

# BELKIN®

## Dual-Band Wireless A+G Notebook Network Card

### Connect your notebook computer to a wireless network



## User Manual



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# Introduction

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Thank you for purchasing the Belkin Dual-Band Wireless A+G Notebook Network Card (the Card). The Card features 802.11g and 802.11a technology, which allows you to share networked files and resources wirelessly. The Card works like a conventional network card, but without the wires. It uses revolutionary 108 Technology to achieve data rates up to 108Mbps, when used with 108 Technology routers. In addition, the Card features eXtended Range XR™ Technology (XR), which doubles the coverage area of standard 802.11g and 802.11a networks when used with XR routers. Belkin's easy installation and setup will have your network up 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".

## Advantages of a Wireless Network

- **Mobility** – you no longer need a dedicated "computer room" – you can work on a networked 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

## Placement of your Wireless Networking Hardware for Optimal Performance

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

If you have concerns about your network's performance that might be related to range or obstruction factors, try moving the computer to a position between five and 10 feet from the 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. Wireless Router or Access Point Placement

Place your 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 router's (or access point's) networking antennas are parallel to each other, and are positioned vertically (toward the ceiling). If your router (or access point) itself is positioned vertically, point the antennas as much as possible in an upward direction.
- In multistory homes, place the router (or access point) on a floor that is as close to the center of the home as possible. This may mean placing the router (or access point) on an upper floor.
- Try not to place the router (or access point) near cordless 2.4GHz and 5GHz phones.

## 2. Avoid Obstacles and Interference

Avoid placing your router (or access point) near devices that may emit radio “noise”, such as microwave ovens. Dense objects that can inhibit wireless communication 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 router or access point).

## 3. Cordless Phones

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 routers (or access points) and your wireless-enabled computers.
- Unplug and remove the battery from any cordless phone that operates on the 2.4 or 5GHz band (check the manufacturer’s information). If this fixes the problem, the phone may be interfering.
- If your phone supports channel selection, change the channel on the phone to the farthest channel from your wireless network. For example, change the phone to channel 1 and move your router (or access point) to channel 11. See your phone’s user manual for detailed instructions.
- If necessary, consider switching to a 900MHz 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 found in the Wireless Network Utility of this Card to locate any other wireless networks that are available (see this User Manual), and move your 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.
- For Belkin wireless networking products, use the detailed Site Survey and wireless channel information included with this Card. See this User Manual for more information.

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

## 5. Secure Connections, VPNs, and AOL

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

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

Secure connections can be interrupted by a computer’s power management setting, which causes it to “go to sleep.” The simplest solution to avoid this is to simply reconnect by 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 Connections, VPNs, and AOL, please review the steps above to be sure you have addressed these issues.

# Introduction

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For more information regarding our networking products, visit our website at [www.belkin.com/networking](http://www.belkin.com/networking) or call Belkin Technical Support at:

<b>US:</b>	877-736-5771 310-898-1100 ext. 2263
<b>Europe:</b>	00 800 223 55 460
<b>Australia:</b>	1800 235 546
<b>New Zealand:</b>	0800 235 546
<b>Singapore:</b>	800 616 1790

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# Overview

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## Product Features

The Card complies with the IEEE 802.11a and 802.11g standards in order to communicate with other 802.11a- and 802.11g-compliant wireless devices at 108Mbps. The Card is compatible with 802.11b devices at 11Mbps. 802.11g and 802.11b products operate on the same 2.4GHz frequency and 802.11a operates on the 5.0GHz band.

