

Chapter 2

Network Connections and Wireless Security

This chapter explains how to use your WG511v2 Wireless PC Card to connect to your Wireless Local Area Network (WLAN) and how to set up wireless security for the WG511v2 Wireless PC Card so that it matches the wireless security settings for your network.

Disabling the Windows Zero Configuration Utility

If you chose the Windows XP or Windows Vista Zero Configuration utility during installation, and now you want to use the Smart Wizard, then you need to disable the Windows utility.

To disable the Windows Zero Configuration utility:

1. Attach the wireless adapter to a USB port for your computer.
2. Go to Windows Start menu and select Network Connections.
3. On the Network connections page, select the Wireless Network Connection and right-click to choose the Properties option.

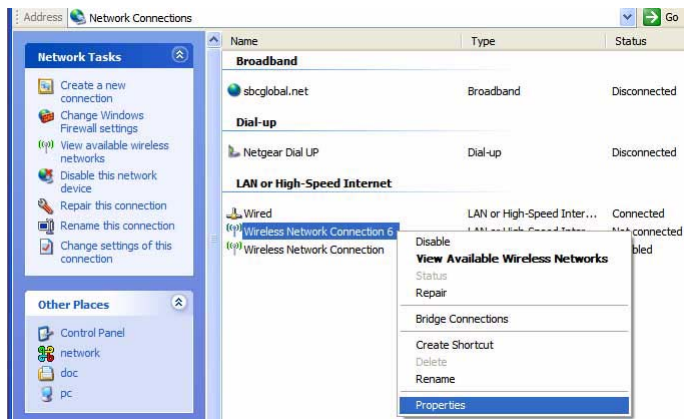



Figure 2-1

4. Click the Wireless Networks tab. Then clear the “Use Windows to configure my wireless settings” check box.

Understanding the Smart Wizard

These instructions explain how to use the NETGEAR WG511v2 Smart Wizard to change the WG511v2 wireless settings.

When you have installed the software from the *NETGEAR 54 Mbps Wireless PC Card WG511v2 Resource CD*, the  icon appears on your desktop and in the Windows System Tray. The Windows System Tray is located on the Windows taskbar. You can either double-click this icon on the desktop, or click it in the System Tray at any time, to use the Smart Wizard. This software automatically restarts when you reboot your computer.

The Smart Wizard provides a complete and easy to use set of tools to:


- View details about wireless networks in your area.
- Choose the network that you want to use.
- Configure wireless settings for your wireless PC card
- Save your wireless network settings in profiles.
- Remove or reinstall the wireless adapter software.

The following sections in this chapter explain how to use the Smart Wizard.

Viewing Wireless Networks in Your Area

You can use the Networks tab to view all available wireless networks in your area. You can also scan to search for wireless networks and refresh the page.

To view information about wireless networks:

1. Use the  icon to open the Smart Wizard. The Settings tab page opens.
2. Click the Networks tab to view the following page.

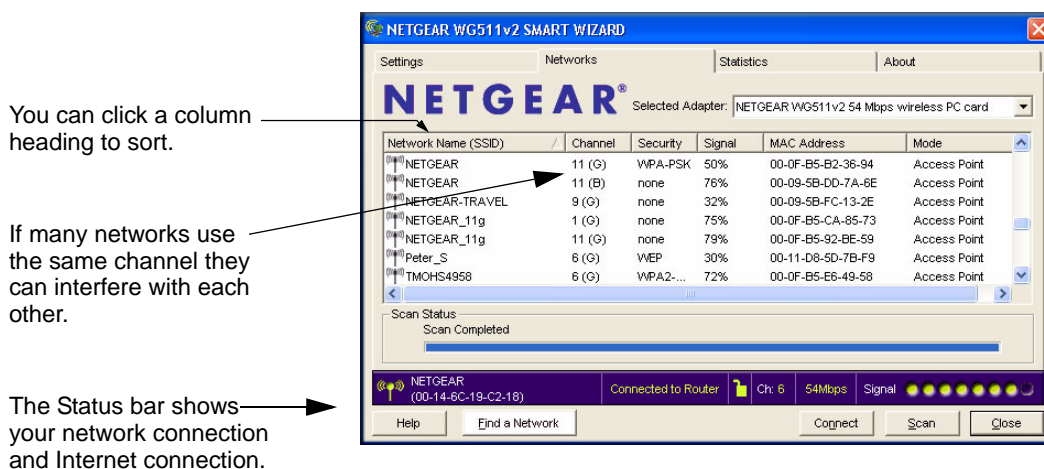


Figure 2-2

The screen shows the following information for each network scanned:

