

11g Wireless PCI Adapter User's Manual

User's Manual

11g Wireless PCI Adapter

WN4201B-18
E082003-R01

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Introduction

The 11g Wireless PCI adapter is a 54 Mbps wireless network adapter that seamlessly integrates with existing Ethernet networks to support multiple applications. This solution offers a high data rate and reliable wireless connectivity with considerable cost savings over wired LANs (which include long-term maintenance overhead for cabling). Just install the access point or wireless router and configure your wireless adapter in your PC, and your home is connected.

Features

- Up to 54 Mbps data rate
- Wireless connection without hassles and cost of cabling
- Greater flexibility to locate or move networked PCs
- Seamless connectivity to wired Ethernet LANs augments existing networks quickly and easily
- Device and the driver are pre-installed in your system
- Auto fallback data rate under noisy environment
- Orthogonal Frequency Division Multiplexing (OFDM) technology provides robust, wireless connection
- Enhances your network security with WEP and WPA encryption

Applications

The 11g Wireless PCI adapter offers a fast, reliable, cost-effective solution for wireless client access to the network in applications such as:

- **Remote access to corporate network information**
Email, file transfer, and terminal emulation
- **Difficult-to-wire environments**
Historic or old buildings, asbestos installations, and open areas where wiring is difficult to employ
- **SOHO users**
SOHO (Small Office Home Office) users who need easy and quick installation of a small computer network

Package Checklist

The 11g Wireless PCI Adapter package includes:

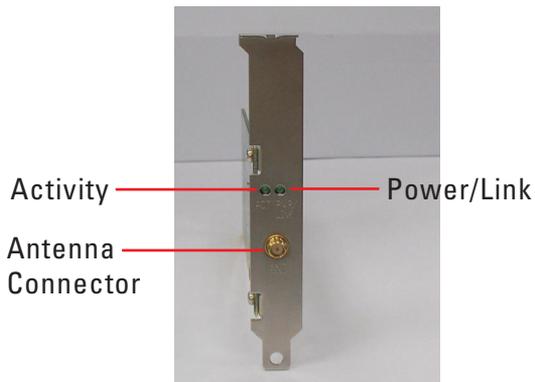
- One external antenna with attached cable and wall mounting kit
- One Quick Installation Guide

Hardware Description

The 11g Wireless PCI Adapter supports up to 54 Mbps connections to Ethernet networks. This adapter is fully compliant with the IEEE 802.11g specifications and certified by Wi-Fi.

LED Indicators

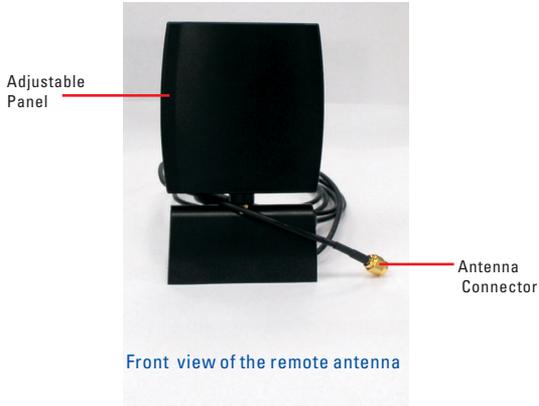
There are two status LED indicators on the adapter, as described in the following figure and table.



LED	Status	Description
Power/Link	On	Indicates a valid connection.
	Flashing	Indicates that the adapter is scanning for available networks.
Activity	Flashing	Indicates that the adapter is transmitting or receiving packets.

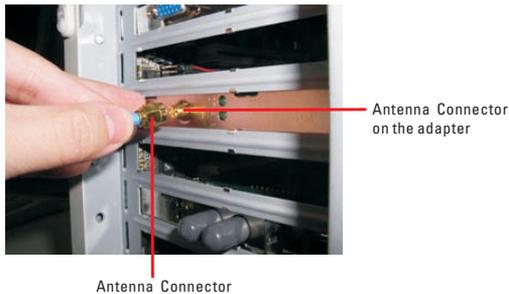
Antenna

The 11g Wireless PCI Adapter comes with one external antenna.

