BELKIN®

Wireless Pre-N
Notebook Network Card

Enjoy superior wireless network performance and coverage

User Manual

airgo™
TRUE
MIMO

PRE
((N))
802.11g • 2.4GHz

800%
WIDER Coverage than standard 802.11g
True MIMO™

600% FASTER than standard 802.11g

F5D8010

Table of Contents

Introduction

Congratulations and thank you for purchasing the Belkin Wireless Pre-N Notebook Network Card (the Card). This product features new MIMO (Multiple Input Multiple Output) technology that solves interference and range challenges of wireless networking in larger homes and offices. MIMO delivers the best wireless network performance over expanded coverage area, and will be the heart of the upcoming 802.11n standard. Belkin's new "Pre-N" products with MIMO achieve twice the coverage of 802.11g networks with exceptional data transfer results.

Using MIMO's revolutionary, smart-antenna technology, Belkin Pre-N products can boost network speeds by up to 6 times previous capacities. Its enhanced data rates and range make MIMO a perfect technology for streaming multimedia content more reliably.

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** – Belkin spares you the expense and hassle of retrofitting Ethernet cabling throughout your home or office

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

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. Conversely, 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. Additionally, metal appliances, obstructions, and walls can weaken signals simply by getting in the way of your network's radio waves.

If you have concerns about your network's performance 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 (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.

Introduction

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 the cordless phone away from your 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 manufacturer's 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 (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 Client 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.

Introduction

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 wireless router's (or access point's) user guide for more information.

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 that 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 rerunning 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 on pages 2–3 to be sure you have addressed these issues.

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 Client Utility

• CardBus interface, for operation in virtually any notebook computer

• WPA, 64-bit WEP (Wired Equivalent Privacy), or 128-bit encryption

• Wireless access to networked resources

• Supports for both Infrastructure and Ad-Hoc (peer-to-peer) networking modes

• Easy installation and use

• Internal antenna

• LED power and network link indicators

Overview

Applications and Advantages

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

• **Compatibility with 802.11g and 802.11b products**
  Pre-N wireless LAN solutions are backward-compatible with existing
  Wi-Fi (IEEE 802.11g and 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 provides an ideal
  solution for 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
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)

Overview

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

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

(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® 2000 or XP

Package Contents

• Wireless Pre-N Notebook Network Card

• Quick Installation Guide

• Installation Software CD

• User Manual

Installing and Setting Up the Card

Step 1	Install the Software Drivers

**IMPORTANT NOTE: Install the software before inserting the Card.**

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

1.2 The Belkin Wireless Client Utility Setup screen will automatically appear (may take 15–20 seconds to appear).


Note: If the Wireless Client Utility Setup screen does not appear within 20 seconds, access your CD-ROM by double-clicking on the "My Computer" icon 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 "Install Software" from the menu.

Installing and Setting Up the Card
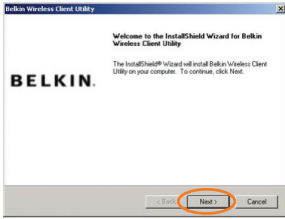
1.4 The installer will now start. Click "Next" and follow the on-screen instructions.
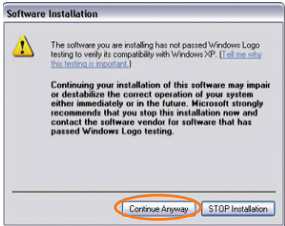
1.5 You might see a screen similar to this one. This DOES NOT mean there is a problem. Our software has been fully tested and is compatible with this operating system. Select "Continue Anyway" and follow the on-screen instructions.

Step 2 | **Plug the Card into an Available CardBus Slot on your Laptop**

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. The power light on the top will turn on when it is inserted properly.

