U S E R ' S   M A N U A L

T60H677

Mini-PCI Type IIIB 802.11a/b WLAN CARD

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Section One: Introduction

Ambit Wireless Mini-PCI Module complied with IEEE 802.11a/b Standard, it can be used to provide a variety of low-cost wireless network interface card to connect your wireless LAN via fitting into the Mini-PCI Type III slot. The Wireless Mini-PCI Module that complies with this specification and combines networking with high-speed Internet access will let people connect to the Internet anywhere, anytime.

With seamless roaming, fully interoperability and advanced security with WEP standard, Wireless Mini-PCI Module can allow user to switch to different vendors' Access Points through the wireless networks and to prevent from eavesdropping.

1-1 Features

1.1.1   Wireless LAN Function

802.11a

Wireless LAN Compliance	IEEE 802.11a
Operating Frequency	5.15~5.25GHz (lower band) for US/Canada/Japan
	5.25~5.35GHz (middle band) for US/Canada
	5.725~5.825GHz (high band) for US
Modulation Schemes	OFDM, QPSK, BPSK,16-QAM and 64-QAM
WLAN Data Rate	54Mbps with fall back rates of 48, 36, 24, 18, 12, 9, and 6Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power	Typical 16 dBm for 54, 48Mbps of 5.15 to 5.35GHz
	Typical 16 dBm for 48Mbps of 5.725 to 5.825GHz
	Typical 16 dBm for 54Mps of 5.725 to 5.825GHz
	Typical 16 dBm for 36, 24, 18, 12, 9, 6Mbps
Receiver Sensitivity	UNII low and middle band (5.15 to 5.35GHz)
	Typical −70 dBm for 54Mbps @ 10% PER
	Typical −72 dBm for 48Mbps @ 10% PER
	Typical −78 dBm for 36Mbps @ 10% PER
	Typical −81 dBm for 24Mbps @ 10% PER

Typical –83 dBm for 18Mbps @ 10% PER

Typical –85 dBm for 12Mbps @ 10% PER

Typical –87 dBm for 9Mbps @ 10% PER

Typical –87 dBm for 6Mbps @ 10% PER

UNII high band (5.725 to 5.825GHz)

Typical –63 dBm for 54Mbps @ 10% PER

Typical –71 dBm for 48Mbps @ 10% PER

Typical –78 dBm for 36Mbps @ 10% PER

Typical –81 dBm for 24Mbps @ 10% PER

Typical –83 dBm for 18Mbps @ 10% PER

Typical –85 dBm for 12Mbps @ 10% PER

Typical –87 dBm for 9Mbps @ 10% PER

Typical –87 dBm for 6Mbps @ 10% PER

Current Consumption   600mA at transmit mode (typically)

330mA at receive mode (typically)

20mA at normal power saving mode (typically)

10mA at maximum power saving mode (typically)

802.11b

Radio Technology	IEEE 802.11b Direct Sequence Spread Spectrum
Operating Frequency	2412 ~ 2484MHz ISM band
Modulation Schemes	DQPSK, DBPSK and CCK
Channel Numbers	IEEE 802.11b compliant
	11 channels for United States
	13 channels for Europe Countries
	14 channels for Japan
Data Rate	11Mbps with fall back rates of 5.5, 2, and 1Mbps
Spreading	11-chip Barker Sequence
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power	16dBm typically
Receiver Sensitivity	Typical –83dBm for 11Mbps @ 8% PER

	Typical –85dBm for 5.5Mbps @ 8% PER
	Typical –86dBm for 2Mbps @ 8% PER
	Typical –90dBm for 1Mbps @ 8% PER
Current Consumption	500mA at transmit mode (typically)
	350mA at receive mode (typically)
	40mA at normal power saving mode (typically)
	30mA at max power saving mode (typically)

1-2 FCC Notice

FCC Compliance

This equipment complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company. If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will be notify in advance. But if advance notice isn't practical, you will notified as soon as possible. You will be informed of your right to file a complaint with FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity you maintain uninterrupted telephone service. The FCC prohibits this equipment's should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

FCC Class B 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 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.

Caution: the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC RF Safety Requirement :
In August 1996 the Federal Communications Commission (FCC) of the United States
with its action in Report and Order FCC 96-326 adopted an updated safety standard
for human exposure to radio frequency electromagnetic energy emitted by FCC
regulated transmitters. Those guidelines are consistent with the safety standard
previously set by both U.S. and international standards bodies.
The design of this device complies with the FCC guidelines and these international
standards. Use only the supplied or an approved antenna. Unauthorized antennas,
modifications, or attachments could result in violation of FCC regulations. This
device can not co-locate or operate with any other transmitter, such as PCMCIA radio
card.

