

# User Guide for the NETGEAR 802.11b Wireless Compact Flash Card MA701



## NETGEAR

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## Technical Support

Please refer to the support information card that shipped with your product. By registering your product at [www.netgear.com/register](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.

E-mail: [support@netgear.com](mailto:support@netgear.com)

Web site: [www.netgear.com](http://www.netgear.com)

## Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice.

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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August 2003

## Certificate of the Manufacturer/Importer

It is hereby certified that the Model MA701 Wireless PC Card has been suppressed in accordance with the conditions set out in the BMPT- AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

## VCCI Statement

This equipment is in the Class B category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing

Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas. When used near a radio or TV receiver, it may become the cause of radio interference. Read instructions for correct handling.

## **FCC Information to User**

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

### **FCC Guidelines for Human Exposure**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

### **Declaration Of Conformity**

We NETGEAR, Inc., 4500 Great America Parkway, Santa Clara, CA 95054, declare under our sole responsibility that the model MA701 Cardbus Card Wireless Adapter complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

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

## **Regulatory Compliance Information**

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

NOTE: This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

### **Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

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

**NETGEAR 802.11b Wireless Compact Flash Card MA701**



Tested to Comply  
with FCC Standards  
FOR HOME OR OFFICE USE

Modifications made to the product, unless expressly approved by NETGEAR, Inc., could void the user's right to operate the equipment.

**EN 55 022 Statement**

This is to certify that the NETGEAR 802.11b Wireless Compact Flash Card MA701 is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22). Compliance is dependent upon the use of shielded data cables.

**Export Restrictions**

This product or software contains encryption code which may not be exported or transferred from the US or Canada without an approved US Department of Commerce export license.

**Canadian Department of Communications Radio Interference Regulations**

This digital apparatus (Model MA701 Wireless Compact Flash Card) does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

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# Chapter 1

## About This Manual

Congratulations on your purchase of the NETGEAR 802.11b Wireless Compact Flash Card MA701. This section of the User Guide identifies how to use this publication.

### Audience, Conventions, and Scope

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This User Guide assumes that the reader has basic to intermediate computer and Internet skills. However, tutorial information is provided in the Appendices, on the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*.



**Note:** Product updates are available on the NETGEAR web site at [www.netgear.com/support/main.asp](http://www.netgear.com/support/main.asp). Documentation updates are available on the NETGEAR, Inc. web site at [www.netgear.com/docs](http://www.netgear.com/docs).

This manual is written for the MA701 Wireless Compact Flash Card according to these specifications.:

**Table 1-1. Manual Specifications**

Product Version	NETGEAR 802.11b Wireless Compact Flash Card MA701
Manual Part Number	M-10204-01
Manual Publication Date	August 2003

This guide uses the following formats to highlight special messages:



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

This guide uses the following typographical conventions:

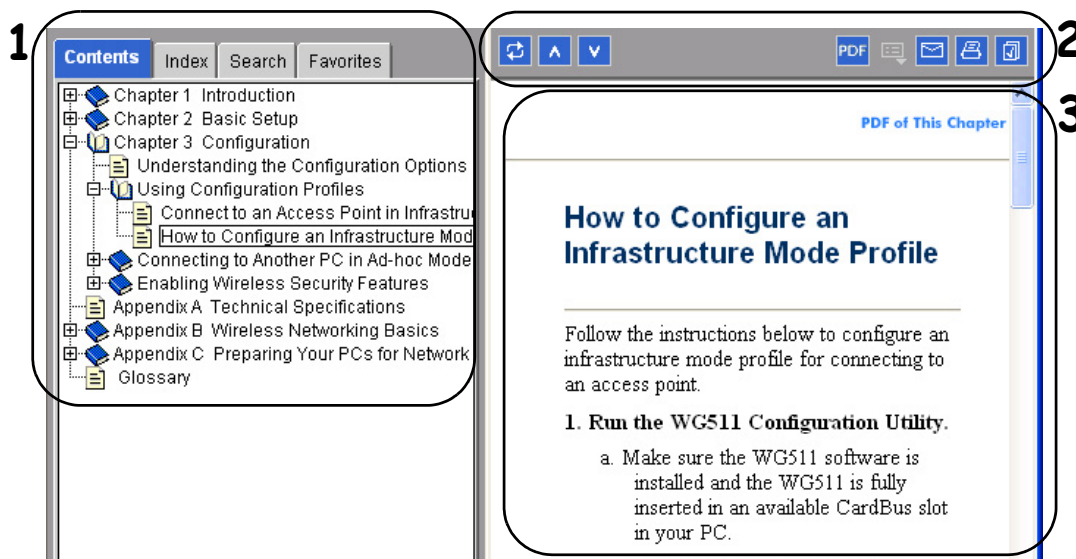
**Table 1. Typographical conventions**

<i>italics</i>	Emphasis.
<b>bold times roman</b>	User input.
[Enter]	Named keys in text are shown enclosed in square brackets. The notation [Enter] is used for the Enter key and the Return key.
SMALL CAPS	DOS file and directory names.

**Note:** Throughout this guide, only Pocket PC screen shots are displayed. Pocket PC screens will be functionally equivalent with various Windows CE systems.

## How to Use This Manual

The HTML version of this manual includes these features.



**Figure Preface -2: HTML version of this manual**

**1. Left pane.** Use the left pane to view the Contents, Index, Search, and Favorites tabs.

To view the HTML version of the manual, you must have a version 4 or later browser with Java or JavaScript enabled. To use the Favorites feature, your browser must be set to accept cookies. You can record a list of favorite pages in the manual for easy later retrieval.

2. **Toolbar buttons.** Use the toolbar buttons across the top to navigate, print pages, and more.
  - The *Show in Contents* button locates the currently displayed topic in the Contents tab.
  - *Previous/Next* buttons display the topic that precedes or follows the current topic.
  - The *PDF* button links to a PDF version of the full manual.
  - The *E-mail* button enables you to send feedback by e-mail to Netgear support.
  - The *Print* button prints the currently displayed topic. Using this button when a step-by-step procedure is displayed will send the entire procedure to your printer--you do not have to worry about specifying the correct range of pages.
  - The *Bookmark* button bookmarks the currently displayed page in your browser.
3. **Right pane.** Use the right pane to view the contents of the manual. Also, each page of the manual includes a “PDF of This Chapter” link at the top right which links to a PDF file containing just the currently selected chapter of the manual.

## How to Print this Manual

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

- **A “How To” Sequence of Steps in the HTML View.** Use the *Print* button on the upper right of the toolbar to print the currently displayed topic. Using this button when a step-by-step procedure is displayed will send the entire procedure to your printer--you do not have to worry about specifying the correct range of pages.
- **A Chapter.** Use the “PDF of This Chapter” link at the top right of any page.
  - Click “PDF of This Chapter” link at the top right of any page in the chapter you want to print. A new browser window opens showing the PDF version of the chapter you were viewing.
  - 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.
- **The Full Manual.** Use the PDF button in the toolbar at the top right of the browser window.
  - Click PDF button. A new browser window opens showing the PDF version of the chapter you were viewing.
  - 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 2 Introduction

This chapter introduces the features, package contents, and appearance of the NETGEAR 802.11b Wireless Compact Flash Card MA701.

### About the MA701 Wireless Compact Flash Card

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The NETGEAR 802.11b Wireless Compact Flash Card MA701 gives you ultimate mobility in your office or while you are traveling.

With this new Wireless Compact Flash Card, your Pocket PC (Windows CE 3.02.11 or above) and Handheld PC (Windows CE 3.0 or above) can take advantage of wireless access to your corporate LAN, surf the Internet, access e-mails, and communicate with other mobile devices enabled for IEEE 802.11b standard-based wireless LAN connectivity.

It is designed for notebook computers running Microsoft® Windows®. It is both 16-bit PCMCIA and 32-bit CardBus compatible and works in any available PCMCIA or CardBus slot.

Its auto-sensing capability allows high packet transfer at up to 11 Mbps for maximum throughput or dynamic range shifting to lower speeds due to distance or operating limitations in an environment with a lot of electromagnetic interference.

The MA701 Wireless Compact Flash Card provides reliable, standards-based 802.11b 11 Mbps WLAN connectivity that is protected with industry-standard security.

## Key Features and Related NETGEAR Products

---

The MA701 Wireless Compact Flash Card provides the following features:

- Reliable IEEE 802.11b standards-based wireless technology designed for multi-vendor compatibility.
- Fast data transfer speeds up to 11 Mbps.
- Easy installation on all Pocket PCs with Compact Flash Type I or Type II card slots.
- Supports multiple data rates, including 1, 2, 5.5 and 11 Mbps, with an auto fallback feature to ensure dependable connectivity.
- Built-in privacy protection supports both 40/64 and 128-bit WEP (Wired Equivalent Privacy) encryption systems.
- Offers a wireless range up to 300 feet in an office environment.
- Supports roaming between access points when configured in Infrastructure mode.

The following NETGEAR products can communicate with the MA701:

- WGT624 108 Mbps Wireless Firewall Router
- WG602 54 Mbps Wireless Access Point
- WGR614 54 Mbps Wireless Cable/DSL Router
- WAB102 Dual Band Access Point
- WAB501 Dual Band PC Card
- MA101 802.11b Wireless USB Adapter
- ME102 802.11b Wireless Access Point
- MA311 802.11b Wireless PCI Adapter
- MR314 and MR814 802.11b Wireless Cable/DSL Routers

## What's in the Box?

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The product package should contain the following items:

- NETGEAR 802.11b Wireless Compact Flash Card MA701
- Installation Guide for the NETGEAR 802.11b Wireless Compact Flash Card MA701
- *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*, including:

- Driver and Configuration Utility Software
- User Guide for the NETGEAR 802.11b Wireless Compact Flash Card MA701
- Animated Network Properties Configuration Tutorial
- PC Networking Tutorial
- Warranty card
- Support information card

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.

The NETGEAR 802.11b Wireless Compact Flash Card MA701 can be used in two ways:

- As a wireless compact flash card in Windows CE devices
- When used with a CF-to-PCMCIA adapter, as a PCMCIA Type I wireless adapter for notebook PCs

## **A Road Map for ‘How to Get There From Here’**

---

The introduction and adoption of any new technology can be a difficult process. Wireless technology has removed one of the barriers to networking—running wires. It allows more people to try networking while at the same time exposes them to the inherent complexity of networking. General networking concepts, setup, and maintenance can be difficult to understand. In addition, wireless technology adds issues, such as range, interference, signal quality, and security to the picture.

To help overcome potential barriers to successfully using wireless networks, the table below identifies how to accomplish such things as connecting to a wireless network, assuring appropriate security measures are taken, browsing the Internet through your wireless connection, exchanging files with other computers and using printers in the combined wireless and wired network.

**Table 2-1. A Road Map for How to Get There From Here**

If I Want To?	What Do I Do?	What's Needed?	How Do I?
Connect to a wireless network	<ol style="list-style-type: none"> <li>1. Identify the wireless network name (SSID) and, if used, the wireless security settings.</li> <li>2. Set up the NETGEAR 802.11b Wireless Compact Flash Card MA701 with the settings from step 1.</li> </ol>	<ol style="list-style-type: none"> <li>1. A wireless network</li> <li>2. A PDA, or a notebook PC within the operating range of the wireless network. For guidelines about the range of wireless networks, see <a href="#">"Observing Location and Range Guidelines" on page 3-2.</a></li> </ol>	<p>To set up the MA701, see <a href="#">Chapter 3, "Basic Setup"</a> and follow the instructions provided.</p> <p>To learn about wireless networking technology, see <a href="#">Appendix B, "Wireless Networking Basics"</a> for a general introduction.</p>
Protect my wireless connection from snooping, hacking, or information theft.	<ol style="list-style-type: none"> <li>1. Assure that the wireless network has security features enabled.</li> <li>2. Configure my MA701 with the security settings of the wireless network.</li> <li>3. Use Windows security features.</li> </ol>	<ol style="list-style-type: none"> <li>1. A wireless network with authentication and WEP encryption enabled.</li> <li>2. Wireless networking equipment that supports WEP encryption, such as the MA701 and all NETGEAR wireless networking products.</li> </ol>	<p>To learn about wireless networking security, see <a href="#">"Authentication and WEP" on page B-2.</a></p> <p>To use WEP security features, see <a href="#">"Enabling Wireless Security Features" on page 5-9</a> and configure your MA701 accordingly.</p>
<p><b>Note:</b> Secure Internet sites such as banks and online merchants use encryption security built into browsers like Internet Explorer and Netscape. Any wireless networking security features you might implement are in addition to those already in place on secure Internet sites.</p>			



**Table 2-1. A Road Map for How to Get There From Here**

If I Want To?	What Do I Do?	What's Needed?	How Do I?
<p>Connect to the Internet over my wireless network.</p>	<ol style="list-style-type: none"> <li>1. Activate my wireless link and verify my network connection.</li> <li>2. Open an Internet browser.</li> </ol>	<ol style="list-style-type: none"> <li>1. An active Internet connection like those from cable or DSL service providers.</li> <li>2. A wireless network connected to the cable or DSL Internet service through a cable/DSL router as illustrated in <a href="#">"Connecting to an Access Point in Infrastructure Mode"</a> on page 5-2.</li> <li>3. TCP/IP Internet networking software installed and configured according to the requirements of the local network.</li> <li>4. A browser.</li> </ol>	<p>To configure your MA701 in Infrastructure Mode, see <a href="#">"Basic Installation Instructions"</a> on page 3-4.</p> <p>For assistance with configuring the TCP/IP Internet software on a PC, see <a href="#">"Preparing Your Computers for TCP/IP Networking"</a> on page C-1 or refer to the PC Networking Tutorial on the <i>NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)</i> and the Help information provided in the Windows system you are using.</p>

**Table 2-1. A Road Map for How to Get There From Here**

If I Want To?	What Do I Do?	What's Needed?	How Do I?
<p>Exchange files between a wirelessly connected Pocket or notebook PC and other computers in a my combined wireless and wired network.</p>	<ol style="list-style-type: none"> <li>1. Use the Windows Network Neighborhood feature to browse for computers in the combined wireless and wired network.</li> <li>2. Browse the hard drive of the target computer in the network in order to locate the directory or files you want to work with.</li> <li>3. Use the Windows Explorer copy and paste functions to exchange files between the computers.</li> </ol>	<ol style="list-style-type: none"> <li>1. The computer I am using to connect to the wireless network needs to be configured with the Windows Client and File and Print Sharing.</li> <li>2. The computer I am using to connect to the wireless network needs to be configured with the same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network.</li> <li>3. Any Windows networking security access rights such as login user name/ password that have been assigned in the Windows network or for sharing particular files must be provided when Windows prompts for such information.</li> <li>4. If so-called Windows 'peer' Workgroup networking is being used, the drive, file system directory, or file need to be enabled for sharing.</li> </ol>	<p>For assistance with Windows networking software, see <a href="#">Appendix , "Preparing Your Computers for TCP/IP Networking"</a> for configuration scenarios or refer to the Help system included with your version of Windows.</p> <p>Windows Domain settings are usually managed by corporate computer support groups.</p> <p>Windows Workgroup settings are commonly managed by individuals who want to set up small networks in their homes, or small offices.</p> <p>For assistance with setting up Windows networking, refer to the PC Networking Tutorial on the <i>NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)</i> and the Help information provided in the Windows system you are using.</p>

**Table 2-1. A Road Map for How to Get There From Here**

If I Want To?	What Do I Do?	What's Needed?	How Do I?
<p>Use printers in a combined wireless and wired network.</p>	<ol style="list-style-type: none"> <li>1. Use the Windows Printers and Fax features to locate available printers in the combined wireless and wired network.</li> <li>2. Use the Windows Add a Printer wizard to add access to a network printer from the notebook PC you are using to wirelessly connect to the network.</li> <li>3. From the File menu of an application such as Microsoft Word, use the Print Setup feature to direct your print output to the printer in the network.</li> </ol>	<ol style="list-style-type: none"> <li>1. The computer I am using to connect to the wireless network needs to be configured with the Windows Client and File and Print Sharing.</li> <li>2. The computer I am using to connect to the wireless network needs to be configured with the same Windows Workgroup or Domain settings as the other Windows computers in the combined wireless and wired network.</li> <li>3. Any Windows networking security access rights such as login user name/ password that have been assigned in the Windows network must be provided when Windows prompts for such information.</li> <li>4. If so-called Windows 'peer' networking is being used, the printer needs to be enabled for sharing.</li> </ol>	<p>Windows Domain settings are usually managed by corporate computer support groups.</p> <p>Windows Workgroup settings are commonly managed by individuals who want to set up small networks in their homes, or small offices.</p> <p>For assistance with setting up Windows networking, refer to the PC Networking Tutorial on the <i>NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)</i> and the Help information provided in the Windows system you are using.</p> <p>For assistance with setting up printers in Windows, refer to the Help and Support information that comes with the version of the Windows operating systems you are using.</p>



# Chapter 3

## Basic Setup for a PDA

This chapter describes how to install your NETGEAR 802.11b Wireless Compact Flash Card MA701 and set up basic wireless connectivity on your Wireless Local Area Network (WLAN). Advanced wireless network configuration is covered in [Chapter 5, “PDA Configuration”](#) in this manual.