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

2.2 You might see a screen similar to this one. This DOES NOT mean there is a problem. Our drivers have been fully tested and are compatible with this operating system. Select "Continue Anyway" and follow the on-screen instructions.
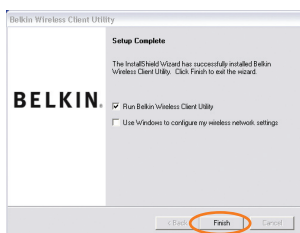
Step 3	Install the Wireless Client Utility
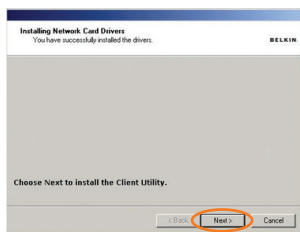
3.1 After the network card driver installation is complete, click "Next" to install the Wireless Client Utility.

3.2 The wizard will prompt you to choose an installation location. Click "Next" to accept the default location, or click "Browse" to select a different location before clicking "Next".

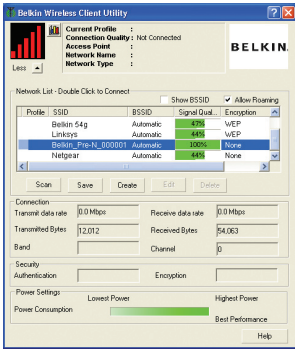**3.3** Click "Finish" to start the Belkin Wireless Client Utility.

3.4 A small Signal Indicator icon should appear in your system tray (bottom right corner of most screens). Double-click on this to bring up the Wireless Client Utility.

3.5 The compact Wireless Client Utility screen will appear. Click on "More" to open up the expanded view.

Installing and Setting Up the Card

3.6 Select a network to connect to by double-clicking on a network from the Network List.

Note: In order to see your available networks, you must be near a working wireless router or access point. If using with the Belkin Wireless Pre-N Router, connect to the "Belkin_Pre-N_" SSID network name. The network name may be followed by six numbers, which are specific to your router.
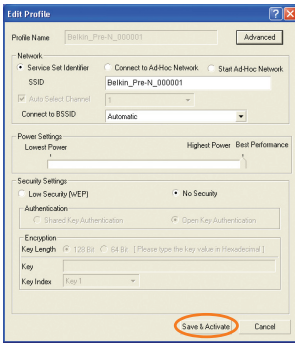
3.7 The Profile screen will appear to save the settings to the network selected. Click "Save & Activate" to save the Profile and activate it.

3.8 The Signal Indicator icon should appear green in your system tray (bottom right corner of most screens). The color of the icon reflects the connection link: green for good, yellow for weak, red if it is not active, and a red X if the radio is turned off.

Installation is now complete!
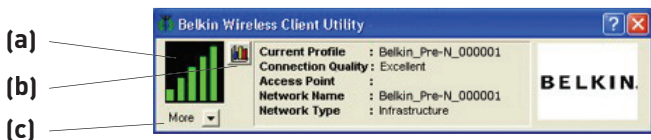
11

Using the Belkin Wireless Client Utility

How to Access the Belkin Wireless Client Utility

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

The following screen will appear.

Navigating the User Interface

Using the Compact View

(a)
(b)
(c)

(a) Signal icon
The signal icon on the left changes color according to current received signal strength: green indicates an excellent signal, yellow indicates it is acceptable, and red means there is no active signal.

(b) Display Mode
The Display Mode button alternates between the current Connection Information Screen and the received Signal Strength Chart. The Signal Strength Chart displays the signal strength of the Card for the last 60 seconds.

(c) More
The More button opens the expanded view that allows you to view and configure more options of your Card.

Using the Belkin Wireless Client Utility

Using the Expanded View
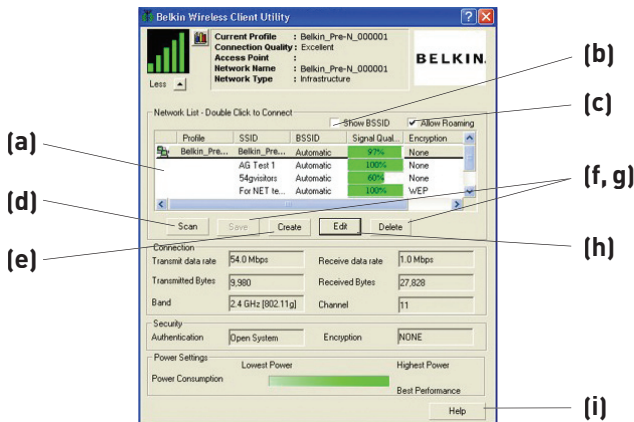
(a) Network List
List all available networks; double-click on a network to connect.

