Wireless Mini-PCI Card

User Manual

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Chapter 1 Introduction

This product is an IEEE 802.11b Wireless Mini-PCI Card that uses a standard Type ⅢA interface which integrated with wireless LAN technology. It provides an easy and fast way to access the Internet via wireless network. This Wireless Mini-PCI Card allows the users to install on NB or PC (with an adapter) with Mini-pci interface, Wireless Access Point/Bridge/Router and other devices equipped with a Type ⅢA slot. This Wireless Mini-PCI Card is 802.11b compliant and the data rate of connection is up to 11Mbps. With an 802.11b Wireless Mini-PCI Card you can send and receive E-mail, synchronize with your desktop computer, and surf the Internet while on the move.

1.1 Features and Benefits

11Mbps data transfer rate	High-speed data transmission
Flexible design for embeded system	Can be designed or embedded for OEM project/embedded system
IEEE802.11b compliant	Fully interoperable with IEEE802.11b compliant products
Automatic data rate scaling at 11, 5.5, 2 and 1 Mbps	Optimized throughput, range and connectivity
Improved 64/128-bit WEP Engine	Significantly improved security
Wide coverage range up to 800 meters in open space	Wireless connectivity for all your computers
Advanced Power Management	Extended battery life
Significantly improved indoor multipath distortion	Higher link quality in indoor environment
High transmit power	Long operating range, up to two times range of standard products

Wireless Solutions and Application

- **Access existed networks for mobile workers**
  Allow doctors, nurses, sales access their database while keeping mobility in the hospitals, retail stores, office campus or other buildings.
- **Difficult-to-wire environment**
  There are many situations where wires cannot or cannot easily be laid. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.
- **Frequently changed environment**
  Show rooms, meeting rooms, retail stores, and manufacturing sites where the workplace located are frequently rearranged.
- **Wired LAN backup**
  Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.
- **Wireless extensions to wired networks**
  Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.
- **Temporary workgroup**
  Trade shows, exhibitions, and construction sites that require a temporary network.
  Retailers, airlines, and shipping companies need additional workstations during peak periods.
- **Small Office/ Home Office (SOHO) Networks**
  SOHO users need a cost-effective, easy and quick installation of a small network.

1.2 Package Contents

- Wireless Mini-PCI Card
- Installation CD (Include User's Manual, Acrobat® Reader Program)
- Quick Installation Guide

☆Package content depends on different model. Some models are preinstalled in a device equipped with an *internal* Type IIIA mini PCI card slot, such as Wireless Access Point/Bridge/Router and other devices equipped with a Type ⅢA slot.

Chapter 2 Installing Drivers & Client Utility

This chapter describes how to install the Mini-PCI Card drivers and client under Windows 95/98/ME/2000/XP. If you want to install this Wireless Mini-PCI Card in another device such as Wireless Access Point/Bridge/Router and other devices equipped with a Type ⅢA slot. Make Sure these devices can support Intersil chipset.

2-1 Installation for Windows 95/98/ME/2000/XP

During the installation, Windows 95/98/ME/2000/XP may need to copy Windows system files from the Windows 95/98/ME/2000/XP installation diskette or CD-ROM.Therefore you will need a copy of the Windows installation the driver.On many syetem, instead of a CD,the necessary installation files are archived on the hard disk in C:\Windows\OPTIONS\CABS directory

Installation Procedures:

Before installing the new driver in your computer, you need to remove all of the Wireless LAN Mini-PCI/PCMCIA/USB Card's driver that you had installed in your computer(Refer page 5). Please follow the installation procedures below.

◎ **Install Wireless Mini-PCI Card Driver**

1. Turn on the computer
2. Be sure that there is no Wireless LAN Mini-PCI Card has been insterted yet
3. Instert the Wireless LAN Installation CD into your CD-ROM drive.

Figure 2-1-1

1. The setup program should start automatically as shown in ***Figure 2-1-1***. If it does not start, you can run it manually by selecting RUN from the Start menu and running ***Setup.htm*** from CD-ROM drive.
2. From Wireless LAN Installer, select ***Utility & Driver Install***. The driver and utility of Wireless LAN Mini-PCI Card will be installed automatically.
3. Insert the Mini-PCI Card into the Mini-PCI type ⅢA slot of your computer/AP/Router/other devices equipped with a Type ⅢA slot..
4. The Wireless LAN Mini-PCI Card will be found and installed without restart the computer.
5. Make sure that the network protocol parameters are set correctly for your computer. These include the IP address, subnet mask, gateway and DNS. If you are unfamiliar with how to set network protocol parameters, refer to Chapter 3 Connection to Network for details.

