

BELKIN®

High-Speed Mode Wireless G Desktop Network Card

Connect your desktop computer to a
FASTER wireless network



User Manual



35% FASTER

Table of Contents

1 Introduction	1
Benefits of a Home Network	1
Advantages of a Wireless Network	1
Placement of your Wireless Networking Hardware for Optimal Performance	2
2 Overview	6
Product Features	6
Applications and Advantages	7
Product Specifications	8
System Requirements	9
Package Contents	9
3 Installing and Setting Up the Card	10
Step 1: Install the Software	10
Step 2: Insert the Card into your Computer	11
Step 3: Let Windows Finish the Installation	13
4 Using the Belkin Wireless LAN Utility	16
Setting Wireless Network Preferences	16
Securing your Wi-Fi Network	19
Monitoring the Status of your Network Connection	32
Monitoring Data Transfer	34
Finding Available Networks in your Area	35
Performing Diagnostic Tests on your Computer	36
5 Troubleshooting	38
6 Information	47

Introduction

Thank you for purchasing the Belkin High-Speed Mode Wireless G Desktop Network Card (the Card). Now you can take advantage of this great new technology and gain the freedom you need around the home or office without using cables. The Card works like a conventional network card, but without the wires. The easy installation and setup will have you networking wirelessly in minutes. Please be sure to read through this User Manual completely, and pay special attention to the section entitled “Placement of your Wireless Networking Hardware for Optimal Performance”. By following our simple setup instructions your Belkin Home Network will allow you to:

- Share one high-speed Internet connection with all the computers in your home
- Share resources, such as files, and hard drives among all the connected computers in your home
- Share a single printer with the entire family
- Share documents, music, video, and digital pictures
- Store, retrieve, and copy files from one computer to another
- Simultaneously play games online, check Internet e-mail, and chat

Here are some of the advantages of setting up a Belkin Wireless Network:

- **Mobility** –you’ll no longer need a dedicated “computer room”— now 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) 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 ten 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.

Placement of your Wireless Networking Hardware

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 (or Access Point) 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.

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 a cordless phone:

- Try moving cordless phones away from your Wireless Router or Access Point and your wireless-enabled computers
- Unplug and remove the battery from any cordless phone that operate on the 2.4GHz band (check manufacturers information). If this fixes the problem, your 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 to channel 11. See your phone’s user manual for detailed instructions.
- If necessary, consider switching to a 900MHz or 5GHz cordless phone.

Introduction

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 LAN Utility to locate any other wireless 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 Site Survey and wireless channel information included in your User Guide for more information.

5. Secure connections, VPNs, and AOL

Secure connections are connections that 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 on-line banking websites
- Many commercial websites which require a username 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 web site.

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.

Introduction

If you continue to have difficulty with Secure Connection, VPNs and AOL please review steps 1-4 above 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 Belkin's 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 or the faster 125 High-Speed Mode (HSM). The Card is compatible with all 802.11g devices as well as other 802.11b products at 11Mbps. 802.11g products run at speeds of up to 54Mbps (or 125Mbps* using HSM) and 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 Configuration Utility
- PCI interface, for operation in virtually any desktop computer
- WPA, 64-bit WEP (Wired Equivalent Privacy), or 128-bit encryption
- Wireless access to networked resources
- Support for both Infrastructure and Ad-Hoc (peer-to-peer) networking modes
- Data rate of up to 125Mbps* in High-Speed Mode (802.11g 125HSM), 54Mbps (802.11g), or 11Mbps (802.11b)
- Easy installation and use
- External antenna
- LED power and network link indicators

*When operating in High-Speed Mode, this Wi-Fi device may achieve an actual throughput of up to or greater than 34.1 Mbps, which is the equivalent throughput of a system following 802.11g protocol and operating at a signaling rate of 125 Mbps. Actual throughput will vary depending on environmental, operational and other factors.

Overview

Applications and Advantages

- **Wireless roaming with a laptop around the home or office**
Offers the freedom of networking without cables
- **Connection rates of up to 54Mbps or 125Mbps* using HSM**
Provides immediate, higher-speed wireless connectivity at home, work, and hot spot locations without compromising the use of existing 802.11b and 802.11g products
- **Compatibility with 802.11b products**
802.11g and 125HSM wireless LAN solutions are backward-compatible with existing Wi-Fi (IEEE 802.11b) products and with other products that display the 54g and/or 125HSM 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 constructions sites, which need networks on a short-term basis; also companies who need additional workstations for a peak activity
- **SOHO (Small Office/Home Office) networking needs**
Provides the easy and quick, small network installation SOHO users need

*When operating in High-Speed Mode, this Wi-Fi device may achieve an actual throughput of up to or greater than 34.1 Mbps, which is the equivalent throughput of a system following 802.11g protocol and operating at a signaling rate of 125 Mbps. Actual throughput will vary depending on environmental, operational and other factors.

