

Belkin

Wireless G PCI Network Adapter

User Manual

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Introduction

Thank you for purchasing the Belkin Wireless G Desktop Card (the Card). Now you can take advantage of this great new technology and gain the freedom to network your home and office computers wirelessly. This Card allows you to connect a desktop computer to your network. The easy installation and setup will have you networking wirelessly in minutes. Please be sure to read through this User Manual completely, and pay special attention to the section entitled "Placement of your Wireless Networking Hardware for Optimal Performance" on page 2.

Benefits of a Home Network

Your Belkin Home Network will allow you to:

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

Advantages of a Wireless Network

Here are some of the advantages of setting up a Belkin wireless network:

- **Mobility** –you'll no longer need a dedicated "computer room"— now you can work on a networked laptop or desktop computer anywhere within your wireless range
- **Easy installation** – Belkin Easy Installation Wizards make setup simple
- **Flexibility** – set up and access printers, computers, and other networking devices from anywhere in your home
- **Easy expansion** – the wide range of Belkin networking products lets 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 wireless router (or access point). Typical indoor operating range for your wireless devices is between 100 and 200 feet. In the same way, your wireless connection

and performance will degrade somewhat as the distance between your wireless router (or access point) and connected devices increases. This may or may not be noticeable to you. As you move farther from your wireless router (or access point), connection speed may decrease. Factors that can weaken signals simply by getting in the way of your network's radio waves are metal appliances or obstructions, and walls.

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

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

1. Placement of your Wireless Router (or Access Point)

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

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

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

2. Avoid Obstacles and Interference

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

- Refrigerators

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

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

3. Cordless Phone Placement

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

- Try moving cordless phones away from the wireless router (or access point) and your wireless-enabled computers.
- Unplug and remove the battery from any cordless phone that operates on the 2.4GHz band (check 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 farthest 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. (Your channel selection will vary depending on your region.) 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 Networking Utility to locate any other wireless networks, and move your wireless router (or access point) and computers to a channel as far away from other networks as possible.

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

For more Belkin wireless networking products, use the detailed Site Survey and wireless channel information included in your User Manual.

5. Secure Connections, VPNs, and AOL

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

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

- Many commercial websites 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 re-running the VPN or AOL software, or by re-logging into the secure website.

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

If you continue to have difficulty with Secure Connections, VPNs, and AOL, please review steps 1–4 above to be sure you have addressed these issues.

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

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

Overview

Product Features

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

- 2.4GHz ISM (Industrial, Science, and Medical) band operation
- Integrated easy-to-use Wireless Networking Utility
- PCI interface, for operation in virtually any desktop computer
- WPA, WPA2, 64-bit WEP (Wired Equivalent Privacy), or 128-bit encryption
- Wireless access to networked resources

- Support for both Infrastructure and Ad-Hoc (peer-to-peer) networking modes
- Data rate of up to 54Mbps (802.11g), or 11Mbps (802.11b)
- Easy installation and use
- External antenna
- LED power and network link indicators

Applications and Advantages

- **Wireless roaming with a laptop around the home or office**

Offers the freedom of networking—without cables

- **Connection rates of up to 54Mbps**

Provides immediate wireless connectivity at home, work, and hotspot locations without compromising the use of existing 802.11b and 802.11g products

- **Compatibility with 802.11b products**

802.11g wireless LAN solutions are backward-compatible with existing Wi-Fi (IEEE 802.11b) products and with other products that display the 54g logo

- **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, which need networks on a short-term basis; also companies who need additional workstations for a peak activity period

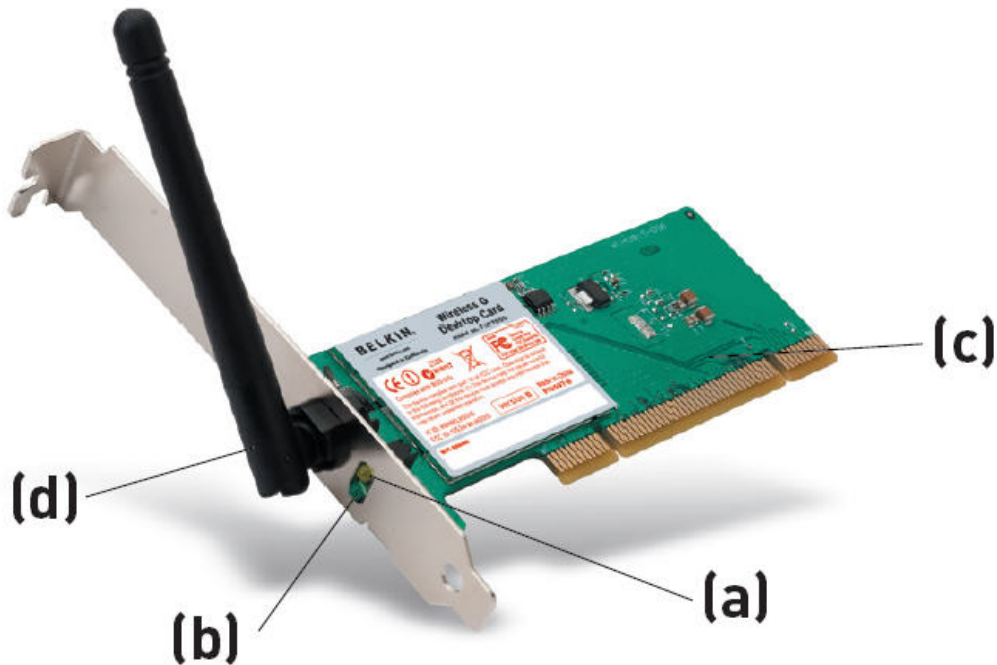
- **SOHO (Small Office/Home Office) networking needs**

Provides the easy and quick, small network installation SOHO users need

Product Specifications

Host Interface:	32-bit PCI interface
Power Consumption:	Tx/Rx peak 510/250mA @ 3.3VDC (max.)
Operating Temperature:	32–140 degrees F (0–60 degrees C)
Storage Temperature:	-4–176 degrees F (-20–80 degrees C)
Humidity:	Max. 90% (non-condensing)
Typical Operating Range:	100–200 ft. (30–60m) indoors

[insert F5D7000v8-23.jpg]



(Designer we need a new image)

(a) Link LED

Lights up when the Card links to a wireless network

(b) Activity LED

Lights up and flashes when the Card is active

(c) Card Connector

Fits securely into your computer's PCI slot

(d) Antenna

System Requirements

- PC-compatible desktop computer with one available PCI slot and CD-ROM drive
- Windows[®] 2000, XP, or Vista[™]

Package Contents

- Wireless G Desktop Card
- Quick Installation Guide
- Installation Software CD
- User Manual

Installing and Setting up the Card

For users of Windows Vista, refer to the following installation steps:

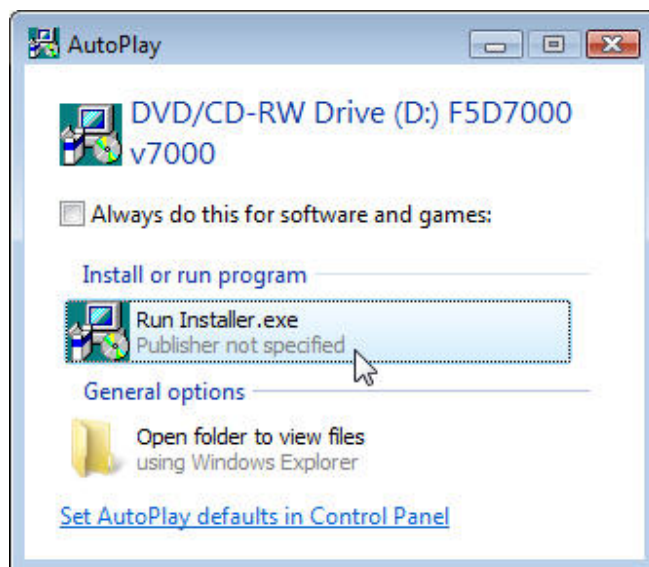
1A Install

IMPORTANT: INSTALL THE SOFTWARE BEFORE INSERTING THE CARD.

1A.1 Insert the Installation Software CD into your CD-ROM drive.

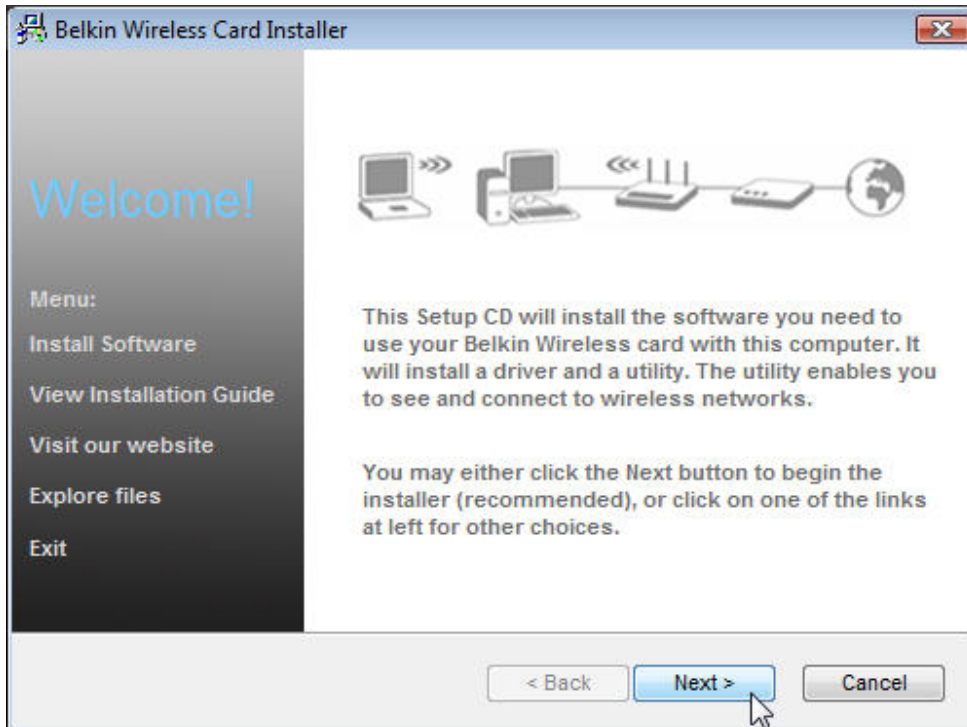
1A.2 Select the “Run Installer.exe” option.

[***Insert screen shot***]

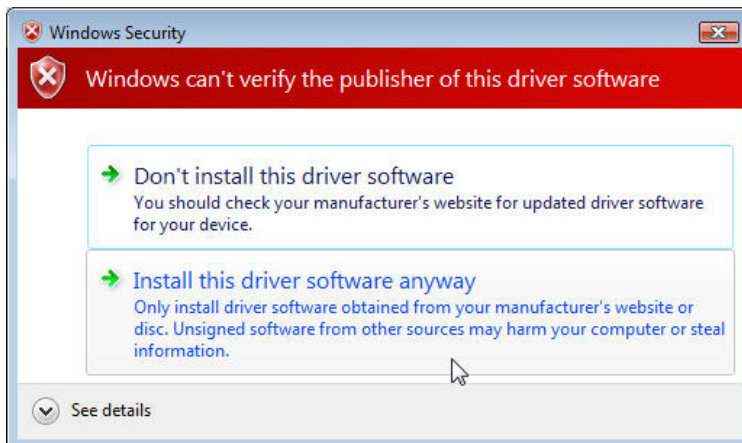


1A.3 You may see a window titled, “A program needs your permission to continue”. Click “Continue”.

