

Wireless LAN Card User Manual

User Manual

Wireless LAN Card

IEEE 802.11b 11 Mbps Wireless LAN Card

Contents

Introduction	1
Features	1
Applications	2
System Requirements	2
Package Checklist	2
Utility Configuration	3
Wireless Card Manager	3
Configuration	4
Link information	6
IP information	7
Site browse	8
Version Information	9
Network Configuration and Planning	10
Network Topologies	10
Ad Hoc Wireless LAN	10
Infrastructure Wireless LAN	11
Setting the Communication Domain	12
Troubleshooting	13
Adapter Installation Problems	13
Network Connection Problems	14
Compliances	15
Federal Communication Commission Interference Statement	15
CSA Statement (Canada)	16
CE Mark Declaration of Conformance for EMI and Safety (EEC)	16
Specifications	17
General Specifications	17
Software Drivers	18

Introduction

The Wireless LAN Card is an 11 Mbps wireless network adapter that seamlessly integrates with existing Ethernet networks to support applications such as mobile users or temporary conferences. 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 enough wireless access points to cover your network area, plug wireless cards into your notebooks, and start networking.

Using this card in conjunction with a wireless access point, you can create an instant network that integrates with existing 10/100 Mbps Ethernet LANs. Moreover, moving or expanding your network is as easy as moving or installing additional access points – no wires!

Features

- 1, 2, 5.5 and 11 Mbps data rate
- Wireless connection without the hassles and cost of cabling
- Greater flexibility to locate or move networked PCs
- Integrates with or replaces wired LANs at dramatically lower cost than wired alternatives
- Seamless connectivity to wired Ethernet LANs augments existing networks quickly and easily
- Easy installation and user-friendly configuration
- Working range up to 50 m (164 ft) at 11 Mbps, up to 90 m (295 ft) at 2 Mbps, or lower indoors
- Direct Sequence Spread-Spectrum (DSSS) technology provides robust, interference-resistant wireless connection
- Supports a wide range of systems (Windows 98/Me/2000/XP, and Linux)
- Enhances your network security with WEP data encryption
- Domain Channel Selection (DCS) allows access to the channels prescribed by the regulations of different countries
- Multiple language support, provides user friendly interface in 7 languages

Applications

Offers a fast, reliable, cost-effective solution for wireless client access to the network in applications like these:

- **Remote access to corporate network information**
E-mail, file transfer, and terminal emulation
- **Difficult-to-wire environments**
Historic or old buildings, asbestos installations, and open areas where wiring is difficult to employ
- **Frequently changing environments**
Retailers, manufacturers, and banks who frequently rearrange the workplace and change location
- **Temporary LANs for special projects or peak times**
Trade shows, exhibitions, and construction sites that need a temporary setup for a short time period. Retailers, airline, and shipping companies that need additional workstations for peak periods. Auditors who require workgroups at customer sites
- **Access to databases for mobile workers**
Doctors, nurses, retailers, office workers who need access to databases while being mobile in the hospital, retail store or office campus
- **SOHO users**
SOHO (Small Office and Home Office) users who need easy and quick installation of a small computer network

System Requirements

Before you install the Wireless LAN Card, check your system for the following:

- A laptop with a PCMCIA Type II or Type III slot
- Windows 98/Me/2000/XP or Linux
(Prepare the Windows 98 OS installation CD for use during driver and utility installation)
- A minimum of 1500 Kbytes of free disk space for installing the driver and utility program
- Other IEEE 802.11b-compliant devices installed in your network area

Package Checklist

The Wireless LAN Card package includes:

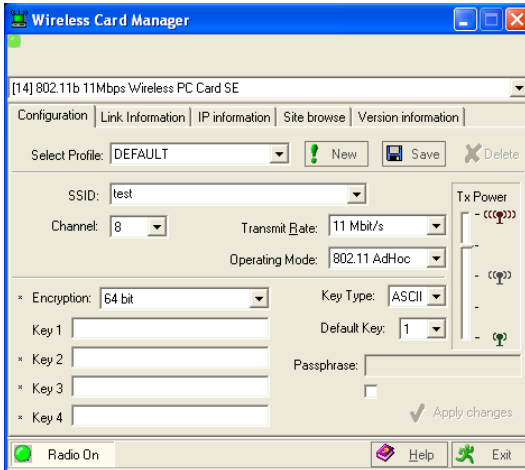
- 1 Wireless LAN Card
- 1 driver and utility installation and documentation CD
- 1 Quick Installation Guide

Please inform your dealer if there are any incorrect, missing, or damaged parts. If possible, retain the carton, including the original packing materials. Use them again to repack the product if there is a need to return it for repair.

