BELKIN®

Wireless G Notebook
Network Card

**Connect your laptop computer to a
FAST wireless network**

54g™
802.11g

54 Mbps
2.4GHz • Wireless

F5D7010

Table of Contents

Introduction

Thank you for purchasing the Belkin Wireless G Notebook Network Card (the Card). The Card features 802.11g technology, allowing you to take advantage of wireless networking without using cables. The Card works like a conventional network card, but without the wires. The easy installation and setup will have you networking in minutes. Please be sure to read through this User Manual completely, and pay special attention to the section entitled "Placement of your Wireless Network Hardware for Optimal Performance".

Advantages of a Wireless Network

- **Mobility** – you no longer need a dedicated "computer room"—you can work on a networked laptop or desktop computer anywhere within your wireless range

- **Easy installation** – Belkin Easy Installation Wizards make setup simple

- **Flexibility** – set up and access printers, computers, and other networking devices from anywhere in your home

- **Easy Expansion** – the wide range of Belkin networking products let you expand your network to include devices such as printers and gaming consoles

- **No cabling required** – you can spare the expense and hassle of retrofitting Ethernet cabling throughout the home or office

- **Widespread industry acceptance** – choose from a wide range of interoperable networking products

Introduction

Placement of your Wireless Networking Hardware for Optimal Performance

Your wireless connection will be stronger the closer your computer is to your wireless router (or access point). Typical indoor operating range for your wireless devices is between 100 and 200 feet. In the same way, your wireless connection and performance will degrade somewhat as the distance between your wireless router (or access point) and connected devices increases. This may or may not be noticeable to you. As you move further from your wireless router (or access point), connection speed may decrease. Factors that can weaken signals simply by getting in the way of your network's radio waves are metal appliances or obstructions, and walls.

If you have concerns about your network's performance that might be related to range or obstruction factors, try moving the computer to a position between five and 10 feet from the wireless router (or access point) in order to see if distance is the problem. If difficulties persist even at close range, please contact Belkin Technical Support.

Note: While some of the items listed below can affect network performance, they will not prohibit your wireless network from functioning; if you are concerned that your network is not operating at its maximum effectiveness, this checklist may help.

1. Placement of your Wireless Router or Access Point

Place your wireless router (or access point), the central connection point of your network, as close as possible to the center of your wireless network devices.

To achieve the best wireless network coverage for your "wireless clients," (i.e. computers enabled by Belkin Wireless Notebook Network Cards, Wireless Desktop Network Cards, and Wireless USB Adapters):

• Ensure that your wireless router's (or access point's) antennas are parallel to each other, and are positioned vertically (toward the ceiling). If your wireless router (or access point) itself is positioned vertically, point the antennas as much as possible in an upward direction.

• In multistory homes, place the wireless router (or access point) on a floor that is as close to the center of the home as possible. This may mean placing the wireless router (or access point) on an upper floor.

• Try not to place the wireless router (or access point) near a cordless 2.4GHz phone.

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2.   Avoid Obstacles and Interference

Avoid placing your wireless router (or access point) near devices that may emit radio "noise", such as microwave ovens. Other objects that can inhibit wireless communication can include:

- Refrigerators
- Washers and/or dryers
- Metal cabinets
- Large aquariums
- Metallic-based UV tinted windows

If your wireless signal seems weak in some spots, make sure that objects such as these are not blocking the signal's path between your computers and wireless router (or access point).

3.   Cordless Phone Placement

If the performance of your wireless network is impaired after attending to the above issues, and you have your cordless phone:

- Try moving cordless phones away from the wireless router (or access point) and your wireless-enabled computers.
- Unplug and remove the battery from any cordless phone that operates on the 2.4GHz band (check the manufacturer's information). If this fixes the problem, the phone may be interfering.
- If your phone supports channel selection, change the channel on the phone to the furthest channel from your wireless network, as possible. For example, change the phone to channel 1 and move your wireless router (or access point) to channel 11. See your phone's user manual for detailed instructions.
- If necessary, consider switching to a 900MHz or 5GHz cordless phone.

4. Choose the "Quietest" Channel for your Wireless Network

In locations where homes or offices are close together, such as apartment buildings or office complexes, there may be wireless networks nearby that can conflict with yours. Use the Site Survey capabilities of your Wireless Utility to locate any other wireless

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Introduction

networks, and move your wireless router (or access point) and computers to a channel as far away from other networks as possible.

Experiment with more than one of the available channels in order to find the clearest connection and avoid interference from neighboring cordless phones or other wireless devices.

Use the detailed information in the "Finding Available Networks in your Area" section in this User Manual.

5. Secure Connections, VPNs, and AOL

Secure connections typically require a user name and password, and are used where security is important. Secure connections include:

- • Virtual Private Network (VPN) connections, often used to connect remotely to an office network
- • The "Bring Your Own Access" program from America Online (AOL), which lets you use AOL through broadband provided by another cable or DSL service
- • Most online banking websites
- • Many commercial websites which require a user name and password to access your account

Secure connections can be interrupted by a computer's power management setting, which causes it to "go to sleep." The simplest solution to avoid this is to simply reconnect by re-running the VPN or AOL software, or by re-logging into the secure website.