Notice: The device will automatically discontinue transmission in case of either
absence of information to transmit or operational failure. These provisions are not
intended to preclude the transmission of control or signaling information or the use of
repetitive codes used by certain digital technologies to complete frame of burst
intervals.

Laptop Computer Operation:
This device was tested with Quantatw laptop (Model ZG1S), Quantatw Laptop
(Model ZI1S) and Compal laptop (Model L1S) for typical body-worn operations with
the device directly contracted to the human body to the back and side of the laptop
computer. This device cannot be used in other laptops. To maintain compliance with
FCC RF exposure compliance requirements, maintain at least 1.5 cm to nearby
person.

Note:
1. T60H677 is for OEM installation only.
2. OEM integrators are instructed to ensure that the End-User has NO manual
instructions
to remove or install the device (EUT).

Section Two: Wireless Utility and Configuration

The following sections describe the Wireless Network Configuration Utility. This utility provides quick access and friendly interface to configure the card setup.

2-1 Windows 98/ME/2000 Wireless Utility

After installation is completed, a Wireless LAN Utility icon will appear in task bar screen. Click it, then you will see the screen below. If you cannot find the icon, you can select "Start" ->"Program"->"Wireless LAN Configuration Utility" Icon.

Card Status
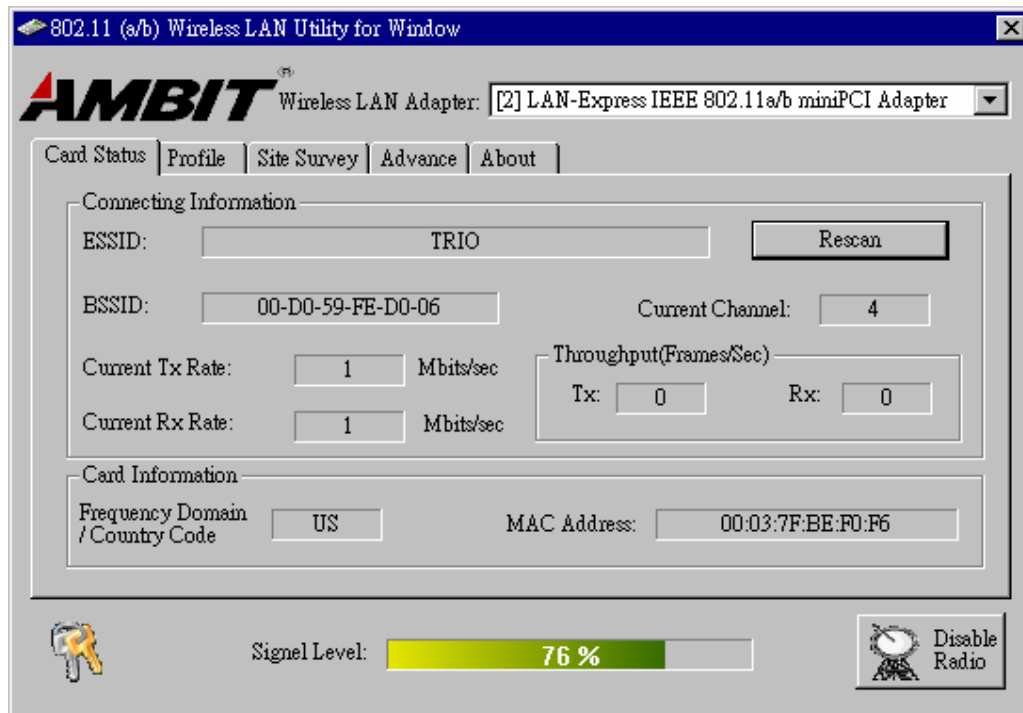
You can see the some information that your card connected. In this page you also can find information like **TX/RX Rate**, **Current Channel**, **Throughput**, **MAC Address** and **Frequency Domain**.

ESSID: An acronym for Extended Service Set Identifier, ESSID is the unique name shared among all clients and Access Points in a wireless network. The ESSID must be identical for all clients or Access Points participating in the same network. The ESSID is case sensitive and must not exceed 32 characters. Press '**Rescan**' it will

scan the specific ESSID that your profile set. If your profile set the ESSID to be
ANY, then while you press 'Rescan', it will scan AP in the nearby area and choose
the stronger one. From Signal level, you can tell the wireless transmission quality.

