

NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 User Manual



NETGEAR®

NETGEAR, Inc.
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Technical Support

Please refer to the support information card that shipped with your product. By registering your product at <http://www.netgear.com/register>, we can provide you with faster expert technical support and timely notices of product and software upgrades.

NETGEAR, INC. Support Information

Phone: 1-888-NETGEAR, for US & Canada only. For other countries, see your support information card.

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Statement of Conditions

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NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

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Maximum Wireless Signal Rate Derived from IEEE Standard 802.11 Specifications

Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

Safety and Regulatory Notices

FCC Statement

The WN111 has been tested and complies with the specifications for a Class B digital device, pursuant to 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.

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

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any change or modification to the product not expressly approved by Netgear could void the user's authority to operate the device.

FCC RF Radiation Exposure and SAR Statements

SAR Statement

The NETGEAR WN111 has been tested for body-worn Specific Absorption Rate (SAR) compliance. The FCC has established detailed SAR requirements and has established that these requirements have been met while installed in host notebook computer.

RF Exposure Information

The radio module has been evaluated under FCC Bulletin OET 65C (01-01) and found to be compliant to the requirements as set forth in CFR 47 Sections, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. This model meets the applicable government requirements for exposure to radio frequency waves. The highest SAR level measured for this device was 0.74 W/kg.

Canadian Department of Communications Industry Canada (IC) Notice

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210. Cet appareil numérique de la classe B est conforme à la norme NMB-003 et CNR-210 du Canada.

“To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.”

“Pour empêcher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit être utilisé à l'intérieur et devrait être placé loin des fenêtres afin de fournir un écran de blindage maximal. Si le matériel (ou son antenne d'émission) est installé à l'extérieur, il doit faire l'objet d'une licence.”

Europe - EU Declaration of Conformity

A printed copy of the EU Declaration of Conformity certificate for this product is provided in the WN111 product package.

Ěesky [Czech]	NETGEAR, Inc. tímto prohlašuje, že tento NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]	Hiermit erklärt NETGEAR, Inc., dass sich das Gerät NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab NETGEAR, Inc. seadme NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, NETGEAR, Inc., declares that this NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente NETGEAR, Inc. declara que el NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ NETGEAR, Inc. ΔΗΛΩΝΕΙ ΟΤΙ NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente NETGEAR, Inc. déclare que l'appareil NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente NETGEAR, Inc. dichiara che questo NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo NETGEAR, Inc. deklarā, ka NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo NETGEAR, Inc. deklaruoja, kad šis NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
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Slovensko [Slovenian]	NETGEAR, Inc. izjavlja, da je ta NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	NETGEAR, Inc. týmto vyhlasuje, že NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 spáda základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	NETGEAR, Inc. vakuuttaa täten että NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar NETGEAR, Inc. att denna [utrustningstyp] står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Product and Publication Details

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About This Manual

The *NETGEAR® RangeMax™ Wireless USB 2.0 Adapter WN111 User Manual* describes how to install, configure and troubleshoot the NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111. The information in this manual is intended for readers with intermediate computer and Internet skills.


Conventions, Formats, and Scope


The conventions, formats, and scope of this manual are described in the following paragraphs:

- **Typographical Conventions.** This manual uses the following typographical conventions:

<i>Italics</i>	Emphasis, books, CDs, URL names
Bold	User input

- **Formats.** This manual uses the following formats to highlight special messages:

	Note: This format is used to highlight information of importance or special interest.
---	--

	Tip: This format is used to highlight a procedure that will save time or resources.
---	--

- **Scope.** This manual is written for the RangeMax Next WN111 Wireless USB 2.0 Adapter according to these specifications:

Product Version	NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111
Manual Publication Date	December 2007






For more information about network technologies, see the links to the NETGEAR website in Appendix B, “Related Documents”.



Note: Product updates are available on the NETGEAR, Inc. website at <http://kbserver.netgear.com/products/WN111.asp>.

How to Use This Manual

The HTML version of this manual includes the following:

- Buttons,  and , for browsing forwards or backwards through the manual one page at a time
- A  button that displays the table of contents and an  button. Double-click on a link in the table of contents or index to navigate directly to where the topic is described in the manual.
- A  button to access the full NETGEAR, Inc. online knowledge base for the product model.
- Links to PDF versions of the full manual and individual chapters.

How to Print this Manual

To print this manual you can choose one of the following several options, according to your needs.

- **Printing a Page in the HTML View.**

Each page in the HTML version of the manual is dedicated to a major topic. Use the *Print* button on the browser toolbar to print the page contents.

- **Printing a Chapter.**

Use the *PDF of This Chapter* link at the top left of any page.

- Click the *PDF of This Chapter* link at the top left of any page in the chapter you want to print. The PDF version of the chapter you were viewing opens in a browser window.
- Your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe website at <http://www.adobe.com>.

- Click the print icon in the upper left of the window.



Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

- **Printing the Full Manual.**

Use the *Complete PDF Manual* link at the top left of any page.

- Click the Complete PDF Manual link at the top left of any page in the manual. The PDF version of the complete manual opens in a browser window.
- Click the print icon in the upper left of the window.



Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Chapter 1

Basic Setup

This chapter describes how to install your RangeMax Next WN111 Wireless USB 2.0 Adapter and set up basic wireless connectivity on your Wireless Local Area Network (WLAN). Advanced wireless network set up is covered in [Chapter 2, “Network Connections and Wireless Security”](#).



Note: Indoors, computers can easily connect to 802.11 wireless networks at distances of several hundred feet. Because walls do not always block wireless signals, others outside your immediate area could access your network. It is important to take steps to secure your network from unauthorized access. The wireless USB adapter provides highly effective security features, which are covered in [“Using Wireless Security Features”](#) in [Chapter 2](#). Use the security features appropriate to your needs.

What You Need Before You Begin

You need to verify that your computer meets the minimum system requirements and identify the wireless network settings of the WLAN where you will connect before you can set up your wireless USB adapter and connect.

Verify System Requirements

Before installing the NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111, please make sure that these minimum requirements have been met:

- You must have a PC with a Pentium 300 MHz or higher compatible processor with an available USB 2.0 or 1.1 port.



Note: The maximum speed of a USB v2.0 port is 480 Mbps. If your computer has a USB v1.1 port, the WN111 is limited to that port’s maximum speed, which is 14 Mbps.

- A CD drive.
- 10 Mbytes of free hard disk space.

- Vista, Windows XP Home, Windows XP Professional, or Windows 2000. Some versions of Windows might ask for the original Windows operating system installation files to complete the installation of the WN111 driver software.