A second alternative is to change your computer's power management settings so it does not go to sleep; however, this may not be appropriate for portable computers. To change your power management setting under Windows, see the "Power Options" item in the Control Panel.

If you continue to have difficulty with Secure Connection, VPNs, and AOL, please review steps 1-4 in the previous pages to be sure you have addressed these issues.

These guidelines should allow you to cover the maximum possible area with your wireless router. Should you need to cover an even wider area, we suggest the Belkin Wireless Range Extender/Access Point.

For more information regarding our networking products, visit our website at www.belkin.com/networking or call Belkin Technical Support.

Overview

Product Features

The Card complies with the IEEE 802.11g standard in order to communicate with other 802.11g-compliant wireless devices at 54Mbps. The Card is compatible with all 802.11g devices as well as other 802.11b products at 11Mbps. 802.11g products operate on the same 2.4GHz frequency band as 802.11b Wi-Fi products.

- 2.4GHz ISM (Industrial, Science, and Medical) band operation
- Integrated easy-to-use Wireless Utility
- CardBus interface, for operation in virtually any notebook computer
- WPA, 64-bit WEP (Wired Equivalent Privacy), 128-bit encryption, and 802.1x authentication
- Wireless access to networked resources
- Support for both Infrastructure and Ad-Hoc (peer-to-peer) networking modes
- Easy installation and use
- Internal antenna
- LED power and network link indicators

Applications and Advantages

• **Wireless roaming with a laptop around the home or office**
Offers the freedom of networking without cables

• **Compatibility with 802.11b products**
802.11g wireless LAN solutions are backward-compatible with existing Wi-Fi (IEEE 802.11b) products and with other products that display the Wi-Fi mark

• **Difficult-to-wire environments**
Enables networking in buildings with solid or finished walls, or open areas where wiring is difficult to install

• **Frequently changing environments**
Adapts easily in offices or environments that frequently rearrange or change locations

• **Temporary LANs for special projects or peak time**
Sets up temporary networks (such as at trade shows, exhibitions, and construction sites) on a short-term basis; also companies that need additional workstations for a peak activity period.

• **SOHO (Small Office/Home Office) networking needs**
Provides the easy and quick, small network installation SOHO users need

Product Specifications

Host Interface	32-bit Cardbus
Power Consumption	Tx/Rx peak 450/260mA @ 3.3VDC (max.)
Operating Temperature	32—185 degrees F (0—85 degrees C)
Storage Temperature	-40—194 degrees F (-40—90 degrees C)
Humidity	(Max. 95% (non-condensing)
Typical Operating Range	100 to 200 feet (30-60 meters)

Overview

(a) Link LED
Lights up when the Card links to a wireless network

(b) Activity LED
Lights up and flashes when the Card is active

(c) Card Connector
Part of the Card that fits into your computer's CardBus slot

System Requirements

• PC-compatible laptop with one available CardBus slot
• Windows® 98SE, Me, 2000, XP

Package Contents

• Wireless G Notebook Network Card
• Quick Installation Guide
• Installation Software CD
• User Manual

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Installing and Setting Up the Card

Step 1	Install the Software

WARNING: INSTALL THE SOFTWARE BEFORE INSERTING THE CARD.

1.1 Insert the Installation Software CD into your CD-ROM drive.

1.2 The Belkin Wireless Utility screen will automatically appear (may take 15–20 seconds to appear). In the menu window, drag your mouse over the "Install" button, then select "Click here" to start the software installation program.

Note: If the Wireless Utility screen does not appear within 20 seconds, access your CD-ROM by double-clicking on the "My Computer" icon and and double-click on the CD-ROM drive that the installation CD has been placed in. Double-click on the folder named "Files", then double-click on the icon named "setup.exe".

1.3 Click "Next" to install the software.

Installing and Setting Up the Card

1.4 You will be prompted to choose an installation location. Click "Next" to accept the default location, or click "Browse" to select a different location before clicking "Next".

1.5 Click "Next" to add the software to a program folder.

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Installing and Setting Up the Card

Step 2 | **Install the Hardware**

2.1 During the install process, you will be prompted to insert your Card. Insert the Card, label side UP, into your computer's CardBus slot firmly until it stops. Click "OK" to continue.

Note: If your system did not prompt you to insert your Card after the installation is completed, please do so now.

Using the Belkin Wireless Utility

How to Access the Belkin Wireless Utility

Double-click the Signal Indicator icon to bring up the "Belkin Wireless Utility". If the icon is not present, click on "Start > Programs > Belkin 802.11g Wireless Card > Belkin 802.11g Wireless Card Utility".

Note: The color of the icon reflects the connection link: green for good, yellow for weak, and red if it is not active.

Using the Belkin Wireless Utility

Monitoring the Status of your Network Connection

Click on the "Status" tab to monitor the link status of your network connection.

