

Broadband Residential Gateway

User's Guide

Model No. BRG700

Rev: A1

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Preliminary

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FCC RF Radiation Exposure Statement:

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

TRADEMARKS

NDC is a trademark of NDC Inc. All other names mentioned in this document are trademarks/registered trademarks of their respective owners. NDC provides this document “as is,” without warranty of any kind, neither expressed nor implied, including, but not limited to, the particular purpose. We may make improvements and/or changes in this manual or in the product(s) and/or the program(s) described in this manual at any time. This document could include technical inaccuracies or typographical errors.

FCC WARNING

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

- Reorient or relocate the receiving antenna
- Relocate the equipment with respect to the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult your dealer or an experienced radio/TV technician for help

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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

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

Safety Declaration

Proper operation of this product according to the instructions found in this manual will result in user exposure to radio waves substantially below the FCC recommended limits.

- Do not touch or move the antenna(s) while the units are transmitting or receiving
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is of a type specially certified for such use.

Packing List

Check the contents of your package to ensure that they match the packing list below. If anything is missing or damaged, contact the store where you purchased the product.

The BRG700 package contains the following:

- One BRG700 Device
- One Power Adapter
- One Quick Guide
- One CD-ROM with User's Guide in PDF format
- One straight-through RJ-45 UTP cable
- Registration card (or go to www.ndc.com.tw for on-line registration) Register to receive free:
 - Warranty protection (1 year on the BRG700 device and the power adapter)
 - Information on upcoming product releases and special product offers
 - Free technical support and firmware upgrades

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Chapter 1: Introduction

The NDC Broadband Residential Gateway provides convenient Internet access to office/family users by sharing a single Broadband Service Provider (BSP) account. The BRG700 functions with cable/DSL modems and allows up to 253 computers, installed with an Ethernet NIC or wireless NIC, to share secure broadband Internet access simultaneously.

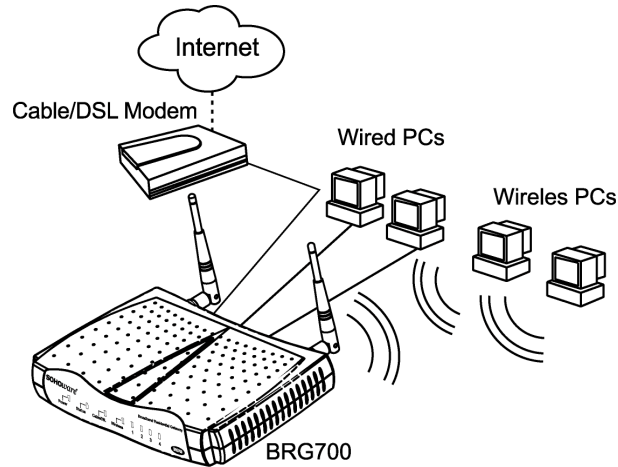


Figure 1. BRG700 Connections

The BRG700 combines an access point, router, and firewall into a single device. It is optimized for home offices sharing an Internet connection among several desktop PCs, mobile PCs or handheld devices.

The BRG700 is designed with an easy-to-use web-based configuration program and can be set up within minutes of removing it from the box. Based on the IEEE 802.11b specification, the BRG700 supports a network of up to 128 computers, installed with a wireless networking card. Additionally, 128-bit encryption and an embedded firewall help protect against network intrusions.

Embedded Network Address Translation (NAT) enables you to use a private set of IP addresses that the BRG700 translates into a single public IP address. The BRG700 can also act as a DHCP server and automatically allocate a dynamic IP address to each computer on the network.

The enhanced firewall and the Access Control feature monitor incoming and outgoing data packets and filter requests from local computers. Together they allow parents/employers to see how the network connection is being used, and protect all PCs behind the BRG700.

Features and Benefits

- **Share Your Internet Connection** – Built-in NAT, DHCP, and 10/100 Ethernet Switch allow multiple users to share a single cable/DSL account simultaneously.
- **Easy-to-use** – No driver or software required. Easily configured and managed through a web browser (Netscape Communicator 4.0/Microsoft Internet Explorer 3.0 or above), from LAN-connected PCs.
- **Built-in Firewall** – Security via NAT (Network Address Translation) protects your network from intruders. Built in anti-attack algorithm (Stateful Packet Inspection and Denial of Service) protect your PCs from hacker attacks.
- **Multi-DMZ** – This feature places multiple PCs on your network outside the protection of the firewall and allows them to respond to requests from the Internet, e.g. for multiple simultaneous connections to a PPTP server.
- **Port Forwarding** – Provides enhanced security. The firewall accepts IP packets addressed to a specific port number. Port Forwarding then re-writes the header information on the packets and forwards them to the internal server providing the actual service. The reply packets from the internal server are re-written to make it appear that they came from the firewall.
- **Access Control** – Provides management and control of Internet application use. The feature allows parents/employers to monitor what their children are doing or to see how the network connection is being used.
- **Flexible and Expandable** – Connects directly to computers or to an Ethernet hub/switch for network expansion.
- **Virtual Private Network (VPN)** – Allows Internet security protocol packets such as PPTP to pass through the BRG700 so that a remote PC can securely access a server located on your network, or allows a PC behind the BRG700 to remotely access a VPN server.
- **Multimedia Streaming Protocol** – Multimedia data is streamed at a constant rate for best enjoyment of RealPlayer, QuickTime, IP/TV, Video on Demand, and Video Phone.
- **Intelligent Routing** – Built in RIP I & II routing protocols. The BRG700 automatically learns the outside Internet infrastructure and determines the most efficient data transfer route.
- **FCC Class B Certified** – Safe for use in residential environments.

Getting to Know Your BRG700

Front Panel

Users can monitor the status of the BRG700 via the LEDs on the front panel (Figure 2).

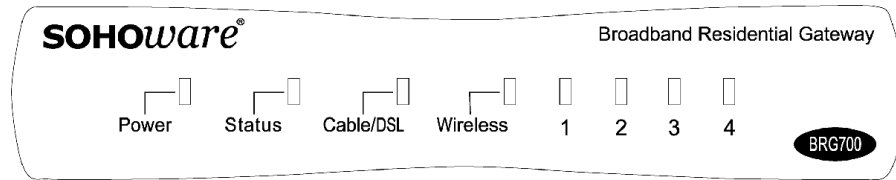


Figure 2. Front Panel

LED Indicators

LED	Color	Function
<i>Power</i>	Green	Lit: Power ON Unlit: Power OFF
<i>Status</i>	Red	Blinking: On power-up the BRG700 checks for proper operation. The checking procedure takes only a few seconds Lit: If this LED is always lit, the device is not working properly. Go to Chapter 4: Troubleshooting, page 56
<i>Cable/DSL</i>	Orange	Lit: Indicates a good connection to a cable/DSL modem Blinking: Data is being transmitted/received to/from a cable/DSL modem
<i>Wireless</i>	Green	Blinking: Indicates the activity of Wireless LAN data
<i>LAN Ports 1~4</i>	Green Orange	Lit/Blinking: Indicates the link status and activity of 100Mbps Ethernet data Lit/Blinking: Indicates the link status and activity of 10Mbps Ethernet data

Rear Panel

Rear Panel ports are shown below (Figure 3)



Figure 3. Rear Panel

LAN Ports	There are four 10/100Base-T Switch ports for linking computers or other Ethernet devices. When linking to other networking devices, e.g. a hub/switch, we need a cross-over cable or an uplink port on that device
Cable/DSL Port	An Ethernet 10Base-T port is used for linking to the Ethernet port of a cable/DSL modem
Reset	Re-start the BRG700 by pressing the <i>Reset</i> button for 1~3 seconds. If you forget the password for the Setup Wizard, restore the default settings by pressing the reset button for longer than 5 seconds. Enter the default users name (admin) and password (1234) to regain access to the BRG700.
Power (5V)	Used to connect the external power adapter supplied with the BRG700. Note that only the supplied adapter should be used.

Chapter 2: Installation

What You Need

Before installing the NDC BRG700 you need the following:

Any Network Operating System with:

- TCP/IP installed
- Internet browser installed
- 10Mbps/100Mbps or 10/100Mbps Ethernet network adapters installed

Broadband Internet Account

You should be subscribed to a broadband Internet service and have a cable/DSL modem with a 10Base-T interface. Know whether your Public IP address is fixed or is dynamically assigned (ask your Broadband Service Provider).

1. If your IP address is dynamically assigned (most common), the BRG700 will automatically get a public IP address from your BSP through the modem. You will not need to do any IP address configuration.
There is no need to enter any information in *Broadband Connection* unless your BSP has assigned you specific Internet connection information (Host Name, Domain Name, MAC address authentication, PPPoE, or a static IP address).
To do a manual setup, type **192.168.1.1** into the web address location on a web browser on any connected PC. Enter the factory default user name **admin** and password **1234**. After clicking **OK**, you will enter the setup home page. Select **Cable** or **DSL** to begin setup of the broadband connection.
2. If you have an AT&T cable service (formerly MediaOne), or any service that requires a Media Access Control (MAC) address for authentication, when you are setting up the BRG700 for first use, only the PC with the registered Ethernet card's MAC address should be connected to the BRG700.
3. If you have a DSL service with PPPoE, obtain the following information from your BSP:
 - The user login name
 - The login password
 - Service name (some BSPs may not require you to use this)
4. If you have a fixed public IP address, obtain the following information from your BSP

- The assigned Gateway IP address
- Domain Name Server's IP address
- Subnet Mask

Hardware Installation

All the connection ports are on the rear panel of the BRG700. One straight-through cable is supplied. Most Cable and DSL modems use straight-through Ethernet cable so use this cable unless you know you need a crossover cable. Follow the steps below to complete the hardware installation.

- step1.** Connect one end of the cable to the port marked *Cable/DSL* on the BRG700
- step2.** Connect the other end of the cable to the Ethernet or Output port of your cable or DSL modem
- step3.** Turn ON both the modem and BRG700. Observe the Link indicator on the modem and the indicator marked *Cable/DSL* on the front of the BRG700. If the indicators are lit, you have a good connection. If the indicators are not lit, then your modem requires a crossover cable - replace it with a crossover cable

Note: Use only the power adapter supplied with the BRG700.

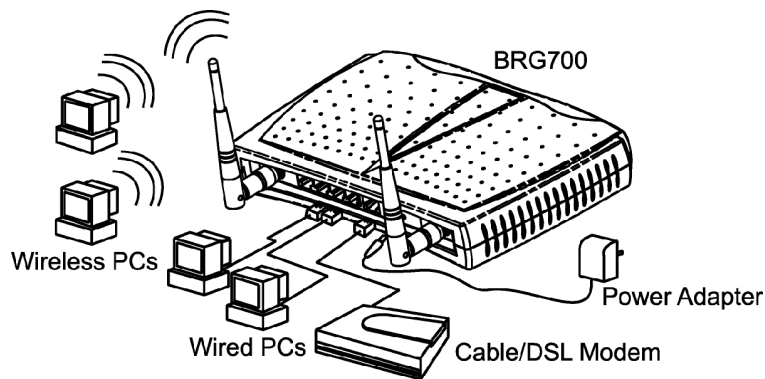


Figure 4. Connecting the BRG700

Note: Only one PC should be connected to the BRG700 during MAC Address Cloning.

Installation Considerations

Designed to operate up to 300 feet indoors and up to 1000 feet outdoors, the BRG700 lets you access your network from anywhere you want. Keep in mind, however, that the number of walls, ceilings, or other objects that the wireless signals must pass thru will limit range. Typical ranges vary depending on the types of materials and background RF noise in your home or business. The key to maximizing range is to follow these basic principles:

- For the best data transmission/reception quality, you should place the BRG700 as high as possible
- Keep the number of walls and ceilings to a minimum - Each wall or ceiling can reduce your BRG700 range from 5-100 feet. Position your BRG700 and computers so that the number of walls or ceilings is minimized
- Be aware of the direct line between BRG700 and Computers - A wall that is 16 feet thick, at a 45 degree angle appears to be almost 3.2 feet thick. At a 2 degree angle it looks over 45 feet thick! For best reception, try to make sure that the BRG700 and wireless networking adapters are positioned so that the signal will travel horizontally through a wall or vertically through a ceiling
- Building Materials make a difference - A solid metal door or aluminum studs may have a negative effect on range. Again, try to position the BRG700 and computers so that the signal passes through drywall or open doorways and not other materials
- Make sure that the antenna is positioned for best reception by using the software signal strength tools offered by your wireless networking adapter supplier
- Keep the BRG700 away (at least 3.5-7 feet) from electrical devices that generate RF noise, e.g. microwave ovens, monitors, electric motors, etc. For the average American 4-bedroom home, range should not be a problem. If you experience low or no signal strength in areas of your home that you wish to access, consider positioning the Access Point in a location directly between the Residential Gateways and/or Computers that will be connected. Additional Access Points can be connected to provide better coverage in rooms where the signal does is not as strong as desired

Placement

Your BRG700 should be placed in a safe and secure location. To ensure proper operation, keep the unit away from water and other damaging elements.

Safety Precautions

- Do not try to open or repair the BRG700 yourself
- Do not place the BRG700 in a damp or humid location, i.e. a bathroom.
- The BRG700 should be placed in a sheltered and non-slip location within

- a temperature range of 32 to 122°Fahrenheit.
- Keep the wrapping bag of the BRG700 and the clip binding the cable out of reach of children and babies to avoid choking.
- Do not expose the BRG700 to direct sunlight or other heat sources

Some BSPs use an Ethernet adapter's MAC address as an identifier to provide Internet service. In these cases you need to clone the Ethernet adapters MAC address to the BRG700. At the BRG700, disconnect the Ethernet cables from the other PCs on the network, leaving only the PC with the Ethernet adapter that you wish to register connected.