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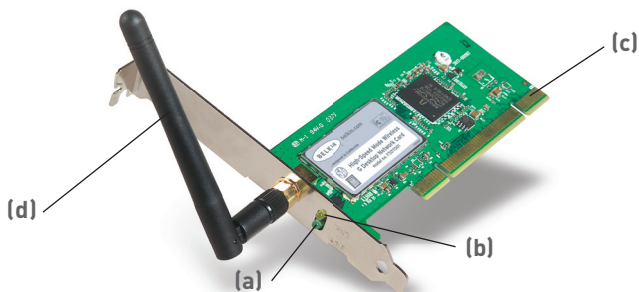
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Overview



(a) Activity LED (green)

Indicates wireless activity when blinking.

(b) Link LED (orange)

Lights up when the Card links to a wireless network.

(c) Card Connector

Indicates the side of the Card that fits into your computer's PCI slot.

(d) Detachable Antenna

Product Specifications

Host Interface:	32-bit PCI
Power Consumption:	Tx/Rx peak 550/350mA@3.3VDC (max.)
Certification:	FCC Class B, CE Mark, C-Tick
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:	Up to 200 feet (Wireless performance may vary depending on the networking environment)

Overview

System Requirements

- PC-compatible desktop with one available PCI slot
- Windows® 98SE, 2000, Me, XP

Package Contents

- High-Speed Mode Wireless G Desktop Network Card
- Quick Installation Guide
- Installation Software CD
- User Manual

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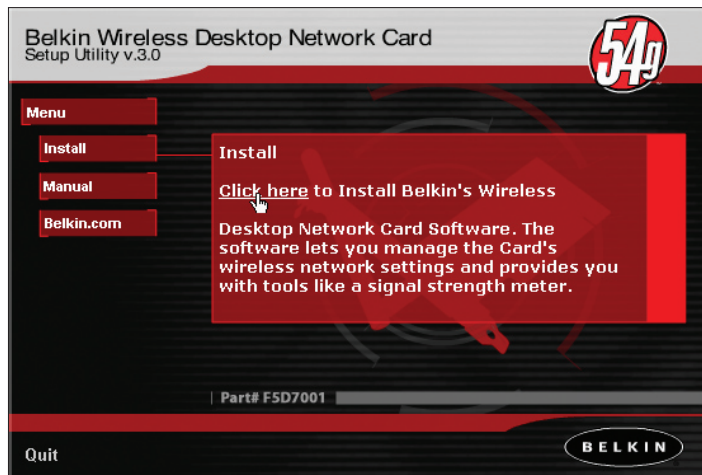
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Installing and Setting Up the Card

Step 1 | Install the Software

WARNING: Install the software before inserting the Card.

- 1.1 Insert the CD into your CD-ROM drive.
- 1.2 The Belkin Setup Utility screen will automatically appear.

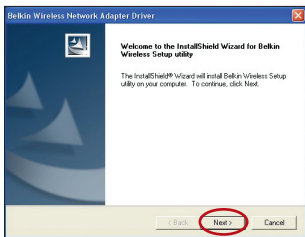


Note: If the Setup Utility screen does not appear within 20 seconds, open up your CD-ROM drive by double-clicking on the “My Computer” icon. Then, double-click on the folder named “Files”. Next, double-click on the icon named “Setup.exe”.

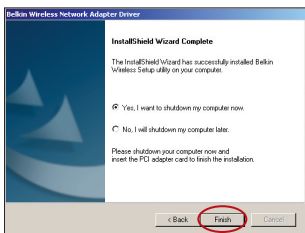


- 1.3 In the “Menu” window, drag your mouse over the “Install” button, then click on the words “Click here” located to the right side of the “Install” button to start the software installation program.

Installing and Setting Up the Card



1.4 The installer will now start. Click “Next” and follow the on-screen instructions.



1.5 After the installation is complete, click “Finish” to shut down your computer.

Step 2 | Insert the Card into the Computer

WARNING: Be sure to power off your computer and disconnect your power cord before opening up your computer.

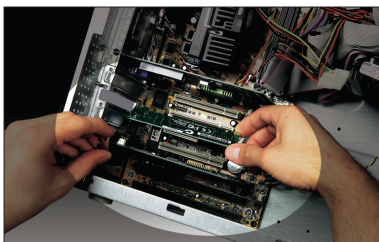
- 2.1 Remove the screws behind your computer case that secure the computer cover and remove cover.
- 2.2 Touch any metal part of the case to discharge static electricity, to avoid damage your product or your computer.



2.3 Locate an empty PCI expansion slot. It is usually white in color.

Installing and Setting Up the Card

- 2.4 Confirm that the Card will fit into the slot you have chosen. Keep in mind that the included antenna needs to be oriented with the top pointing up. If there are cables and other connectors in the way, try to pick the PCI slot that has the fewest obstructions to the correct positioning of the antenna.
- 2.5 Remove the metal port cover from the back of the computer that corresponds to the PCI slot you selected. If there is a screw, place it in a safe place, as you will be using it to attach the Card to the computer later.
- 2.6 Push the Card firmly into the PCI slot that you have chosen. Apply pressure as needed until the connector is fully seated.



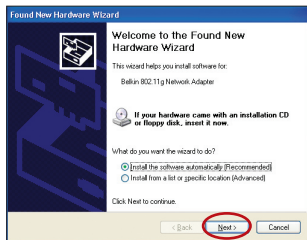
- 2.7 Now secure the Card with the screw that you previously placed in a safe place.
- 2.8 Carefully screw the antenna onto the threaded connector on the Card. Turn the antenna until it is vertical and pointing up.