**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 appropriate steps to secure your network from unauthorized access. The NETGEAR 802.11b Wireless Compact Flash Card MA701 provides highly effective security features which are covered in [“Enabling Wireless Security Features” on page 5-9](#) in this manual. Deploy the security features appropriate to your needs.

### What You Need Before You Begin

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Verify that your computer meets the minimum system requirements. Also, identify the wireless network configuration settings of the wireless network where you will connect before you configure your wireless compact flash card.

### Verifying System Requirements

Before installing the NETGEAR 802.11b Wireless Compact Flash Card MA701, please make sure that these minimum requirements have been met:

- You must have a Pocket PC 2000/2002 (P/PC) with a Compact Flash Type I or II slot.

**Note:** Pocket PC 2003 will be supported in a future release. Please check the Netgear support web site at <http://www.netgear.com> for upgrades.

- Windows CE should be version 2.11 or higher.
- The PDA should have at least 500 Kilobytes of free memory.

- You must have Microsoft *ActiveSync* software version V3.5 or above successfully installed on your desktop or notebook PC that will be used for installing the MA701 software to your PDA.
- A CD-ROM drive.

## Observing Location and Range Guidelines

The range of wireless network connections indoors can vary significantly based on the physical location of the wireless devices. 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.

## Two Basic Operating Modes

---

The MA701 Wireless Compact Flash Card can operate in the following two basic modes:

- **Infrastructure Mode:** An 802.11 networking framework in which devices and computers communicate with each other by first going through an access point (AP). For example, this mode is used when computers in a house connect to an Access Point that is attached to a router which lets multiple computers share a single Cable or DSL broadband Internet connection.
- **Ad-Hoc Mode:** An 802.11 networking framework in which devices or computers communicate directly with each other, without the use of an AP. For example, Ad-Hoc Mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

Both of these configuration options are available with the MA701 Wireless Compact Flash Card. Infrastructure configuration procedures for basic network connectivity are covered below. Advanced infrastructure configuration procedures and ad-hoc configuration are covered in [Chapter 5, “PDA Configuration”](#) of this manual.

## MA701 Default Wireless Configuration Settings

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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, identify the wireless settings of the existing network.

Your NETGEAR 802.11b Wireless Compact Flash Card MA701 factory default basic settings are:

- Network Name Service Set Identification (SSID): **Any** (first available network)  
**Note:** In order for the MA701 Wireless Compact Flash Card to communicate with a wireless access point or wireless adapter, it must use the same wireless network name (SSID).
- Network Mode (Infrastructure or Ad-hoc): **Infrastructure**
- Data security WEP encryption: **Disabled**

The section below provides instructions for setting up the NETGEAR 802.11b Wireless Compact Flash Card MA701 for basic wireless connectivity to an access point.

## Basic Installation Instructions

**Note:** Remove any previously installed MA701 utility and driver software from the PDA before proceeding.

1

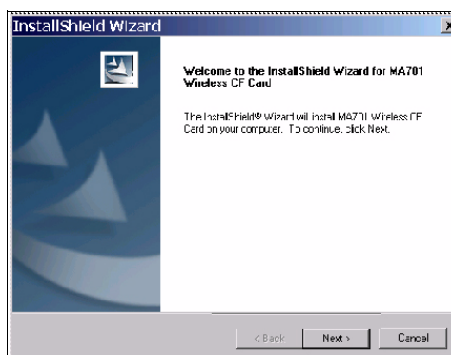
### Install the MA701 driver and configuration utility software.

- a. Insert the Resource CD for the MA701 into your PC. The CD main page loads.
- b. Click **Install Driver & Utility For Pocket PC Users**.
- c. Follow the InstallShield Wizard steps.
- d. Click **Finish** when done to complete the installation.
- e. Disconnect the PDA from the host PC.
- f. Reset the PDA.



MA701 Resource CD

**Note:** If the screen above does not automatically start, go to your Windows Start menu and choose **Run**, and type **d:/Autorun.exe** ("d" is the drive letter for the CD-ROM drive on your PC).



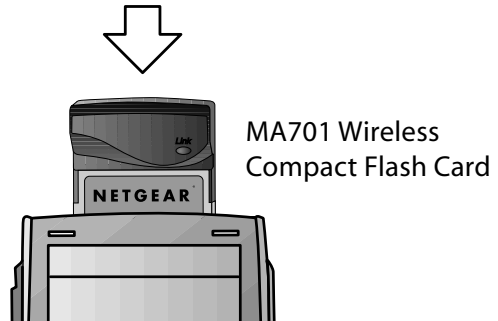
InstallShield Wizard



2

**Insert the MA701 flash card.**

- a. Hold the wireless compact flash card with the NETGEAR logo facing you and insert it into the compact flash I/O slot.
- b. After your PDA recognizes the MA701, the LED will either flash or remain a solid green. Check the LED on the MA701:
  - Solid Green: Associated with an access point or ad-hoc wireless device.
  - Flashing:
    - Power save mode (default from power up or reset)
    - Not associated with an access point.
    - Associated with an ad-hoc network
  - Off: No power applied to the card.



Insert the MA701



**3**

**Configure your MA701.**

- a. From the Start Menu, tap **Settings**, then tap the **Connections** tab page, and finally, tap the **Network Adapters** option. The Network Adapters page will display.
- b. Highlight the MA701 entry and tap **Properties**.
- c. Configure the IP address settings. Usually, the default “Use server-assigned IP address” option is fine.
- d. Click OK and exit the Settings utility.
- e. From Start Menu tap **Settings, System**, and then **MA701** icon. The MA701 Configuration Utility opens to the Status page.
- f. Tap the **Configuration** tab and configure the wireless network settings to match your network.

**Tip:** As an alternative to typing in the SSID, you can use the drop-down list to view the available wireless networks, and choose the one you want.

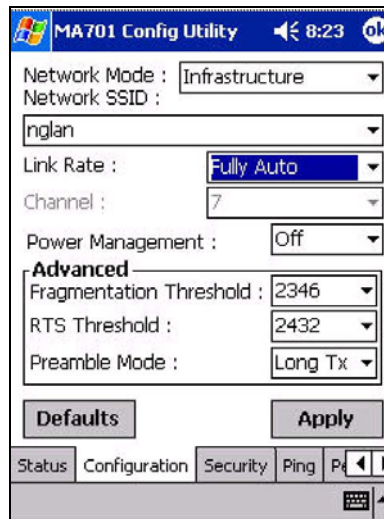
**Note:** Generally, the Advanced default settings will work fine. Applying incorrect Advanced settings could prevent wireless communications.

- g. Click Apply to activate the connection.

**Tip:** Use the Profiles tab page to create profiles called *work* and *home*. Then, activate whichever one you need for your current location.



PDA Settings



MA701 Configuration

**4**

**Verify wireless connectivity to your network.**

- a. Verify that the Status information matches your wireless network.
- b. Check the LED on the MA701:
  - Solid Green: Associated with an access point or ad-hoc wireless device.
  - Flashing: Power save mode (default from power up or reset), not connected to an access point, or associated with an ad-hoc network.
  - Off: No power applied to the card.
- c. Verify connectivity to the Internet or network resources.

**Note:** If you are unable to connect, see [“Troubleshooting” on page 3-10](#).

## MA701 Wireless Connection Indicators

---

The NETGEAR 802.11b Wireless Compact Flash Card MA701 provides the following indicators which give you feedback on the status of your wireless connection:

- The LED on the NETGEAR 802.11b Wireless Compact Flash Card MA701 indicates the condition of wireless link.
- The color of the SysTray icon is on the System Tray portion of the taskbar in the Microsoft Windows desktop indicates the status of the connection.

### Interpreting the LED on the MA701



**Figure 3-1: MA701 LED**






The LED is described in this table.

**Table 3-1: LED Descriptions**

LED	Meaning
Blinking	<ul style="list-style-type: none"><li>• Not connected to an access point</li><li>• Power save mode (default from power up or reset)</li><li>• Associated with an ad-hoc network</li></ul>
Solid	Associated with a wireless access point
Off	No power applied to the card

## Interpreting Windows CE System Tray Icon Colors

The System Tray (SysTray) resides on one end of the taskbar in the Microsoft Windows desktop.

Color	Condition	Description
<b>Red</b> 	The wireless card is not inserted in the device.	The wireless card is inserted. Check that the card is fully inserted.
<b>Red</b> 	The wireless card has no connection to any other wireless node.	The wireless card is not able to 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.
<b>Red</b> 	The wireless card has a poor connection with the other wireless node.	The wireless card signal is weak and may drop. Try moving to a location where the wireless signal quality is better.
<b>Yellow</b> 	The wireless PC Card has a connection with another wireless node.	The wireless link is weak. You may 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.
<b>Green</b> 	The wireless PC Card has a connection with another wireless node.	The wireless PC Card has established good communication with an access point and the signal quality is strong.

## Troubleshooting

---

Use the information below to solve common problems you may encounter. Also, please refer to the knowledge base on the NETGEAR web site at [www.netgear.com/support/main.asp](http://www.netgear.com/support/main.asp).

Also, for problems with accessing network resources, the Windows software might not be installed and configured properly on your computers. For assistance with configuring network settings on Windows PC, please refer to [Appendix , “Preparing Your Computers for TCP/IP Networking”](#) or see the tutorials on the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*.

### Basic Troubleshooting Tips

If you have problems connected to your wireless network, try the tips below.

Symptom	Cause	Solution
The wireless compact flash card LED is not lit.	The MA701 is not inserted into the slot properly or the MA701 software is not loaded.	Reset the PDA. Remove and reinsert the MA701. Check the Windows device manager to see if the PC Card is recognized and enabled. Reload the MA701 software, if necessary.
The LED blinks and cannot connect to an access point.	The MA701 is attempting to connect to an access point, but cannot connect.	Reset the PDA. The access point may not be powered on. Or, the access point and the wireless compact flash card are not configured with the same wireless parameters. Check the SSID and WEP settings.
I can connect to an access point, but I cannot connect to other computers on the network or the Internet.	This could be a physical layer problem or a network configuration problem.	Check to make sure that the access point is physically connected to the Ethernet network. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. Restart the cable or DSL modem, router, access point, and notebook PC.

The PDA does not get an IP Address.	The IP Address has not taken effect yet.	Remove and reinsert the MA701 Wireless CF Card or turn off and then turn on the PDA.
	Mismatched network settings, such as SSID and WEP encryption.	Check and re-enter the same SSID and WEP settings as Access Point.
The PDA does not recognize the MA701.	The MA701 Software may not be installed properly.	Remove and then reinstall the MA701 Wireless CF Card's Driver/Utility software.
	The PDA may need to be reset.	Reset the PDA.
	The battery power may be too low.	Recharge the battery.
The MA701 cannot connect to a known Access Point within range.	The SSID may be incorrect.	Check and enter the correct SSID.
	Mismatched WEP settings.	Check and make sure you have configured the same WEP settings as the Access Point
	Incorrect Network Mode.	Check to see if the MA701 Wireless CF Card is configured in Infrastructure mode.
The PDA cannot browse the web even when the MA701 is associated with an Access Point correctly.	Incorrect setting on PDA.	Under the Connections Settings in Windows, make sure that you have selected the Internet option for the "My network card connects to:" field.
	The IP address may not be correct.	Change to a known valid IP address or reset the PDA.

## Troubleshooting Frequently Asked Questions

1. Question: How do I remove the MA701 software and utility? How come there is no “Uninstall MA701 Software” shortcut in the “Start>Program> NETGEAR MA701 Adapter” menu?

Answer: The MA701 uninstaller program is in the Windows Control Panel. To remove the MA701 software, do the following: Use “Add or Remove Programs” in the Control Panel and remove the MA701 entry.

2. Question: My MA701 is connected to a wireless network but I cannot browse the Internet?

Answer: The default Settings Connection for “My network card connects to:” options is Work. You need to select “The Internet” from the drop-down list.

3. Question: All my wireless settings are correct, but the automatically assigned IP address is incorrect (for example, a Windows assigned private IP address of 169.254.85.227)?

Answer: The association with the wireless network took too long. Reset the PDA.

4. Question: How do I know if my MA701 card has received a valid IP address from my Wireless Router/AP?

Answer: One easy way is to open up the MA701 utility program and check the “IP Address” in the About page.

5. Question: Is this MA701 IEEE 802.11b standards compliant?

Answer: Yes, the MA701 comply with IEEE 802.11b standards.

6. Question: It is nice to have a browser-based type of Manual on the Resource CD, but how do I get a PDF copy of it, like the Installation Guide?

Answer: In the Manual html page, there is a PDF button image at the top right hand corner of the web page. Click on the PDF button brings up the PDF file of the entire manual. You can also Print, Email, Bookmark pages using the appropriate icons next to the PDF button.



# Chapter 4

## Basic Setup for a Notebook PC

This chapter describes how to install your NETGEAR 802.11b Wireless Compact Flash Card MA701 as a wireless adapter in a notebook PC, and how to set up basic wireless connectivity. Advanced wireless network configuration is covered in [Chapter 6, “Notebook Configuration”](#) in this manual.



**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 appropriate steps to secure your network from unauthorized access. The NETGEAR 802.11b Wireless Compact Flash Card MA701 provides highly effective security features which are covered in [“Enabling Wireless Security Features” on page 5-9](#) in this manual. Deploy the security features appropriate to your needs.

### What You Need Before You Begin

---

Verify that your computer meets the minimum system requirements and identify the wireless network configuration settings of the WLAN where you will connect.

### Verifying System Requirements

Before installing the NETGEAR 802.11b Wireless Compact Flash Card MA701, please make sure that these minimum requirements have been met:

- Use a CF-to-PCMCIA adapter (sold separately) with a PCMCIA Type I connector to connect to any notebook PC with an available PCMCIA or CardBus slot.
- You must have a notebook PC with a Pentium® 300 MHz or higher compatible processor with an available PCMCIA or Cardbus slot.
- A CD-ROM drive.
- 5 Mbytes of free hard disk space.

- Windows XP, Windows 2000, Me, 98SE or 98

Some versions of Windows may ask for the original Windows operating system installation files to complete the installation of the MA701 driver software.

## Observing Location and Range Guidelines

Computers can connect over wireless networks indoors at a range which vary significantly based on the physical location of the computer with the NETGEAR 802.11b Wireless Compact Flash Card MA701. 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.