◎ Remove Wireless Mini-PCI Card Driver

1. Turn on your computer.
2. Right-click on ***My Computer*** icon on the Windows desktop to choose ***Properties*** and then ***System Properties*** window will pop out.
3. Click on the tab ***Device Manager*** and then move the mouse to ***Network Adapters*** node to expend the tree list by clicking on the plus sign.
4. Remove Wireless LAN Mini-PCI Card that you have installed already.
5. Uninstall the Old Driver
6. You must remove the old existing driver before installing the new driver.
7. Click **Start** icon on the tool bar and select **Control Panel** from **setting** item.
8. Double click the ***Add/Remove Programs*** icon to open up Add/Remove Programs window then choose the tab ***Install/Uninstall***, pick up the utility that you have installed for Wireless LAN Mini-PCI Card and press the button ***Add/Remove***.
9. The dialog box will show up to confirm if you want to remove the driver and all of its components. Please click on ***OK*** button to complete the uninstallation procedure of the old driver.
10. Restart the computer and remove the Wireless LAN Mini-PCI Card.
11. Follow the ***Install Wireless Mini-PCI Card Driver*** to complete the Installation Procedure.
12. If the computer still use the old driver, please follow the step below,
    a. Right click the ***My Computer*** icon on the desktop and choose ***Properties*** (Windows 98/ME) or ***Manage*** (Windows 2000/XP).
    b. In the ***Device Manager*** window, right click the ***Wireless LAN Mini-PCI Card*** from the Network adapters' tree list and choose the ***Properties*** as shown in ***Figure 2-1-2***.

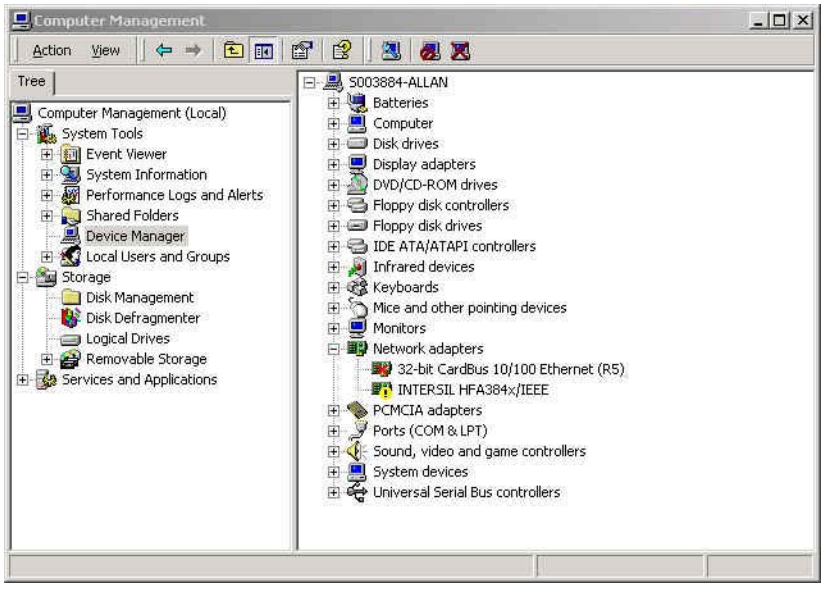


Figure 2-1-2

c. Click ***Update Driver*** button from the ***Driver*** tab as shown in ***Figure 2-1-3***.

Figure 2-1-3

d. Click next of the Welcome to Upgrade the Device Driver Wizard dialog box. The Install Hardware Device Driver dialog window will be showed up as shown in ***Figure 2-1-4***.

Figure 2-1-4

e. Choose Display a list of the known drivers for this device so that I can choose the specific driver and click Next as shown in ***Figure 2-1-5***.

Figure 2-1-5

f. In the ***Network Type*** dialog window, choose ***Network adapters*** and then click ***Next*** .

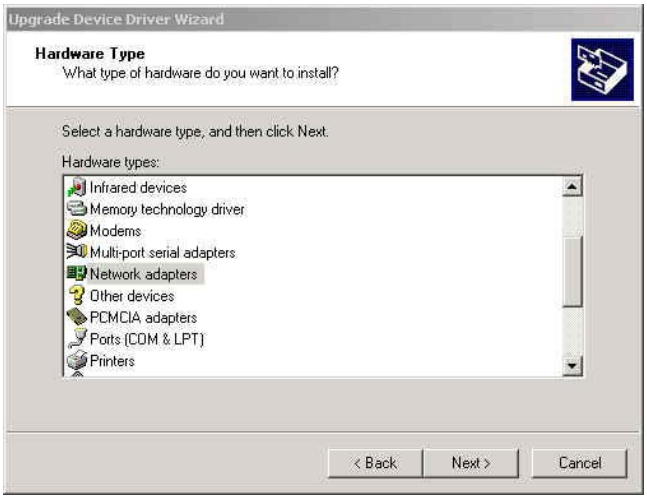


Figure 2-1-6

g. Select the network adapter for ***802.11b Wireless LAN PCI Card*** and then click **Next**. The ***Start Device Driver Installation*** dialog window will show up, click **Next** to enter the **Digital Signature Notice** window.

Figure 2-1-7

h. Click **Yes** to continue the installation procedure.

Figure 2-1-8

i. Click **Finish** to complete the installation procedure.


Upgrade Device Driver Wizard
Completing the Upgrade Device Driver Wizard
802.11b Wireless LAN PC Card
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

Figure 2-1-9

2- 2 Checking after Installation

After installing the driver and utility, follow the steps below to check that the Mini-PCI Card is operating correctly.

1. Click the ***Start*** button, select ***Settings***, and then click ***Control Panel***.
2. In the ***Control Panel*** window, double-click the ***System*** icon, and then select the ***Device Manager*** tab.
3. Double-click ***Network adapters***, then select ***Wireless LAN PCI Card*** as shown in ***Figure 2-2***.