- **Network Name (SSID):** The name assigned to a wireless network. This is the same as the SSID or ESSID configuration parameter. Note that as a security measure, some wireless access points do not broadcast their SSID. In such cases, the SSID field will be blank even though the rest of the information will still be displayed.
- **Channel:** The channel determines which operating frequency will be used.
- **Security:** Identifies whether the wireless network uses security settings such as WEP, WPA2-PSK, or WPA-PSK.
- **Signal:** Identifies the signal strength of the communications.
- **MAC Address:** Identifies the hardware address (MAC Address) of the wireless device broadcasting this information.
- **Mode:** Identifies the type of wireless network — Access Point (Infrastructure) or Computer-to-Computer (Ad Hoc)

The buttons located at the bottom of the Networks tab are:

- **Help:** Display online help.
- **Find a Network:** Find and connect to a network. See [“Finding a Network” on page 2-4](#).
- **Connect:** Connect to the network that you selected.
- **Scan:** Check for wireless networks. Clicking Scan refreshes the page.
- **Close:** Close the window of the Wizard.


Finding a Network

During the WG511v2 software installation, the Smart Wizard lists the available networks. After installation you can use the Find a Network button on the Network tab at any time to view the available networks and select the one that you want to use.



Note: Make sure that you know the security settings for the network that you want to use. For example, if WEP is used then you need to know the WEP key. If you use secure networks frequently, set up profiles for each network with the wireless network and security settings.

Follow the steps below to Find a Network.

1. Use the  icon to open the Smart Wizard.
The Settings tab page opens.
2. On the Networks tab page, click Find a Network.
3. Select a network from the drop down list. If you select a hidden network then you must enter the SSID. Click Next.
4. Follow the steps of the wizard to specify the wireless security if used, and to create a profile.
5. Review you settings, and click Finish.

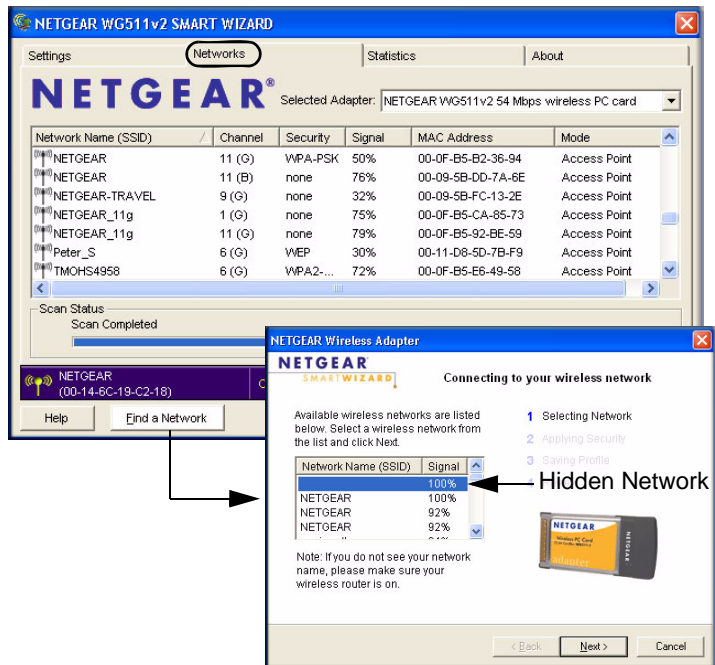


Figure 2-3

The Smart Wizard initiates your wireless connection. You can use the Status Bar to verify your network connection. For more information, see [“The Smart Wizard Status Bar” on page 1-7](#).

