an IP conflict error message.

If your OS is not listed below, consult your OS manufacturer for details on performing this procedure.

Windows XP/2000

Note: These instructions assume that Windows XP users are using “Classic View”.

1. From your Control Panel, double-click on **Network and Dial-Up Connections** (Windows 2000) or **Network Connections** (Windows XP).
2. Right-click on the Local Area Connection and select **Properties**.
3. In the “Components checked are used by this connection” box, select Internet Protocol (TCP/IP), and click the **Properties** button.
4. Select “Use the following IP address”. Enter a unique IP address that is not used by any other computer on the network connected to the router. Make sure that each IP address is unique for each PC or network device. Make sure that the IP address you select is **NOT** in the range specified for the router’s DHCP server.
5. Enter “255.255.255.0” as the Subnet Mask.
6. Enter **192.168.2.1** (the router’s default IP address) as the default gateway.
7. Toward the bottom of the window, select “Use the following DNS server addresses” and enter the Preferred DNS server and Alternative DNS server (provided by your ISP). Contact your ISP for information.
8. Click **OK** and restart the computer to allow the changes to take effect.

Windows Me/98/95

1. From your Control Panel, double-click on the **Network** icon.
2. Under the Protocols tab, highlight TCP/IP and click the **Properties** button.
3. Select the IP address tab, and select "Specify an IP address". Enter a unique IP address that is not used by any other computer on the network connected to the router. Make sure that each IP address is unique for each PC or network device. Make sure that the IP address you select is **NOT** in the range specified for the router's DHCP server.
4. Click the Gateway tab and enter **192.168.2.1** (the router's default IP address) in the "New Gateway" field. Click **Add**.
5. Click the "DNS Configuration" tab and make sure the "Enable DNS" option is selected. Enter the **Host** and **Domain** names. Enter the IP address of your ISP's DNS server. Contact your ISP if you can not find this information.
6. Click **OK** and restart your computer to allow the changes to take effect.

Windows NT 4.0

1. From your Control Panel, double-click on **Network**.
2. Click the Protocol tab, and highlight TCP/IP and click "**Properties**".
3. Enter a unique IP address that is not used by any other computer on the network connected to the router. Make sure that each IP address is unique for each PC or network device. Make sure that the IP address you select is **NOT** in the range specified for the router's DHCP server.
4. Enter "255.255.255.0" as the Subnet Mask.
5. Enter **192.168.2.1** (the router's default IP address) as the default gateway.
6. Click the DNS tab and enter the **Host** and **Domain** names. Enter the IP address of your ISP's DNS server. Contact your ISP if you can not find this information.
7. Click **OK** and restart the computer if asked.

Troubleshooting

If you are experiencing connection difficulties, first check your cables:

- Make sure that all cables are in their proper ports and firmly seated.
- Make sure that cables connected to PCs/LAN clients are **not** plugged into the WAN port and that the cable from the modem **is** plugged into the WAN port.
- Make sure that your modem is connected to the proper WAN port. If the WAN LNK/ACT LED is lit, you are using the correct WAN port. If the WAN LNK/ACT LED is not lit, you are using the wrong WAN port. Try plugging your modem cable into the other WAN port.
- Check to see if your power supply is plugged into a functioning power source and that your Power LED is on.
- Avoid interference. Network cabling can be run under floors, around office dividers, or over dropped ceilings. When planning your wiring layout, try to keep cables away from power outlets, florescent lighting fixtures, uninterruptible power supplies, and other sources of strong electromagnetic interference.
- Some modems may require the use of a cross-over cable. Check with your modem manufacturer for details.

Make sure you have entered the proper configuration information.

- Reread the instructions on the Quick Install page and in Chapters 1 and 2. Make sure you have completed all steps.
- Make sure that you have selected the proper Internet connection type and have entered all the required information about your computer's IP configuration. **Ask your ISP if you have any difficulties finding the required information.**
- Some ISPs may bind your Internet connection to the MAC address of your PC's NIC. You may be required to clone this MAC address. See the **Broadband Type** on page 12 for details.

Make sure that each PC connected to the router has a functioning NIC and a functioning modem.