Utility Configuration

Wireless Card Manager

To configure the Wireless LAN Card, double-click on the Wireless Card Manager icon on the desktop to launch the utility. Or you can access it from the Start menu.



The configuration utility includes 5 tabs:

Configuration — Allows you to monitor network status and configure parameters for the Wireless LAN Card.

Link information — Shows Wireless LAN Card statistics.

IP information — Shows the Internet Address of the Wireless LAN Card.

Site Survey — Scans/shows all the wireless devices in range.

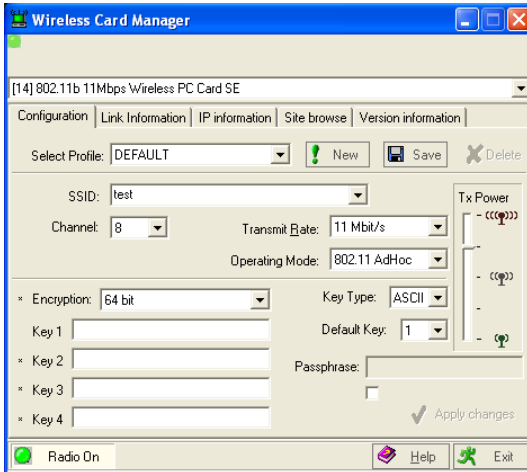
Version information — Shows the version information for the driver and utility.

At the bottom of each screen, there are 3 items that can be selected:

- **Radio On/Radio Off** — This allows you to turn on/off the transmission/reception of the Wireless LAN Card.
- **Help** — Click here to display the help file.
- **Exit** — Clicking on this button closes the configuration utility dialogue box.

Configuration

This utility allows you to configure the Wireless LAN Card parameters.



Select Profile — Specify a profile name for a specific configuration of parameters.

New — You can set up a new profile by clicking New.

Save — To save a profile after configuring the settings, click Save.

Delete — To delete a profile, select the profile from the drop-down menu for Select Profile, then click Delete.

SSID — Input a SSID string for the wireless network to which you want to connect. This should be set to the same value as the SSID of the access point or wireless router to which you are connected. To roam among multiple access points with different BSSIDs, set this value to ANY to allow connection to any access point.

Channel — If you are setting up an ad hoc wireless LAN (see “Network Topologies” on page 10), set the channel to the same radio channel as that used by the other wireless clients in your group. However, if you are connecting to a network via an access point, then the channel is automatically set by the access point.

Note: The available channels are limited to local regulations.
FCC: 11 channels

Transmit Rate — Indicates the data transmission rate. Select an appropriate transmission speed. Lower speeds will give better range.

Operating Mode — Set the operation mode to 802.11 ad hoc for connections that do not have any access points, or to infrastructure for connections with an access point (see “Network Topologies” on page 10 for more information).

Tx Power — Move the slider up and down to increase or decrease the transmission power.

Encryption — WEP (Wired Equivalent Privacy) is implemented in the Wireless LAN Card to prevent unauthorized access. For more secure data transmission, set the encryption to 128-bit or 64-bit.

Key Type — Select ASCII or Hex.

Default Key — Choose the key for encryption.

Passphrase — Check this box to automatically generate key strings for encryption.

How to set up WEP:

The WEP mechanism is based on the RC4 encryption algorithm. The security keys are provided to ensure data confidentiality. When you select 64-bit Encryption, 4 keys will be generated. When 128-bit Encryption is selected, only one key will be generated. WEP security protects your wireless LAN against eavesdropping and unauthorized access by intruders. If WEP is in use, all clients on the same network must use the same WEP key settings in order to communicate with each other.

To use the WEP function, take the following steps:

Step 1: Select 128-bit or 64-bit in the Encryption field.

Step 2: Check the Passphrase box, and type in a string of characters in this field to automatically generate keys.

Step 3: In the Default Key field, select one key as the default key that you want to use for encryption.

Step 4: Click the Apply changes button to allow the settings to take effect.

Or

Step 1: Select 128-bit or 64-bit in the Encryption field.

Step 2: In the Key Type field, select ASCII or Hex.