Note: If you previously used a registered MAC address to connect to your broadband service, you need to clone this Ethernet adapter's MAC address to the BRG700 (see MAC Address Clone, page 27).

Network Extension

This section describes how to extend your BRG700 LAN using one of our NDC products, e.g. a 10Mbps or 10/100Mbps Ethernet Hub/Switch.

Easy two-step installation procedure:

- step1.** Set the Uplink port of the external hub/switch to the *Uplink* position
- step2.** Use standard RJ-45 Ethernet cable to connect any BRG700 LAN port to the *Uplink* port of the hub/switch. If the device does not feature an Uplink switch, use a cross-over cable

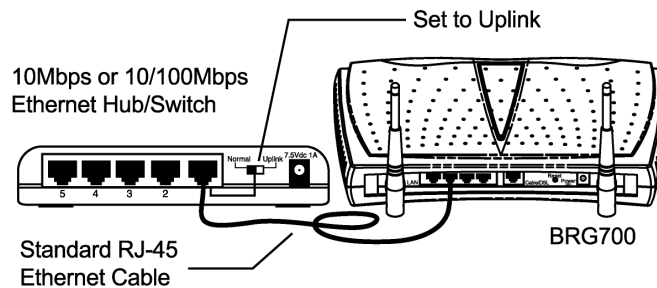


Figure 5. Wired LAN Extension

TCP/IP Settings

If your local network will access the Internet through a single IP, you need to configure the TCP/IP settings. For Windows 95/98/Me, see the following section, for Windows NT 4.0 go to page 13, and for Windows 2000 go to page 16. For Mac OS users, turn to page 20.

Windows 95/98/Me

step1. Click *Start/Settings/Control Panel* (Figure 6)



Figure 6. Control Panel

step2. In *Control Panel*, double-click the *Network* icon. The *Network* dialog box will open (Figure 7)

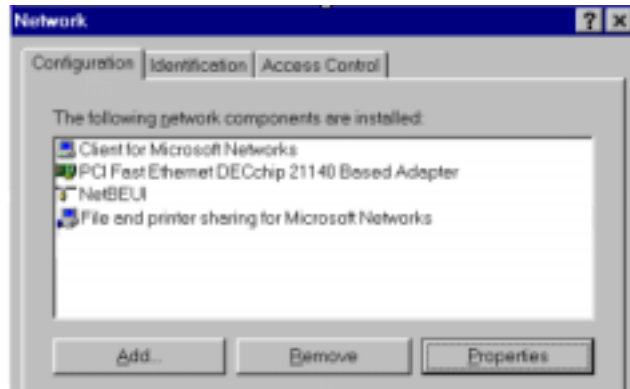


Figure 7. Network

- step3.** If TCP/IP is already shown in the list, go to Step 6. If not, click *Add*. The *Select Network Component Type* dialog box will open (**Figure 8**)



Figure 8. Select Network Component Type

- step4.** Double-click *Protocol*. The *Select Network Protocol* dialog box will open (**Figure 9**)

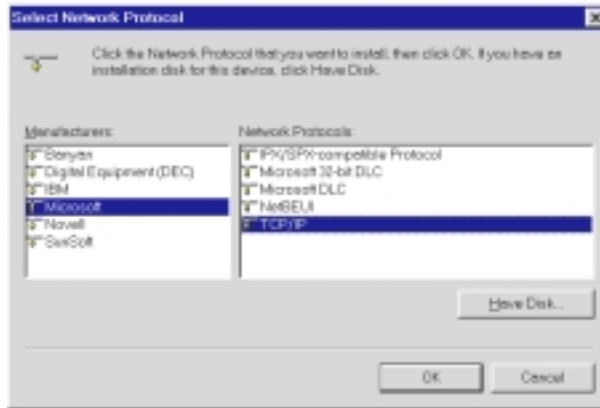


Figure 9. Select Network Protocol

- step5.** In the left window, choose *Microsoft*. In the right, select *TCP/IP*. After the TCP/IP component is completely installed, click **OK**. You will be returned to the *Network* menu (**Figure 10**). The *TCP/IP* item in the *Network* box indicates that TCP/IP has been installed

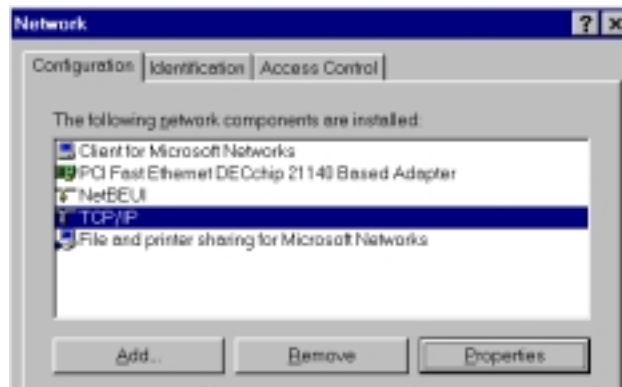


Figure 10. Network

- step6.** On the *Configuration* card (**Figure 10**), select *TCP/IP* and click **Properties**. The *TCP/IP Properties* dialog box will open (**Figure 11**)

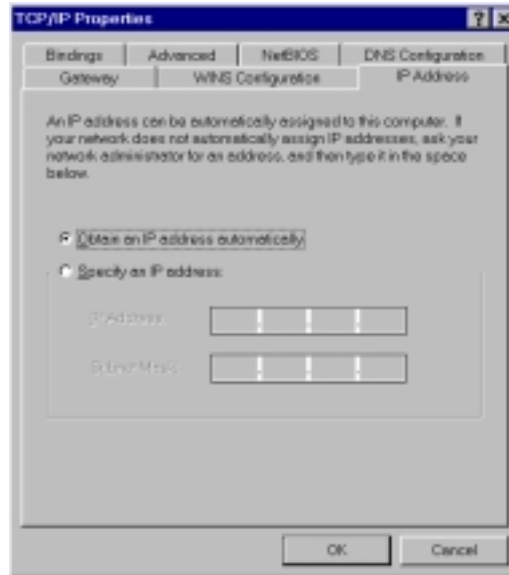


Figure 11. TCP/IP Properties-1

- step7.** On the *IP Address* page (**Figure 11**), check ***Obtain an IP address automatically***. Click **OK** and go to step 12. If you want to assign a static IP to a PC, go to step 8

Note: The BRG700 operates as a DHCP server (it automatically assigns an IP address to connecting computers) and must be the only DHCP server on the network.

- step8.** On the *IP Address* page (**Figure 11**), select ***Specify an IP address*** and assign an IP to your PC in the *IP Address* field. If you keep the starting dynamic IP address as default (default is .100. See the page of DHCP Settings), assign an IP address within the BRG700 IP address range (excluding the range .100~.254).
- step9.** Enter the BRG700's subnet mask into the *Subnet Mask* field. The default value is 255.255.255.0
- step10.** Click the *Gateway* tab and enter the BRG700's IP address into the *New Gateway* field (the default value is 192.168.1.1). Click **Add** to add this value to the *Installed Gateway* list. Click **OK**



Figure 12. TCP/IP Properties-2

- step11.** On the *DNS Configuration* page (**Figure 12**), check **Enable DNS**. Enter your PC name into the *Host* field (see Finding your PC Host Name, page 28) and your BSP's domain name into the *Domain* field. Enter your BSP's domain name server's IP address into the *DNS Server Search Order* field and click **Add**. If you don't know your BSP's domain name and domain name server IP address, contact your BSP to get this information
- step12.** Click **OK**. The system will ask you to restart the computer. Click **Yes** to complete the installation

Windows NT 4.0

- step1.** Click *Start/Settings/Control Panel*

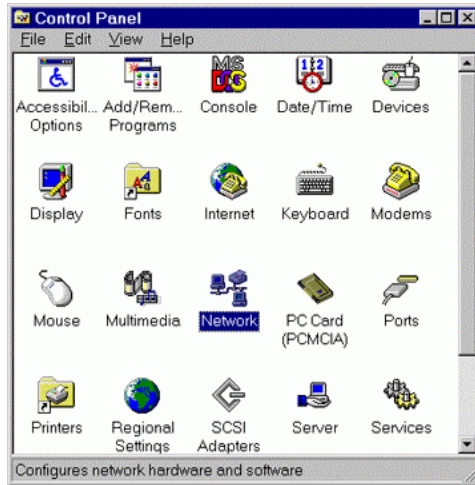


Figure 13. Control Panel

- step2.** Double-click the *Network* icon (**Figure 13**). The *Network* dialog box will open (**Figure 14**)

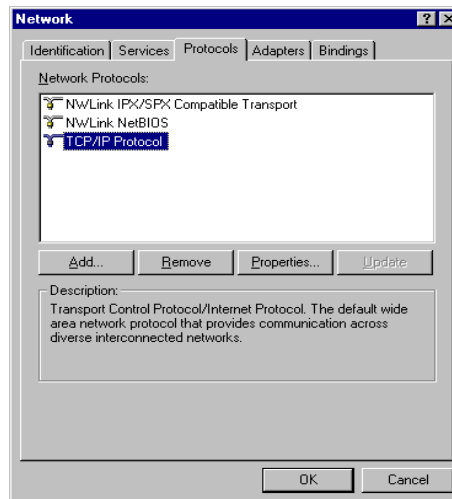


Figure 14. Network

- step3.** On the *Protocols* card, select *TCP/IP Protocol* and click *Properties* (**Figure 14**)

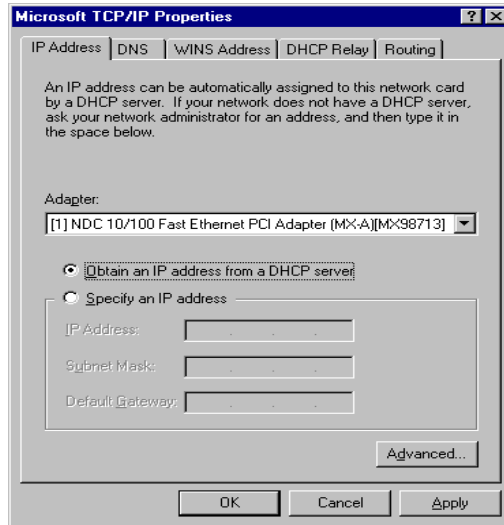


Figure 15. Microsoft TCP/IP Properties-1

- step4.** On the *IP Address* page (**Figure 15**), check *Obtain an IP address from a DHCP server*. Click **OK** and go to step 8. If you want to assign a static IP to a PC, go to step 5

Note: The BRG700 operates as a DHCP server (it automatically assigns an IP address to connecting computers) and must be the only DHCP server on the network.

- step5.** On the *IP Address* page (**Figure 15**), select *Specify an IP address* and assign an IP address to your PC in the *IP Address* field. If you keep the starting dynamic IP address as default (default is .100. See the page of DHCP Settings), assign an IP address within the BRG700 IP address range (excluding the range .100~.254).
- step6.** Enter the BRG700's subnet mask into the *Subnet Mask* field. The default value is 255.255.255.0. Enter the BRG700's IP address into the *Default Gateway* field (the default value is 192.168.1.1). Click **OK**
- step7.** On the *DNS* page, enter your PC name into the *Host name* field (see Finding your PC Host Name, page 28) and your BSP's domain name into the *Domain* field. Enter your BSP's domain name server's IP address into the *DNS Service Search Order* field and click **Add**. If you don't know your BSP's domain name and domain name server IP address, contact your BSP to get this information.

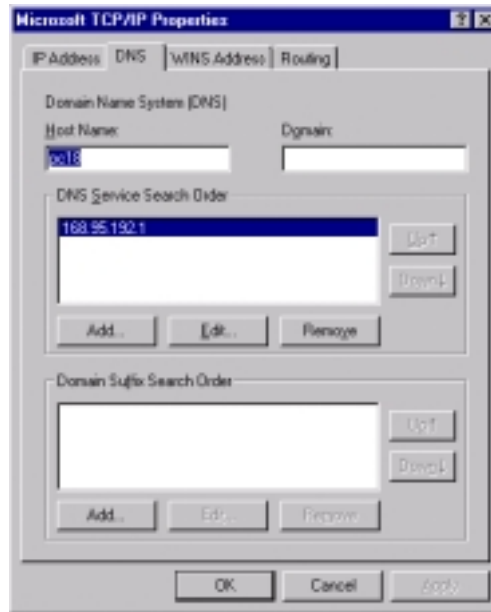


Figure 16. Microsoft TCP/IP Properties-2

step8. The system will ask you to restart the computer. Click *Yes* to complete the installation

Windows 2000

step1. Click *Start/Settings/Control Panel*



Figure 17. Control Panel

- step2.** Double-click the *Network and Dial-up Connections* icon (Figure 17). The *Network and Dial-up Connections* window will open (Figure 18)



Figure 18. Network and Dial-up Connections

- step3.** Double-click *Local Area Connection*. The *Local Area Connection Status* dialog box will open (Figure 19)