(b) Show BSSID
Select this check box if you wish to see the MAC address of the access point or router.

(c) Allow Roaming
Select this check box to move from one network to another without changing the active network selection.

(d) Scan
Click this button to scan the available networks in your area.

(e) Create
You may create a new profile using this button.

(f, g) Save, Delete
You may save and delete networks from the Network List by using these buttons.

(h) Edit
To edit a saved profile, use this button.

(i) Help
Click this button to link to the help files for assistance using this Utility or any of the features.
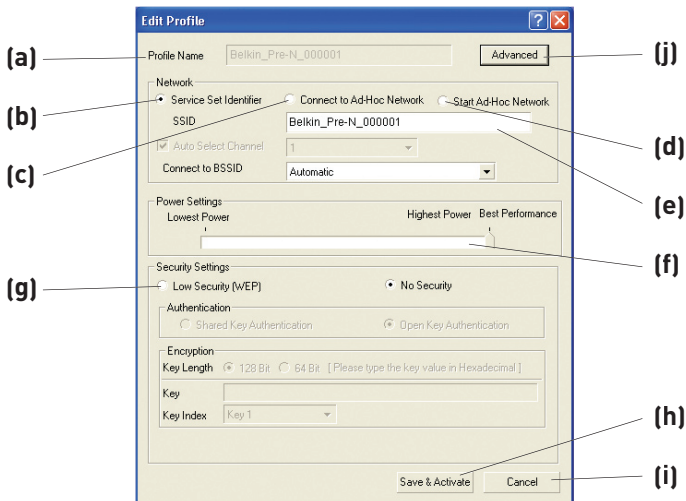
Setting Wireless Network Preferences

To create a new Wireless Network Profile, click on the "Create" button, which will open up the "Profile" window.

(a) **(j)**

(b)

(c) **(d)**

(e)

(f)

(g)

(h)

(i)

(a) Profile Name
Enter a profile name of your choice for the new profile.

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

(c) Connect to Ad-Hoc Network
When this option is selected, the Card will attempt to connect to any available computer in the area that is configured to be used in ad-hoc mode. Wireless router(s) or access point(s) will be excluded from the list of available networks when this option is selected.

(d) Start Ad-Hoc Network
When this option is selected, the Card will create a new ad-hoc network for any available computer in the area that is configured to be used in ad-hoc mode to connect to this computer.

(e) SSID
Enter the SSID of the network you want to connect to or create.

(f) Power Settings
Drag the sliding bar to select a power level. Higher settings enable the highest performance, lower settings draw less power from your PC when you want to conserve battery power or when you are within close range.

(g) Security Settings Box
The Security Settings box includes choices for configuring a secure connection. Please see the "Securing your Wi-Fi Network" section of this User Manual for information on setting up security for this Card.

(h) Save & Activate
Click "Save & Activate" to save the settings on this window.

(i) Cancel
Click "Cancel" to choose not to save any settings and exit this window.

(j) Advanced
The Advanced button opens the "Advanced Profile Settings" window. These settings enable you to take advantage of the enhanced performance features of the Belkin Router. We recommended that you keep the default "Auto" settings, because they provide compatibility with basic and enhanced data rates and network density. This window also allows you to choose the transmit rate between the Card and Router.
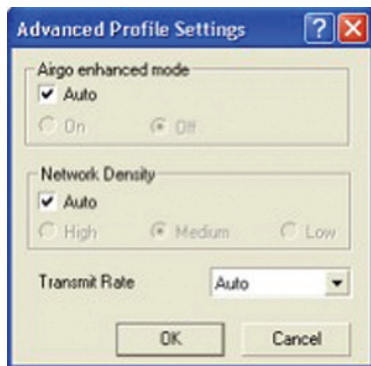
Securing your Wi-Fi Network

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 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.

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.