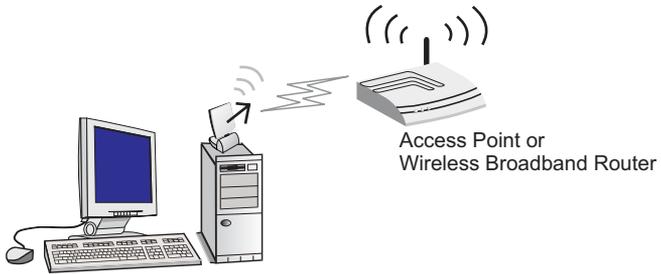


How to Install and position the remote antenna

- Screw the antenna to the antenna connector located on the back of your desktop PC



- Place the antenna on the desktop PC, table, or mount it on the wall, to get better data transmission and reception
- Keep the antenna patch facing toward your Access Point (AP) or Wireless Broadband Router



Note: A clear and open area provides better wireless performance. Performance may be affected by the interference of microwave ovens and 2.4GHz cordless phones.

Using Windows XP Wireless Zero Configuration

It is recommended that you use Windows XP's built-in program, Wireless Zero Configuration, to manage the 11g Wireless PCI adapter. For details on how to use Microsoft Windows Zero Configuration tool to set up a wireless network, go to the following web site at <http://www.microsoft.com/technet/treeview/default.asp?url=/technet/columns/cableguy/cg1102.asp>.

You can choose either Option A or Option B to open the program, follow these steps:

Step 1

Option A:

- Go to your system tray (located on the lower right hand corner of your screen), and right-click on the Wireless Network Connection icon. Select "View Available Wireless Networks".



- The Wireless Network Connection window will then appear. If your network is shown on the list, select it and enter the Network key, confirm the key again, and click Connect.



For detailed settings, click Advanced (proceed to step 2 on the following page for configuration).

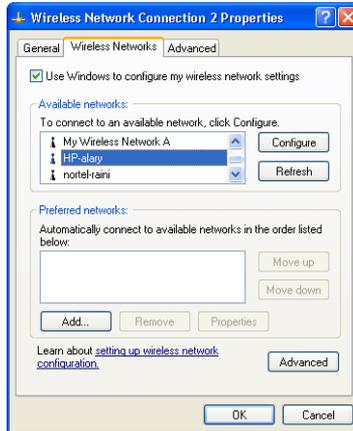
Step 1

Option B:

- Go to Start menu, Control Panel, and open Network Connections. Right-click on Wireless Network Connection, and select Properties.

Step 2

Go to the Wireless Networks tab, you can view and configure these settings here:



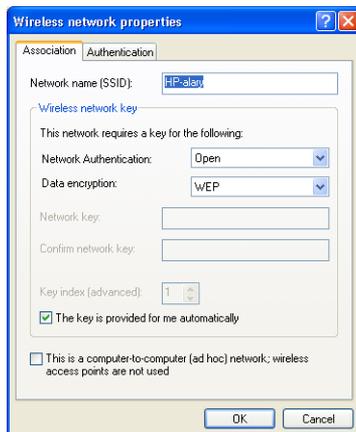
- Use Windows to configure my wireless network settings — This box is checked by default.
- Available networks — The available networks within the adapter's signal range. To set the configuration of a specific wireless network and add it to the list of preferred networks, select it from the list, and then click Configure. Click Refresh to scan for available wireless networks within range.
- Preferred networks — This is a list of preferred networks. You can organize several networks for your adapter to connect in different locations. If you want to add a new wireless network that does not appear in the Available networks list, click Add. To remove a wireless network, click Remove. To configure the settings of the wireless network to which you are connecting, click Properties.
- Advanced — Click Advanced to configure advanced settings for wireless networks that are not on the preferred network list.

Step 3

Click on Configure to set the parameters for the selected network.

Step 4

The Wireless network properties window will appear.



You can set up the SSID, Wireless network key, and operating mode here.

- Network name (SSID) — This field is required, you should set a name for the wireless network to which you want to connect. This should be set to the same as the SSID of the access point or wireless router to which you are connecting.
- Wireless network key — If the access point (AP) or router that you are connecting to uses authentication and encryption, then you should set the adapter with the same settings to have a successful connection.

There are 4 types of Network Authentication: Open, Shared, WPA-PSK, and WPA. With Open, Shared, and WPA-PSK, there is no RADIUS (Remote Authentication Dial-In User Service) server involved. WPA is designed for the enterprise or for environment with RADIUS (or a centralized) server. Contact your network administrator for the detail information on how to set up WPA Authentication and Encryption.