- 2.9 Replace the computer's cover. Now that the Card is installed, you can reconnect the power cord, and turn it back on.

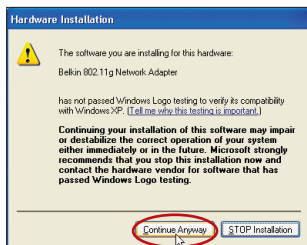
Installing and Setting Up the Card

Step 3 | Let Windows Finish the Installation



- 3.1 After powering on your computer, you will see a “Found New Hardware Wizard” screen. Select “Install the software automatically (Recommended)” and click “Next”.

Note: Specific screens differ depending upon which version of the Windows OS you are using.



- 3.2 Depending on the version of Windows you are using, you might also see a screen similar to this one. This **DOES NOT** mean there is a problem as the drivers have been fully tested and are compatible with this Windows operating system. Select “Continue Anyway” and follow the on-screen instructions.

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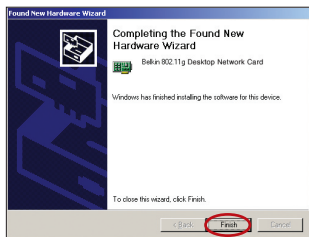
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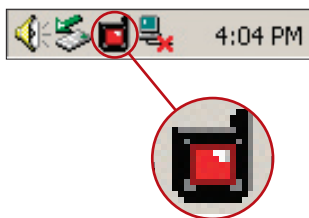
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Installing and Setting Up the Card

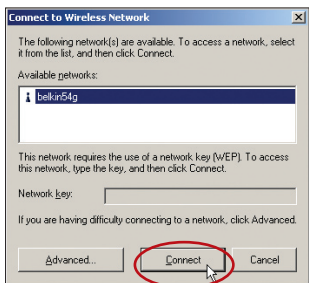


- 3.3 Windows will ask you where the drivers are located. Make no changes and click “Next” until you see the screen that asks you to click “Finish” to complete the installation.

Note: Specific screens differ depending upon which version of the Windows OS you are using.



- 3.4 When the installation is complete, a small Signal Indicator icon (red) in your system tray (bottom right corner of most screens) will appear. Double-click the Signal Indicator icon to bring up the “Wireless Network” screen.



- 3.5 Select the network you want to connect to under “Available networks” and click “Connect”.

Installing and Setting Up the Card

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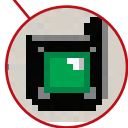
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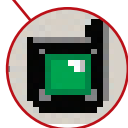


3.6 The Signal Indicator icon in your system tray should now turn green (yellow if the signal is weak.)

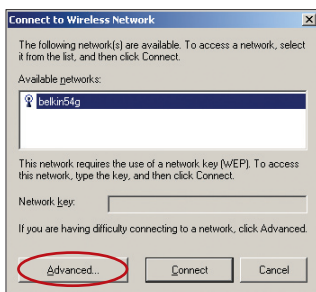


Installation is now complete!

Double-click the Signal Indicator icon to bring up the “Wireless Network” screen.



The following screen will appear:

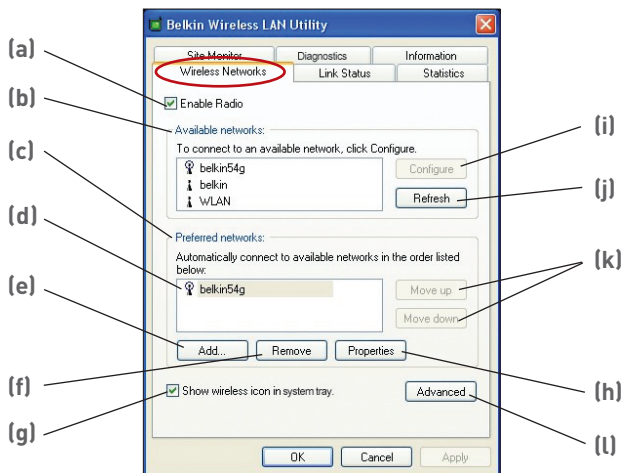


Next, clicking on the “Advanced” button will allow you to view and configure more options of your Card. The “Advanced” button will take you to the Belkin Wireless LAN Utility.

Using the Belkin Wireless LAN Utility

Setting Wireless Network Preferences

Click on the “Wireless Networks” tab.




(a) Enable Radio

Use this option to turn your wireless network radio ON or OFF. You may want to turn the radio off while in airplanes or to conserve the battery life of your mobile computer. When the radio is disabled, the power LED on your Card will turn off and the Windows 2000 or XP system tray wireless network icon will be depicted with an “X”.


(b) Available Networks

This displays a list of wireless networks in your area. If you don't see a name in the box, click on the “Refresh” (j) button to rescan for any available networks. To connect to a network, select a network name in the Available Networks list box and click the “Configure” (i) button. Click “OK” (m) in the “Wireless Network Properties” box to add the network name to the “Preferred Networks” (c) list.

Wait up to one minute for the network connection to be made. Your computer is connected to the selected network when you see a blue bubble  (d) on top of the icon for that network.