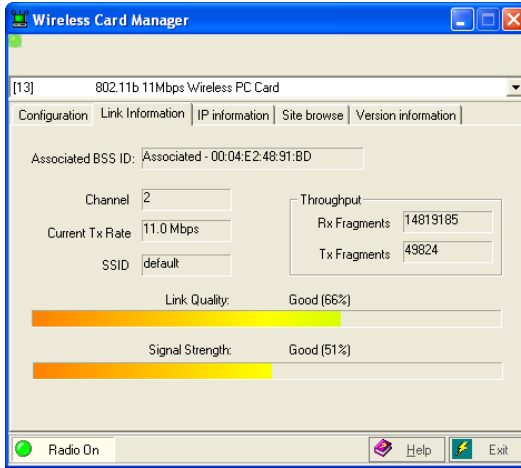
Step 3: In the Default Key field, select one key as the default key that you want to use for encryption.

Step 4: Manually type in a string of characters in the corresponding Key # (Key 1~Key 4) field that you selected in step 3. Then Click Apply changes to allow the settings to take effect.

Note: When setting up WEP without using the Passphrase function, if the Key Type is set to Hex, only Hexadecimal characters (range: 0~9 and A~F) can be used. When Encryption is set to 64-bit, a maximum of 10 Hex characters can be entered in the Key field. And when 128-bit Encryption is selected, a maximum of 26 Hex characters can be entered to generate the key string. If the Key Type is set to ASCII, and Encryption is set to 64-bit, then 5 ASCII characters can be used in the Key field. And for 128-bit Encryption, 13 ASCII characters can be used.

Link information

This screen displays current connection information of the Wireless LAN Card.



Associated BSS ID — The MAC address of the access point to which the Wireless LAN Card is connected in an infrastructure network. In an ad hoc network, the BSS ID is a random number generated by the first station that communicates with other clients in the network.

Channel — The channel used to communicate with the connecting wireless device.

Current Tx Rate — The data transmission rate.

SSID — The Service Set Identification of the wireless network to which the Wireless LAN Card is connected.

Rx Fragments — The number of received fragments.

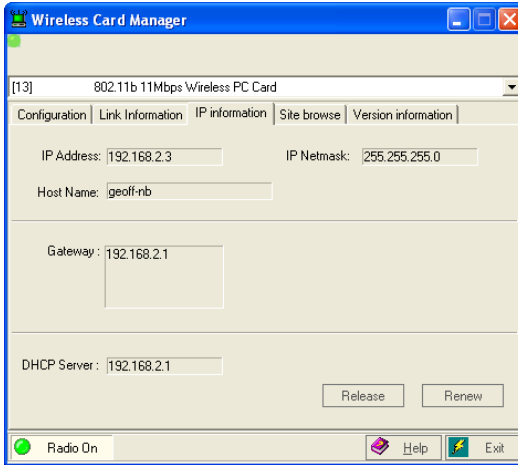
Tx Fragments — The number of transmitted fragments.

Link Quality — Shows the link quality or the current wireless connection.

Signal Strength — Indicates the relative strength of the connection between the Wireless LAN Card and the connected device.

IP information

This screen displays IP information for your notebook. Now that you have configured your Wireless LAN Card to connect to wireless networks, you need to obtain new network settings.



IP Address — Internet address of the notebook.

IP Netmask — A mask used to determine to what subnet an IP address belongs.

Host Name — The notebook's name on the network.

Gateway — The IP address of the Gateway.

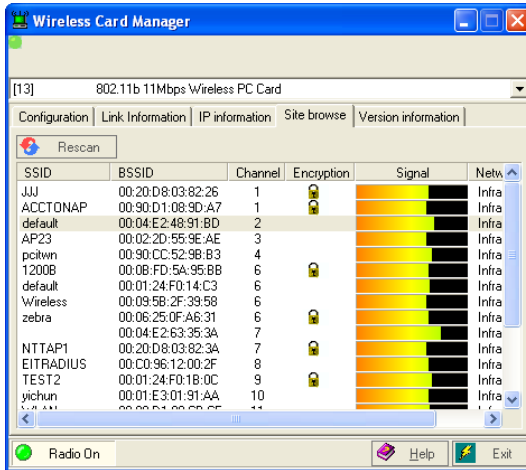
DHCP Server — The IP address of the DHCP server.

Release — Click this button to release the current IP settings of the Wireless LAN Card.

Renew — Click this button to obtain new IP settings for the Wireless LAN Card.

Site browse

Site browse scans and displays all wireless devices within range. You can connect to a wireless device by double-clicking on that entry.



Rescan — Click this button to scan for available network connections.