Profile
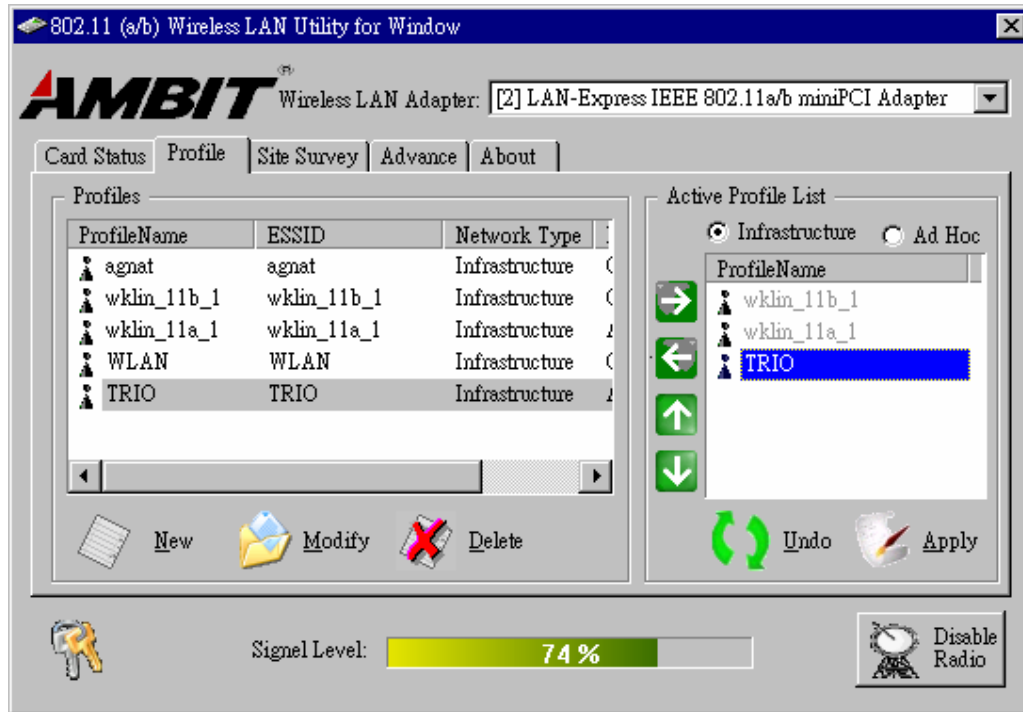
Profiles
The Profiles column will show all the profiles you set.

Active Profile List
Select the favorite profiles you want to activate in the Profiles list. While you use the
following bottoms to decide what profiles you favorers and what priority they are.
Then use 'Apply' to decide the Active Profile List you want. If you want to forget the
action you just do, use 'Undo' to turn back to the previous status.

Use it to let this specific profile add in the Active Profile List.

If you want to remove this profile out of Active Profile List, you can use it.

Use these two bottoms to change the scanning priorities
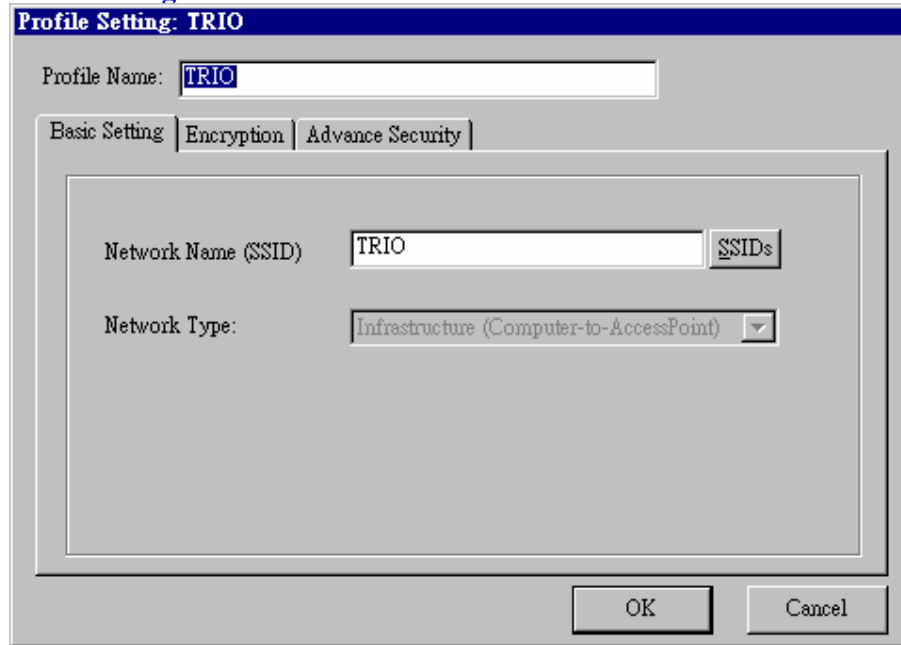
Disable Radio/Enable Radio: You can use this bottom to disable/enable Radio
by this Utility.