1A.4 Click “Next” to begin the installation process. [Insert screen shot]

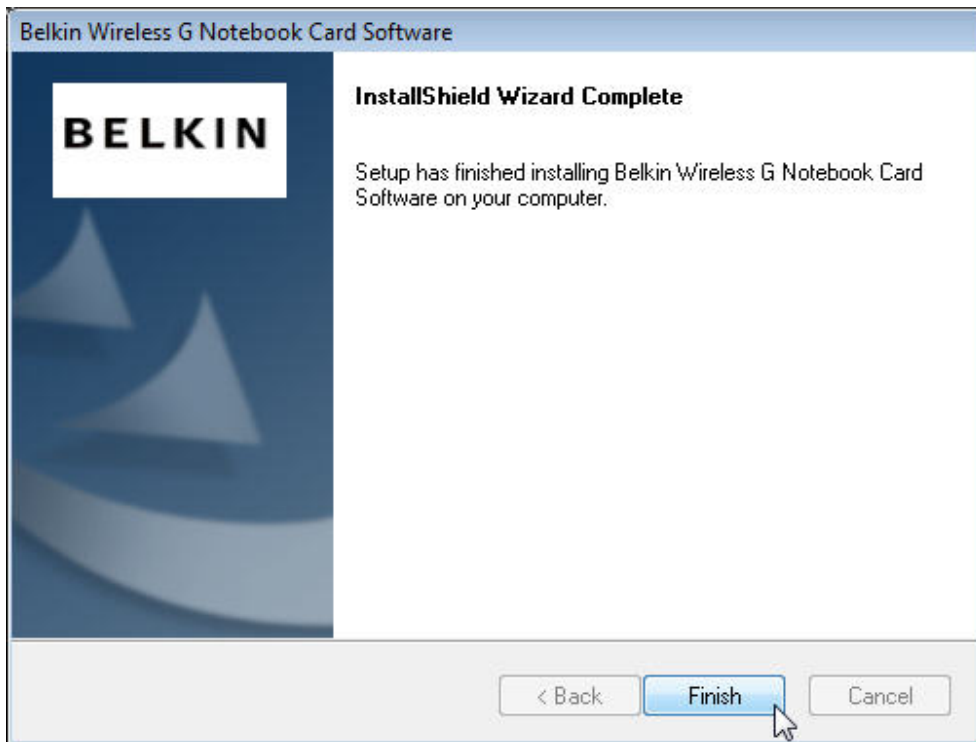


1A.5 A window may appear with the message, “Windows can’t verify the publisher of this driver software” across the top. This is normal and does not indicate a problem. Our software has been fully tested and is compatible with this operating system. (Insert screen shot)

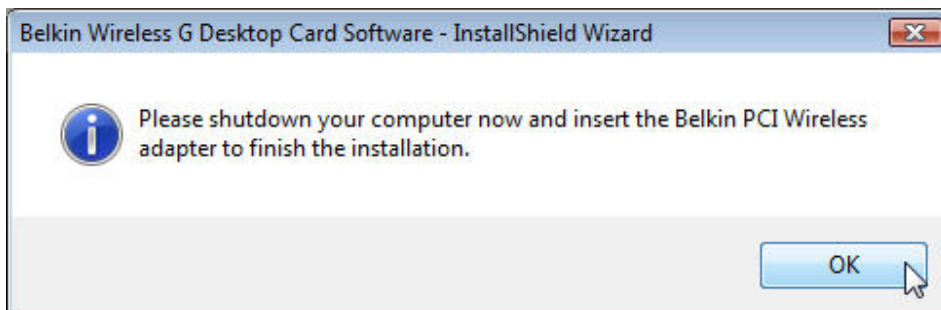


1A.6 When the installation completes, click on “Finish”. (Insert screen shot)

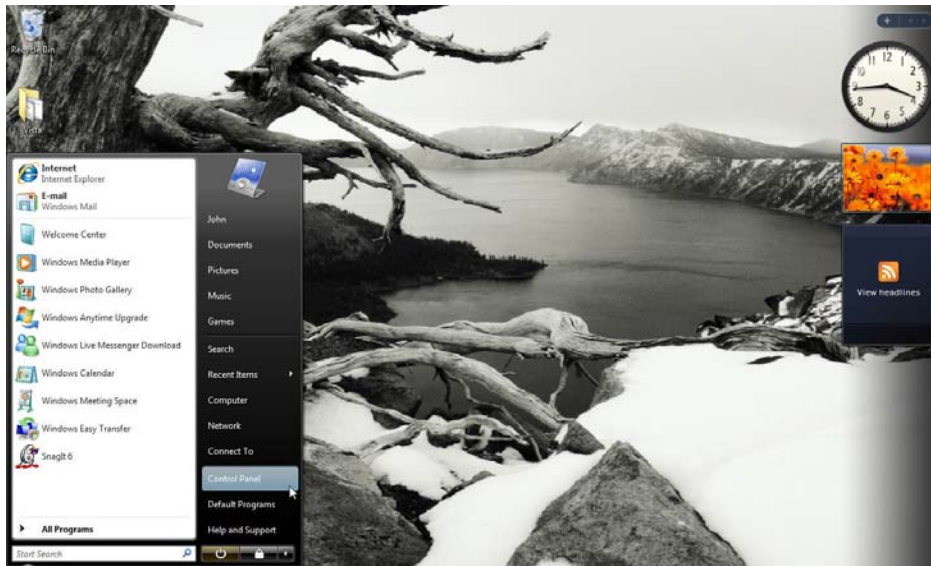
[Designer: pls photoshop “Desktop” over “Notebook” in image below]



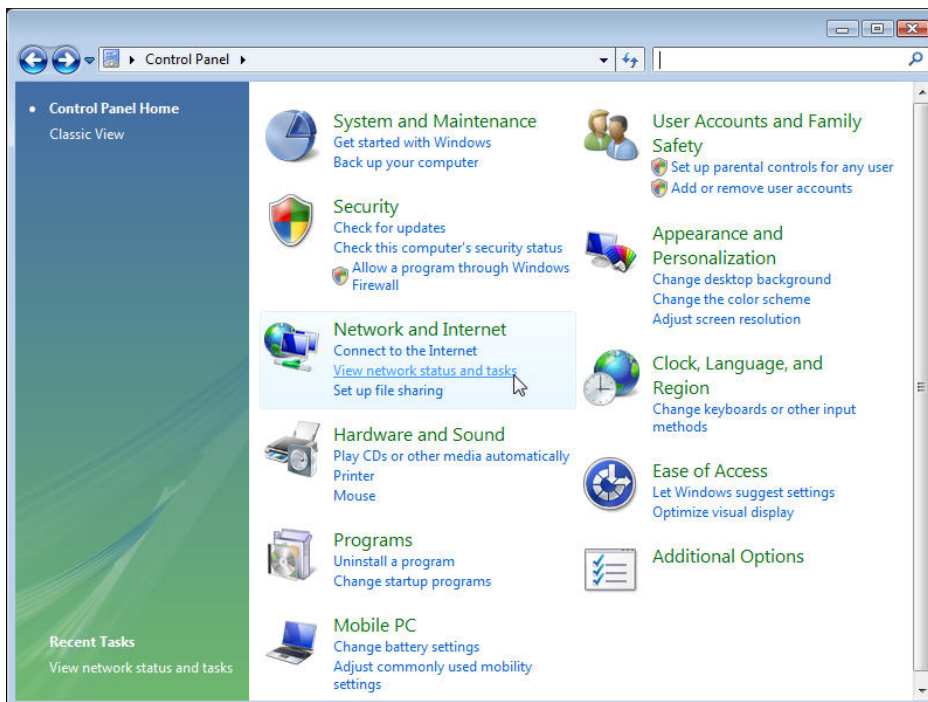
1A.7 When prompted, turn off your computer and plug in your Card. Your installation is now complete. (Insert screen shot)



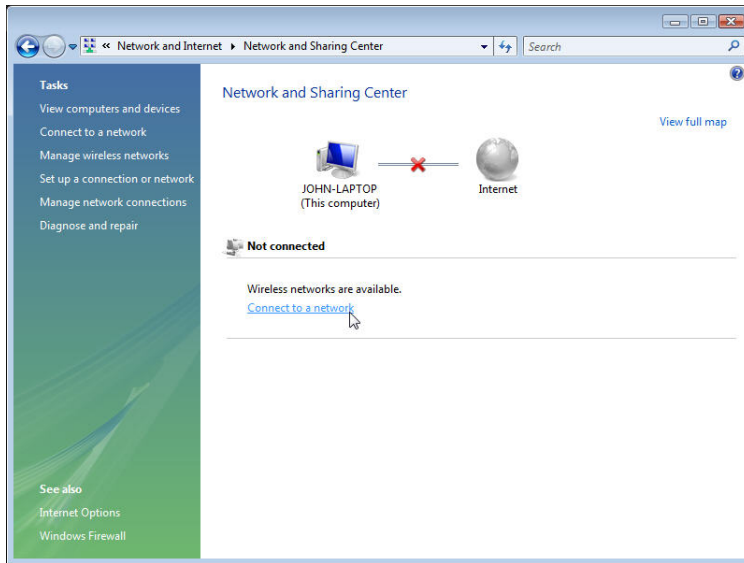
1A.8 To connect to the Internet, open the Network and Sharing Center by first opening the Control Panel from the "Start" menu. (Insert screen shot)



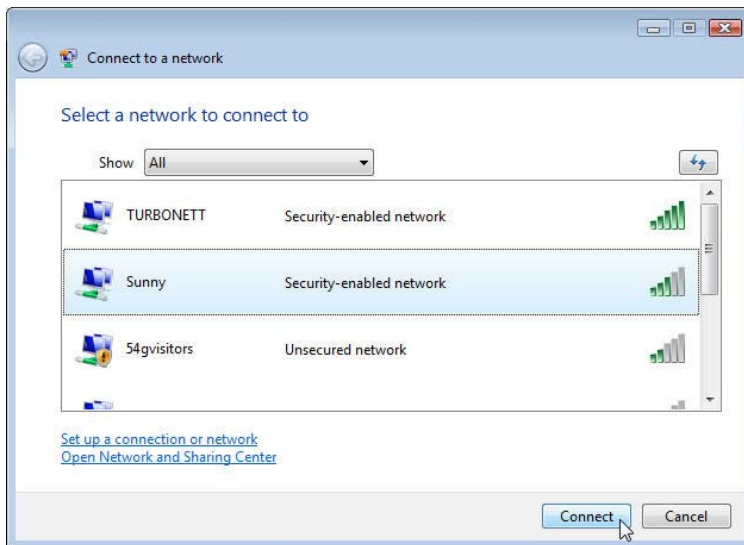
1A.9 In the Control Panel, click on “View network status and tasks”.
(Insert screen shot)



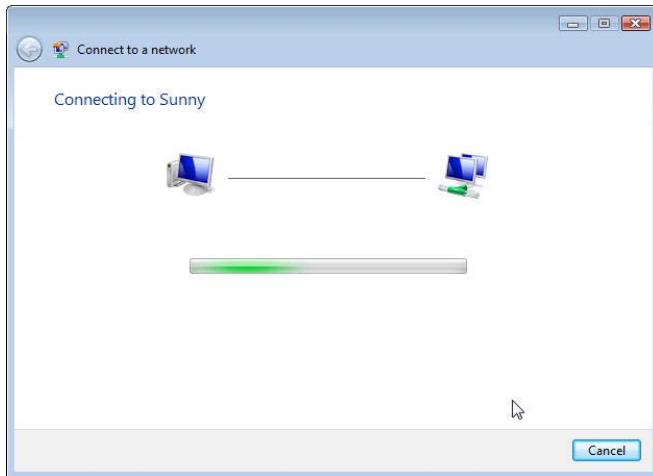
1A.10 In the Network and Sharing Center, click on “Connect to a network”.
(Insert screen shot)



1A.11 Select an available wireless network and click “Connect”. (Insert screen shot)