## Two Basic Operating Modes

---

The MA701 Wireless Compact Flash Card can operate in the following two basic modes:

- **Infrastructure Mode:** An 802.11 networking framework in which devices and computers communicate with each other by first going through an access point (AP). For example, this mode is used when computers in a house connect to an Access Point that is attached to a router which lets multiple computers share a single Cable or DSL broadband Internet connection.
- **Ad-Hoc Mode:** An 802.11 networking framework in which devices or computers communicate directly with each other, without the use of an AP. For example, Ad-Hoc Mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

Both of these configuration options are available with the MA701 Wireless Compact Flash Card. Infrastructure configuration procedures for basic network connectivity are covered below. Advanced infrastructure configuration procedures and ad-hoc configuration are covered in [Chapter 5, “PDA Configuration”](#) of this manual.

## MA701 Default Wireless Configuration 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 configuration and security parameters already defined.

Your NETGEAR 802.11b Wireless Compact Flash Card MA701 factory default basic settings are:

- Network Name Service Set Identification (SSID): **Any** (First available network)  
**Note:** In order for the MA701 Wireless Compact Flash Card to communicate with a wireless access point or wireless adapter, all devices must be configured with the same wireless network name (SSID).
- Network Mode (Infrastructure or Ad-hoc): **Infrastructure**
- Data security WEP encryption: **Disabled**

The section below provides instructions for setting up the NETGEAR 802.11b Wireless Compact Flash Card MA701 for basic wireless connectivity to an access point. The procedures below provide step-by-step installation instructions for Windows PCs. Use the procedure that corresponds to the version of Windows you are using.

## Basic Installation Instructions

Use the procedure below that corresponds to the version of Windows you are using. Use the procedure below that corresponds to the version of Windows you are using.

### For Windows XP Users Installing a MA701

1

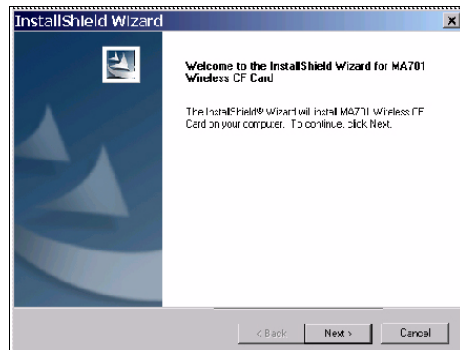
**First, install the MA701 driver and configuration utility software.**

- a. Power on your notebook, let the operating system boot up completely, and log in as needed.
- b. Insert the Resource CD for the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)* into your CD-ROM drive.
- c. Click **Install Driver & Utility For Notebook PC Users**. Follow the InstallShield Wizard steps.
- d. Click **Finish** when done to complete the installation and restart your computer.



MA701 Resource CD

**Note:** If the screen above does not automatically start, go to your Windows Start menu and choose **Run**, and type **d:/Autorun.exe** ("d" is the drive letter for the CD-ROM drive on your PC).



InstallShield Wizard

2

**After installing the software, insert the MA701.**

- a. Insert the MA701 into the CF-to-PCMCIA adapter.
- b. Locate an available CardBus or PCMCIA slot on your notebook PC.
- c. With the Netgear logo facing up insert the MA701 into the slot.

The Found New Hardware Wizard displays.

- d. Click **Next** and follow the prompts to proceed.

Click **Continue Anyway** if you are prompted with a Windows XP Logo testing message.

After the installation completes, click **Finish** to close the wizard.

You should see the MA701 system tray icon on the right in the lower right portion of the Windows task bar.

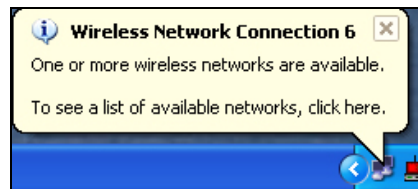
After a short delay, Windows XP will display a Wireless Network Connection pop-up message.



Add New Hardware Wizard



MA701 System Tray Icon



Windows XP Network Connection Alert

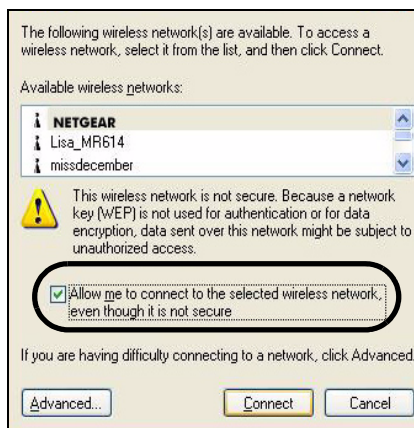
3

**Configure your MA701.**

- a. Click the pop-up Wireless Network Connection message. If the pop-up message has gone away, you can also right click on the network icon in the Windows XP system tray to open the network options menu, and click on the View Available Wireless Networks menu item.
- b. If there is more than one wireless network in your vicinity, click on the one to which you will connect.
- c. Click on the “Allow me to connect to the selected wireless network even though this is not secure” check box.
- d. Click Connect.



Right click here to display this menu.




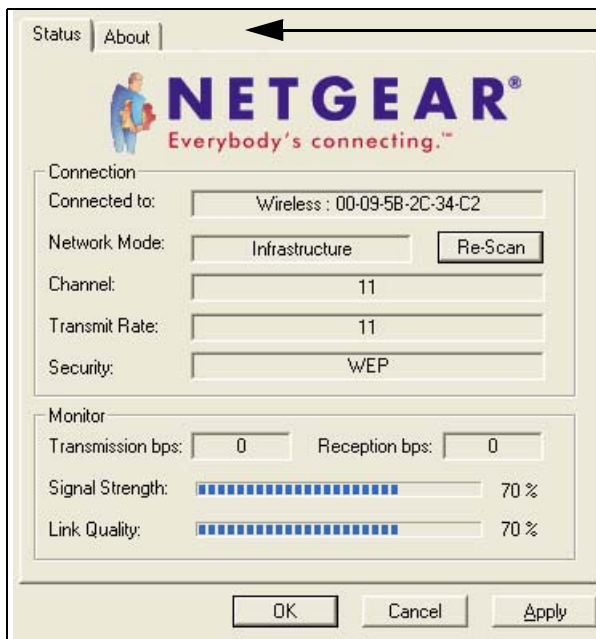
Windows XP Network Connection Alert

**Note:** This procedure assumes your wireless network is not using WEP security. If your wireless network uses WEP, set up your MA701 accordingly. To view WEP settings help, click the Advanced button and click the “Learn about...” link on the Windows XP Local Area Connection Wireless Networks Properties tab page.

## 4

**Verify wireless connectivity to your network.**

- a. Open the MA701 utility by clicking on the icon  in the Windows system tray.



**Note:** When the Windows XP wireless configuration utility is enabled (the default), only these two tab pages appear.

For Windows XP users to use the full feature set of the NETGEAR configuration utility, you must first deselect the Windows XP configuration utility. To do so, with the MA701 inserted in the PC, open the Windows XP Network Connections screen by clicking on the system tray icon. Then, click Properties, click the Wireless Networks tab, and clear the “Use Windows to configure my wireless network settings” check box.

- b. Verify that your Status information matches your wireless network.
- c. Check the MA701 LED:  
Solid green for the LINK LED indicates a good connection. Blinking for the LINK LED indicates attempting to connect. Off for the LINK LED indicates the card is turned off or not fully plugged in.
- d. Verify connectivity to the Internet or network resources.

**Note:** If you are unable to connect, see [“Troubleshooting” on page 4-13](#).

## For Windows 2000 & 98/Me Users Installing a MA701

1

**First, install the MA701 driver and configuration utility software.**

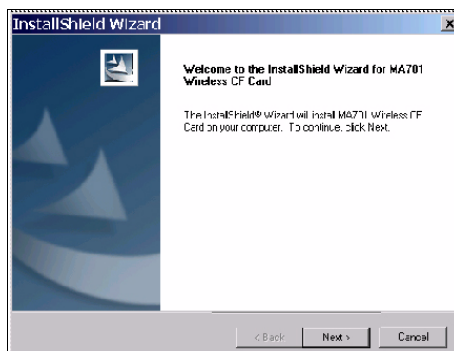
**Note:** Windows 2000, may require you to be logged on with administrator rights.

- a. Power on your notebook, let the operating system boot up completely, and log in as needed.
- b. Insert the Resource CD for the MA701 into your CD-ROM drive.
- c. Click **Install Driver & Utility For Notebook PC Users**. Follow the InstallShield Wizard steps.
- d. Click **Finish** when done to complete the installation and restart your computer.



MA701 Resource CD

**Note:** If the screen above does not automatically start, go to your Windows Start menu and choose **Run**, and type **d:/Autorun.exe** ("d" is the drive letter for the CD-ROM drive on your PC).



InstallShield Wizard



2

**After installing the software, install the MA701.**

- a. Insert the MA701 into the CF-to-PCMCIA adapter.
- b. Locate an available CardBus or PCMCIA slot on your notebook PC.
- c. With the Netgear logo facing up insert the MA701 into the slot.

The Found New Hardware Wizard displays.

- d. Click **Next** and follow the prompts to proceed. After the installation completes, click **Finish** to close the wizard.

You should see the MA701 system tray icon on the right in the lower right portion of the Windows task bar.



Add New Hardware Wizard

**Note:** If Windows warns about a Digital Signature Not Found, click **Yes** to continue.



MA701 System Tray Icon

3

**Configure your MA701 and save the Profile.**

- a. Click on the MA701 systray icon in the to open the MA701 configuration utility.

The MA701 Wireless Compact Flash Card configuration utility displays.

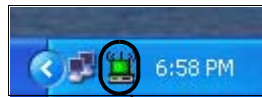
- b. Change the Network Name SSID to match your network.

**Tip:** As an alternative to typing in the SSID, you can use the drop-down list or the Site Survey tab to view the available wireless networks, choose the one you want connect to it.

- c. Click the **Profile** tab. Enter a name for your profile.
- d. Click **Save** to save all your settings in the Profile, and then click the Activate button. You can save multiple profiles and activate whichever one you need to use.

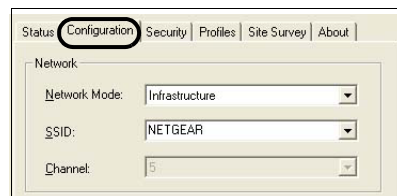
**Tip:** Create profiles called *work* and *home*. Then, activate whichever one you need for wherever you are located.

- e. Click **OK** to close the utility.



Click here to open the configuration utility.

MA701 system tray icon



MA701 Configuration Utility

**Note:** The NETGEAR default settings are **Infrastructure mode**, with **ANY** for the wireless network name SSID, and WEP disabled. If your WLAN settings are different from the Netgear default settings, you will not connect. Set up your MA701 accordingly.



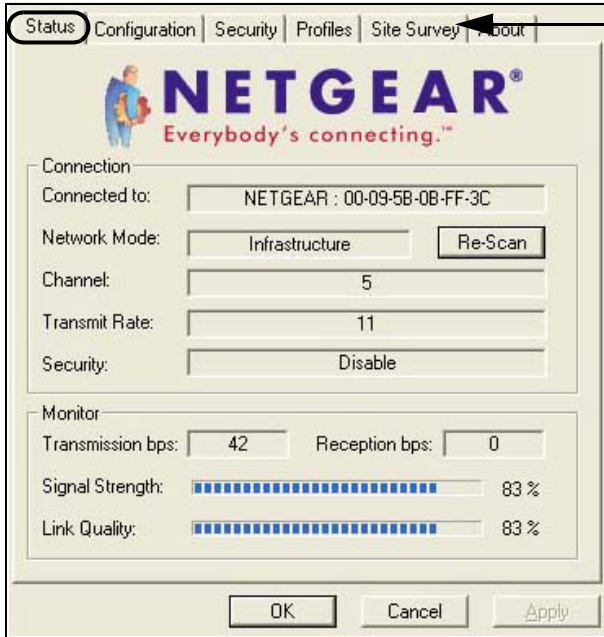
**Note:** This procedure assumes you are connecting to a wireless network which is not using WEP security. If your network includes WEP settings, click the Security tab page and configure the MA701 accordingly. For help with these steps, please see [“Enabling Wireless Security Features” on page 6-8](#) below.

4

**Verify wireless connectivity to your network.**



- a. Open the MA701 utility by clicking on the icon in the Windows system tray.



**Note:** You can use the Site Survey to verify the availability of wireless networks and their SSIDs.

- b. Click the Status tab page. Verify that your Connection and Status Monitor information matches your wireless network.
- c. Check the MA701 LED:  
Solid green for the LINK LED indicates a good connection. Blinking for the LINK LED indicates attempting to connect. Off for the LINK LED indicates the card is turned off or not fully plugged in.
- d. Verify connectivity to the Internet or network resources.




## MA701 Wireless Connection Indicators

The NETGEAR 802.11b Wireless Compact Flash Card MA701 provides a LED and system tray icons that show the status of your wireless connection: The LED is described in this table.

**Table 4-1: LED Descriptions**

LED	Meaning
Slow blink	Power save mode (default from power up or reset)
	Associated or joined with network; no activity
Fast blink	Associated or joined with network; blink rate increases with activity on the network over the air or locally on the network
OFF	No power applied to the card

The System Tray (SysTray) resides on one end of the taskbar in the Microsoft Windows desktop.

Color	Condition	Description
<b>Red</b> 	The wireless card has no connection to any other wireless node.	The wireless card is not able to 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.
<b>Yellow</b> 	The wireless PC Card has a connection with another wireless node.	The wireless link is weak. You may 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.
<b>Green</b> 	The wireless PC Card has a connection with another wireless node.	The wireless PC Card has established good communication with an access point and the signal quality is strong.

## Troubleshooting

Use the information below to solve common problems you may encounter. Also, please refer to the knowledge base on the NETGEAR web site at [www.netgear.com/support/main.asp](http://www.netgear.com/support/main.asp).

Also, for problems with accessing network resources, the Windows software might not be installed and configured properly on your computers. For assistance with configuring network settings on Windows PC, please refer to [Appendix , “Preparing Your Computers for TCP/IP Networking”](#) or see the tutorials on the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*.

### Basic Troubleshooting Tips

If you have problems connected to your wireless network, try the tips below.

Symptom	Cause	Solution
The LED is not lit.	The MA701 is not inserted into the slot properly or the MA701 software is not loaded.	Remove and reinsert the MA701. Check the Windows device manager to see if the PC Card is recognized and enabled. Reload the MA701 software, if necessary.
The LED blinks and cannot connect to an access point.	The MA701 is attempting to connect to an access point, but cannot connect.	The access point may not be powered on. Or, the access point and the wireless compact flash card are not configured with the same wireless parameters. Check the SSID and WEP settings.
I can connect to an access point, but I cannot connect to other computers on the network or the Internet.	This could be a physical layer problem or a network configuration problem.	Check to make sure that the access point is physically connected to the Ethernet network. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. Restart the cable or DSL modem, router, access point, and notebook PC.

## Troubleshooting Frequently Asked Questions

1. Question: How do I remove the MA701 software and utility? How come there is no “Uninstall MA701 Software” shortcut in the “Start>Program> NETGEAR MA701 Adapter” menu?

Answer: The MA701 uninstaller program is in the Windows Control Panel. To remove the MA701 software, do the following: Use “Add or Remove Programs” in the Control Panel and remove the MA701 entry.

2. Question: All my wireless settings are correct, but the automatically assigned IP address is incorrect (for example, a Windows assigned private IP address of 169.254.85.227)?

Answer: The association with the wireless network took too long. Remove and re-insert the card.

3. Question: How do I know if my MA701 card has received a valid IP address from my Wireless Router/AP?

Answer: One easy way is to open up the MA701 utility program and check the “IP Address” in the About page.

4. Question: Is this MA701 IEEE 802.11b standards compliant?

Answer: Yes, the MA701 comply with IEEE 802.11b standards.