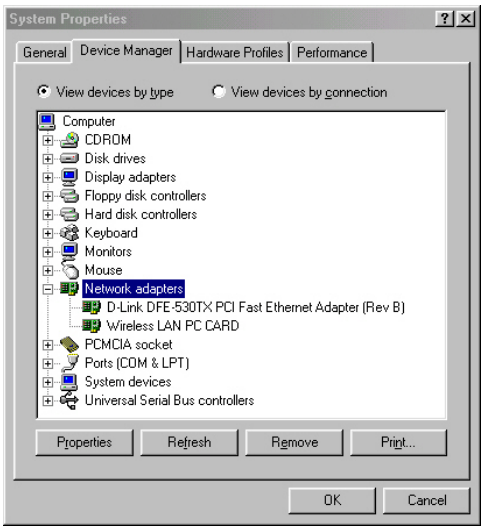


Figure 2-2-1

4. Click the ***Properties*** button, and then check the message. ***This device is working properly*** is displayed for Device status as shown in ***Figure 2-2-2***.
5. If you find the Yellow (?) sign on the adapter or the above message is not displayed, it shows the installation is not successful or the Wireless LAN Mini-PCI Card is not operating properly. Uninstall and re-install the driver, referring to Chapter 2-6 Uninstalling Driver and Utility.


Wireless LAN PC CARD Properties
General
Driver
Resources
Wireless LAN PC CARD
Device type: Network adapters
Manufacturer: %INTERSIL_STR%
Hardware version: Not available
Device status
This device is working properly.
Device usage
Disable in this hardware profile
Exists in all hardware profiles
OK
Cancel

Figure 2-2-2

2- 3 Wireless LAN Client Utility

Wireless LAN Client Utility is used to display or change the Mini-PCI Card information about link, configuration, encryption, and utility/driver/firmware version information. The client utility will also help you with site selection. The client utility will be installed automatically after installing the driver and utility. The Mini-PCI Card Utility icon will appear in the System Tray in the bottom right corner on your screen as shown in the ***Figure 2-3-1*** and ***Table 2-3-1***.

Figure 2-3-1

	Green indicates good or excellent link status
	Yellow indicates fair link status
	Red indicates no or poor link status

Table 2-3-1

After finishing installing the driver and utility, the client utility will automatically be executed and show a small green ***radio*** icon at the right corner of ***Taskbar*** whenever the Mini-PCI Card is inserted into the Mini-PCI Card slot of your computer. Double-click the ***radio*** icon to open the ***Wireless LAN Client Utility*** window as shown in ***Figure 2-3-2***. You can click the taps on the top of the windows to select various screen messages. Below we explain the use and meanings of the various screen messages.

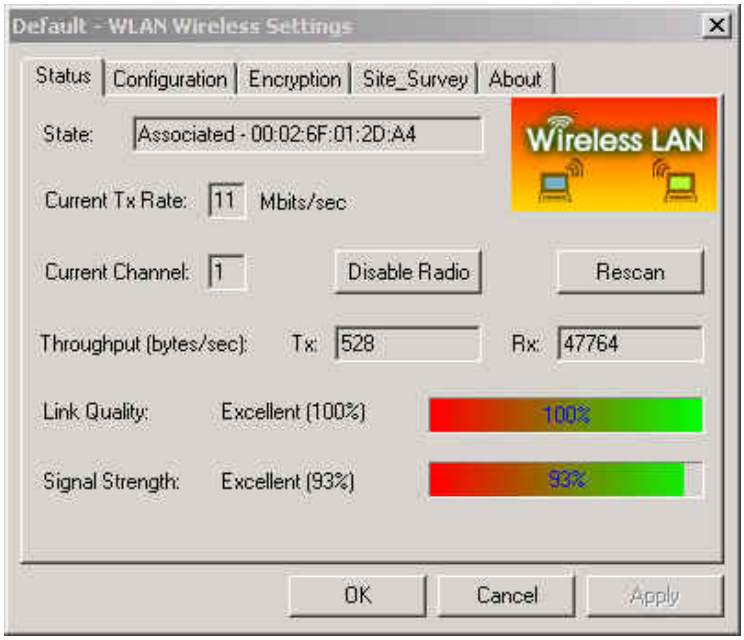


Figure 2-3-2

1. Menu of System Icon

Right-click on the system tray icon, the icon menu will display as shown in ***Figure 2-3-3***. Below is the introduction to this icon menu.

Figure 2-3-3

- Wireless Radio On/ Wireless Radio Off

The first two items in the icon menu are used to turn on/off the wireless radio. When the wireless radio is turned off, a red cross is placed on the system tray icon as shown in ***Figure 2-3-4***. When the wireless radio is turned on, the icon will vary in colors depending on the link quality as described in the ***Table 2-3-1***.

Figure 2-3-4

- Remove Status Icon

This item allows you to set the System Tray Icon to appear or disappear. Once you choose this item, the system will display the dialog box to confirm if you want to remove the System Tray Icon. You can also set the System Tray Icon to disappear permanently by checking the box Remove Status Icon Permanently as shown in the Figure 2-3-5. When the computer is restarted, the System Tray Icon will come back if you have removed the System Tray Icon before but not checked the box Remove Status Icon Permanently.