Note: Windows XP users must install SP2 or install the KB822603 Hot fix, which fixes the USB 2.0 Host controller driver. Go to the following link to install the Hot fix:
<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=733dd867-56a0-4956-b7fe-e85b688b7f86>

Observe Wireless Location and Range Guidelines

For best performance, place the wireless USB adapter at least 4 feet (over 1 meter) away from the wireless router or access point.

Computers can connect over wireless networks indoors at a range which vary significantly based on the physical location of the computer with the RangeMax Next WN111 Wireless USB 2.0 Adapter. For best results, avoid potential sources of interference, such as:

- Large metal surfaces
- Microwaves
- 2.4 GHz Cordless phones

In general, wireless devices can communicate through walls. However, if the walls are constructed with concrete, or have metal, or metal mesh, the effective range will decrease if such materials are between the devices.

What Is In the Box

The product package should contain the following items:

- NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111
- *Installation Guide for the NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111*
- *Resource CD*, including:
 - Driver and Configuration Utility Software
 - *NETGEAR RangeMax Next Wireless USB 2.0 Adapter WN111 User Manual* (this document)
 - Animated Network Properties Configuration Tutorial
 - PC Networking Tutorial

- Warranty and Support information card
- A plastic cradle to hold the WN111
- Velcro fasteners to attach the WN111 to the plastic cradle
- USB adapter cable

If any of the parts are incorrect, missing, or damaged, contact your NETGEAR dealer. Keep the carton, including the original packing materials, in case you need to return the product for repair.

WN111 Default Wireless Settings

If this is a new wireless network installation, use the factory default settings to set up the network and verify wireless connectivity. If this is an addition to an existing wireless network, you will need to identify the wireless network and wireless security settings that are already defined.

Your RangeMax Next WN111 Wireless USB 2.0 Adapter factory default basic settings are:

- Network Name Service Set Identification (SSID): **Any** (First available network)



Note: In order for the RangeMax Next WN111 Wireless USB 2.0 Adapter to communicate with a wireless access point or wireless adapter, all devices must be set up to use the same wireless network name (SSID).

- Network Mode (Infrastructure or Ad-hoc): **Infrastructure**
- Data security WEP, WPA2-PSK, or WPA-PSK encryption: **Disabled**

Installation

To install the RangeMax Next WN111 Wireless USB 2.0 Adapter:

1. First, install the WN111 software:

Insert the Resource CD. If the Welcome screen does not open, double click Autorun.exe on the CD.

- a. Click Install the Software. The Check for Updates screen displays:




Figure 1-1

- b. If you are connected to the Internet, click Check for Updates. If not, you can choose to install from the CD.
- c. Follow the onscreen instructions for the InstallShield wizard and the NETGEAR Smart Wizard.
- For Windows XP, if a Windows logo testing message appears, click Continue Anyway.
 - If a message that Windows Vista cannot verify the publisher of this driver appears, click Install this driver software anyway.
- d. When the Installation Complete message appears, click Next.
2. Now, connect the wireless USB adapter.



Figure 1-2

- a. Locate an available USB port on your PC.

	Note: If you do not have a USB 2.0 port on your PC, the throughput of the WN111 will be limited to the 14 Mbps of the USB 1.1 standard.
---	--

- b. Insert the wireless adapter in a USB port on your PC.
- For best results, put the wireless adapter at least 4 feet (1 meter) from your router.
 - To use the USB cable, connect it to the wireless USB adapter and a USB port. See [“Placing the USB Adapter Cradle” on page 1-11.](#)
- c. For Windows XP computers, the Found New Hardware Wizard opens. Follow the wizard prompts.
- d. For Windows Vista, the wireless USB adapter is automatically added with the installed driver.
3. Select the country where you will primarily use the USB adapter. Click Agree.



Figure 1-3

4. Use the Smart Wizard to set up your wireless USB adapter.



Figure 1-4

- a. Windows 2000 users go to Step b. Windows XP or Vista users can set up the wireless adapter either with the NETGEAR Smart Wizard (recommended) or the Windows configuration utilities.
 - **NETGEAR Smart Wizard:** Reveals more information about each network and makes it easier to troubleshoot network connection problems.
 - **Windows configuration utilities:** See the Windows documentation or “Using Windows XP and Vista Wireless Configuration Utilities” at: <http://documentation.netgear.com/reference/enu/winzerocfg/index.htm>.
- b. Click Next to accept the NETGEAR Smart Wizard.
- c. You will be prompted to let the wizard help you connect to a network (recommended).




Figure 1-5

- d. Click Next to accept.

5. Depending on whether or not a wireless access point or router in the network supports Wi-Fi Protected Setup (WPS), there are two possibilities:
- If a wireless access point or router in the network supports WPS, the following screen displays. Select Yes to connect to the access point or router through WPS, and click Next. Follow the Wizard.



Figure 1-6



Note: See [“Using WPS to Connect to a Wireless Network”](#) on page 2-4 for a detailed explanation of how to connect to an access point or router through WPS.

- If none of the wireless access points or routers in the network support WPS, the following screen displays. Select the wireless network from the drop-down list, and click Next. The wizard records your choice. If the network uses security, then the Smart Wizard detects it. Follow the Wizard steps for Security (if used) and for saving a Profile.

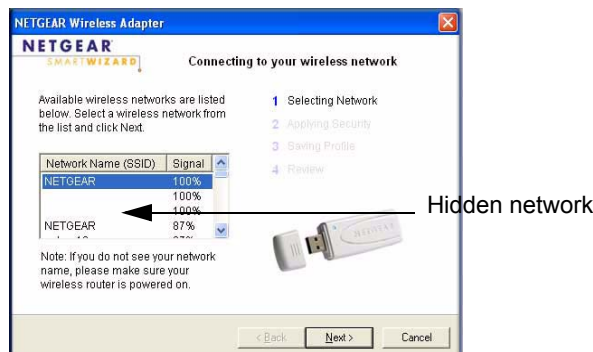


Figure 1-7



Note: Hidden networks do not broadcast the Network Name (SSID). These networks are in the drop-down list, but the Network Name (SSID) is blank.




Note: See “[Manually Selecting a Wireless Network](#)” on page 2-9 for a detailed explanation of how to connect to an access point or router through manually selecting a wireless network.

6. After you have reviewed the settings, click Finish. The Settings screen displays:



Figure 1-8

The  icon appears in the system tray and on the desktop. The wizard initiates your wireless connection, which could take up to a minute.


7. Use the status bar to verify your wireless connectivity. See “[Smart Wizard Status Bar](#)”.

Connecting to Wireless Networks and the Internet






Note: The maximum speed of a USB v2.0 port is 480 Mbps. If your computer has a USB v1.1 port, the WN111 is limited to that port's maximum speed, which is 14 Mbps.