5. Question: It is nice to have a browser-based type of Manual on the Resource CD, but how do I get a PDF copy of it, like the Installation Guide?

Answer: In the Manual html page, there is a PDF button image at the top right hand corner of the web page. Click on the PDF button brings up the PDF file of the entire manual. You can also Print, Email, Bookmark pages using the appropriate icons next to the PDF button.

# Chapter 5

## PDA Configuration

This chapter describes how to configure your NETGEAR 802.11b Wireless Compact Flash Card MA701 for wireless connectivity in your PDA.

### Understanding the Configuration Options

---

The MA701 configuration utility provides a complete and easy to use set of tools to:

- Configure wireless settings.
- Run PING diagnostic tests to verify network connectivity.
- Monitor wireless network connections.
- Save your settings in configuration profiles.

The section below introduces these capabilities of the configuration utility.

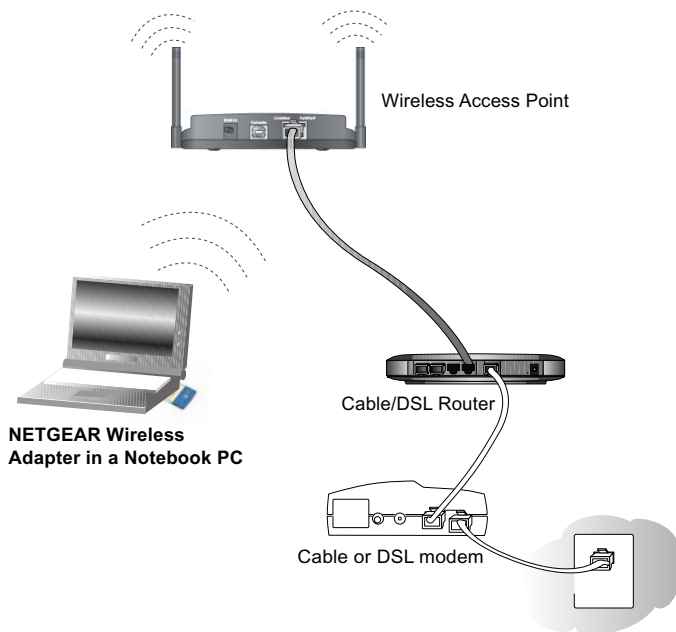
### Using Configuration Profiles

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The MA701 configuration utility uses profiles to store all the configuration settings for a particular wireless network. You can store multiple profiles and recall the one which matches the network you want to join.

For example, if you use your notebook PC to connect to a wireless network in an office and a wireless network in your home, you can create a profile for each wireless network. Then, you can easily load the profile that has all the configuration settings you need to join the network you are using at the time.

## Connecting to an Access Point in Infrastructure Mode



**Figure 5-1: MA701 Wireless Compact Flash Card connecting to a wireless access point.**


This section provides instructions for configuring the NETGEAR 802.11b Wireless Compact Flash Card MA701 to connect to a wireless access point.



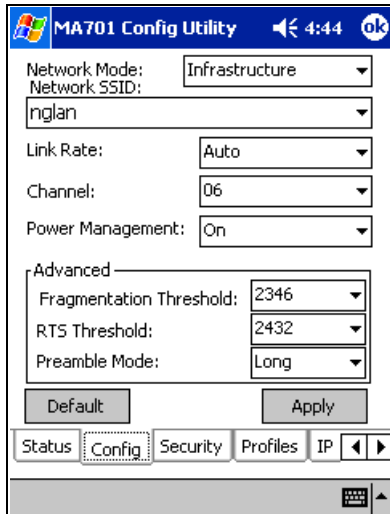
## How to Configure an Infrastructure Mode Profile

Follow the instructions below to configure an infrastructure mode profile for connecting to an access point.

### 1. Run the MA701 Configuration Utility.

- a. Make sure the MA701 software is installed and the MA701 is fully inserted in your PDA.
- b. Open the configuration utility by tapping on the MA701 icon  in the Windows system tray.
- c. Tap the **Config** tab.

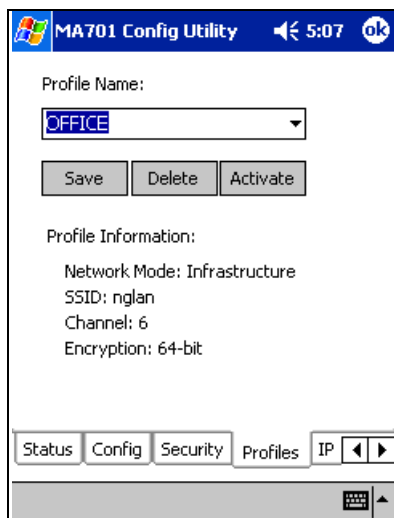
### 2. Configure the wireless Network settings.



- a. In the Network Mode section, be sure that Infrastructure is selected.
- b. Enter the SSID. This is also called the Wireless Network Name.

**Tip:** You can use the drop-down list to select from the list of available wireless networks.

### 3. Save your settings in a Profile.

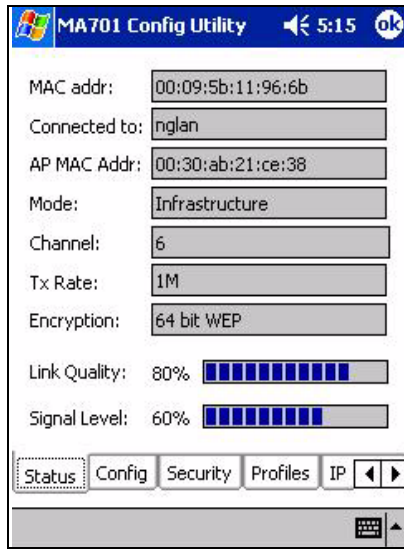


- a. Type a descriptive name for the Profile in the “Profile Name” field.
- b. Tap **Save**. All the configuration settings are saved in this profile.
- c. Tap **Activate** to activate this profile.

#### 4. Verify wireless connectivity to your network.

Verify connectivity using the following:

- Status tab page
- Internet Explorer to connect to the Internet
- Check for file and printer access on your network.



**Note:** If you cannot connect, see the [“Troubleshooting”](#) on page 3-14. 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 [“Preparing Your Computers for TCP/IP Networking”](#) on page C-1.

## Connecting to Another PC in Ad-hoc Mode



**Figure 5-2: NETGEAR MA701 Wireless PC Card in Peer-to-Peer Mode**


The peer-to-peer setting of the MA701 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.

## How to Configure an Ad-hoc Mode Profile

**Note:** Ad-hoc mode will not work using DHCP settings. Ad-hoc mode requires either static IP addresses (such as 192.168.0.1). For instructions on setting up static IP addresses on a Windows PC, refer to the PC Networking Tutorial included on the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*.

Follow the instructions below to configure an Ad-hoc mode profile.

### 1. Run the MA701 Configuration Utility.

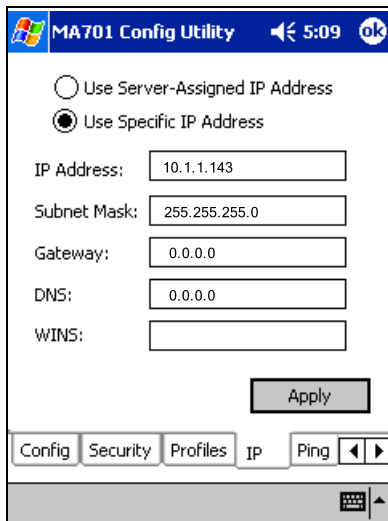
- a. Make sure the MA701 software is installed and the MA701 is fully inserted in your PDA.
- b. Open the configuration utility by tapping on the MA701 icon  in the Windows system tray.

- c. Tap the Config tab.
- d. Select Ad-hoc for the Network Mode.
- e. Enter the SSID for the Ad-Hoc network.
- f. Click Apply.

**2. Save your settings in a Profile.**

- a. Type a descriptive name in the “Profile Name” field.
- b. Click Save Profile. All the configuration settings are saved in this profile.
- c. Click Apply.
- d. Click Close to exit the configuration utility.

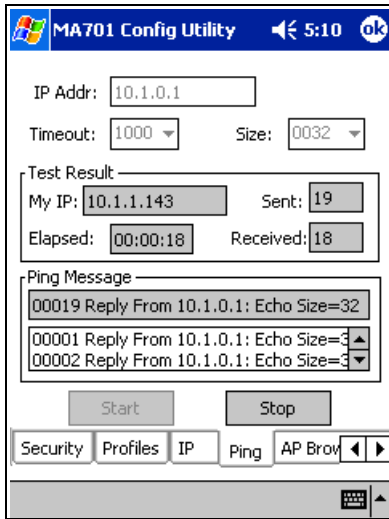
**3. Configure the static IP network settings.**



- a. Configure each wireless device with a static IP address.
- b. Restart the devices.

**4. Verify wireless connectivity by running Ping tests between your peer devices.**

- a. Tap the **Ping** tab.



- b. Assuming the target PC is configured with 10.1.0.1 as its IP address, enter 10.1.0.1 in the IP Addr: field.
- c. Set the timeout to 1000.
- d. Tap **Start**. This will cause a 1000 ping messages to be sent to the device with the 10.1.0.1 static IP address. The ping response should change to “reply.”

At this point the connection is established.

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

**Note:** If you cannot connect, see the [“Troubleshooting” on page 3-14](#). 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 [“Preparing Your Computers for TCP/IP Networking” on page C-1](#).

## Enabling Wireless Security Features

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You can strengthen the security of your wireless connection by enabling Wired Equivalent Privacy (WEP) encryption of the wireless data communications. For more information on 802.11 wireless security, see [“Authentication and WEP” on page B-2](#).

In addition to the MA701 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 identify how to configure the WEP encryption settings of your NETGEAR 802.11b Wireless Compact Flash Card MA701.

## Identifying the Wireless Network Name (SSID) and WEP 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.

- **Wireless Network Name (SSID):** Write your wireless network name (SSID) below. The SSID is case sensitive.

Wireless network name (SSID): \_\_\_\_\_

- **WEP Security Encryption key:** The default WEP encryption key number is 1, and the default key size is 64 bits.

**Note:** The key number as well as the key value used by all wireless nodes must be the same. If they are different, you will not be able to connect.

WEP Encryption Key Size, circle one: 64 or 128 bits

WEP Encryption Passphrase, if used: \_\_\_\_\_

WEP Characters or Hexadecimal Numbers: \_\_\_\_\_


The WEP Characters or Hexadecimal Numbers are needed if a Passphrase is not used in the wireless network access point, but rather if the key is manually entered.

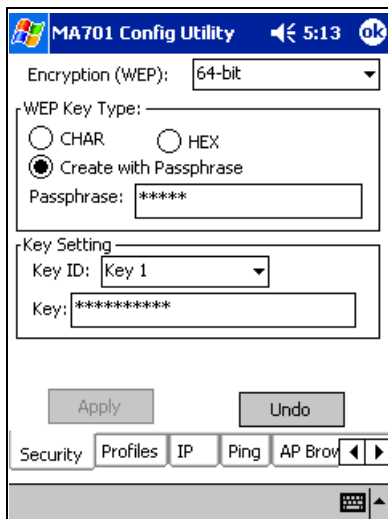
Use the procedures below to configure basic security settings in the MA701.

## How to Configure WEP Encryption Security

Follow the steps below to configure WEP Encryption Security.

### 1. Run the MA701 Configuration Utility.

- a. Make sure the MA701 software is installed and the MA701 is fully inserted in your PDA.
- b. Open the configuration utility by tapping on the MA701 icon  in the Windows system tray.
- c. Tap on the Security tab.



### 2. 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.



### 3. Configure the WEP Keys.

Select the Create with Passphrase radio button. 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.

### 4. Save your settings in a Profile.

- a. Tap **Profiles**, and type a descriptive name in the “Profile Name” field.
- b. Tap **Save**. All the configuration settings are saved in this profile.
- c. Tap **Activate** to activate your security settings.

## Understanding the Advanced Settings Page

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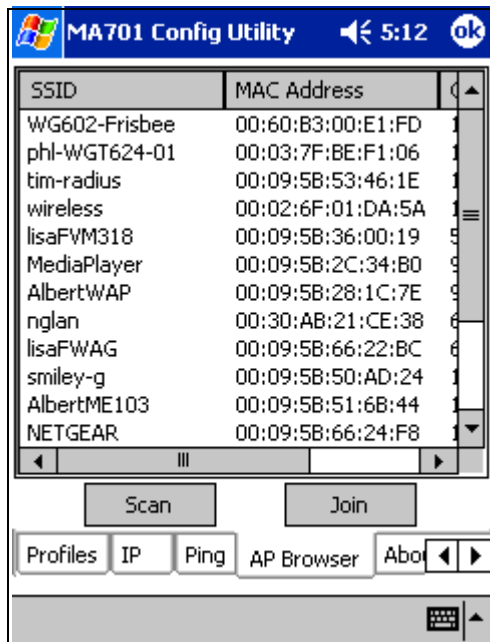
The Advanced settings should not require adjustment. Except for the power saving setting, changing any of the settings incorrectly on this page could cause your wireless connection to fail.

- **Preamble:** A long transmit preamble may provide a more reliable connection or slightly longer range. A short transmit preamble might give slightly better performance.
- **Fragmentation Threshold:** This is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented. The Fragmentation Threshold value must be larger than the RTS/CTS Threshold value.
- **RTS/CTS Threshold:** The packet size that is used to determine whether to use the CSMA/CD (Carrier Sense Multiple Access with Collision Detection) mechanism or the CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) mechanism for packet transmission. CSMA/CD is slightly more efficient.

## Understanding AP Browser Property Page

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The AP Browser page of the MA701 Configuration Utility displays a list of the Access Points that have been detected by the MA701 Wireless CF Card.



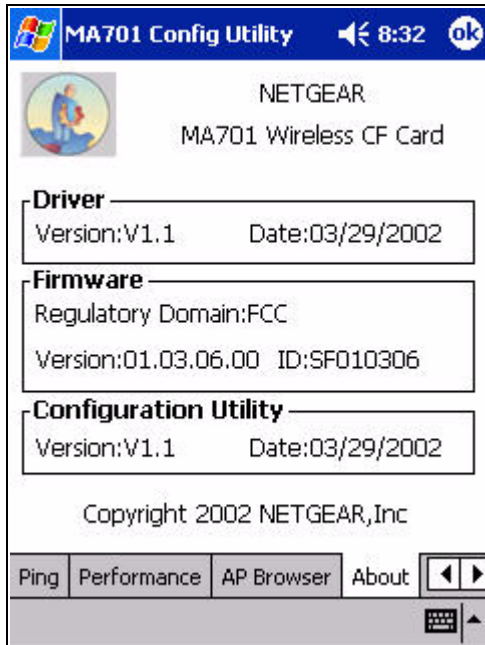
The SSID, MAC Address, Channel in use, Signal Strength, WEP information are displayed.

Tap Scan to update the list of known Access Points.

**Note:** This page is only available while in Infrastructure mode.

## Understanding the About Property Page

The About page of the MA701 Configuration Utility displays the Driver, Firmware, Configuration Utility Versions, and the Regulatory Domain of the MA701 Wireless CF Card.





# Chapter 6

## Notebook Configuration

This chapter describes how to configure your NETGEAR 802.11b Wireless Compact Flash Card MA701 for wireless connectivity in a notebook PC.



**Note:** The instructions in this section refer to the NETGEAR MA701 configuration utility. For Windows XP users to use the NETGEAR configuration utility, you must first disable the Windows XP configuration utility. Open the Network Connections screen by clicking on the system tray icon. Click the Properties button, click the Wireless Networks tab and then clear the “Use Windows to configure my wireless network settings” check box.

### Understanding the Configuration Options

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The MA701 configuration utility provides a complete and easy to use set of tools to:

- Configure wireless settings.
- Monitor wireless network connections.
- Save your settings in configuration profiles.