New/Modify/Delete:

Use '**New**' can let you create a new configuration of profile setting. And use '**Delete**' can let you delete this profile setting. Or you can use '**Modify'** or just *double click* one specific profile name column in Profiles list to modify the existing profile configuration. Then it will pop up the following Profile Setting manu to let you modify it.

Basic Setting

Network Name (SSID): The SSID differentiates one WLAN from another, so all access points and all devices attempting to connect to a specific WLAN must use the same SSID. A device will not be permitted to join the BSS unless it can provide the unique SSID.

Network Type:

   Ad-Hoc- This mode is used for a simple peer-to-peer network. It offers file sharing between wireless clients without a wireless Access Point (AP).

   Infrastructure- This mode allows a wireless LAN to be integrated into an existing wired network through an AP. Infrastructure type networks also permit roaming between Access Points while maintaining connection to all network resources. Infrastructure mode provides additional features, such as WEP security, power saving and extended range.

Encryption

Enable Encryption (AES/WEP): If you check the '**Enable Encryption (AES/WEP)**', then the Encryption Keys will need you enter the encryption keys

KEY: You can enter the key values either by "Hex Mode" or "ASCII Mode". The encryption key value is case-sensitive. Following are the valid key value for "Hex Mode" and "ASCII Mode".

Hex Mode:

0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

ASCII Mode:

Numberic values in the range of "0~9",

Alphabetical characters in the range of "a~z" and

Alphabetical characters in the range of "A~Z"

Key Index: Select which key you want to enter now.

KEY1~4: Encryption key values. The key length depend on what the Key Format be selected.

64 bits:

5-digit keys in "ASCII Mode" or

10-digit keys in "Hex Mode".

128 bits:

13-digit keys in "ASCII Mode" or

26-digit keys in "Hex Mode".

Advance Security

To enable the LEAP support on Windows XP by checking the check box of "Enable Cisco LEAP".

User Name: The user name used to log in to the LEAP network.

Password: The password used to log in to the LEAP network.

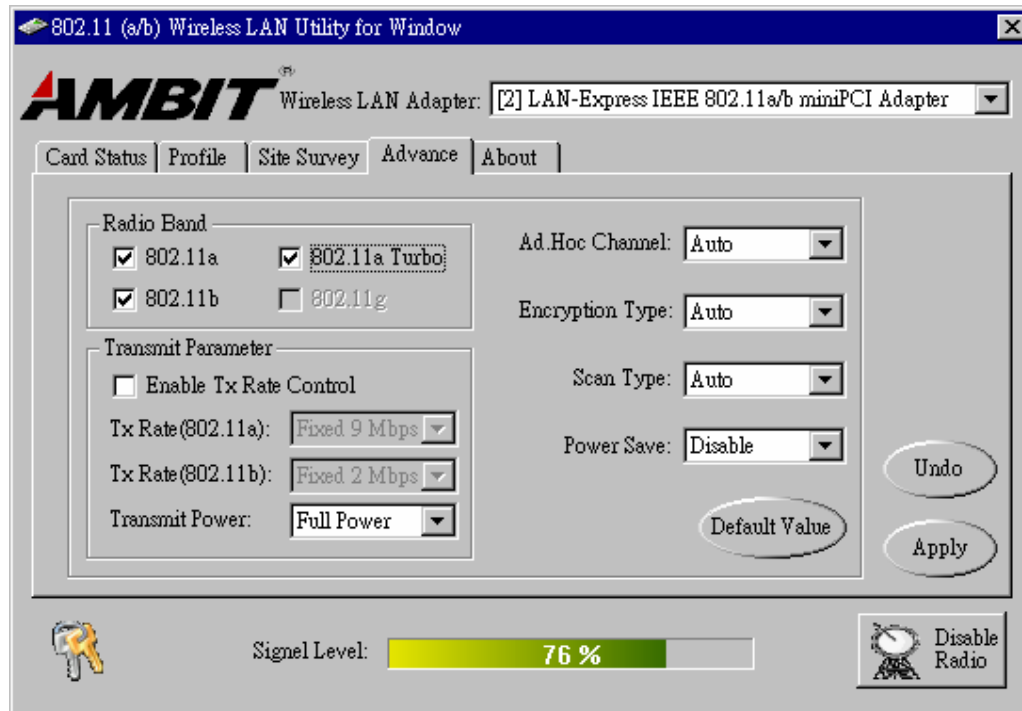**Site Survey**

Use the Site Survey Tool. You can identify each ESSID information like MAC Address(BSSID), channel you use, Encryption On/Off, Network Type and signal quality.