- Integrated 802.11g and 802.11a wireless technology
- 2.4GHz ISM (Industrial, Science, and Medical) and 5.0GHz band operation
- 108 A+G Technology achieves data rates up to 108Mbps
- XR Technology doubles the coverage area compared to standard 802.11g and 802.11a networks.
- Integrated easy-to-use Wireless Network Utility
- CardBus interface, for operation in virtually any notebook computer
- WPA, 64-bit WEP (Wired Equivalent Privacy), 128-bit encryption, and 802.1x authentication
- Wireless access to networked resources
- Support for both Infrastructure (Access Point) and Ad-Hoc (peer-to-peer)
- Easy installation and use
- Internal antenna
- LED power and network link indicators



## Applications and Advantages

- **Wireless roaming with a desktop around the home or office**  
Offers the freedom of networking without cables.
- **Compatibility with 802.11a, 802.11b, and 802.11g products**  
Compatible with existing Wi-Fi® networks 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 a 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
Power Consumption	Tx/Rx peak 560/250mA @ 3.3V (max.)
Operating Temperature	0 ~ 60 degrees C
Storage Temperature	-20 ~ 80 degrees C
Operating Humidity	10% to 85% non-condensing
Storage Humidity	5% to 90% non-condensing

# Overview

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**(a) Power LED**

Lights when the Card is on.

**(b) Link LED**

Lights solid when the Card is linked to a wireless network, flashes when the Card is actively transferring data.

**(c) Card Connector**

The part of the Card that fits into your computer's CardBus slot.

## System Requirements

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

## Package Contents

- Belkin Dual-Band Wireless A+G Notebook Network Card
- Quick Installation Guide
- Installation Software CD
- User Manual

# Installing and Setting Up the Card

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section

## Step 1 | Install

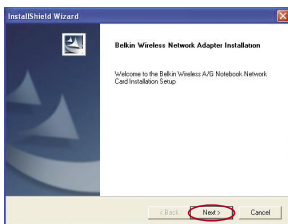
### Important: Install the Software before Inserting the Card



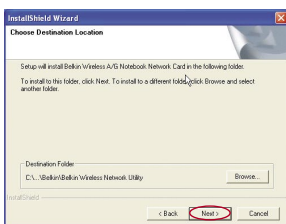
1.1 Insert the Installation Software CD into your CD-ROM drive.

1.2 The Belkin Setup Utility screen will automatically appear. (This may take 15-20 seconds to appear.) Click “Install” to start the installation.

**Note:** If the Wireless Setup Utility 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 “Next” to install the software.



1.4 Choose an installation location, click “Next” to accept the default location or click “Browse” to select a different location before clicking “Next”.

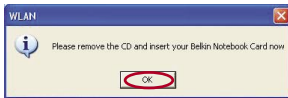
# Installing and Setting Up the Card

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## Step 2 | Insert

### Insert the Card into your Computer

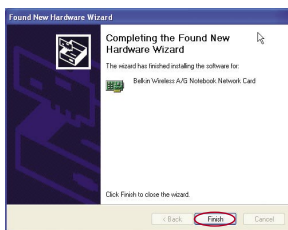
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**2.1** You will be prompted to remove the CD and insert your Card. To do so, remove the CD from the CD-ROM drive and insert the Card, label side UP, into your computer's CardBus slot firmly until it stops. Click "OK" to continue.



**2.2** The Found New Hardware Wizard will appear. (This may take 15-20 seconds to appear.) Select "Install the software automatically" and click "Next" to install the hardware.



**2.3** The installation is now complete. Click "Finish" to exit.

# Installing and Setting Up the Card

## Step 3 | Connect

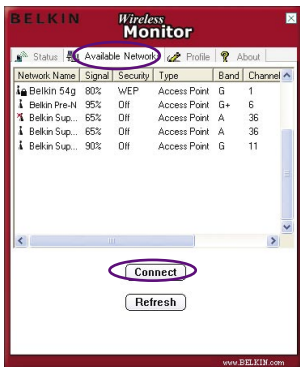
### Connect to a Network Using the Wireless Network Utility




**3.1** Double-click on the “Signal Indicator” icon located in the lower right corner of your screen (in the system tray) to bring up the Belkin Wireless Network Utility.



If the “Signal Indicator” icon does not appear, double-click on the Belkin Wireless Network Utility shortcut icon on your desktop window.



