

# Belkin

## N1 Wireless ExpressCard™ Adapter

### User Manual

F5D8071

P75321-A OK in Oracle -SC-5/22/07

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#### Introduction

Thank you for purchasing the Belkin N1 Wireless ExpressCard Adapter (the Adapter). Now you can take advantage of this great new technology and gain the freedom to network your home and office computers wirelessly. This Adapter allows you to connect a notebook computer to your network. 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".

### **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**

- **Mobility** –you'll no longer need a dedicated "computer room"—now you can work on a networked laptop or desktop computer anywhere within your wireless range
- **Easy installation** – Belkin Easy Installation Wizards make setup simple
- **Flexibility** – set up and access printers, computers, and other networking devices from anywhere in your home
- **Easy expansion** – the wide range of Belkin networking products let you expand your network to include devices such as printers and gaming consoles
- **No cabling required** – you can spare the expense and hassle of retrofitting Ethernet cabling throughout the home or office
- **Widespread industry acceptance** – choose from a wide range of interoperable networking products

### **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 Adapters or Cards):

- 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 Belkin 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 in the previous pages to be sure you have addressed these issues.

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

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

## Overview

### Product Features

The Adapter complies with the IEEE draft-802.11n specification to communicate with other draft-802.11n-compliant wireless devices at up to 300Mbps\*. The Adapter is also compatible with 802.11g devices at 54Mbps as well as 802.11b products at 11Mbps. The Adapter operates on the same 2.4GHz frequency band as 802.11b/g Wi-Fi® products.

- 2.4GHz ISM (Industrial, Science, and Medical) band operation
- Integrated easy-to-use Belkin Wireless Networking Utility
- ExpressCard slot with PCI Express interface, for operation in newer computers with an ExpressCard slot
- WPA™, WPA2™, 64-bit WEP (Wired Equivalent Privacy), or 128-bit encryption
- Wireless access to networked resources

- Data rate of up to 300Mbps\* (draft 802.11n), 54Mbps (802.11g), or 11Mbps (802.11b)
- Easy installation and use
- LED power and network link/activity 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 300Mbps\***

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

- **Compatibility with 802.11b/g products**

The Adapter is backward-compatible with existing Wi-Fi (IEEE 802.11b/g) products

- **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

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

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

### **Product Specifications**

**Form Factor: ExpressCard/34 module**

Host Interface: PCI Express Operating Temperature: 32–131 degrees F (0–55 degrees C)

Storage Temperature: -4–176 degrees F (-20–80 degrees C)

Humidity: Max. 90% (non-condensing)

Typical Operating Range: Up to 1,000 ft.\*\*

\***NOTE:** The standard transmission rate—300Mbps—is the physical data rate. Actual data throughput will be lower.

\*\*Wireless performance may vary depending on the networking environment.

(Insert image of F5D8071 v1000 with blue LEDs)

#### **(a) Power LED**

Lights up when the Adapter is powered up

**(b) Link/Activity LED**

Lights up when the Adapter is connected; flashes when wireless activity is detected

**(c) Adapter Connector**

Part of the Adapter that fits into your computer's ExpressCard slot

**System Requirements**

- PC-compatible laptop with one available ExpressCard (ExpressCard/34 or ExpressCard/54) slot
- Windows® 2000, XP with SP2, or Vista™
  - 1GHz processor or greater
  - 512MB memory or greater
  - 100MB hard-disk space

**Package Contents**

- N1 Wireless ExpressCard Adapter
- Quick Installation Guide
  
- CD with Installation Software and User Manual

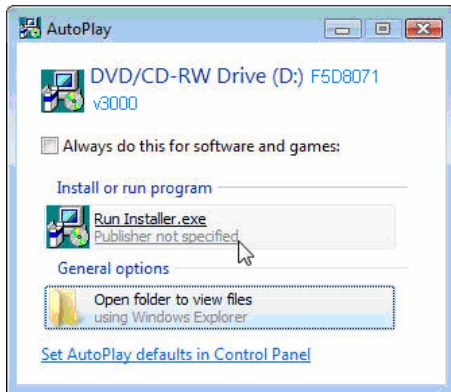
## 3 Installing and Setting up the Adapter

### A. Installation Process for Windows Vista

**IMPORTANT:** INSTALL THE SOFTWARE BEFORE INSERTING THE ADAPTER.

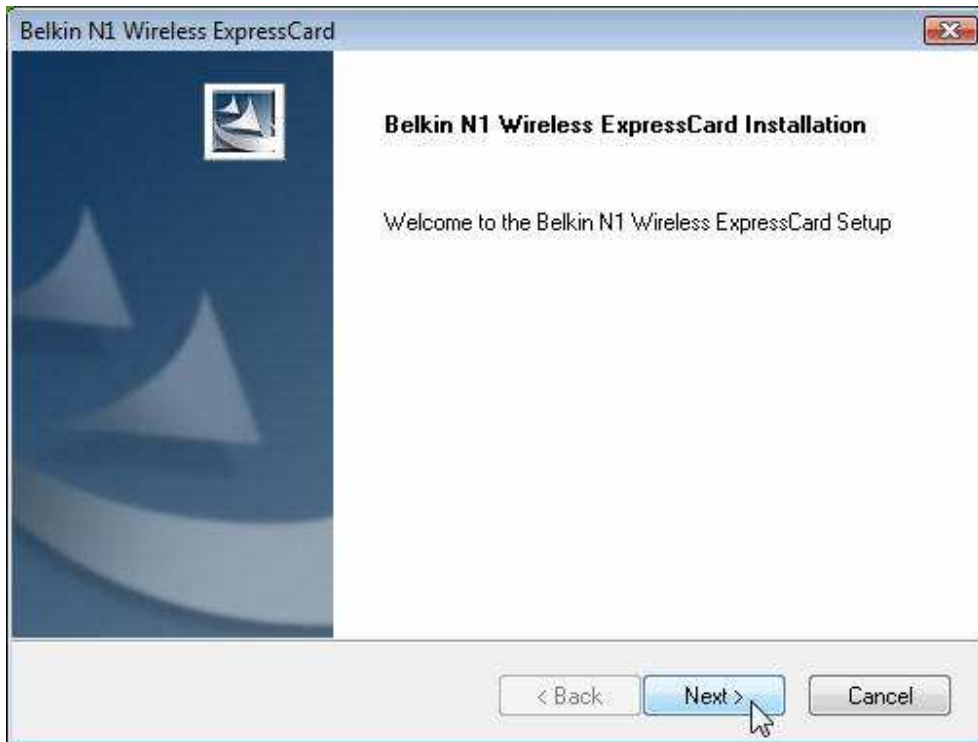
A.1 Insert the Installation Software CD into your CD-ROM drive.

A.2 Select the "Run Installer.exe" option.



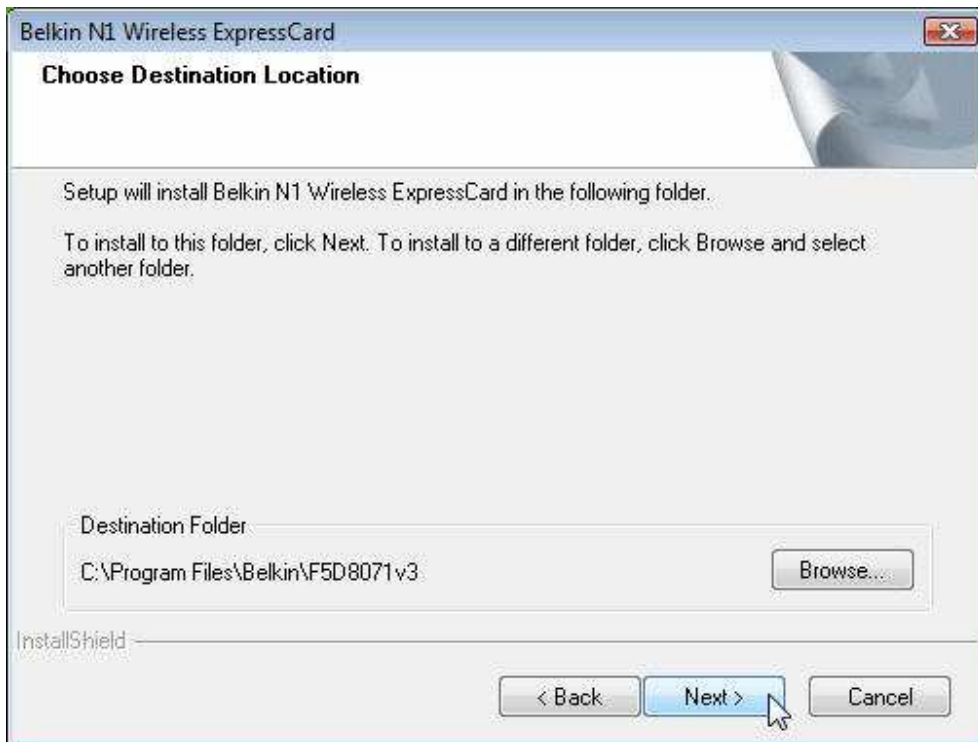
A.3 You may see a window titled, “An unidentified program wants access to your computer”. Click “Allow”.

A.4 Click “Next” to begin the installation process. (Insert screen shot)

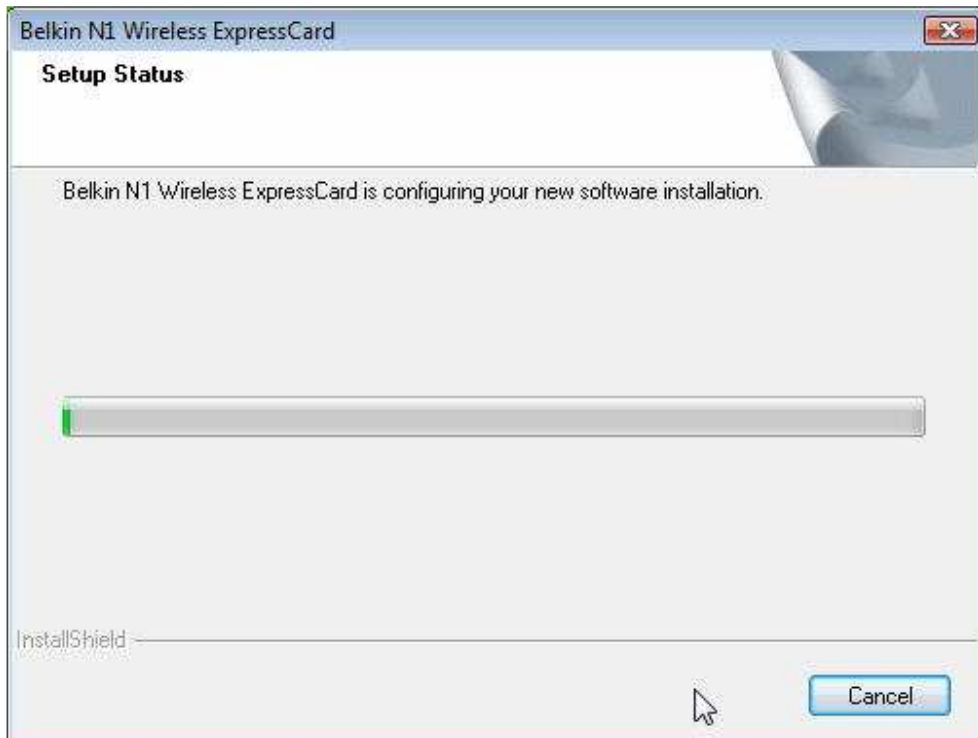


A.5 Click “Next” to continue the installation process. (Insert screen shot)





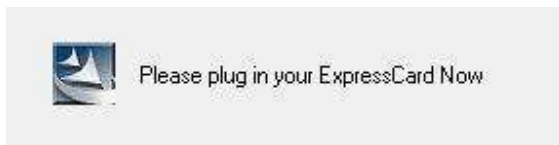
A.6 The software will automatically install the driver. (Insert screen shot)