High-light the list and double-click the selecting item will allow you to add the new wireless Profile with corresponding parameters.

Advance

Radio Band

You can choose the Radio Band you want to use like '**802.11a**', '**802.11b**', '**802.11a Turbo**', '**802.11g**'. Currently '**802.11g**' is not supported at our 802.11a/b MiniPCI wireless LAN Card. And '**802.11a Turbo**' is the specific Turbo mode for Atheros solution to let you reach the data rate up to 108Mbps while connecting to the same Atheros AP that also enable this turbo mode.

Transmit Parameter

You can set TX Rate of 802.11a or 802.11b by checking '**Enable TX Rate Control**'. Then go to **TX Rate** (802.11a or 802.11b) to choose the data rate you want to fix.

Transmit Power: You can choose the Full Power, 50%, 25%, 12% or Lowest Power depend on the device distance you want to associate with. While the device is very close to your Wireless LAN Card, then you can choose Lowest output Power to save the battery life.

Ad Hoc Channel: Select which channel you want to use at Ad hoc mode. If you

don't know which channel you want to use, please select Auto.

Encryption Type: This field defines the card to use the specific security type (WEP, AES only or Auto switching on WEP and AES) when the card enable the encryption.

Scan Type: Specify passive or auto scans. Most regions are set to use an active scan mode. Passive mode sets the wireless card to listen-only mode when its power on state or roam state.

Power Save: This property controls whether 802.11 power management is used. Power management is disabled in Ad. Hoc mode. The driver turns off power to the adapter for period time.

About
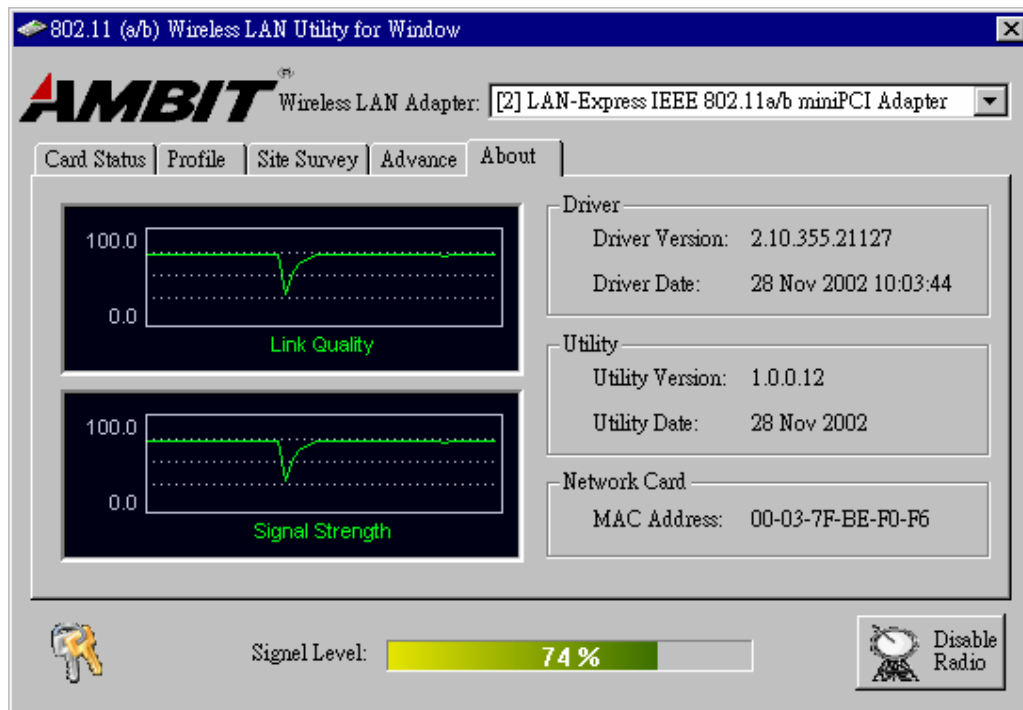
D

You can see some statistic value of Link Quality and Signal Strength in About column.

Driver: Displays the current driver version of wireless card.
Utility: Displays the current wireless configuration utility version for your wireless card.
Network Card: Displays the MAC address of wireless card.