The WN111 has indicators in three locations that show the status of your connection to a wireless network and to the Internet:


- **WN111 Icon:** After you install the WN111 software, the  icon appears on the desktop and in the lower right of the Windows task bar. It is color coded to show the status of the connection.
- **Smart Wizard Status Bar:** Clicking on the system tray icon opens the Smart Wizard. The status bar at the bottom of the page shows details about your wireless and Internet connection. See "[Smart Wizard Status Bar](#)".
- **LED:** The LED on the wireless USB adapter shows the network connection. Solid indicates a connection. The LED blinks when the wireless USB adapter is looking for a network association.

WN111 Icon Colors

The WN111 icon is on the desktop and in the Windows System Tray. The System Tray is on one end of the taskbar in the Microsoft Windows desktop.

Color	Condition	Description
Red 	The wireless USB adapter has no connection to any other wireless node.	The wireless USB adapter cannot link to any other wireless node or the link is lost. Check your configuration or try moving to a location where the wireless signal quality is better.
Yellow 	The wireless USB adapter has a connection with another wireless node.	The wireless link is weak. You might need to move to a better spot, such as closer to the wireless access point. Also, look for possible interference such as a 2.4 GHz cordless phone or large metal surface.
Green 	The wireless USB adapter has a connection with another wireless node.	The wireless USB adapter has established good communication with an access point and the signal quality is strong.

Smart Wizard Status Bar

Click the  icon to open the Smart Wizard so you can view the status bar. The Smart Wizard Settings screen displays. The status bar is located at the bottom of the Settings page.

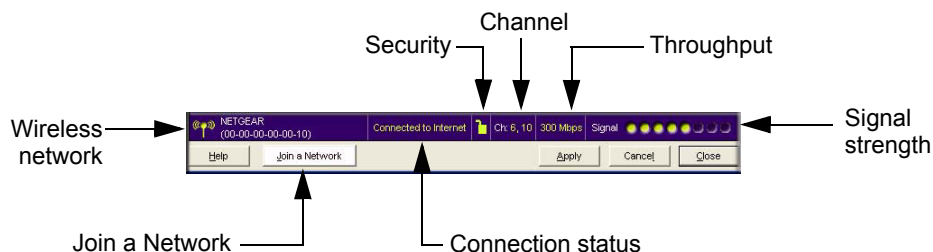


Figure 1-9

The following table describes how to interpret the Smart Wizard status bar

Understanding the Status Bar	
Wireless network	Identifies which wireless network you have joined.
Security	<ul style="list-style-type: none"> • Locked: security enabled. • Unlocked: security not enabled.
Channel	The wireless channel used by the network. If many wireless networks in your area use the same channel they can interfere with one another.
Throughput	<ul style="list-style-type: none"> • Wireless throughput measured in Mega bits per second. To optimize throughput, connect to a network with a high-speed router or access point, and a high-speed Internet connection. See Chapter 3, "Wireless Network Performance". • If your computer has a USB v1.1 port, the WN111 is limited to that port's maximum speed, which is 14 Mbps.
Signal strength	More dots indicates a stronger signal. Usually, you will experience higher throughput when the signal is strongest.
Join a Network	Click Join a Network to open the Connection Wizard.
Connection status	Identifies the status of your network connection. <ul style="list-style-type: none"> • Connected to Internet: Wireless Internet connection is OK. • Connected to Router: Wireless connection to the router is OK but the router is not connected to the Internet. • 169.254.x.x or _. _ . _ . _ : The wireless connection to the router is OK but there is a problem with the router. See Chapter 4, "Troubleshooting".

The Connection status is useful in isolating a problem. For example, if you are connected to a router, but not to the Internet, then check the router's Internet connection.

If you right-click the system tray icon, you can disable the Internet notification feature by clearing the check mark enabling notification, as shown in the following figure. If you do so, then only the IP address is shown.



Figure 1-10

In Vista, there is one more option: Enable NETGEAR Smart Wizard.

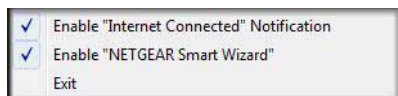



Figure 1-11

If you clear the check mark for Enable NETGEAR Smart Wizard, the NETGEAR Smart Wizard will be disabled and you will need to setup the wireless adapter with Vista Auto configuration.

WN111 LED

The LED on the WN111 indicates the condition of wireless link

	LED	Meaning
	Off	<ul style="list-style-type: none"> The WN111 is not plugged in to the PC. Power save mode (default from power up or reset).
	Blink	Looking for network association.
	On	Associated or joined with network.

Placing the USB Adapter Cradle

You can attach the RangeMax Next WN111 Wireless USB 2.0 Adapter directly to a USB port on your computer, or use the USB cable to extend the range and obtain better wireless reception.

Follow these instructions to use the USB cable, plastic cradle, and loop and hook fastener provided in the package for better USB Adapter placement on a notebook computer:

1. The RangeMax Next WN111 Wireless USB 2.0 Adapter comes with three black fasteners. Locate the one with a prickly side and attach it to the plastic cradle on the middle of the outside rear.

2. Insert the RangeMax Next WN111 Wireless USB 2.0 Adapter in the plastic cradle.

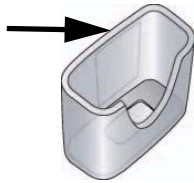


Figure 1-12

3. Place one of the other pieces of loop and hook fastener on the back of your monitor near the top for better reception.



Figure 1-13



Note: The last piece of the fastener can be placed on the side of your PC monitor nearest your wireless access point, if you are using the USB Adapter with a desktop PC.

Removing the WN111 Software

You can remove the wireless adapter software in these two ways:

- Navigate the Windows Start menu to the RangeMax Next WN111 Wireless USB 2.0 Adapter program group, select the uninstall option, and follow the screen prompts.
- Navigate the Windows Start menu to the Control Panel Add or Remove Program item, select the RangeMax Next WN111 Wireless USB 2.0 Adapter option, and follow the screen prompts.

Upgrading the WN111 Software

Upgrades might be available at the NETGEAR website. To install an upgrade, follow these steps.

1. Write down the settings for any profiles that you want to save. They will not be retained.
2. Download the upgrade from the NETGEAR website Support page.
3. Remove the WN111 software from your computer.
4. Remove the WN111 adapter from your computer, and if prompted restart your laptop computer.
5. Run the installer that you downloaded (the file ends in .exe).
6. Follow the installer instructions, and if prompted, then restart your computer.

Chapter 2

Network Connections and Wireless Security

This chapter explains how to use your Wireless USB 2.0 Adapter to connect to your Wireless Local Area Network (WLAN) and how to set up wireless security for the Wireless USB 2.0 Adapter so that it matches the wireless security settings for your network.

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. If you are working with the Vista configuration utility, see the online document:

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

Disabling the Windows Zero Configuration 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.