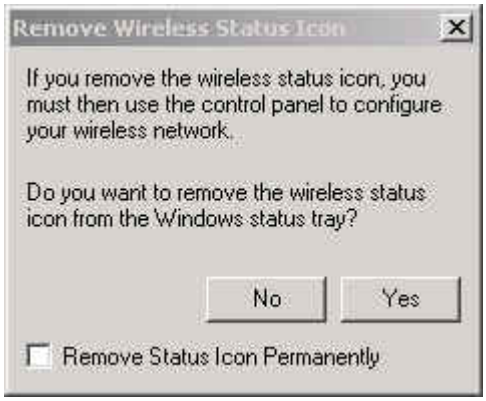


Figure 2-3-5

- Wireless Network Status

This item launches the Mini-PCI Card Utility with the tab ***Status*** that displays the information about link status to users.

- Advanced Configuration

  This item launches the Mini-PCI Card Utility with the tab ***Configuration*** that allows users to configure Mini-PCI Cards to suit their specific network settings.
- WEP Encryption

  This item launches the Mini-PCI Card Utility with the tab ***WEP Encryption*** that allows users to set up the Encryption Key which is used in their network environment.
- SITE Survey

  This item launches the Mini-PCI Card Utility with the tab ***Site Survey*** that allows users to browser the available active access points which users can connect to by pressing the ***Connect*** button.
- Version Information

  This item launches the Mini-PCI Card Utility with the tab ***About*** that displays the information about driver version, utility version, and firmware version.

2. Status

State

Shows status information about the radio link, as shown in ***Figure 2-3-6***

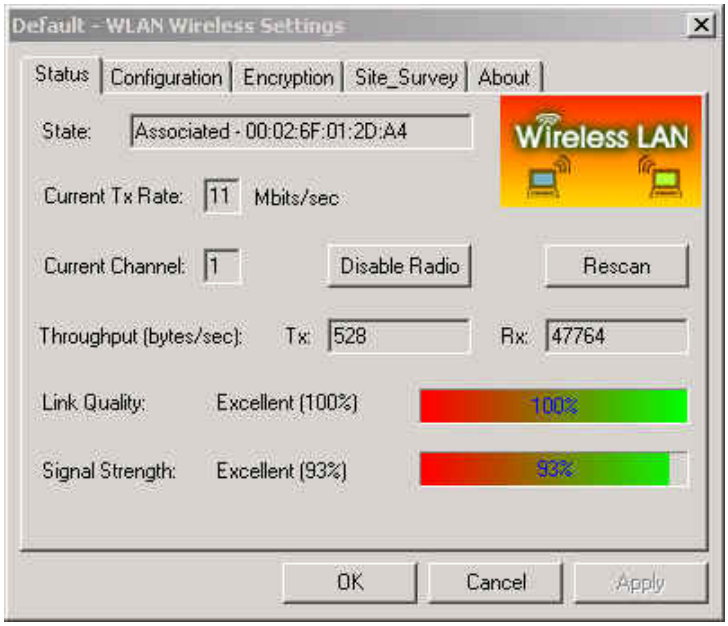


Figure 2-3-6

- Associated BSSID

  means the wireless client is connected to an access point. BSSID is shown in the form of six hex digits which is the MAC address of the access point.
- Scanning

  means the wireless client is searching for an available access point in infrastructure mode.
- Disconnected

  means there are no access points or other wireless clients (if communicating in Ad-hoc mode), or the Mini-PCI Card is unplugged in your computer.

Current Tx Rate (Mbits/s)

The data speed that wireless client is transmitting.

Current Channel

The operation radio frequency channel that wireless client is using in infrastructure mode. In infrastructure mode, wireless client will always operate in the same channel as their Access Point.

Throughput (Bytes/sec)

- Tx: shows the outgoing (sent) data speed.
- Rx: shows the incoming (received) data speed.

Link Quality

In infrastructure mode, this bar displays the transmission quality between a WLAN station (Access Point) and Wireless LAN Mini-PCI Card. In Peer-to-Peer mode (Ad-Hoc), this bar displays the link quality between two Wireless LAN Mini-PCI Cards.

Signal Strength

This bar displays the signal strength level. The higher bar is, the more powerful radio signal is received by the Mini-PCI Card.

Disable/Enable Radio

This button is used like a switch that allows users to turn off the wireless radio by clicking this button and turn it on again.

Rescan

The radio will rescan all available channels by pressing this button. You can push this button to rescan the channels for better link quality when the link quality is poor.

3. Configuration

Make configuration changes by specifying the proper configuration parameters on this configuration tab as shown in ***Figure 2-3-7***.

Figure 2-3-7

Profile

You can give a name for this field to a setting of configuration parameters, such as Network Name, Network Type, Transmit Rate, Encryption (WEP Security), etc. It makes much easier for users to change WLAN configuration settings who need to switch working places frequently. Suppose that a user has to work between the two different offices where there are different network settings. In this case, this user just needs to setup two profiles for the two offices and simply selects the proper profile when the user switches to the different office.

Network Name

For infrastructure mode, you need to type in the SSID of the access point to which your computer connects. For Ad-Hoc (peer-to-peer) mode, you need to

type in the virtual SSID of the Ad-Hoc network to which your computer attaches.

Network Type

There are two types of network modes in this drop-down list as shown in ***Figure 2-3-8***, Peer-to-Peer and Access Point (Infrastructure).