The section below introduces these capabilities of the configuration utility.

### Using Configuration Profiles

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The MA701 configuration utility uses profiles to store all the configuration settings for a particular wireless network. You can store multiple profiles and recall the one which matches the network you want to join.

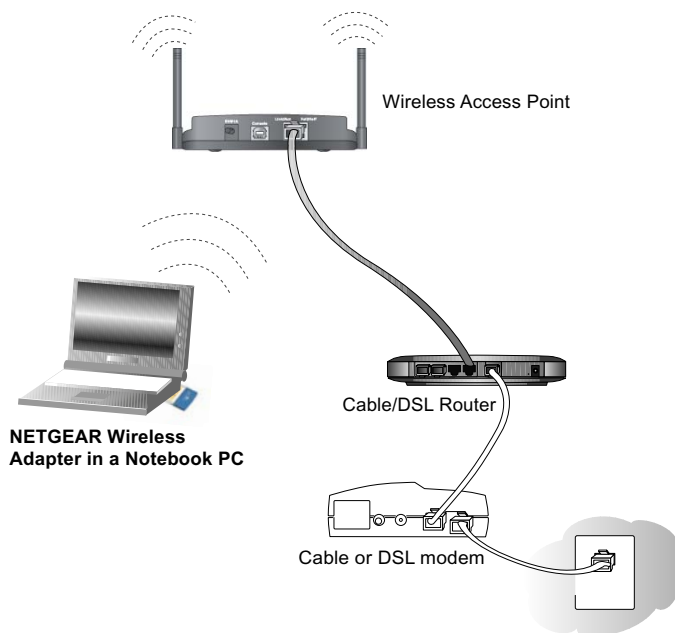
For example, if you use your notebook PC to connect to a wireless network in an office and a wireless network in your home, you can create a profile for each wireless network. Then, you can easily load the profile that has all the configuration settings you need to join the network you are using at the time.

There are two types of wireless network connections you can configure:

- **Infrastructure Mode** — uses the 802.11 infrastructure mode.
- **Ad-hoc Mode** — uses the 802.11 ad-hoc mode

For more information on 802.11 wireless network modes, see [“Wireless Networking Overview” on page B-1](#) of this manual.

## Connecting to an Access Point in Infrastructure Mode




**Figure 6-1: MA701 Wireless Compact Flash Card connecting to a wireless access point.**

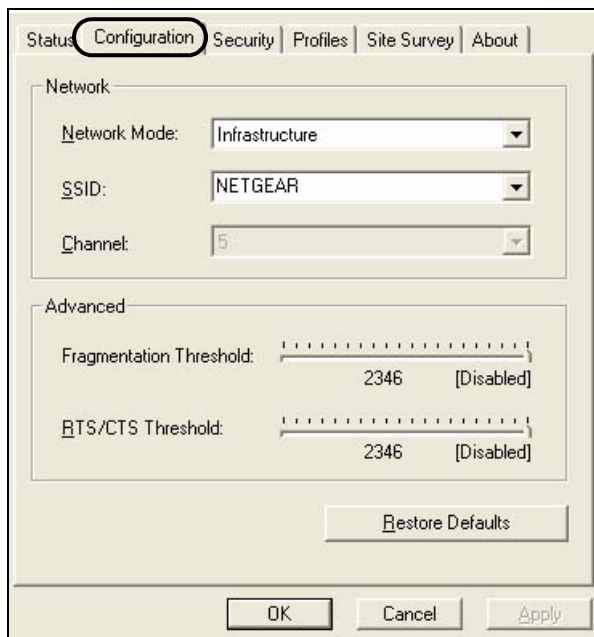
This section provides instructions for configuring the NETGEAR 802.11b Wireless Compact Flash Card MA701 to connect to a wireless access point.

## How to Configure an Infrastructure Mode Profile

Follow the instructions below to configure an infrastructure mode profile for connecting to an access point.

### 1. Run the MA701 Configuration Utility.

- a. Make sure the MA701 software is installed and the MA701 is fully inserted in an available slot in your PC.
- b. Open the configuration utility by clicking on the MA701 icon  in the Windows system tray.



**Figure 6-2: Configuration tab page**

- c. Click on the Configuration tab to display the view shown above.

### 2. Configure the wireless Network settings.

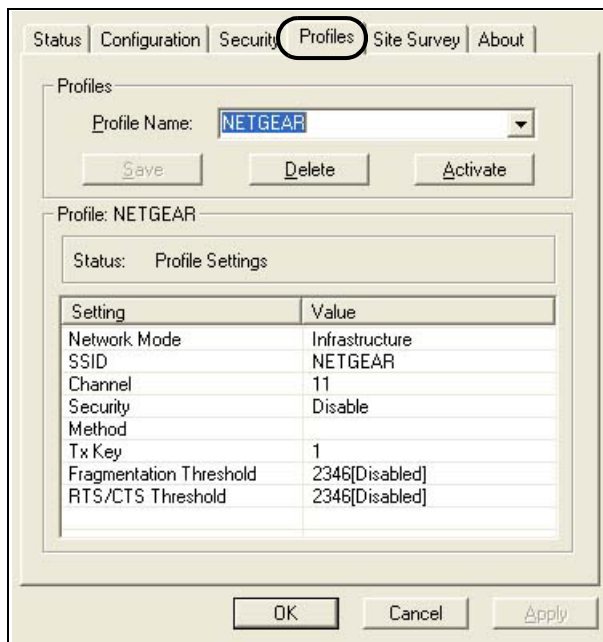
- a. In the Network section, be sure that Infrastructure is selected for the Network Mode.
- b. Enter the SSID. This is also called the Wireless Network Name.

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

**Tip:** You can the drop-down list or click the Site Survey tab to view a list of the available wireless networks and their SSIDs at the location where you are.

### 3. Save your settings in a Profile.

- a. Click the Profiles tab to view the screen below.



**Figure 6-3: Profiles tab page**

- b. Type a descriptive name for the Profile Name.
- c. Click the Save button to save this profile. All the configuration settings are saved in this profile.
- d. Click Activate to activate your settings.
- e. Click OK to exit the configuration utility.



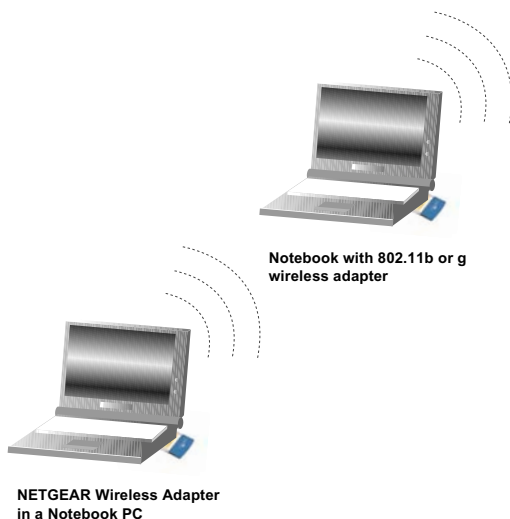
#### 4. Verify wireless connectivity to your network.

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.

**Note:** If you cannot connect, see the “[Troubleshooting](#)” on page 4-13. 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 “[Preparing Your Computers for TCP/IP Networking](#)” on page C-1.

## Connecting to Another PC in Ad-hoc Mode

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**Figure 6-4: NETGEAR MA701 Wireless PC Card in Peer-to-Peer Mode**


The peer-to-peer setting of the MA701 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.

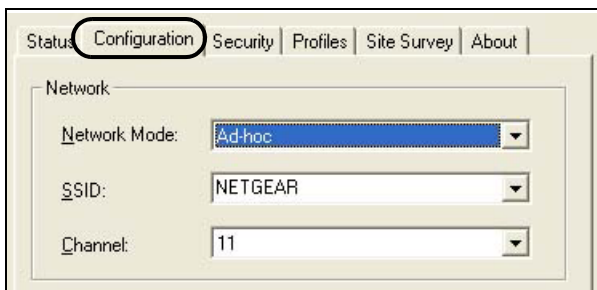
## How to Configure an Ad-hoc Mode Profile

**Note:** Ad-hoc mode will not work using DHCP settings. Ad-hoc mode requires either static IP addresses (such as 192.168.0.1). For instructions on setting up static IP addresses on a Windows PC, refer to the PC Networking Tutorial included on the *NETGEAR 802.11b Wireless Compact Flash Card Resource CD (SW-10040-01)*.

Follow the instructions below to configure an Ad-hoc mode profile.

### 1. Run the MA701 Configuration Utility.

- a. Make sure the MA701 software is installed and the MA701 is fully inserted in an available PCMCIA or CardBus slot in your PC.
- b. Open the configuration utility by clicking on the MA701 icon  in the Windows system tray.

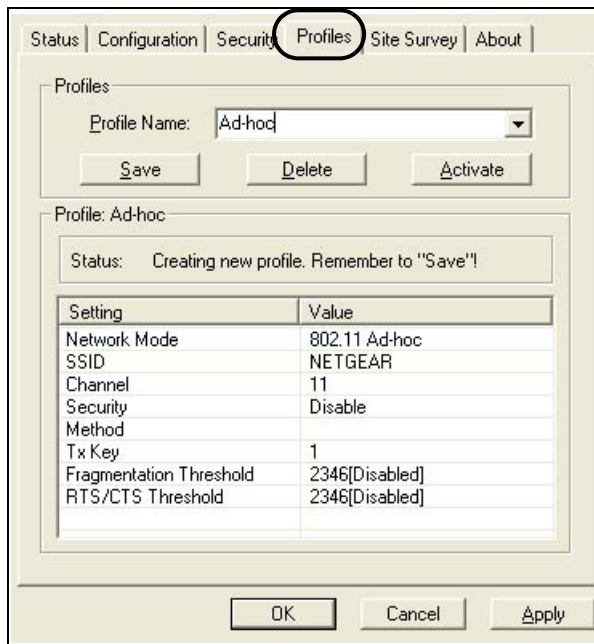


**Figure 6-5: Configuration tab page Ad-hoc mode selected**

- c. Click the Configuration tab to display the view shown above.
- d. Select Ad-hoc from the Network mode drop-down list.
- e. Click Apply to apply your settings

### 2. Save your settings in a Profile.

- a. Click the Profiles tab to view the screen below.



**Figure 6-6: Profiles tab page**

- b. Type a descriptive name for the Profile Name.
- c. Click the Save button to save this profile. All the configuration settings are saved in this profile.
- d. Click Activate to activate your settings.
- e. Click OK to exit the configuration utility.

### 3. Configure the PC network settings.

- a. Configure each PC with either a static IP address or with the IPX protocol.

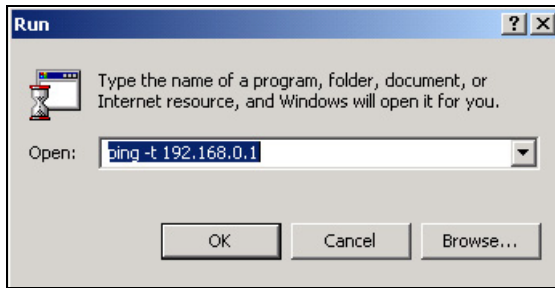
**Note:** For instructions on configuring static IP addresses or the IPX protocol, please refer to the networking tutorial on your *NETGEAR 802.11b Wireless PC Card MA401 GearBox CD*.

- b. Restart the PCs.

### 4. Verify wireless connectivity between your peer devices.

Verify connectivity by using the Ping.