**3.2** Click on the “Available Networks” tab in the Utility. Select a network to connect to and click “Connect”.

**3.3** Click  to exit the Utility. The color of the “Signal Indicator” icon reflects the connection link—green indicates that the Card is connected and red indicates that the Card is not connected to a wireless network.



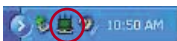
**Your setup is now complete!**

# Using the Belkin Wireless Network Utility

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## How to Access the Belkin Wireless Network Utility

Double-click on the “Signal Indicator” icon located in the lower right corner of your screen (in the system tray) to bring up the Belkin Wireless Network Utility. The color of the icon reflects the connection link—green indicates that the Card is connected and red indicates that the Card is not connected to a wireless network.



You can also double-click on the Wireless Network Utility shortcut icon on your desktop window.



If the icon is not present, click on “Start > Programs > Belkin > Belkin Wireless A+G Network Utility” to bring up the Utility.

## Monitoring the Status of your Network Connection

Click on the “Status” tab to monitor the link status of your network connection. From this tab you can see your current connection status on the screen. The example below shows that there is a connection between the computer and the wireless router (or access point) by displaying a wireless signal and the word “connected” in between the two. The diagram below also shows there is a connection between the wireless router (or access point) and the Internet, to view the status of the router to the Internet click on the “Internet Status” button.

### (a) Signal Strength

Displays the signal strength of the related router (or access point).

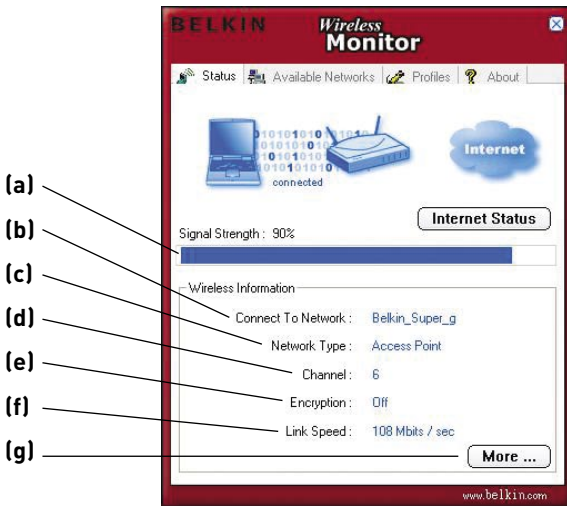
### (b) Connect to Network

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

### (c) Network Type

Displays either “Access Point” if connected to a router (or access point) or “Ad-Hoc” when connected to another computer.

# Using the Belkin Wireless Network Utility



**(d) Channel**

Displays the channel the network is on.

**(e) Encryption**

Displays “Off” when encryption is disabled, “WEP” when either 64-bit or 128-bit is enabled, or “WPA” when WPA is enabled.

**(f) Link Speed**

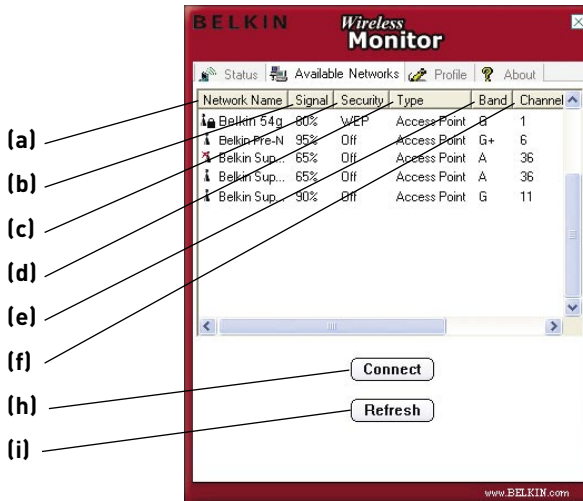
Displays the data rate of the current connection.

**(g) More...**

Clicking the “More...” button lets you see detailed specifics about the network you are connected to such as DHCP Status, Current IP, Subnet Mask, Default Gateway and DNS Server IP information.