(a) Connected to

This is the current network SSID, the network name of the router (or access point) you are connected to

(b) Encryption

Will display "Off" when encryption is disabled, "WEP" when either 64-bit or 128-bit encryption is enabled, or "WPA" when WPA is enabled

(c) Speed

Displays the data rate of the current connection

(d) Channel

Shows the channel the network is on

Using the Belkin Wireless Utility

(e) Tx Packets

Displays the data packets that have been transmitted

(f)   Rx Packets

Displays the data packets that have been received

(g) Signal Strength

The signal strength of the related router (or access point)

(h) Network Mode

Will display either "Infrastructure" if connected to a router (or an access point) or "Ad-Hoc" when connected to another computer

(i)   BSSID

Displays the MAC address of the wireless router (or access point) that you are connected to

(j)   IP Address

Shows the IP address of the computer

(k) Use Windows to configure my wireless network settings

Click this box to use the Windows Zero Configuration Utility

Using the Belkin Wireless Utility

Configuring your Current Network Settings

Click on the "Configure" tab to make any changes to the current network settings or to make changes to a saved profile.

(a) Network Mode

Select the current wireless mode the Card is operating in from the two available operating modes. Infrastructure is used when connecting your PC to a wireless router (or access point), and Ad-Hoc is used when connecting two or more computers together without a wireless router (or access point).

(b) Network SSID

The SSID is the wireless network name of a router (or access point). Select an available SSID from the drop-down box or enter an SSID name of a wireless router (or access point) you would like to connect to that is in range of your PC.

Using the Belkin Wireless Utility

(c) 2.4GHz (802.11b)

Click here to use only the 802.11b radio band.

(d) 2.4GHz (802.11b/g)

Click here to use both the 802.11b and 802.11g radio band.

(e) Fragmentation threshold

Click on the bar to adjust the fragmentation threshold. Fragmentation can be set between 256 and 2346 bytes. Using fragmentation to divide frames into smaller pieces can increase transmission reliability but increase overhead and reduce performance speeds. Setting the fragmentation threshold to 2346 disables fragmentation and is the default setting.

(f) RTS/CTS Threshold

Click on the bar to adjust the RTS/CTS threshold. RTS/CTS can be set between 256 and 2346 bytes. Using RTS/CTS (Request to Send/Clear to Send) will control the data sent to minimize collisions with other PCs sending data on the same network. Setting RTS/CTS threshold to 2346 disables RTS/CTS and is the default setting.

(g) Power Saving

Select from either Off, Max, or Dynamic. The "Max" setting draws less power from your PC when you want to conserve battery power or when you are in close range; the "Off" setting will enable the highest performance but draws the most power from your PC; and the "Dynamic" setting will adjust the power setting automatically for a moderate level of power.

(h) Transmitted Rate

Select the transmit rate for data transmission. Lower speeds will give better range but slower throughput speeds.

(i) 2.4GHz Preamble

Select from either "Long" or "Auto Preamble" type. Auto is recommended for high network traffic environments.

Securing your Wi-Fi® Network

Here are a few different ways to maximize the security of your wireless network and protect your data from unwanted intrusion. This section is intended for the home, home office, and small office user. At the time of publication, three encryption methods are available.

Encryption Methods:

Name	64-bit Wired Equivalent Privacy	128-bit Encryption	Wi-Fi Protected Access	Wi-Fi Protected Access
Acronym	64-bit WEP	128-bit	WPA-TKIP	WPA-AES
Security	Good	Better	Best	Best
Features	Static keys	Static keys	Dynamic key encryption and mutual authentication	Dynamic key encryption and mutual authentication
	Encryption keys based on RC4 algorithm (typically 40-bit keys)	Added security over 64-bit WEP using a key length of 104 bits, plus 24 additional bits of system-generated data	TKIP (temporal key integrity protocol) added so that keys are rotated and encryption is strengthened	AES (Advanced Encryption Standard) does not cause any throughput loss.

WEP (Wired Equivalent Privacy)

WEP is a common protocol that adds security to all Wi-Fi-compliant wireless products. WEP gives wireless networks the equivalent level of privacy protection as a comparable wired network.

64-Bit WEP

64-bit WEP was first introduced with 64-bit encryption, which includes a key length of 40 bits plus 24 additional bits of system-generated data (64 bits total). Some hardware manufacturers refer to 64-bit as 40-bit encryption. Shortly after the technology was introduced, researchers found that 64-bit encryption was too easy to decode.

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Using the Belkin Wireless Utility

128-Bit Encryption

As a result of 64-bit WEP's potential security weaknesses, a more secure method of 128-bit encryption was developed. 128-bit encryption includes a key length of 104 bits plus 24 additional bits of system-generated data (128 bits total). Some hardware manufacturers refer to 128-bit as 104-bit encryption.

Most of the new wireless equipment in the market today supports both 64-bit WEP and 128-bit WEP encryption, but you might have older equipment that only supports 64-bit WEP. All Belkin wireless products will support both 64-bit WEP and 128-bit encryption.

Encryption Keys

After selecting either the 64-bit WEP or 128-bit encryption mode, it is critical that you generate an encryption key. If the encryption key is not consistent throughout the entire wireless network, your wireless networking devices will be unable to communicate with one another.