If you select “Open” Network Authentication, and try to associate with the AP, that is also set to “Open”, you are free to connect to the AP (under the same SSID). And you can choose either to disable the encryption function, or you can use WEP to encrypt your data. When a combination of “Open” and “Disabled” is selected, that means there is no security at all for your wireless network. It is strongly advised not to select this combination for your wireless network.

With “Shared” Network Authentication, there is a shared key between the client adapter and the AP that you are trying to connect. You need to know the key in order to connect with the AP. And then you can choose to disable or to use WEP for Data encryption.

WPA-PSK (Pre Shared Key) is specially designed for home or SOHO environment. It provides strong authentication and encryption functions to protect your network against intrusion. With “WPA-PSK ” Network Authentication, there is a shared key

between the client adapter and the AP (broadband router). When “WPA-PSK” is selected, you should then choose “TKIP” for Data encryption. A combination of “WPA-PSK” and “TKIP” provides the best security protection for your wireless network. This combination uses a passphrase (or a shared secret) that must be set in the AP and your adapter.

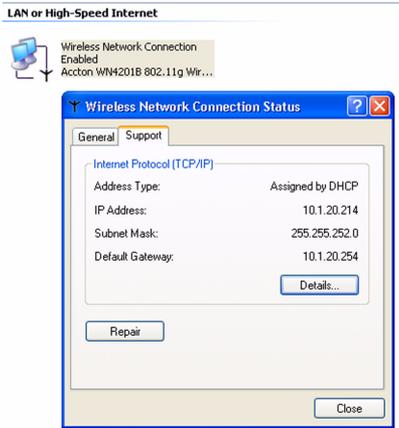
“The key is provided for me automatically” is checked by default. When “Open” or “Shared” Network Authentication is selected, you can choose to manually set the Network key. To do so, uncheck this box, and enter the Network key to correspond to the AP or wireless router to which you are connecting.

Verify your Wireless Connection

To know if the wireless connection is established, check the following:

Click on “Network” icon in the system tray and go to “Support” tab. Check the IP address. If IP address is shown as 192.168.X.X (e.g. 192.168.1.10) your PC should be connected to your Access Point or Wireless Broadband Router successfully. If after setting up your wireless connection successfully, you are still unable to access the internet, please refer to your Internet Service Provider (ISP).

Note: if IP address is 169.254.Y.Y (e.g. 169.254.149.168), it indicates that the address is assigned by your own computer and your PC is not associated with your Access Point or Wireless Broadband Router. Please check the network name (SSID) and security key. Make sure you enter the information correctly



- In the dialogue box of Step 4 “This is a computer-to-computer (ad hoc) network, wireless access points are not used” — If you are using this adapter in a peer-to-peer mode, check this box. For an Ad hoc mode, WPA security may not work properly with other wireless devices. WEP security is recommended. For detail please refer to Microsoft’s web site at <http://www.microsoft.com/windowsxp/expertzone/columns/bowman/03july28.asp>

How to set up an ad hoc network

At ad hoc mode (when your PC is connecting directly to another PC)

For the first user (PC#1)

Step 1

On PC screen, right click the “network” icon in the system tray. Select “View available wireless networks”.



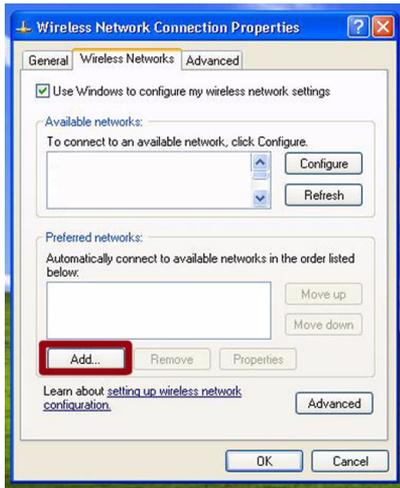
Step 2

Choose “Advanced”.