Profiles

The WG511v2 Smart Wizard uses profiles to store all the settings for a particular wireless network. There are two special profile names: Default and Profile.

Default: The Profile named Default automatically scans for any available network. You cannot change this profile name.

Profile: If you do not enter a name in the Profile Name box, then the name Profile is used to save your settings. If you do this more than once then you will be asked if you want to replace the previous settings stored in Profile.

Adding Profiles

You can store multiple profiles and recall the one which matches the network you want to join.

If you use your computer to connect to different wireless networks, you can create a profile for each wireless network. Then, you can easily load the profile that has all the settings that you need to join the network you are using at the time.

There are two types of wireless network profiles that you can set up:

- **Access Point (Infrastructure)** — connect to an access point or router with the 802.11 infrastructure mode.
- **Computer-to-Computer (Ad Hoc)** — connect directly to another computer with the 802.11 ad hoc mode.

For more information on 802.11 wireless network modes, see the wireless reference document at:

<http://documentation.netgear.com/reference/enu/wireless/index.htm>.

Setting up a Profile to Connect to an Access Point or Router

Follow these instructions to set up the NETGEAR 54 Mbps Wireless PC Card WG511v2 to connect to a wireless access point or router.

1. Use the  icon to open the Smart Wizard. The Settings page opens.

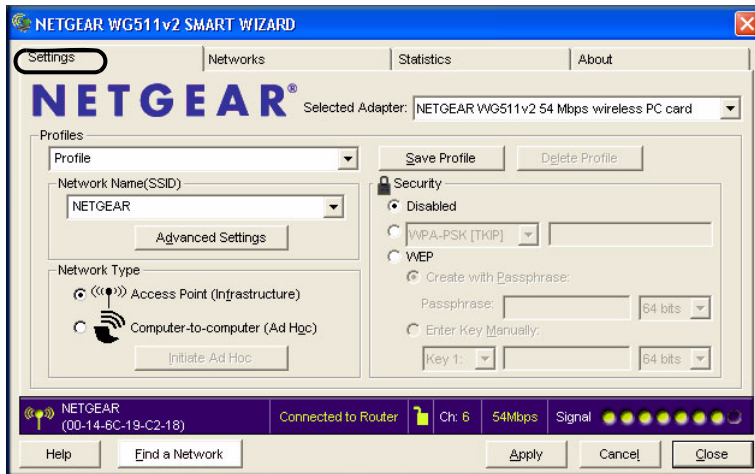


Figure 2-4

2. Enter the network settings.
 - a. In the Network Type section, be sure that Access Point (Infrastructure) is selected.
 - b. In the Profile box, type the name of the profile.
 - c. In the Network Name (SSID) field select a network or enter the SSID.



Note: You will not get a wireless network connection unless the network SSID matches exactly the SSID used by the access point.

3. Save your settings in a Profile.
 - a. Click the Save Profile button.
All the configuration settings are saved in this profile.
 - b. Click **Apply**.

- c. Click Close to exit the wizard, or Cancel to return to the previous settings.
4. Verify wireless connectivity to your network.

Verify connectivity by using a browser such as Netscape or Internet Explorer to connect to the Internet, or check for file and printer access on your network.

You can check the status bar in the Smart Wizard for the current connection status.



Note: If you cannot connect, see [Chapter 3, “Troubleshooting”](#). Also, for problems with accessing network resources, the Windows Client and File and Print Sharing software might not be installed and configured properly on your computers. Please refer to [“Internet Networking and TCP/IP Addressing”](#) on [page -1](#).