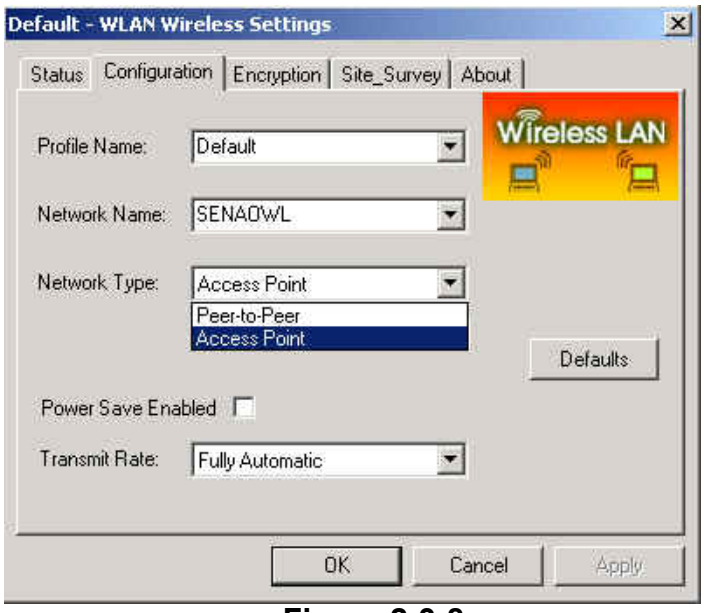


Figure 2-3-8

- Peer to Peer: If two or more stations exchange data directly without an access point, you need to select Peer-to-Peer mode. Each station in a Peer-to-Peer (Ad-Hoc) network must specify the same ***network name (SSID)*** and ***peer-to-peer channel***.
- Access Point: If at least one access point involves in the communications in a group of stations, you need to select Infrastructure mode. Each station needs to specify the same ***network name (SSID)*** as the access point. Please refer to the section 1-6 for more details about peer-to-peer mode and Access Point (infrastructure) mode.

Peer-to-Peer Channel

This option is just for Peer-to-Peer (Ad-Hoc) mode. You need to specify a channel on which the communications are established. Each station in a Peer-to-Peer (Ad-Hoc) network must specify the same ***channel*** and ***network type*** *(SSID)*.

Power Save Enabled

Select Power Save Enabled item to conserve more battery energy and extend the battery life. When this function is enabled, the Mini-PCI Card will be set in sleep mode between beacons.

Transmit Rate

The transmission rate on which the data packets are transmitted by the client can be specified in this drop-down list as shown in ***Figure 2-3-9***. Below are the available transmission rates.

Full Automatic :	Mini-PCI Card chooses the highest available transmission rate
11 Mb :	allows only 1 or 2 Mbps operation
5.5 Mb :	allows only 5.5 Mbps operation

Auto 1 or 2 Mb : allows only 1 or 2 Mbps operation

Table 2-3-2

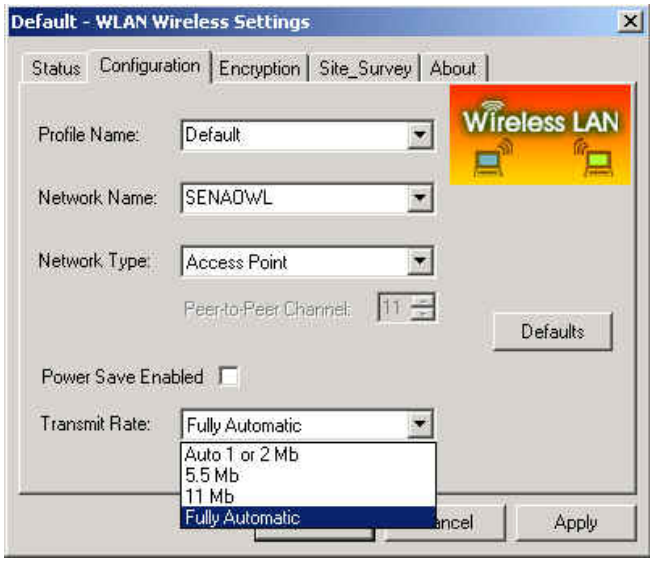


Figure 2-3-9

Defaults

Once this button is pressed, all the settings will be set back to the default settings.

4. Encryption

Encryption is designed to make the data transmission more secure. you can select 64 or 128-bit WEP (Wired Equivalent Privacy) key to encrypt data (Default setting is ***Disable***) as shown in ***Figure 2-3-10***. WEP encrypts each frame transmitted from the radio using one of the Keys from this panel. When you use WEP to communicate with the other wireless clients, all the wireless devices in this network must have the same encryption key or passphrase.

Choose one of the encryption key (64 bit or 128bit) from the ***Encryption (WEP Security)*** drop-down list to create encryption key. Click either on ***Create Keys Manually*** radio button or on ***Create Keys with Passphrase*** radio button. There are two ways, ***Alphanumeric*** and ***Hexadecimal***, to set the different characters as shown in ***Table 2-3-3***.

- **Create Keys Manually→Alphanumeric**

Type 5/13 alphanumeric characters in the key field

- **Create Keys Manually→Hexadecimal**

Type a 10-26 hexadecimal numbers (1-9; A-F) in the key field

- **Use WEP Key**

This drop-down list allows you to specify which of the four encryption keys that you want to use.