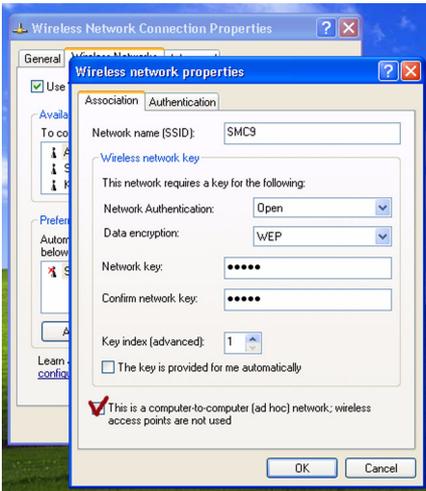
Step 3

Choose “Add”



Step 4

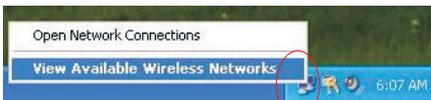
Key in any “Network name (SSID)”, for example, “SMC9”. Enable “This is a computer-to-computer (ad hoc) network” check box. Choose “Open” in Network Authentication and “WEP” in Data encryption. Fill in and confirm “network key” (5 or 10 ASCII characters, OR 10 or 26 Hexadecimal characters) is the same as in AP or wireless broadband router you wish to connect to. Then click “OK”.



For the second (PC#2) and the following users

Step 1

On PC screen, right click the “network” icon in the system tray. Select “View available wireless networks”.



Network Icon

Step 2

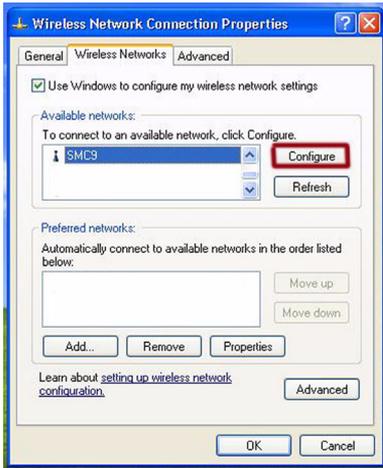
Choose "Advanced".



Step 3

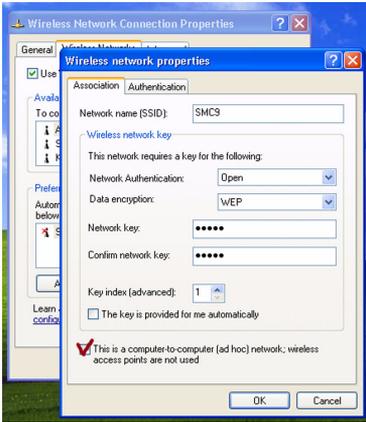
Click the Refresh button.

Select "SMC9", click "Configure".



Step 4

Fill in the same settings as the first user's computer. Click "OK".

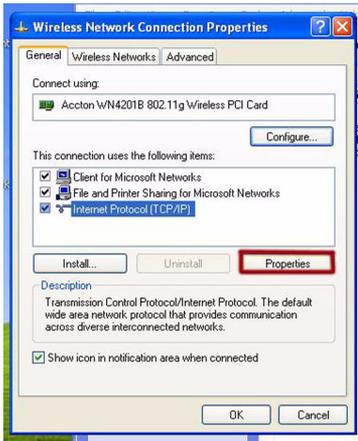


Verify your wireless connection in ad hoc mode

Click on “Network” icon in the system tray and go to “General” tab. Highlight “Internet Protocol (TCP/IP)” and click on “Properties”

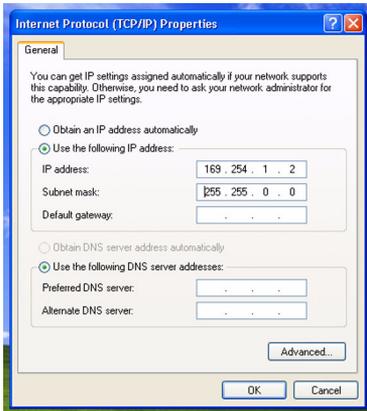


Network Icon



Step 2

Enable “Use the following IP address”. Enter IP address 169.254.1.2 on PC#1 and 169.254.1.3 on PC#2. The subnet mask will be assigned 255.255.0.0 automatically.



Step 3 Verify the ad hoc connection

Go to <Start> <My Computer>. Under “Other Places” on the left panel, click on “ My Network Places” and then “View workgroup computers”. The ad hoc computer names should be shown on the right panel. Make sure the 2 computers are configured for the same Workgroup name but with different computer names.



Note: The ad hoc mode can set up wireless connection between 2 or more computers

Network Configuration and Planning

This Wireless Solution supports a stand-alone wireless network configuration, as well as an integrated configuration with Ethernet LANs.