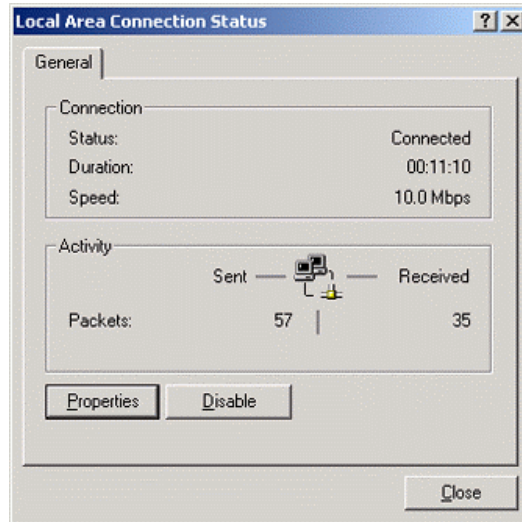


Figure 19. Local Area Connection Status

step4. Click *Properties*

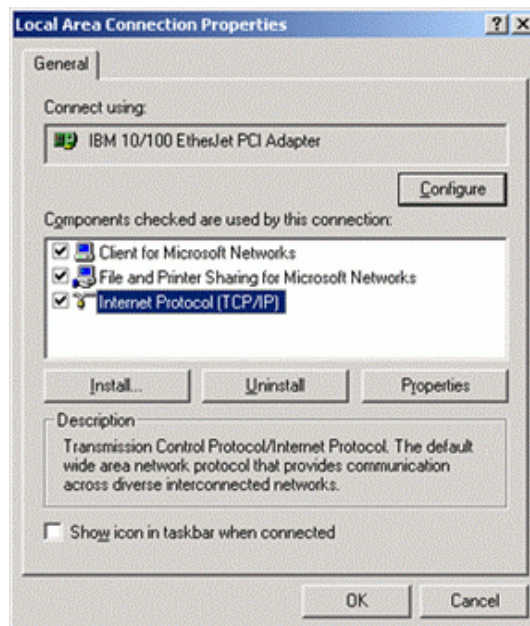


Figure 20. Local Area Connection Properties

- step5.** Select *Internet Protocol (TCP/IP)*, and click *Properties* (**Figure 20**). The *Internet Protocol (TCP/IP) Properties* window will open (**Figure 21**)

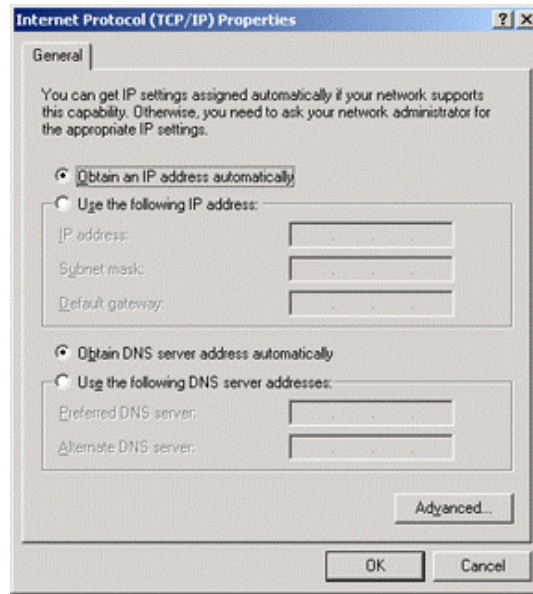


Figure 21. Internet Protocol (TCP/IP) Properties-1

- step6.** Select *Obtain an IP address automatically* and *Obtain DNS server address automatically*. Click **OK** and go to step 10. If you want to assign a static IP to a PC, go to step 7

Note: The BRG700 operates as a DHCP server (it automatically assigns an IP address to connecting computers) and must be the only DHCP server on the network.

- step7.** Check *Use the following IP address* (**Figure 22**) and enter an IP address for your PC in the *IP Address* field. If you keep the starting dynamic IP address as default (default is .100. See the page of DHCP Settings), assign an IP address within the BRG700 IP address range (excluding the range .100~.254).
- step8.** Enter the BRG700's subnet mask into the *Subnet Mask* field. The default value is 255.255.255.0. Enter the BRG700's IP address into the *Default Gateway* field (the default value is 192.168.1.1). Click **OK**
- step9.** Check *Use the following DNS server addresses* (**Figure 22**) and enter a DNS IP address for your BSP in the *Preferred DNS server* field. If you

don't know your BSP's domain name server IP address, contact your BSP to get this information

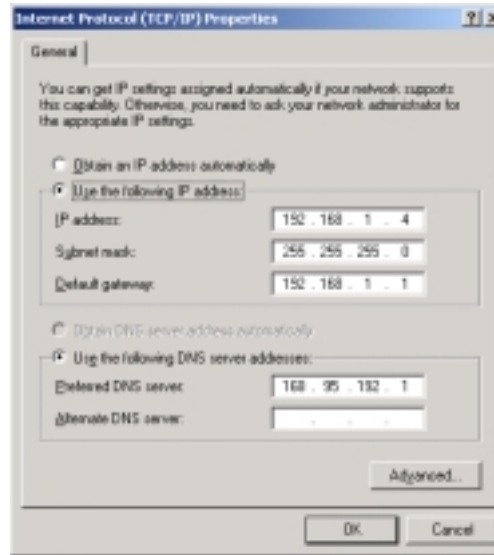


Figure 22. Internet Protocol (TCP/IP Properties-2

step10. Click **OK** to complete the installation

Mac OS

Using the DHCP server to assign an IP address

step1. Click the *Apple* icon in the upper left corner of the screen and select *Control Panel/TCP/IP*. The *TCP/IP (Setup Ethernet)* dialog box will appear as shown in **Figure 23**

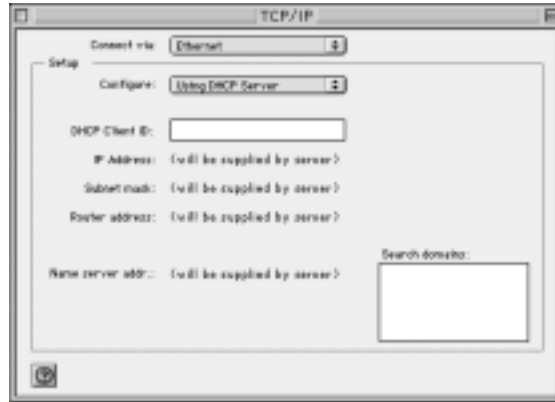


Figure 23. Using the DHCP Server

- step2.** From the *Connect Via* list box, choose *Ethernet*
- step3.** From the *Configure* list box, choose *Using DHCP Server*
- step4.** Leave the *DHCP Client ID* field blank

Manual Assignment of IP addresses

- step1.** Click the *Apple* icon in the upper left corner of the screen and select *Control Panel/TCP/IP*. The *TCP/IP (Setup Ethernet)* dialog box will appear as shown in **Figure 24**



Figure 24. Manual Configuration of IP Addresses

- step2.** From the *Connect Via* list box, choose *Ethernet*
- step3.** From the *Configure* list box, choose *Manually*

- step4.** If you keep the starting dynamic IP address as default (default is .100. See the page of DHCP Settings), assign an IP address within the BRG700 IP address range (excluding the range .100~.254).
- step5.** In the *Subnet mask* field, enter the BRG700's subnet mask. The default value is *255.255.255.0*
- step6.** In the *Router address* field, type the BRG700 IP (the default value is *192.168.1.1*)
- step7.** In the *Name server addr.* field, type the name server address(es) provided by your broadband service provider
- step8.** Close the screen and save the configuration

Chapter 3: Network Configuration

BRG700 Configuration

Configuration is simple and easy via a standard web browser (Netscape Communicator 4.0/Microsoft Internet Explorer 3.0 or above).

Before connecting to the BRG700, you must make the ESSID of your wireless networking card the same with the BRG700's. The default ESSID of the BRG700 is Wireless (case sensitive).

If you are already a NetBlaster II networking wireless card user, you must always use a web browser to configure your BRG700.

Enter the BRG700 Setup Home Page

- step1.** Start the web browser and type 192.168.1.1 in the address field (**Figure 25**). Press *Enter*

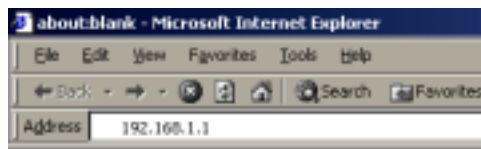


Figure 25. Entering the Setup Wizard

- step2.** The *Enter Network Password* window will open (**Figure 26**)

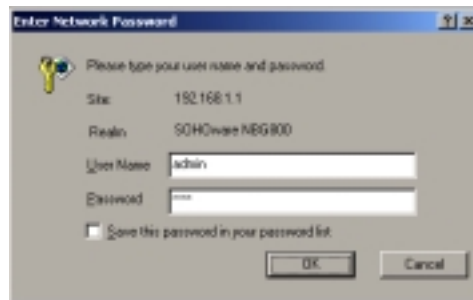


Figure 26. Enter Network Password

- step3.** Enter the factory default user name *admin*
step4. Enter the factory default password *1234*
step5. Click **OK**

Note: Refer to Change Password on page 34 if you wish to change the password (recommended).

Welcome Page

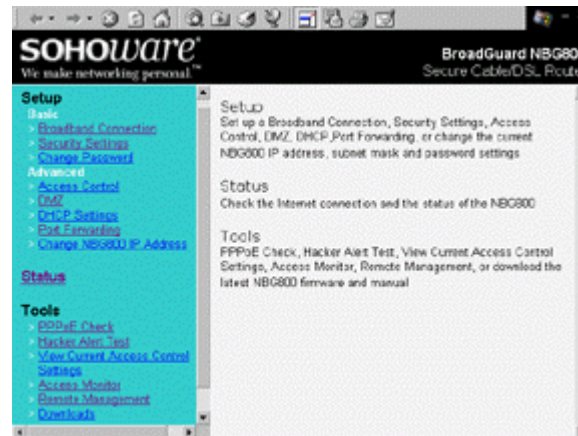


Figure 27. Setup Start Page

There are five sections on the home page:

Basic Setup

<i>Broadband Setup</i>	Use when your BSP (Broadband Service Provider) requests you to enter specific settings, e.g. MAC address authentication, PPPoE, host name/domain name, or specifies an IP address to make an Internet connection.
<i>Wireless Setup</i>	Set the Wireless configuration
<i>Time Zone</i>	Set your time zone.
<i>Change Password</i>	Changes the security password.
<i>DHCP Settings</i>	Enable/Disable the BRG700's DHCP server. Use to set the dynamic IP address range
<i>Change BRG700 IP</i>	Change the BRG700's default IP address (192.168.1.1) and subnet mask (255.255.255.0).

**Advanced
Setup**

<i>Security Settings</i>	An anti-attack algorithm is built into the BRG700 to protect your network from conventional hacker attacks. If you enable e-mail alerts, whenever the BRG700 detects an attack it will send a warning e-mail to the address entered here. If you disable firewall protection, <i>E-mail Alerts</i> are also disabled.
<i>Site Blocker</i>	Set web site up to 30 to restrict users to access
<i>Access Control</i>	The Access Control section allows you to control Internet use in your home/office.
<i>Port Forwarding</i>	Forward packets sent to the BRG700 from the external network to specified ports on the internal computers.
<i>DMZ</i>	Use this function to expose multiple PCs to the Internet for playing interactive Internet games, video conferencing, or VPN connections through the BRG700. To use the DMZ, you must set a static IP address for a DMZ PC and set that PC to use the selected IP address.

Tools

<i>Renew WAN IP Address</i>	Use this function to prevent your Internet connection dropped because many cable broadband service providers set their DHCP servers to frequently expire the lease on the IP address.
<i>PPPoE Check</i>	Checks PPPoE is functioning correctly.
<i>E-mail Alert Test</i>	Sends a test Alert E-mail.
<i>DHCP Assigned IP's</i>	Shows the IP addressed assigned to PCs.
<i>Log</i>	View log here to see what attacks been dropped and what traffic passed through the BRG700.

<i>Upgrades & Manual</i>	Upgrade the latest BRG700 firmware, UI, and manual.
------------------------------	---

Status

<i>View WAN connection status and Internet Network settings</i>
<i>View LAN Network Settings</i>
<i>View Firewall Status</i>

Restart

<i>Restarts the BRG700 to allow any changes to take affect</i>
--

Click the **Broadband Connection** link to begin setup of your broadband connection.

Basic Setup

Broadband Setup

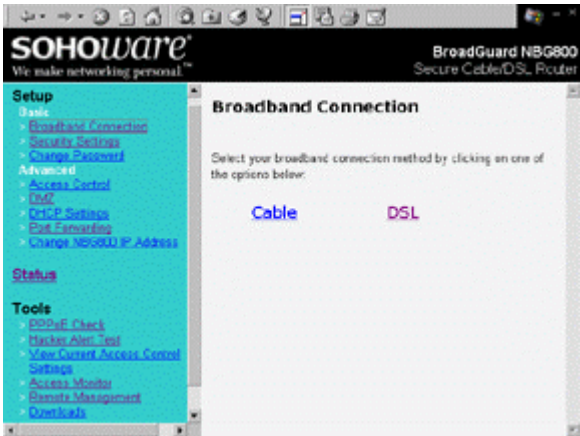


Figure 28. Broadband Setup

Select the type of Broadband service that you are subscribed to. Select either **Cable** or **DSL** to set up the network properties.

There is no need to enter any information in *Broadband setup* (**Figure 28**) unless your BSP has assigned you specific Internet connection information (Host Name, Domain Name, MAC address authentication, PPPoE, or a static IP Address).

Cable Setup

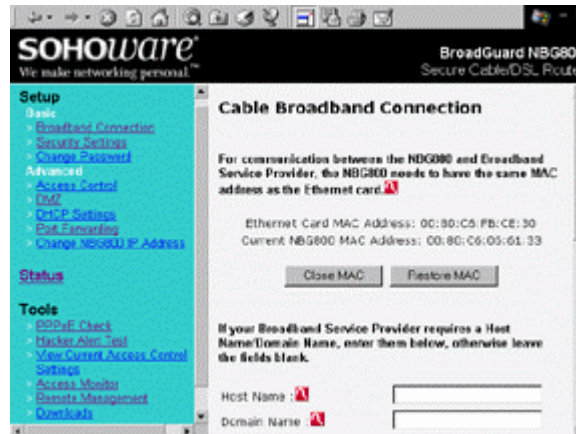


Figure 29. Cable Broadband Setup

MAC Address Clone: Some BSPs use a networking adapter's MAC address as an identifier to provide Internet service. In these cases, you need to clone the network adapter's MAC address to the BRG700.