Setting up a Computer-to-Computer (Ad Hoc) Profile

The computer-to-computer setting of the WG511v2 uses Ad Hoc mode. Ad Hoc mode is an 802.11 networking framework in which devices or computers communicate directly with each other, without the use of an access point. For example, this mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

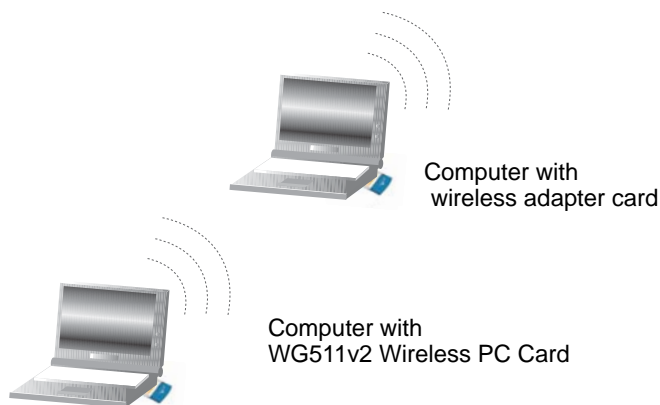



Figure 2-5



Note: Ad Hoc mode will not work using DHCP settings. Ad Hoc mode requires either static IP addresses (such as 192.168.0.1) or the IPX protocol. For instructions on setting up static IP addresses on a Windows PC, refer to the PC Networking Tutorial included on the *NETGEAR 54 Mbps Wireless PC Card WG511v2 Resource CD*.

Follow the instructions below to create an Ad Hoc mode profile.

1. Run the WG511v2 Smart Wizard.
 - a. Make sure the WG511v2 software is installed and the WG511v2 is fully inserted in an available CardBus slot in your PC.
 - b. Use the  icon to open the Smart Wizard. The Settings page opens.

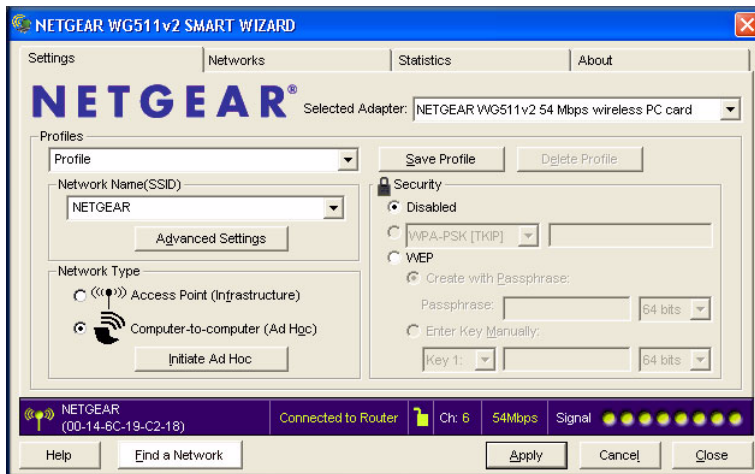



Figure 2-6

- c. Select Computer-to-Computer (Ad Hoc) for the Network Type.
 - d. Select or enter the Network Name (SSID) for the Ad Hoc network.
 - e. In the Profile box, type the name of the profile.
 - f. Click **Apply**.
2. Save your settings in a Profile.
 - a. Click the Save Profile button.

All the configuration settings are saved in this profile.

- b. Click **Apply**.
 - c. Click Close to exit the Smart Wizard, or Cancel to return to the previous settings.
3. Configure the PC network settings.
 - a. Configure each PC with either a static IP address or with the IPX protocol.

	Note: For instructions on configuring static IP addresses, refer to the networking tutorial on your <i>NETGEAR 54 Mbps Wireless PC Card WG511v2 Resource CD</i> .
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- b. Restart the PCs.
4. Verify wireless connectivity between your peer devices.

Verify connectivity by using the Ping program:

- a. On the Windows taskbar click the Start button, and then click Run.
- b. Assuming the target PC is configured with 192.168.0.1 as its IP address, type `ping -t 192.168.0.1` and then click OK.