Using the Belkin Wireless Client 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 hexadecimal (hex) key. A hex 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.

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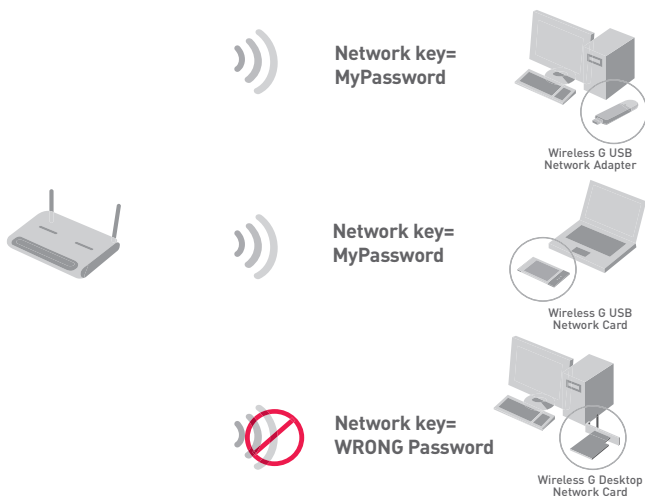
WPA-PSK (no server) uses what is known as a pre-shared key as the network key. A network key is a password that is between eight and 63 characters long. It can be a combination of letters, numbers, or characters. Each client uses the same network key to access the network. Typically, this is the mode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

Using the Belkin Wireless Client Utility

The following diagram shows the effect of not having the correct network key throughout your network.

**Network key=
MyPassword**

Wireless G USB
Network Adapter

**Network key=
MyPassword**

Wireless G USB
Network Card

**Network key=
WRONG Password**

Wireless G Desktop
Network Card

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 the Belkin Wireless Router (or Access Point), 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 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 or access point manual for directions on how to access the security settings.)

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 hexadecimal (hex) 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.

Using the Belkin Wireless Client Utility

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 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 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.
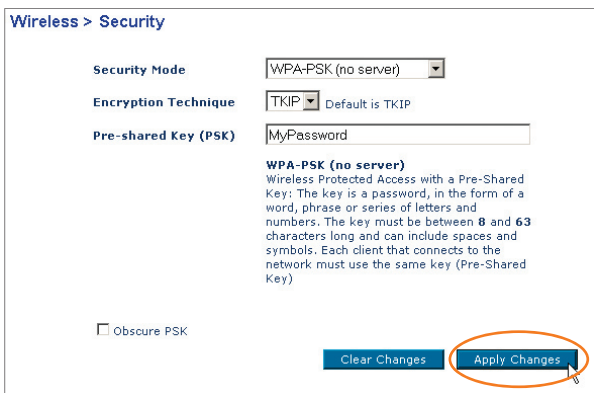
Using the Belkin Wireless Client Utility

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 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.

Using the Belkin Wireless Client Utility

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 re-key interval. The re-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. 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.

Configuring your Belkin Wireless Notebook or Wireless Desktop Network Card 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 "Wireless Client Utility" screen. The "More" button will allow you to view and configure more options of your Card.

2. Under the "Network List" window, click on a network name from the available networks and click "Create".

3. Under "Security Settings" select "Low Security (WEP)".

4. Select from the following authentication choices:
    • Shared Key Authentication
    • Open Key Authentication

5. Select "128-Bit" or "64-Bit" encryption and type your WEP key in the "Key" box.
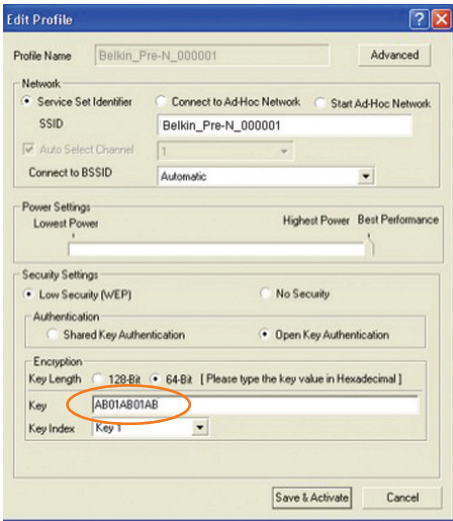
IMPORTANT: A WEP key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 keys. For 64-bit WEP, you need to enter 10 keys. This network key needs to match the key you assign to your wireless router or access point.