## Finding Available Networks in your Area

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



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

### (a) Network Name

The SSID of the router or access point.

### (b) Signal

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

### (c) Security

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



# Using the Belkin Wireless Network Utility

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**(d) Type**

Will display the network type of either “Access Point” if connected to a router (or access point) or “Ad-Hoc” when connected to another computer.

**(e) Band**

The wireless band the network is on.

**(f) Channel**

The wireless channel the network is using.

**(g) Mac Address**

The Mac address of the router or access point. (Scroll right in the Utility to see the “Mac address” tab.)

**(h) Connect**

Connects to the selected network.

**(i) Refresh**

Refreshes the status of the networks in the area.

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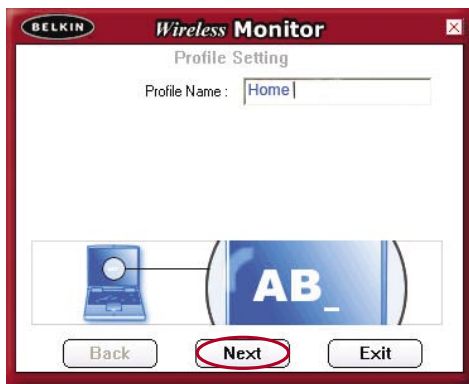
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## Setting up Wireless Network Profiles

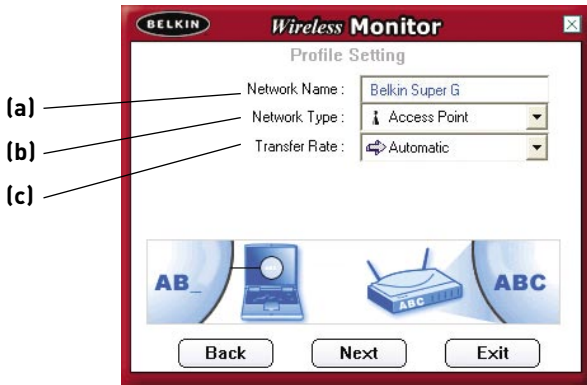
Using Profiles allows you to save configurations for different wireless networks, for instance at home or at work without having to reconfigure your connection each time you connect. This allows you to quickly change from one profile to another profile without having to remember the particular settings of a certain network.

- Step 1.** To create a new wireless network profile, click on the “Profiles” tab. Click “Add” to open the new profile screen. Type in a name for the profile. You should pick something easy to remember like “Work” for your work network, or “Home” for your home network. Click “Next” to continue.



# Using the Belkin Wireless Network Utility

**Step 2.** The next screen you will see allows you to type in the name of the network you will be connecting to, the type of network it is, and optionally, set the data rate for that network. After making the selections, click “Next” to continue.



**(a) Network Name**

The exact name of the network you will be connecting to. The “Network Name” is the same as the network SSID.

**(b) Network Type**

Select either “Access Point”, if it is a network with a wireless router or access point, or “Peer-to-Peer” if this is a direct connection to another computer.

**(c) Transfer Rate**

“Automatic” is the suggested “Transfer Rate” unless there is a specific need to change this setting.

# Using the Belkin Wireless Network Utility

- Step 3.** The next screen allows you to input security encryption settings for the network. If the network you are connecting to is not encrypted, leave the “Authentication Mode” in “Off” and click the “Complete” button to save the profile. If your network is encrypted, please see page 27 to continue.



- Step 4.** To begin using your new profile, highlight the profile name by clicking on the name one time, then click “Connect”.



## 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

### Wired Equivalent Privacy (WEP)

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.

#### 1. 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.

#### 2. 128-Bit Encryption

As a result of 64-bit WEP's potential security weaknesses, a more secure method of 128-bit encryption was developed. 128-bit encryption includes a key length of 104 bits plus 24

additional bits of system-generated data (128 bits total). Some hardware manufacturers refer to 128-bit as 104-bit encryption.

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

## Encryption Keys

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

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

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.