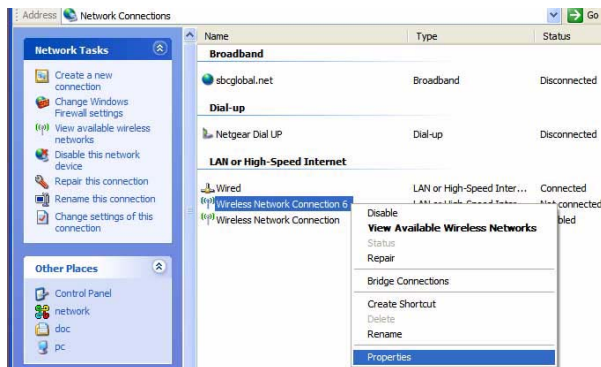



Figure 2-1

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 WN111 Smart Wizard to change the RangeMax Next WN111 Wireless USB 2.0 Adapter wireless settings.

When you have installed the software from the 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.
- Connect securely to an access point or router through Wi-Fi Protected Setup (WPS)
- Choose the network that you want to use.
- Configure wireless settings for your wireless USB adapter
- 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.

2. Click the Networks tab. The Networks screen displays:

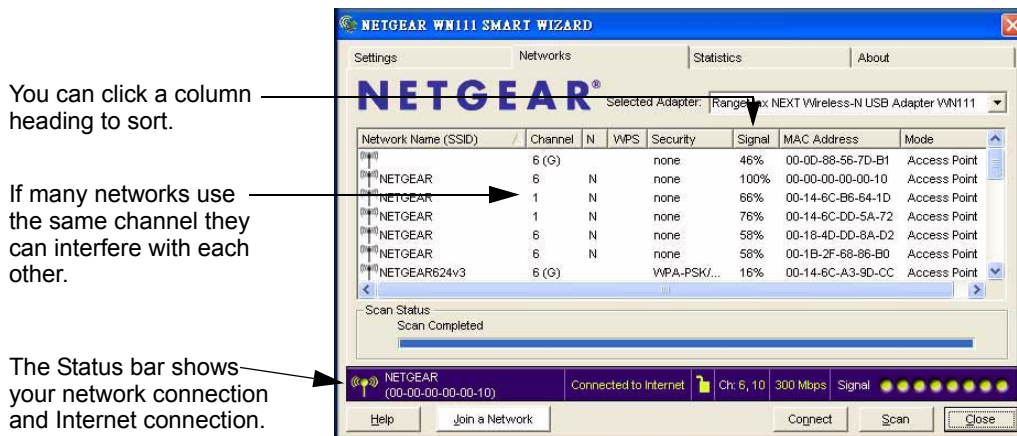


Figure 2-2

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

- **Help.** Displays utility help contents.
- **Join a Network.** View networks and join a network. See [“Joining 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.

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.
- **N.** The access point supports wireless N mode.
- **WPS.** The access point supports WPS.
- **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)

Joining a Network

During the WN111 software installation, the Smart Wizard connects the WN111 to a wireless access point or router, or lists the available networks to let you select a network. After installation you can use the Join a Network button or the Networks tab at any time to either connect to another access point or router or to view the available networks and select one:

- If a wireless access point or router in the network supports Wi-Fi Protected Setup (WPS), see the [“Using WPS to Connect to a Wireless Network”](#) section on this page.
- If none of the wireless access points or routers in the network support WPS, or if you prefer to manually select a network, see the [“Manually Selecting a Wireless Network”](#) section on [page 2-9](#).

Using WPS to Connect to a Wireless Network

The easiest way to connect securely to an access point or router is through WPS. If an access point or router in the wireless network that you try to connect to supports WPS, you can use WPS to set up the WN111 wireless settings and connect securely to the access point or router. (An access point or router that supports WPS has a WPS symbol.) WPS automatically configures the network name (SSID) and WPA security key for the access point or router and the WN111. Note that WPS is not a new security feature—it makes existing security features easier to configure.

For an access point or router that supports WPS, there are two methods to enable WPS with a client such as the WN111:

- **Push Button Configuration (PBC).** To enable WPS, push an actual push button or push dome on the access point or router or a simulated push button in the software. This is a fairly new technology, so only some access points and routers provide a PBC.
- **PIN entry.** To enable WPS, enter in the Smart Wizard for the WN111 a Personal Identification number (PIN) that is associated with the access point or router.

Using a PCB to Connect to a Wireless Access Point or Router

To join a network using a PCB:



1. Use the  icon to open the Smart Wizard. On the status bar, click Join a Network.



Figure 2-3

	<p>Note: Instead of clicking Join a Network on the status bar, you can also click the Networks tab on the Smart Wizard Settings screen. Then, select a network.</p>
---	--

2. The following screen displays. Select Yes, and click Next.

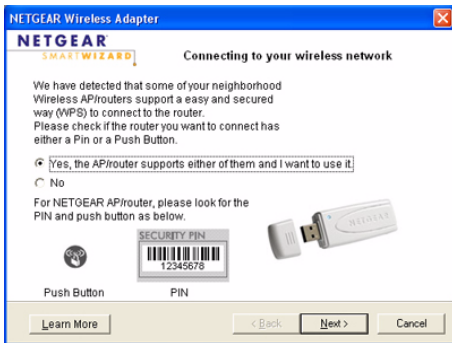


Figure 2-4

3. The following screen displays. Select Yes (to use a push button), and click Next.



Figure 2-5



4. Open the Smart Wizard for the access point or router that you have selected.
5. Select Add WPS Client from the menu of the Smart Wizard for the access point or router.
6. On the Add WPS Client page, select Push Button.
7. To start the WPS process, either physically press the Push Button on the access point or router, or press the Soft Push Button by clicking on the  icon on the Add WPS Client page.
8. Within 2 minutes of completing [Step 7](#), return to the Smart Wizard page for the WN111, and click the  icon. The Smart Wizard initiates your wireless connection.



Figure 2-6

9. You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar” on page 1-10](#). Click Close to exit the Smart Wizard.
10. Close the Smart Wizard for the access point or router.

Using a PIN to Connect to a Wireless Access Point or Router

To join a network using a PIN:



1. Use the  icon to open the Smart Wizard. On the status bar, click Join a Network.



Figure 2-7

	<p>Note: Instead of clicking Join a Network on the status bar, you can also click the Networks tab on the Smart Wizard Settings screen. Then, select a network.</p>
---	--

2. The following screen displays. Select Yes, and click Next.



Figure 2-8

3. The following screen displays. Select No (to use a PIN), and click Next.



Figure 2-9

4. Generate a client security PIN for the WN111. Write down (or copy) the PIN.



Figure 2-10

5. Open the Smart Wizard for the access point or router that you have selected.
6. Select Add WPS Client from the menu of the Smart Wizard for the access point or router.
7. On the Add WPS Client page, select PIN.
8. Within 4 minutes of completing [Step 4](#), enter the PIN in the box for the 'Client's PIN' on the Add WPS Client page, and click Next. The Smart Wizard initiates your wireless connection.
9. You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar” on page 1-10](#). Click Close to exit the Smart Wizard.
10. Close the Smart Wizard for the access point or router.