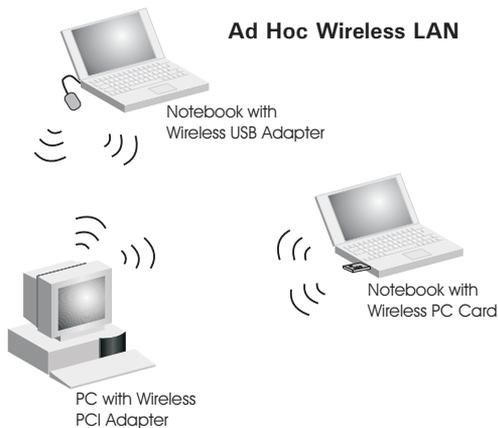
The 11g Wireless PCI Adapter can be configured as:

- Ad hoc for peer-to-peer communications
- Infrastructure for connections with wireless LANs

Network Topologies

Ad Hoc Wireless LAN

An ad hoc wireless LAN consists of a group of computers, each equipped with a wireless adapter, connected via radio signals as an independent wireless LAN. Computers in a specific ad hoc wireless LAN must be configured to the same radio channel. An ad hoc wireless LAN can be used for a branch office or SOHO operation.

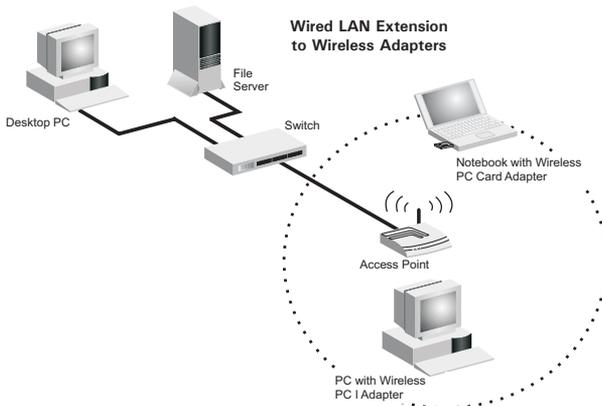


Infrastructure Wireless LAN

The Wireless PC Card can also provide wireless workstations with access to a wired LAN. An integrated wired and wireless LAN is called an Infrastructure configuration. A Basic Service Set (BSS) consists of a group of wireless PC users, and an access point that is directly connected to the wired LAN. Each wireless PC in this BSS can talk to any computer in its wireless group via a radio link, or access other computers or network resources in the wired LAN infrastructure via the access point.

The infrastructure configuration not only extends the accessibility of wireless PCs to the wired LAN, but also extends the effective wireless transmission range for wireless PCs by passing their signals through one or more access points.

A wireless infrastructure can be used for access to a central database, or for connection between mobile workers, as shown in the following figure.



Troubleshooting

Check the following troubleshooting items, and reboot the system before contacting customer support.

If the Link LED on the Wireless PCI adapter does not light, or if you cannot access any network resources from the computer, check the following:

1. Make sure the computer is powered.
2. Make sure the remote antenna is connected with the adapter.
3. Check your access point or wireless router is powered, and make sure it is working properly.
4. If you cannot access the Internet, check wireless broadband router settings and make sure the login information provided by your ISP is correct.
5. In ad hoc mode, if the network does not work after changes of WEP (WPA-PSK) key, or SSID (network name), click right button of the “Network” icon in system tray, select “Open Network Connection”. Disable the “Wireless Network Connection” (click right button of this icon), then enable it in all ad hoc mode PCs.

If your wireless station cannot communicate with a computer in the Ethernet LAN when configured for Infrastructure mode, check the following:

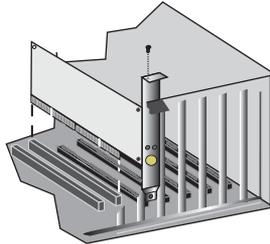
6. Make sure the access point (broadband router) that the station is associated with is powered on.
7. Make sure the SSID is the same as that used by the access point for a station with roaming disabled, or the same as that used by the access points in the extended service set (ESS).

The 11g Wireless PCI adapter is pre-installed in your computer. But for any reason, you should ever need to re-install the adapter, please see the following guidelines for the hardware installation:

Note: Network adapters are sensitive to static electricity. To protect the adapter, always touch the metal chassis of your computer or the ground to equalize the static charges, before handling the adapter.