You can enter your key by typing in the hex key. A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 64-bit WEP, you need to enter 10 hex keys. For 128-bit WEP, you need to enter 26 hex keys.

For instance:

AF 0F 4B C3 D4 = 64-bit WEP key

C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7 = 128-bit key

Write down the hex WEP key from your wireless router (or access point) and enter it manually into the hex WEP key table in your Card's configuration screen.

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WPA (Wi-Fi Protected Access)

WPA is a new Wi-Fi standard that improves upon the security features of WEP. To use WPA security, the drivers and software of your wireless equipment must be upgraded to support it. These updates will be found on your wireless vendor's website. There are two types of WPA security: WPA-PSK (no server), and WPA (with radius server).

WPA-PSK (no server) uses what is known as a pre-shared key as the network key. A network key is a password that is between eight and 63 characters long. It can be a combination of letters, numbers, or characters. Each client uses the same network key to access the network. Typically, this is the mode that will be used in a home environment.

WPA (with radius server) is a system where a radius server distributes the network key to the clients automatically. This is typically found in a business environment. For a list of Belkin wireless products that support WPA, please visit our website at **www.belkin. com/networking**.

Most wireless products ship with security turned off. So once you have your network working, you may need to activate WEP or WPA and make sure all your wireless devices are sharing the same network key.

The following diagram shows the effect of not having the correct network key throughout your network.
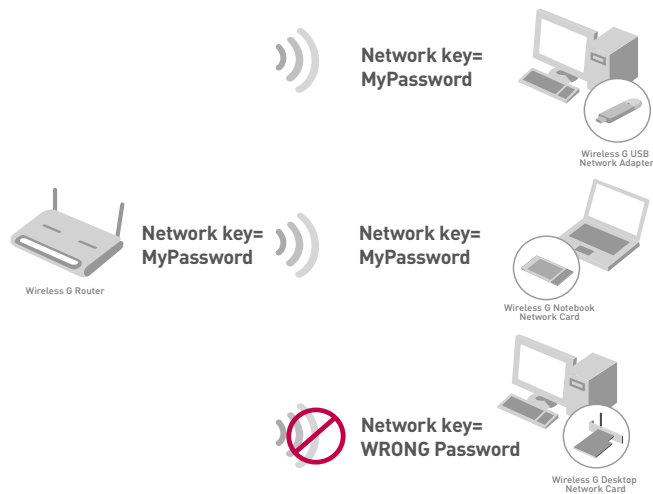
The bottom Card cannot access the network because it uses a different network key than the one configured on the wireless router.

Setting Up your Belkin Wireless Router (or Access Point) to Use Security

To start using security, you need to first enable WEP or WPA for your wireless router (or access point). For Belkin Wireless Routers (or access points), these security features can be configured by using the web-based interface. See your wireless router's (or access point's) manual for directions on how to access the management interface.

Changing the Wireless Security Settings

The Belkin Wireless G Router and Belkin Wireless G Range Extender/ Access Point are equipped with the latest WPA security feature. They also support the legacy WEP security standard. By default, wireless security is disabled.

To enable security, you will need to determine which standard you want to use. To access the security settings, click "Security" on the wireless section using the web-based interface. (See your wireless router's or access point's manual for directions on how to access the security settings.)

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WEP Setup

64-Bit WEP Encryption

1. Select "64-bit WEP" from the drop-down menu.

2. After selecting your WEP encryption mode, you can enter your key by typing in the hex key manually, or you can type in a passphrase in the "Passphrase" field and click "Generate" to create a key.

A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 64-bit WEP, you need to enter 10 hex keys.

For instance:

AF 0F 4B C3 D4 = 64-bit WEP Key

3. Click "Apply Changes" to finish. Encryption in the wireless router (or access point) is now set. Each of your computers on your wireless network will now need to be configured with the same security settings.

WARNING: If you are using a wireless client to turn on the security settings in your wireless router (or access point), you will temporarily lose your wireless connection until you activate security on your wireless client. Please record the key prior to applying changes in the wireless router (or access point). If you don't remember the hex key, your client will be locked out of the wireless router (or access point).

128-Bit WEP Encryption

1. Select "128-bit WEP" from the drop-down menu.

2. After selecting your WEP encryption mode, you can enter your key manually by typing in the hex key manually, or you can type in a passphrase in the "Passphrase" field and click "Generate" to create a key.

A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 hex keys.

For instance:

C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7 = 128-bit WEP key

3. Click "Apply Changes" to finish. Encryption in the wireless router (or access point) is now set. Each of the computers on your wireless network will now need to be configured with the same security settings.

WARNING: If you are using a wireless client to turn on the security settings in your wireless router (or access point), you will temporariy lose your wireless connection until you activate security on your wireless client. Please record the key prior to applying changes in the wireless router (or access point). If you don't remember the hex key, your client will be locked out of the wireless router (or access point).

WPA-PSK (no server)

Choose this setting if your network does not use a radius server. WPA-PSK (no server) is typically used in home and small office networking.

1. From the Security Mode drop-down menu, select "WPA-PSK (no server)".

2. Enter your network key. This can be from eight to 63 characters and can be letters, numbers, or symbols. This same key must be used on all of the clients (network cards) that you want to include in your wireless network.