Manually Selecting a Wireless Network

During the WN111 software installation, the Smart Wizard lists the available networks. After installation you can use the Join a Network button or the Networks 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.

Depending on whether or not a wireless access point or router in the network supports Wi-Fi Protected Setup (WPS), the Smart Wizard presents different screens to manually configure a network.

Manually Selecting a Wireless Network in a WPS Configuration

To manually join a network in which a wireless access point or router supports WPS:

1. Use the  icon to open the Smart Wizard. On the status bar, click Join a Network.



Figure 2-11



Note: Instead of clicking Join a Network on the status bar, you can also click the Networks tab on the Smart Wizard Settings screen. Then, select a network.

2. The following screen displays. Select No, and click Next.



Figure 2-12

3. Select a network from the drop-down list. If you select a hidden network then you must enter the SSID. Click Next.

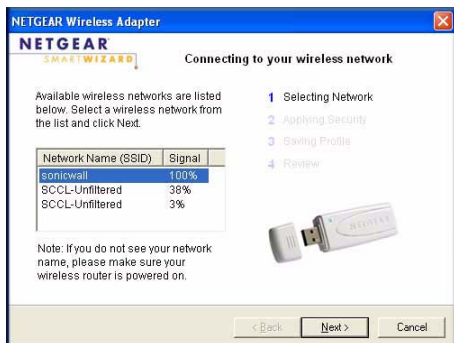


Figure 2-13

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.
6. You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar”](#) on page 1-10. Click Close to exit the Smart Wizard.

Manually Selecting a Wireless Network in a Configuration without WPS

To manually join a network in which none of the wireless access points or routers support WPS:

1. Use the  icon to open the Smart Wizard. On the status bar, click Join a Network.



Figure 2-14



Note: Instead of clicking Join a Network on the status bar, you can also click the Networks tab on the Smart Wizard Settings screen. Then, select a network.

2. Select a network from the drop-down list. If you select a hidden network then you must enter the SSID. Click Next.

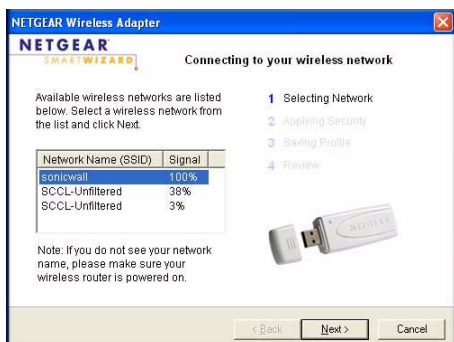


Figure 2-15

3. Follow the steps of the wizard to specify the wireless security if used, and to create a profile.
4. Review you settings, and click Finish.
5. You can use the Status Bar to verify your network connection. For more information, see [“Smart Wizard Status Bar”](#) on page 1-10. Click Close to exit the Smart Wizard.

Profiles

The WN111 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 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 RangeMax Next WN111 Wireless USB 2.0 Adapter to connect to a wireless access point or router.



1. Use the  icon to open the Smart Wizard. The Settings screen displays.



Figure 2-16

2. Enter the network settings.
 - a. In the Network Type section, make 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 Save Profile.

All the configuration settings are saved in this profile.
 - b. Click **Apply** and then click Close to exit, or Cancel to return to the previous settings.
4. Verify wireless connectivity to your network.

Use a browser 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 4, “Troubleshooting”](#). 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. See the link to [“Internet Networking and TCP/IP Addressing:”](#) in [Appendix B](#).

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

The Computer-to-Computer setting 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.



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 help setting up static IP addresses, see the PC Networking Tutorial on the Resource CD.

To create an Ad Hoc mode profile:


1. Use the  icon to open the Smart Wizard. The Settings screen displays:



Figure 2-17

2. Enter the network settings.
 - a. Select Computer-to-Computer (Ad Hoc) for the Network Type.
 - b. Select or enter the Network Name (SSID) for the Ad Hoc network.
 - c. In the Profile box, type the name of the profile.
 - d. Click **Apply**.
3. Save your settings in a Profile.
 - a. Click Save Profile and 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.
4. Configure the PC network settings.
 - a. Configure each PC with either a static IP address or with the IPX protocol.
 - b. Restart the PCs.
5. Verify wireless connectivity between your peer devices with the Ping program:
 - a. On the Windows taskbar click Start, and then click Run.

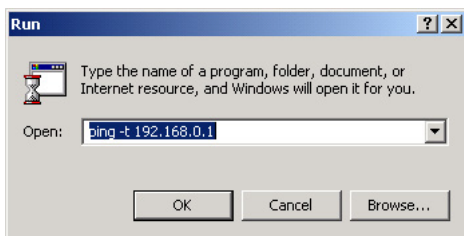


Figure 2-18

- 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.
- c. A continuous ping will 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 2-19

At this point the connection is established.



Note: If you cannot connect, see [“Removing the WN111 Software”](#) in Chapter 1. For problems accessing network resources, the Windows Client and File and Print Sharing software might not be installed or configured properly on your computers. See the link to [“Internet Networking and TCP/IP Addressing:”](#) in Appendix B.

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:

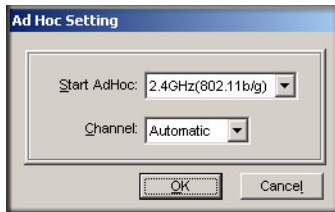


Figure 2-20

4. In the Start Ad Hoc field, choose the wireless standard (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 to view 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 WN111 with exactly the same kind of wireless security settings. The main types of wireless security used for home networks are:

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

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.

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:](#)” in [Appendix B](#).

In addition to the WN111 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.

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 WN111 wireless network name (SSID). You might 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 USB adapter. 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 match 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.

Setting up WEP Encryption Security

Follow these steps to configure WEP Encryption Security:

1. Run the WN111 Smart Wizard.

- a. Make sure the WN111 software is installed and the WN111 is connected to the USB port in your computer.



- b. Use the  icon to open the Smart Wizard. The Settings screen displays.