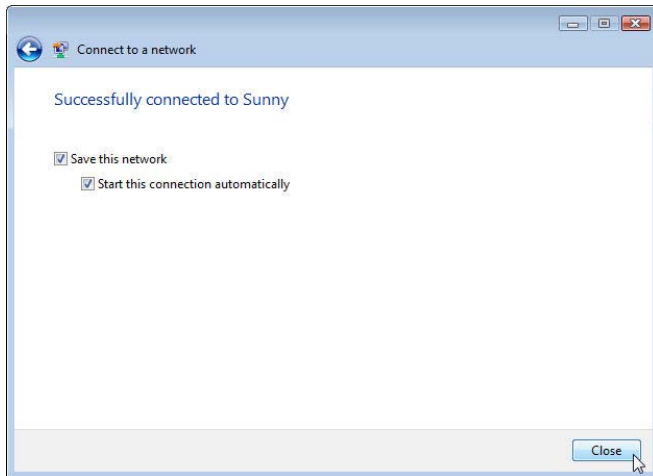
1A.12 Your Card will attempt to connect to the selected network. (Insert screen shot)



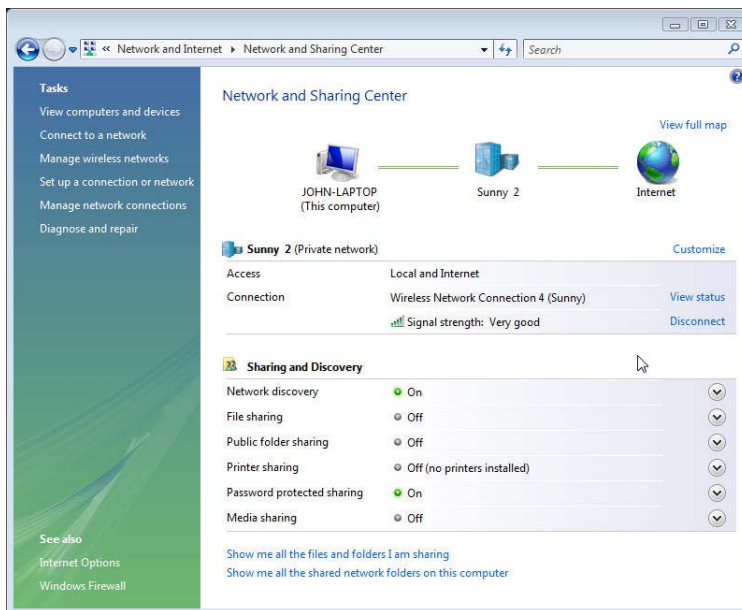
1A.13 Depending on the security settings of your wireless network, you may be prompted to enter in a network security key or a passphrase. Click "Connect" after you have done so. (Insert screen shot)



1A.14 After connecting to the network, you may choose to save this network and connect automatically once your Card is in range. (Insert screen shot)



1A.15 The Network and Sharing Center should now show the network connection that you have just made. The links on the left of the window allow you to configure your network connections. (Insert screen shot)



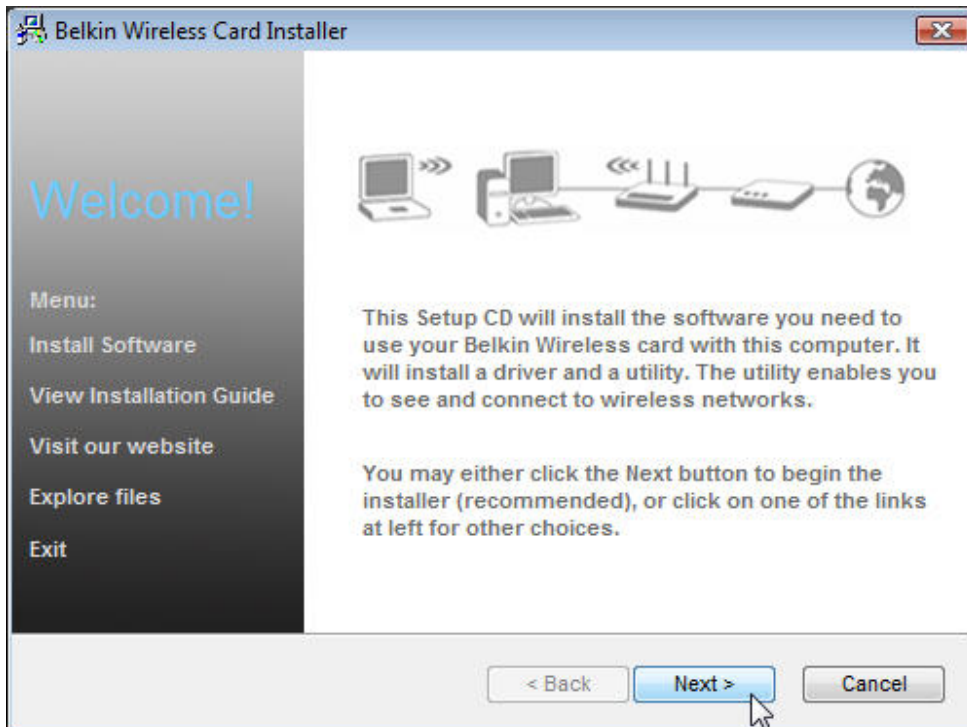
For users of other Windows operating systems, refer to the installation instructions below.

1B Install

IMPORTANT: INSTALL THE SOFTWARE BEFORE INSERTING THE CARD.

1B.1 Insert the Installation Software CD into your CD-ROM drive.

1B.2 The Belkin Wireless Card Installer screen will automatically appear. (This may take 15–20 seconds.) Click “install” to start the installation. ** Insert Screen shot



Note: If the Belkin Wireless Networking Utility screen does not appear within 20 seconds, access your CD-ROM by double-clicking on the “My Computer” icon; then, double-click on the CD-ROM drive into which the installation CD has been placed. Double-click on the folder named “Files”, then double-click on the icon named “setup.exe”.

1B.3 The first in a series of progress-monitoring screens will let you know where you are in the setup process.

1B.4 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.



1B.5 Once the software is installed, you will be prompted to shut down your computer. Click "Yes".

2. Insert

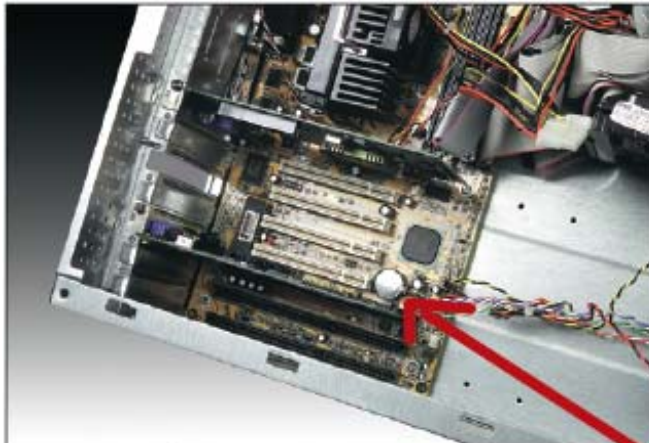
Insert the Card into an Available PCI Slot on your Desktop Computer

2.1 Shut down your computer and disconnect your power cord.

2.2 Remove the screws behind your computer case that secure the computer cover and remove cover.

Note: Touch any metal part of the case to discharge static electricity to avoid damage to the product or your computer.

2.3 Locate an empty PCI expansion slot. It is usually white in color. Confirm that the Card will fit into the slot you have chosen. Keep in mind that the included antenna needs to be oriented with the top pointing up. If there are cables and other connectors in the way, try to pick the PCI slot that has the fewest obstructions to the correct positioning of the antenna.



2.4 Remove the metal port cover from the back of the computer that corresponds to the PCI slot you selected. If there is a screw, place it in a safe place, as you will be using it to attach the Card to the computer later.



2.5 Push the Card firmly into the PCI slot that you have chosen. Apply pressure as needed until the connector is fully seated.

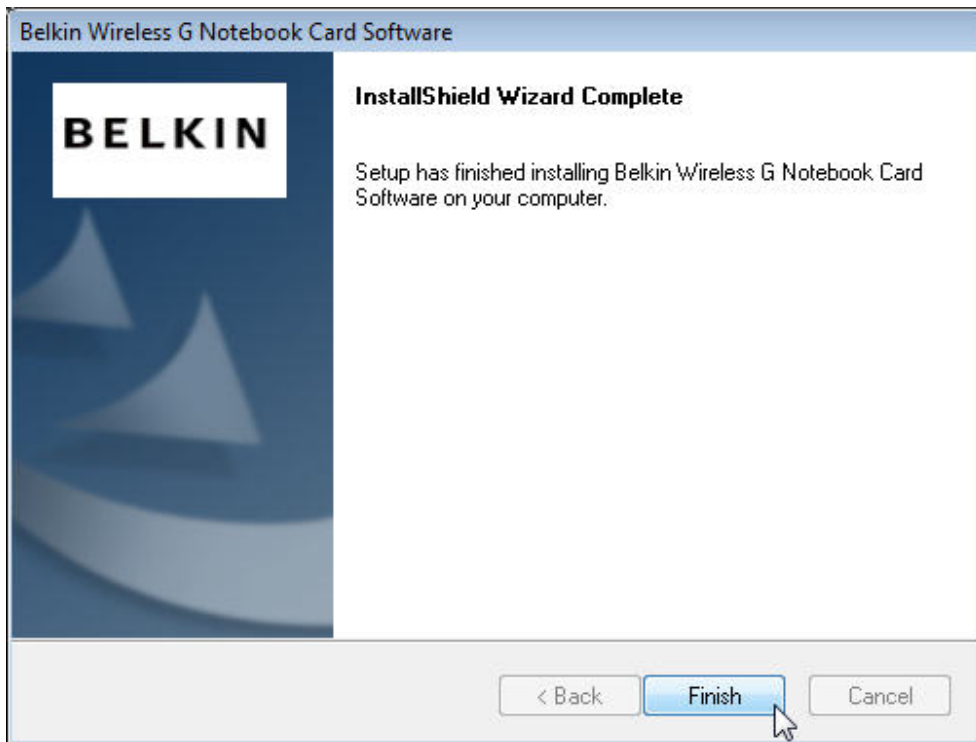


2.6 Now secure the Card with the screw that you previously placed in a safe place.

2.7 Carefully screw the antenna onto the threaded connector on the Card. Turn the antenna until it is vertical and pointing up.

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

2.9 The Belkin Wireless Networking Utility installation is now complete. Click "Finish" to close the Wizard and restart your computer.



3. Configure Connect to a Network

3.1 After restarting your computer, double-click the Belkin Wireless Networking Utility icon located on the desktop screen.

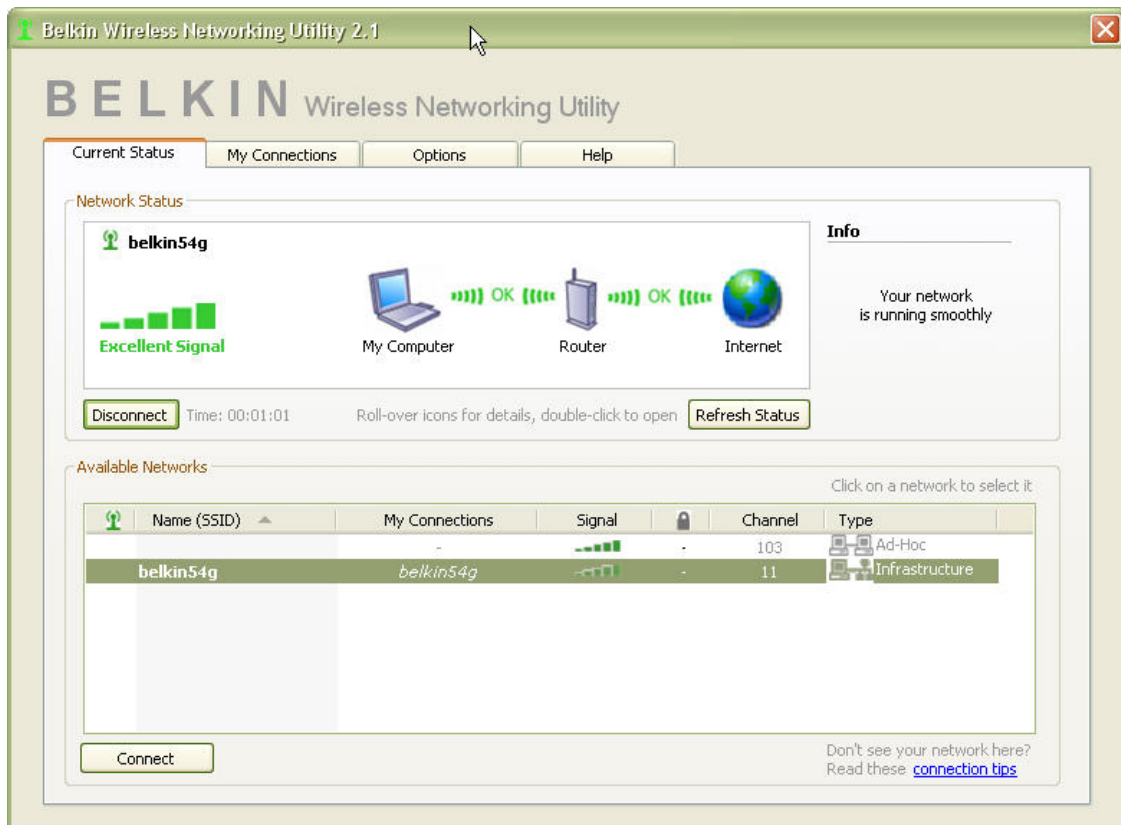
[insert F5D7000v8 QIG 06.jpg]



3.2 The Wireless Networking Utility screen will appear.

Select a network to connect to by selecting a network from the "Available Networks" list. Then, click "Connect".