- **Create Keys with Passphrase**

Type a character string in the field Passphrase.

- **Disabled**

Select ***Disabled*** item in the Encryption(WEP security) drop-down list allows you to disable the encryption function.

Data Mode	Alphanumeric	Hexadecimal
64 bit	5	10
128 bit	13	26

Table 2-3-3

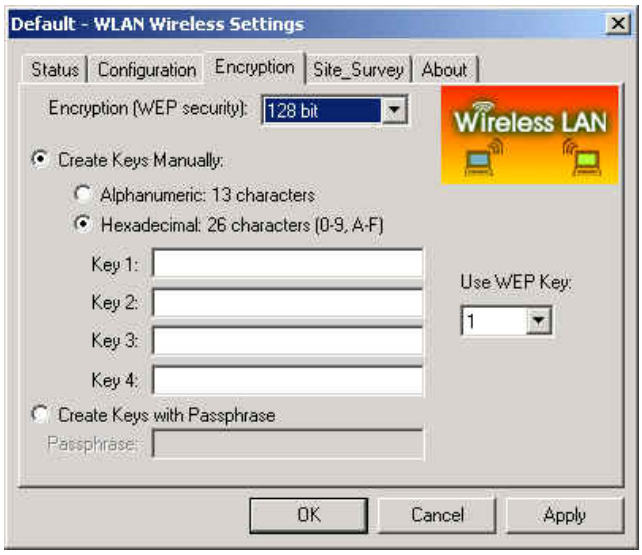


Figure 2-3-10

5. Site Survey

Browse the available access points in your network environment by clicking the ***Rescan*** button and make a connection to one of them by pushing the ***Connect*** button in the ***Site Survey*** tab as shown in ***Figure 2-3-11***.

SSID	The Network Type (SSID) of an access point
RSSID	The MAC address of an access point
Channel	The operating channel number of an access point
Link Quality	The quality of link status
WEP	"Y" indicates the WEP function enabled in an access poin "N" indicates the WEP function disabled in an access point
Mode	Indicates which mode does the access points use (Infrastructure or Peer to Peer)

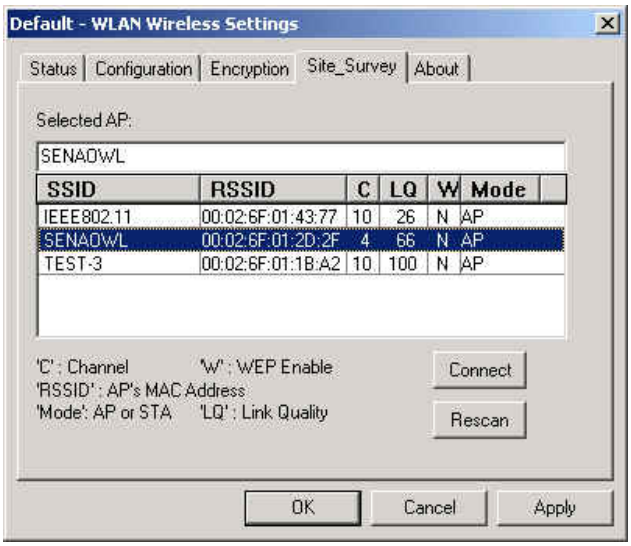


Figure 2-3-11

6. About

About tab shows the product/driver/utility/Mini-PCI Card firmware version as shown in ***Figure 2-3-12***. Users have to use this version number when reporting their problems to technical support.

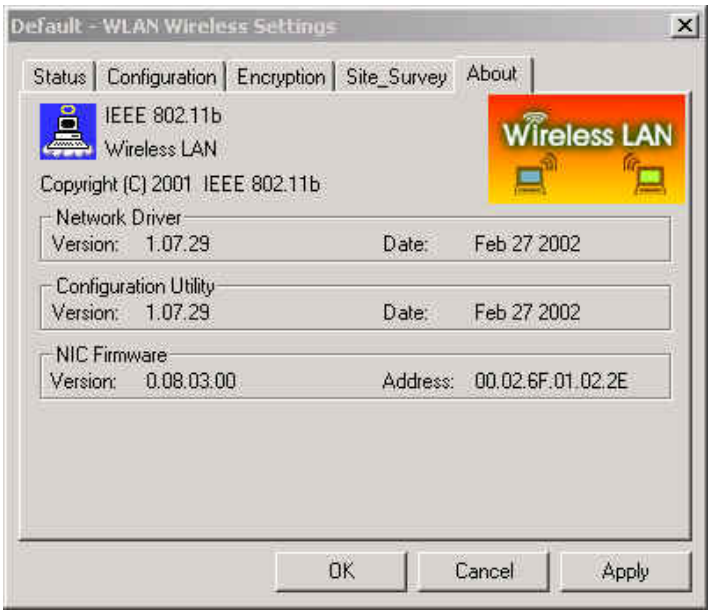


Figure 2-3-12

2- 4 Uninstalling Driver and Utility

If the Mini-PCI Card installation is unsuccessful for any reason, the best way to solve the problem may be to completely uninstall the Mini-PCI Card and its software and repeat the installation procedure again.