- Plug your cable or DSL modem directly into the RJ-45 port on your PC's network adapter, without using your router. If your Internet connection is still not up, then it is likely that your PC's network card is not functional. **Remember, the router does not replace a modem.** The router works in conjunction with a cable or DSL modem. The router alone will not provide you with Internet access.

Test your Internet connection.

You can try to pin down the location of the problem by completing the following steps:

- **Ping your router.**

1. Click on **Start** then **Run**.
2. Type "cmd"(or "command") in the field and click **Run**.
3. Type "ping 192.168.2.1" (the router's default IP address) and press **Enter**.

If you see four "Reply from 192.168.2.1" messages, the connection is successful. If you see four "Request timed out" or "Destination host unreachable" messages, there is a problem with your router connection. This is likely a hardware problem. Check your cables, NICs, and router.

- **Ping an outside IP address.**

1. Click on **Start** then **Run**.
2. Type "cmd" (or "command") in the field and click **Run**.
3. Type "ping xx.xx.xx.xx" (where xx.xx.xx.xx is the IP address of computer that is outside your network) and press **Enter**.

If you were able to successfully ping your router, but are not able to ping an IP address outside the router, the problem likely lies with the router. Please contact StarTech.com technical support.

- **Ping an outside website.**

1. Click on **Start** then **Run**.
2. Type "cmd" (or "command") in the field and click **Run**.
3. Type "ping <web address>". Make sure you enter a valid web address after you type "ping". Press **Enter**.

Note that some websites may have firewalls that will not respond to ping requests. Be sure to try a few different web sites. If you are unable to ping an outside web address, there is possibly a DNS error on the PC. See "Configuring Your PCs" on page 7.

If problems persist, try resetting the router.

- Press the router's reset button with a pencil tip for less than 4 seconds and the router will re-boot itself, keeping your original configurations. If problems persist or you experience extreme problems, press the reset button for longer than 4 seconds and the router will reset itself to the factory default settings. **Warning:** This procedure will erase all your configurations and replace them with the factory default settings.

Online Gaming Problems

- Some online games require certain ports to be opened in order to function properly. See **Special Applications** on **page 29** in the manual for details on how to open ports. Check with the game manufacturer's technical support for details on which specific ports need to be opened.
- Multiple gamers on the LAN may not be able to get on a game server and play simultaneously with only one public IP. Check with the game's technical support for details on whether they support multi-login on one IP address.

Forgotten Password

- If you have forgotten your password, you have to reset the router. Press the reset button for **more** than 4 seconds and the router will reset itself to the factory default settings. All your configurations will be replaced with the factory default settings.

Remove your proxy settings

PPPoE users may need to disable the proxy settings or the dial-up popup window. Since the router is the gateway for the Internet connection, your computer does not need proxy settings to gain access. Follow the directions below to verify that you do not have any proxy settings and that your browser is set to connect directly to the LAN.

- **Microsoft Internet Explorer 5.0 or higher:**
 1. From your PC's Control Panel, click on **Internet Options**.
 2. Click the Connections tab.
 3. Click on the **LAN settings** button and make sure no boxes are checked.
 4. Click the **OK** button to go back to the previous screen.
 5. Make sure "Never dial a connection" is checked. This will remove any dial-up pop-ups for PPPoE users.
 6. Click **OK** to close the Internet Options window.
- **For Netscape Navigator 4.7 or higher:**
 1. Start Netscape Navigator.
 2. From the Edit menu, click **Preferences**.
 3. Expand the Advanced list by clicking on the "+" sign and click **Proxies**.
 4. Make sure "Direct connection to the Internet" is selected.
 5. Close all windows to finish.

Glossary

Bridge: An intelligent, internetworking device that forwards or filters packets between different networks based on data link layer (MAC) address information.

Broadband: A method of communication where a wide band of frequencies is available to transmit voice, data, and video signals over a single medium. Information can be sent on many different channels, allowing more information to be sent in a given period of time (the same way multiple lanes allow more cars on the road).

Cable Modem: A device that provides Internet access to a user by connecting a computer to the cable television network, which in turn connects to the Internet. Cable modem users have a continuous always-on connection to the Internet.

Daisy Chain: A hardware configuration where devices are connected one after the other in series. Transmitted signals proceed down the chain from the first device to the second, and so on.