At the BRG700, disconnect the network adapters from the other PCs on the network, leaving only the PC with the network adapter that you wish to register connected.

Note: If you previously used a registered MAC address to connect to your broadband service, you need to use the same network adapter and clone its MAC address to the BRG700.

There are two MAC addresses shown on the screen. One is the PC's network adapter MAC address, the other is the BRG700's. Click **Clone MAC** to change the IP address of the BRG700 to that of the network adapter. Click **Restore MAC** to restore the original MAC address of the BRG700.

Note: After saving the settings and restarting the BRG700, you **MUST** turn your Cable/DSL modem off and on.

Host Name: Some BSPs may ask their subscribers to enter information into this field in order to make a connection to their broadband service. Begin setting up the BRG700 with the computer originally installed by the @Home technician or the computer that you registered with your BSP - this computer will already contain your @Home Host Name.

Finding your PC Host Name

Windows 95/98/98SE/Me

- step1.** Right-click *Network Neighborhood*. Click *Properties*. The *Network* dialog box will open



Figure 30. Network-1

- step2.** Click on the *Identification* tab and write down the information contained in the *Computer Name* field – this is your Host Name

Windows NT 4.0

- step1.** Right-click *Network Neighborhood*. Click *Properties*. The *Network* dialog box will open



Figure 31. Network-2

- step2.** Write down the information contained in the *Computer Name* field – this is your Host Name

Windows 2000

- step1.** Right-click *My Computer*. Click *Properties*. The *System Properties* dialog box will open

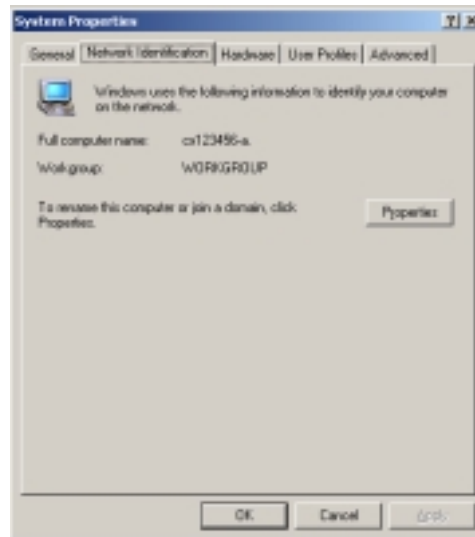


Figure 32. System Properties

step2. Click on the *Identification* tab and write down the information contained in the *Computer Name* field – this is your Host Name

Domain Name: Some BSPs may ask their subscribers to enter information into this field in order to make a connection to their broadband service. This is not necessary as the BRG700 will automatically get this information from the BSP's server.

Click **Save** and restart the BRG700. Go to the *Status* page to check whether your BRG700 has received all necessary IP address information from your BSP. Restart the PC used to configure the BRG700.

If your broadband service provider assigns you a static IP address, you must check ***Specify an IP Address*** and then enter all IP address information into all fields (**Figure 33**). If not, you can skip this step.

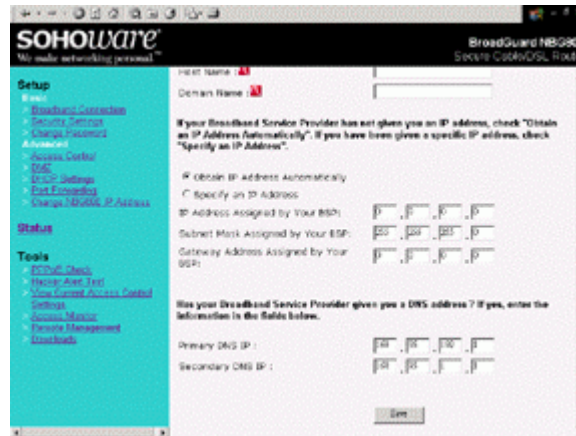


Figure 33. Cable Broadband Setup

If you do not wish to accept the BRG700 default IP address (192.168.1.1), go to the *Basic Setup---Change BRG700 IP* page to change it.

Click **Save**. If you do not wish to configure other items, click **Restart** to start sharing your broadband connection.

DSL Setup

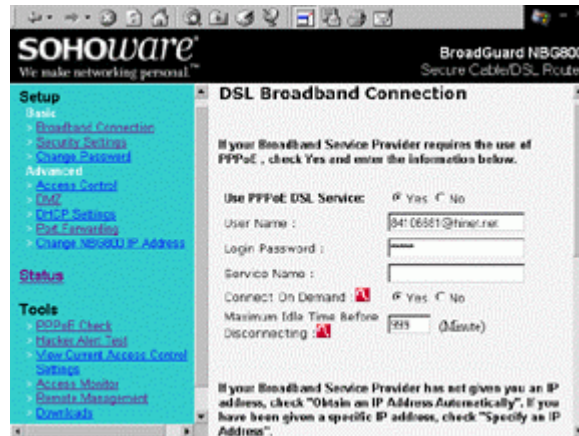


Figure 34. DSL Broadband Setup-1

Check **Yes** to enable PPPoE service. Several parameters are required to establish a DSL connection via PPPoE (User Name, Login Password, some broadband service providers also require a Service Name). Enter all information provided by your BSP into all required fields.

Connect-on-Demand --- This setting allows the BRG700 to automatically make a connection to your BSP whenever you launch an Internet application. The default setting is "Yes".

Maximum Idle Time Before Disconnecting --- If there is no activity on the connection within the time set here, the connection will be dropped.

Note: If you check "No" to Connect-on-Demand, "Maximum Idle Time Before Disconnection" won't be activated even if you enter a value into the field.

If your Broadband service provider assigns you a static IP address, you must set **Use PPPoE DSL Service** to **NO**. Next check **Specify an IP Address** and enter all IP address information into all fields. If not, you can skip this step.



Figure 35. DSL Broadband Setup-2

If you do not wish to accept the BRG700 default IP address (192.168.1.1), go to the *Basic Setup---Change BRG700 IP* page to change it.

Click **Save**. If you do not configure others items, click **Restart** to start sharing your broadband connection.

Wireless Setup

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Figure 36. Wireless Setup-1

If your PC has a wireless networking card installed, you have to do some configuration to make sure that the wireless connection is working properly.

SSID: Identifies the wireless group of computers that your computer is in. A wireless group is composed of the computers that you need to communicate with, and contains the network resources you will want to use. This field is defined in the 802.11b Wireless Standard as SSID (Service Set ID).

Transmission Rate: The default is *Fully Automatic*. The data rate is automatically adjusted based on the receiving data error rate. Usually the connection quality will vary depending on the distance between the wireless hub and wireless adapter. You can also select a lower transmission data rate to maximize the radio communication range.

Basic Rate: The highest rate specified will be the rate that the BRG700 will use when transmitting broadcast/multicast and management frames. Available options are: All (1, 2, 5.5, and 11Mbps), and 1, 2Mbps.

Channel: The BRG700 will automatically assign itself a radio channel, or one may

be selected manually. The following table shows the channels and non-overlapping channels.

<i>Channels Available</i>	<i>Non-Overlapping Channels</i>
11	Channel 1 Channel 6 Channel 11

Note: Non-overlapping channels cannot communicate with each other or with resources on their respective networks

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Figure 37. Wireless Setup-2

Encryption provides more secure wireless data communication. The default is *Disabled* and initially the keys section will be blank.

Two levels of encryption are provided:

- 40-bit WEP (Wired Equivalent Privacy) encryption
- 128-bit WEP (Wired Equivalent Privacy) encryption

- step1.** Choose the encryption method
- step2.** Enter a security keyword or phrase. The string may contain both letters and numbers. The maximum number of characters is 255. The key is case sensitive; input using capital letters will produce a different key from the same words input in lower case. Click **Generate**
- step3.** Four keys will be generated (if you chose 128-bit, only one key will be generated). Select any one of them and enter the number for the key in the *Default Key* field. If you do not select a key, key 1 is selected as the default key. Record this key carefully, e.g. key #1 (9C9627A395)
- step4.** Click **Save** and click **Restart** to make the key effective and enable secured communication mode

Time Zone

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Figure 38. Time Zone-1

For accurate timing of the events recorded in the log, you need to set your time zone.

Select your time zone from the dropdown list (figure XX)

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Figure 39. Time Zone-2

If your area requires it, check to automatically adjust the clock for daylight saving changes.

Click **Save**. If you do not wish to configure others items, click **Restart** to start sharing your broadband connection.

Change Password

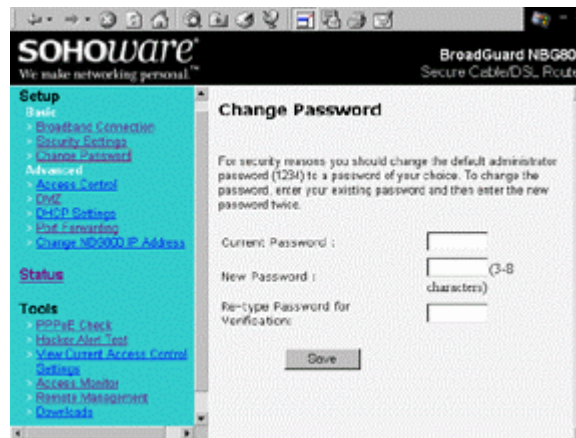


Figure 40. Change Password

For security reasons you should change the default administrator password (1234) to a password of your choice.

step1. Enter the current password, the new password, and then retype it for verification. Click **Save**. Click **Restart** to initialize the BRG700 with the new password

step2. The *Enter Network Password* dialog box will open

- step3.** Enter the username *admin*, and key in the new password. Click **OK** and you will enter the BRG700 Welcome page again
- step4.** Click **Save**. If you do not wish to configure others items, click **Restart** to start sharing your broadband connection

DHCP Settings

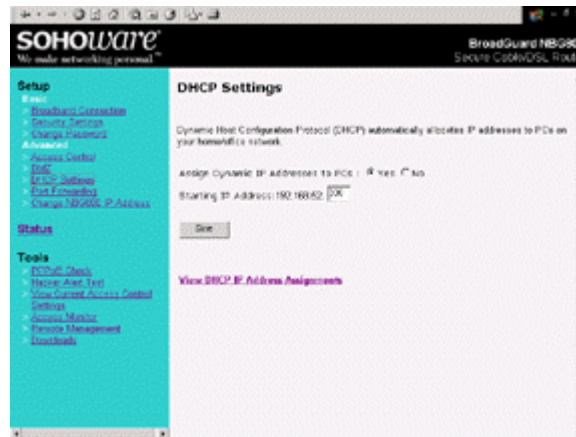


Figure 41. DHCP Settings

Under normal operation, all client PCs' IP addresses are automatically assigned by the BRG700's DHCP server.

The IP address range runs from 192.168.1.1 to 192.168.1.254. Up to 253 IP addresses may be assigned to client PCs. The IP address 192.168.1.1 is reserved for the BRG700. The other IP addresses are divided into two IP groups. One is the dynamic IP group, the other is the static IP group.

The dynamic IP start address may be specified by the user, e.g. 192.168.1.100 (default value). Once this start IP address has been assigned, all IP addresses running from 192.168.1.100 to 192.168.1.254 will be part of the dynamic IP address pool. IP addresses from 192.168.1.2 to 192.168.1.99 will be available as static IP addresses.

You can see the client PC's information on the *DHCP Assigned IPs* page in the *Tools* menu.

Click **Save**. If you do not wish to configure others items, click **Restart** to start sharing your broadband connection.

Change BRG700 IP

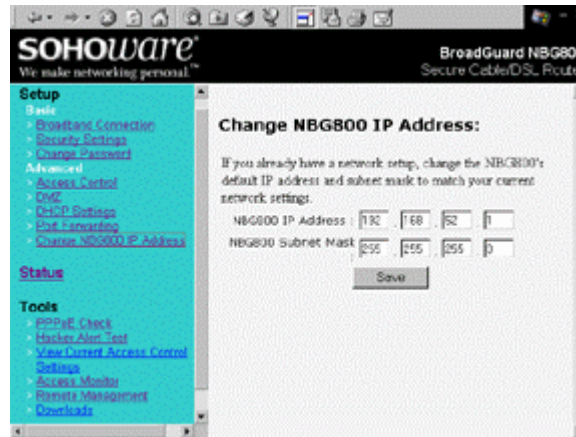


Figure 42. Change the BRG700 IP Address

If you do not wish to accept the BRG700 default IP address (192.168.1.1) and subnet mask (255.255.255.0), change them to a setting of your choice.

Click **Save** and **Restart** to restart your BRG700. Close your browser. Release and renew your PC's IP address in order to get a new IP address (For Windows 95/98/Me go to page 57, for Windows NT 4.0, see page 58. For Windows 2000 see page 59).

Advanced Setup

Security Settings



Figure 43. Security Settings

Two anti-attack algorithm, SPI (Stateful Packet Inspection) and anti-DoS (Denial of Service), are built into the BRG700 so that it can protect client PCs from common hacker attacks (see page 64 for an explanation of these terms). With a BRG700, you have a professional firewall but without the need for specialized setup/configuration. A BRG700 gives your network protection from many kinds of hacker attacks.

Ping from WAN Side: This option allows you to remotely ping the WAN IP address of the BRG700 to verify that the BRG700 is alive. In the interests of network security, we recommend that you enable it only when necessary.

Enter the e-mail address to which the warnings should be sent, to enable the e-mail alert function. If you turn on the e-mail alert function, whenever the BRG700 detects an Internet attack it will automatically send an e-mail with an attached log file to you.

Note: If you check “No” to disable firewall protection, no e-mail alerts are sent out even you have entered an e-mail address.