6. Click "Save" to save the settings.

Setting Up WPA in Windows XP to Connect your Computer to a Wireless Router or Access Point that is Using WPA

In order to use WPA, ensure you are using "Windows Wireless Network Utility" instead of the "Belkin Wireless Client Utility" by doing the following:

1. Under Windows XP, click "Start > Control Panel > Network Connections".

2. Right-click on "Wireless Network Connection", and select "Properties".

3. Clicking on the "Wireless Networks" tab will display the following screen. Ensure the "Use Windows to configure my wireless network settings" box is checked.
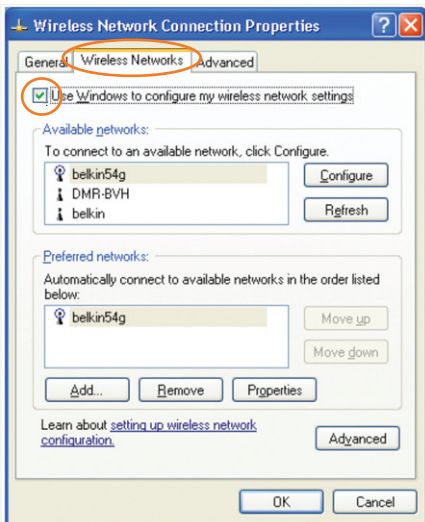
4. Under the "Wireless Networks" tab, click the "Configure" button and you will see the following screen.
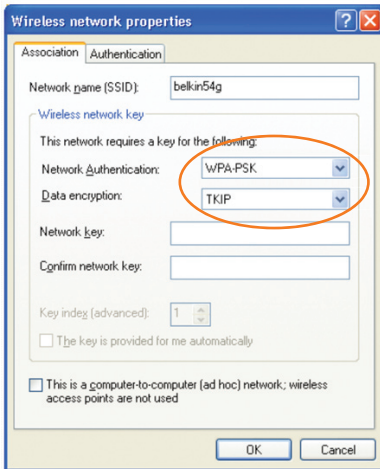
5. For Home or Small Business Users: Select "WPA-PSK" under "Network Authentication".

NOTE: Select WPA if you are using this computer to connect to a corporate network that supports an authentication server such as radius server. Please consult your network administrator for further information.

6. Select "TKIP" or "AES" under "Data Encryption". This setting will have to be identical to the router you set up.

7. Type in your encryption key in the "Network Key" 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.

8. Click "OK" to apply settings.

Monitoring the Status of your Network Connection
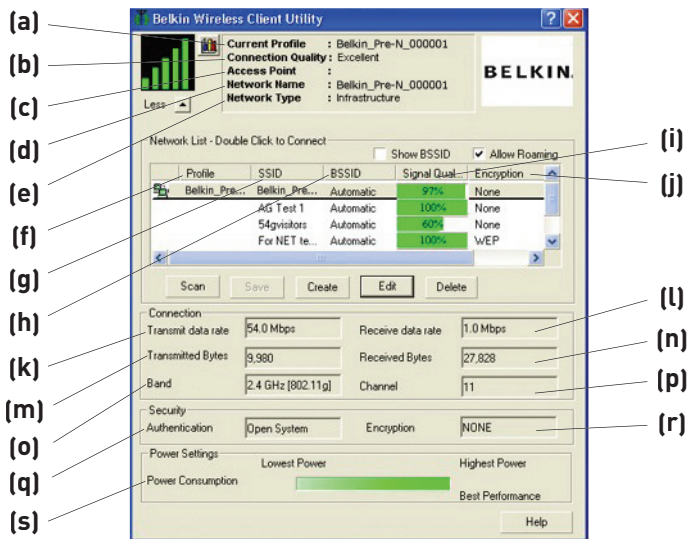
(a) Current Profile
This is the current profile you are using.