## 3. Wi-Fi Protected Access (WPA)

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: Wi-Fi Protected Access-Pre-Shared Key (WPA-PSK), typically for use in home-network configurations when not operating on a radius server; and WPA (with radius server), typically for office-network configurations.

**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.

# Using the Belkin Wireless Network Utility

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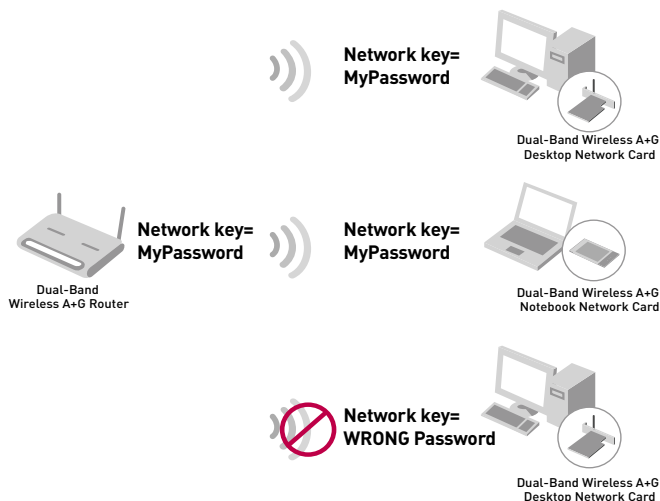
section

**WPA (with radius server)** is a system in which 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](http://www.belkin.com/networking).

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

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



## **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 Belkin Wireless Router (or Access Point) User Manual for directions on how to access the management interface.

## **Changing the Wireless Security Settings**

The Belkin Dual-Band Wireless A+G Router is 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. (Please 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 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 characters.

For instance:

**AF 0F 4B C3 D4** = 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 key input fields labeled 'Key 1' through 'Key 4'. 'Key 1' is pre-filled with the hex values 'AF', '0F', '4B', 'C3', and 'D4'. The other keys are empty. A note below the keys 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.

# Using the Belkin Wireless Network 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 (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 characters.

For instance:

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

Wireless > Security

Security Mode: 128bit WEP

C3	03	0F	AF	0F
4B	B2	C3	D4	4B
C3	D4	E7	(13 hex digit pairs)	

NOTE: To automatically generate hex pairs using a PassPhrase, input it here

PassPhrase:  generate

Clear Changes Apply Changes

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.

## 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.

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 Network Utility

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## WPA (with server) Settings

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

1. From the Security Mode drop-down menu, select “WPA (with Radius Server)”.
2. Enter the IP address of the radius server into the “Radius Server” fields.
3. Enter the radius key into the “Radius Key” field.
4. Enter the key interval. The key interval is how often the keys are distributed (in packets).

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.

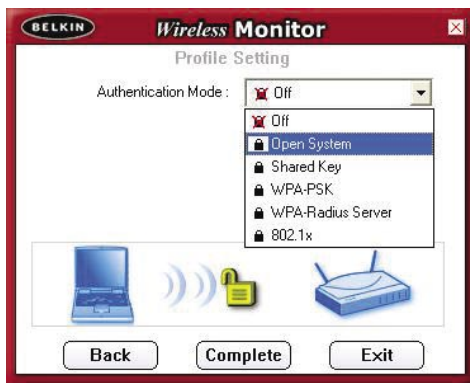
## Configuring your Belkin Wireless Card to use Security

At this point, you should already have your wireless router or access point set to use WPA or WEP (see “Securing your Wireless Network” section of this manual). 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 to a Wireless Network using 64-Bit or 128-Bit WEP:

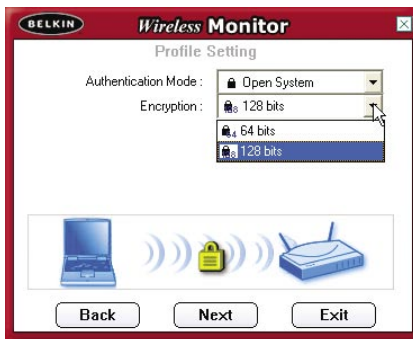
To enable the security settings for the Card, you must select a network from the “Available Networks” tab or a profile from the “Profiles” tab and follow steps 1-3 of “Setting up Wireless Network Profiles” on page 16 before continuing.