[insert F5D7000v8 QIG 09.jpg]



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

3.3 The Belkin Wireless Networking Utility icon can also be found on the system tray.

[insert F5D7000v8 QIG 10.jpg]



Note: Double-clicking on the Belkin Wireless Networking Utility icon on the system tray will bring up the “Utility” screen.

Installation is now complete.

Using the Belkin Wireless Networking Utility

After successfully installing the Belkin Wireless Networking Utility (WNU), configurations for wireless connection and security are just a few easy clicks away.

Accessing the Belkin Wireless Networking Utility from the Windows System Tray

To access the WNU, simply place your mouse pointer and right-click over the WNU icon on the Windows system tray on the lower right-hand corner of your computer's desktop.

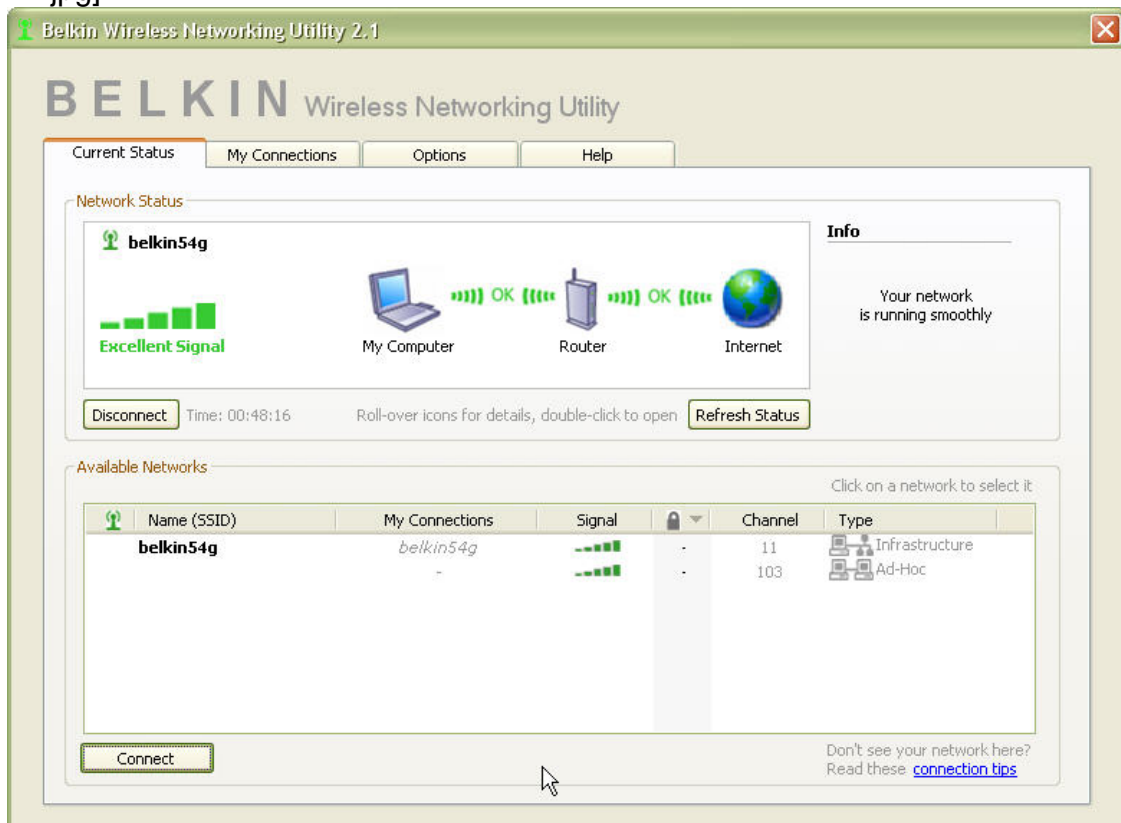
[insert F5D7000v8-10.jpg]

[insert F5D7000v8-11.jpg]



If the icon is not present, click on "Start > Programs > Belkin > Wireless Networking Utility".

[insert F5D7000v8
22.jpg]



The WNU's default screen is the "Current Status" tab. The "Current Status" tab displays the current network status and available networks.

Network Status

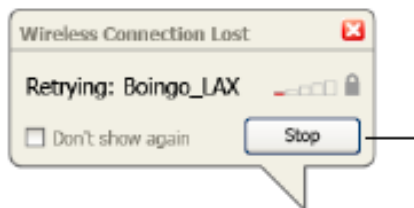
This window displays the connectivity status of the current network, between the computer and router, and between the router and the Internet. In the event of a problem, use the "Network Status" window to determine the source (e.g., computer, router, or Internet/modem).

Available Networks

This window displays the available networks at the current location as well as their SSID, Signal Strength, Security Type, Channel, and Network Type.

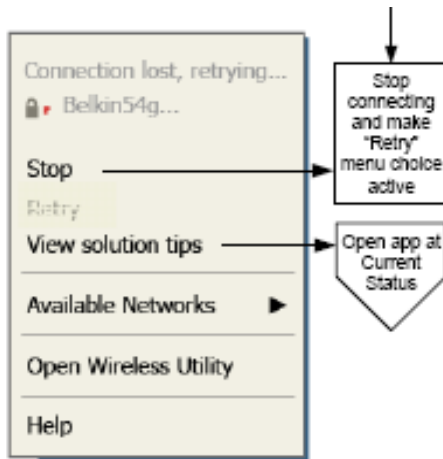
Lost Wireless Connection

If the current wireless connection is lost, a window will pop up and the WNU will attempt to reconnect.



Connection Failure

Other options will appear during attempts to reconnect. To stop connecting, click "Stop" and to reattempt connection, click "Retry".

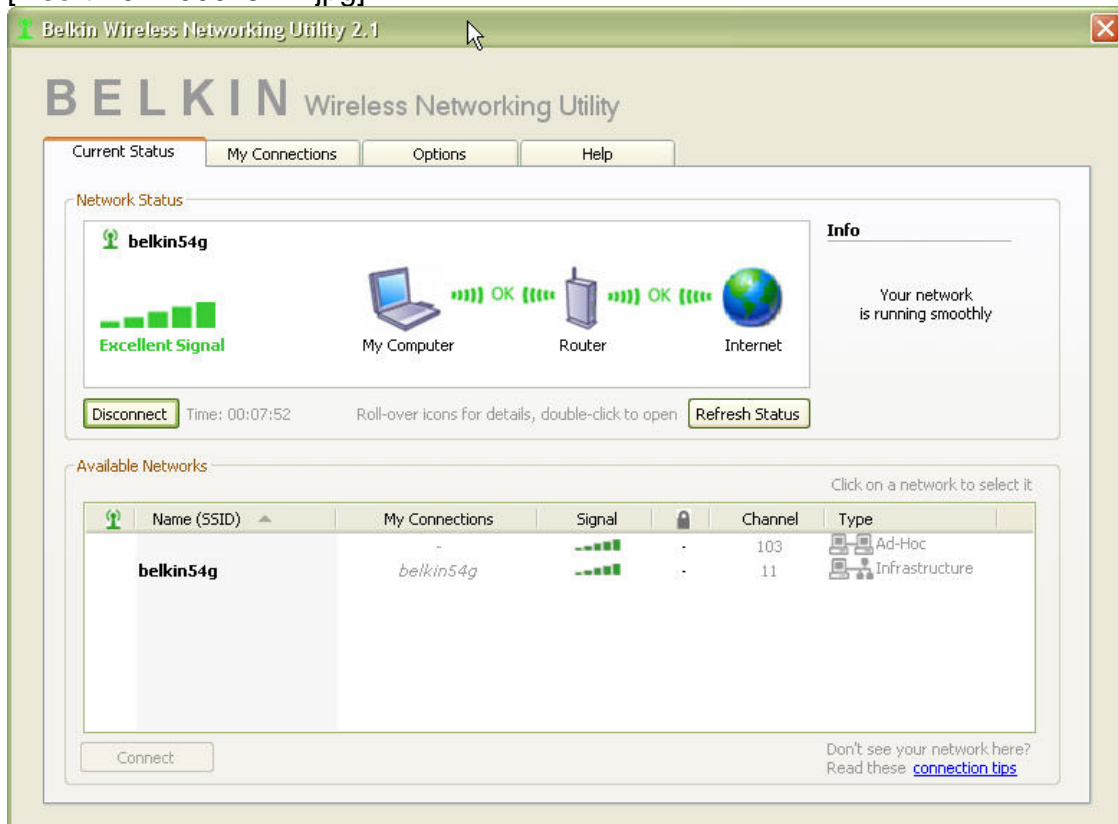


Right-Click during connection failure

Network Status and Solution Tips

To further understand the current Network Status, click "Open Wireless Utility". The default screen will be the "Current Status" tab and the "Network Status" section determines which connections are good and/or faulty.

[insert F5D7000v8-12.jpg]

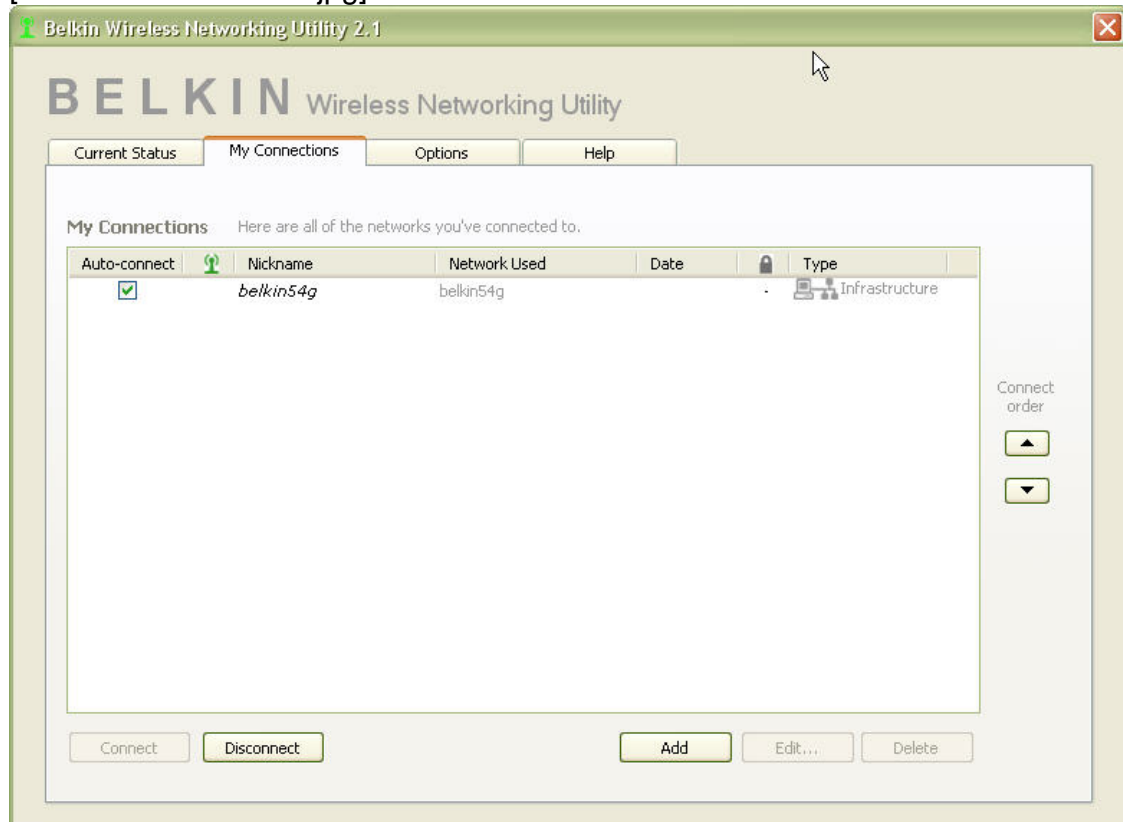


The WNU also features a “Solution Tips” section that provides troubleshooting guidelines.