The info. in the log file will look something like the following:

```
udp -(203.69.97.139 ,211.55.79.155 )-840 -port scan attack-forward
udp -(203.69.97.139 ,211.55.79.155 )-546 -port scan attack-forward
udp -(203.69.97.139 ,211.55.79.155 )-544 -port scan attack-forward
```

In the example above, the first IP address (203.69.97.139) on each line indicates the address the hacker is using. The second (211.55.79.155) is the user's Internet

IP address. As for numbers 840, 546, and 544, they are the ports numbers that are being attacked.

It is highly recommended that you use the default e-mail server provided by NDC as many e-mail servers refuse to relay e-mail.

Click **Save** to store the settings. If you do not wish to configure others items, click **Restart** to initialize the BRG700 with the new settings.

Site Blocker

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Figure 44. Access Control

You can control access to websites by entering either a full address or just a keyword. Any address that users browse to that contains the keyword will be blocked. Only PCs assigned static IP addresses (Advanced Setup/Access Control) may have their Internet access controlled.

Click **Save** to store the settings. Go to *Advanced Setup/Access Control* to add PCs to the restricted access list.

To disable Site Blocker, click **Clear All** and click **Save**. If you do not wish to configure others items, click **Restart** to initialize the BRG700 with the new settings.

Access Control



Figure 45. Access Control-1

This feature prevents up to 30 users (or children), from running specified Internet applications or accessing unsuitable websites (maximum 30 websites). In order to achieve this functionality, a static IP must be assigned to users who will be restricted.

Note: If you assign a static IP address to a PC, you will need to configure TCP/IP settings (see page 9) and related network settings.

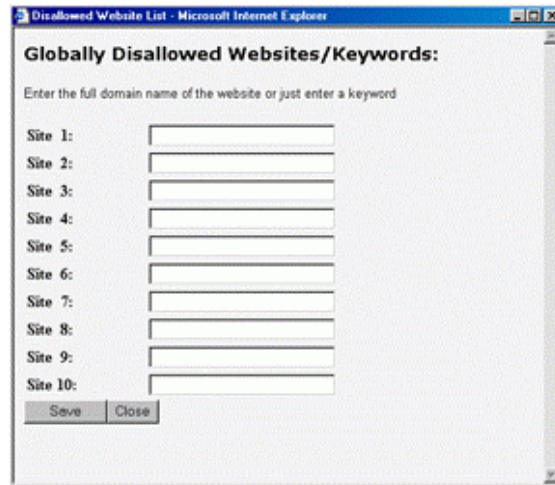


Figure 46. Add New Pic

You may control the Internet access of up to 30 PCs on your home/office network.

1. Click **Add PC**
2. Enter a *PC Description*. This is not necessarily the same as the *computer name* displayed in the networking configuration of the client PC
3. Enter the PC IP address into the *PC IP Address* field
4. Check the boxes for the applications you wish to deny to this IP address
5. Click **Save**

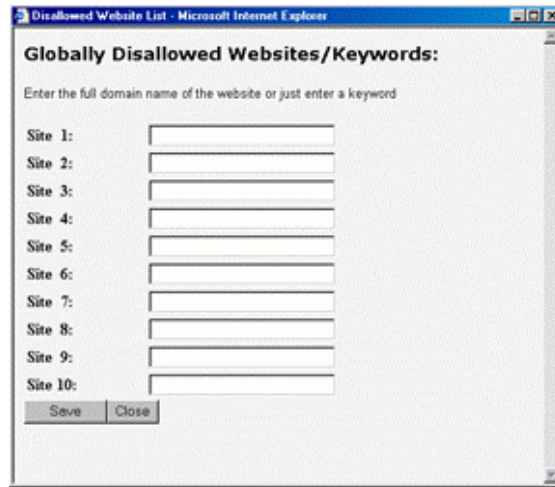


Figure 47. Access Control-2

Click *Edit* to change the PC setting or click *Remove* to delete this PC from *Access Control*.

If you do not wish to configure others items, click ***Restart*** to initialize the BRG700 with the new settings.

Port Forwarding

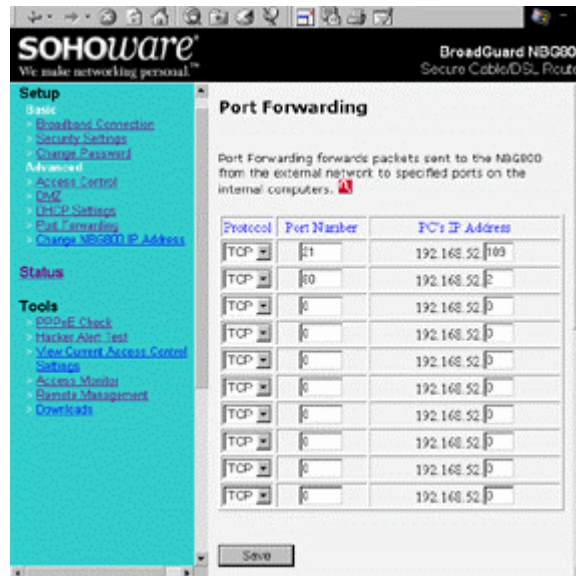


Figure 48. Port Forwarding-1

An increasing number of web applications, games, etc. need access to some service on your local computer in order to function properly. Since this access may pose a security problem, the machine providing the service should not be directly connected to the Internet.

Port Forwarding provides an almost ideal solution to this access problem. On the firewall, IP packets that come in to a specific port number are re-written and forwarded to the internal server providing the actual service. The reply packets from the internal server are re-written to make it appear that they came from the firewall.

In order to achieve this functionality, a static IP must be assigned to users who will be restricted.

Note: If you assign a static IP address to a PC, you will need to configure TCP/IP settings (see page 9) and related network settings.

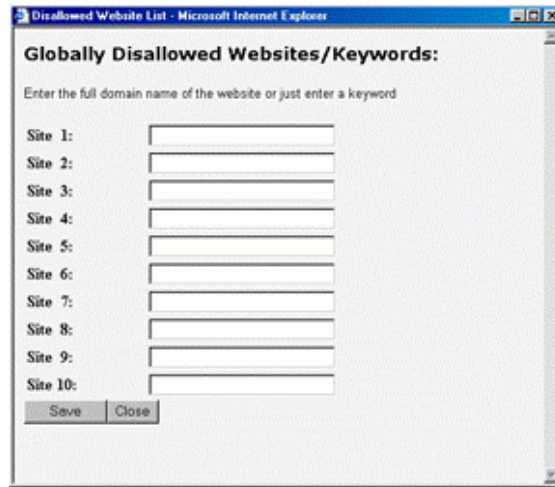


Figure 49. Add PC

1. Click **Add PC**
2. Enter a *PC Description*. This name is not necessarily the same as the *computer name* displayed in the networking configuration of the client PC
3. Enter the PC IP address into the *Destination PC IP Address* field
4. In the *Protocol* column, choose either TCP or UDP
5. Enter the port number you wish to open in the *Port Number* field. Well known ports include 7(Echo), 21(FTP), 23(TELNET), 25(SMTP), 53(DNS), 79(Finger), 80/8080(HTTP), 110(POP3), 113(Authentication Service), 119(NNTP), 161(SNMP), 162(SNMP Trap), 1723(PPTP)
6. Click **Save**

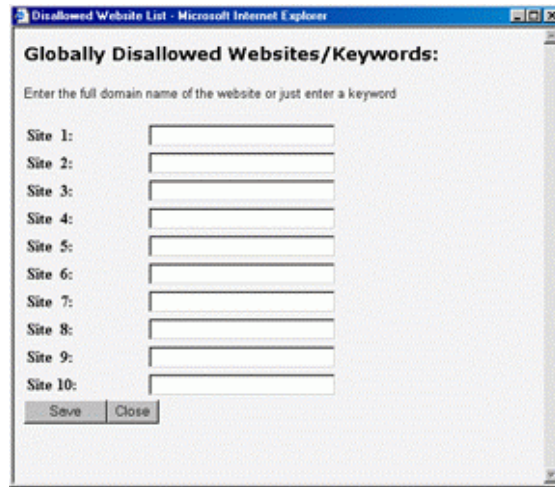


Figure 50. Port Forwarding-2

Click *Edit* to change the PC setting or click *Remove* to delete this PC from *Access Control*.

If you do not wish to configure others items, click ***Restart*** to initialize the BRG700 with the new settings.

DMZ



Figure 50. DMZ

Usually all PCs connected to the BRG700 are protected from Internet intruders by the built-in firewall (if enabled). For some kinds of Internet applications, for example, Internet interactive games, video-conferencing, VPN (Virtual Private Networks) connections etc., computers must be exposed to the Internet. The DMZ function assigns up to eight client computers to be exposed.

Note: One public IP address is mapped to one DMZ PC.

BRG700 Setting: You must set a static IP address for a DMZ PC to be exposed to the Internet and set that PC to use the selected IP address. Then click **Save** to make the setting effective. Click **Restart** to initialize the BRG700 with the updated settings.

DMZ opens all ports on a computer to requests for service from the Internet and exposes the computer to risk from hackers. “Open only the ports you need” is the most important rule for your broadband Internet security. Therefore, it is highly recommended that, unless you don’t know the ports used by the application, the

Port Forwarding feature be used to support your Internet applications (see Port Forwarding, page 42).

Tools

Six useful tools are provided: Renew WAN IP Address, PPPoE Check, E-mail Alert Test, DHCP Assigned IPs, Log, and Upgrades & Manual.

Renew WAN IP Address

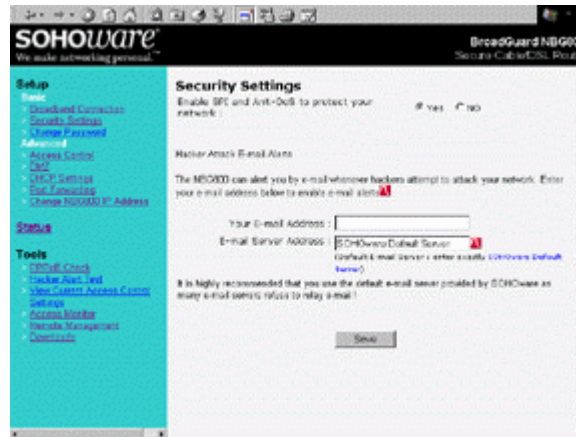


Figure 51. Renew WAN IP Address

This tool is generally only required by cable users who use a WAN IP dynamically assigned by their BSP.

Many cable broadband service providers set their DHCP servers to frequently expire the lease on the IP address. If this happens you will lose service until you acquire a new IP address.

Click **Release & Renew IP** to renew the WAN IP. If the BRG700 shows “*The BRG700 has failed to renew the WAN IP address*”, refer to Chapter 4: Troubleshooting, page 56, item 6.

PPPoE Check (DSL Users Only)

If you are a DSL user, this page will help you to check whether your settings for PPPoE work or not. After making the PPPoE settings on the *Basic Setup/Broadband Setup* page, save the settings and restart the BRG700. Then open the *PPPoE Check* page and click **Check Now**. You may click **Disconnect** to terminate your DSL connection.

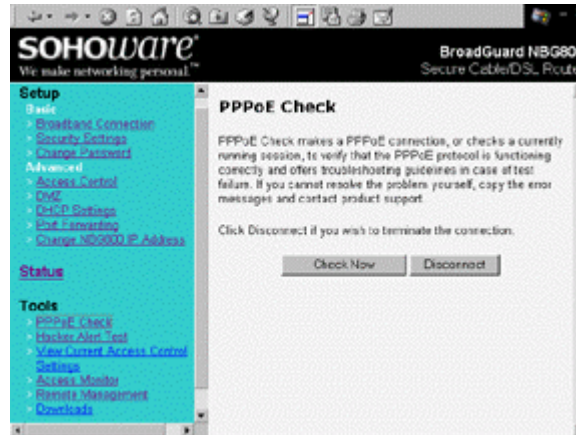


Figure 52. PPPoE Check

Either of the following screens (Figure 53 or Figure 54) indicate that PPPoE is operating correctly.

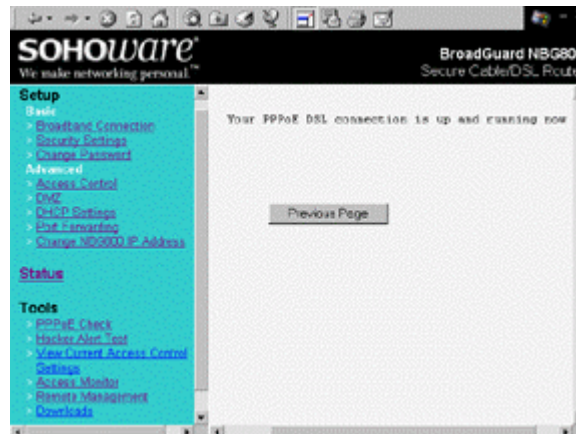


Figure 53. PPPoE Service Running

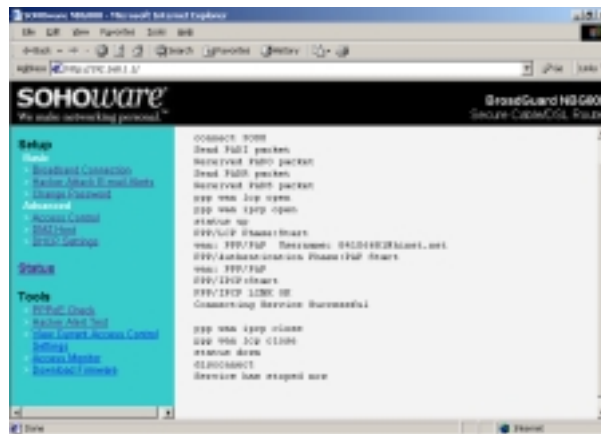


Figure 54. PPPoE Check Successful

If you see a screen similar to the following (**Figure 55**), it means that your BSP's server may not be operating, or something could be wrong with your DSL modem, e.g. a loose cable either on the DSL modem or the BRG700 port.