SSID — Service Set ID (see page 4 for details).

BSSID — Basic Service Set ID (see page 6 for more information).

Channel — The radio channel on which the wireless device operates (see page 6).

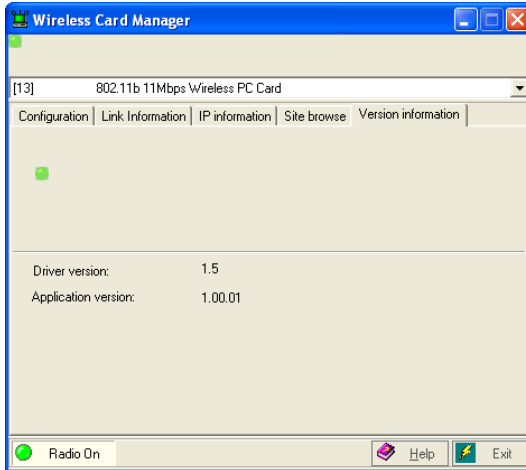
Encryption — The locking icon indicates that the encryption function has been enabled.

Signal — Shows the signal strength from the adapter to the listed wireless devices.

Network Type — This indicates the operating mode of the listed networks. (See page 4 for a definition of Operating Mode.)

Version Information

This screen shows information on the current version of the driver and configuration utility.



Network Configuration and Planning

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

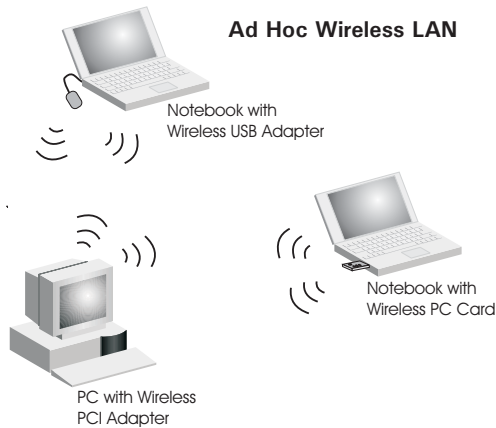
The Wireless LAN Card can be configured as:

- Ad hoc for departmental or SOHO LANs
- Infrastructure for enterprise 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.

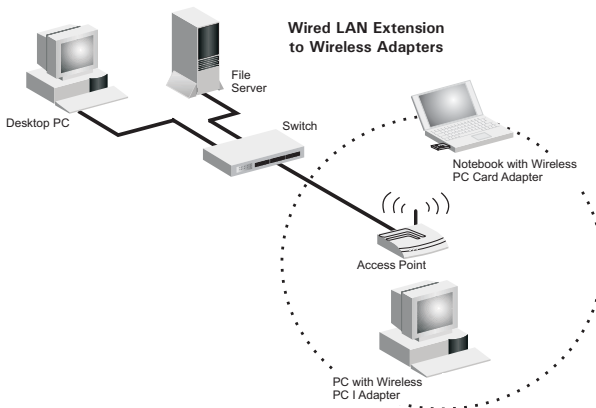


Infrastructure Wireless LAN

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.



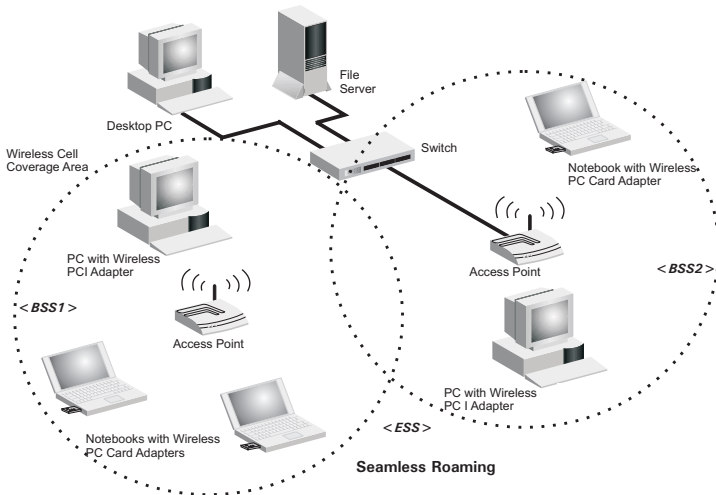
Setting the Communication Domain

Stationary Wireless PCs

The Basic Service Set (BSS) is the communication domain for each access point. For wireless PCs that do not need to support roaming, set the domain identifier (SSID) for the wireless card to the SSID of the access point you want to connect to. Check with your administrator for the SSID of the access point to which you are connecting.