## Section Three: Windows XP Wireless Utility and Configuration

3-1 Windows XP Wireless Utility

1. To configure the wireless card setting, you can select Start\Settings\Network Connection in the Windows XP. Choose the wireless network connection, then you will see below screen. From this screen, you can see wireless connection status and wireless signal level.

2. Select 'Properties' in the above screen. The following windows will show up.

In 'General' page, Wireless LAN card information and networking protocol have been displayed. Extra networking protocol can be installed in this page.
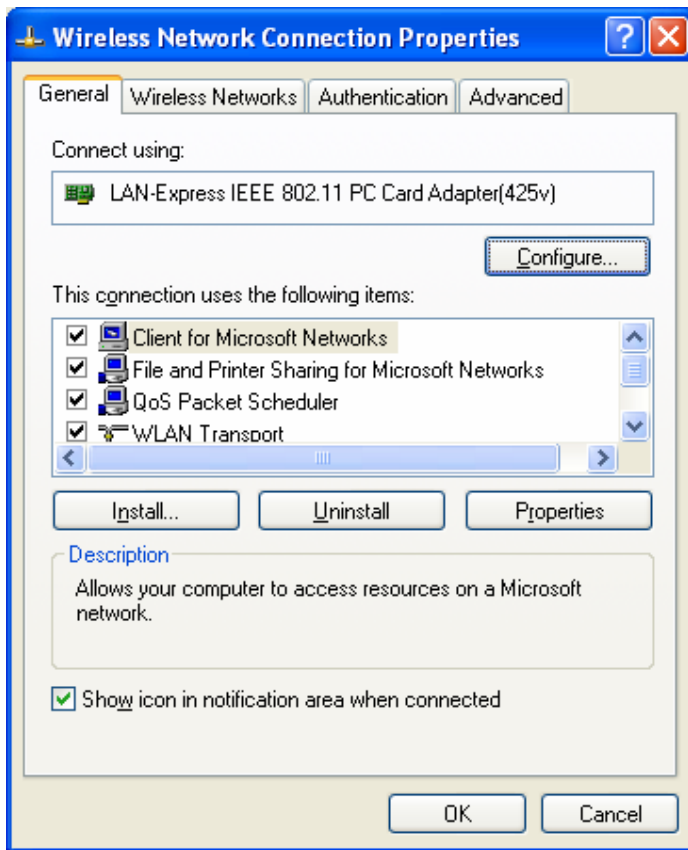
3. Select Wireless Networks page, you can see available wireless networks in your nearby area. You can add your preferred wireless Access Point to your list, so your wireless card will search for specific wireless networks.
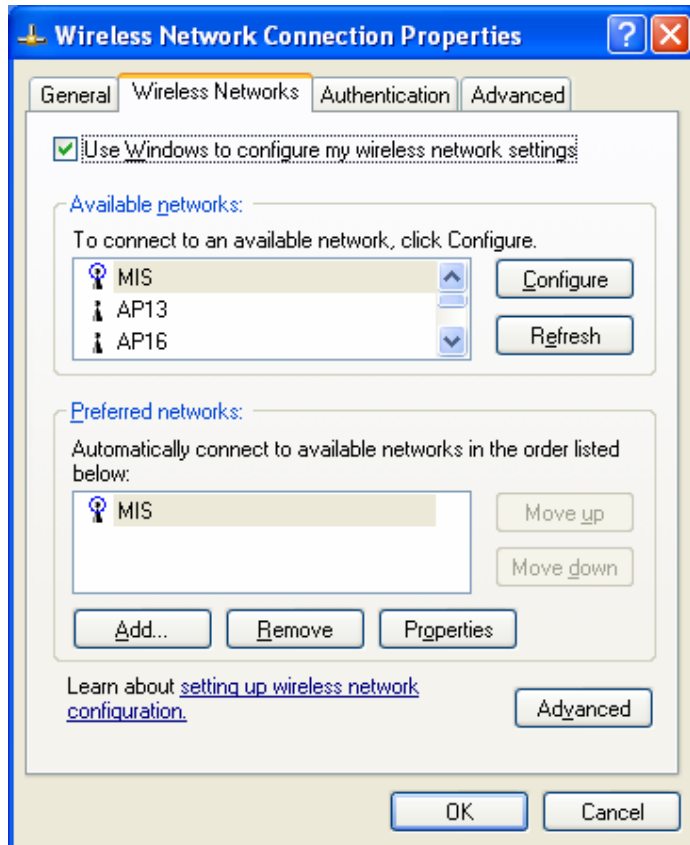
Configure

To connect to an existing access point (infrastructure) network, under Available networks, click the network name, and then click 'Configure' to setup wireless security and data encryption.