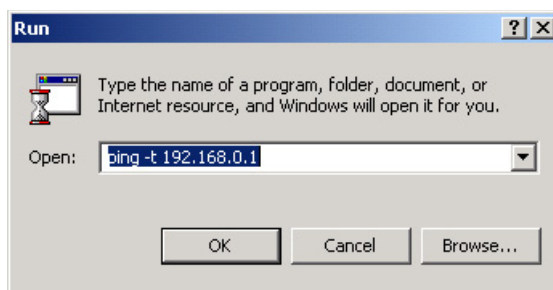


Figure 2-7

- c. This will cause a continuous ping to be sent to the device with the 192.168.0.1 static IP address. The ping response should change to “reply.”

```
Request timed out.
Request timed out.
Reply from 192.168.0.1: bytes=32 time=40ms TTL=127
Reply from 192.168.0.1: bytes=32 time=41ms TTL=127
Reply from 192.168.0.1: bytes=32 time=30ms TTL=127
```

Figure 2-8

At this point the connection is established.

You may need to reboot in certain Windows operating systems such as Windows 98SE.



Note: If you cannot connect, see [“Removing the WG511v2 Software”](#) on page -9. Also, for problems with accessing network resources, the Windows Client and File and Print Sharing software might not be installed and configured properly on your computers. Please see the link to [“Internet Networking and TCP/IP Addressing”](#) on page B-1.

Starting a Computer-to-Computer (Ad Hoc) Network Connection

1. On the Settings tab page of the Smart Wizard, select or type the Network Name (SSID).
2. Select the Computer-to-Computer (Ad Hoc) network type.
3. Click Initiate Ad Hoc. The Ad Hoc Setting dialog box opens:

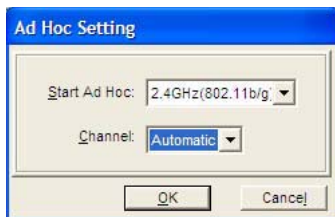


Figure 2-9

4. In the Start Ad Hoc field, choose the wireless standard (802.11a, 802.11b, or 802.11g) for your Ad Hoc computer-to-computer network.
5. In the Channel field, Automatic should work. If you notice interference problems with another nearby wireless device, select a channel that is not being used by any other wireless networks near your wireless adapter. Use the Networks tab page to identify the channels in use in your area.
6. Click OK.



Note: The channel number differs depending on the country. The connection speed automatically defaults to the highest speed.

Wireless Security

Many networks use wireless security to encrypt wireless data communications. If you try to connect to a network with wireless security the Smart Wizard detects it. Before you can use that network you must set up the WG511v2 with exactly the same kind of wireless security settings. The main types of wireless security used for home networks are:

- Wi-Fi Protected Access 2 Pre-Shared Key (WPA2-PSK)
- Wi-Fi Protected Access Pre-Shared Key (WPA-PSK)
- Wi-Fi Protected Access (WPA)
- Wired Equivalent Privacy (WEP)

For more information about wireless security, see the wireless reference document at:

<http://documentation.netgear.com/reference/enu/wireless/index.htm>

In addition to the wireless security features, networks should use LAN network security features such as requiring a user name and password to access the shared resources in the network.

The procedures below explain how to configure the wireless encryption settings of your NETGEAR 54 Mbps Wireless PC Card WG511v2.

Using Wireless Security Features

You can strengthen the security of your wireless connection by enabling Wired Equivalent Privacy (WEP) encryption of the wireless data communications. Or, you can use WPA-PSK (Wi-Fi Protected Access Pre-Shared Key) encryption. For more information about wireless security, see the Web link to [“Wireless Communications” on page B-1](#).

In addition to the WG511v2 wireless security features, you should also configure appropriate LAN network security features such as requiring a user name and password to access the shared resources in your network.

The procedures below show how to set up the WEP encryption settings of your NETGEAR 54 Mbps Wireless PC Card WG511v2.

Wireless Network Name (SSID) and Security Settings

Print this form, fill in the configuration parameters and put it in a safe place for possible future reference. For an existing wireless network, the person who set up the network will be able to provide this information.

- **Network Name (SSID):** The Service Set Identification (SSID) identifies the wireless local area network. **Any (First available network)** is the default WG511v2 wireless network name (SSID). You may customize it using up to 32 alphanumeric characters. Write your customized wireless network name (SSID) on the line below.