Roaming Wireless PCs

A wireless infrastructure can also support roaming for mobile workers. More than one access point can be configured to create an Extended Service Set (ESS). By placing the access points so that a continuous coverage area is created, wireless users within this ESS can roam freely. All wireless adapters and access points within a specific ESS must be configured with the same SSID and to the same radio channel.



Troubleshooting

Check the following troubleshooting items before contacting Technical Support.

Adapter Installation Problems

If your notebook cannot find the Wireless LAN Card or the driver software does not install correctly, check the following:

- Make sure the adapter is securely seated in the PCMCIA slot. Check for any hardware problems, such as physical damage to the card's connector.
- Try the card in another PCMCIA slot. If this also fails, test your notebook with another wireless card that is known to operate correctly.
- Make sure your notebook is using the latest BIOS, check the manual of your laptop for details.
- If there are other network adapters in the notebook, they may be in conflict. Remove the other network adapters from the notebook and test the wireless adapter separately.
- Check for a defective notebook or PCMCIA connection by trying the adapter in another notebook that is known to operate correctly.

If all fails, and the card still does not work, take out the wireless adapter. Uninstall the driver and utility from your system, then go to "Control Panel" and delete the adapter from your network configuration menu. Restart your notebook and reinstall the card and the driver and utility software.

Network Connection Problems

If the Link LED on the Wireless LAN Card does not light, or if you cannot access any network resources from the notebook, check the following:

- Make sure the driver and utility software is installed correctly. If necessary, try uninstall and then reinstalling the software.
- Make sure the notebook and other network devices are receiving power.
- The access point that you are connecting to might be defective. Try connecting to another access point.
- If you cannot access a Windows or NetWare service on the network, check that you have enabled and configured the service correctly. If you cannot connect to a particular server, be sure that you have access rights and a valid ID and password.
- If you cannot access the Internet, be sure you have configured your system for TCP/IP.

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

- Make sure the access point that the station is associated with is powered on.
- Check the SSID of the access point that you are connecting to, make sure you set the adapter to the same SSID.
- If there is still no connection, change the radio channel of the access point and all the clients within the same BSS.
- Check if WEP settings have been enabled in the access point to which you are connecting. Make sure that the encryption, default key and passphrase settings of the adapter are set to the same as the access point. Contact your network administrator for more information.

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.

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

General Specifications

Functional Criteria

Data Rate	1, 2, 5.5, 11 Mbps
Network Connection	IEEE 802.11b - Wireless LAN
Operating Range	Indoor: Up to 50 m (164 ft) at 11 Mbps, up to 90 m (295 ft) at 2 Mbps, up to 115 m (377 ft) at 1 Mbps Outdoor: Up to 160 m (525 ft) at 11 Mbps, up to 400 m (1312 ft) at 2 Mbps, up to 550 m (1804 ft) at 1 Mbps

Radio Signal

Signal Type	Direct Sequence Spread-Spectrum (DSSS)
Operating Frequency	USA, Canada and Europe (ETSI): 2.400-2.4835 GHz
Sensitivity	-82 dBm (minimum) at 11 Mbps -85 dBm (minimum) at 5.5 Mbps -87 dBm (minimum) at 2 Mbps -92 dBm (minimum) at 1 Mbps
Modulation	CCK, BPSK, QPSK
Output Power	+17.5 dBm (normal)

Physical Characteristics

Power Consumption	3.3 V, 375 mA transmit, 285 mA receive (normal)
Dimensions	12.8 x 5.3 cm (5.04 x 2.09 in.)
Antenna	Dual antenna
LED Indicator	Link, Activity
Host Interface	PCMCIA, Type II or Type III

Standards Conformance

Wireless Standard	IEEE 802.11b
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Software Drivers

Environmental

Temperature	Operating: 0 to 50 °C (32 to 122 °F) Storage: 0 to 70 °C (32 to 158 °F)
Humidity	5 to 80% (non-condensing)
Vibration/Shock/Drop	IEC 68-2-34, IEC 68-2-27, IEC68-2-32

Certification

CE Mark	EN 50081-1, EN 55022 Class B EN 50082-1, EN 61000-4-2/3/4/6/11
Emissions	FCC Part 15(B), ETS 300-328

Software Drivers

NDIS Drivers	Windows 98 Windows Me Windows 2000 Windows XP Linux
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