- 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.
- 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
```

At this point the connection is established.

**Note:** If you cannot connect, please see the [“Basic Troubleshooting Tips” on page 2-27](#). 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: [“Preparing Your Computers for TCP/IP Networking” on page C-51](#).

## Enabling Wireless Security Features

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You can strengthen the security of your wireless connection by enabling Wired Equivalent Privacy (WEP) encryption of the wireless data communications. For more information on 802.11 wireless security, please see [“Authentication and WEP” on page B-44](#).

In addition to the MA701 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 identify how to configure the WEP encryption settings of your NETGEAR 802.11b Wireless Compact Flash Card MA701.

## Identifying the Wireless Network Name (SSID) and WEP 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.

- **Wireless Network Name (SSID):** The Service Set Identification (SSID) identifies the wireless local area network. **Any** (First available network) is the default MA701 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 compact flash 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): \_\_\_\_\_

- **WEP Security Encryption key:** The default WEP encryption key number is 1, and the default key size is 64 bits.

**Note:** The key number as well as the key value used by all wireless nodes must be the same. If they are different, you will not be able to connect.

WEP Encryption Key Size, circle one: 64 or 128 bits

WEP Encryption Passphrase, if used: \_\_\_\_\_

A Passphrase is used to automatically generate the WEP hexadecimal numbers for the key. If the wireless network Access Point uses a Passphrase, you can also use that here. Otherwise, you will have to manually enter the hexadecimal numbers.

WEP Hexadecimal Numbers: \_\_\_\_\_


The WEP Hexadecimal Numbers are needed if a Passphrase is not used in the wireless network access point, but rather if the key is manually entered.

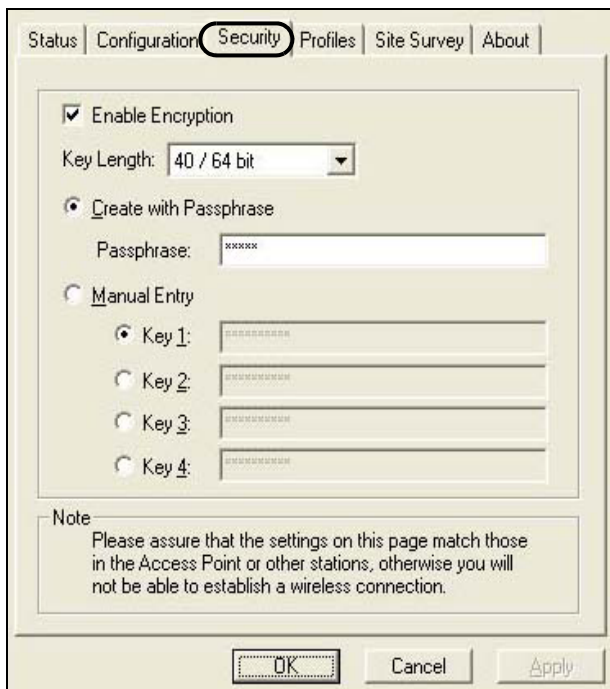
Use the procedures below to configure basic security settings in the MA701.

## How to Configure WEP Encryption Security

Follow the steps below to configure WEP Encryption Security.

### 1. Run the MA701 Configuration Utility.

- a. Make sure the MA701 software is installed and the MA701 is fully inserted in an available PCMCIA or CardBus slot in your PC.
- b. Open the configuration utility by clicking on the MA701 icon  in the Windows system tray.



**Figure 6-7: Security tab page**

- c. Click on the Configuration tab to display the view shown above.

### 2. Configure the Security settings.

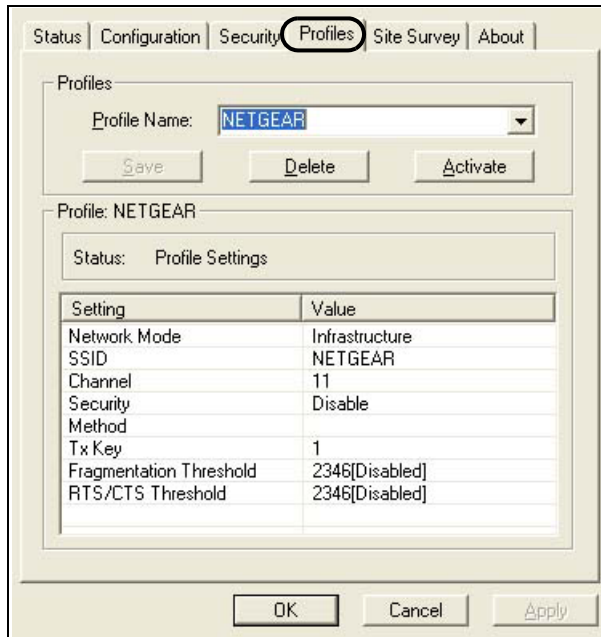
- a. Check the Enable Encryption check box.
- b. Enter the SSID. This is also called the Wireless Network Name.

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

**Tip:** You can use the drop-down list or click the Site Survey tab to view a list of the available wireless networks and their SSIDs at the location where you are.

### 3. Save your settings in a Profile.

- a. Click the Profiles tab to view the screen below.



**Figure 6-8: Profiles tab page**

- b. Type a descriptive name for the Profile Name.
  - c. Click the Save button to save this profile. All the configuration settings are saved in this profile.
  - d. Click Activate to activate your settings.
  - e. Click OK to exit the configuration utility.
1. Run the Configuration Utility and select the Encryption tab page.
  2. 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.

3. Check the Create with Passphrase radio button and enter the passphrase. Click Apply and the configuration utility automatically generates 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.

4. The Default Key setting must match what is set in the access point and the other 802.11 wireless devices.
5. Click Apply then OK for the changes to take effect.



# Appendix A

## Technical Specifications

This appendix provides technical specifications for the NETGEAR 802.11b Wireless Compact Flash Card MA701.

Host Interface	Compact Flash V1.4, CF+ I/O interface, Type I (Type II compatible)									
Standards	IEEE 802.11b, Direct Sequence Spread Spectrum (DSSS)									
Data Rate	1, 2, 5.5, or 11 Mbps, and Auto Fall-back									
Frequency Range	2.412 ~ 2.462 GHz for US and Canada 2.412 ~ 2.472 GHz for Europe and Australia									
Operating Range	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"></td> <td style="text-align: center;">Outdoor environment</td> <td style="text-align: center;">Indoor environment</td> </tr> <tr> <td>@5.5 Mbps</td> <td style="text-align: center;">1000 ft.</td> <td style="text-align: center;">265 ft.</td> </tr> <tr> <td>@11 Mbps</td> <td style="text-align: center;">500 ft.</td> <td style="text-align: center;">165 ft.</td> </tr> </table>		Outdoor environment	Indoor environment	@5.5 Mbps	1000 ft.	265 ft.	@11 Mbps	500 ft.	165 ft.
	Outdoor environment	Indoor environment								
@5.5 Mbps	1000 ft.	265 ft.								
@11 Mbps	500 ft.	165 ft.								
Encryption	RC4 40-bit (also called 64-bit) and 128-bit WEP data encryption									
Antenna	One PIFA antenna									
RF Output power	13dBm (15dBm Max.)									
Power Consumption	TX power consumption <350mA RX power consumption <250mA Power save mode 80mA									
Operating Systems Supported	Handheld PC with Windows CE 2.11 or higher, Pocket PC or Pocket PC 2002 with Windows CE 3.0 or higher									
Operation Voltage	3.3VDC± 5%									
Dimensions	W: 1.69 in. ((42.8 mm) D: 2.44 in (62 mm) H: .13 in. (3.3 mm)									
Weight	<20 g (<0.71 oz)									



# Appendix B

## Wireless Networking Basics

This chapter provides an overview of Wireless networking.

### Wireless Networking Overview

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The MA701 Wireless Compact Flash Card conforms to the Institute of Electrical and Electronics Engineers (IEEE) 802.11b standard for wireless LANs (WLANs) and a product update will bring the MA701 into conformance to the 802.11g standard when it is ratified. On an 802.11b or g wireless link, data is encoded using direct-sequence spread-spectrum (DSSS) technology and is transmitted in the unlicensed radio spectrum at 2.5GHz. The maximum data rate for the wireless link is 11 Mbps, but it will automatically back down from 11 Mbps to 5.5, 2, and 1 Mbps when the radio signal is weak or when interference is detected. The 802.11g auto rate sensing rates are 1, 2, 5.5, 6, 9, 12, 18, 24, 36, 48, and 54 Mbps.

The 802.11 standard is also called Wireless Ethernet or Wi-Fi by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standard group promoting interoperability among 802.11 devices. The 802.11 standard offers two methods for configuring a wireless network - ad hoc and infrastructure.

### Infrastructure Mode

With a wireless Access Point, you can operate the wireless LAN in the infrastructure mode. This mode provides wireless connectivity to multiple wireless network devices within a fixed range or area of coverage, interacting with wireless nodes via an antenna.

In the infrastructure mode, the wireless access point converts airwave data into wired Ethernet data, acting as a bridge between the wired LAN and wireless clients. Connecting multiple Access Points via a wired Ethernet backbone can further extend the wireless network coverage. As a mobile computing device moves out of the range of one access point, it moves into the range of another. As a result, wireless clients can freely roam from one Access Point domain to another and still maintain seamless network connection.

## Ad Hoc Mode (Peer-to-Peer Workgroup)

In an ad hoc network, computers are brought together as needed; thus, there is no structure or fixed points to the network - each node can generally communicate with any other node. There is no Access Point involved in this configuration. This mode enables you to quickly set up a small wireless workgroup and allows workgroup members to exchange data or share printers as supported by Microsoft networking in the various Windows operating systems. Some vendors also refer to ad hoc networking as peer-to-peer group networking.

In this configuration, network packets are directly sent and received by the intended transmitting and receiving stations. As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

## Network Name: Extended Service Set Identification (ESSID)

The Extended Service Set Identification (ESSID) is one of two types of Service Set Identification (SSID). In an ad hoc wireless network with no access points, the Basic Service Set Identification (BSSID) is used. In an infrastructure wireless network that includes an access point, the ESSID is used, but may still be referred to as SSID.

An SSID is a thirty-two character (maximum) alphanumeric key identifying the name of the wireless local area network. Some vendors refer to the SSID as network name. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID.

## Authentication and WEP

---

The absence of a physical connection between nodes makes the wireless links vulnerable to eavesdropping and information theft. To provide a certain level of security, the IEEE 802.11 standard has defined two types of authentication methods, Open System and Shared Key. With Open System authentication, a wireless PC can join any network and receive any messages that are not encrypted. With Shared Key authentication, only those PCs that possess the correct authentication key can join the network. By default, IEEE 802.11 wireless devices operate in an Open System network.

Wired Equivalent Privacy (WEP) data encryption is used when the wireless devices are configured to operate in Shared Key authentication mode. There are two shared key methods implemented in most commercially available products, 64-bit and 128-bit WEP data encryption.

## 802.11 Authentication

The 802.11 standard defines several services that govern how two 802.11 devices communicate. The following events must occur before an 802.11 Station can communicate with an Ethernet network through an access point such as the one built in to the MA701:

1. Turn on the wireless station.
2. The station listens for messages from any access points that are in range.
3. The station finds a message from an access point that has a matching SSID.
4. The station sends an authentication request to the access point.
5. The access point authenticates the station.
6. The station sends an association request to the access point.
7. The access point associates with the station.
8. The station can now communicate with the Ethernet network through the access point.

An access point must authenticate a station before the station can associate with the access point or communicate with the network. The IEEE 802.11 standard defines two types of authentication: Open System and Shared Key.

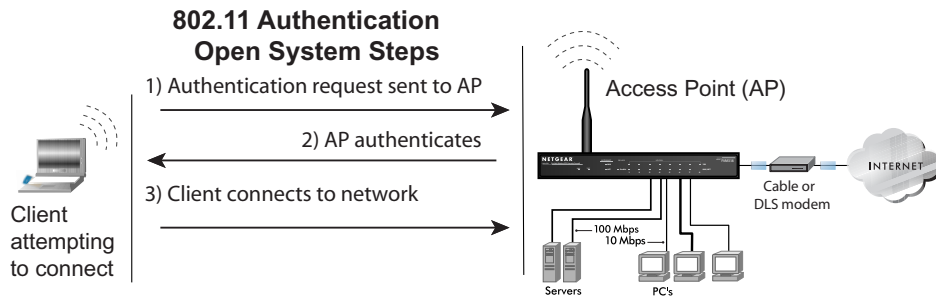
- Open System Authentication allows any device to join the network, assuming that the device SSID matches the access point SSID. Alternatively, the device can use the “Any” SSID option (case sensitive) to associate with any available Access Point within range, regardless of its SSID.
- Shared Key Authentication requires that the station and the access point have the same WEP Key to authenticate. These two authentication procedures are described below.

## Open System Authentication

The following steps occur when two devices use Open System Authentication:

1. The station sends an authentication request to the access point.
2. The access point authenticates the station.
3. The station associates with the access point and joins the network.

This process is illustrated in below.



**Figure 6-9: 802.11 open system authentication**

## Shared Key Authentication

The following steps occur when two devices use Shared Key Authentication:

1. The station sends an authentication request to the access point.
2. The access point sends challenge text to the station.
3. The station uses its configured 64-bit or 128-bit default key to encrypt the challenge text, and sends the encrypted text to the access point.
4. The access point decrypts the encrypted text using its configured WEP Key that corresponds to the station's default key. The access point compares the decrypted text with the original challenge text. If the decrypted text matches the original challenge text, then the access point and the station share the same WEP Key and the access point authenticates the station.
5. The station connects to the network.

If the decrypted text does not match the original challenge text (i.e., the access point and station do not share the same WEP Key), then the access point will refuse to authenticate the station and the station will be unable to communicate with either the 802.11 network or Ethernet network.

This process is illustrated in below.

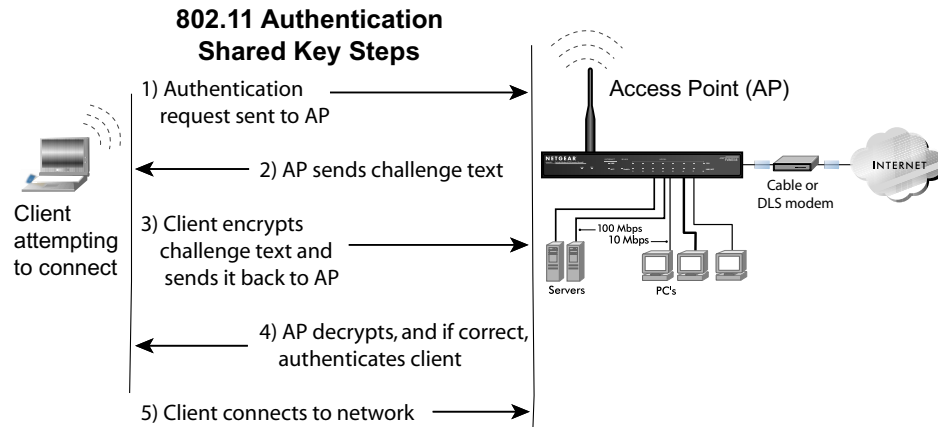


Figure 6-10: 802.11 shared key authentication

## Overview of WEP Parameters

Before enabling WEP on an 802.11 network, you must first consider what type of encryption you require and the key size you want to use. Typically, there are three WEP Encryption options available for 802.11 products:

1. **Do Not Use WEP:** The 802.11 network does not encrypt data. For authentication purposes, the network uses Open System Authentication.
2. **Use WEP for Encryption:** A transmitting 802.11 device encrypts the data portion of every packet it sends using a configured WEP Key. The receiving 802.11b device decrypts the data using the same WEP Key. For authentication purposes, the 802.11b network uses Open System Authentication.
3. **Use WEP for Authentication and Encryption:** A transmitting 802.11 device encrypts the data portion of every packet it sends using a configured WEP Key. The receiving 802.11 device decrypts the data using the same WEP Key. For authentication purposes, the 802.11 network uses Shared Key Authentication.

**Note:** Some 802.11 access points also support **Use WEP for Authentication Only** (Shared Key Authentication without data encryption).

## Key Size

The IEEE 802.11 standard supports two types of WEP encryption: 40-bit and 128-bit.

The 64-bit WEP data encryption method, allows for a five-character (40-bit) input. Additionally, 24 factory-set bits are added to the forty-bit input to generate a 64-bit encryption key. (The 24 factory-set bits are not user-configurable). This encryption key will be used to encrypt/decrypt all data transmitted via the wireless interface. Some vendors refer to the 64-bit WEP data encryption as 40-bit WEP data encryption since the user-configurable portion of the encryption key is 40 bits wide.

The 128-bit WEP data encryption method consists of 104 user-configurable bits. Similar to the forty-bit WEP data encryption method, the remaining 24 bits are factory set and not user configurable. Some vendors allow passphrases to be entered instead of the cryptic hexadecimal characters to ease encryption key entry.

128-bit encryption is stronger than 40-bit encryption, but 128-bit encryption may not be available outside of the United States due to U.S. export regulations.

When configured for 40-bit encryption, 802.11 products typically support up to four WEP Keys. Each 40-bit WEP Key is expressed as 5 sets of two hexadecimal digits (0-9 and A-F). For example, “12 34 56 78 90” is a 40-bit WEP Key.

When configured for 128-bit encryption, 802.11b products typically support four WEP Keys but some manufacturers support only one 128-bit key. The 128-bit WEP Key is expressed as 13 sets of two hexadecimal digits (0-9 and A-F). For example, “12 34 56 78 90 AB CD EF 12 34 56 78 90” is a 128-bit WEP Key.

**Note:** Typically, 802.11 access points can store up to four 128-bit WEP Keys but some 802.11 client adapters can only store one. Therefore, make sure that your 802.11 access and client adapters configurations match.

## WEP Configuration Options

The WEP settings must match on all 802.11 devices that are within the same wireless network as identified by the SSID. In general, if your mobile clients will roam between access points, then all of the 802.11 access points and all of the 802.11 client adapters on the network must have the same WEP settings.