Reflesh

To update the list of available networks that are within range of your computer, click Refresh.

Add

To connect to an access point (infrastructure) network that you know is available but that does not appear under Available networks, under Preferred networks, click Add. In Wireless Network Properties, specify the network name (Service Set Identifier).

Remove

To remove a wireless network from the list of preferred networks.
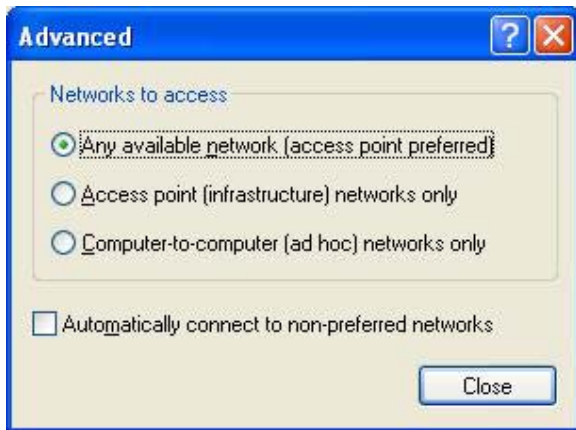
Advanced

＊If your network are configuring to a computer-to-computer (ad hoc) network, select 'Computer-to-computer (ad hoc) network only'.

＊If you want to connect to a computer-to-computer and access point (infrastructure) networks are within range of your computer, click 'Access point (infrastructure)network only'.

＊If you want to connect to a computer-to-computer (ad hoc) network and both computer-to-computer and access point (infrastructure) networks are within range of your computer, click 'Any available network (access point preferred)'.

To automatically connect to available networks that do not appear in the Preferred networks list, click Advanced, and then select the Automatically connect to non-preferred networks check box.

Define your network name (SSID) in the following windows, so your can join a specific wireless network. Check AP has WEP on or not. You wireless network will need to have same WEP setting with AP in order to communicate. If your wireless network don't have any AP, check the **'This is computer-to computer (ad-hoc) network; wireless access points are not used'**
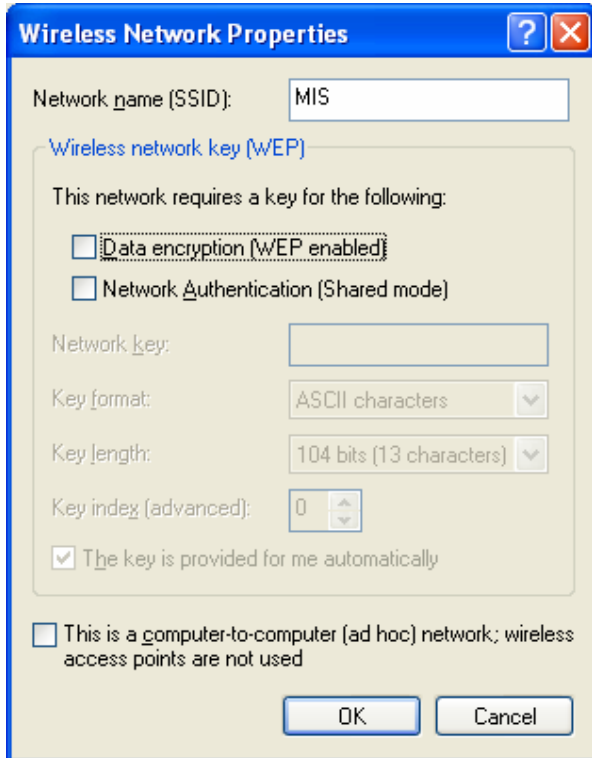
This window provides authentication via 802.1X. 802.1X, an IEEE standard that provides an authentication framework for 802-based LANs. 802.1X takes advantage of an existing authentication protocol known as the Extensible Authentication Protocol. 802.1x, giving someone secure, encrypted, wireless access on a Microsoft network will be as easy as setting a flag on the users domain account.