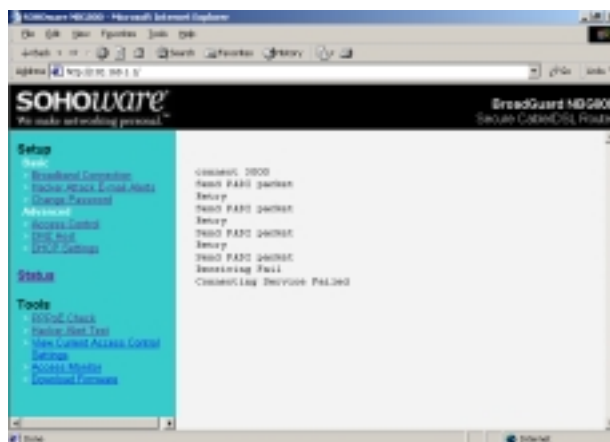


Figure 55. PPPoE Check Unsuccessful

A screen such as that shown in Figure 56 indicates that you entered a wrong username, login password, or service name. Go to the DSL broadband connection setup page to check them again.

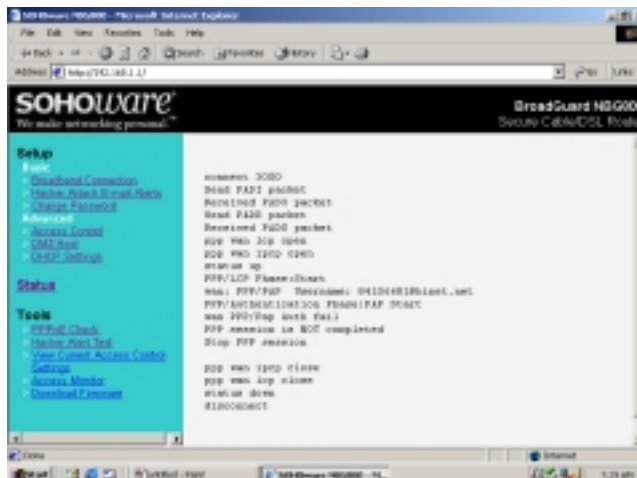


Figure 56. Authentication Failed

E-mail Alert Test

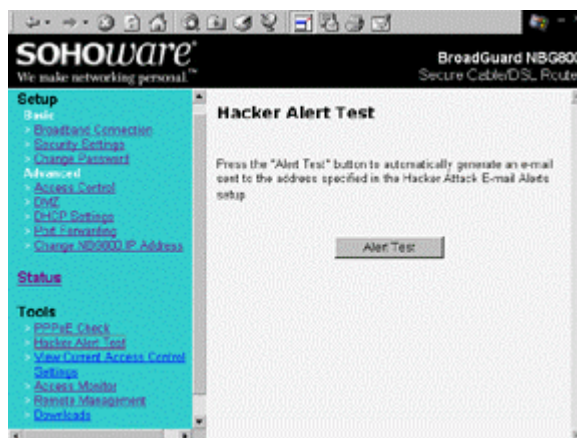


Figure 57. E-mail Alert Test

Click the **Alert Test** button to automatically generate an email sent to the address specified in **Security Settings**.

Either of the following screens indicate that the E-mail Alert Test is operating correctly.

Missing pic

Figure 58. E-mail Alert Test Successful

If you see a screen similar to the following (**Figure 55**), it means that NDC default server or your BSP's server may not be operating, or something could be wrong with your DSL modem, e.g. a loose cable either on the DSL modem or the BRG700 port.

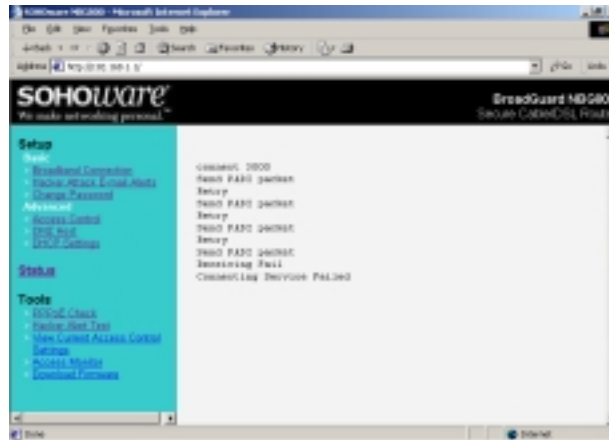
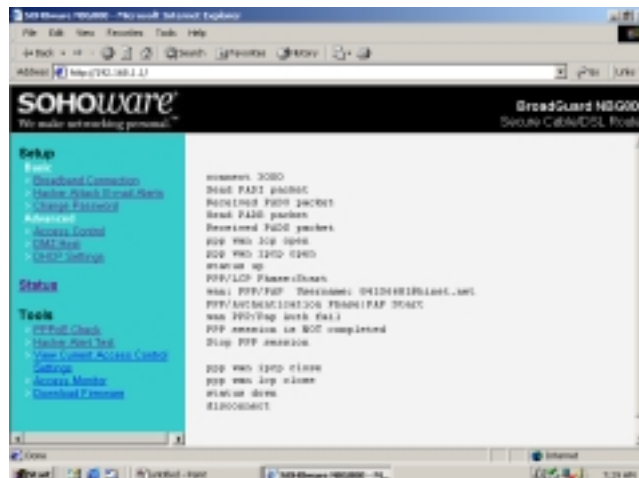
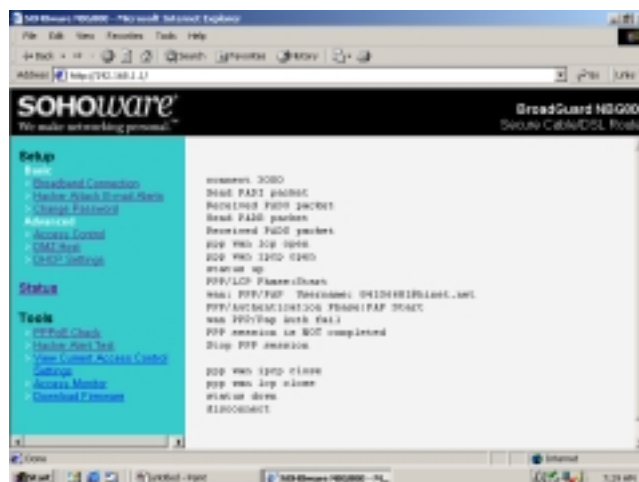


Figure 59. E-mail Alert Test Unsuccessful-1

A screen such as that shown in Figure 56 indicates that you entered a wrong e-mail server address on security settings page. Go to the Security Settings page to check them again.



Screens such as that shown in Figure 56 and Figure 56 indicate that you didn't specify a e-mail server address or e-mail address on security settings page. Go to the Security Settings page to check them again.



DHCP Assigned IPs

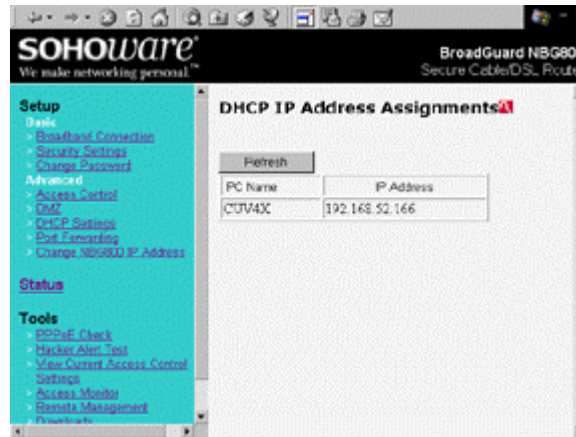


Figure 63. DHCP Assigned IPs

Note: IP information of statically assigned IP PCs is not shown here.

When your PC asks the BRG700 for an IP address, it issues an IP address with a validity period of three days. If you turn off the BRG700 and turn it on within that three-day period, your PC will not attempt to renew the IP address. As the previous IP assignment table will be cleared when the BRG700 was turned off, your IP address will not be shown in the table.

To renew the IP address: for Windows 95/98/Me go to page 57, for Windows NT 4.0 go to page 58, and for Windows 2000 go to page 59.

Log

The log gives you a record of the kinds of attacks the BRG700 has defended your network against. It also gives the time an attack was stopped and identifies the origination and destination of the attack.

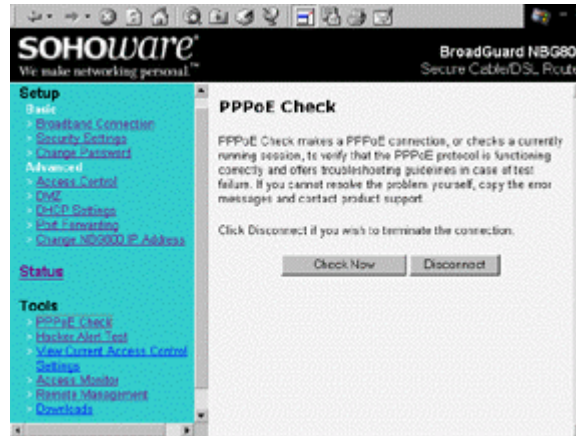


Figure 64. Log

Upgrades & Manual

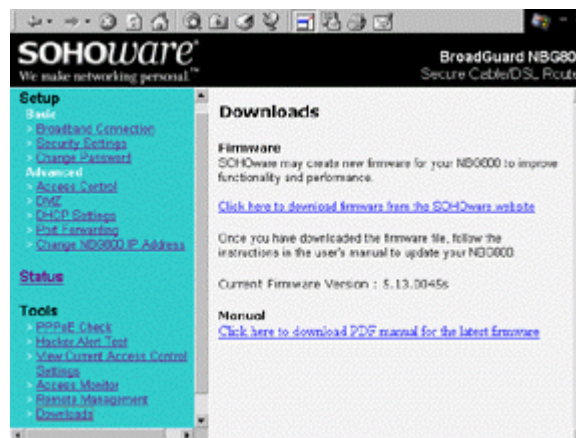


Figure 65. Upgrades & Manual

This tool permits easy downloading of the latest BRG700 firmware, software (User Interface) and manual. The NDC website provides the server IP address and the file name to download. Choose the action from the dropdown list, enter the server IP address and file name into the field and click **Upgrade Now**. The BRG700 will download the file and automatically upgrade the BRG700. The whole process is transparent. If the download will be completed, the BRG700 will not activate to upgrade a uncompleted file into the system.

Status

The *Status* section contains; Internet information, the Public IP Address assignment, and the BRG700 LAN IP address assignments (**Figure 66**). This information is useful in resolving a connection problem.

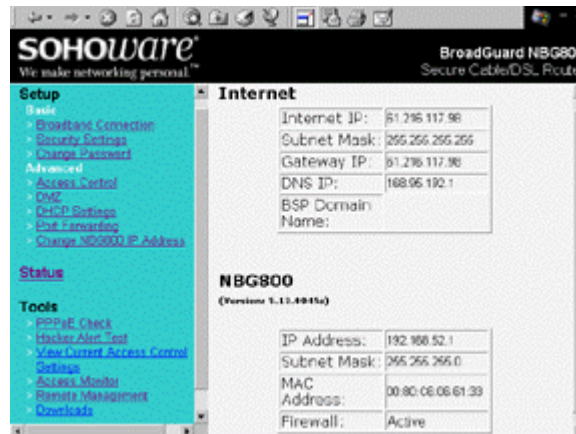


Figure 66. Status

XX

Internet	Internet IP address assigned by your BSP Subnet Mask: 255.255.255.0 is the default setting Gateway IP: The IP address of the BSP's Internet Network Gateway DNS IP: The IP address of the BSP's Domain Name Server BSP Domain Name: The BSP's Domain Name Server (this field may be blank depending on your BSP)
-----------------	---

BRG700	IP Address: The IP address of the BRG700 Subnet Mask: 255.255.255.0 is the default setting MAC Address: The MAC address of the BRG700 SPI & Anti-DoS: The BRG700 firewall status Current Firmware Version: The BRG700 firmware version SSID: The SSID of the BRG700 Transmission Rate: The transmission rate of the BRG700 Basic Rate: The basic rate of the BRG700 Channel: The channel being used by the BRG700 Regulatory Domain: The regulatory domain to which the BRG700 belong Current Wireless Firmware Version:
---------------	---

Chapter 4: Troubleshooting

If you cannot find your problem listed below, see, page 63, or see the BRG700 FAQ at the NDC website.

1. I can't connect to the BRG700. The BRG700 is properly installed, LAN connections are OK, and it is powered ON

- Ensure that your PC and the BRG700 are on the same network segment. If you are not sure, restart the BRG700, let the PC get the IP address automatically.
- Ensure that a static IP address is within the default range of *192.168.1.2* to *192.168.1.254* and is thus compatible with the BRG700 default IP address of *192.168.1.1*.
- The Subnet Mask should be set to *255.255.255.0* to match the BRG700. On the client PC, check these settings by using *Control Panel/Network* and checking the properties for the TCP/IP protocols.

2. The Status LED is permanently lit

The Status LED lights when the device powers up and is checking for proper operation. After finishing the checking procedure, the LED should turn off to show the system is working fine.

If the LED remains lit after this time, the BRG700 is not working properly. Contact your dealer.

3. I can't browse through the BRG700

- Check that both ends of the network cable and power adapter are properly connected. Check that all LEDs on the front panel are functioning properly. Use *Status (Figure 67)* to check that your BRG700 is still connected to your BSP. If there is no public IP address shown on the screen, the problem lies with the BSP.

