# IEEE802.11b WLAN MiniPCI CARD
# User's Guide

# Introduction

This User Guide is to guide you to install a Wireless LAN designed for both large and small business and SOHO environments and let you share a local printer and files, access internet, and roam about different working places. The attached drivers and utilities support for Windows 95 (OSR2), Windows 98, and Windows 2000, NT4.0 and Windows Millennium.

# Package Contents

- WLAN MiniPCI Card
- Wireless LAN CD-ROM with drivers and utilities
- User's Guide
- Quick Start Guide
- Warranty Card

# Planning your Wireless LAN

There are two usage modes for Wireless LAN, Ad-hoc mode and Infrastructure mode. Please review your need and build your Wireless LAN.

## Ad-hoc Networking

Ad-hoc network also is called Peer-to-Peer network. Without Access Point, notebook users with WLAN MiniPCI Card can build Ad-hoc Peer-to-Peer wireless networks to share files with each other, share a public office printer and other peripheral resources, even access the Internet via a modem.

## Infrastructure Networking

802.11b-compatible Access Point is a bridge or routers connecting to the wired Ethernet network and wireless network. Through the deployment of Access Point, wireless LAN can be extended to the reach of a wired network. Therefore, a notebook user with WLAN MiniPCI Card can access to fixed local network resources.

# Installation

## Installation for Windows 95, Windows 98 and Windows 2000

Before installing the driver, you will need a copy of the operating system installation media, usually a CD supplied with your computer or operating system.

On Windows 98 systems, the installation files are sometimes archived on the hard disk in C:\WINDOWS\OPTIONS\CABS. On Windows 2000 systems, the system may prompt you to load operating system files from the Windows 2000 installation disk. Installation under Windows 95 is identical to the procedure given above for Windows 98 and Windows 2000. Only Windows 95 OSR2 or higher is supported.

The Setup program also installs Configuration Utility in the WLAN MiniPCI Card in the Program directory. This configuration utility can help you to understand and maintain your Wireless LAN.

### *Install Driver*

**Step 1:** Insert the WLAN MiniPCI Card into the MiniPCI socket of Notebook.

**Step 2:**. Turn on your computer.

**Step 3:** Windows finds a new hardware shown WLAN MiniPCI and asks for the driver of WLAN MiniPCI Card. The driver installation wizard guides you through the steps standard for your operating system.

**Step 4:** You will be asked to supply CDs or directory path information for the driver. This driver shall be located in the following directory.
D:\      (if D:\ is your CD-ROM drive)

**Step 5:** Windows finds the driver described as WLAN MiniPCI Card. Follow the directions of Windows dialog boxes to complete the driver installation. After completing the installation, Windows dialog will display *Systems Setting Change* and ask to restart the notebook. Click "Yes" to reboot the computer.

### *Install Configuration Utility*

1. Restart the computer and ensure *ireless LAN Configuration Utility CD* in the CD-ROM drive.

You can run the program manually by selecting *Run* from the Start menu and running SETUP.EXE from the CD-ROM drive.
D:\ SETUP.EXE (if D:\ is your CD-ROM drive)

2. On the WLAN MiniPCI Card– Installation screen, click next to start software installation. Read the information in the Welcome dialog box and click "Next". Then, click ""Yes"" if you accept the Software License Agreement.

3. Enter the name of the Wireless LAN Service Set of the wireless network (SSID) to which your computer will connect. The name you enter here must match exactly the name assigned to the access point. Characters, capitalization, and spacing must be identical.

   NOTE: *If the access point you wish to associate with has encryption active, you must also enable encryption on the wireless client. Click Encryption in the Configuration Utilities after reboot to go to screens where you can enable and configure encryption. You must set the wireless client for the same Encryption algorithm and Key values as the access point it will associate. Refer to the Advanced Configuration section for more details about configuring encryption*

4. Select which network mode is suitable for your Wireless LAN. Infrastructure Mode is default selection. This setting can be changed at any time after installation completion.

5. Accept the default program folder or select where the SETUP.exe stores the Configuration Utility.

6. Select ""Yes", I want to restart my computer now". Reboot your computer by clicking Finish.

## LED Indication
The yellow LED of Wireless LAN MiniPCI Card performs identical functions when indicating the operational status of the card.