Default Gateway: A routing device used to forward traffic that is not on the local subnet. When a network device wants to send an IP packet to a destination that is not on the same network, the device sends the packet to a default gateway, which will send it out towards the destination. In the case of the BR4100DC, the router's IP address acts as a default gateway.

Denial of Service Attack: A method used by hackers to prevent legitimate users from accessing a service or resource. A DoS attack usually involves the hacker sending a large number of request packets to a targeted network service, making it unusable for other users.

DHCP (Dynamic Host Configuration Protocol): A protocol that automatically assigns dynamic IP addresses to PC/LAN clients logging in to a TCP/IP network. Without DHCP, IP addresses must be logged in manually at each computer.

DMZ (DeMilitarized Zone): A computer host or small subnetwork that exists between a trusted Internal network and an external, untrusted network (such as the Internet). Users on the external network can access your DMZ without being able to access the rest of your network.

DNS (Domain Name System): A system that translates an Internet address (like `www.startech.com`) into a proper IP address (like `192.168.2.1`). A DNS server keeps a database of Internet servers and their respective Internet and IP addresses, so that when you type "`www.startech.com`" into your web browser, you are sent to the web site located at `192.168.2.1`, for example. Your ISP can provide you with the IP address of the DNS server you use when connected to the Internet.

DSL Modem (Digital Subscriber Line Modem): A device that provides a user with Internet access using telephone lines to connect the computer to the Internet at high speeds.

Dynamic IP Address: A temporary IP address given to a PC/LAN client by the DHCP server for the duration of an Internet session or some other established period of time. The IP address is chosen at random from a pool of available IP addresses on the DHCP server. When the session is concluded or the lease-time has expired, the IP address is returned to the pool.

Ethernet: A popular network standard of communication using either twisted pair or coaxial cables. The most widely used LAN access method, Ethernet networks are connected by special cables and hubs, and can transfer data at speeds up to 10 or 100 million bits per second (Mbits/sec). Also known as IEEE 802.3.

Firewall: A configurable program or hardware device that filters information coming to your private network or computer from the Internet. If a firewall flags a packet of information, it does not get through to your network or PC.

Firmware: Programming that is inserted into a device's read-only memory (ROM) to become a permanent part of the device. Firmware upgrades are often provided to upgrade or improve a hardware device.

Idle Timeout: A pre-configured amount of time after which an Internet connection will automatically disconnect if there has been no activity on the Internet.

IP Address (Internet Protocol Address): A unique number that identifies a device on a network. IP addresses are expressed in decimal form as four numbers between 0 and 255 that are separated by periods. (Example: 192.168.2.1) *See also: Dynamic IP Address, Static IP Address, Public IP Address, Private IP Address.*

ISP (Internet Service Provider): A company that provides individuals or businesses with access to the Internet.

ISP Gateway Address: The IP address for the Internet router located at the ISP's office. Your ISP can provide you with this address, if needed.

LAN (Local Area Network): A group of computers and devices connected together in a relatively small area (such as a house or an office).

MAC Address (Media Access Control Address): A unique number assigned by the manufacturer to any Ethernet networking device (such as a network adapter) that allows the network to identify it at the hardware level. Also known as the physical address or Ethernet number.

MTU (Maximum Transmission Unit): The largest physical packet size (in bytes) that a network can transmit. Any messages larger than the MTU are divided into smaller packets before being sent.

NAT (Network Address Translation): A process that allows a single public IP address to represent several private IP addresses when accessing the Internet. This allows multiple users on a network to share an Internet connection without having to purchase multiple IP addresses from an ISP.

Network Mask: *See Subnet Mask.*

NIC (Network Interface Card): A circuit board or card that is installed inside a computer or network device so that the device can be connected to the Internet. Also known as a network adapter.

Physical Address: *See MAC Address.*

Ping of Death Attack: A denial of service attack where a hacker sends an IP packet larger than the maximum size specified by IP protocols, causing the computer or server to crash. *See also: Denial of Service.*

Port: A number used to identify a specific process or application (such as HTTP or SMTP) to which an Internet or other network message is to be forwarded. If you are operating behind a firewall, you may need to open specific ports to allow users to access these applications.