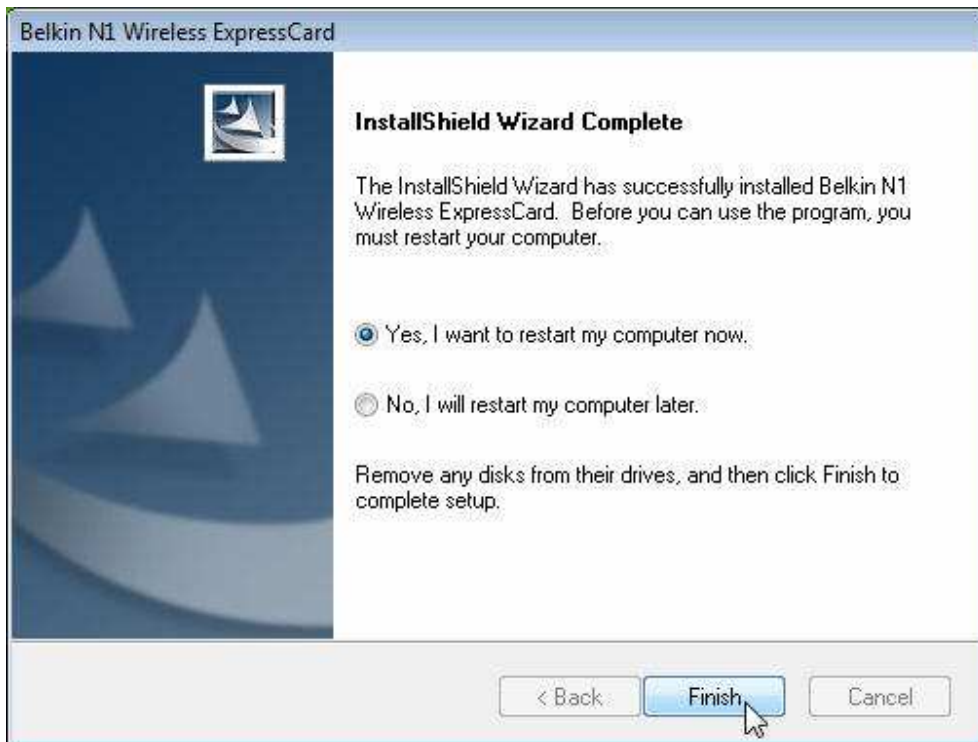
A.7 You may see a window titled, “Windows can’t verify the publisher of this driver software”. This is normal and does not indicate a problem. Our software has been fully tested and is compatible with this operating system. (Insert screen shot)



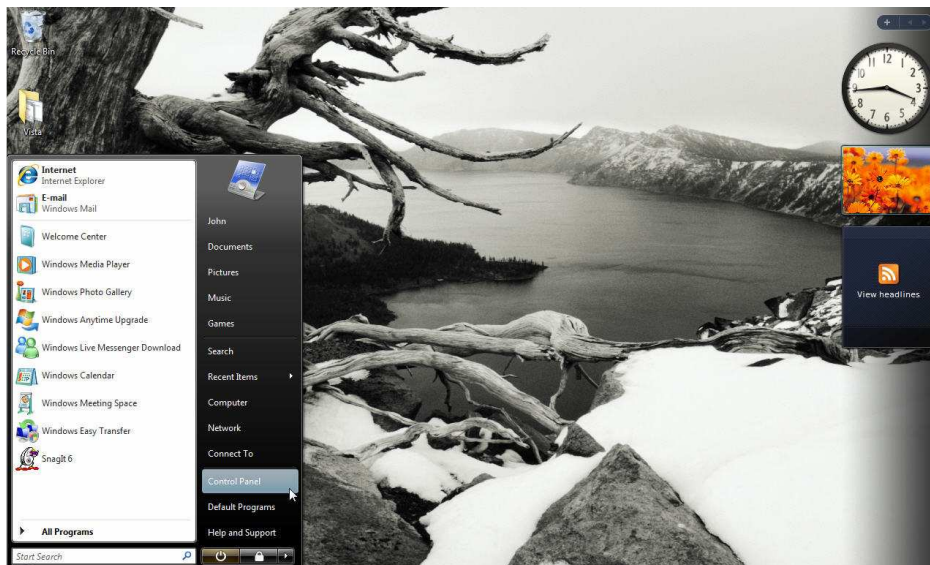
A.8 When prompted, plug in your Adapter. (Insert screen shot)



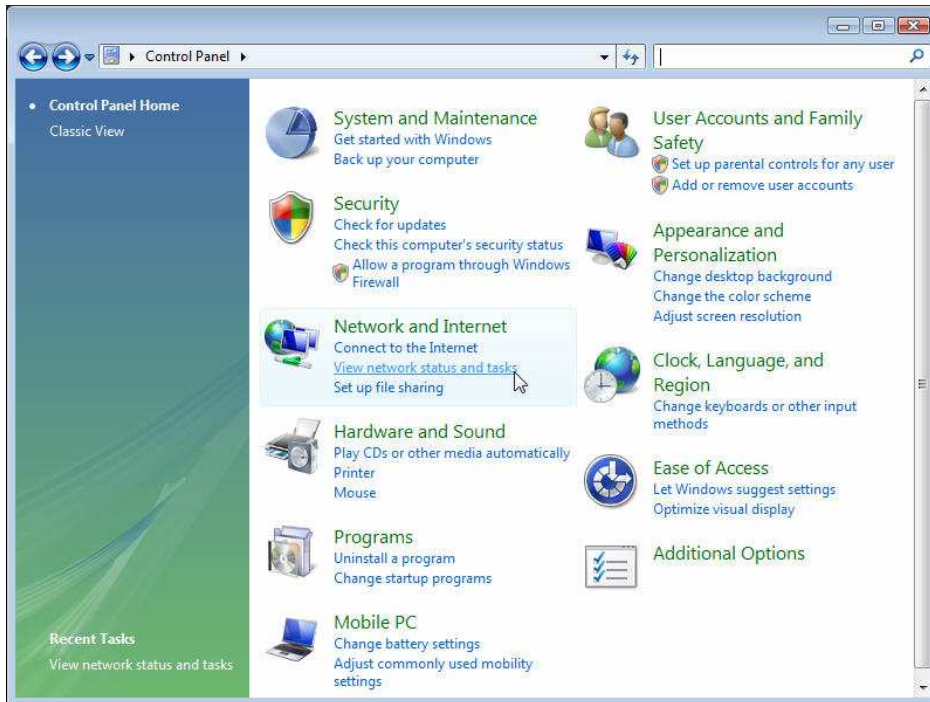
A.9 When the installation completes, click on “Finish”. Your installation is now complete. (Insert screen shot)



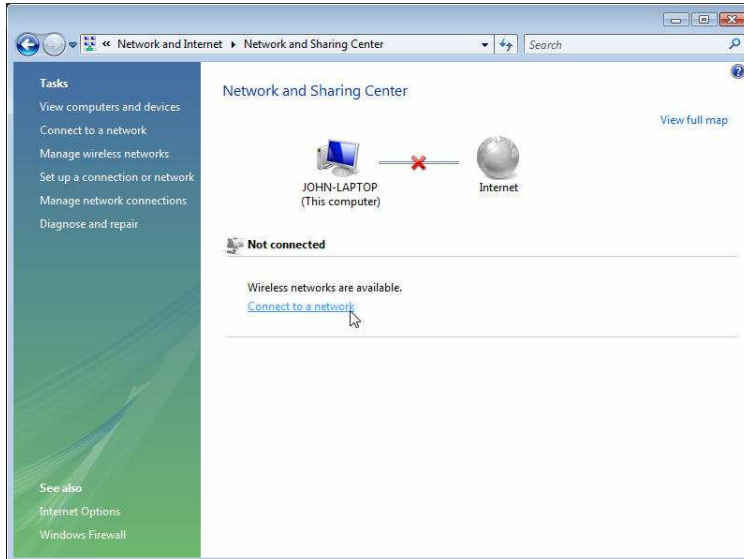
A.10 To connect to the Internet, open the Network and Sharing Center by first opening the Control Panel from the “Start” menu. (Insert screen shot)



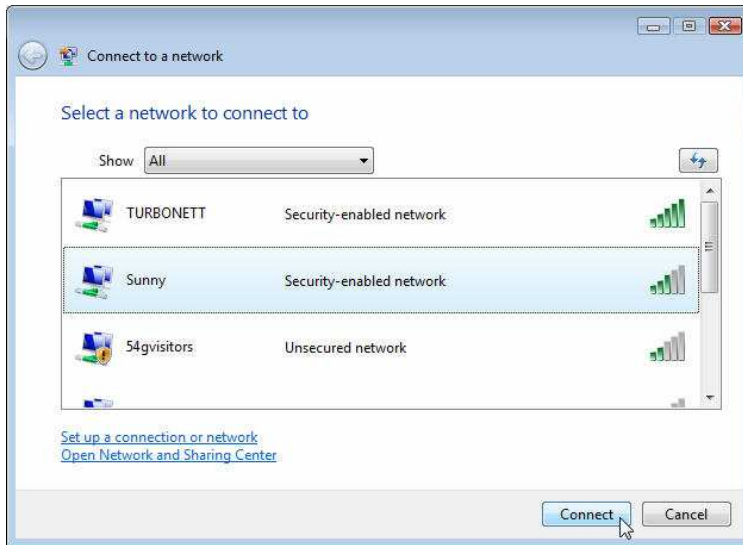
A.11 In the Control Panel, click on “View network status and tasks”. (Insert screen shot)



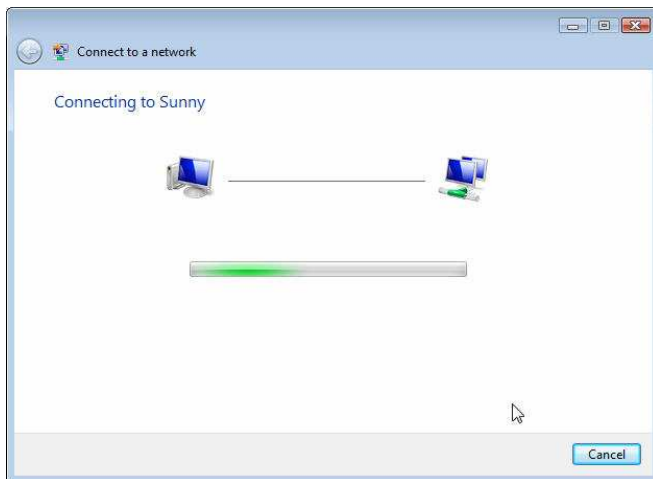
A.12 In the Network and Sharing Center, click on “Connect to a network”. (Insert screen shot)



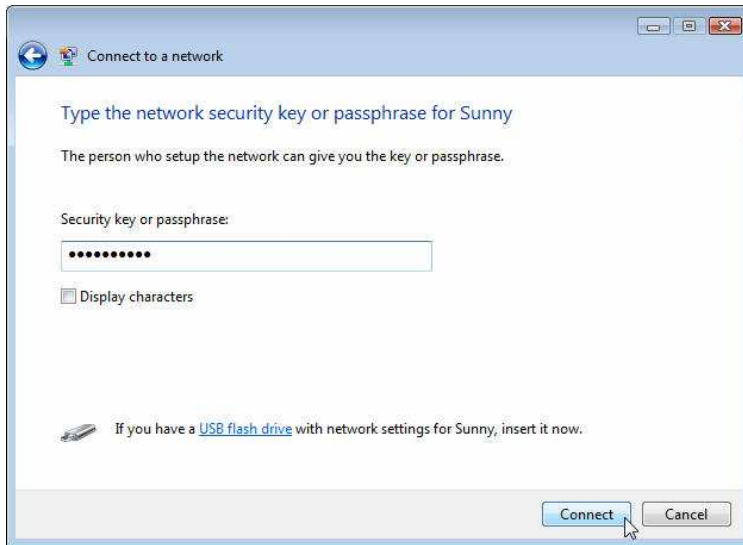
A.13 Select an available wireless network and click “Connect”. (Insert screen shot)