3. Click "Apply Changes" to finish. You must now set all clients (network cards) to match these settings.

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WPA (with server) Settings

Choose this setting if your network uses a radius server to distribute keys to the clients (network cards). WPA (with server) is typically used in business networks.

1. From the Security Mode drop-down menu, select "WPA (with Radius Server)".

2. Enter the IP address of the radius server into the "Radius Server" fields.

3. Enter the radius key into the "Radius Key" field.

4. Enter the key interval. The key interval is how often the keys are distributed (in packets).

5. Click "Apply Changes" to finish. You must now set all clients (network cards) to match these settings.

IMPORTANT: You must now set all wireless network cards/ adapters to match these settings.

Using the Belkin Wireless Utility

Configuring your Belkin Wireless Notebook and Wireless Desktop Network Cards to Use Security

At this point, you should already have your wireless router (or access point) set to use WPA or WEP. In order for you to gain wireless connection, you will need to set your Wireless Notebook and Wireless Desktop Network Cards to use the same security settings.

Connecting your Computer to a Wireless Router (or Access Point) that requires a 64-Bit or 128-Bit WEP Key:

1. Double-click the Signal Indicator icon to bring up the "Belkin Wireless Utility" screen.

2. Under the "Security" tab, click "Enable WEP Encryption".

3. Select either "Create with a Passphrase" to type in a passphrase to generate a network key, or "Manual Entry" to manually enter the network key.

4. If selecting "Create with a Passphrase", type in the passphrase and select either "64 Bit" or "128 Bit" then click the "Apply" button.

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Using the Belkin Wireless Utility

5. If selecting "Manual Entry", select one of the four encryption keys and type in the network key.

Important: A WEP key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 keys. For 64-bit WEP, you need to enter 10 keys. This network key needs to match the key you assign to your wireless router (or access point).

6. Select "64-bit" or "128-bit" encryption.

7. Click "Apply" to save the settings.

Connecting your Computer to a Wireless Router (or Access Point) that uses WPA-PSK (no server)

1. Double-click the Signal Indicator icon ▓ to bring up the "Belkin Wireless Utility" screen.

2. Under the "Security" tab, click "Enable WPA Encryption".

3. Select "WPA-PSK" from the "Security Type" drop-down box and "TKIP" from the "Encryption Type"drop-down box.

> **Important:** A WPA key is a mixture of numbers and letters from A–F and 0–9. This can be from eight to 63 characters in length. This network key needs to match the key you assign to your wireless router (or access point).

4. Enter the passphrase or network key into the "Pre-Shared Key" box.

5. Click "OK" to save the settings.

Using the Belkin Wireless Utility

Connecting your Computer to a Wireless Router (or Access Point) that Requires WPA (with Radius Server), 802.1x, or Cisco LEAP

1. **1.** Double-click the Signal Indicator icon ▨ to bring up the "Belkin Wireless Utility" screen.

2. **2.** Under the "Security" tab, click "Enable WPA Encryption".

3. **3**. Select "WPA", "802.1x", or "Cisco-LEAP" from the "Security Type" drop-down box.

4. **4.** Under "EAP Selection", select the settings to connect to your router or as indicated by your network administrator.

5. **5.** Click "OK" to save the settings.

Finding Available Networks in your Area

Click on the "Available Networks" tab to display a list of all available wireless routers (and/or access points) in your area. To connect to an available network, click on the network you would like to connect to from the "Available Networks" list, and then click on the "Connect" button.

Note: In order to see your available networks, you must be near a working wireless router (or access point).

(a) Network SSID
The Network SSID is the wireless network name of a router (or access point). Connect to an available network by double-clicking on an SSID.

(b) Signal
The signal strength of the related router (or access point).

(c) Encryption
Will display "Not Use" when encryption is disabled, "WEP" when either 64-bit or 128-bit encryption is enabled, or "WPA" when WPA is enabled.

(d) Channel
The channel the router (or access point) is using.

(e) MAC Address
The router's (or access point's) MAC address.

(f) Connect
Click "Connect" to connect to the highlighted router (or access point) listed in "Available Networks".

(g) Re-Scan
Click "Re-Scan" to scan the area of available routers (or access points) to connect to.

Using the Belkin Wireless Utility

Setting Wireless Network Profiles

Click on the "Profiles" tab to save a wireless network profile or to create a new wireless network profile.

To create a new wireless network profile, enter a profile name in the "Profile Name" drop-down box. Click "Save" to save the current configuration settings. If you would like to make any modifications to the configuration settings, click on the "Configure" tab to make changes, then click on the "Profiles" tab, enter in the "Profile Name", and click the "Save" button.

(a) Profile Name
Enter in the profile name you wish to call a new profile or to look for a previously saved profile.

(b) Save
Click "Save" to save the current profile listed in the "Profile Name" box and to save the values of the current configuration settings.

(c) Delete
Click "Delete" to delete the current profile listed in the "Profile Name" box.

(d) Activate
Click "Activate" to activate the current profile listed in the "Profile Name" box.