Figure 2-21


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

	Note: Larger encryption keys require more processing and might 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 WPA-PSK Security

Follow these steps to configure WPA-PSK Security:

1. Run the WN111 Smart Wizard.
 - a. Make sure the WN111 software is installed and the WN111 is fully inserted in a USB port in your computer.
 - b. Use the  icon to open the Smart Wizard. The Settings screen displays:

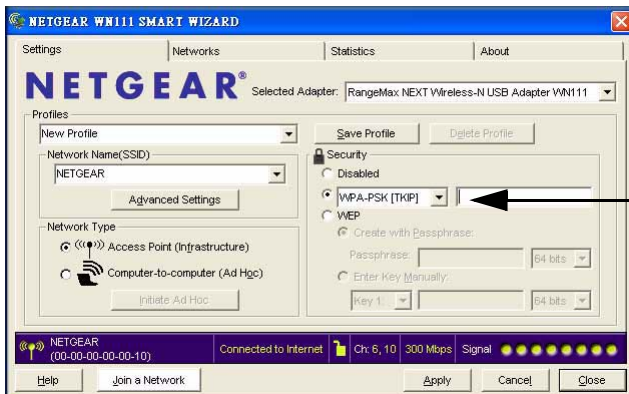
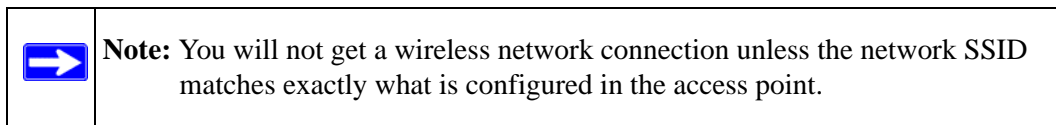


Figure 2-22

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.



- c. In the Security section, select WPA-PSK [TKIP] and enter the passphrase. For more information about WPA-PSK, see the link to [“Wireless Communications:” in Appendix B.](#)
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** and then click Close to exit the Smart Wizard.

Setting up WPA2-PSK Security

Follow these steps to configure WPA2-PSK Security:



1. Run the WN111 Smart Wizard.
 - a. Make sure the WN111 software is installed and the WN111 is fully inserted in a USB port in your computer.
 - b. Use the  icon to open the Smart Wizard. The Settings screen displays:



Figure 2-23

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 WPA2-PSK [AES] and enter the passphrase. For more information about WPA2-PSK, see the link to [“Wireless Communications:” in Appendix B.](#)
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** and then click Close to exit the Smart Wizard.

Statistics Tab

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

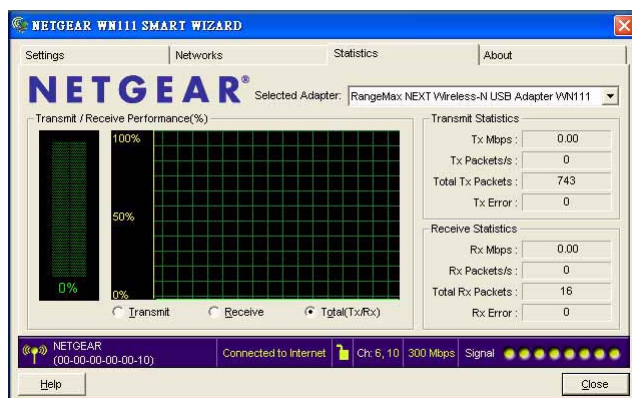


Figure 2-24

- **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 Tab

The About Tab displays the current version information.

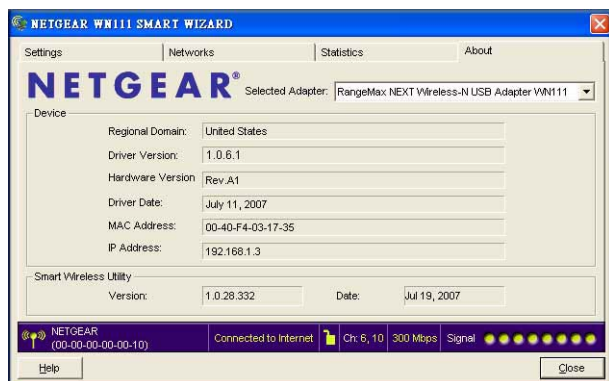


Figure 2-25

The following information is displayed in the About screen:

- **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 might violate local laws.
- **Driver Version.** The wireless adapter driver version.
- **Hardware 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 Wireless Utility.** The version and release date of the Smart Wizard.

Advanced Settings

The default advanced settings usually work fine. To view or change the advanced settings, from the Settings tab, click Advanced Settings. The Advanced Settings screen displays:

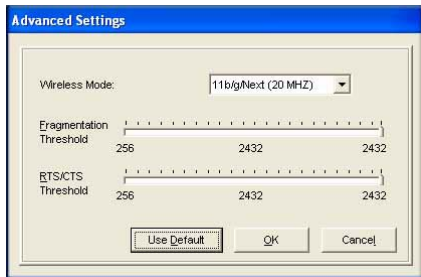


Figure 2-26

Chapter 3

Wireless Network Performance

This chapter explains how to use your RangeMax Next WN111 Wireless USB 2.0 Adapter to connect to your Wireless Local Area Network (WLAN) and how to set up wireless security for the wireless USB adapter so that it matches the wireless security settings for your network.

Optimizing Wireless Performance

The speed and operating distance or range of your wireless connection can vary significantly based on the location of the wireless router. You should choose a location for your router that will maximize the network speed.

The following list describes how to optimize wireless router performance.

- Identify critical wireless links.
If your network has several wireless devices, decide which wireless devices need the highest data rate, and locate the router near them. Many wireless products have automatic data-rate fallback, which allows increased distances without losing connectivity. This also means that devices that are further away might be slower. Therefore, the most critical links in your network are those where the traffic is high and the distances are great. Optimize those first.
- Choose placement carefully.
For best results, place your router:
 - Near the center of the area in which your computers will operate.
 - In an elevated location such as a high shelf where the wirelessly connected computers have line-of-sight access (even if through walls).
- Avoid obstacles to wireless signals.
 - Keep wireless devices at least two feet from large metal fixtures such as file cabinets, refrigerators, pipes, metal ceilings, reinforced concrete, and metal partitions.
 - Keep away from large amounts of water such as fish tanks and water coolers.

- Reduce interference.
Avoid windows unless communicating between buildings.
Place wireless devices away from various electromagnetic noise sources, especially those in the 2400–2500 MHz frequency band. Common noise-creating sources are:
 - Computers and fax machines (no closer than one foot)
 - Copying machines, elevators, and cell phones (no closer than 6 feet)
 - Microwave ovens (no closer than 10 feet)
- Choose your settings.
 - Use a scanning utility to determine what other wireless networks are operating nearby, and choose an unused channel.
 - Turn off SSID Broadcast, and change the default SSID. Other nearby devices might automatically try to connect to your network several times a second, which can cause significant performance reduction.