Using the Belkin Wireless LAN Utility

(c) Preferred Networks

Displays a list of the networks that you have previously configured. The one with the blue bubble  **(d)** is the network you are currently connected to.

You may rank the networks by selecting the network name in the “Preferred Networks” list then clicking on the “Move Up” and “Move Down” **(k)** buttons. Networks appearing higher on the list will be preferred over networks listed lower on the list. If a preferred network is unavailable, the Card will attempt to connect to the next available network on the list.

(e, f) Add, Remove

You may “Add” **(e)** and “Remove” **(f)** networks from the Preferred Networks list by using these buttons.

(g) System Tray Icon

Check this box so that the wireless icon appears on your system tray.

(h) Properties

To change the properties and WEP (security) settings of a network, select a network from the Preferred Networks **(c)** then click on the “Properties” **(h)** button.

(l) Advanced

Allows you to select the type of network you want to connect to. When the “Advanced” **(l)** button is checked, the screen on the next page will appear.

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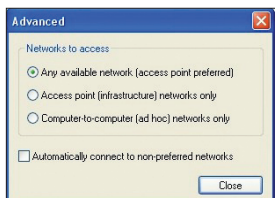
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6

section

Using the Belkin Wireless LAN Utility



Any Available Network (Access Point Preferred)

When this option is selected, the Card will attempt to connect to any available network in the area. Wireless router or access point networks will be preferred networks over Ad-Hoc networks.

Access Point (Infrastructure) Networks Only

When this option is selected, the Card will attempt to connect to any available wireless router or access point in the area. Ad-Hoc networks (computer-to-computer) will be excluded from the list of available networks when this option is selected.

Computer-to-Computer (Ad-Hoc) Networks Only

When this option is selected, the Card will attempt to connect to any available computer in the area that's also configured to be used in Ad-Hoc mode. The wireless router or access point will be excluded from the list of available networks when this option is selected.

Using the Belkin Wireless LAN Utility

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 intrusions. 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 WEP	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.

Using the Belkin Wireless LAN Utility

WEP (Wired Equivalent Privacy)

WEP (Wired Equivalent Privacy) 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.

128-Bit WEP

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 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 and 128-bit WEP.

Encryption Keys

After selecting either the 64-bit or 128-bit WEP 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 manually. 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.

Using the Belkin Wireless LAN Utility

1

2

3

4

5

6

section

For instance:

AF0F4BC3D4 = 64-bit WEP key

C3030FAF0F4BB2C3D44BC3D4E7 = 128-bit WEP key

If you have multiple vendors' equipment in your network, the easiest thing to do is to 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.

WPA (Wi-Fi Protected Access)

WPA (Wi-Fi Protected Access) 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 8 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.

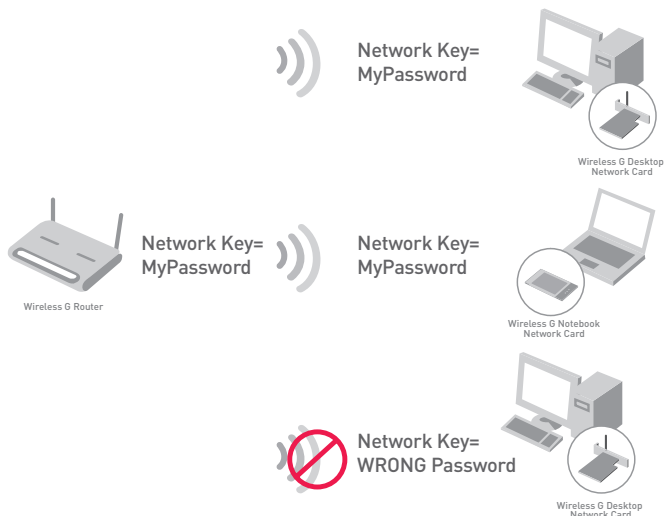
WPA (with radius server) is a system where a radius server distributes the network key to the clients automatically. This is typically found in a business environment.

For a list of Belkin wireless products that support WPA, please visit our website at www.belkin.com/networking.

Using the Belkin Wireless LAN Utility

Most Wi-Fi products ship with security turned off. So once you have your network working, you 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 Card cannot access the network because it uses a different network key than the one configured on the wireless router.

Using a Hexadecimal Key

A hexadecimal key is a mixture of numbers and letters from A–F and 0–9. 64-bit keys are five two-digit numbers. 128-bit keys are 13 two-digit numbers.

For instance:

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

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

Using the Belkin Wireless LAN Utility

1

2

3

4

5

6

section

In the boxes below, make up your key by writing in two characters between A–F and 0–9 in each box. You will use this key to program the encryption settings on your Wireless Router (or Access Point) and your wireless computers.

Example:

64-bit:

128-bit:

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 or access point manual for directions on how to access the management interface.)

Changing the Wireless Security Settings

The Belkin Wireless G Router and 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 (see page 19). To access the security settings, click “Security” on the wireless section using the web-based interface. (See your wireless router or access point manual for directions on how to access the security settings.)