- Step 1.** Select either “Open System” or “Shared Key” from the “Authentication Mode” drop-down box. Most networks with WEP use “Open System” key type.

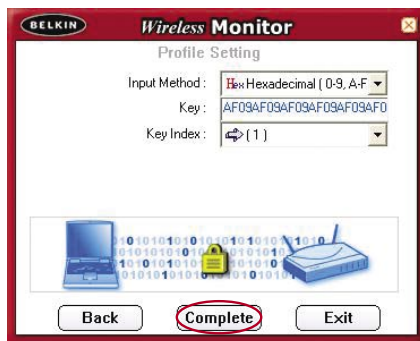


# Using the Belkin Wireless Network Utility

- Step 2.** Next depending on the WEP security settings the router (or access point) you are connecting to may be using, select “64 bits” or “128 bits” from the “Encryption” drop-down box and click “Next” to continue.



- Step 3.** The next screen allows you to select the encryption key “Input Method” using alphanumeric, hexadecimal, or passphrase. Most WEP encryption keys are hexadecimal consisting of letters A through F and numbers 0 through 9. The method you choose should match the same method used by the router (or access point). Select the “Input Method”, enter in the Key and select 1, 2, 3, or 4 from the “Key Index”. Click “Complete” to save the security settings and the new profile.



# Using the Belkin Wireless Network Utility

- Step 4.** To begin using your new profile, highlight the profile name by clicking on the name one time, then click “Connect”.



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# Using the Belkin Wireless Network Utility

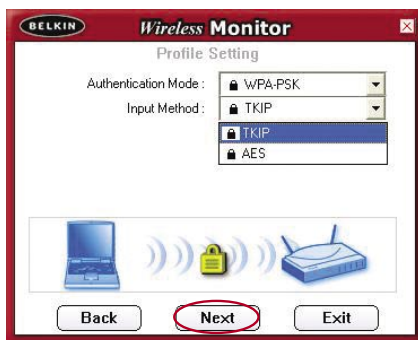
## Connecting to a Wireless Network using WPA-PSK (no server):

To enable the security settings for the Card, you must select a network from the “Available Networks” tab or a profile from the “Profiles” tab and follow steps 1-3 of “Setting up Wireless Network Profiles” on page 16 before continuing.

**Step 1.** Select “WPA-PSK” from the “Authentication Mode” drop-down box.



**Step 2.** Choose either “TKIP” or “AES” from the “Input Method” drop-down box depending on the WPA-PSK security settings the router (or access point) you are connecting to may be using. Click “Next” to continue.





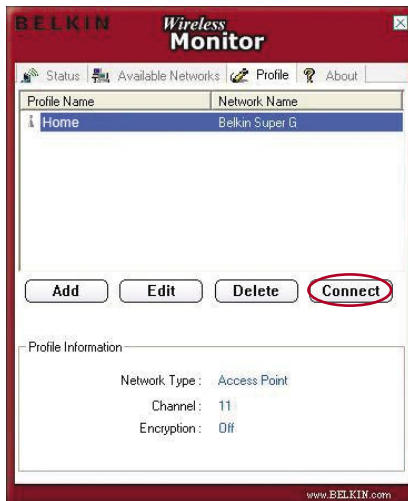
# Using the Belkin Wireless Network Utility

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**Step 3.** Next, enter the encryption key in the “Key” box. The key should match the key used in the router (or access point). Click “Complete” to save the security settings and the new profile.



**Step 4.** To begin using your new profile, highlight the profile name by clicking on the name one time, then click “Connect”.