Optimizing Your Network Bandwidth

The speed of network connections depends on the type of equipment that you use. Try to use high-speed technologies for network connections with the heaviest traffic to avoid lower-speed bottlenecks in the path. The following figure shows a home network that includes many different connection speeds.

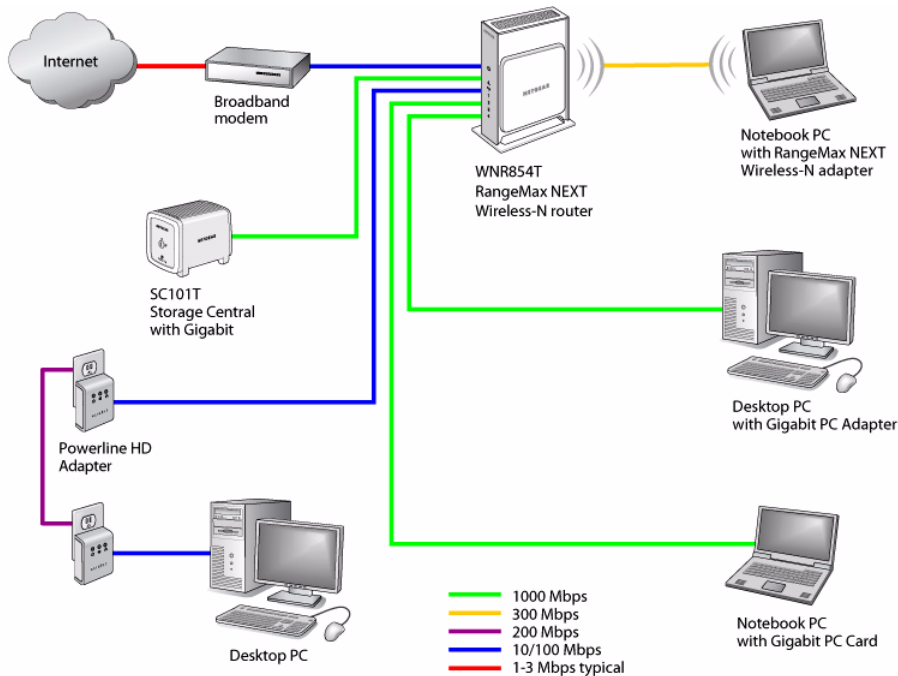


Figure 3-1

In the network shown in [Figure 3-1](#), the two PCs with gigabit (1000 Mbps) Ethernet adapters have a gigabit connection through the router to the storage server. With a high-speed router this connection allows for extremely fast backups or quick access to large files on the server. The PC connected through a pair of Powerline HD adapters is limited to the 200 Mbps speed of the Powerline HD connection. Although any of the links in this example would be sufficient for high-traffic applications such as streaming HD video, the use of older devices such as 10 Mbps Ethernet or 802.11b wireless would create a significant bottleneck.

In planning your network, think about which tasks will have the heaviest traffic flow between them. Examples are:

- A media center in one room streaming high-definition video from a server in another room
- A storage device that is used for backing up your computers

Overview of Home and Small Office Networking Technologies

Common connection types and their speed and security considerations are:

- **Broadband Internet**

Your Internet connection speed is determined by your modem type, such as ADSL or cable modem, as well as the connection speed of the sites to which you connect, and general Internet traffic. ADSL and cable modem connections are asymmetrical, meaning they have a lower data rate *to* the Internet (upstream) than *from* the Internet (downstream). Keep in mind that when you connect to someone else who also has an asymmetrical connection, the data rate between your sites is limited by each side's upstream data rate. A typical residential ADSL or cablemodem connection provides a downstream throughput of about one to three megabits per second (Mbps). Newer technologies such as ADSL2+ and Fiber to the Home (FTTH) will increase the connection speed to tens of Mbps.

- **Wireless**

A high-speed wireless router can provide a wireless data throughput of up to 300 Mbps using technology called Multiple-Input Multiple-Output (MIMO), in which multiple antennas transmit multiple streams of data. The use of multiple antennas also provides excellent range and coverage. With the introduction of the newer WPA and WPA2 encryption and authentication protocols, wireless security is extremely strong.

To get the best performance, use newer adapters such as RangeMax adapters for your computers. A high-speed router might be compatible with older 802.11b and 802.11g adapters, but the use of these older wireless technologies in your network can result in lower throughput overall (typically less than 10 Mbps for 802.11b and less than 40 Mbps for 802.11g). In addition, many older wireless products do not support the latest security protocols, WPA and WPA2.

- **Powerline**

For connecting rooms or floors that are blocked by obstructions or are distant vertically, consider networking over your building's AC wiring. NETGEAR's Powerline HD family of products delivers up to 200 Mbps to any outlet, while the older generation XE family of products delivers 14 Mbps or 85 Mbps. Data transmissions are encrypted for security, and you can configure an individual network password to prevent neighbors from connecting.

The Powerline HD family of products can coexist on the same network with older generation XE family products or HomePlug 1.0 products, but they are not interoperable with these older products.

- **Wired Ethernet**

As Gigabit Ethernet ports become common on newer computers, wired Ethernet remains a good choice for speed, economy, and security. Gigabit Ethernet can extend up to 100 meters with twisted-pair wiring of CAT-5e or better. A wired connection is not susceptible to interference, and eavesdropping would require a physical connection to your network.



Note: Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, can lower actual data throughput rate.

Assessing Your Speed Requirements

Because your Internet connection is likely to operate at a much lower speed than your local network, faster local networking technologies might not improve your Internet experience. However, many emerging home applications require high data rates. For example:

- Streaming HD video requires 10 to 30 Mbps per stream. Because latency and packet loss can disrupt your video, plan to provide at least twice the capacity you need.
- Streaming MP3 audio requires less than 1 Mbps per stream and does not strain most modern networks. Like video, however, streaming audio is also sensitive to latency and packet loss, so a congested network or a noisy link can cause problems.
- Backing up computers over the network has become popular due to the availability of inexpensive mass storage. [Table 3-1](#) shows the time to transfer one gigabyte (1 GB) of data using various networking technologies.

Table 3-1. Theoretical Transfer Time for 1 Gigabyte

Network Connection	Theoretical Raw Transfer Time
Gigabit Wired Ethernet	8 seconds
RangeMax NEXT Wireless-N	26 seconds
Powerline HD	40 seconds
100 Mbps Wired Ethernet	80 seconds
802.11g wireless	150 seconds
802.11b wireless	700 seconds
10 Mbps Wired Ethernet	800 seconds

Table 3-1. Theoretical Transfer Time for 1 Gigabyte

Network Connection	Theoretical Raw Transfer Time
Cable Modem (3 Mbps)	2700 seconds
Analog Modem (56 kbps)	144,000 seconds (40 hours)

Chapter 4

Troubleshooting

This chapter provides information about troubleshooting your RangeMax Next WN111 Wireless USB 2.0 Adapter. For information about connecting to wireless networks and the Internet, see “Basic Setup” in Chapter 1.