Using the Belkin Wireless LAN Utility

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:

AF0F4BC3D4 = 64-bit WEP Key

The screenshot shows the 'Wireless > Security' configuration page. The 'Security Mode' dropdown menu is set to '64bit WEP'. Below this, there are four radio buttons for 'Key 1', 'Key 2', 'Key 3', and 'Key 4'. The 'Key 1' radio button is selected, and its corresponding input field contains the hex key 'AF0F4BC3D4'. Below the key fields is the text '(hex digit pairs)'. A note states: 'NOTE: To automatically generate hex pairs using a PassPhrase, input it here'. There is a 'PassPhrase' input field and a 'generate' button. At the bottom, there are two buttons: 'Clear Changes' and 'Apply Changes'. The 'Apply Changes' button is circled in red.

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:

C3030FAF0F4BB2C3D44BC3D4E7 = 128-bit WEP key

The screenshot shows the 'Wireless > Security' configuration page. The 'Security Mode' dropdown is set to '128bit WEP'. Below it, a grid of 13 hex digit pairs is displayed: C3, 03, 0F, AF, 0F, 4B, B2, C3, D4, 4B, C3, D4, E7. A note indicates that a passphrase can be used to generate these pairs. The 'Passphrase' field is empty, and the 'generate' button is visible. At the bottom, there are 'Clear Changes' and 'Apply Changes' buttons. The 'Apply Changes' button is circled in red, with a mouse cursor pointing to it.

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 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.

Using the Belkin Wireless LAN Utility

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 8 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 network.

Wireless > Security

Security Mode WPA-PSK (no server) ▼

Encryption Technique TKIP ▼ Default is TKIP

Pre-shared Key (PSK) MyPassword

WPA-PSK (no server)
Wireless Protected Access with a Pre-Shared Key: The key is a password, in the form of a word, phrase or series of letters and numbers. The key must be between **8** and **63** characters long and can include spaces and symbols. Each client that connects to the network must use the same key (Pre-Shared Key)

Obscure PSK

Clear Changes Apply Changes

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

Using the Belkin Wireless LAN Utility

1

2

3

4

5

6

section

WPA (with server) Settings

Choose this setting if your network uses a radius server to distribute keys to the clients (network cards). This is typically used for a business network.

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

Wireless > Security

WPA (with server)
Advanced Setting - Wireless Protected Access using a server to distribute keys to the clients: This option requires that a Radius server is running on the network.

Security Mode WPA (with Radius Server) ▾

Encryption Technique TKIP ▾

Radius Server [] . [] . [] . []

Radius Port 1812

Radius Key []

Re-Key Interval 900 (seconds)

Clear Changes Apply Changes

5. Click “Apply Changes” to finish.


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

Using the Belkin Wireless LAN Utility

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

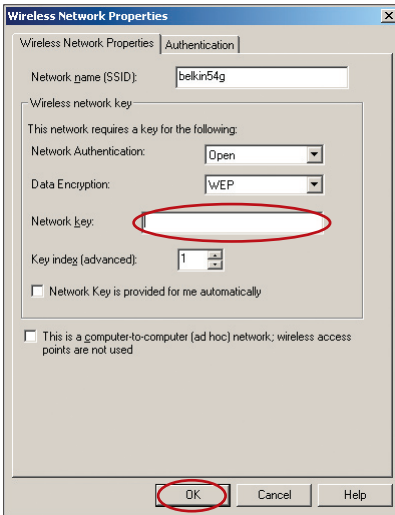
At this point, you should already have your wireless router or access point set to use WPA or WEP. In order for you to gain wireless connection, you will need to set your Wireless G Notebook and Wireless G Desktop Network Cards to use the same security settings.

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 “Wireless Network” screen. The “Advanced” button will allow you to view and configure more options of your Card.
2. Under the “Wireless Network” tab, select a network name from the “Available networks” list and click “Configure”.
3. Under “Data Encryption” select “WEP”.
4. Ensure that the check box “Network key is provided for me automatically” at the bottom is unchecked. If you are using this computer to connect to a corporate network, please consult your network administrator if this box needs to be checked.

Using the Belkin Wireless LAN Utility

5. Type your WEP key in the “Network key” box.




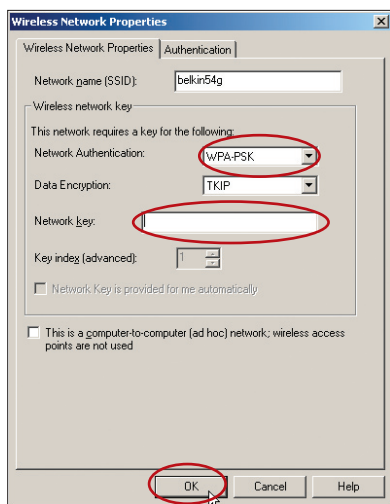
Important: A WEP key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 keys. For 64-bit WEP, you need to enter 10 keys. This network key needs to match the key you assign to your wireless router or access point.

6. Click “OK”, to save the settings.

Using the Belkin Wireless LAN Utility

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 “Wireless Network Properties” screen. The “Advanced” button will allow you to view and configure more options of your Card.
2. Under the “Wireless Networks” tab, select a network name from the “Available networks” list and click “Configure”. The following screen will appear.