**Note:** Whatever keys you enter for an AP, you must also enter the same keys for the client adapter in the same order. In other words, WEP key 1 on the AP must match WEP key 1 on the client adapter, WEP key 2 on the AP must match WEP key 2 on the client adapter, etc.

**Note:** The AP and the client adapters can have different default WEP Keys as long as the keys are in the same order. In other words, the AP can use WEP key 2 as its default key to transmit while a client adapter can use WEP key 3 as its default key to transmit. The two devices will communicate as long as the AP's WEP key 2 is the same as the client's WEP key 2 and the AP's WEP key 3 is the same as the client's WEP key 3.

## Wireless Channels

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IEEE 802.11b and g wireless nodes communicate with each other using radio frequency signals in the ISM (Industrial, Scientific, and Medical) band between 2.4 GHz and 2.5 GHz. Neighboring channels are 5 MHz apart. However, due to spread spectrum effect of the signals, a node sending signals using a particular channel will utilize frequency spectrum 12.5 MHz above and below the center channel frequency. As a result, two separate wireless networks using neighboring channels (for example, channel 1 and channel 2) in the same general vicinity will interfere with each other. Applying two channels that allow the maximum channel separation will decrease the amount of channel cross-talk, and provide a noticeable performance increase over networks with minimal channel separation.

The radio frequency channels used are listed in [Table 6-1](#):

**Table 6-1. 802.11b and g Radio Frequency Channels**

Channel	Center Frequency	Frequency Spread
1	2412 MHz	2399.5 MHz - 2424.5 MHz
2	2417 MHz	2404.5 MHz - 2429.5 MHz
3	2422 MHz	2409.5 MHz - 2434.5 MHz
4	2427 MHz	2414.5 MHz - 2439.5 MHz
5	2432 MHz	2419.5 MHz - 2444.5 MHz
6	2437 MHz	2424.5 MHz - 2449.5 MHz
7	2442 MHz	2429.5 MHz - 2454.5 MHz
8	2447 MHz	2434.5 MHz - 2459.5 MHz
9	2452 MHz	2439.5 MHz - 2464.5 MHz
10	2457 MHz	2444.5 MHz - 2469.5 MHz
11	2462 MHz	2449.5 MHz - 2474.5 MHz
12	2467 MHz	2454.5 MHz - 2479.5 MHz
13	2472 MHz	2459.5 MHz - 2484.5 MHz

**Note:** The available channels supported by the wireless products in various countries are different.

The preferred channel separation between the channels in neighboring wireless networks is 25 MHz (5 channels). This means that you can apply up to three different channels within your wireless network. There are only 11 usable wireless channels in the United States. It is recommended that you start using channel 1 and grow to use channel 6, and 11 when necessary, as these three channels do not overlap.

# Appendix C

## Preparing Your PCs for Network Access

This appendix describes how to prepare your PCs to connect to the Internet through the NETGEAR 802.11b Wireless Compact Flash Card MA701.

For adding file and print sharing to your network, please consult the Windows help information included with the version of Windows installed on each computer on your network.

### Preparing Your Computers for TCP/IP Networking

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Computers access the Internet using a protocol called TCP/IP (Transmission Control Protocol/Internet Protocol). Each computer on your network must have TCP/IP installed and selected as its networking protocol. If a Network Interface Card (NIC) is already installed in your PC, then TCP/IP is probably already installed as well.

Most operating systems include the software components you need for networking with TCP/IP. Windows 95 or later includes the software components for establishing a TCP/IP network.

In your TCP/IP network, each PC and the wireless access point must be assigned a unique IP addresses. Each PC must also have certain other TCP/IP configuration information such as a subnet mask (netmask), a domain name server (DNS) address, and a default gateway address. In most cases, you should install TCP/IP so that the PC obtains its specific network configuration information automatically from a DHCP server during startup.

### Configuring Windows 98 and Me for TCP/IP Networking

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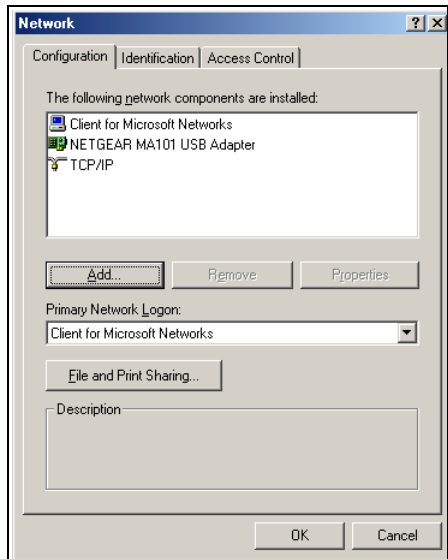
As part of the PC preparation process, you may need to install and configure TCP/IP on your PC. Before starting, locate your Windows CD; you may need to insert it during the TCP/IP installation process.

### Install or Verify Windows Networking Components

To install or verify the necessary components for IP networking:

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Network icon.

The Network window opens, which displays a list of installed components:



You must have an Ethernet adapter or an MA701, the TCP/IP protocol, and the Client for Microsoft Networks.



**Note:** It is not necessary to remove any other network components shown in the Network window in order to install the adapter, TCP/IP, or Client for Microsoft Networks.

If you need to add TCP/IP:

- a. Click the Add button.
- b. Select Protocol, and then click Add.
- c. Select Microsoft.
- d. Select TCP/IP, and then click OK.

If you need to add the Client for Microsoft Networks:

- a. Click the Add button.
- b. Select Client, and then click Add.
- c. Select Microsoft.
- d. Select Client for Microsoft Networks, and then click OK.

If you need to add File and Print Sharing for Microsoft Networks:

- a. Click the Add button.
  - b. Select Client, and then click Add.
  - c. Select Microsoft.
  - d. Select File and Print Sharing for Microsoft Networks, and then click OK.
3. Restart your PC for the changes to take effect.

## Enabling DHCP to Automatically Configure TCP/IP Settings in Windows 98 and Me

After the TCP/IP protocol components are installed, each PC must be assigned specific information about itself and resources that are available on its network. The simplest way to configure this information is to allow the PC to obtain the information from a DHCP server in the network.

You will find there are many similarities in the procedures for different Windows systems when using DHCP to configure TCP/IP.

The following steps will walk you through the configuration process for each of these versions of Windows.

**1**

Locate your **Network Neighborhood** icon.

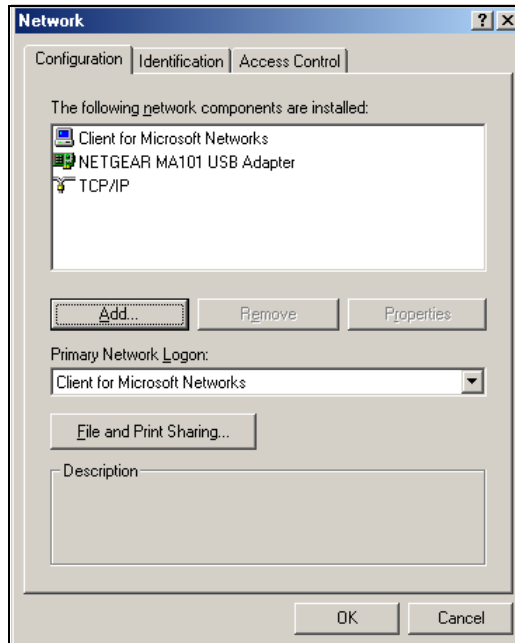
- If the Network Neighborhood icon is on the Windows desktop, position your mouse pointer over it and right-click your mouse button.
- If the icon is not on the desktop,
  - Click **Start** on the task bar located at the bottom left of the window.
  - Choose **Settings**, and then **Control Panel**.
  - Locate the **Network Neighborhood** icon and click on it. This will open the Network panel as shown below.

2

Verify the following settings as shown:

- Client for Microsoft Network exists
- Ethernet adapter is present
- TCP/IP is present
- **Primary Network Logon** is set to Windows logon

Click on the **Properties** button. The following TCP/IP Properties window will display.



3

By default, the **IP Address** tab is open on this window.

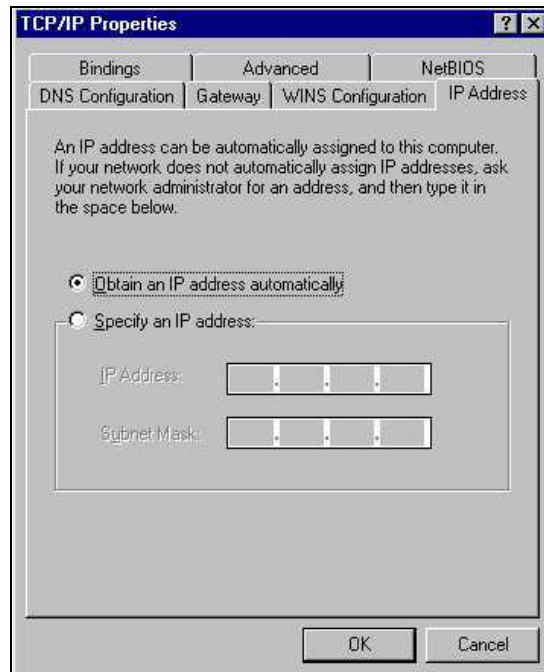
- Verify the following:

**Obtain an IP address automatically** is selected. If not selected, click in the radio button to the left of it to select it. This setting is required to enable the DHCP server to automatically assign an IP address.

- Click **OK** to continue.

Restart the PC.

Repeat these steps for each PC with this version of Windows on your network.



## Selecting Windows' Internet Access Method

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Internet Options icon.
3. Select "I want to set up my Internet connection manually" or "I want to connect through a Local Area Network" and click Next.
4. Select "I want to connect through a Local Area Network" and click Next.
5. Uncheck all boxes in the LAN Internet Configuration screen and click Next.
6. Proceed to the end of the Wizard.

## Verifying TCP/IP Properties

After your PC is configured and has rebooted, you can check the TCP/IP configuration using the utility *wipcfg.exe*:

1. On the Windows taskbar, click the Start button, and then click Run.

2. Type **winipcfg**, and then click OK.

The IP Configuration window opens, which lists (among other things), your IP address, subnet mask, and default gateway.

3. From the drop-down box, select your Ethernet adapter.

The window is updated to show your settings, which should match the values below if you are using the default TCP/IP settings that NETGEAR recommends for connecting through a router or gateway:

- The IP address is between 192.168.0.2 and 192.168.0.254
- The subnet mask is 255.255.255.0
- The default gateway is 192.168.0.1

## **Configuring Windows 2000 or XP for TCP/IP Networking**

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As part of the PC preparation process, you may need to install and configure TCP/IP on each networked PC. Before starting, locate your Windows CD; you may need to insert it during the TCP/IP installation process.

### **Install or Verify Windows Networking Components**

To install or verify the necessary components for IP networking:

1. On the Windows taskbar, click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Network and Dialup Connections icon.
3. If an Ethernet adapter is present in your PC, you should see an entry for Local Area Connection. Double-click that entry.
4. Select Properties.
5. Verify that 'Client for Microsoft Networks' and 'Internet Protocol (TCP/IP)' are present. If not, select Install and add them.
6. Select 'Internet Protocol (TCP/IP)', click Properties, and verify that "Obtain an IP address automatically is selected.
7. Click OK and close all Network and Dialup Connections windows.
8. Then, restart your PC.



## DHCP Configuration of TCP/IP in Windows XP or 2000

You will find there are many similarities in the procedures for different Windows systems when using DHCP to configure TCP/IP.

The following steps will walk you through the configuration process for each of these versions of Windows.

### DHCP Configuration of TCP/IP in Windows XP

1

Locate your **Network Neighborhood** icon.

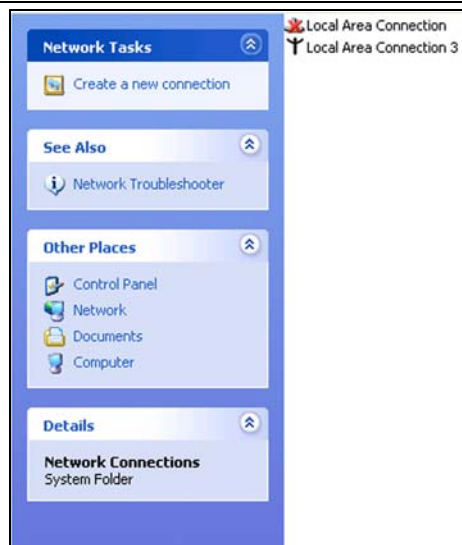
- Select **Control Panel** from the Windows XP Start Menu.
- Select the **Network Connections** icon on the Control Panel. This will take you to the next step.

2

Now the Network Connection window displays.

The Connections List that shows all the network connections set up on the PC, located to the right of the window.

- Right-click on the **Connection with the wireless icon** and choose **Status**.

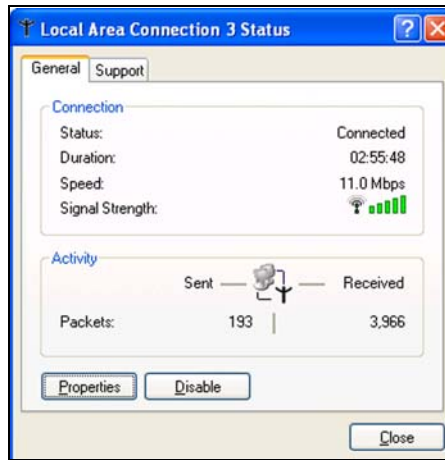


3

Now you should be at the Local Area Network Connection Status window. This box displays the connection status, duration, speed, and activity statistics.

Administrator logon access rights are needed to use this window.

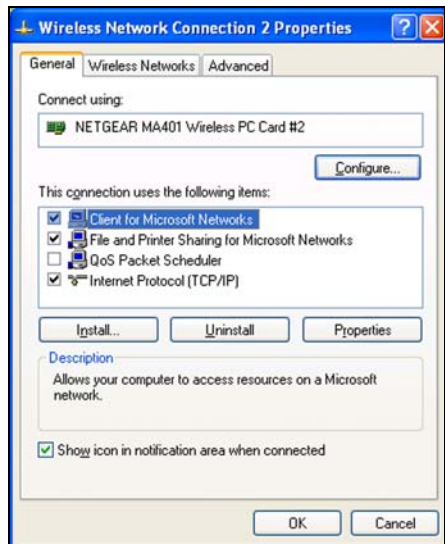
- Click the **Properties** button to view details about the connection.



4

The TCP/IP details are presented on the Support tab page.

- Select **Internet Protocol**, and click **Properties** to view the configuration information.



Verify that **Obtain an IP address**

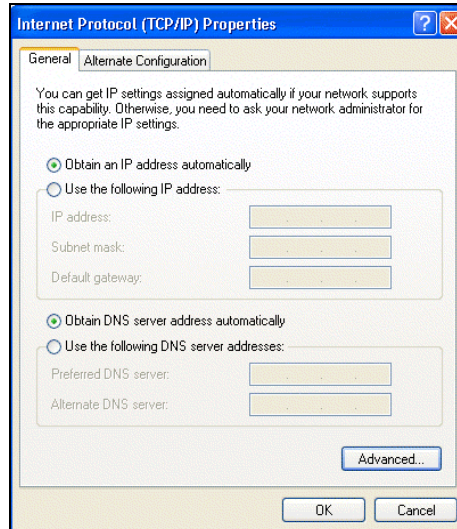
**5**

**automatically** radio button is selected and that the **Obtain DNS server address automatically** radio button is selected.

- Click the **OK** button.

This completes the DHCP configuration in Windows XP.

Repeat these steps for each PC with this version of Windows on your network.



## DHCP Configuration of TCP/IP in Windows 2000

After you install a network card, TCP/IP for Windows 2000 is configured and set to DHCP without your having to configure it. However, if there are problems, following the steps below to configure TCP/IP with DHCP for Windows 2000.

**1**

Click on the **My Network Places** icon on the Windows desktop. This will bring up a window called Network and Dial-up Connections.

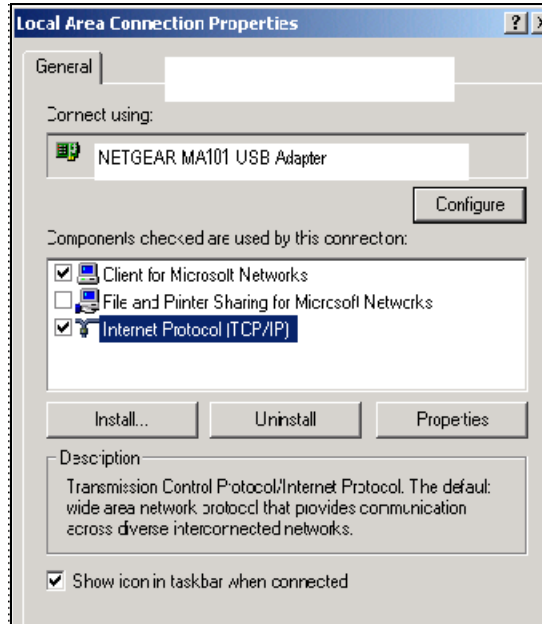
- Right click on **Local Area Connection** and select **Properties**.

2

The **Local Area Connection Properties** dialog box appears. Verify that you have the correct Ethernet card selected in the **Connect using:** box and that the following two items are displayed and selected in the box of “Components checked are used by this connection:”

- Client for Microsoft Networks and
- Internet Protocol (TCP/IP)

Click **OK**.



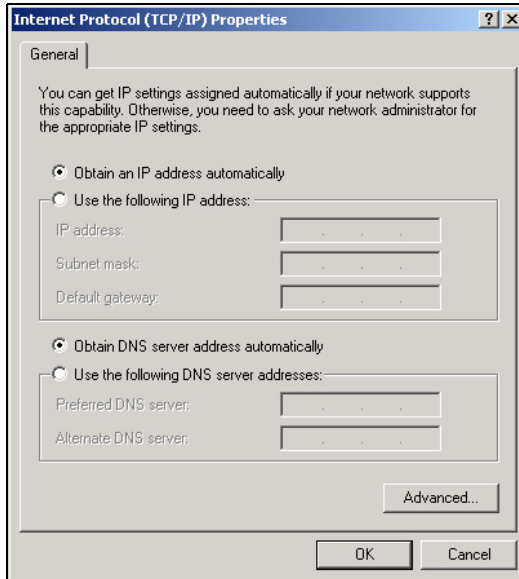
3

With Internet Protocol (TCP/IP) selected, click on **Properties** to open the Internet Protocol (TCP/IP) Properties dialogue box. Verify that

- **Obtain an IP address automatically** is selected.
- **Obtain DNS server address automatically** is selected.

Click **OK** to return to Local Area Connection Properties. Click **OK** again to complete the configuration process.

Restart the PC. Repeat these steps for each PC with this version of Windows on your network.



## Verifying TCP/IP Properties for Windows XP or 2000

To check your PC's TCP/IP configuration:

1. On the Windows taskbar, click the Start button, and then click Run.

The Run window opens.

2. Type `cmd` and then click OK.

A command window opens

3. Type `ipconfig /all`

Your IP Configuration information will be listed, and should match the values below if you are using the default TCP/IP settings that NETGEAR recommends for connecting through a router or gateway:

- The IP address is between 192.168.0.2 and 192.168.0.254
- The subnet mask is 255.255.255.0
- The default gateway is 192.168.0.1

4. Type `exit`



# Glossary

Use the list below to find definitions for technical terms used in this manual.

## Numeric

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### **802.1x**

802.1x defines port-based, network access control used to provide authenticated network access and automated data encryption key management.

The IEEE 802.1x draft standard offers an effective framework for authenticating and controlling user traffic to a protected network, as well as dynamically varying encryption keys. 802.1x uses a protocol called EAP (Extensible Authentication Protocol) and supports multiple authentication methods, such as token cards, Kerberos, one-time passwords, certificates, and public key authentication. For details on EAP specifically, refer to IETF's RFC 2284.

### **802.11a**

IEEE specification for wireless networking at 54 Mbps operating in unlicensed radio bands over 5GHz.

### **802.11b**

IEEE specification for wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.5GHz.

### **802.11g**

A soon to be ratified IEEE specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.5GHz. 802.11g is backwards compatible with 802.11b.

### **10BASE-T**

The IEEE specification for 10 Mbps Ethernet over Category 3, 4, or 5 twisted-pair cable.

### **100BASE-TX**

The IEEE specification for 100 Mbps Fast Ethernet over Category 5 twisted-pair cable.  
gain access.

## A

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### **Access Control List**

An ACL is a database that an Operating System uses to track each user's access rights to system objects (such as file directories and/or files).

### **ACL**

See "Access Control List" on page 2.

### **Ad-hoc Mode**

An 802.11 networking framework in which devices or stations communicate directly with each other, without the use of an access point (AP). Ad-hoc mode is also referred to as peer-to-peer mode or an Independent Basic Service Set (IBSS). Ad-hoc mode is useful for establishing a network where wireless infrastructure does not exist or where services are not required.

### **ADSL**

Short for asymmetric digital subscriber line, a technology that allows data to be sent over existing copper telephone lines at data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate).

ADSL requires a special ADSL modem. ADSL is growing in popularity as more areas around the world gain access.

## B

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### **Bandwidth**

The information capacity, measured in bits per second, that a channel could transmit. Bandwidth examples include 10 Mbps for Ethernet, 100 Mbps for Fast Ethernet, and 1000 Mbps (1 Gbps) for Gigabit Ethernet.

### **Baud**

The signaling rate of a line, that is, the number of transitions (voltage or frequency changes) made per second. Also known as line speed.

### **Broadcast**

A packet sent to all devices on a network.