1. Insert the Wireless LAN Mini-PCI Card into the PCMCIA slot.
2. Right click **My Computer**--->Select **Properties**.
3. On the Hardware tab, choose Device Manager, and click *Network .Adapter.*
4. Choose ***Wireless LAN Mini-PCI Card*** and remove it.
5. After removing the ***Wireless LAN Mini-PCI Card***, restart your computer.
6. Click the ***Start*** button, select ***Control Panel*** from ***Settings***. Double click the ***Add/Remove Programs*** icon on the Control Panel. In the ***Change or Remove Programs*** dialog window, choose the ***802.11b Wireless LAN for Windows*** and click Change/Remove button to uninstall this programs as shown in ***Figure 2-3-13***.

Figure 2-3-13

Chapter 3 Connecting to a Network

This chapter describes how to prepare for connection to network after install the Mini-PCI Card drivers and utility.

The following is required for all computers if you want to connect to a network.

1. Check ***Client for Microsoft Networks*** is installed.
2. Check ***NetBEUI -> Wireless LAN Mini-PCI Card*** installed.
3. Check ***TCP/IP -> Wireless LAN Mini-PCI Card*** is installed.
4. Check file and printer sharing for Microsoft Networks.
5. Check computer name and workgroup name.

3-1 Checking and Adding Client for Microsoft Networks

The Client for Microsoft Networks enables you to connect to other Microsoft Windows computers and servers and use the files and printers shared on them. If you work on Microsoft network environment, you need to set up ***Client for Microsoft Networks***.

1. After finishing installing the driver & utility and rebooting the computer as described in Chapter 2. The computer will show a dialog box titled ***Enter Network Password*** dialog box. Enter your password if it had been set or just click ***Cancel***.
2. Click ***Start*** button, select ***Settings*** and then click ***Control Panel*** to open the ***Control Panel*** window.
3. In the ***Control Panel*** window, double-click the ***Network*** icon to open the ***Network*** dialog box.
4. Select ***Configuration*** tab to check ***Client for Microsoft Networks*** is installed as shown in ***Figure 3-1***. If no, click the ***Add*** button. Select ***Client*** and click the ***Add*** button.

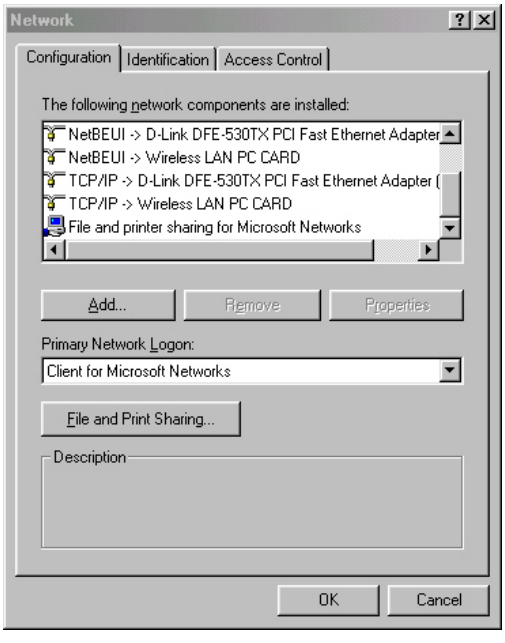


Figure 3-1

5. Select ***Microsoft*** for Manufacturer and ***Client for Microsoft Networks*** for Network Client, and then click ***OK***.

3-2 Checking and Adding NetBEUI

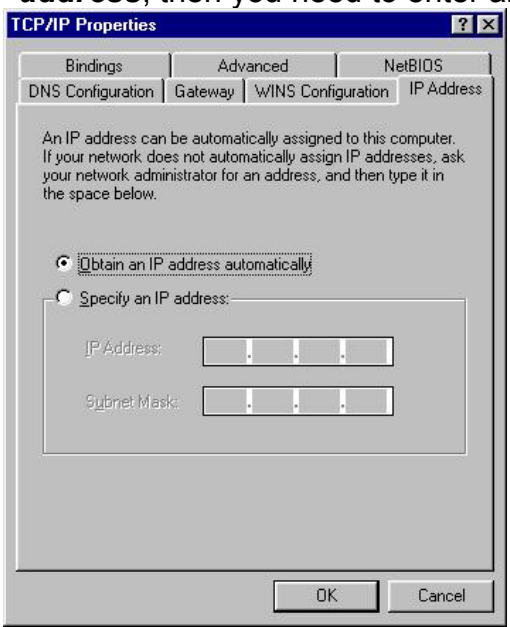
NetBEUI is a protocol you can use to connect to Windows NT, Windows for Workgroups, or LAN Manager servers. If you work on Microsoft network environment, you need to set up NetBEUI protocol.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select ***Configuration*** tab to check ***NetBEUI -> Wireless LAN Mini-PCI Card*** is installed. If no, click the ***Add*** button. Select ***Protocol*** and click the ***Add*** button.
3. Select ***Microsoft*** for Manufacturer and ***NetBEUI*** for Network Protocol, and then click ***OK***.