3. Under “Network Authentication” select “WPA-PSK”.
4. Type your WPA key in the “Network key” box.

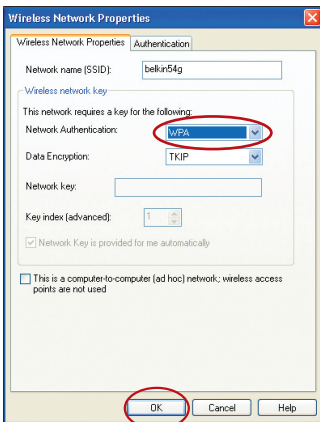
Important: WPA-PSK is a combination of numbers and letters from A–Z and 0–9. For WPA-PSK, you can enter 8 to 63 keys. This network key needs to match the key you assign to your wireless router or access point.

5. Click “OK”, to save the settings.

Using the Belkin Wireless LAN Utility

Connecting your Computer to a Wireless Router or Access Point that uses WPA (with Radius Server)

1. Double-click the “Signal Indicator” icon to bring up the “Wireless Network Properties” screen. The “Advanced” button will allow you to view and configure more options of your Card.

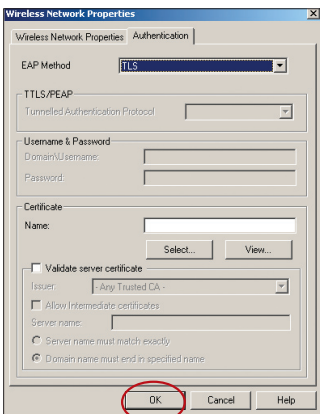


2. Under the “Wireless Networks” tab, select a network name from the “Available networks” list and click “Configure”. The screen to the left will appear.

3. Under “Network Authentication” select “WPA”.

4. Under the “Authentication” tab, select the settings that are indicated by your network administrator.

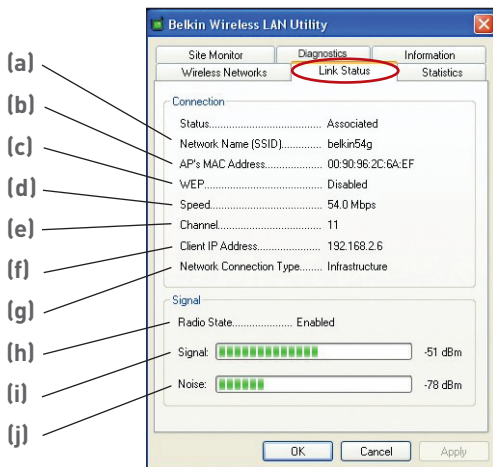
5. Click “OK”, to save the settings.



Using the Belkin Wireless LAN Utility

Monitoring the Status of your Network Connection

Click on the “Link Status” tab.



(a) Network Name (SSID)

The SSID is the wireless network name. This field shows the current network name that you are connected to.

(b) AP's MAC Address

Shows the MAC address of the wireless router or access point that you are connected to.

(c) WEP

Shows whether the network you are associated with has WEP encryption enabled or disabled.

(d) Speed

Displays the data rate of the current connection.

(e) Channel

Shows the current channel (1-11) you are using. When connected to a wireless router or access point, the channel is set automatically. When connected to another computer using Ad-Hoc mode, the channel can be set manually. All computers using Ad-Hoc mode (computer-to-computer) need to operate under the same channel.

Using the Belkin Wireless LAN Utility

1

2

3

4

5

6

section

(f) Client IP Address

Shows the IP address of the computer. The IP address is obtained automatically by default. You may set the IP address manually through Windows Networking Properties.

(g) Network Connection Type

Shows the current wireless mode the Card is operating in. There are two operating modes: Infrastructure and Ad-Hoc. Infrastructure is the most common mode to operate in. Infrastructure mode is used when connecting your PC to a wireless router or a wireless access point. Ad-Hoc mode is used to connect two or more computers together without the use of a wireless router or an access point.

(h) Radio State

Shows whether the radio of your wireless client is enabled or disabled.

(i) Signal

Displays the wireless signal strength in decibels (dBm). The decibel scale is negative, so smaller absolute values correspond to stronger signals (i.e. -20 dBm is stronger than -80 dBm). The signal to noise ratio (SNR) is the difference between the signal and the noise (e.g. if the noise is -80 dBm and the signal is -20 dBm, the SNR is 60 dB); the larger the SNR, the better. In general, connections should have an SNR greater than 20 dBm, or the user may experience poor reliability and/or performance. If the signal is less than -50 dBm, the user should consider repositioning their workstation or Access Point, rotating the Access Point's antennas, or Limiting their Transmission Rate (described on page _ of the troubleshooting section of the manual), to ensure a reliable wireless connection.

(j) Noise

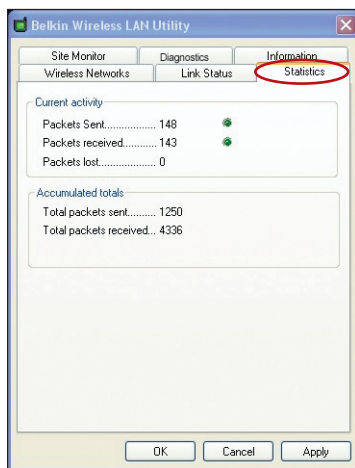
Displays the intensity of the external noise, on this wireless channel, in decibels (dBm). If the noise is greater than -70 dBm, the user should consider changing the wireless channel used, in their Access Point, to ensure a reliable wireless connection.