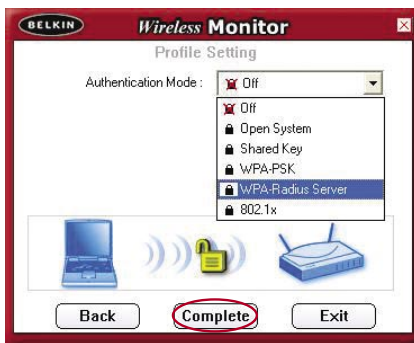
# Using the Belkin Wireless Network Utility

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## Connecting to a Wireless Network using WPA-Radius Server or 802.1x:

To enable the security settings for the Card, you must select a network from the “Available Networks” tab or a profile from the “Profiles” tab and follow steps 1-3 of “Setting up Wireless Network Profiles” on page 16 before continuing.

- Step 1.** Select “WPA-Radius Server” or “802.1x” from the “Authentication Mode” drop-down box.



- Step 2.** Select the settings to connect to your router (or access point) as indicated by your network administrator.

# Using the Belkin Wireless Network Utility

- Step 3.** Click “Complete” to save the security settings and the new profile. To begin using your new profile, highlight the profile name by clicking on the name one time, then click “Connect”.



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# Troubleshooting

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## Problem:

I can't connect to the Internet wirelessly.

## Solution:

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 Router. If you are using a Belkin Router, the lights should be as follows:
  - The "Power" light should be on.
  - The "Connected" light should be on and not blinking.
  - The "WAN" light should be either on or blinking.


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

If this is NOT the case, make sure:

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

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

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

2. Open your Wireless Network Utility software by clicking on the "Tray" icon in the system tray at the bottom right-hand corner of the screen. The tray icon should look like this.  The icon may be red, yellow, or green.
3. The Belkin Wireless Network Utility window will display the available networks in the "Available Networks" tab. Available networks are wireless networks you can connect to.

If you are using a Belkin Dual-Band Wireless A+G Router in 802.11a mode, "Belkin Super A" is the default name.

If you are using a Belkin Dual-Band Wireless A+G Router in 802.11b/g mode, "Belkin Super G" is the default name.

# Troubleshooting

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

2

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

3

If you are using a Belkin Pre-N Router, the default name should be “Belkin pre-N” followed by the serial number specific to that Router. If you are NOT using a Belkin Router, please consult your router manufacturer’s user manual for the default name.

4

## **The name of your wireless network appears in “Available Networks”.**

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

6

- Click on the correct network name in the “Available Networks” to connect to the network.
- If the network has security (encryption) enabled, you will need to enter the network key. For more information regarding security, see the page entitled: “Configuring your Belkin Wireless Card to use Security” in this User Manual.
- Within a few seconds, the tray icon in the lower right-hand corner of your screen should turn green, indicating a successful connection to the network.

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

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

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

**Note:** To check the SSID settings or look for an available network, double-click the “Signal Indicator” icon to bring up the Belkin Wireless Network Utility, then click on the “Available Networks” tab. Click on the “Profiles” box if you do not see the network you are trying to connect to and click “Add”. Then follow the instructions in “Setting Wireless Network Profiles” of this manual. 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

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## **Problem:**

Installation CD-ROM does not start Setup Utility.

## **Solution**

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”.

## **Problem:**

Power LED does not come ON; Card is not working.

## **Solution:**

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, please contact Belkin Technical Support.

## **Problem:**

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

## **Solution**

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

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

**Note:** To check the SSID settings or look for an available network, double-click the “Signal Indicator” icon to bring up the Belkin Wireless Network Utility then click on the “Available Networks” window. If you do not see the network you are trying to connect to, click on the “Profiles” tab and type in the “Network Name” box the SSID of the router or access point you are trying to connect to. Then follow the instructions in the “Setting Up Wireless Network Profiles” section of this manual.

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

## **Problem:**

Link LED is solid but cannot connect to the Internet.

## **Solution:**

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” in this manual.

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

## **Problem:**

Data transfer is sometimes slow.