3-3 Checking and Adding TCP/IP

TCP/IP is the protocol you use to connect to the Internet and wide-area networks. If you want to connect to Internet, you need to set up TCP/IP protocol.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select ***Configuration*** tab to check ***TCP/IP -> Wireless LAN Mini-PCI Card*** is installed. If no, click the ***Add*** button. Select ***Protocol*** and click the ***Add*** button.
3. Select ***Microsoft*** for Manufacturer and ***TCP/IP*** for Network Protocol, and then click ***OK***.
4. If yes, double-click ***TCP/IP -> Wireless LAN Mini-PCI Card*** to open ***TCP/IP properties*** as shown in ***Figure 3-2***. Due to different network applications there are many different settings here. You can select either ***Obtain an IP address automatically*** or ***specify an IP address***. If you use the ***Specify and IP address***, then you need to enter an ***IP address***,



Subnet Mask, ***Gateway*** IP address, and ***DNS Server*** IP address for connecting to Internet.

Figure 3-2

3-4 Checking and Adding File and Printer Sharing for Microsoft Networks

File and printer sharing for Microsoft networks gives you the ability to share your files or printers with Windows NT and Windows for Workgroups computers. If you want to share your files or printers with Microsoft networks, you need to set up this service.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select ***Configuration*** tab to check ***File and printer sharing for Microsoft Networks*** is installed. If no, click the ***File and Printer Sharing*** button.
3. In the ***File and Print Sharing*** window, select what you need, and click ***OK***. ***File and printer sharing for Microsoft Networks***, and then click ***OK***.

3-5 Checking and Adding Computer Name & Workgroup Name

Windows uses the computer name and workgroup name to identify your computer on the network. Please enter a unique name for your computer, the workgroup it will appear in, and a short description of the computer.

1. Repeat the step 2 and 3 of Chapter 3-1 Checking and Adding Client for Microsoft Networks.
2. Select ***Identification*** tab (Windows 98) or User Information tab (Windows 95) to check the computer name, workgroup and computer description are entered. If no, enter a computer name, a workgroup name and then click ***OK***. The description field may be left blank. If you want to share data with other persons, make sure you have the same workgroup name.

Chapter 4 Troubleshooting

This chapter describes the problems and corresponding solutions that may occur when installing a Mini-PCI Card.

Symptom	Solution
Windows does not detect the Mini-PCI Card when installed.	Verify that the Mini-PCI Card is properly inserted into the Mini-PCI Card slot. Check whether the computer has a Plug and Play BIOS. Windows 95/98/ME/2000/XP might not detect the Mini-PCI Card if a previous installation of the Mini-PCI Card was cancelled before it was finished. Remove the previous driver, and redo the installation again.
Driver fails to load	A resource conflict could exist. For Windows 95/98/ME/2000, use the ***Device Manager*** to resolve resource conflicts. Select ***System*** from the ***Control Panel***, then click on the ***Device Manager*** tab.
Device conflict on a Windows system	A device conflict under Windows 95/98/ME/2000/XP may be related to the Mini-PCI Card. For Windows 95/98/ME/2000, use the Computer properties to identify the used I/O port addresses and IRQ values. If there is a device conflict, select alternative settings for I/O Base Address or IRQ values. If you know which device is conflicting with the Mini-PCI Card, you have the option of changing that device's I/O address or IRQ instead of changing the Mini-PCI Card.

No resource conflicts were detected, but the wireless station does not attach to the network	Verify that the ***SSID*** of the Mini-PCI Card matches that of the access point. Use the ***Network Configuration Properties Application*** in the ***Control Panel*** to modify the ***SSID***. Verify that the ***Network Mode*** of the Mini-PCI Card is configured correctly.

Appendix A Product Specifications

General

Radio Data Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Range (open environment with high supply current)	11 Mbps –250m 5.5 Mbps –300m 2 Mbps – 600m 1 Mbps –800m
Operating Voltage	3.3V
Compatibility	Fully interoperable with IEEE802.11b compliant products

Network Information

Network Architecture	Support ad-hoc, peer-to-peer networks and infrastructure communications to wired Ethernet networks via Access Point
Drivers	Windows 95/98/ME/2000/XP
Access Protocol	CSMA/CA
Roaming	IEEE802.11b compliant
Security	64/128-bit WEP data encryption

Radio

Frequency Band	2.4 – 2.484 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Modulation	CCK (11, 5.5Mbps) DQPSK (2Mbps) DBPSK (1Mbps)
Operation Channels	11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France
RF Output Power	22dBm(Max. Supply Current is 750mA), 18dBm(Max. Supply Current is 500mA)
Antenna connector	Diversity supported by two external antenna
Sensitivity @FER=0.08	11 Mbps <-86dbm 5.5 Mbps <-88dbm 2 Mbps <-90dbm

	1 Mbps <-92dbm
Power Consumption	Tx Current ≦ 750 mA(used in AP/Bridge/Router) ≦ 500mA (used in NB/PC) Rx Current ≦ 240 mA Sleep Mode ≦ 200 mA

Environmental

Temperature Range	0 to 50 C (operating) -20 to 80 C (storage)
Humidity (non-condensing)	5% to 95% typical

Physical Specifications

Form Factor	Mini PCI Type ⅢA
Interface	PCI bus interface
Dimensions	50.9(L) mm x 59.6(W) mm x 4.8.(H) mm 2 (L) in x 2.3(W) in x 0.2.(H) in
Weight	15 g (0.53 oz.)

Appendix B Regulatory Compliance Information

Radio Frequency Interference Requirements

This device complies with Part 15 of FCC Rules and Canada RSS-210. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
3. To comply with RF safety requirements, you must maintain a distance of 20 cm from the antenna when operating the device.
4. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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 of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation 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.