Using the Belkin Wireless LAN Utility

Monitoring Data Transfer

Click on the “Statistics” tab.

The Statistics tab shows you how much data has been sent and received and if any errors occurred. This screen is mostly for diagnostics. Note that the number of data packets lost is recorded. A large number of lost data packets may indicate that there is a problem or interference in your area. (See the Troubleshooting section for tips on how to improve performance.)

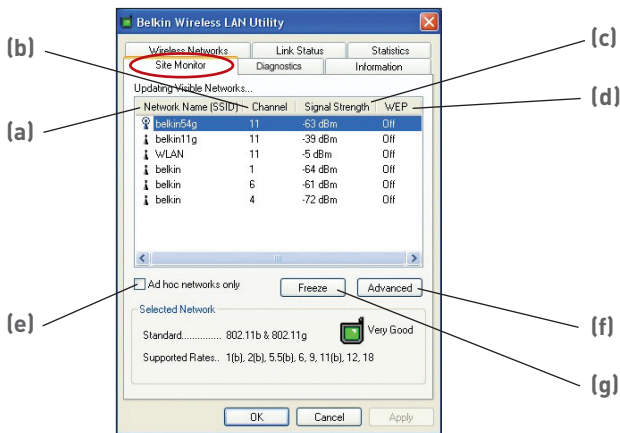


Using the Belkin Wireless LAN Utility

Finding Available Networks in your Area

Click on the “Site Monitor” tab.

Clicking on the “Site Monitor” tab will display a list of all available wireless routers or access points in your area.



(a) Network Name (SSID)

The network name of the wireless router or access point.

(b) Channel

The current operating channel of the wireless router or access point.

(c) Signal Strength

The signal strength of the related wireless router or access point.

(d) WEP (Encryption)

Will display “Off” when encryption is disabled, “64-bit” when 64-bit encryption is enabled, and “128-bit” when 128-bit encryption is enabled.

(e) Ad-Hoc Networks Only

Check this box to display available Ad-Hoc networks only. An Ad-Hoc network is a computer-to-computer network.

(f) Advanced

Displays additional information about the selected network.

(g) Freeze

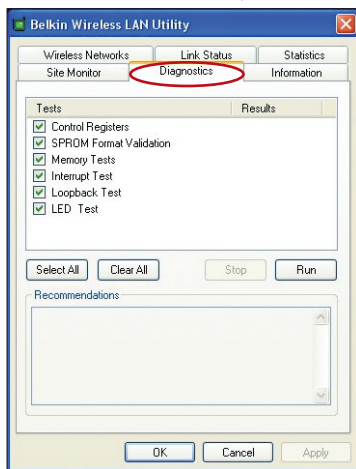
Takes a “snapshot” of the signal strength at the time of the site survey. Click again to unfreeze.

Using the Belkin Wireless LAN Utility

Performing Diagnostic Tests on your Connection

Click on the “Diagnostics” tab.

This page allows you to perform several diagnostic tests that are available for your Belkin Wireless G Desktop Network Card.



Control Registers

This test verifies the read and write capabilities of the network controller registers by writing various values to the registers and verifying the result. The device driver uses these registers to perform network functions such as sending and receiving information. If the test fails, the network adapter may not work properly.

SPROM Format Version

This test verifies the content of the SPROM by reading a portion of the SPROM and computing the checksum. The test fails if the computed checksum is different than the checksum stored in the SPROM.

Memory Tests

This tests verifies that the network controller internal memory is functioning properly. The test writes patterned values to the memory and reading back the results. The test fails if an erroneous value is read back. The network controller will not function without its internal memory.

Using the Belkin Wireless LAN Utility

Interrupt Test

This test verifies that the NDIS driver is able to receive interrupts from the network controller.

Loopback Test

This test verifies that the NDIS driver is able to send packets and receive packets from the network controller.

LED Test

This test verifies that your 802.11g wireless networking hardware is functioning correctly.

1

2

3

4

5

6

section

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 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 User Manual
- 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 manufacturers 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 or green):



3. The exact window that opens will vary depending on the model of wireless card you have; however, any of the utilities should have a list of “Available Networks”. Available networks are wireless networks you can connect to.

If you are using a Belkin 802.11g (125HSM) Router, “Belkin54g” is the default name.

If you are using a Belkin 802.11g (54g) router, “Belkin54g” is the default name.

If you are using a Belkin 802.11b router, the default name should be “WLAN”.

If using a non-Belkin router, please consult your router manufacturers 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.
2. If the network has security (encryption) enabled, you will need to enter the network key. Click “Connect”. For more information regarding security, see the page entitled: “Securing your Wi-Fi Network” on pg.19 of the 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.

Troubleshooting

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

If the correct network name is not list 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 “Wireless Networks” screen. Click “Add” if you do not see the network you are trying to connect to and type in the SSID. For more information about setting up a SSID please reference your router manufacture’s user manual.