(e) Configuration Settings
List the current configuration settings of the profile. For information on these configurations, please see the "Configuring your Current Network Settings" section of this User Manual.

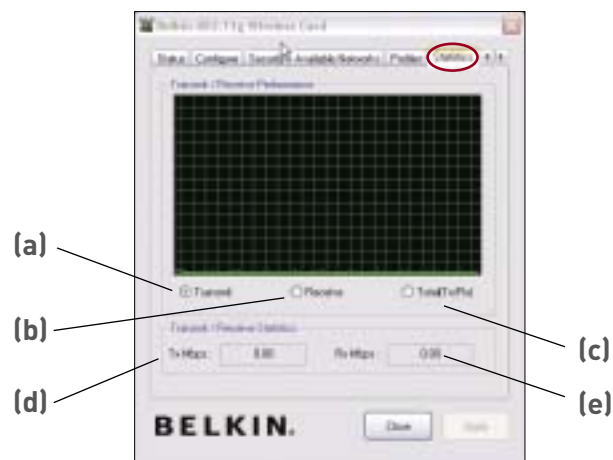## Monitoring Data Transfer

Click on the "Statistics" tab to view transmit-and-receive data transfer rates.

(a)
(b)
(c)
(d)
(e)

(a) Transmit
Click "Transmit" to view the transmit data rate in the performance chart.

(b) Receive
Click "Receive" to view the receive data rate in the performance chart.

(c) Total (Tx/Rx)
Click "Total (Tx/Rx)" to view transmit and receive data rates in the performance chart.

(d) Tx Mbps
The current transmit throughput speeds.

(e) Rx Mbps
The current transmit throughput speeds.

Troubleshooting

I can't connect to the Internet wirelessly

If you are unable to connect to the Internet from a wireless computer, please check the following items:

1. Look at the lights on your wireless router. If you're using a Belkin Wireless Router, the lights should be as follows:
   • The "Power" light should be on.
   • The "Connected" light should be on, and not blinking.
   • The "WAN" light should be either on or blinking.

If your Belkin Wireless Router's lights have the above characteristics, go to number **2** below.

If this is **NOT** the case, make sure:

   • The router's power cord is plugged in.
   • All cables are connected between the router and the modem.
   • All the modem's LEDs are functioning correctly. If not, see your modem's user manual.
   • Reboot the router.
   • Reboot the modem.

If you continue to have issues, please contact Belkin Technical Support.

If you are not using a Belkin Wireless Router, consult that router manufacturer's user guide.

2. Open your Wireless Utility software by clicking on the icon in the system tray at the bottom, right-hand corner of the screen. If you're using a Belkin Wireless Card, the tray icon should look like this (the icon may be red, yellow, or green):

3. The Belkin Wireless Utility window will display the available networks in the "Available Networks" tab. Available networks are wireless networks you can connect to.

If you are using a Belkin 802.11g (125 HSM) Wireless Router, or Belkin 802.11g (54g) Wireless Router, "Belkin54g" is the default name.

If you are using a Belkin 802.11b Wireless Router, the default name should be "WLAN".

If you are NOT using a Belkin Router, please consult your router manufacturer's user manual for the default name.

The name of your wireless network appears in "Available Networks"

If the correct network name is listed in the "Available Networks" list, please follow the steps below to connect wirelessly:

1. Click on the correct network name in the "Available Networks" list to connect to the network.
2. If the network has security (encryption) enabled, you will need to enter the network key. For more information regarding security, see the "Securing your Wi-Fi Network" section of this User Manual.
3. Within a few seconds, the tray icon in the lower, right-hand corner of your screen should turn green, indicating a successful connection to the network.

If you are still unable to access the Internet after connecting to the wireless network, please contact Belkin Technical Support.

The name of your wireless network DOES NOT appear in the list of "Available Networks"

If the correct network name is not listed, check the SSID settings to see if they match. The SSID is case-sensitive and the spelling on each computer must be exactly the same in order for the Card to connect to the wireless router (or access point).

Note: To check the SSID settings or look for an available network, double-click the Signal Indicator icon to bring up the Belkin Wireless Utility, and then click on the "Configure" tab. Click on the "Network SSID" box if you do not see the network you are trying to connect to and type in the SSID of the router (or access point) you are trying to connect to. Next, click "Apply" to save the setting. For more information about setting up an SSID, please reference your router manufacturer's user manual. If issues persist even at close range, please contact Belkin Technical Support.

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Troubleshooting

Installation CD-ROM does not start Wireless Utility setup

If the CD-ROM does not start the Wireless Utility setup automatically, it could be that the computer is running other applications that are interfering with the CD drive.

If the Wireless Utility setup screen does not appear within 15-20 seconds, open up your CD-ROM drive by double-clicking on the "My Computer" icon. Next, double-click on the CD-ROM drive that the Installation CD has been placed in to start the installation. Then double-click on the folder named "Files". Next, double-click on the icon named "setup.exe".