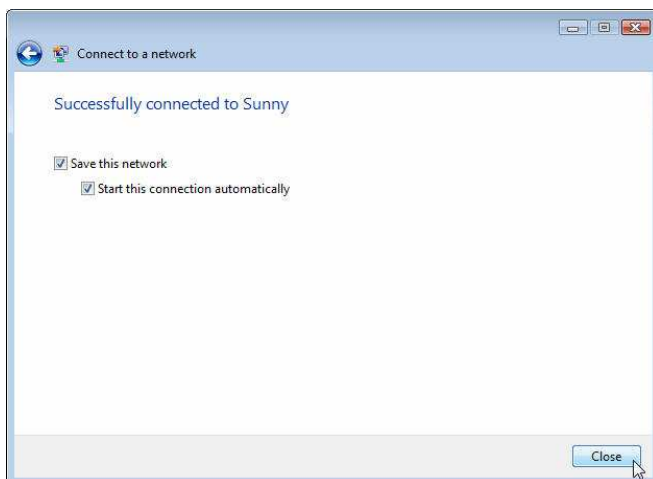
A.14 Your Adapter will attempt to connect to the selected network. (Insert screen shot)



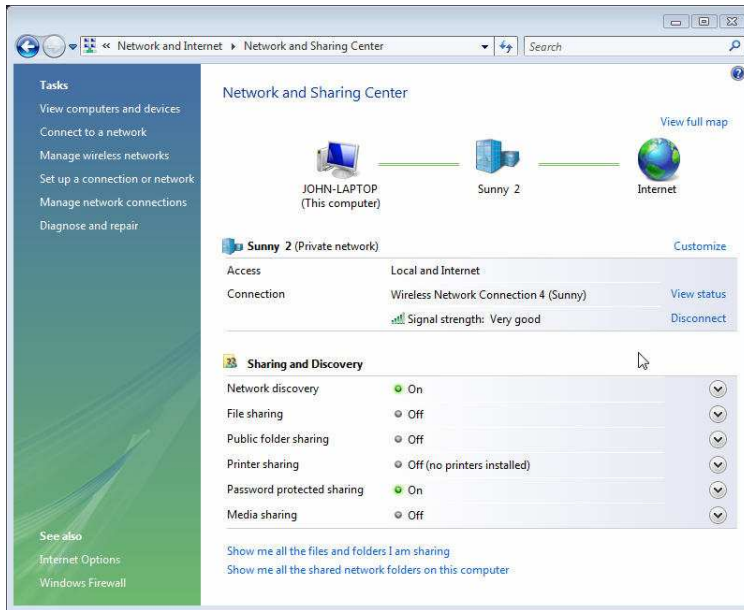
A.15 Depending on the security settings of your wireless network, you may be prompted to enter in a network security key or a passphrase. Click "Connect" after you have done so. (Insert screen shot)



A.16 After connecting to the network, you may choose to save this network and connect automatically once your Adapter is in range. (Insert screen shot)



A.17 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)



## B. Installation Process for Windows Operating Systems other than Windows Vista

**IMPORTANT:** INSTALL THE SOFTWARE BEFORE INSERTING THE ADAPTER.

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

B.2 The Belkin Wireless Card Installer screen will automatically appear. (This may take 15–20 seconds.) Click “Install Software” or “Next” to start the installation.



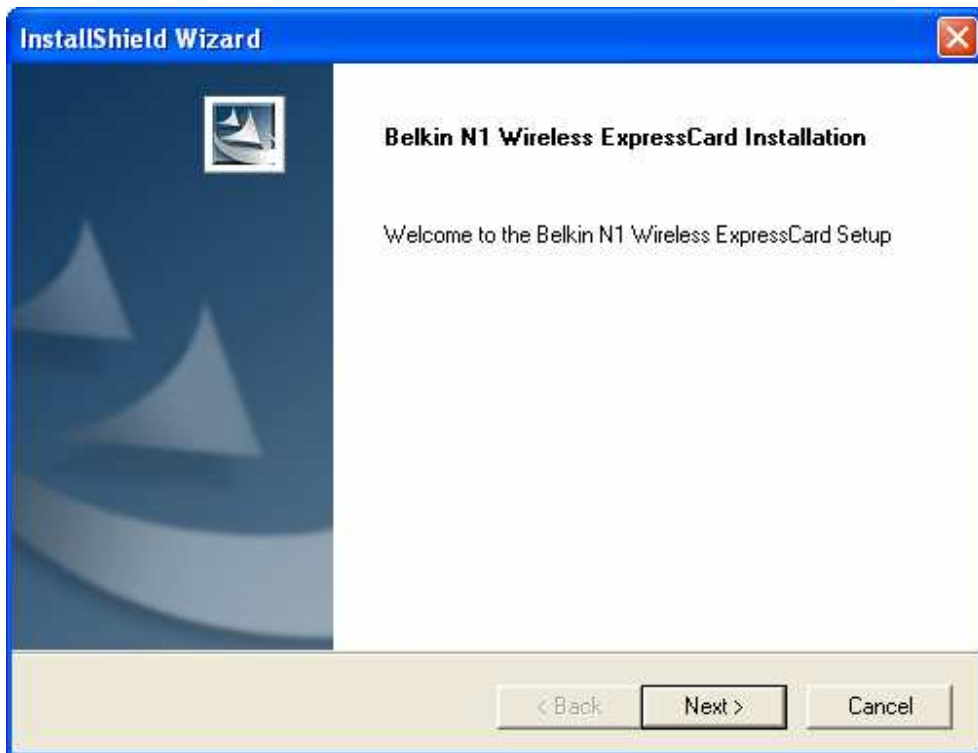
[Insert 8071\_installer.tif]

**Note:** If the Belkin Wireless Adapter Installer 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 icon named “Setup.exe”, if the Installer does not start.

B.3 The InstallShield Wizard will now start. Click “Next” to continue.

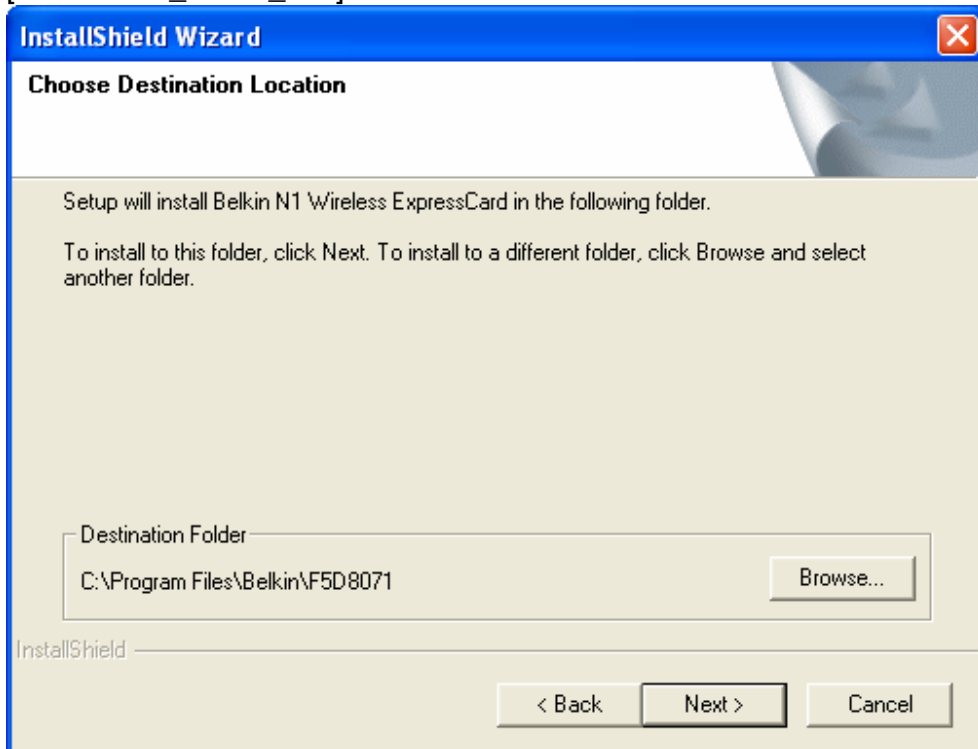
[insert 8071\_Install\_4.tif ]





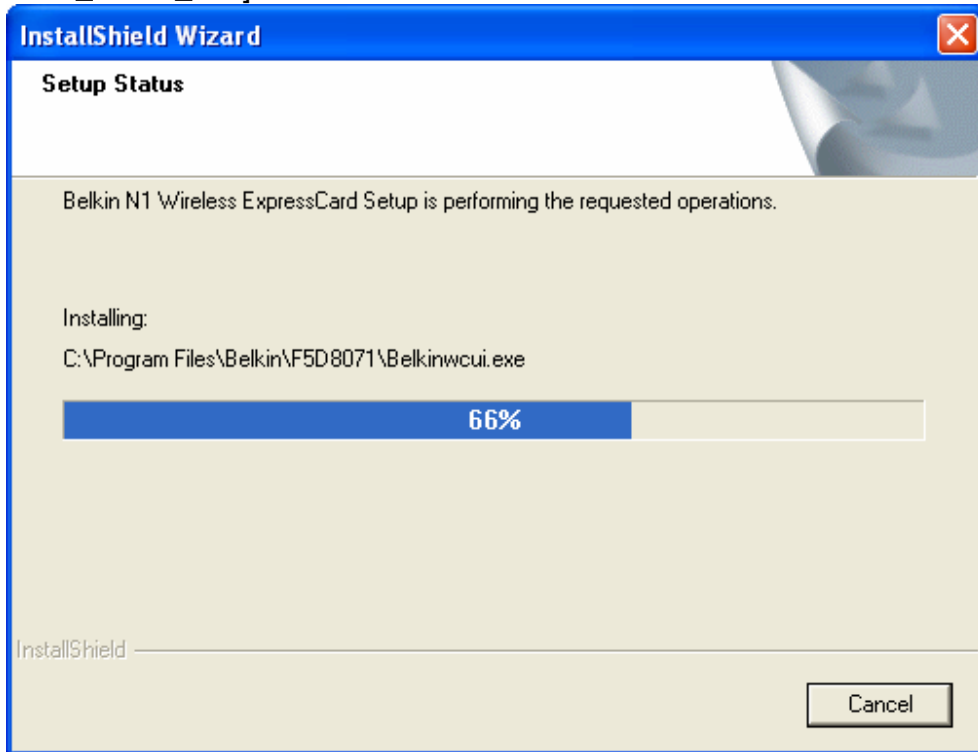
B.4 Select a different destination folder for the software installation, or simply click "Next".

[insert 8071\_Install\_5.tif]



B.5 The first in a series of progress-monitoring screens will let you know where you are in the setup process.

[insert  
8071\_Install\_6.tif]



B.6 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.

[use the same screenshot]

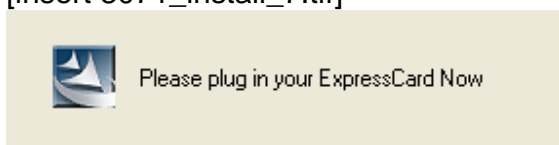


### C. Insert Insert the Adapter into your Computer

(Please insert the NEW image of Adapter insert into laptop)

C.1 After the software installation is finished, the message "Please plug in your ExpressCard now" will appear. Insert your Adapter.