Note: The SSID in the wireless access point is the SSID you configure in the wireless PC card. For the access point and wireless nodes to communicate with each other, all must be configured with the same SSID.

Wireless network name (SSID): _____

- **If WEP Authentication is Used.**
 - **WEP Encryption key size.** Identify one: **64-bit** or **128-bit**. The encryption key size must be the wireless network settings.
 - **Data Encryption (WEP) Keys.** There are two methods for creating WEP data encryption keys. Whichever method you use, record the key values in the spaces below.
 - **Passphrase method.** _____ These characters *are* case sensitive. Enter a word or group of printable characters and click the Generate Keys button. Not all wireless devices support the passphrase method.
 - **Manual method.** These values *are not* case sensitive. For 64-bit WEP, enter 10 hex digits (any combination of 0-9 or a-f). For 128-bit WEP, enter 26 hex digits.


Key 1: _____ Key 2: _____

Key 3: _____ Key 4: _____
- **If WPA2-PSK or WPA-PSK Authentication is Used.**
 - **Passphrase:** _____ These characters *are* case sensitive. Enter a word or group of printable characters. When you use WPA-PSK, the other devices in the network will not connect unless they are set to WPA-PSK as well and are configured with the correct Passphrase.

Use the procedures below to set up basic security settings in the WG511v2.

Setting up WEP Encryption Security

Follow the steps below to configure WEP Encryption Security.

1. Run the WG511v2 Smart Wizard.
 - a. Make sure the WG511v2 software is installed and the WG511v2 is fully inserted in an available CardBus slot in your laptop computer.
 - b. Use the  icon to open the Smart Wizard. The Settings tab page opens.

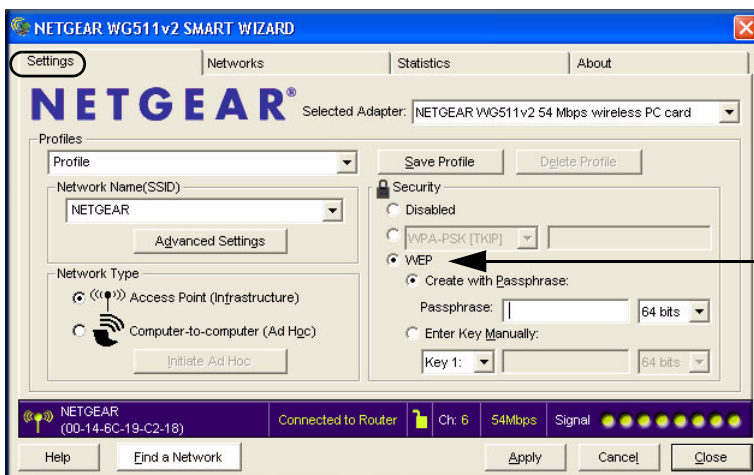


Figure 2-10

2. Configure the Security settings.
 - a. In the Profile box, select the profile or type in a profile name.
 - b. In the Network Name (SSID) field select the network, or enter the SSID.



Note: You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

- c. In the Security section, select WEP.

3. Select the WEP encryption strength you will use.

The choices are:

- 64-bit WEP data encryption
- 128-bit WEP data encryption



Note: Larger encryption keys require more processing and may slow the communications response times.

4. Select Create with Passphrase and enter the passphrase. The configuration utility will automatically generate the WEP keys.



Note: The characters are case sensitive. Be sure to use the same passphrase for all the wireless devices in the network.

If the passphrase method is not available in the other devices, you must manually enter the keys to match exactly what is in the access point and other 802.11b wireless devices.

5. Save your settings in a Profile.
 - a. Click the Save Profile button. All the configuration settings are saved in this profile.
 - b. Click **Apply**.
 - c. Click Close to exit the configuration utility.

Setting up WPA2-PSK Security

Follow the steps below to configure WPA2-PSK Security.

1. Run the WG511v2 Smart Wizard.
 - a. Make sure the WG511v2 software is installed and the WG511v2 is fully inserted in an available CardBus slot in your laptop computer.