Setting Wireless Network Profiles

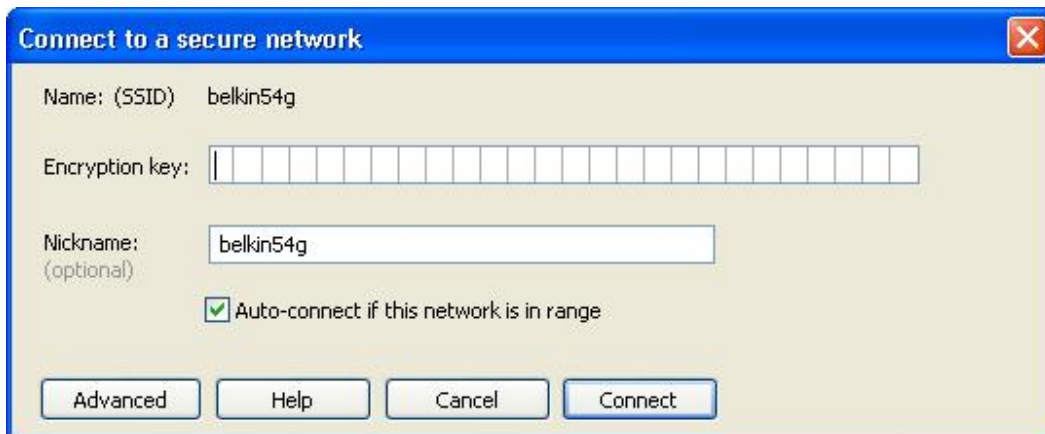
The “My Connections” tab on the WNU allows you to add, edit, and delete connection profiles. It also displays signal strength, security, and network type.

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Securing your Wi-Fi® Network

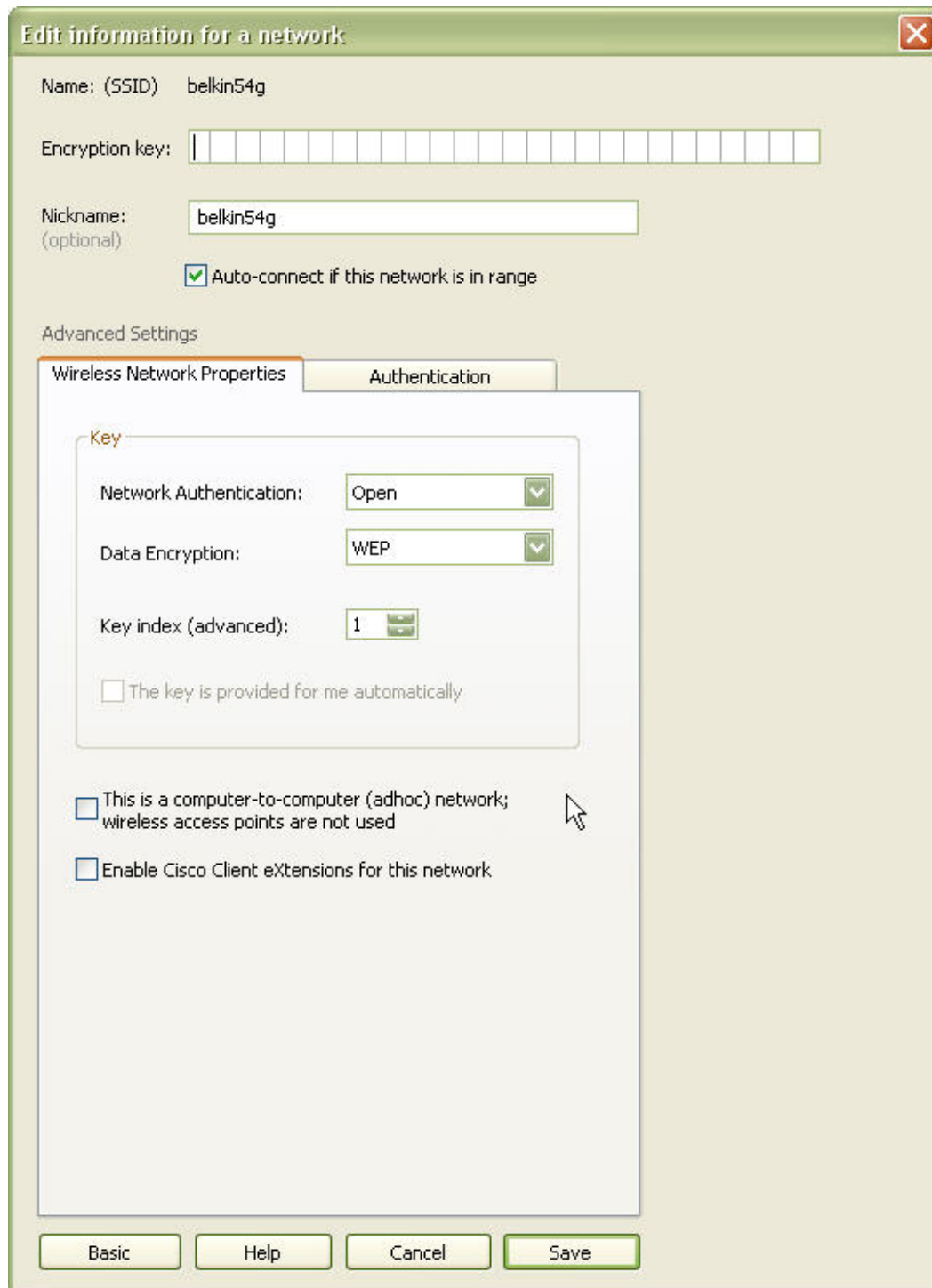
If you choose to connect to a secure network, determine the type of security (*WPA or WEP**) and use the appropriate field in the dialog box.



*Note: Types of security

Note: When you select a network using encryption, you will first see the simple security screen. Click the “Advanced” button to see other security options (below).

[insert F5D7000v8-14.jpg]



Wired Equivalent Privacy (WEP) is a less secure, but more widely adopted wireless security protocol. Depending on the security level (64- or 128-bit), the

user will be asked to input a 10- or 26-character hex key. A hex key is a combination of letters, a–f, and numbers, 0–9.

Wireless Protected Access (WPA) is the new standard in the wireless security. However, not all wireless cards and adapters support this technology. Please check your wireless adapter's user manual to check if it supports WPA. Instead of a hex key, WPA uses only passphrases, which are much easier to remember.

The following section, intended for the home, home office, and small office user, presents a few different ways to maximize the security of your wireless network.

At the time of publication, four Encryption Methods are available:

Encryption Methods:

Using the Belkin Wireless Networking Utility

Name	64-Bit Wired Equivalent Privacy	128-Bit Encryption	Wi-Fi Protected Access	Wi-Fi Protected Access 2
Acronym	64-bit WEP	128-bit	WPA-TKIP/AES	WPA2-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.

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 and 128-bit WEP encryption, but you might have older equipment that only supports 64-bit WEP. All Belkin wireless products will support both 64-bit and 128-bit WEP.

Encryption Keys

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

You can enter your key by typing in the hex key manually, or you can type a passphrase into the "Passphrase" field and click "Generate" to create a key. A hex (hexadecimal) key is a combination 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 WEP key

The WEP passphrase is NOT the same as a WEP key. Your Card uses this passphrase to generate your WEP keys, but different hardware manufacturers might have different methods on generating the keys. If you have multiple vendors' equipment in your network, the easiest thing to do is to use the hex WEP key from your wireless router (or access point) and enter it manually into the hex WEP key table in your Card's configuration screen.

WPA (Wi-Fi Protected Access)

WPA (Wi-Fi Protected Access) is a new Wi-Fi standard that improves upon the security features of WEP. To use WPA security, the drivers and software of your

wireless equipment must be upgraded to support it. These updates will be found on your wireless vendor's website. There are three types of WPA security: WPA-PSK (no server), WPA (with radius server), and WPA2

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) works best in a business environment, in which a radius server automatically distributes the network key to clients.

WPA2 requires Advanced Encryption Standard (AES) for encryption of data, which offers much greater security than WPA. WPA uses both Temporal Key Integrity Protocol (TKIP) and (AES) for encryption.

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

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

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

Diagram:

Network key=

MyPassword

Wireless G Desktop Card

Network key=

MyPassword

Wireless G Router

Network key=

MyPassword

Wireless G Notebook Card

Network key=

WRONG Password

Wireless G Desktop Card

The Card cannot access the network because it uses a different network key than the one configured on the wireless router.

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

Configuring your Belkin Wireless G Desktop Card to use Security

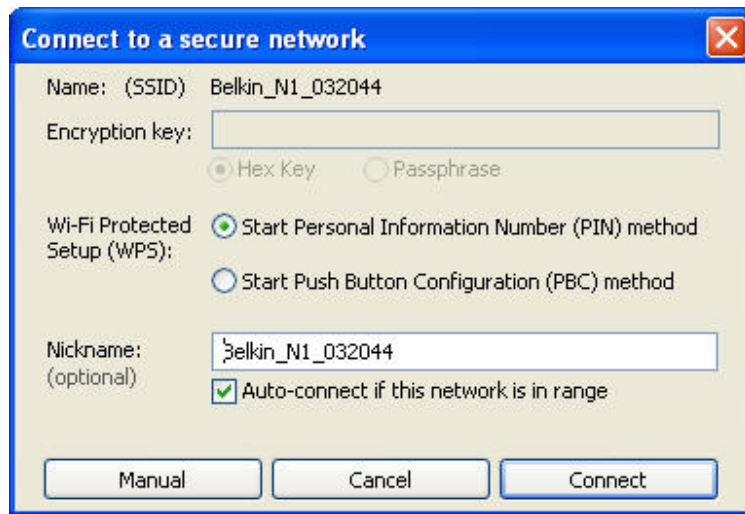
At this point, you should already have your wireless router (or access point) set to use WPA or WEP. In order for you to gain a wireless connection, you will need to set your Wireless G Desktop Card to use the same security settings.

Changing the Wireless Security Settings

Your Belkin wireless adapter is equipped with the latest security standard called Wi-Fi Protected Access 2 (WPA2™) and the legacy security standard called Wired Equivalent Privacy (WEP). It also supports the Wi-Fi Protected Setup (WPS) specification, which simplifies the setup of a wireless network. WPS uses familiar methodologies, such as typing in a Personal Identification Number (PIN) or pushing a button, to enable users to automatically configure network names and strong WPA/WPA2 data encryption and authentication.

Using Wi-Fi Protected Setup

1. Encryption key if not using WPS
2. Personal Identification Number (PIN) Method: In this method, your wireless adapter will generate a PIN to be entered into your router
3. Push Button Configuration (PBC) Method: Your wireless adapter can also connect by using the software push button.
4. Manual Configuration Method: This section lists the default security settings to be set up if not using WPS.