Power LED does not come ON; Card is not working

If the LED indicators are not ON, the problem may be that the Card is not connected or installed properly. Verify that the Card is plugged firmly into the CardBus slot of your computer. Check to see that the drivers for the Card have been installed. Right-click on the "My Computer" icon on your desktop. Choose "Properties" and navigate to the "Device Manager" and see if your CardBus Card is listed without any errors. If an error is indicated, contact Belkin Technical Support.

Link LED does not come on; cannot connect to a wireless network or the Internet

If your Card appears to be functioning properly, but you cannot connect to a network or you have a red wireless icon at the bottom of your screen, the problem may be that there is a mismatch between the network name (SSID) settings in your wireless network properties.

Check the SSID settings to see if they match. The SSID is case-sensitive and the spelling on each computer must be exactly the same in order for the Card to connect to the wireless router (or access point).

Note: To check the SSID settings or look for an available network, double-click the Signal Indicator icon to bring up the Belkin Wireless Utility, and then click on the "Available Networks" window. If you do not see the network you are trying to connect to, click on the "Configure" tab and type the SSID of the router (or access point) you are trying to connect to into the "Network SSID" box.

Troubleshooting

For more information about setting up an SSID, please reference your router manufacturer's user manual. If issues persist even at close range, please contact Belkin Technical Support.

Link LED is solid but cannot connect to the Internet

If you have a signal but can't get online or obtain an IP address, the problem may be that there is a mismatch between the encryption key settings in your computer and wireless router (or access point).

Check the WEP key settings to see if they match. The key is case-sensitive and the spelling on each computer and wireless router (or access point) must be exactly the same in order for the Card to connect to the router. For more information about encryption, please see the "Securing your Wi-Fi Network" section of this User Manual.

If issues persist even at close range, please contact Belkin Technical Support.

Data transfer is sometimes slow

Wireless technology is radio-based, which means connectivity and the throughput performance between devices **decreases** when the distance between devices **increases**. Other factors that will cause signal degradation (metal is generally the worst culprit) are obstructions such as walls and metal appliances. As a result, the typical indoor range of your wireless devices will be between 100 to 200 feet. Note also that connection speed may decrease as you move farther from the wireless router (or access point).

In order to determine if wireless issues are related to range, we suggest temporarily moving the computer, if possible, to five to 10 feet from the wireless router (or access point). Please see the section titled "Placement of your Wireless Networking Hardware for Optimal Performance" of this User Manual. If issues persist even at close range, please contact Belkin Technical Support.

Troubleshooting

Signal strength is poor

Wireless technology is radio-based, which means connectivity and the throughput performance between devices **decreases** when the distance between devices **increases**. Other factors that will cause signal degradation (metal is generally the worst culprit) are obstructions such as walls and metal appliances. As a result, the typical indoor range of your wireless devices will be between 100 to 200 feet. Note also that connection speed may decrease as you move farther from the wireless router (or access point).

In order to determine if wireless issues are related to range, we suggest temporarily moving the computer, if possible, to five to 10 feet from the wireless router (or access point).

Changing the wireless channel – Depending on local wireless traffic and interference, switching the wireless channel of your network can improve performance and reliability. The default channel the router is shipped with is channel 11, but you may choose from several other channels depending on your region; see your router's (or access point's) user manual for instructions on how to choose other channels.

Limiting the wireless transmit rate – Limiting the wireless transmit rate can help improve the maximum wireless range and connection stability. Most wireless cards have the ability to limit the transmission rate.To change this property, go to the Windows Control Panel, open the "Network Connections" folder and double-click on your wireless card's connection. In the properties dialog, select the "Configure" button on the "General" tab (Windows 98 users will have to select the wireless card in the list box and then click "Properties"), then choose the "Advanced" tab and select the rate property. Wireless client cards are usually set to automatically adjust the wireless transmit rate for you, but doing so can cause periodic disconnects when the wireless signal is too weak; as a rule, slower transmission rates are more stable. Experiment with different connection rates until you find the best one for your environment; note that all available transmission rates should be acceptable for browsing the Internet. For more assistance, see your wireless card's literature.

If issues persist even at close range, please contact Belkin Technical Support.

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Troubleshooting

Why are there two wireless utilities in my system tray? Which one do we use?

There are several features and advantages for using the Belkin Wireless Utility over the Windows XP Wireless Zero Configuration Utility. We offer a Site Survey, detailed link information, and adapter diagnosis, to name a few.

It's essential to know which Utility is managing your Card. We recommend using the Belkin Wireless Utility.
To use the Belkin Wireless Utility, follow the steps below:

Step 1 Right-click on the network status icon in the system tray and select the "Status" tab.

Step 2 From the Status tab uncheck the "Use Windows to configure my wireless network settings" check box. Once the box is unchecked, click the "Close" button to close the window.

You are now using the Belkin Wireless Utility to configure the Wireless Card.

Card does not perform or connection is unstable when computer has a second built-in wireless network card (such as a mini PCI or Intel® Centrino™)

This condition occurs if your computer has a built-in wireless card while your Belkin Wireless Card is also active. This happens because Windows must now handle two active wireless connections.

You need to disable the built-in wireless card from your computer under "Network Adapters" in the Device Manager.