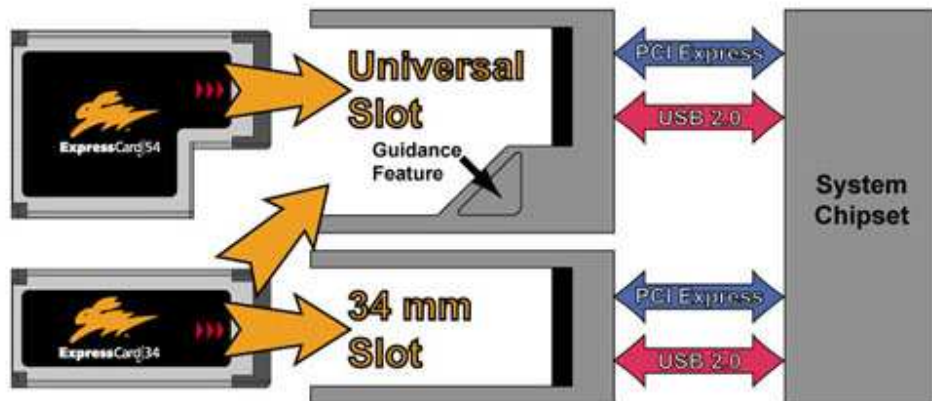
[insert 8071\_install\_7.tif]



[This paragraph is new. Use the smaller font and lighter font color. Also need a new lineart drawing, see below for reference]

If your notebook computer comes with the wider, universal ExpressCard (ExpressCard/54) slot, align the Adapter to the left side of the slot and then insert it straight into the wide opening. The universal ExpressCard slot has an internal notch that will gently guide the Adapter to the left side of the slot. This allows the Adapter to link properly with the ExpressCard connector.

[NOTE: this graphic FPO 9/15/06]



C.2 The Found New Hardware Wizard might appear. (This may take 3–15 seconds.) If it does, continue with the following instruction. Select “Yes, this time only” and click “Next” to install the hardware.

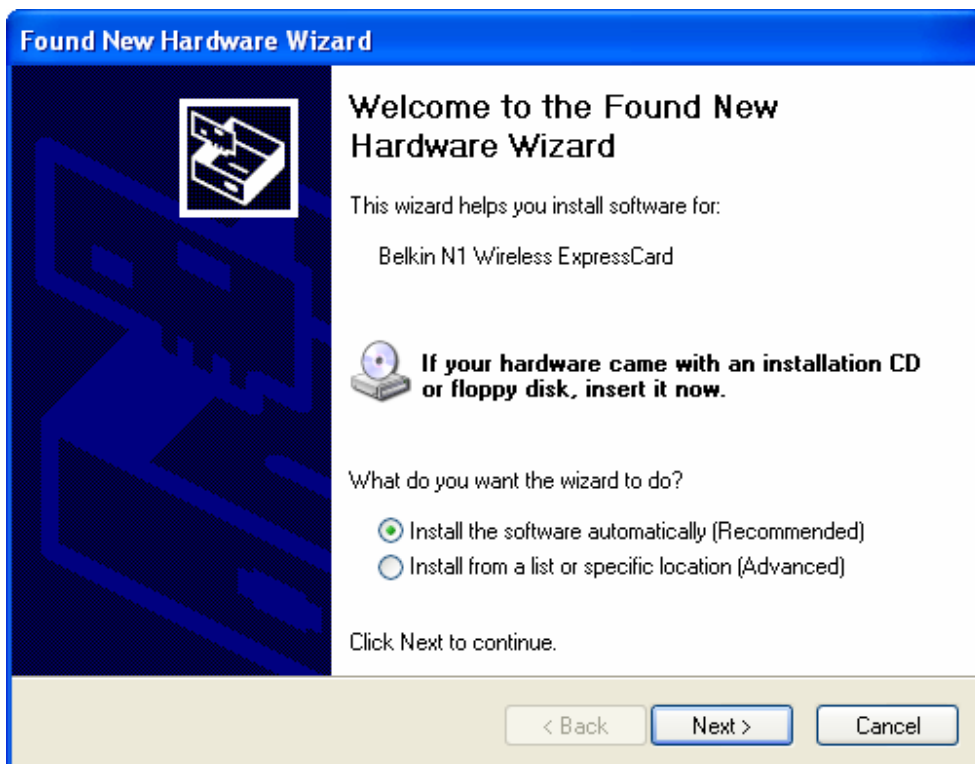
If the Found New Hardware Wizard does not appear, skip to step C.7.

[Use same shot]

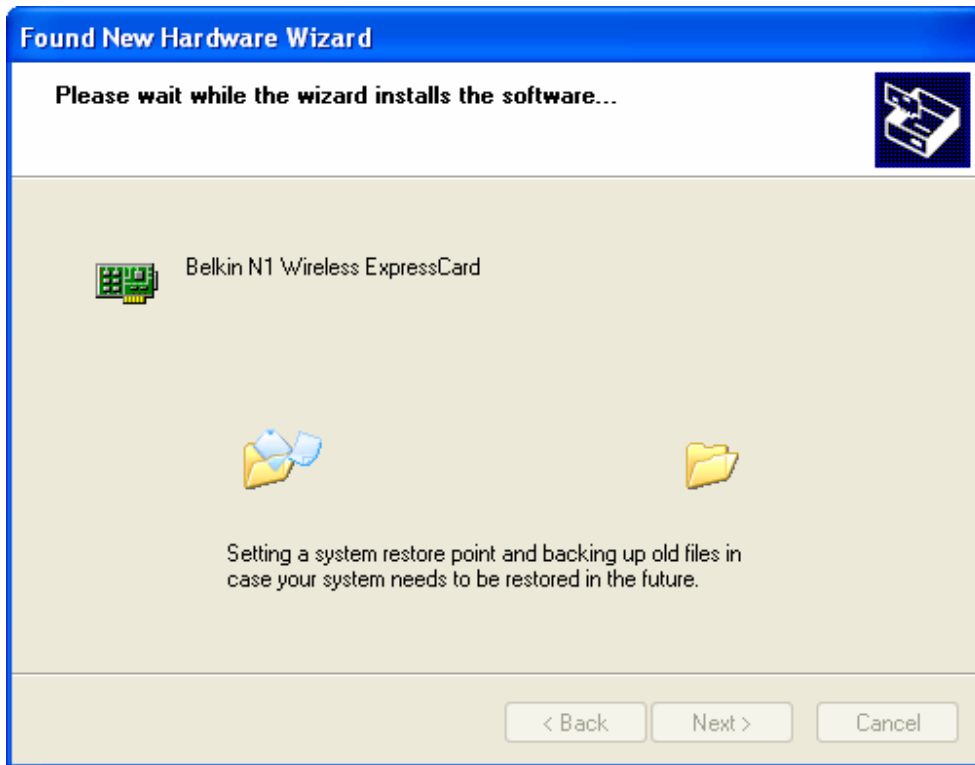


C.3 Select "Install the software automatically" and click "Next" to install the hardware.

[insert 8011\_install\_8.tif]



C.4 The Wizard will now install your software.  
[insert 8071\_install\_10.tif]



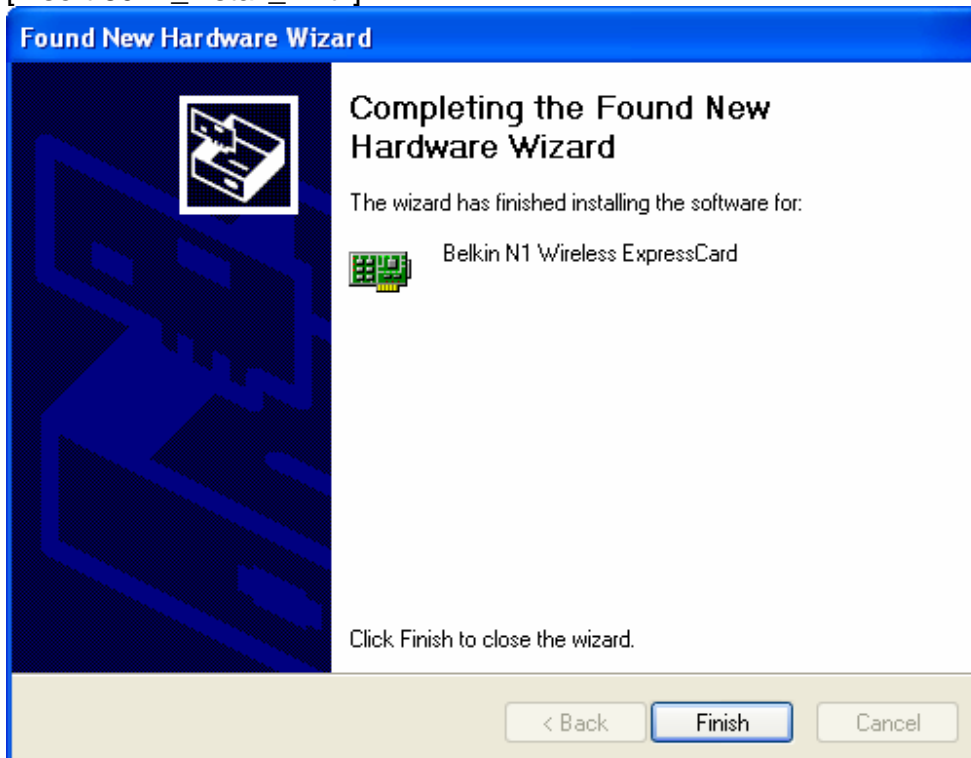
C.5 You might see a screen similar to this one. This DOES NOT mean there is a problem. Our software has been fully tested and is compatible with this operating system. Select "Continue Anyway" and follow the on-screen instructions.

[insert 8011\_install\_9b.tif]

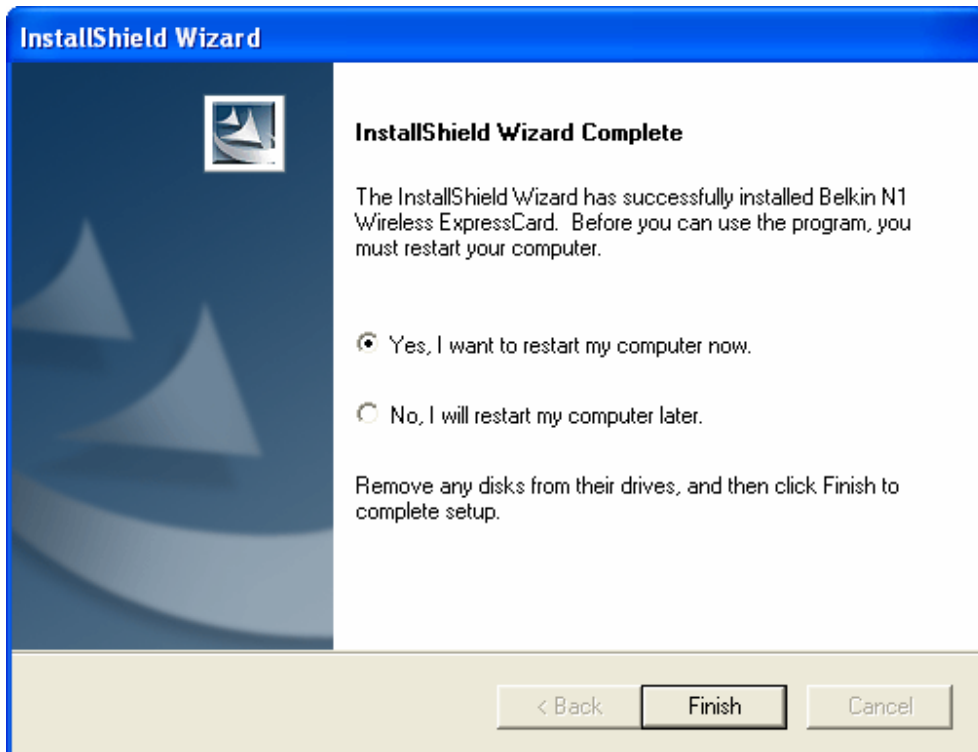


C.6 The installation is now complete. Click "Finish" to exit.

[Insert 8071\_install\_11.tif]



C.7 Your computer must reboot for the changes to take effect. Close all other applications and save your data. Then, click “Finish” to restart your computer.  
[insert 8071\_install-12.tif]



## D. Configure Use the Belkin Wireless Networking Utility

D.1 After restarting your computer, double-click the Belkin Wireless Networking Utility icon on the desktop screen.