(b) Connection Quality
Depending on the distance or noise in your area, the quality you receive may be excellent, good, or bad.

(c) Access Point
The MAC address of the access point.

(d) Network Name
This is the current network SSID to which you are connected.

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

(f) Profile
This column shows if the network has been saved as a profile.

(g) SSID
The network name of the router or access point.

(h) BSSID
This column will display the router or access point's MAC address.

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

(j) Encryption
Will display "None" when encryption is disabled, "WEP" when either 64-bit or 128-bit encryption is enabled.

(k) Transmit Data Rate
This displays the transmit rate from the router to the Card.

(l) Receive Data Rate
This displays the receive rate from the router to the Card. The receive data rate may fluctuate as the Card is transmitting data.

(m) Transmitted Bytes
This displays the bytes that have been transmitted.

(n) Received Bytes
This displays the bytes that have been received.

(o) Band
This displays the frequency band the network is using.

(p) Channel
This displays the channel the network is on.

(q) Authentication
Displays the authentication settings the network is using.

(r) Encryption
Will display "None" when encryption is disabled, "WEP" when either 64-bit or 128-bit encryption is enabled.

(s) Power Consumption
This displays the power consumption settings the Card is currently using.

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 step 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 Client 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 Client Utility window will display the available networks in the Network List window. Available networks are wireless networks you can connect to.

If you are using a Belkin Pre-N Wireless Router, the default name is Belkin Pre-N.

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

Troubleshooting

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

If you're 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 "Network List"

If the correct network name is listed in the "Network List", please follow the steps below to connect wirelessly:

1. Click on the correct network name in the "Network 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 in 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 "Network List"

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 "Network List" window. Click "Create" 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 manufacturer's user manual. If issues persist even at close range, please contact Belkin Technical Support.

Troubleshooting

Installation CD-ROM does not start the Wireless Client Utility

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

If the Wireless Client 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 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 "Network List" window. Click "Create" if you do not see the network you are trying to connect to and type in the SSID.

Troubleshooting

For more information about setting up a 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 "Securing your Wi-Fi Network" 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 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 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.

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 can cause signal degradation are obstructions such as walls and metal appliances (metal is generally the worst culprit). 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 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; however, you may choose from several other channels depending on your region. See your router 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 "Network Connections" and double-click on your Wireless Card's connection. In the Properties dialog, select "Configure" 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.

If issues persist even at close range, 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 Client Utility over the Windows Wireless Network 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 Client Utility.

To use the Belkin Wireless Client 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 "Advanced" 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 Client Utility to configure the Wireless Card.

The 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.

The 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 Belkin 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.

Troubleshooting

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.	8x 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** or **www.belkin.com/networking**. If you want to contact technical support by phone, please call:

US:	**877.736.5771**
	310.898.1100 ext. 2263
Europe:	**00 800 223 55 460**
Australia:	**1800 235 546**
New Zealand:	**0800 235 546**
Singapore:	**800 616 1790**

Information

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,

F5D8010

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.

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 during 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.

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 0682 or CE alert marking comply with the R&TTE Directive (1995/5/EC) issued by the Commission of the European Community.
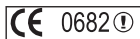
Compliance with this directive implies conformity to the following European Norms (in brackets are the equivalent international standards).

- 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.

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

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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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.

Information

Wi-FI® Interoperability Certificate

Wi-Fi® Interoperability Certificate			Certification ID: W002655

Wi-Fi®
CERTIFIED
bg

This certificate represents the capabilities and features that have passed the interoperability testing governed by the Wi-Fi Alliance. Detailed descriptions of these features can be found at www.wi-fi.org/certificate

Certification Date: July 30, 2004
Category: Internal Card
Company: Belkin Components
Product: Cardbus Adpater/F5D8010
Model/SKU #: F5D8010

This product has passed Wi-Fi certification testing for the following standards:

IEEE Standard	Security		
802.11b	WPA - Personal		
802.11g			

For more information: www.wi-fi.org/certified_products

BELKIN®

Wireless Pre-N
Notebook Network Card

BELKIN®

www.belkin.com

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New Zealand: 0800 235 546

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