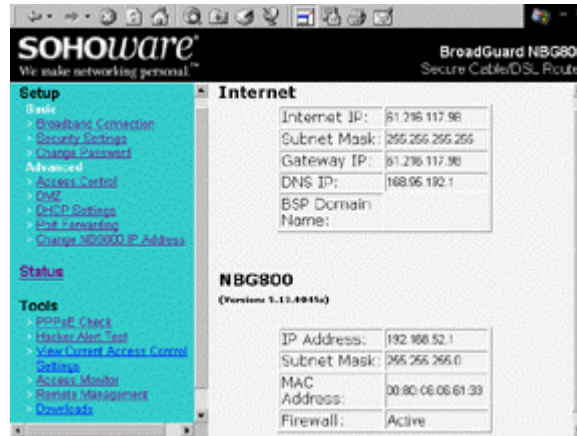


Figure 67. Status

- Check that the PC got an IP address assigned to it automatically (for Windows 95/98/Me see the following section. For Windows NT 4.0, see page 58. For Windows 2000 see page 59.
- Make sure that TCP/IP is setup on the client PCs and that the IP addresses are in the range 192.168.1.x (x is from 2 to 254). Check the IP address via the *DHCP Assigned IPs* page. If the IP address assignments are not within the stated range, follow the steps below to rebuild the setup.

Windows 95/98/Me

step1. Click *Start/Run*, type *winipcfg*, and click **OK** (Figure 68)

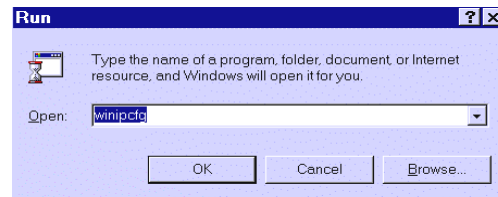


Figure 68. Run

step2. The *IP Configuration* dialog box will open (Figure 69)

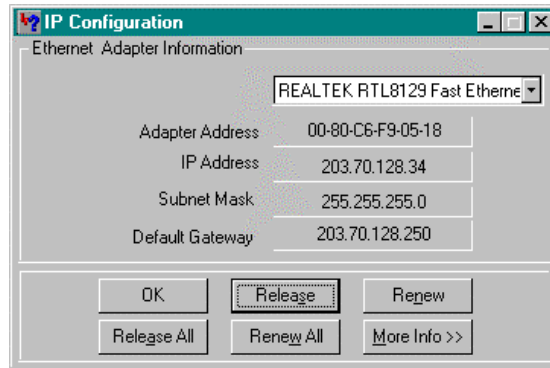


Figure 69. IP Configuration

- step3.** Select the network adapter you use to connect to the BRG700. Click **Release**
- step4.** Click **Renew** to retrieve new information (IP address, subnet mask, and default gateway address) from the BRG700. Click **OK** to save the changes and exit the program
- step5.** Go to *DHCP Assigned IPs* (see Figure 63, page 52). Click **Refresh**

Windows NT 4.0

- step1.** Click *Start/Programs/Command Prompt*

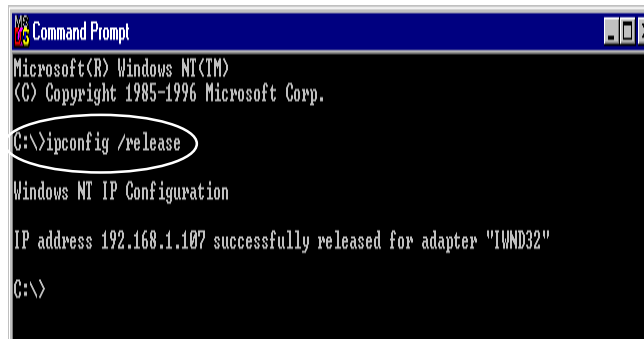
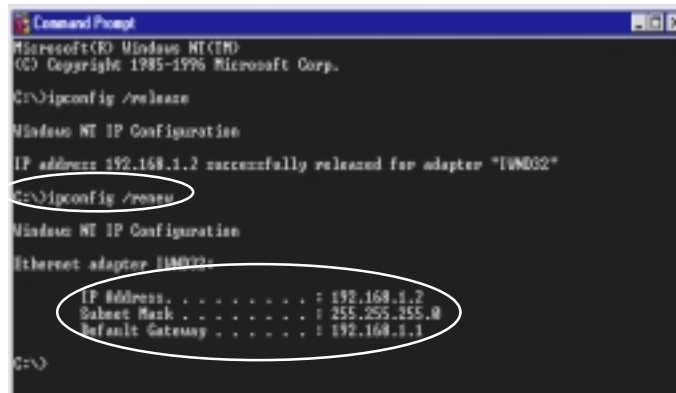


Figure 70. Command Prompt-1

- step2.** Type "*ipconfig /release*" (**Figure 70**) and press **Enter**
- step3.** Type "*ipconfig /renew*", and press **Enter** to retrieve new information (IP address, subnet mask, and default gateway address) from the BRG700 (**Figure 71**)



```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

C:\>ipconfig /release

Windows NT IP Configuration

IP address 192.168.1.2 successfully released for adapter "TUND02"

C:\>ipconfig /renew

Windows NT IP Configuration

Ethernet adapter TUND02:

    IP Address. . . . . : 192.168.1.2
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . : 192.168.1.1

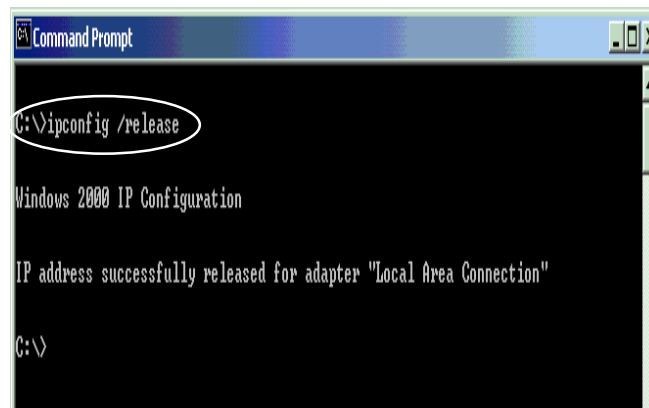
C:\>
```

Figure 71. Command Prompt-2

- step4.** Type *Exit*
- step6.** Go to *DHCP Assigned IPs* (see Figure 63, page 52). Click *Refresh*

Windows 2000

- step1.** Click *Start/Programs/Accessories/Command Prompt*



```
Command Prompt

C:\>ipconfig /release

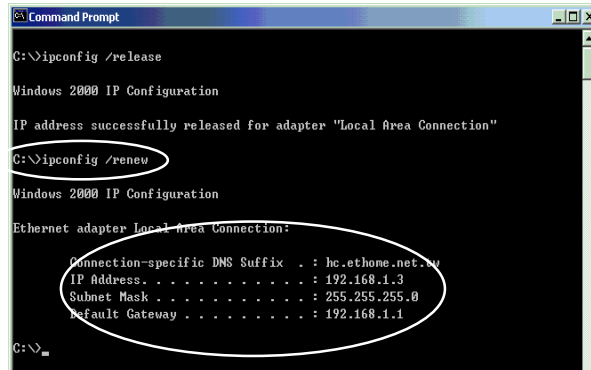
Windows 2000 IP Configuration

IP address successfully released for adapter "Local Area Connection"

C:\>
```

Figure 72. Command Prompt-3

- step2.** Type *"ipconfig /release"* (Figure 72) and press *Enter*
- step3.** Type *"ipconfig /renew"* and press *Enter* to retrieve new information (IP address, subnet mask, and default gateway address) from the BRG700 (Figure 73)



```
C:\>ipconfig /release

Windows 2000 IP Configuration

IP address successfully released for adapter "Local Area Connection"

C:\>ipconfig /renew

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : hc.ethone.net.au
    IP Address. . . . . : 192.168.1.3
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

C:\>
```

Figure 73. Command Prompt-4

step4. Type *Exit*

step5. Go to *DHCP IP Address Assignments* (see Figure 63, page 52). Click *Refresh*

4. Entering a URL or IP address results in a timeout error

Follow the steps below to solve this problem:

step1. Check whether other PCs can connect to the network without problems. If they can, ensure the problem PC's IP settings are correct (IP address, subnet mask, default gateway, and DNS)

step2. Check the BRG700's Internet settings (IP address, subnet mask, default gateway, and DNS) in *Status* (**Figure 74**). If there is no information shown on the screen, it means that your BSP has a problem

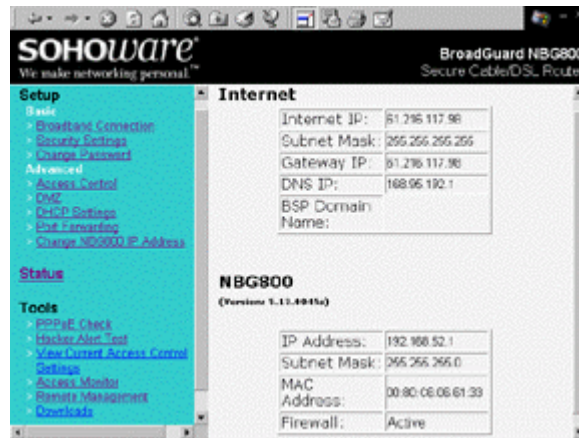


Figure 74. Status

5. I can't view a PC's name or its IP address in the *DHCP Assigned IPs* page, though it can still access the Internet

When your PC asks the BRG700 for an IP address, it issues an IP address with a validity period of three days. If you turn off the BRG700 and turn it on within that three day period, your PC will not attempt to renew the IP address. As the previous IP assignment table will be cleared when the BRG700 was turned off, your IP address will not be shown in the table.

To renew the IP address: for Windows 95/98/Me go to page 57, for Windows NT 4.0 go to page 58, and for Windows 2000 go to page 59.

6. I can connect to the BRG700, but can't get outside connections

- Ensure that all of your cabling is properly connected and that all of the BRG700's cable/DSL and LAN LEDs are correctly illuminated.
- Power down your cable/DSL modem and BRG700 for a few seconds. Then turn the cable/DSL modem on. After the modem goes through its self-test, turn the BRG700 on. After the BRG700 goes through its self-test, check whether you can get an outside connection.
- Ensure that your cable or DSL modem is DHCP-capable.
- Make sure all broadband connection setup is correct.
- The problem may be caused by your BSP (Broadband Service Provider) issuing a different IP address from time to time. The BRG700 gets its public IP from the BSP's DHCP server automatically. The BRG700 must renew the public IP if the BSP cancels the originally assigned IP address.

7. I can connect to the BRG700 with Ethernet card but can't with wireless networking card, why?

- Does the PC connected to the network have the same SSID?
You have set the SSID of wireless networking card same with the BRG700. The default is *Wireless* (case sensitive).
- Is your adapter operating correctly after installation? If not, remove it and install it again.

8. My computer was originally connected to the Internet via PPPoE without any problem. When I install a BRG700 into the network, all LEDs light correctly but I cannot get a connection. When I switch back to my original network setup (without a BRG700), the network connection operates normally. What should I do?

Completely remove the PPPoE software from all your PCs. The PPPoE software supplied by Broadband Service Providers causes many conflicts, including one with the BRG700's PPPoE program.

Chapter 5: FAQs

- **How many PCs simultaneously accessing the Internet can be supported by the BRG700?**
253 PCs may simultaneously access the Internet via the BRG700 .
- **Where should we install the BRG700 on our network?**
In a typical environment, the BRG700 is installed between a cable/DSL modem and LAN. Connect the BRG700 to the cable/DSL modem with Cat.5 RJ-45 cable.
Plug one end of the cable into the WAN port of the BRG700 and the other end into the Ethernet port of the cable/DSL modem.
- **Does the BRG700 support IPX or AppleTalk?**
No. TCP/IP is the protocol standard for the Internet and has become the global standard for communications. IPX, a NetWare communications protocol used only to route messages from one node to another, and AppleTalk, a communications protocol used on Apple and Macintosh networks, can be used for LAN to LAN connections, but those protocols cannot connect from WAN to LAN.
- **I'm using Linux. Does the BRG700 support this operating system?**
Yes. The BRG700 is compatible with any operating system.
- **Does the BRG700 support 100Mbps Fast Ethernet?**
Yes. Both 10 and 100Mbps Fast Ethernet are supported.
- **What's the wireless operating range to my BRG700?**

Data Rate (Mbps)	Indoor Range	Outdoor Range
11	120 feet (37 meters)	400 feet (122 meters)
5.5	200 feet (61 meters)	600 feet (183 meters)
2	240 feet (73 meters)	750 feet (228 meters)
1	300 feet (91 meters)	1000 feet (305 meters)

-
- **Does the BRG700 support ICQ send file?**
Yes, with the following setting: ICQ menu-> Preferences -> Connections tab-> check "I am behind a firewall or proxy", and set the firewall time-out to 80 seconds.
- **Can multiple gamers on the LAN get on one game server and play**

simultaneously with just one public IP address?

It depends on which network game or what kind of game server you are using. For example, Unreal Tournament supports multi-login with one public IP.

▪ **How will I be notified of new BRG700 firmware upgrades?**

All firmware upgrades are posted on the NDC website at www.ndc.com.tw, where they can be downloaded for free.

▪ **Does the BRG700 pass PPTP and IPSec packets?**

Yes.

▪ **What is the recommended maximum number of VPN sessions I can run on the BRG700?**

If you setup a VPN server behind the BRG700, and users from the Internet want to access the VPN server, we recommend the number of sessions is five or less to prevent influencing the throughput of the BRG700.

If multiple PCs behind the BRG700 wish to simultaneously access the same VPN server located on the Internet, you must have multiple public IP addresses and enable DMZ. Otherwise only one session can be created.