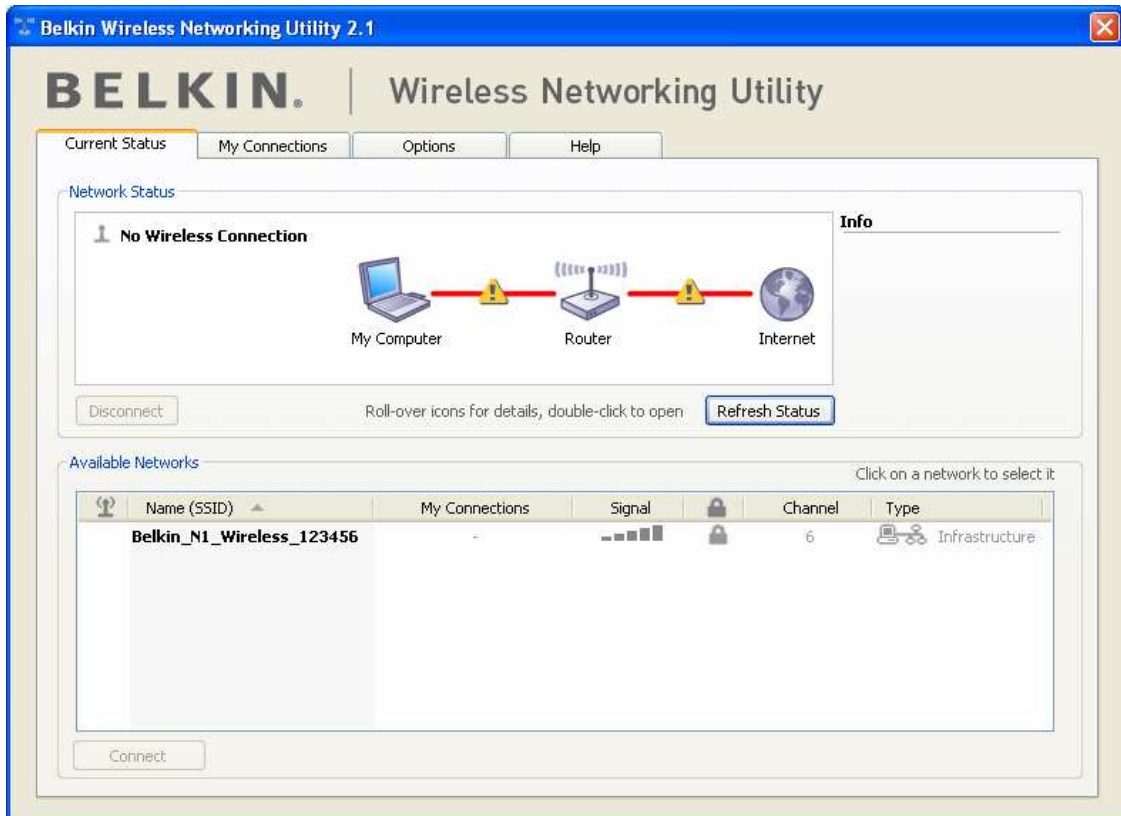
[Use same icon from 8051 mn]



D.2 The Belkin Wireless Networking Utility screen will appear.

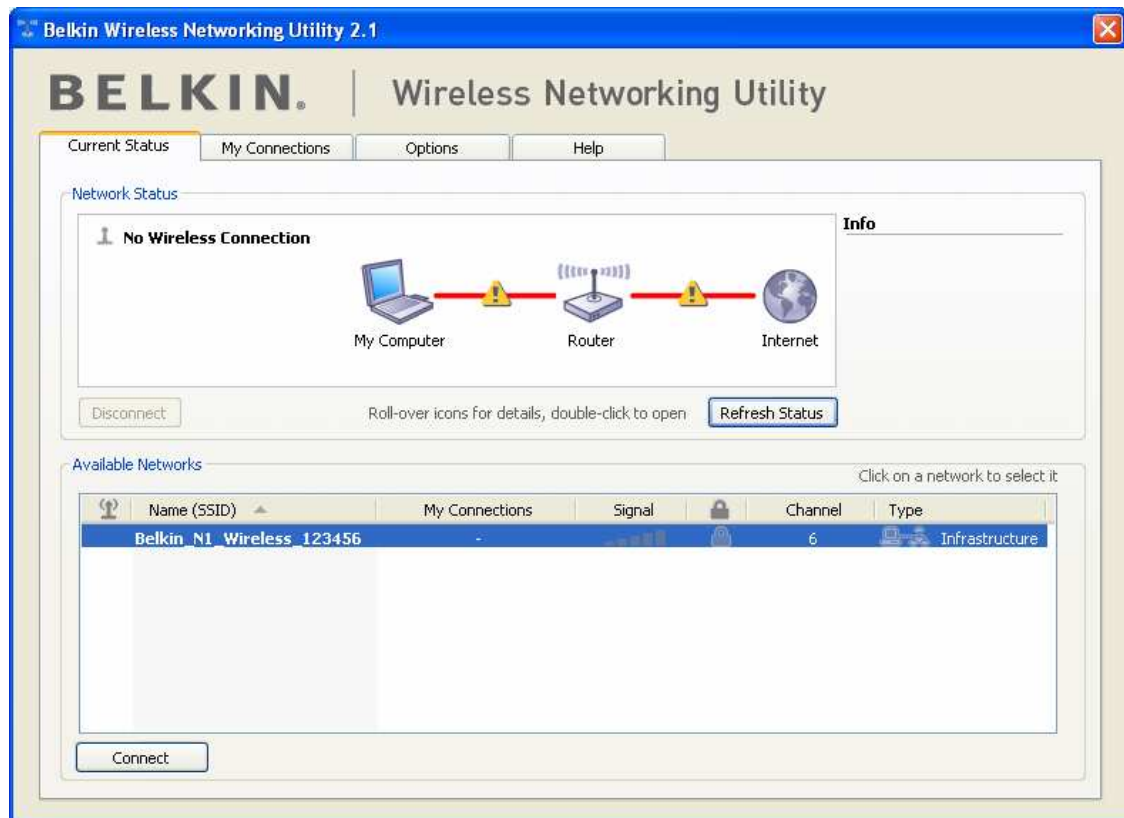
[Use same screenshot from 8051 mn]





D.3 Select a network to which to connect from the “Available Networks” list and click “Connect”.

*[Use same screenshots from 8051 mnl from this point on]*



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

D.4 The Belkin Wireless Networking Utility icon can also be found on the system tray.

[KEEP]



**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 task tray.

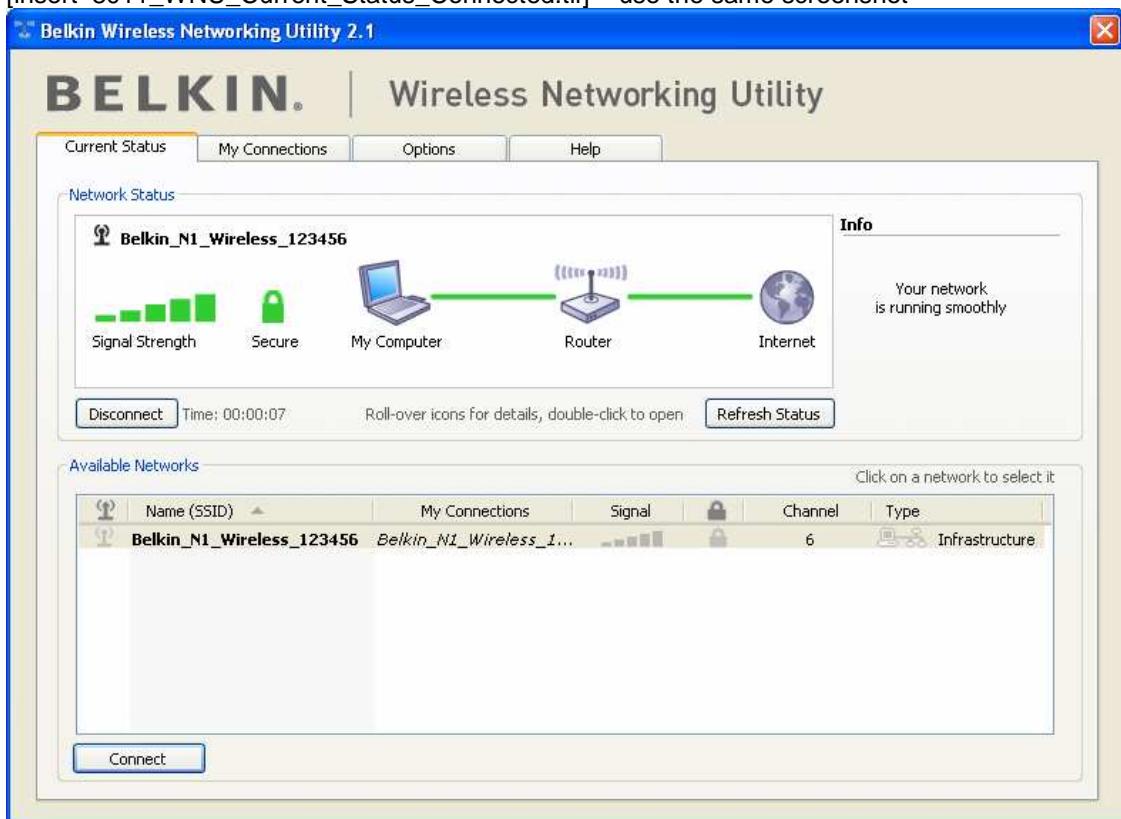
[KEEP]

[KEEP]



If the icon is not present, click on “Start > Programs > Belkin > N1 Wireless ExpressCard > Belkin Wireless Networking Utility”.

[insert 8011\_WNU\_Current\_Status\_Connected.tif] – use the same screenshot



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. It even displays connectivity between the computer and router, and router and Internet. In the event of a connectivity problem, this window can be used to determine the problem's 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

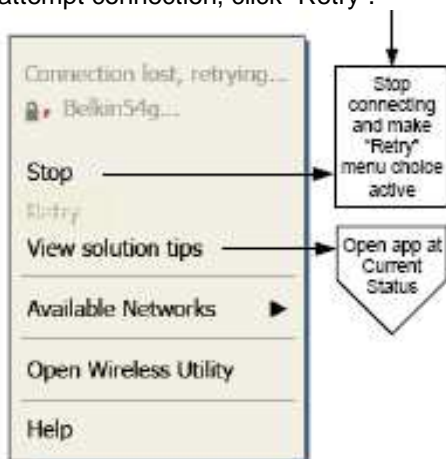
If the current wireless connection is lost, a window will pop up and the WNU will attempt to reconnect.