- b. Use the  icon to open the Smart Wizard. The Settings tab page opens.



Figure 2-11


2. Configure the Security settings.
 - a. In the Profile box, select the profile or type in a profile name.
 - b. In the Network Name (SSID) field select the network, or enter the SSID.

	Note: You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.
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- c. In the Security section, select WPA2-PSK [AES].
For more information about WPA2-PSK security, see the Web link to [“Wireless Communications”](#) on page B-1.
3. Save your settings in a Profile.
 - a. Click the Save Profile button. All the configuration settings are saved in this profile.
 - b. Click **Apply**.
 - c. Click Close to exit the Smart Wizard.

Setting up WPA-PSK Security

Follow the steps below to configure WPA-PSK Security.

1. Run the WG511v2 Smart Wizard.
 - a. Make sure the WG511v2 software is installed and the WG511v2 is fully inserted in an available CardBus slot in your laptop computer.
 - b. Use the  icon to open the Smart Wizard. The Settings tab page opens.

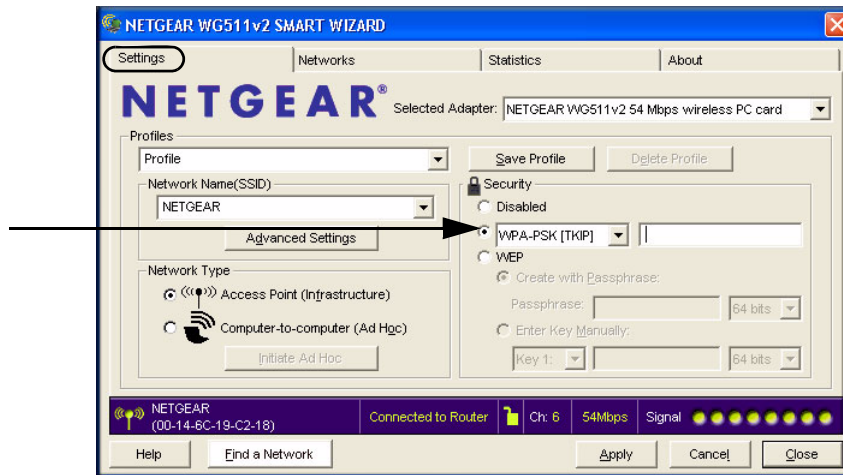



Figure 2-12

2. Configure the Security settings.
 - a. In the Profile box, select the profile or type in a profile name.
 - b. In the Network Name (SSID) field select the network, or enter the SSID.

	Note: You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.
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- c. In the Security section, select WPA-PSK [TKIP].

For more information on WPA security, see the Web link to [“Wireless Communications”](#) on page B-1.

3. Save your settings in a Profile.
 - a. Click the Save Profile button. All the configuration settings are saved in this profile.
 - b. Click **Apply**.
 - c. Click Close to exit the Smart Wizard.

Advanced Settings

The Advanced Settings should normally work in their default settings. On the Settings tab click the Advanced Settings button to display the dialog box shown to the right.

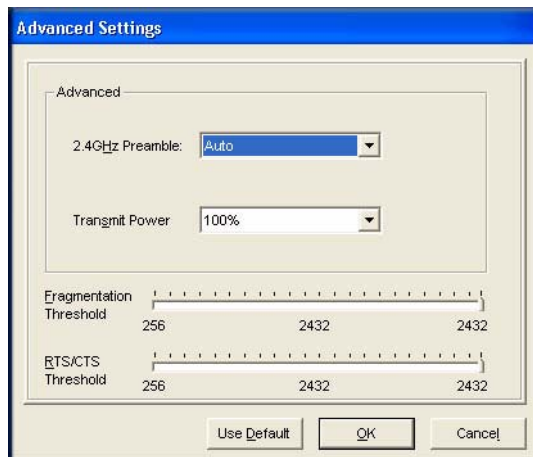


Figure 2-13

Statistics Page

The Statistics page provides real time and historical trend information on the data traffic and performance of your wireless adapter.