▪ **Will the BRG700 function in a Macintosh environment?**

Yes, but the BRG700's setup pages are accessible only through Internet Explorer v4.0 or Netscape Navigator v4.0 or higher for Macintosh.

▪ **With which type of firewall is the BRG700 equipped?**

The BRG700 uses NAT, (SPI) Stateful Packet Inspection, and anti-DoS (Denial of Service).

▪ **What is DoS (Denial of Service)?**

The goal of a Denial of Service (DoS) attack is not to steal information, but to disable a device or network so users no longer have access to network resources. For example, "TearDrop", a DoS tool which is widely available on the Internet, allows users to remotely crash any unprotected Windows computer on the Internet. Most types of Internet attacks try to exploit the weaknesses in the TCP stacks of the operating systems of host machines. The BRG700 protects against the following types of attacks:

▪ SYN Flooding	▪ IP Spoofing
▪ Ping of Death	▪ TearDrop
▪ LAND attacks	▪ WinNuke
▪ Smurf attacks	▪

▪ **What is Stateful Packet Inspection (SPI)?**

Stateful Packet Inspection is a technology similar to that used in enterprise-

level firewall products. It is generally regarded as a "state of the art" firewall technology. With SPI, the BRG700 makes security decisions based on the origination of Internet sessions. The BRG700 will allow incoming data from the Internet only if it is part of a session that was initiated by one of the users on the secure Local Area Network (LAN), but will block all communications that are initiated from the Internet. SPI has the added benefit of being easy to manage, making it ideal for those who don't have MIS people for networking maintenance.

- **Does the BRG700 support routing protocols?**
Yes, it supports both RIP I & RIP II.
- **I am not able to get the web configuration screen for the BRG700. What can I do?**
You may have to remove the proxy settings on your Internet browser, e.g., Netscape Navigator or Internet Explorer. Or remove the dial-up settings on your browser.
- **Will the BRG700 allow me to use my own public IP and Domain?**
The BRG700 allows for customization of your public IP and Domain. If you use a cable connection, see Figure 33, page 30. For DSL users, see Figure 35, page 32.
- **Is there an internal cable or DSL modem in the BRG700?**
No, the BRG700 only operates in conjunction with an external cable or DSL modem.
- **Which modems are compatible with the BRG700?**
The BRG700 is compatible with virtually any cable or DSL modem that supports Ethernet.
- **How can I check whether I have static DHCP IP addresses?**
Consult your BSP.
- **How do I get *Half-Life: Counter Strike* to work with the BRG700?**
If you want to host a game, you must expose your PC to the Internet using DMZ or Port Forwarding. If you only want to join a game hosted by somebody else, then there is no need to set your machine as a DMZ Host.
- **How do I get mIRC to work with the BRG700?**
You must expose your PC to the Internet using DMZ or Port Forwarding.
- **How can I learn more about Internet safety issues?**
As parents, protecting children from accessing websites that contain improper content is critical. Many sites discuss this issue on the Internet. You can use a search engine (e.g. www.yahoo.com) to get those sites addresses by entering the keywords "Internet child safety". The www.getnetwise.org website is suggested for parents to obtain more information.

Appendix: Glossary

Ethernet

One of the most common Local Area Network (LAN) protocols. Ethernet uses a bus topology that supports a data transfer rate of 10Mbps.

Fast Ethernet

Much the same as Ethernet but ten times faster; requires upgraded network cards and hubs.

Protocol

A protocol is a set of rules for communicating between computers.

10Base-T

A variant of Ethernet that allows computers to be networked at 10Mbps via twisted pair cable.

100Base-TX

A variant of Ethernet that allows computers to be networked at 100Mbps via twisted pair cable.

Browser

A software application used to locate and display Web pages, such as Netscape Navigator and Microsoft Internet Explorer.

DHCP (Dynamic Host Configuration Protocol)

DHCP is a protocol that assigns temporary IP addresses to PCs. Without DHCP the IP address must be entered manually at each computer.

Domain Name

The Domain Name identifies one or more IP addresses. For example, the domain name of NDC.com represents about a dozen IP addresses.

URL (Uniform Resource Locator)

A Uniform Resource Locator is a standard for specifying the location of an object on the Internet, such as a file or a newsgroup. URLs are used extensively on the World Wide Web. They are used in HTML documents to specify the target of a hyperlink, which is often another HTML document (possibly stored on another computer).

DNS (Domain Name Server)

A server used to translate a Domain Name to a numerical form IP address.

PPPoE

PPPoE supports reliable and straightforward end-user authentication with no security risk and can provide a range of operational benefits to both the subscriber as well as the service provider. Among these are network management and diagnostic capabilities that can identify operational problems and automatically offer solutions.

Firewall

A security system used to enforce an access control policy between a LAN and the Internet.

Gateway

A device that links two different networks.

Internet

A global network that connects millions of computers for information exchange.

IP Address

The Internet Protocol (IP) is a set of basic rules for network communication. Each computer on the Internet has a unique IP address (e.g. 192.168.1.2) and its IP functions as an I.D. number/identifier/address.

BSP (Broadband Service Provider)

A BSP is a company that provides individuals or companies broadband access to the Internet and other related Internet services via cable or DSL.

Local Area Network (LAN)

A LAN is a network of interconnected workstations, sharing the resources of a single server or each other, within a relatively small geographic area.

LAN Adapter

A device that connects the computer to the network cable.

MAC Address

Short for Media Access Control address, a hardware address that uniquely identifies each node on a network.

NAT (Network Address Translation)

A routing protocol that allows global IP addresses to be translated into multiple private IP addresses for use on internal LAN networks. The explosion in the use of the Internet has created a critical problem for the Internet Assigned Numbers Authority (IANA) which is charged with assigning IP addresses to Internet users, ISPs, etc. NAT is a technology that has been introduced to help maximize the utilization of assigned IANA or global IP addresses.

TCP/IP

TCP/IP protocols are used for Internet communications and consist of:

- TCP (Transmission Control Protocol), which uses a set of rules to exchange messages with other Internet points
- IP (Internet Protocol), which uses a set of rules to identify Internet addresses on the Internet. Every computer on the Internet has a unique IP address. The IP protocol helps Internet users to identify each sender or receiver of information that is sent across the Internet

VPN

Virtual Private Network: The use of encryption in the lower protocol layers to provide a secure connection through an otherwise insecure network, typically the Internet.

BBS (Bulletin Board Service)

A computer and associated software that provides an electronic message database where people can login and leave messages. Apart from public message areas, a BBS may provide archives of files, personal electronic mail, and any other services or activities of interest to the bulletin board's system operator (the "sysop").

News Forum

An electronic meeting place where people can exchange news or discuss common interests.

Hacker

A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users, who prefer to learn only the minimum necessary. Recently misused to describe a Cracker. See the next item.

Cracker

An individual who attempts to gain unauthorized access to a computer system. These individuals are often malicious. Contrary to widespread myth, cracking does not usually involve some mysterious leap of hackerly brilliance, but rather persistence and the dogged repetition of a handful of fairly well-known tricks that exploit common weaknesses in the security of target systems.

Firmware

Software stored in read-only memory (ROM) or programmable ROM (PROM). Easier to change than hardware, but harder than software stored on disk. Firmware is often responsible for the behavior of a system when it is first switched on.

Technical Support

Support from Your Network Supplier

If additional assistance is required, call your supplier for help. Have the following information ready before you make the call.

1. LED status
2. A list of the product hardware (including revision levels), and if possible, a brief description of the network structure
3. Details of recent configuration changes, if applicable

Support from NDC

If you have any problems that you cannot resolve with the information in troubleshooting, please note the following information and contact our technical support team.

- What you were doing when the error occurred
- What error messages you saw
- Whether the problem can be reproduced
- The serial number of your NDC product

USA

E-mail	:	support@NDC.com
Technical Support Call Center (24 hrs)	:	888 785-8222
Customer Service & Sales Information	:	800 632-1118 ext: 2828
Fax	:	408-565-9889

Europe and Asia Pacific

E-mail	:	techsupt@ndc.com.tw
Telephone	:	+886-3-578-3966
FAX	:	+886-3-577-7989

For more information on networking, please visit us at: [NDC](#)

NDC Limited Warranty

Hardware

NDC, Inc. warrants its products to be free of defects in workmanship and materials, under normal use and service, from the date of purchase from NDC or its Authorized Reseller, and for the period of time specified in the documentation supplied with each product.

Should a product fail to be in good working order during the applicable warranty period, NDC will, at its option and expense, repair or replace it, or deliver to the purchaser an equivalent product or part at no additional charge except as set forth below. Repair parts and replacement products are furnished on an exchange basis and will be either reconditioned or new. All replaced products and parts will become the property of NDC. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

NDC shall not be liable under this warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's, or any third party's misuse, neglect, improper installation or testing, unauthorized attempt to repair or modify, or any other cause beyond the range of the intended use, or by accident, fire, lightning, or other hazard.

Software

Software and documentation materials are supplied "as is" without warranty as to their performance, merchantability, or fitness for any particular purpose. However, the diskette media containing the software are covered by a 90-day warranty that protects the purchaser against failure within that period.

Limited Warranty Service Procedures

Any product (1) received in error, (2) in a defective or non-functioning condition, or (3) exhibiting a defect under normal working conditions, can be returned to NDC by following these steps:

You must prepare:

- dated proof of purchase
- product model number & quantity
- product serial number
- precise reason for return
- your name/address/e-mail address/telephone/fax

1. Inform the distributor or retailer
2. Ship the product back to the distributor/retailer with prepaid freight. The purchaser must pay the shipping freight from the distributor/retailer to NDC. Any package sent C.O.D. (Cash On Delivery) will be refused
3. Charges: Usually RMA (Returned Material Authorization) items will be returned to the purchaser via Airmail, prepaid by NDC. If returned by another carrier, the purchaser will pay the difference. A return freight and handling fee will be charged to the purchaser if NDC determines that there was “No Problem Found” or that the damage was caused by the user

Warning

NDC is not responsible for the integrity of any data on storage equipment (hard drives, tape drives, floppy diskettes, etc.). We strongly recommend that our customers backup their data before sending such equipment in for diagnosis or repair.

Services after Warranty Period

After the warranty period expires, all products can be repaired for a reasonable service charge. The shipping charges to and from the NDC facility will be borne by the purchaser.

Return for Credit

In the case of a DOA (Dead on Arrival) or a shipping error, a return for credit will automatically be applied to the purchaser’s account, unless otherwise requested.

Limitation of Liability

All expressed and implied warranties of a product’s merchantability, or of its fitness for a particular purpose, are limited in duration to the applicable period as set forth in this limited warranty, and no warranty will be considered valid after its expiration date.

If this product does not function as warranted, your sole remedy shall be repair or replacement as provided for above. In no case shall NDC be liable for any incidental, consequential, special, or indirect damages resulting from loss of data, loss of profits, or loss of use, even if NDC or an authorized NDC distributor/dealer has been advised of the possibility of such damages, or for any claim by any other party.

Specifications

Standards Compliance	IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.11b
Certifications	FCC Class B
Standards Compliance	Compression TCP/IP (RFC 1144), DHCP (1533,1541), DNS (1034,1035)
Network Interfaces	LAN: Four 10/100 Switched Ethernet RJ-45 connectors Autosensing Switch (LAN ports: Four RJ-45 10Base-T/100Base-TX Ethernet ports (for PCs, peripherals, or a wireless LAN bridge)), Wireless Data Rate (11Mbps /5.5 Mbps/2 Mbps/1Mbps/ Auto fallback) WAN: One 10Base-T Ethernet RJ-45 connector for a cable/DSL modem
Communication Method	CSMA/CD for Ethernet, CSMA/CA for Wireless
User Interface	Browser-based Management
Wireless Security	WEP 40-bit/128-bit
RF Frequency Range	2400MHz ~ 2483.5MHz - North America and Europe
RF Output Power	Maximum 20 dBm
Antenna Type	External dual dipole antenna with diversity
Maximum Number of PCs	253
Firewall Security	SPI, Prevention of DoS attacks
VPN Support	Client and server pass through (Microsoft PPTP, IPSec)
Protocols	WAN: TCP/IP, DHCP Client, IP Multicast, RTSP, PPTP, and PPPoE LAN: TCP/IP, DHCP server, NAT, RIP I & II
LED Indicators	Power Status Cable/DSL Internet activity (WAN) Ethernet port activity (LAN) Wireless activity (LAN)
Operating Environment	Operating Temperature: 0-50°C (32-122°F) Humidity 0 to 90%, (non-condensing)
Dimensions	258 x 168 x 45mm (10.2 x 6.6 x 1.8 in.)
Weight	770 g (27.2 oz.)
Power Consumption	DC 5V, 2A Switching Voltage
Warranty	BRG700 Unit: One-year Limited Power Adapter: One year

EC DECLARATION OF CONFORMITY

For the following equipment:

Product Name : BRG700™ - Broadband Residential Gateway

Model Number : BRG700

Produced by:

Manufacturer's Name : NATIONAL DATACOMM CORPORATION

**Manufacturer's Address : 4F, NO. 24-2, INDUSTRY EAST 4TH ROAD
SCIENCE PARK, HSIN-CHU
TAIWAN, R.O.C.**

is hereby confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (89/336/ EEC).

The product meets or exceeds the following EMC standards:

EMI **EN50081-1:1992** **EN55022(B)**

EMS **EN50082-1:1997**

The manufacturer/importer is responsible for this declaration:

Company Name : NDC Europe

**Company Address : 1, Earlsfort Centre,
Hatch Street,
Dublin 2, Ireland.**

Person authorized to make this declaration:

Name : Changhua Chiang

Position/Title : President & CEO

August 10, 2001

Date _____

Chapman AG.

Legal Signature

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