To install the Wireless PCI Adapter:

1. Turn off your computer, unplug the power cord, and remove the computer panel.
2. Find an available PCI slot on your computer and remove the cover bracket. Firmly insert the adapter into the slot, making sure that no “gold fingers” are exposed.



3. Secure the bracket using the screw.
4. Place the computer's panel back.
5. Attach the external antenna to the Wireless PCI Adapter by screwing the antenna connector onto the adapter's antenna connector.
6. Connect the power cord back to your computer, turn on your machine and the adapter will automatically re-install itself.

Customer Support

Customer support information can be found in your computer. Simply go to <Start> and right click on "My Computer" and select " Properties". Go to "General" tab and click on " Support Information". Or you can refer to your System Warranty and Support Guide.

Compliances

Federal Communication Commission Interference Statement

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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment into 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 Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. 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.

IMPORTANT NOTE

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

CSA Statement (Canada)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par l'Industrie.

CE Mark Declaration of Conformance for EMI and Safety (EEC)

This information technology equipment complies with the requirements of the Council Directive 89/336/EEC on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility and 73/23/EEC for electrical equipment used within certain voltage limits and the Amendment Directive 93/68/EEC. For the evaluation of the compliance with these Directives, the following standards were applied:

- RFI
- Limit class B according to EN 55022:1998
- Emission:
- Limit class B for harmonic current emission according to EN 61000-3-2/1995
 - Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3/1995
- Immunity:
- Product family standard according to EN 55024:1998
 - Electrostatic Discharge according to EN 61000-4-2:1995 (Contact Discharge: ± 4 kV, Air Discharge: ± 8 kV)
 - Radio-frequency electromagnetic field according to EN 61000-4-3:1996 (80 - 1000 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Electrical fast transient/burst according to EN 61000-4-4:1995 (AC/DC power supply: ± 1 kV, Data/Signal lines: ± 0.5 kV)
 - Surge immunity test according to EN 61000-4-5:1995 (AC/DC Line to Line: ± 1 kV, AC/DC Line to Earth: ± 2 kV)
 - Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6:1996 (0.15 - 80 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Power frequency magnetic field immunity test according to EN 61000-4-8:1993 (1 A/m at frequency 50 Hz)
 - Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11:1994 (>95% Reduction @10 ms, 30% Reduction @500 ms, >95% Reduction @5000 ms)
- LVD:
- EN 60950 (A1/1992; A2/1993; A3/1993; A4/1995; A11/1997)

Specifications

Functional Criteria

Data Rate	Up to 54 Mbps
Operating Range	Up to 30 m (100 ft) at 11 Mbps Up to 100 m (300 ft) at 5.5 Mbps or lower indoors

Radio Signal

Modulation	Orthogonal Frequency Division Multiplexing (OFDM) Complementary Code Keying (CCK)
Operating Frequency	USA (FCC), Canada (IC): 2412~2462 MHz Europe (ETSI): 2412~2472 MHz Spain: 2457~2462 MHz France: 2457~2472 MHz Japan: 2412~2484 MHz
Operating Channel	USA, Canada: 11 channels ETSI: 13 channels Spain: 2 channels France: 4 channels Japan: 14 channels

Physical Characteristics

Power Consumption	TX: 480 mA, RX: 422 mA
Dimensions	12.8 x 5.3 cm (5.04 x 2.09 in.)
Antenna	External directional antenna
LED Indicator	Power, Link, Activity
Host Interface	PCI specification v.2.2

Standards Conformance

Wireless Standard	IEEE 802.11g, WiFi, WPA
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Environmental

Temperature	Operating: 0 to 55 °C (32 to 131 °F) Storage: -20 to 75 °C (-4 to 167 °F)
Humidity	5 to 90% (non-condensing)

Certification

Emissions	EN 55022 Class B EN 61000-4-2/3/4/6/11 FCC Part 15(B),
Safety	EN60950
ETSI	EN300328, EN301489

Software Drivers

NDIS Drivers	Windows XP
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Antenna Specification

Antenna Type	External directional
Frequency Band	2.4 ~ 2.5GHz
Impedance	50 Ohms nominal
Gain	6.0 dBi Peak
Radiation	Directional
Polarization	No
VSWR	2.0 or less
Connector	Reverse SMA connector

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