Card does not perform or connection is slow when computer has a built-in wired Ethernet card

This condition occurs if your computer has an active Ethernet card while your Wireless Card is also active. This happens because Windows must now handle two active network connections.

You need to disable the Ethernet card from your computer under "Network Adapters" in the Device Manager.

Troubleshooting

What's the difference between 802.11b, 802.11g, 802.11a, and Pre-N?

Currently there are four levels of wireless networking standards, which transmit data at very different maximum speeds. Each is based on the designation 802.11(x), so named by the IEEE, the board that is responsible for certifying networking standards. The most common wireless networking standard, 802.11b, transmits information at 11Mbps; 802.11a and 802.11g work at 54Mbps; and Pre-N works at 108Mbps. Pre-N, the precursor to the upcoming 802.11n release, promises speeds that exceed 802.11g, and up to twice the wireless coverage area. See the following chart for more detailed information.

Wireless Comparison Chart

Wireless Technology	802.11b	802.11g	802.11a	Belkin Pre-N
Speed	11Mbps	54Mbps	54Mbps	108Mbps
Frequency	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz	5GHz - uncrowded band	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz
Compatibility	Compatible with 802.11g	Compatible with 802.11b	Incompatible with 802.11b or 802.11g	Compatible with 802.11g or 802.11b
Coverage	Depends on interference - typically 100–200 ft. indoors	Depends on interference - typically 100–200 ft. indoors	Less interference - range is typically 50-100 ft.	2x the coverage of standard 802.11g
Adoption	Mature – widely adopted	Expected to continue to grow in popularity	Slow adoption for consumers - more popular in business environments	Expected to continue to grow in popularity

Troubleshooting

Technical Support

You can find technical support information at
www.belkin.com/networking. If you want to contact technical support
by phone, please call:

US:	**877-736-5771**
Europe:	**00 800 223 55 460**
Australia:	**1800 235 546**
New Zealand:	**0800 441 913**
Singapore:	**800 616 1790**

Information

Wi-Fi® Interoperability Certificate

Information

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Information

This equipment generates, uses, and can radiate radio frequency energy.
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 and correct the interference by one or more of the
following measures:

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

Modifications
The FCC requires the user to be notified that any changes or modifications to
this device that are not expressly approved by Belkin Corporation may void
the user's authority to operate the equipment.

Canada-Industry Canada (IC)
The wireless radio of this device complies with RSS 139 & RSS 210 Industry
Canada. This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B conforme á la norme NMB-003 du Canada.

Europe-European Union Notice
Radio products with the CE **0984** or CE alert marking
comply with the R&TTE Directive (1995/5/EC) issued by the
Commission of the European Community.
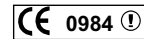
Compliance with this directive implies conformity to the following European
Norms (in brackets are the equivalent international standards).

- EN 60950 (IEC60950) – Product Safety
- EN 300 328 Technical requirement for radio equipment
- ETS 300 826 General EMC requirements for radio equipment.

To determine the type of transmitter, check the identification label on your
Belkin product.

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Information

Products with the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (72/23/EEC) issued by the Commission of the European Community. Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 55022 (CISPR 22) – Electromagnetic Interference
- EN 55024 (IEC61000-4-2,3,4,5,6,8,11) – Electromagnetic Immunity
- EN 61000-3-2 (IEC610000-3-2) – Power Line Harmonics
- EN 61000-3-3 (IEC610000) – Power Line Flicker
- EN 60950 (IEC60950) – Product Safety

$C\epsilon$

Products that contain the radio transmitter are labeled with CE **0984** or CE alert marking and may also carry the CE logo.

Belkin Corporation Limited Lifetime Product Warranty

Belkin Corporation warrants this product against defects in materials and workmanship for its lifetime. If a defect is discovered, Belkin will, at its option, repair or replace the product at no charge provided it is returned during the warranty period, with transportation charges prepaid, to the authorized Belkin dealer from whom you purchased the product. Proof of purchase may be required.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication; if the product has been modified without the written permission of Belkin; or if any Belkin serial number has been removed or defaced.

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No Belkin dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

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Some states do not allow the exclusion or limitation of incidental or consequential damages or exclusions of implied warranties, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

BELKIN®

Wireless G Notebook Network Card

belkin.com

Belkin Tech Support
US: 877.736.5771
310.898.1100 ext. 2263
Europe: 00 800 223 55 460
Australia: 1800 235 546

Belkin Corporation
501 West Walnut Street
Compton • CA • 90220 • USA
Tel: 310.898.1100
Fax: 310.898.1111

Belkin Ltd.
Express Business Park • Shipton Way
Rushden • NN10 6GL • United Kingdom
Tel: +44 (0) 1933 35 2000
Fax: +44 (0) 1933 31 2000

Belkin Ltd.
7 Bowen Crescent • West Gosford
NSW 2250 • Australia
Tel: +61 (0) 2 4372 8600
Fax: +61 (0) 2 4372 8603

Belkin B.V.
Boeing Avenue 333
1119 PH Schiphol-Rijk
The Netherlands
Tel: +31 (0) 20 654 7300
Fax: +31 (0) 20 654 7349

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