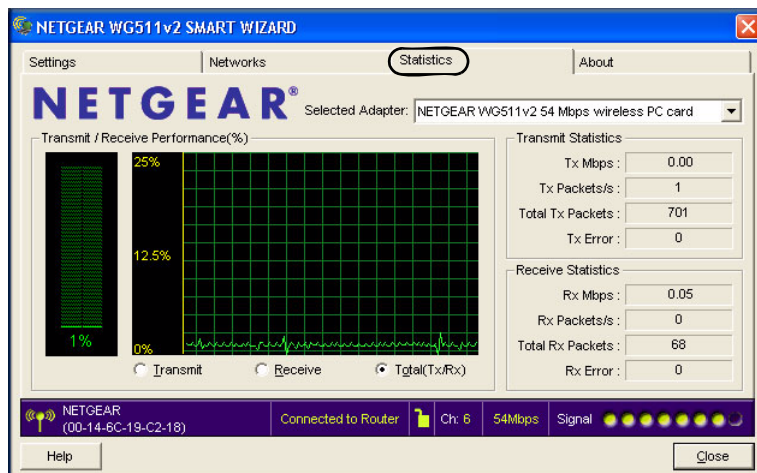


Figure 2-14

- **Transmit/Receive Performance (%)**: A real time graph identifying the total, receive, and transmit utilization as a percentage the total possible.
- **Transmit, Receive, and Total (TxRx)**: Radio buttons let you select whether to display the transmit performance, the receive performance, or both in the same graph.
- **Transmit Statistics**: Identifies transmit megabits per second (Mbps), transmit packets per second (Tx Packets/s), total transmitted packets, and transmit errors.
- **Receive Statistics**: Identifies receive megabits per second (Mbps), receive packets per second (Rx Packets/s), total received packets, and reception errors.

About Page

The About page displays the current software version information.

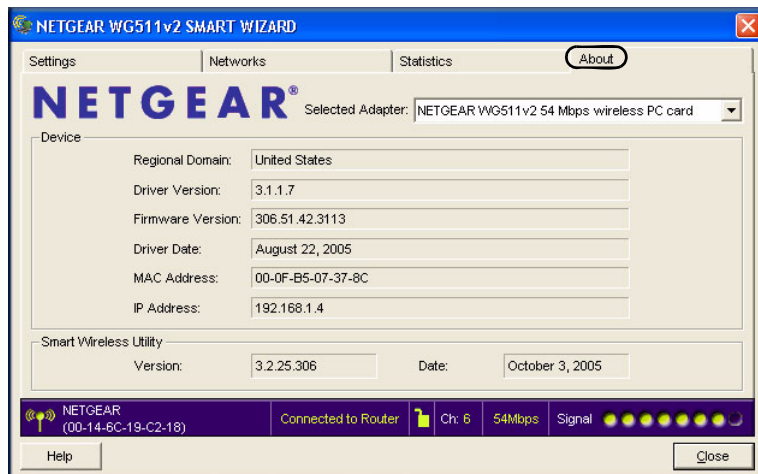


Figure 2-15

The following information is displayed in the About page:

- **Regional Domain:** This is the region setting for the wireless adapter. The approved channels for the region are automatically scanned. Governments regulate the channels used for wireless transmission. Operating the wireless adapter in a different region may violate local laws.
- **Driver Version:** The wireless adapter driver version.
- **Firmware Version:** The wireless adapter firmware version.
- **Driver Date:** The wireless adapter driver release date.
- **MAC Address:** The MAC address of the adapter. The Media Access Control address is a unique 48-bit hardware address assigned to every network interface card. Some wireless networks will restrict access based on a list of known MAC addresses. If you are communicating with such a network, you would have to provide the address shown here to the network administrator before you would be allowed to connect. Restricting access by MAC address adds an obstacle against unwanted access to your network. However, unless you use data encryption security, the data broadcast over the wireless link is fully exposed.
- **IP Address:** The IP address assigned to this adapter.
- **Smart Wizard Wireless Utility:** The version and release date of the Smart Wizard.