## C

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### **Class of Service**

A term to describe treating different types of traffic with different levels of service priority. Higher priority traffic gets faster treatment during times of switch congestion

## D

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### **DHCP**

See “Dynamic Host Configuration Protocol.” on page 4.

### **DNS**

Short for Domain Name System (or Service), an Internet service that translates domain names into IP addresses.

Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address. For example, the domain name `www.example.com` might translate to `198.105.232.4`. The DNS system is, in fact, its own network. If one DNS server doesn't know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

### **Domain Name**

A descriptive name for an address or group of addresses on the Internet. Domain names are of the form of a registered entity name plus one of a number of predefined top level suffixes such as `.com`, `.edu`, `.uk`, etc. For example, in the address `mail.NETGEAR.com`, `mail` is a server name and `NETGEAR.com` is the domain.

### **DoS**

A hacker attack designed to prevent your computer or network from operating or communicating.

### **DSL**

Short for digital subscriber line, but is commonly used in reference to the asymmetric version of this technology (ADSL) that allows data to be sent over existing copper telephone lines at data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate).

ADSL requires a special ADSL modem. ADSL is growing in popularity as more areas around the world gain access.

### **DSLAM**

DSL Access Multiplexor. The piece of equipment at the telephone company central office that provides the ADSL signal.

### **Dynamic Host Configuration Protocol.**

DHCP is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses. Dynamic addressing simplifies network administration because the software tracks IP addresses rather than requiring an administrator to manage the task. A new computer can be added to a network without the hassle of manually assigning it a unique IP address.

## **E**

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### **EAP**

Extensible Authentication Protocol is a general protocol for authentication that supports multiple authentication methods.

EAP, an extension to PPP, supports such authentication methods as token cards, Kerberos, one-time passwords, certificates, public key authentication and smart cards. In wireless communications using EAP, a user requests connection to a WLAN through an AP, which then requests the identity of the user and transmits that identity to an authentication server such as RADIUS. The server asks the AP for proof of identity, which the AP gets from the user and then sends back to the server to complete the authentication. EAP is defined by RFC 2284.

### **ESSID**

The Extended Service Set Identification (ESSID) is a thirty-two character (maximum) alphanumeric key identifying the wireless local area network.

### **Ethernet**

A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks transmit packets at a rate of 10 Mbps.

## **G**

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### **Gateway**

A local device, usually a router, that connects hosts on a local network to other networks.

## **I**

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### **ICMP**

See "Internet Control Message Protocol" on page 5.

## **IEEE**

Institute of Electrical and Electronics Engineers. This American organization was founded in 1963 and sets standards for computers and communications.

## **IETF**

Internet Engineering Task Force. An organization responsible for providing engineering solutions for TCP/IP networks. In the network management area, this group is responsible for the development of the SNMP protocol.

## **IKE**

Internet Key Exchange. An automated method for exchanging and managing encryption keys between two VPN devices.

## **Infrastructure Mode**

An 802.11 networking framework in which devices communicate with each other by first going through an Access Point (AP). In infrastructure mode, wireless devices can communicate with each other or can communicate with a wired network. When one AP is connected to wired network and a set of wireless stations it is referred to as a Basic Service Set (BSS). An Extended Service Set (ESS) is a set of two or more BSSs that form a single subnetwork. Most corporate wireless LANs operate in infrastructure mode because they require access to the wired LAN in order to use services such as file servers or printers.

## **Internet Control Message Protocol**

ICMP is an extension to the Internet Protocol (IP) that supports packets containing error, control, and informational messages. The PING command, for example, uses ICMP to test an Internet connection.

## **Internet Protocol**

The method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it among all other computers on the Internet. When you send or receive data (for example, an e-mail note or a Web page), the message gets divided into little chunks called packets. Each of these packets contains both the sender's Internet address and the receiver's address. Any packet is sent first to a gateway computer that understands a small part of the Internet. The gateway computer reads the destination address and forwards the packet to an adjacent gateway that in turn reads the destination address and so forth across the Internet until one gateway recognizes the packet as belonging to a computer within its immediate neighborhood or domain. That gateway then forwards the packet directly to the computer whose address is specified.

Because a message is divided into a number of packets, each packet can, if necessary, be sent by a different route across the Internet. Packets can arrive in a different order than they were sent. The Internet Protocol just delivers them. It's up to another protocol, the Transmission Control Protocol (TCP) to put them back in the right order. IP is a connectionless protocol, which means that there is no continuing connection between the end points that are communicating. Each packet that travels through the Internet is treated as an independent unit of data without any relation to any other unit of data. (The reason the packets do get put in the right order is because of TCP, the connection-oriented protocol that keeps track of the packet sequence in a message.) In the Open Systems Interconnection (OSI) communication model, IP is in Layer 3, the Networking Layer. The most widely used version of IP today is IP version 4 (IPv4). However, IP version 6

(IPv6) is also beginning to be supported. IPv6 provides for much longer addresses and therefore for the possibility of many more Internet users. IPv6 includes the capabilities of IPv4 and any server that can support IPv6 packets can also support IPv4 packets.

## **IP**

See “Internet Protocol” on page 5.

### **IP Address**

A four-byte number uniquely defining each host on the Internet, usually written in dotted-decimal notation with periods separating the bytes (for example, 134.177.244.57). Ranges of addresses are assigned by Internic, an organization formed for this purpose.

## **ISP**

Internet service provider.

## **L**

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## **LAN**

See “Local Area Network” on page 6.

### **Local Area Network**

A communications network serving users within a limited area, such as one floor of a building. A LAN typically connects multiple personal computers and shared network devices such as storage and printers. Although many technologies exist to implement a LAN, Ethernet is the most common for connecting personal computers and is limited to a distance of 1,500 feet. LANs can be connected together, but if modems and telephones connect two or more LANs, the larger network constitutes what is called a WAN or Wide Area Network.

## **M**

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### **MAC**

(1) Medium Access Control. In LANs, the sublayer of the data link control layer that supports medium-dependent functions and uses the services of the physical layer to provide services to the logical link control (LLC) sublayer. The MAC sublayer includes the method of determining when a device has access to the transmission medium. (2) Message Authentication Code. In computer security, a value that is a part of a message or accompanies a message and is used to determine that the contents, origin, author, or other attributes of all or part of the message are as they appear to be. (*IBM Glossary of Computing Terms*)

**MAC address**

The Media Access Control address is a unique 48-bit hardware address assigned to every network interface card. Usually written in the form 01:23:45:67:89:ab.

**Maximum Receive Unit**

The size in bytes of the largest packet that can be sent or received.

**Maximum Transmit Unit**

The size in bytes of the largest packet that can be sent or received.

**Mbps**

Megabits per second.

**MDI/MDIX**

In cable wiring, the concept of transmit and receive are from the perspective of the PC, which is wired as a Media Dependant Interface (MDI). In MDI wiring, a PC transmits on pins 1 and 2. At the hub, switch, router, or access point, the perspective is reversed, and the hub receives on pins 1 and 2. This wiring is referred to as Media Dependant Interface - Crossover (MDI-X).

**MTU**

The size in bytes of the largest packet that can be sent or received.

## N

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**NAT**

See “Network Address Translation” on page 8.

**NetBIOS**

Network Basic Input Output System. An application programming interface (API) for sharing services and information on local-area networks (LANs). Provides for communication between stations of a network where each station is given a name. These names are alphanumeric names, 16 characters in length.

**netmask**

Combined with the IP address, the IP Subnet Mask allows a device to know which other addresses are local to it, and which must be reached through a gateway or router.

A number that explains which part of an IP address comprises the network address and which part is the host address on that network. It can be expressed in dotted-decimal notation or as a number appended to the IP address. For example, a 28-bit mask starting from the MSB can be shown as 255.255.255.192 or as /28 appended to the IP address.

### **Network Address Translation**

Sometimes referred to as Transparent Proxying, IP Address Overloading, or IP Masquerading. Involves use of a device called a Network Address Translator, which assigns a contrived, or logical, IP address and port number to each node on an organization's internal network and passes packets using these assigned addresses.

### **NIC**

Network Interface Card. An adapter in a computer which provides connectivity to a network.

## **P**

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### **packet**

A block of information sent over a network. A packet typically contains a source and destination network address, some protocol and length information, a block of data, and a checksum.

### **Point-to-Point Protocol**

PPP. A protocol allowing a computer using TCP/IP to connect directly to the Internet.

### **PPP**

A protocol allowing a computer using TCP/IP to connect directly to the Internet.

### **PPPoA**

PPPoA. PPP over ATM is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

### **PPPoE**

PPPoE. PPP over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

### **PPP over ATM**

PPPoA. PPP over ATM is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

### **PPP over Ethernet**

PPPoE. PPP over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

### **PPTP**

Point-to-Point Tunneling Protocol. A method for establishing a virtual private network (VPN) by embedding Microsoft's network protocol into Internet packets.

**Protocol**

A set of rules for communication between devices on a network.

**PSTN**

Public Switched Telephone Network.

**Q**

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**QoS**

See “Quality of Service” on page 9.

**Quality of Service**

QoS is a networking term that specifies a guaranteed level of throughput. Throughput is the amount of data transferred from one device to another or processed in a specified amount of time - typically, throughputs are measured in bytes per second (Bps).

**R**

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**RADIUS**

Short for Remote Authentication Dial-In User Service, RADIUS is an authentication system.

Using RADIUS, you must enter your user name and password before gaining access to a network. This information is passed to a RADIUS server, which checks that the information is correct, and then authorizes access. Though not an official standard, the RADIUS specification is maintained by a working group of the IETF.

**RFC**

Request For Comment. Refers to documents published by the Internet Engineering Task Force (IETF) proposing standard protocols and procedures for the Internet. RFCs can be found at [www.ietf.org](http://www.ietf.org).

**router**

A device that forwards data between networks. An IP router forwards data based on IP source and destination addresses.

**S**

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**SSID**

A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must

be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name. *See also* Wireless Network Name and ESSID.

### **Segment**

A section of a LAN that is connected to the rest of the network using a switch, bridge, or repeater.

### **Subnet Mask**

Combined with the IP address, the IP Subnet Mask allows a device to know which other addresses are local to it, and which must be reached through a gateway or router.

## **T**

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### **TCP/IP**

The main internetworking protocols used in the Internet. The Internet Protocol (IP) used in conjunction with the Transfer Control Protocol (TCP) form TCP/IP.

## **U**

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### **Universal Plug and Play**

UPnP. A networking architecture that provides compatibility among networking technology. UPnP compliant routers provide broadband users at home and small businesses with a seamless way to participate in online games, videoconferencing and other peer-to-peer services.

### **UTP**

Unshielded twisted pair is the cable used by 10BASE-T and 100BASE-Tx Ethernet networks.

## **W**

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### **WAN**

See “Wide Area Network” on page 11.

### **Web**

Also known as World-Wide Web (WWW) or W3. An Internet client-server system to distribute information, based upon the hypertext transfer protocol (HTTP).



### **WEB Proxy Server**

A Web proxy server is a specialized HTTP server that allows clients access to the Internet from behind a firewall. The proxy server listens for requests from clients within the firewall and forwards these requests to remote Internet servers outside the firewall. The proxy server reads responses from the external servers and then sends them to internal client clients.

### **WEP**

Wired Equivalent Privacy is a data encryption protocol for 802.11b wireless networks.

All wireless nodes and access points on the network are configured with a 64-bit or 128-bit Shared Key for data encryption.

### **Wide Area Network**

A WAN is a computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local-area networks (LANs).

### **Wi-Fi**

A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standards group promoting interoperability among 802.11b devices.

### **Windows Internet Naming Service**

WINS. Windows Internet Naming Service is a server process for resolving Windows-based computer names to IP addresses.

If a remote network contains a WINS server, your Windows PCs can gather information from that WINS server about its local hosts. This allows your PCs to browse that remote network using the Windows Network Neighborhood feature.

### **WINS**

WINS. Windows Internet Naming Service is a server process for resolving Windows-based computer names to IP addresses.

### **Wireless Network Name (SSID)**

Wireless Network Name (SSID) is the name assigned to a wireless network. This is the same as the SSID or ESSID configuration parameter.



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