– use the same screenshot

### Connection Failure

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



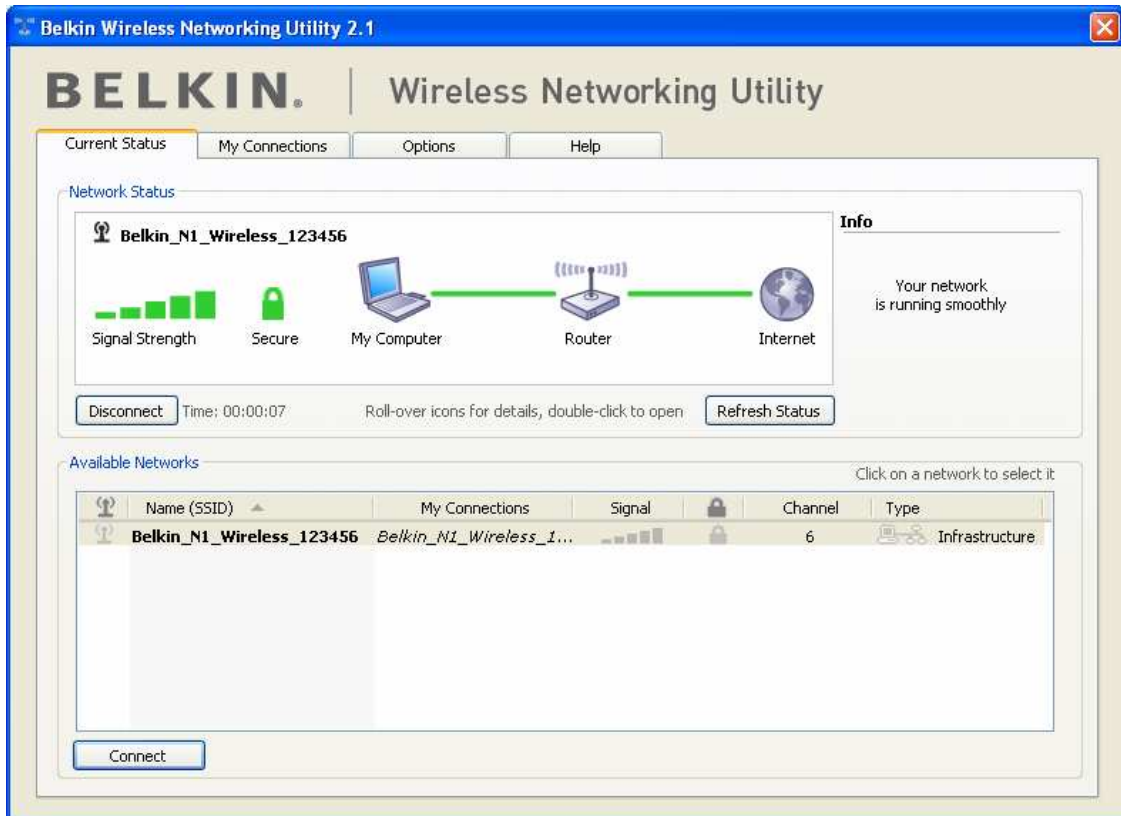
Right-Click during connection failure

[This screenshot needs update]

### 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 8011\_WNU\_Current\_Status\_Connected.tif, pls circle the “Info” box and message]



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.

[insert 8011\_WNU\_My\_Connections.tif– use the same screenshot]



### 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.

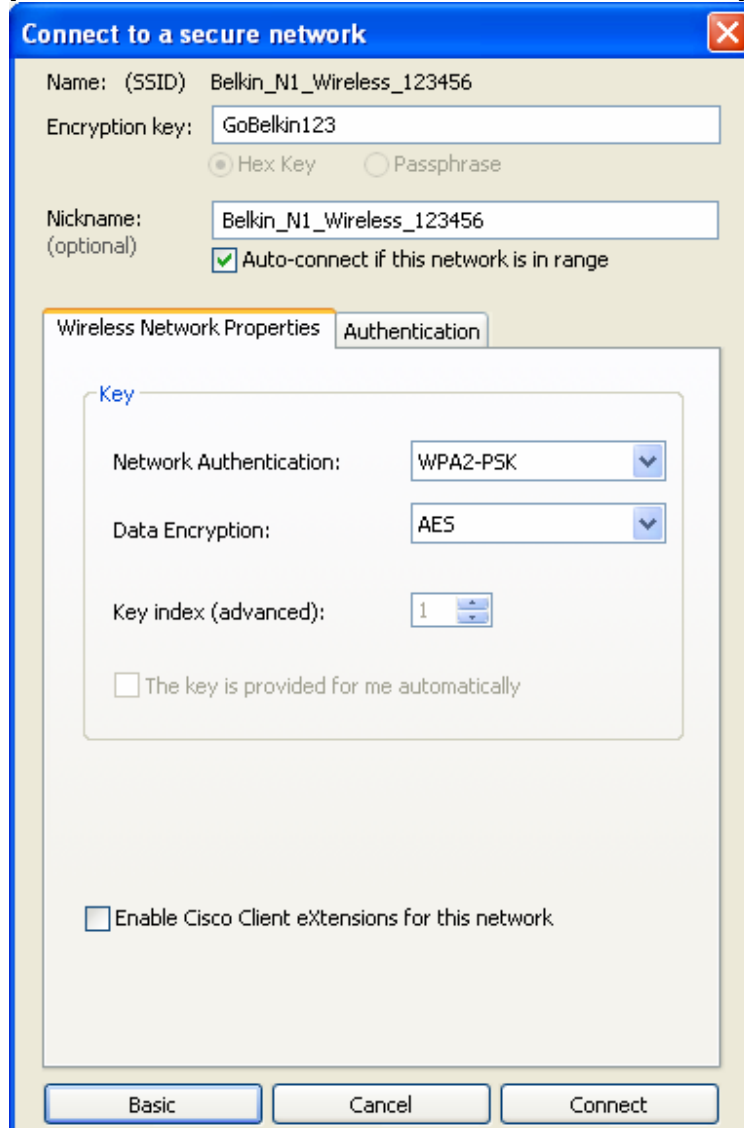
[insert 8011\_WNU\_Connect.tif– use the same screenshot]



\*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: 8011\_WNU\_Connect\_Adv.tif– use the same screenshot]



**Wireless 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.

**Wi-Fi 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:**

Name	64-Bit Wired Equivalent Privacy	128-Bit Wired Equivalent Privacy	Wi-Fi Protected Access-TKIP	Wi-Fi Protected Access 2
Acronym	64-bit WEP	128-bit WEP	WPA-TKIP/AES (or just WPA)	WPA2-AES (or just WPA2)
Security	Good	Better	Best	Best
Features	Static keys  Encryption keys based on RC4 algorithm (typically 40-bit keys)	Static keys  More secure than 64-bit WEP using a key length of 104 bits plus 24 additional bits of system-generated data	Dynamic key encryption and mutual authentication  TKIP (Temporal Key Integrity Protocol) added so that keys are rotated and encryption is strengthened	Dynamic key encryption and mutual authentication  AES (Advanced Encryption Standard) does not cause any throughput loss

(insert chart from P74488-A, p.16)

**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.

**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 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 combination of numbers and letters from A–F and 0–9. For 64-bit WEP, you must enter 10 hex keys. For 128-bit WEP, you must 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

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 Adapter's configuration screen.

### **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 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.

### **Setting up your Belkin Wireless Router (or Access Point) to use Security**

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

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

### Configuring your Adapter to use Security

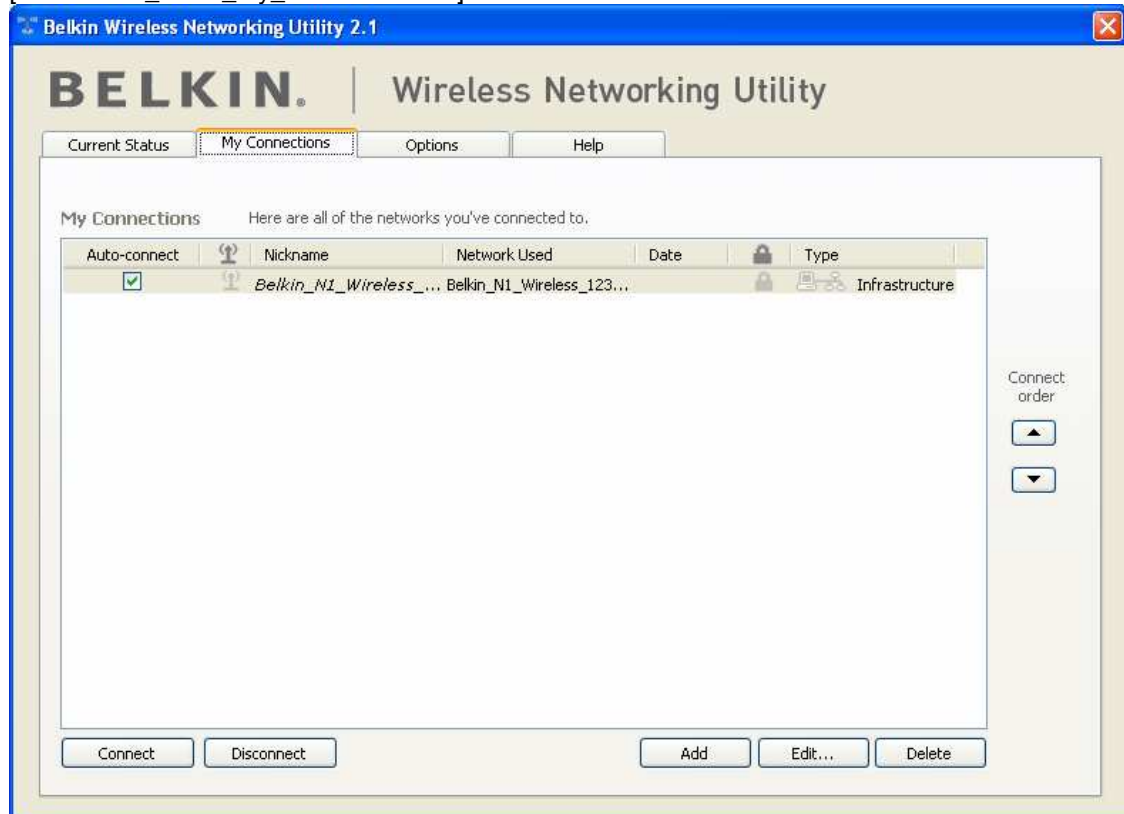
At this point, you should already have your wireless router (or access point) set to use WPA or WEP. In order for you to gain wireless connection, you must set your N1 Wireless ExpressCard Adapter to use the same security settings.

### Changing the Wireless Security Settings

The Belkin N1 Wireless ExpressCard Adapter supports the latest WPA security feature as well as the legacy WEP security standard. By default, wireless security is disabled.

To enable security, you first must 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 8011\_WNU\_My\_Connections.tif]



– use the same screenshot

To access the security settings on your Adapter, 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**

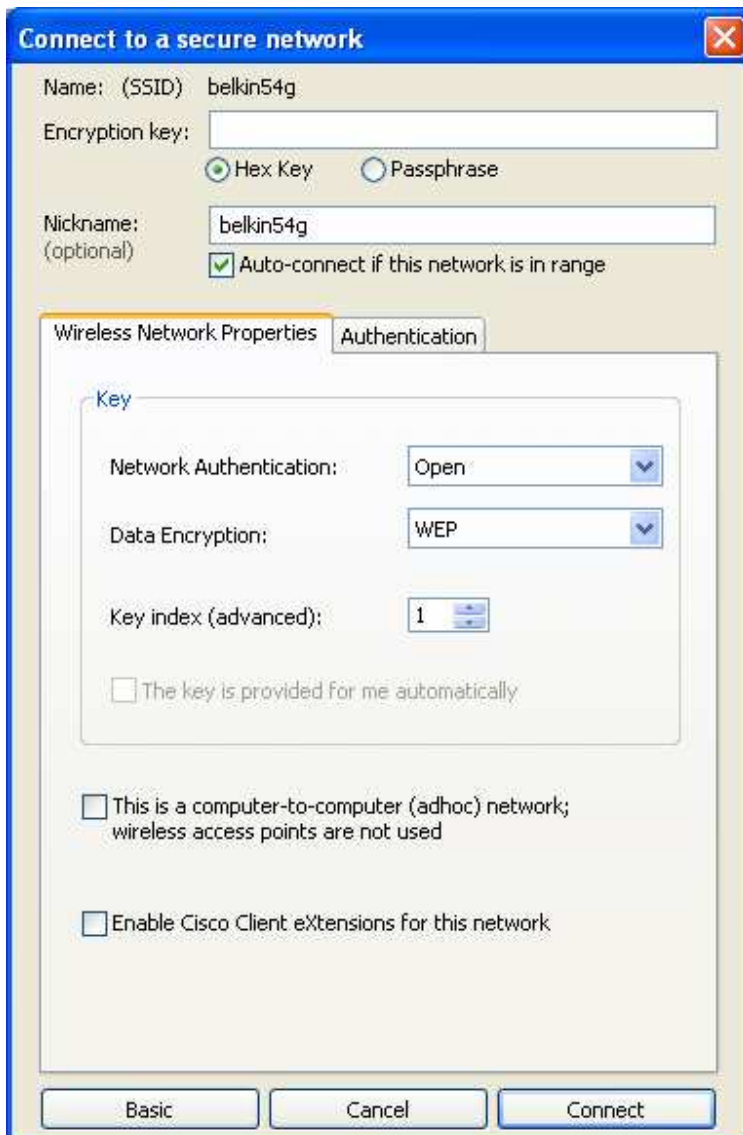
1. Select “WEP” from the “Data Encryption” drop-down menu.
2. After selecting your WEP encryption mode, you can enter your key by typing in the hex key manually.