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

Installation CD-ROM does not start Setup Utility

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

If the Setup Utility 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 PCI 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 PCI Card is listed without any errors. If an error is indicated contact Belkin Technical Support.

Link LED is blinking slowly; 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 “Wireless Networks” screen. Click “Add” if you do not see the network you are trying to connect to and type in the SSID. For more information about setting up a SSID please reference your router manufactures 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 Adapter to connect to the router. For more information about encryption please see “Securing your Wi-Fi Network” on page 19 of this manual.

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

1

2

3

4

5

6

section

Troubleshooting

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 further 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 ten feet from The Wireless Router (or Access Point). Please see the section titled "Placement of your Wireless Networking Hardware for Optimal Performance" on page 2 of this manual. If issues persist even at close range, please contact please contact Belkin Technical Support.

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 further 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 ten feet from 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, you may choose from several other channels depending on your region; see your router 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 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 please contact Belkin Technical Support.

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

There are several features and advantages from 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 adapter. 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 View Available Wireless Networks.

Step 2 Click on the Advanced button in the lower-left corner of the Available Wireless Networks window.

Step 3 From the Advanced tab uncheck Use Windows to configure my wireless network. Once the box is unchecked click OK to close the Window.

You are now using the Belkin wireless utility to configure the wireless card.

Wireless PCI Card is not Detected by Operating System

- The Wireless PCI Card is not recognized by your desktop computer
- The “New Hardware” Wizard does not appear when booting up the computer
- Receive Microsoft Error Code: 10
- Receive Microsoft Error Code: 0

If the “New Hardware Wizard” does not appear, or you receive any of the above error codes, please attempt the following troubleshooting steps:

1. Remove the screws behind your computer case that secures the computer cover and remove cover.
2. Touch any metal part of the case to discharge static electricity, which could damage your product or your computer.
3. Remove the Wireless PCI card.
4. Locate a different empty PCI expansion slot. It is usually white in color.
5. Confirm that the Card will fit into the slot you have chosen. Keep in mind that the included antenna needs to be oriented with the top pointing up. If there are cables and other connections in the way, try to pick the PCI slot that has the fewest obstructions to the correct the positioning of the antenna.
6. Remove the metal port cover from the back of the computer that corresponds to the PCI slot you selected. If there is a screw, place it in a safe place, as you will be using it to attach the Card to the computer later.
7. Push the Card firmly into the PCI slot that you have chosen. Apply pressure as needed until the connector is fully seated.
8. Now secure the Card with the screw that you previously placed in a safe place.
9. Carefully screw the antenna onto the threaded connector on the Card. Turn the antenna until it is vertical and pointing up.
10. Replace the computer’s cover. Now that the Card is installed, you can reconnect the power cord, and turn it back on.
11. The computer should now properly recognize the card.

Troubleshooting

1

2

3

4

5

6

section

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

Currently there are three 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. 802.11b transmits information at 11Mbps; 802.11a and 802.11g work at 54Mbps or 125Mbps* in High-Speed Mode. See the following chart for more detailed information.

Wireless Comparison

Wireless Technology	802.11b	802.11g	802.11a
Speed	11Mbps	54Mbps	54Mbps
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
Compatibility	Compatible with 802.11g	Compatible with 802.11b	Incompatible with 802.11b or 802.11g
Range	Depends on interference - typically 100–200 ft. indoors	Depends on interference - typically 100–200 ft. indoors	Less interference - range is typically 50-100 feet
Adoption	Mature - widely adopted	Expected to continue to grow in popularity	Slow adoption for consumers - more popular in business environments
Price	Inexpensive	More expensive	Most expensive

*When operating in High-Speed Mode, this Wi-Fi device may achieve an actual throughput of up to or greater than 34.1 Mbps, which is the equivalent throughput of a system following 802.11g protocol and operating at a signaling rate of 125 Mbps. Actual throughput will vary depending on environmental, operational and other factors.

Information

Technical Support

You can find technical support information at **www.belkin.com** or **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 666 040

FCC Statement

DECLARATION OF CONFORMITY WITH FCC RULES FOR ELECTROMAGNETIC COMPATIBILITY

We, Belkin Corporation, of 501 West Walnut Street,
Compton, CA 90220, declare under our sole
responsibility that the product,
F5D7001

to which this declaration relates,
complies with Part 15 of the FCC Rules. Operation is
subject to the following two conditions: (1) this device
may not cause harmful interference, and (2) this device
must accept any interference received, including
interference that may cause undesired operation.

1

2

3

4

5

6

section

Caution: Exposure to Radio Frequency Radiation.

The radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such manner that the potential for human contact normal operation is minimized.

When connecting an external antenna to the device, the antenna shall be placed in such a manner to minimize the potential for human contact during normal operation. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

Federal Communications Commission 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 generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may 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.

Information

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 users authority to operate the equipment.

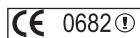
Canada-Industry Canada (IC)

The wireless radio of this device complies with RSS 139 & RSS 210 Industry Canada. This Class B digital 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 0682 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.

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



Products that contain the radio transmitter are labeled with CE 0682 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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