Troubleshooting Tips

Use the following information to solve common problems you might encounter. Also, refer to the knowledge base on the NETGEAR website at <http://www.netgear.com/support/main.asp>.

Table 4-1. Troubleshooting Tips

Problem	Action
The LED is not lit	<p>The WN111 is not connected to the USB port properly or the WN111 software is not loaded.</p> <ul style="list-style-type: none">• Remove and reinsert the WN111.• Check the Windows device manager to see if the WN111 is recognized and enabled. Reload the WN111 software, if necessary.• Try to install the WN111 in a different USB slot on your system if one is available.
The LED blinks but the WN111 is not connected to an access point.	<p>The WN111 is trying to connect to an access point, but cannot connect.</p> <ul style="list-style-type: none">• The access point might not be powered on.• Or, the access point and the WN111 are not configured with the same wireless parameters. Check the SSID and WEP settings.
I cannot connect to an access point. The access point is available and there is good signal strength.	<ul style="list-style-type: none">• If the access point is WPA-PSK protected, you need the correct WPA-PSK passphrase. Otherwise, the WN111 will still be connected to the previous access point and you will not be able to change to the WPA-PSK access point.• If the access point is WEP protected (either 64 or 128 bit encryption), you will be prompted to enter the WEP encryption security information.

Table 4-1. Troubleshooting Tips (continued)

Problem	Action
Throughput is only 54 Mbps or only 14 Mbps.	<p>The RangeMax Next WN111 Wireless USB 2.0 Adapter can operate at faster speeds.</p> <ul style="list-style-type: none"> • At 54 Mbps you are probably connecting to a standard 802.11g network. See Chapter 3, “Wireless Network Performance”. • If you do not have a USB 2.0 port on your PC, the throughput is limited to the 14 Mbps of the USB 1.1 standard.
The Smart Wizard keeps asking me to save settings.	If you change the settings the Smart Wizard offers you the chance to save the changes. To avoid this prompt, simply click Apply before you close the Smart Wizard.
Two WN111 icons are in the system tray.	You have an older software version installed on your system and it needs to be removed. See “Removing the WN111 Software” in Chapter 1 or “Upgrading the WN111 Software” in Chapter 1 .
I can connect to the access point, but not the other computers on the network or to the Internet.	<p>This could be a physical layer problem or a network configuration problem.</p> <ol style="list-style-type: none"> 1. Check to make sure that the access point is physically connected to the Ethernet network. 2. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. See the link to “Internet Networking and TCP/IP Addressing:” in Chapter B. 3. Restart the cable or DSL modem, router, access point, and computer.
Viewing the IP address.	To view the RangeMax Next WN111 Wireless USB 2.0 Adapter IP address, click the WN111 icon to open the Smart Wizard. Then check the IP address in the About page.
No IP address is assigned to the RangeMax Next WN111 Wireless USB 2.0 Adapter.	<p>This might occur if you upgraded your RangeMax Next WN111 Wireless USB 2.0 Adapter software and did not reboot your system.</p> <ul style="list-style-type: none"> • Either restart your computer, or connect to a different access point. • It does not usually help to shut down the Smart Wizard or disable/enable the card.

Ad Hoc Mode Is Not Working Correctly

You must click the Initiate Ad Hoc button before you click **Apply**. Here is how you start an Ad Hoc network:

1. Fill in the Network Name (SSID).
2. Select the Computer-to-Computer (Ad Hoc) Network Type.
3. Click Initiate Ad Hoc.
4. Accept the default settings or make your changes and click OK
5. Click **Apply**.



Note: Be sure all computers in your Ad Hoc network are configured with static IP addresses in the same subnet.

Windows XP Occasional Connection Problems

Windows XP users who apply Windows XP Hotfix (SP2) Q815485 from the Windows XP Update Service might not be able to connect to the Internet, might have dropped wireless connections, or both when using the RangeMax Next WN111 Wireless USB 2.0 Adapter. You can delete this Hotfix from the Add or Remove Program utility in the Control Panel.

To delete Windows XP Hotfix (SP2) Q815485:

1. Click Start, point to Control Panel, and then double click Add/Remove Programs.
2. Click Windows XP Hotfix (SP2) Q815485, and then click Remove.
 - You might receive an error message that states that some program on the computer might not work correctly if the update is removed.
 - You can ignore this error message, and then click Yes to remove the update.
3. Restart your computer and rerun the Smart Display Setup Wizard.

This should solve your connection issue. You can restore this hotfix by following the link below:
<http://microsoft.com/downloads/details.aspx?FamilyId=009D8425-CE2B-47A4-ABEC-274845DC9E91&displaylang=en>

Appendix A

Technical Specifications and Factory Default Settings

Technical Specifications

The following table provides technical specifications for the Wireless USB 2.0 Adapter.

Antenna	1 Integrated internal antenna
Standards	802.11n, 802.11g, or 802.11b
Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, 08, 140, 246, and 300 Mbps (Auto Rate Sensing)
Frequency	2.4GHz to 2.5GHz CCK and OFDM Modulation)
Power	5V Bus powered
Emissions	FCC, CE
Bus interface	USB 2.0
Provided drivers	Microsoft Vista, Windows XP, and Windows 2000
Operating Environment	Operating temperature: 0 to 45 degree C
Encryption	40-bit (also called 64-bit) and 128-bit WEP data encryption, and WPA-PSK
Warranty	Limited 1-year warranty

Factory Default Settings

The following table lists the default settings of your Wireless USB 2.0 Adapter.

Feature	Description
Smart Wizard	Enabled
Wireless	
Wireless Communication	Enabled
Wireless Network Name (SSID)	Any (will connect to first wireless network that responds)
Security	Disabled
Network Type	Infrastructure
Transmission Speed	Auto ^a
Country/Region	United States (varies by region)
Operating Mode	802.11n, 802.11g, 802.11b
Data Rate	Up to 300 Mbps

- a. Maximum wireless signal rate (IEEE Standard 802.11). Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

Appendix B

Related Documents

This appendix provides links to reference documents you can use to gain a more complete understanding of the technologies used in your NETGEAR product.

Document	Link
Windows XP and Vista Wireless Configuration Utilities	http://documentation.netgear.com/reference/enu/winzerocfg/index.htm
Internet Networking and TCP/IP Addressing:	http://documentation.netgear.com/reference/enu/tcpip/index.htm
Wireless Communications:	http://documentation.netgear.com/reference/enu/wireless/index.htm
Preparing a Computer for Network Access:	http://documentation.netgear.com/reference/enu/wsdhcp/index.htm
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