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

For instance:

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

[insert UCUI-Connect2aSecureNetwork-Adv.tif]  
[Add AF0F4BC3D4 to the Encryption key box]



– use the same screenshot

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 must 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

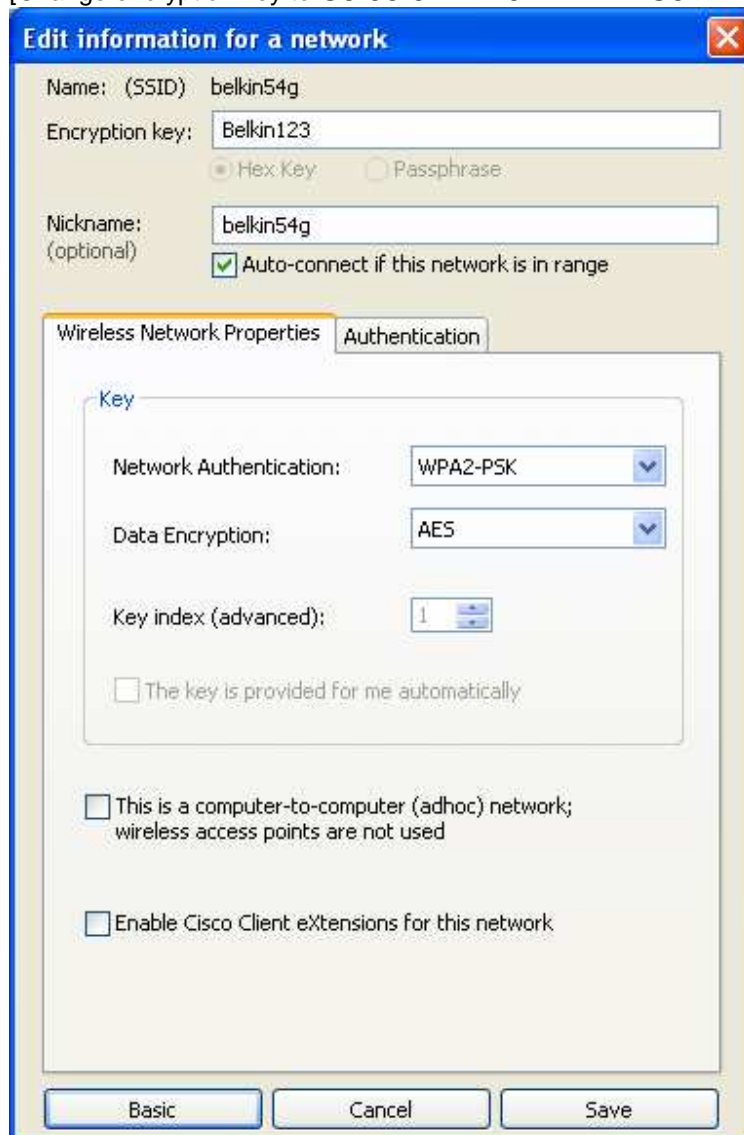
1. Select “WEP” from the drop-down menu.
2. After selecting your WEP encryption mode, you can enter your key by typing in the hex key manually. A hex (hexadecimal) key is a combination of numbers and letters from A–F and 0–9. For 128-bit WEP, you must enter 26 hex keys.

For instance:

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

[insert UCUI-EditInfo-Adv.tif]

[Change encryption key to **C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7**]



– use the same screenshot

**3.** Click “Save” to finish. Encryption in the wireless router (or access point) is now set. You must now configure each of the computers on your wireless network with the same security settings.

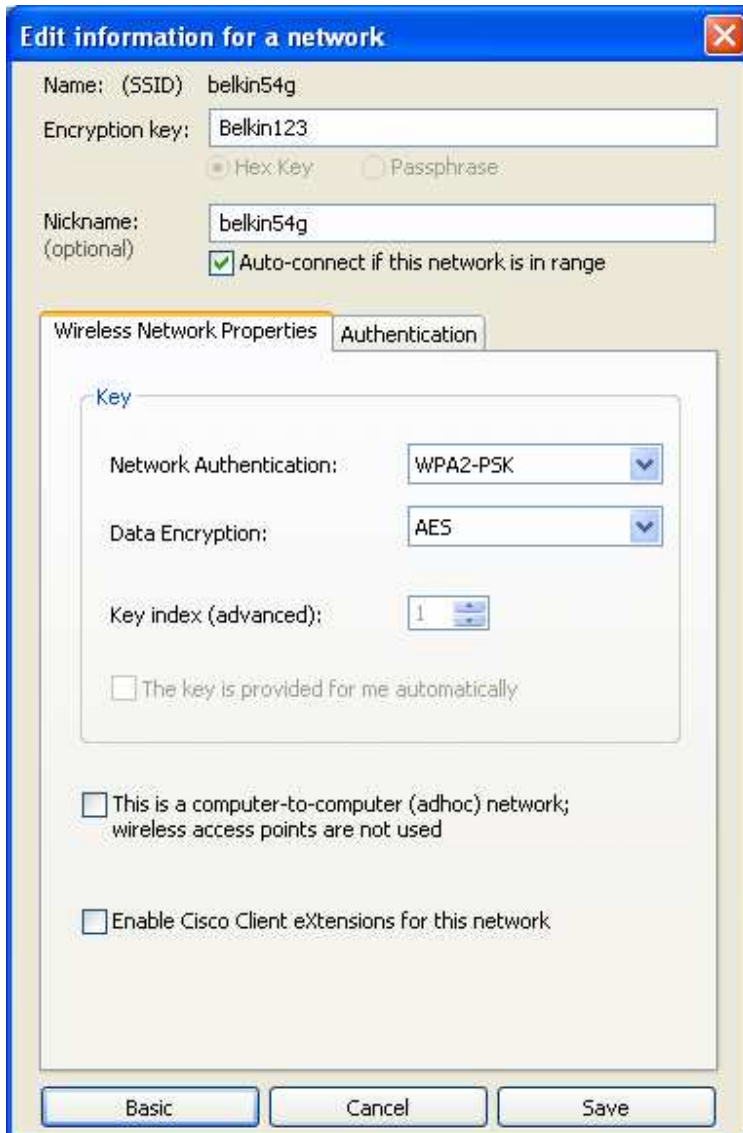
**WARNING:** If you are using a wireless client to turn on the security settings in your wireless router (or access point), you will temporarily lose your wireless connection until you activate security on your wireless client. Please record the key prior to applying changes in the wireless router (or 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 wireless network.

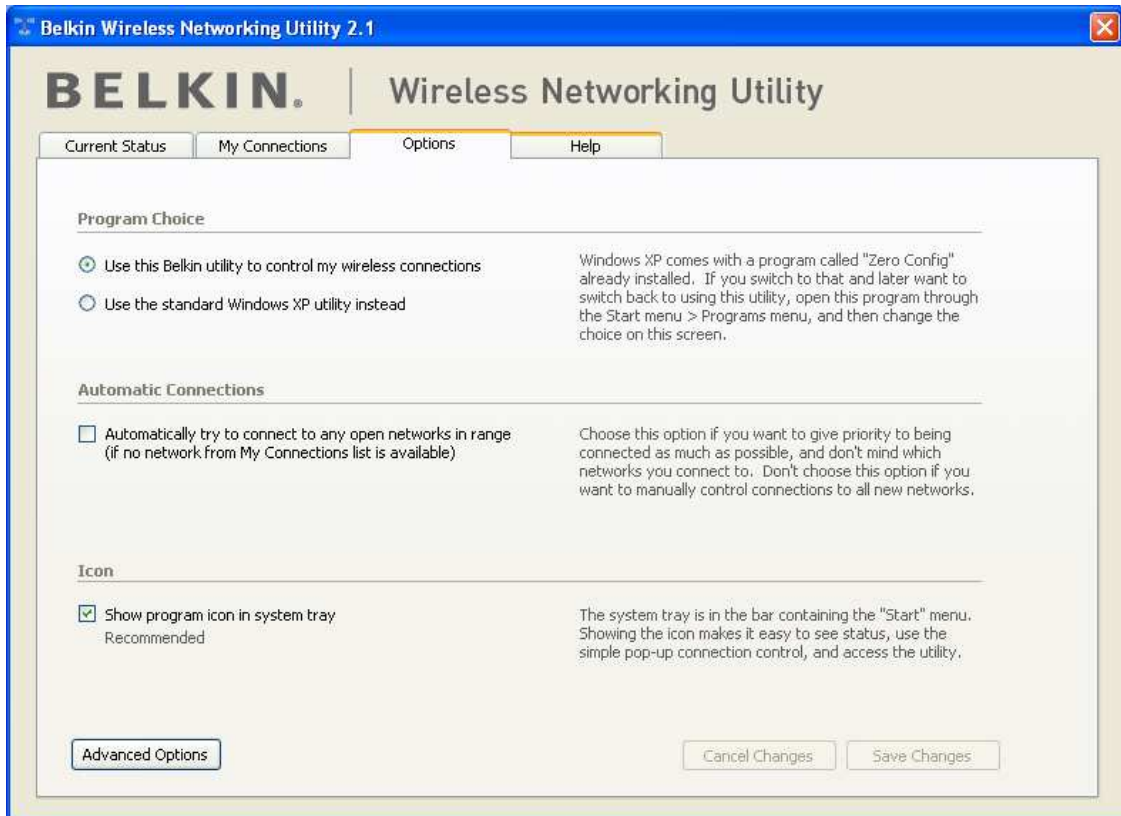
[insert UCUI-EditInfo-Adv.tif– use the same screenshot]



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

#### Wireless Networking Utility Options

[insert 9010-8.tifKEEP– use the same screenshot]



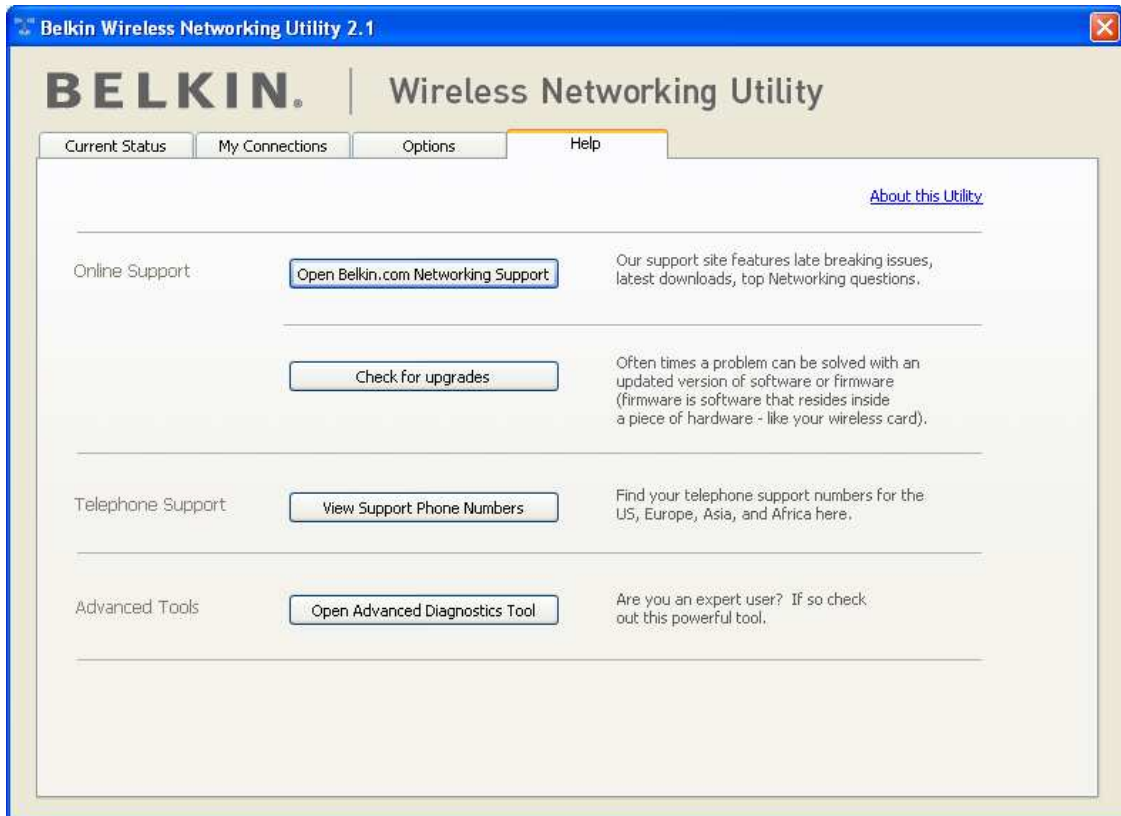
The “Options” tab on the WNU provides the user the ability to customize his or her WNU settings.