WPS uses WPA2 (described below) for encryption. It does not provide additional security, but rather, standardizes the method for securing your wireless network. On your client utility, WPS-enabled networks are denoted with the key icon. You may use either the Push Button Configuration (PBC) method or PIN method to allow a device access to your wireless network. Conceptually, the two methods work as follows:

PBC: Push and hold the WPS button located on the back of your router for three seconds. Then, initiate the WPS procedure on the client utility within two minutes. Select the network name in the utility and click "Connect". Your client will automatically exchange the security information and be added to your wireless network. The Push Button Configuration method can also be initiated from the client side.

PIN: Your client device has an eight digit PIN number that is associated with WPS. Select the WPS-enabled network and click "Connect" to start the WPS process. Choose the PIN method option and complete the WPS procedure on your router. The client will be automatically enrolled into your wireless network within two minutes.

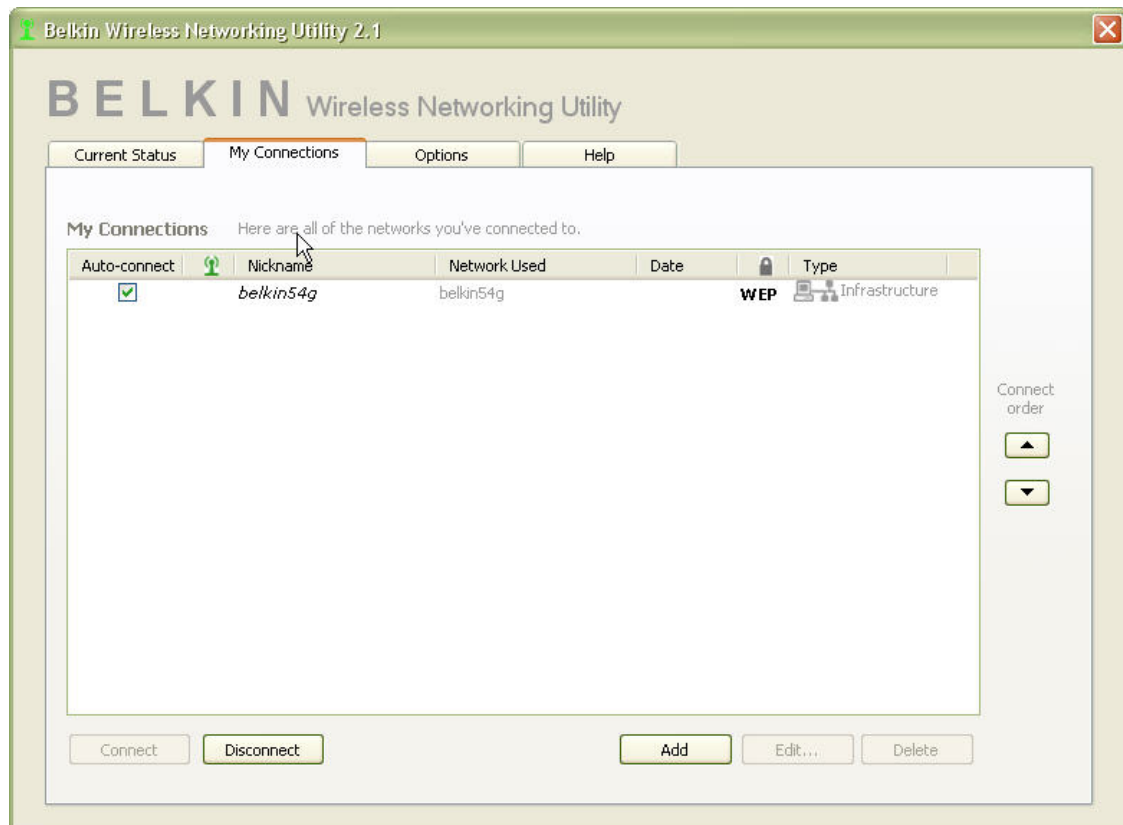
(insert WPS image)



The Belkin Wireless G Desktop Card supports the latest WPA security feature as well as the legacy WEP security standard. By default, wireless security is disabled.

To enable security, you will first need to determine which standard is used by the router or access point. (See your wireless router's or access point's manual for directions on how to access the security settings.)

[insert F5D7000v8-18.jpg]



To access the security settings on your Card, click the “My Connections” tab and point to the connection for which you want to change security settings. Click “Edit” to change settings.

WEP Setup

64-Bit WEP Encryption

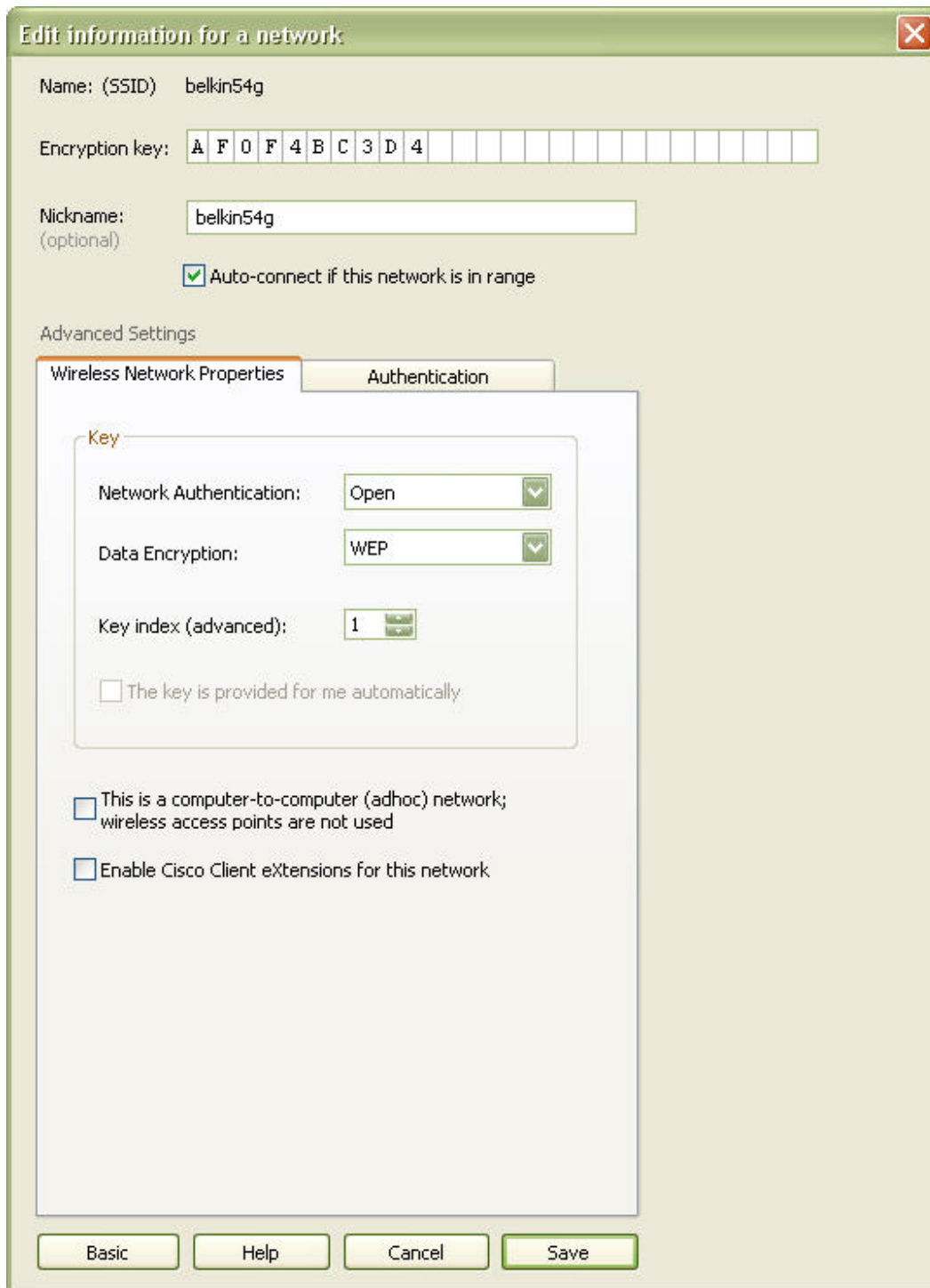
1. Select “WEP” from the drop-down menu.
2. After selecting your WEP encryption mode, you can enter your key by typing in the hex key manually, or you can type in a passphrase in the “Passphrase” field and click “Generate” to create a key.

A hex (hexadecimal) key is a combination 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

[insert F5D7000v8-15.jpg]



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

WARNING: If you are using a wireless client to turn on the security

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

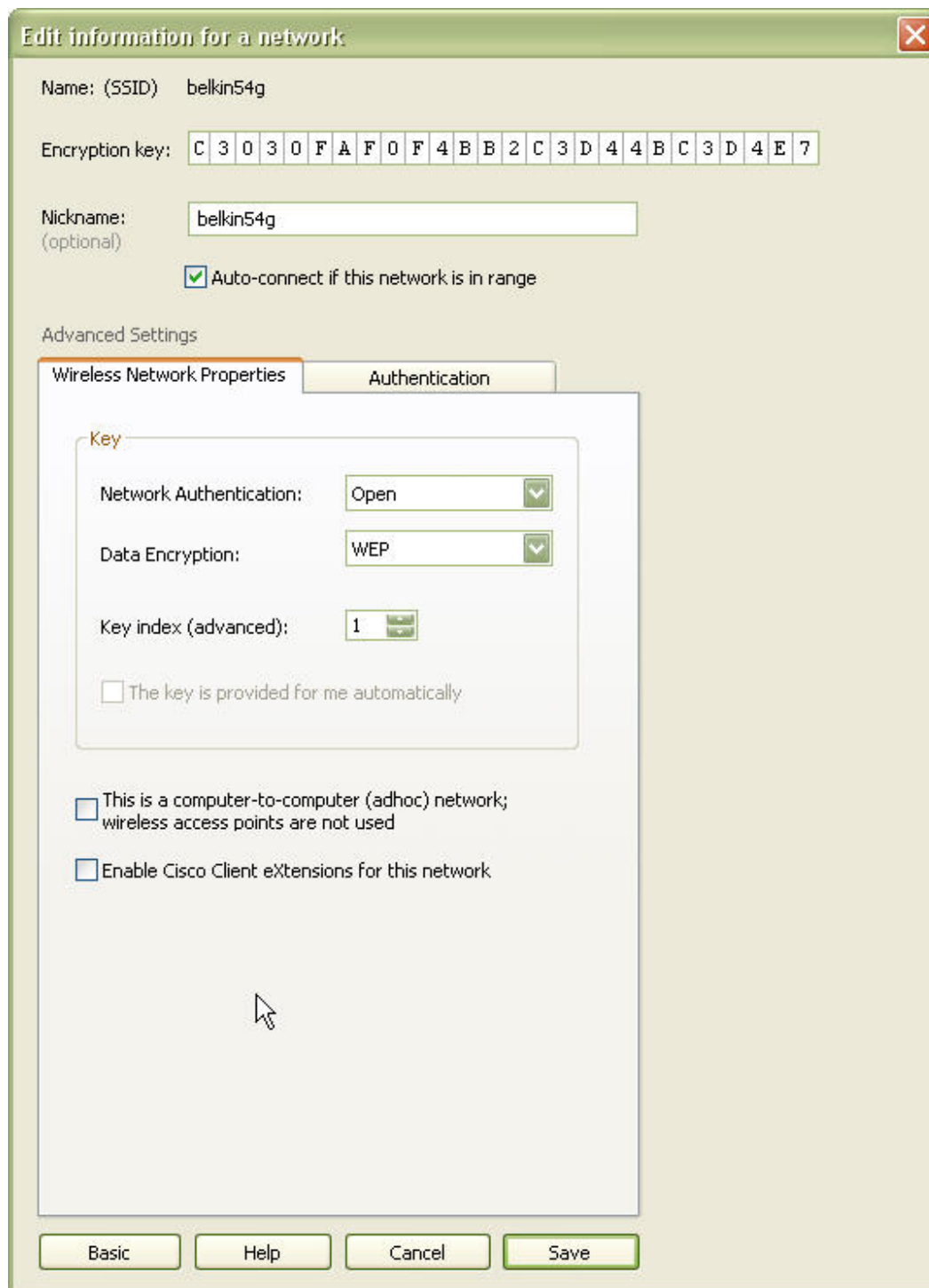
128-Bit WEP Encryption

1. Select "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 combination 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
[insert F5D7000v8-16.jpg]