PPPoE (Point-to-Point Protocol over Ethernet): A communications specification for connecting multiple users on an Ethernet LAN to the Internet through a common broadband medium, such as a single DSL line. PPPoE users have to log in with a user name and password in order to access the Internet.

PPTP (Point-to-Point Tunneling Protocol): A technology that ensures that messages sent between VPN nodes over the Internet are secure. PPTP users can dial into corporate networks via the Internet.

Private IP Address: An IP address given to a LAN device that is unknown to the Internet. These are unregistered IP addresses that have been set aside for use in a LAN environment where constant connection to the Internet is not required. *See also: NAT.*

Protocol: An objective set of rules for how computers communicate with each other across networks. A protocol describes the form a message must take as well as how that message is exchanged. Hypertext Transfer Protocol (HTTP), for example, governs the way information is exchanged on the World Wide Web.

Public IP Address: A unique, “legal” IP address allocated by an ISP that is used when accessing the Internet. A public IP address can be reached by another device over the Internet. *See also: NAT.*

RIP Defect (Routing Information Protocol Defect): A type of attack where a hacker sends bogus routing information to a target host causing all information intended for the target host to be routed to the intruder host instead.

Router: An intelligent network device that forwards packets between different networks based on network layer address information such as IP addresses.

Static IP Address: A dedicated, unique IP address that has been assigned to a given computer or server for an extended period of time. Static IP addresses are useful if you are operating a computer that other Internet users need to access, such as a web server.

SOHO (Small Office/Home Office): A small or at-home business.

Subnet Mask: A technique used by the IP protocol to filter messages into a particular network segment or subnet. Subnet masks are expressed as four decimal numbers between 0 and 255 separated by periods. (Example: 255.255.255.1) It is used to create private IP addresses for use within a particular network. Also known as a network mask.

TCP/IP (Transmission Control Protocol/Internet Protocol): The basic communication protocol for the Internet. TCP breaks data down into packets, “reassembles” the data at its destination and verifies delivery. IP determines how to address and forward data and sets packet size limitations.

UDP (User Datagram Protocol): A communication protocol used in place of TCP when reliable delivery is not required. For example, UDP is used for realtime video traffic where lost packets are ignored because there is no time to retransmit.

VPN (Virtual Private Network): A private network of computers that use the public Internet to connect nodes. *See also: PPTP.*

WAN (Wide Area Network): A communications network that covers a wide geographic area (different buildings, cities, countries). The Internet is an example of a WAN.

xDSL: All types of DSL modems (ADSL, SDSL, HDSL, etc.).

Technical Specifications

LAN Ports	4 x 10/100 BaseT (RJ-45)
WAN Ports	2 x 10/100 BaseT (RJ-45, xDSL or Cable)
LEDs	1 x Power 1 x WAN 10/100M 1 x WAN Link/Activity 4 x LAN 10/100M 4 x LAN Link/Activity
Power	12V DC (500mA)
Dimensions	1.18 x 7.36 x 3.94 in. (30 x 187 x 100mm)
Certifications	FCC Class B, CE Mark, C-Tick

Technical Support

The following technical resources are available for this StarTech.com product:

On-line help:

We are constantly adding new information to the *Tech Support* section of our web site. To access this page, click the *Tech support* link on our homepage, www.startech.com. In the tech support section there are a number of options that can provide assistance with this card.

Knowledge Base - This tool allows you to search for answers to common issues using key words that describe the product and your issue.

FAQ - This tool provides quick answers to the top questions asked by our customers.

Downloads - This selection takes you to our driver download page where you can find the latest drivers for this product.

Call StarTech.com tech support for help: **1-519-455-4931**

Support hours: Monday to Friday 9:00AM to 5:00PM EST (except holidays)

Warranty Information

This product is backed by a two-year warranty. In addition StarTech.com warrants its products against defects in materials and workmanship for the periods noted below, following the initial date of purchase. During this period, the products may be returned for repair, or replacement with equivalent products at our discretion. The warranty covers parts and labor costs only. StarTech.com does not warrant its products from defects or damages arising from misuse, abuse, alteration, or normal wear and tear.

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