### **Wireless Networking Utility Help**

The WNU “Help” tab provides users with access to online and telephone support, one-click check for upgrades to updated versions of software, and advanced diagnostic tools.

[insert 8011\_Help.tif– use the same screenshot]

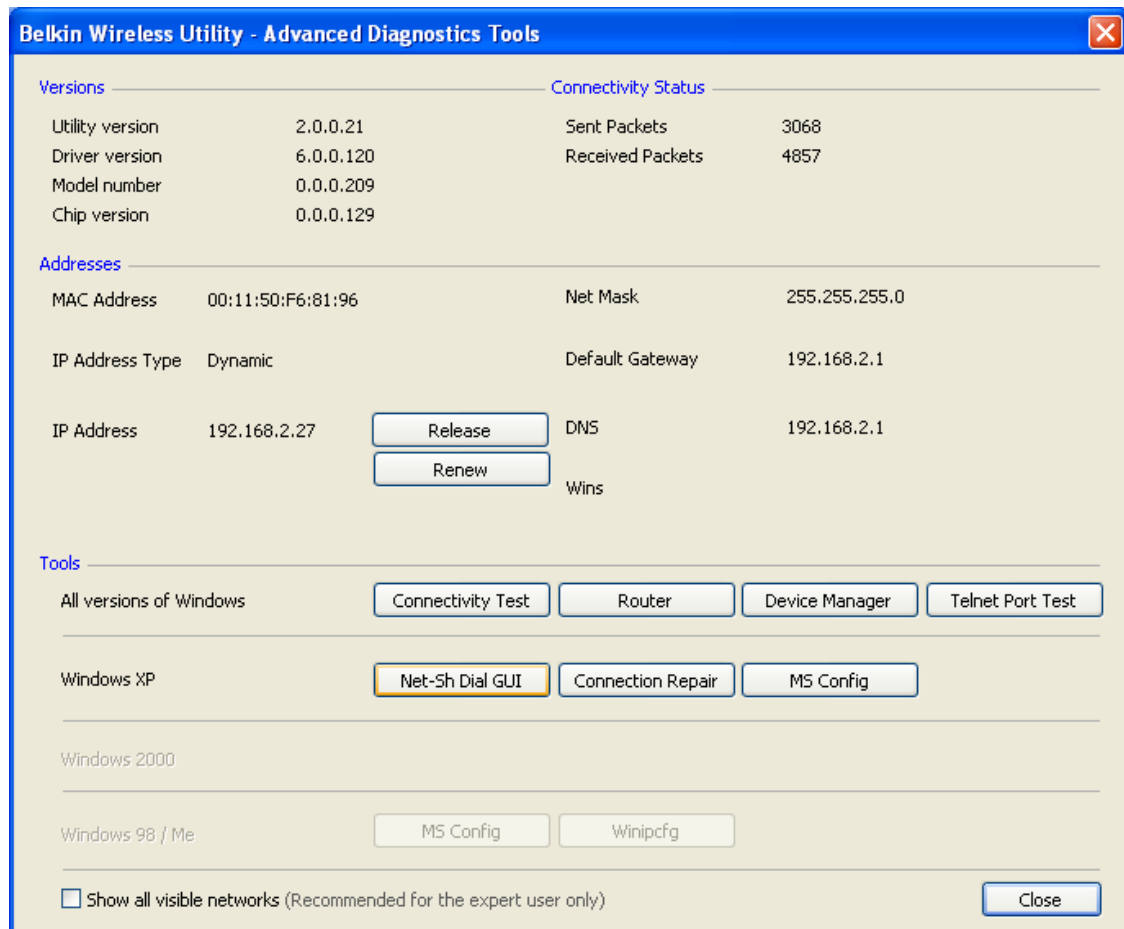




### Advanced Diagnostic Tools

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 8011\_WNU\_Help\_Diagnostic.tif– use the same screenshot]



## Troubleshooting

### **I can't connect to the Internet wirelessly.**

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

**1.** Look at the lights on your wireless router. If you're using a Belkin Wireless Router, the lights should be as follows:

- The "Power" light should be on.
- The "Connected" light should be on, and not blinking.
- The "WAN" light should be either on or blinking.

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

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

- The router's power cord is plugged in.
- All cables are connected between the router and the modem.

- All the modem's LEDs are functioning correctly. If not, see your modem's user manual.

- Reboot the router.
- Reboot the modem.

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

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

2. Open your wireless utility software by clicking on the icon in the system tray at the bottom right-hand corner of the screen. The tray icon should look like this (the icon may be red or green):

[Keep the same icon]



3. The window that opens should have a list of "Available Networks".

Available networks are wireless networks to which you can connect.

If you are using a Belkin 802.11g (G Plus) Router, or 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 must enter the network key. Click "Connect". For more information regarding security, see the page entitled: "Securing your Wi-Fi Network" on page xx of this User Manual.
3. Within a few seconds, the tray icon in the lower right-hand corner of your screen should turn green, indicating a successful connection to the network.

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

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

If the correct network name is not listed, check the SSID settings to see if they match. The SSID is case-sensitive and the spelling on each computer must be exactly the same in order for the Adapter 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 reference your router manufacturer’s user manual.

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

**Installation CD-ROM does not start Belkin Wireless Networking Utility.**

If the CD-ROM does not start the Belkin Wireless Networking Utility automatically, it could be that the computer is running other applications that are interfering with the CD drive. If the Belkin 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 in which the Installation CD has been placed to start the installation. If the installation does not start automatically, right-click to select “Explore”, then double-click on the icon named “setup.exe”.

**Power LED does not come ON; Adapter is not working.**

If the LED indicators are not ON, the problem may be that the Adapter is not connected or installed properly. Verify that the Adapter is plugged firmly into the USB port of your computer. Check to see that the drivers for the Adapter 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 Adapter is listed without any errors. If an error is indicated, contact Belkin Technical Support.

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

If your Adapter 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 Adapter 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 reference 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, WPA, or WPA2 key settings to see if they match. The key is case-sensitive and the spelling on each computer and wireless router (or access point) must be exactly the same in order for the Adapter to connect to the router. For more information about encryption, please see “Securing your Wi-Fi Network” on page 16 of this User Manual. If issues persist even at close range, please contact Belkin Technical Support.

**Data transfer is sometimes slow.**

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

In order to determine if wireless issues are related to range, we suggest temporarily moving the computer, if possible, to five to 10 feet away from the wireless router (or access point). Please see the section titled “Placement of your Wireless Networking Hardware for Optimal Performance” on page 2 of this User Manual. If issues persist even at close range, please contact Belkin Technical Support.

**Signal strength is poor.**

Wireless technology is radio-based, which means connectivity and the throughput performance between devices **decreases** when the distance between devices **increases**. Other factors that 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 wireless router (or access point).

**Changing the wireless channel** – Depending on local wireless traffic and interference, switching the wireless channel of your network can improve

performance and reliability. The default channel the router is shipped with is channel 6. You may choose from several other channels depending on your region; see your router's (or access point's) user manual for instructions on how to choose other channels.

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

### **Why are there two wireless utilities in my system tray? Which one do I use?**

There are several features and advantages from using the Belkin Wireless Networking Utility over the Windows XP Wireless Zero Configuration utility. We offer a site survey, detailed link information, and card 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 the "Status" tab.

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

You are now using the Belkin Wireless Networking Utility to configure the Adapter.

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

This condition occurs if your computer has a built-in wireless card while your Belkin N1 Wireless ExpressCard Adapter is also active. This happens because Windows must now handle two active wireless connections.

You must disable the built-in wireless card from your computer under “Network Cards” in the Device Manager.

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

This condition occurs if your computer has an active Ethernet card while your Adapter is also active. This happens because Windows must now handle two active network connections. You must disable the Ethernet card from your computer under “Network Cards” in the Device Manager.

**What’s the difference between 802.11b, 802.11g, 802.11a, and draft 802.11n?**

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 draft 802.11n works at 108Mbps. See the following chart for more detailed information.

**Wireless Comparison Chart**

Wireless Technology	802.11b	G (802.11g)	G Plus (802.11g with HSM)	G Plus MIMO (802.11g with MIMO MRC)	N1 MIMO (draft 802.11n with MIMO)
Speed*	11Mbps link rate/baseline	5x faster than 802.11b*	10x faster than 802.11b*	10x faster than 802.11b*	Wired speed over the air*
Frequency	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz	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	Common household devices such as cordless phones and microwave ovens may interfere with the unlicensed band 2.4GHz
Compatibility	Compatible with 802.11g	Compatible with 802.11b/g	Compatible with 802.11b/g	Compatible with 802.11b/g	Compatible with draft 802.11n** and 802.11b/g
Coverage*	Typically 100–200 ft. indoors	Up to 400 ft.*	Up to 700 ft.*	Up to 1,000 ft.*	Up to 1,400 ft.*
Advantage	Mature—	Common—	Enhanced	Better coverage	Leading edge—

	legacy technology	widespread use for Internet sharing	speed and coverage	and consistent speed at range	best coverage and throughput
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\*Distance and connection speeds will vary depending on your networking environment.

\*\*This Adapter is compatible with products based on the same version of the draft 802.11n specifications and may require a software upgrade for best results.

### Technical Support

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

**US: 877-736-5771**

**800-223-5546 ext. 2263**

**310-898-1100 ext. 2263**

**UK: 0845 607 77 87**

**Australia: 1800 235 546**

**New Zealand: 0800 235 546**

**Singapore: 65 64857620**

**Europe: [www.belkin.com/support](http://www.belkin.com/support)**

## Information

### 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, F5D8071, 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.

#### IMPORTANT NOTE:

##### Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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

SAR compliance has been established in typical laptop computer(s) with PCI express slot, and product could be used in typical laptop computer with PCI



express slot. Other application like handheld PC or similar device has not been verified and may not compliance with related RF exposure rule and such use shall be prohibited.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

### **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 International, Inc., may void the user's authority to operate the equipment.

### **Industry Canada statement:**

This device complies with RSS-210 of the Industry Canada 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.

### **IMPORTANT NOTE:**

#### **Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

## **Belkin International, Inc., Limited Lifetime Product Warranty**

### **What this warranty covers.**

Belkin International, Inc. ("Belkin") 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 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 for inspection upon Belkin's request at the sole expense of the purchaser, or if Belkin 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 such as flood, earthquake, lightning, 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 reserves the right to review the damaged Belkin product. All costs of shipping the Belkin product to Belkin 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, 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 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. 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 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

**N1 Wireless ExpressCard Adapter**

Belkin Tech Support

US: 877-736-5771

800-223-5546 ext. 2263

310-898-1100 ext. 2263

UK: 0845 607 77 87

Australia: 1800 235 546

New Zealand: 0800 235 546

Singapore: 65 64857620

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

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