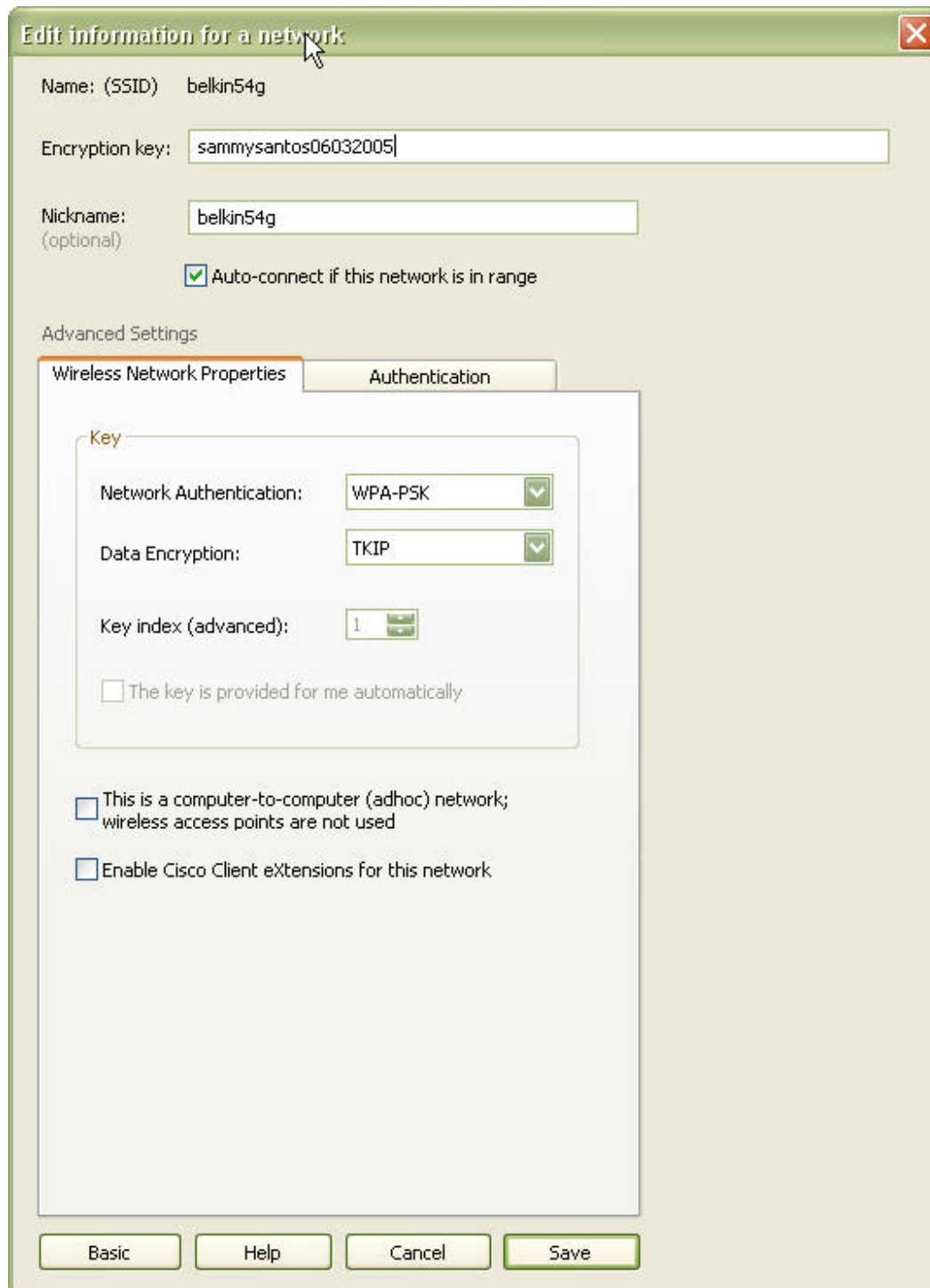
3. Click "Save" to finish. Encryption in the wireless router (or access point) is now set. Each of the computers on your wireless network will now need to be configured with the same security settings.

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.

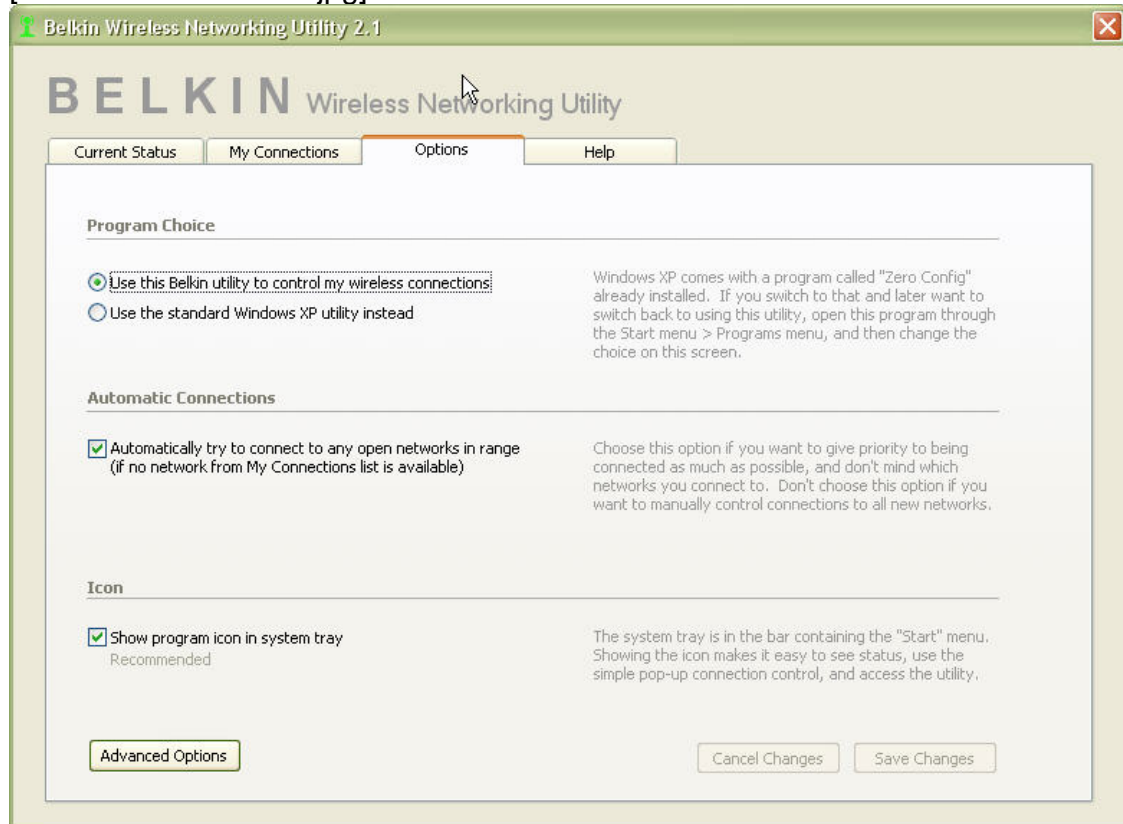
1. From the "Network Authentication" drop-down menu, select "WPA-PSK (no server)".
2. Enter your network key. This can be from eight to 63 characters and can be letters, numbers, or symbols. This same key must be used on all of the clients (network cards) that you want to include in your network.
[insert F5D7000v8-17.jpg]



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

Wireless Networking Utility Options

[insert F5D7000v8-19.jpg]

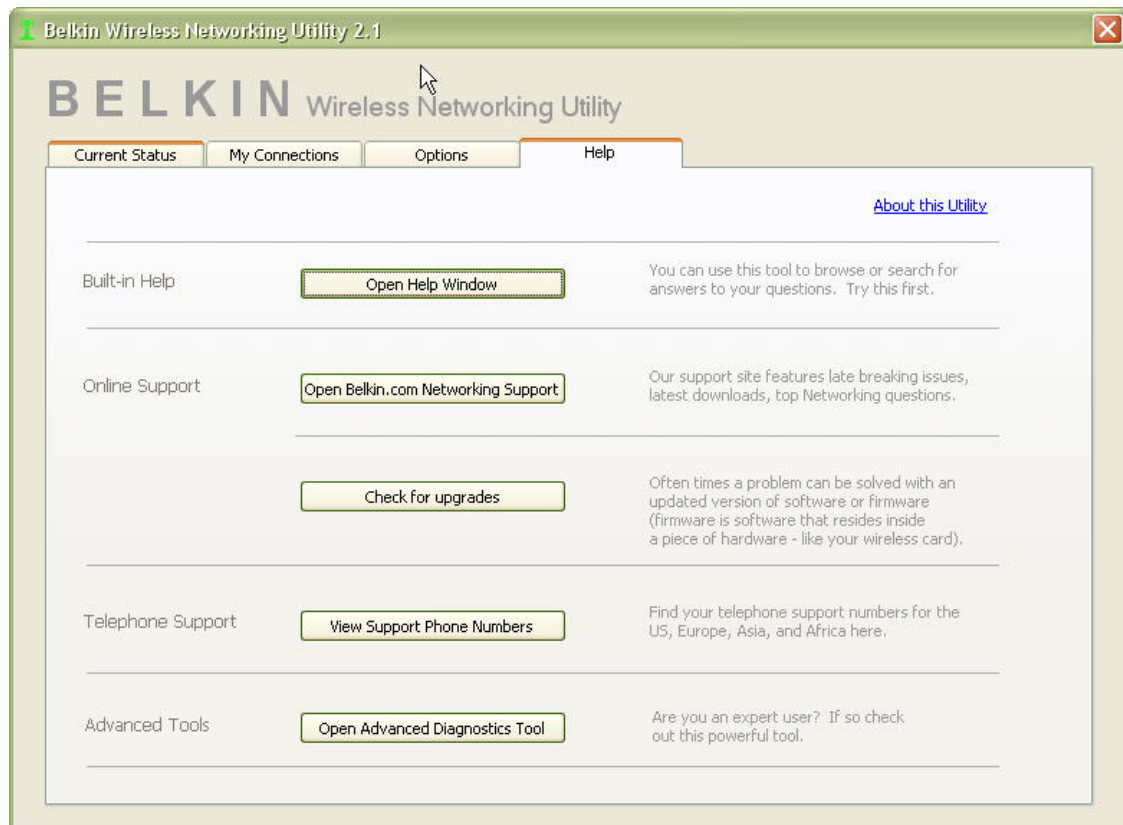


The “Options” tab on the WNU provides the user the ability to customize his or her WNU settings.

Wireless Networking Utility Help

The WNU “Help” tab provides users with access to online and telephone support, as well as advanced diagnostic tools.