## **Solution**

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

# Troubleshooting

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

## **Problem:**

Signal strength is poor.

## **Solution:**

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

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

**Changing the wireless channel** – Depending on local wireless traffic and interference, switching the wireless channel of your network can improve performance and reliability. The default channel the Dual-Band Wireless A+G Router is shipped with is channel 11 for 802.11g and 36 for 802.11a. You may choose from several other channels depending on your region; see your router or access point user manual for instructions on how to choose other channels.

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

## **Problem:**

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

## **Solution:**

There are several features and advantages of using the Belkin Wireless Network Utility over the Windows XP Wireless Zero Configuration Utility. We offer a site survey, detailed link information,



and adapter diagnosis, to name a few.

It's essential to know which utility is managing your Card. We recommend using the Belkin Wireless Network Utility.

To use the Belkin Wireless Network Utility follow the steps below:

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

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

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

## Problem:

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™).

## Solution:

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.

## Problem:

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

## Solution:

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

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

## **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 or 108Mbps. Pre-N, the precursor to the upcoming 802.11n release, promises speeds that exceed 802.11g, and up to 800% the wireless coverage area. See the following chart for more detailed information.

## Wireless Comparison Chart

Wireless Networks	802.11b	802.11g	802.11a+g	Belkin Pre-N
<b>Speed</b>	11Mbps	54Mbps	108Mbps	108Mbps
<b>Frequency</b>	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	Uses the uncrowded 5GHz band which is not susceptible to common household devices such as microwaves and cordless phones that use the 2.4GHz band	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz
<b>Compatibility</b>	Compatible with 802.11g	Compatible with 802.11b	Compatible with 802.11b, 802.11g, or 802.11a	Compatible with 802.11a, 802.11b, or 802.11g
<b>Coverage</b>	Depends on interference - typically 100-200 ft. indoors	Depends on interference - typically 100-200 ft. Indoors	Less interference in 802.11a - typically 100-200 ft. indoors	800% the coverage of standard 802.11g
<b>Adoption</b>	Mature - widely adopted	Expected to continue to grow in popularity	Popular in media devices and business environments	Expected to continue to grow in popularity

# Troubleshooting

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## Technical Support

You can find technical support information at:  
**[www.belkin.com/networking](http://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**

## 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,

F6D3010

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 a 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.

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.

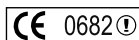
## Canada-Industry Canada (IC)

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 à 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 (IEC61000-3-2) – Power Line Harmonics
- EN 61000-3-3 (IEC61000) – 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.

<b>Wi-Fi® Interoperability Certificate</b>		<b>Certification ID: W002987</b>	
		<p>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 <a href="http://www.wi-fi.org/certificate">www.wi-fi.org/certificate</a></p> <p><b>Certification Date:</b> November 12, 2004 <b>Category:</b> External Card <b>Company:</b> Belkin Components <b>Product:</b> Belkin Wireless A/G Notebook Network Card/F6D3010</p> <p>This product has passed Wi-Fi certification testing for the following standards:</p>	
IEEE Standard	Security		
802.11a 802.11b 802.11g	WPA™ - Personal WPA™ - Enterprise		
<b>For more information: <a href="http://www.wi-fi.org/certified_products">www.wi-fi.org/certified_products</a></b>			

## **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.

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE IN LIEU OF ALL OTHERS, WHETHER ORAL OR WRITTEN, EXPRESSED OR IMPLIED. BELKIN SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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

BELKIN IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO, LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE TO OR REPROGRAMMING OR REPRODUCING ANY PROGRAM OR DATA STORED IN, OR USED WITH, BELKIN PRODUCTS.

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



# BELKIN®

## Dual-Band Wireless A+G Notebook Network Card

# BELKIN®

[www.belkin.com](http://www.belkin.com)

### **Belkin Tech Support**

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Europe: 00 800 223 55 460

Australia: 1800 235 546

New Zealand: 0800 235 546

Singapore: 800 616 1790

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