# Advanced Configuration

# Configuration
## *Mode (Network Mode)*
1. **Ad-Hoc:** The Ad-Hoc network is also known as a peer-to-peer network. An Ad-Hoc networking does not need Access Point. Instead, the Ad-Hoc network is a loose association of wireless computers that can communicate with each other using Wireless LAN MiniPCI Card in Ad-Hoc Mode
2. **Infrastructure:** In a wireless infrastructure network, wireless stations communicate with an Access Point to connect to a wired network. An infrastructure network also can consist of multiple Access Points. This can extend the coverage area of wireless network. In this configuration, the wireless network consists of cells. Each cell is a single Access Point that has different frequency channel to prevent from interfering each other. A wireless station can move from one Access Point to next without losing the network connection.

## *SSID*
The SSID is the name of wireless network for Ad-Hoc or Infrastructure mode. To add a Wireless LAN MiniPCI Card to an existing wireless network, configure SSID to match the name of the wireless network

## *Tx Rate*
The Fixed 1, 2, 5.5, 11Mb/s or Fully Auto transmit rates can be selected for Wireless LAN Card. Basically, the Fully Auto setting allows the MiniPCI Card to automatically switch to a higher Tx rate for better throughput in most environment. A fixed rate setting does not allow MiniPCI Card to re-transmit at a lower rate even as a result of many retransmissions.

## *PS Mode (Power Saving Mode)*
Enabling power saving mode can extend the battery life of the mobile notebook by allowing the MiniPCI Card to sleep, minimizing the power consumption.

## *Channel*
WLAN MiniPCI Card supports up to 14 channels. However, the number of available channels varies in different countries and regions. The Access Point must be set to a channel. To avoid radio interference, adjacent Access Point within the same infrastructure network (the same SSID) should set to different channel. The channels of Access Points must be at least five channels apart, while the Wireless LAN MiniPCI Cards automatically use the same channels as the Access Point and roams between APs in the same wireless network.

## Encryption

The Wireless LAN MiniPCI Card uses WEP encryption to protect wireless data communications.

### *Encryption Selection*

WEP uses a combination of 40-bit keys or 128-bit keys to provide security for every data transmission. In order to decode a data transmission, an identical WEP key must be used by each wireless client on the network. Choose Enable or Disable to activate the security of wireless network.

## 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 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.
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.

## Statement Needed to be Shown on End Product

Since this module is installed inside the end product, the end product should be affixed a label on visible area showing that this product contain a RF module, and also its FCC ID.

## IMPORTANT NOTE:
## FCC Radiation Exposure Statement:

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

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the 2 conditions above are met, further <u>transmitter</u> testing will not be required.   However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> be used on the final product.   In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and Obtaining a separate FCC authorization.

## <u>End Product Labelling</u>

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ASDL modems, and similar equipment).   The final end product must be labeled in a visible area with the following: " Contains TX FCC ID: KA22001120018-1".

## <u>Manual Information That Must be Included</u>

The users manual for end users must include the following information in a prominent location " IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

## European Notice

Equipment with CE marking complies with the R&TTE Directive (1999/5/EC), EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the European Community. Compliance with these directives implies conformity to the following European Norms or Regulations (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) – Electromagnetic Interference
- EN 50082-1 (IEC 801-2, IEC 801-3, IEC 802-4) – Electromagnetic Immunity
- EN 60950 (IEC 60950) – Product Safety
- ETS 300 326 – Technical characteristics and test conditions for data transmission equipment operating in the 2.4GHz ISM band and using spread spectrum modulation techniques
- ETS 300 826 – Electromagnetic Compatibility (EMC) standard for 2.4GHz wide band transmission systems and High Performance Local Area Network (HIPERLAN) equipment

This product may be used in the following EU and EFTA countries: Austria, Belgium, Denmark, Finland, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and United Kingdom. Products not marked with "Not for use in France" may be used in France.

# Specifications

**Radio Technology** IEEE 802.11b Direct Sequence Spread Spectrum

**Operating Frequency** 2400-2497MHz ISM band

**Modulation Schemes** DQPSK, DBPSK and CCK

**Channel Available** 11 channels for United States

 13 channels for Europe

 14 channels for Japan

**Data Rate** 11Mbps with fall back rates of 5.5, 2 and 1Mbps

**Media Access Protocol** CSMA/CA with ACK

**Transmitter Output Power** 14dBm typically

**Antenna Type** Integrated Microstrip dual diversity antennas

**Operating Voltage** 3.3VDC

**Interface** 32-bit PCI

**Range Coverage** Indoor: 35 - 100 meters (depends on environment)

 Outdoor: 100 - 300 meters (depends on environment)

**LED Indicator** Link status