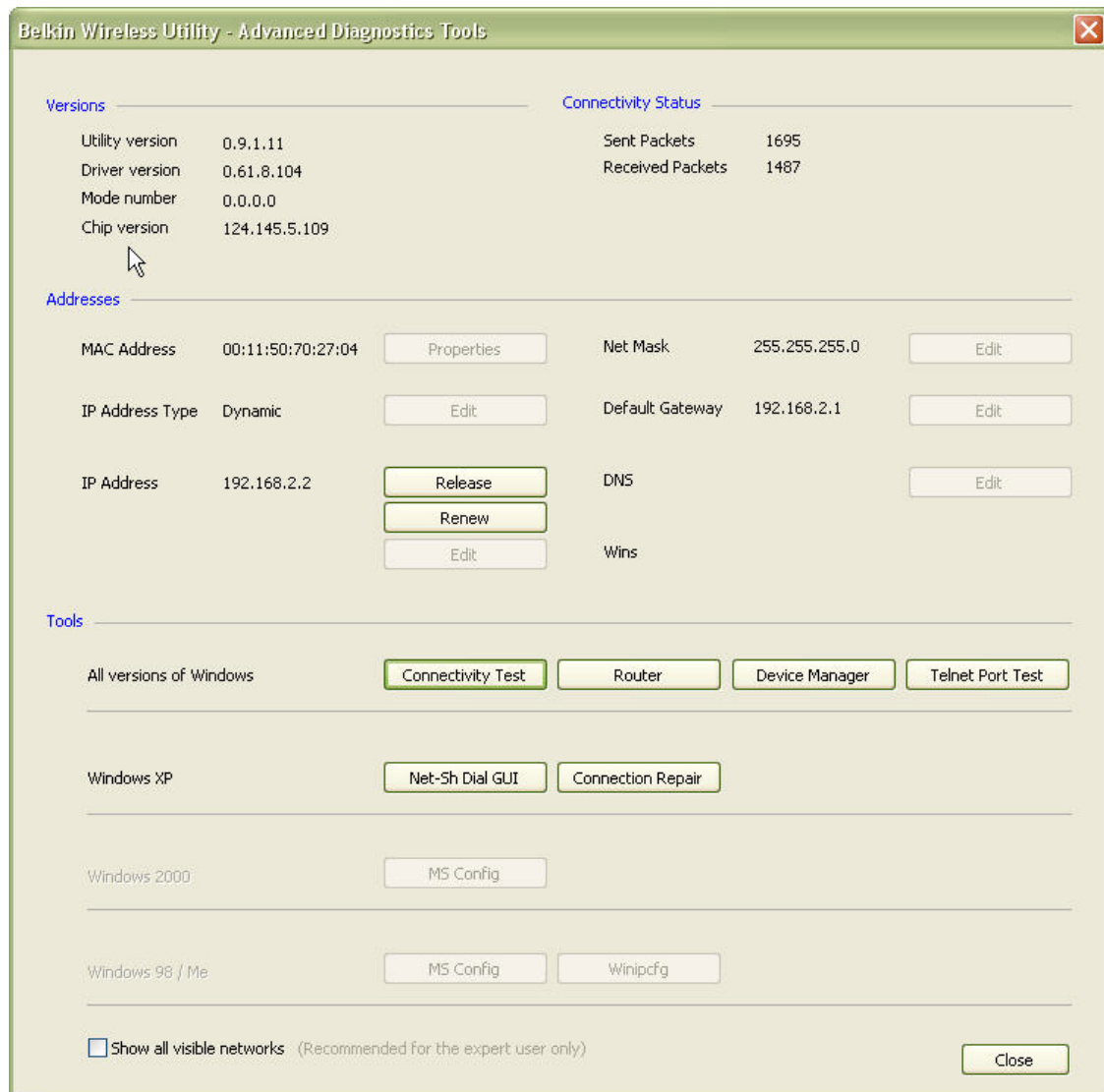
[insert F5D7000v8-20.jpg]



Advanced Diagnostic Tools

The “Advanced Diagnostic Tools” section is the central control panel for all the settings of the hardware and software components of the wireless network. It provides an array of tests and connectivity services to ensure optimal network performance.

[insert F5D7000v8-21.jpg]



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 match these descriptions, go to number 2, below.

If this is NOT the case, 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 Networking Utility software by clicking on the icon in the system tray at the bottom right-hand corner of the screen. If you’re using a Belkin Wireless Card, the tray icon should look like this (the icon may be red or green):

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

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

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

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

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

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

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

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

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

If the correct network name is not listed under “Available Networks” in the Wireless Networking Utility, please attempt the following troubleshooting steps:

1. Temporarily move computer, if possible, to five to 10 feet away from the Wireless Router (or Access Point). Close the Wireless Networking Utility, and reopen it. If the correct network name now appears under “Available Networks”, you may have a range or interference problem. Please see the suggestions listed in the “Placement of your Wireless Networking Hardware for Optimal Performance” section on page 2.
2. Using a computer that is connected to the Wireless Router (or Access Point) via a network cable (as opposed to wirelessly), ensure that “Broadcast SSID” is enabled. This setting is found on the Router’s wireless “Channel and SSID” configuration page. For detailed instructions on accessing this page and changing settings, please see your Wireless Router’s (or Access Point’s) User Manual.

If you are still unable to access the Internet after completing these steps, please contact Belkin Technical Support.

Installation CD-ROM does not start Wireless Networking Utility.

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

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

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

If the LED indicators are not ON, the problem may be that the Card is not connected or installed properly.

Verify that the Card is plugged firmly into the PCI slot of your computer. Check to see that the drivers for the Card have been installed. Right-click on the “My Computer” icon on your desktop. Choose “Properties” and navigate to the “Device Manager” and see if your Card is listed without any errors. If an error is indicated, contact Belkin Technical Support.

Link LED is blinking slowly; cannot connect to a wireless network or the Internet.

If your Card appears to be functioning properly, but you cannot connect to a network or you have a red wireless icon at the bottom of your screen, the

problem may be that there is a mismatch between the network name (SSID) settings in your wireless network properties.

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

Note: To check the SSID settings or look for an available network, double-click the Signal Indicator icon to bring up the “Wireless Networks” screen. Click “Add” if you do not see the network you are trying to connect to and type in the SSID.

For more information about setting up an SSID, please refer to your router manufacturer’s user manual.

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

Link LED is solid but I cannot connect to the Internet.

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

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

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

Data transfer is sometimes slow.

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

In order to determine if wireless issues are related to range, we suggest temporarily moving the computer, if possible, to five to 10 feet away from the wireless router (or access point). Please see the section titled “Placement of your Wireless Networking Hardware for Optimal Performance” in this 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 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). Please see the section titled "Placement of your Wireless Networking Hardware for Optimal Performance" in this manual.

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

Why are there two wireless utilities in my system tray? Which one should I use?

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

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

Step 1 Right-click on the network status icon in the system tray and select "View Available Wireless Networks".

Step 2 Click on the "Advanced" button in the lower left-hand 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 Networking Utility to configure the Card.

The Card is not detected by operating system.

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

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

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

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 for certifying network standards. The most common wireless networking standard, 802.11b, transmits information at 11Mbps; 802.11a and 802.11g work at 54Mbps; and Pre-N works at 108Mbps. Pre-N, the precursor to the upcoming 802.11n release, promises speeds that exceed 802.11g, and up to twice the wireless coverage area. See the following chart for more detailed information.

Wireless Comparison Chart

Wireless Technology	802.11b	802.11g	802.11a	Belkin Pre-N
Speed	11Mbps	54Mbps	54Mbps	600% faster than standard 802.11g*
Frequency	Common household devices such as	Common household devices such as	5GHz—uncrowded band	Common household devices such as

	cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz	cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz		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	Interference range is typically 50–100 ft.	Up to 800% wider coverage than standard 802.11g*
Advantage	Mature—legacy technology	Common—widespread use for Internet sharing	Less interference—great for multimedia application	Leading edge—best coverage and throughput

*Distance and connection speeds will vary depending on your networking environment.

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

UK: 0845 607 77 87

Australia: 1800 235 546

New Zealand: 0800 235 546

Singapore: 800 616 1790

Europe: www.belkin.com/support

Information

Wi-Fi® Interoperability Certificate

FCC Statement

DECLARATION OF CONFORMITY WITH FCC RULES

FOR ELECTROMAGNETIC COMPATIBILITY

We, Belkin International, Inc., of 501 West Walnut Street, Compton, CA 90220, declare under our sole responsibility that the product, F5D7000v8,

This device 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.

Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communications Commission Notice

IEEE 802.11b or 11g or 11n operation of this product in the U.S.A is firmware-limited to channels 1 through 11. 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, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try 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.

FCC Statement

Modifications

The FCC requires the user to be notified that any changes or modifications to this device that are not expressly approved by Belkin International, Inc., may void

the user's authority to operate the equipment.

Canada-Industry Canada (IC)

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that permitted for successful communication.

This device has been designed to operate with an antenna having a maximum gain of 2 dBi. An antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 Ohms.

The wireless radio of this device complies with 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.

Operation is subject to the following two conditions: (1) this device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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 60950-1 (IEC60950-1) – Product Safety
- EN 300 328 Technical requirement for radio equipment
- ETS 301 489 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 (IEC610000) – Power Line Flicker
- EN 60950-1 (IEC60950-1) – 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 International, Inc., Limited Lifetime Product Warranty

What this warranty covers.

Belkin International, Inc., warrants to the original purchaser of this Belkin product that the product shall be free of defects in design, assembly, material, or workmanship.

What the period of coverage is.

Belkin International, Inc., warrants the Belkin product for the lifetime of the product.

What will we do to correct problems?*Product Warranty.*

Belkin will repair or replace, at its option, any defective product free of charge (except for shipping charges for the product).

What is not covered by this warranty?

All above warranties are null and void if the Belkin product is not provided to Belkin International, Inc., for inspection upon Belkin's request at the sole expense of the purchaser, or if Belkin International, Inc., determines that the Belkin product has been improperly installed, altered in any way, or tampered with. The Belkin Product Warranty does not protect against acts of God (other than lightning) such as flood, earthquake, war, vandalism, theft, normal-use wear and tear, erosion, depletion, obsolescence, abuse, damage due to low voltage disturbances (i.e. brownouts or sags), non-authorized program, or system equipment modification or alteration.

How to get service.

To get service for your Belkin product you must take the following steps:

1. Contact Belkin International, Inc., at 501 W. Walnut St., Compton CA 90220, Attn: Customer Service, or call (800)-223-5546, within 15 days of the Occurrence. Be prepared to provide the following information:
 - a. The part number of the Belkin product.
 - b. Where you purchased the product.
 - c. When you purchased the product.
 - d. Copy of original receipt.
2. Your Belkin Customer Service Representative will then instruct you on how to forward your receipt and Belkin product and how to proceed with your claim.

Belkin International, Inc., reserves the right to review the damaged Belkin product. All costs of shipping the Belkin product to Belkin International, Inc., for inspection shall be borne solely by the purchaser. If Belkin determines, in its sole discretion, that it is impractical to ship the damaged equipment to Belkin International, Inc., Belkin may designate, in its sole discretion, an equipment repair facility to inspect

and estimate the cost to repair such equipment. The cost, if any, of shipping the equipment to and from such repair facility and of such estimate shall be borne solely by the purchaser. Damaged equipment must remain available for inspection until the claim is finalized. Whenever claims are settled, Belkin International, Inc., reserves the right to be subrogated under any existing insurance policies the purchaser may have.

How state law relates to the warranty.

THIS WARRANTY CONTAINS THE SOLE WARRANTY OF BELKIN INTERNATIONAL, INC., THERE ARE NO OTHER WARRANTIES, EXPRESSED OR, EXCEPT AS REQUIRED BY LAW, IMPLIED, INCLUDING THE IMPLIED WARRANTY OR CONDITION OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND SUCH IMPLIED WARRANTIES, IF ANY, ARE LIMITED IN DURATION TO THE TERM OF THIS WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

IN NO EVENT SHALL BELKIN INTERNATIONAL, INC., BE LIABLE FOR INCIDENTAL, SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR MULTIPLE DAMAGES SUCH AS, BUT NOT LIMITED TO, LOST BUSINESS OR PROFITS ARISING OUT OF THE SALE OR USE OF ANY BELKIN PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

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

BELKIN
Wireless G Desktop Card

Belkin Tech Support
US: 877-736-5771
310-898-1100 ext. 2263
UK: 0845 607 77 87
Australia: 1800 235 546
New Zealand: 0800 235 546
Singapore: 800 616 1790
Europe: www.belkin.com/support

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P74685-E

[need to check P# later, not yet in Oracle – mk 1/17/07]