What does this mean for the Home Network user?
802.1x will ensure that if and when you make the change over to Wireless Ethernet, your neighbor will not be able to access your wireless LAN!
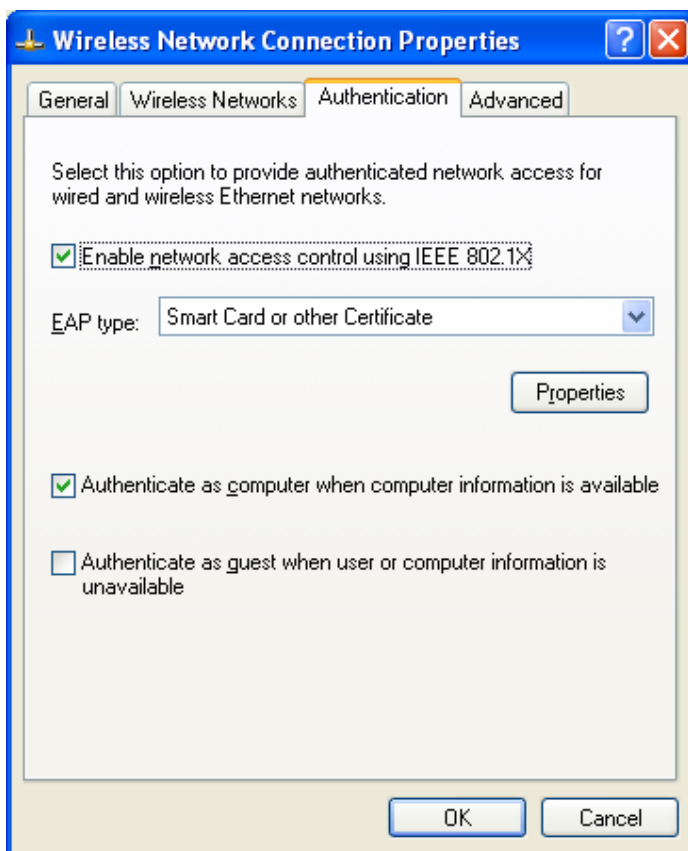
The 'Advanced' window offers Firewall and Internet Connection Sharing functions. Depends on your networking environment, you can select below functions.
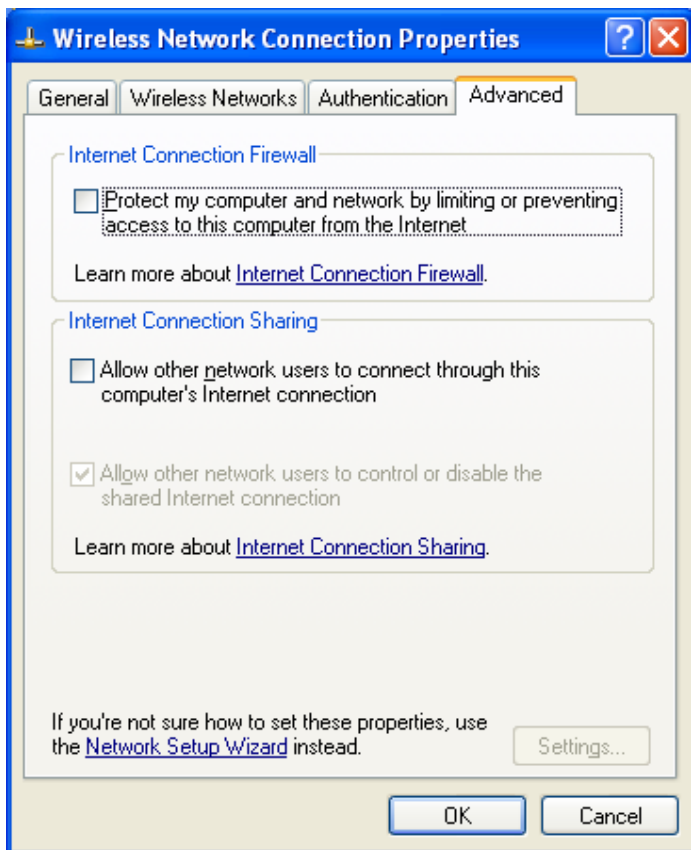
Appendix A Glossary

Access Point - An internetworking device that seamlessly connects wired and wireless networks together.

Ad-Hoc - Ad-Hoc is a peer- to-peer wireless network without Access Point. A group of wireless clients consistent an independent wireless LAN.

Backbone - The core infrastructure of a network, the portion of the network that transports information from one central location to another central location. The information is then off-loaded onto a local system.

BSS - Stands for "Basic Service Set." An Access Point associated with several wireless stations.

ESS - Stands for "Extended Service Set." More than one BSS can be configured as an Extended Service Set. An ESS is basically a roaming domain.

Infrastructure - An integrated wireless and wired LAN is called an Infrastructure configuration.

MINI-PCI TYPE III– Mini-PCI is a small form factor version of the PCI specification. The Mini-PCI format comes in several different form factors: the Type I, Type II, and Type III. The Mini-PCI Type III card is the most popular of the Mini-PCI standards. The Mini-PCI Type III golden finger plugs into a 124-pin card edge type connector that is similar to the SODIMMS type. Mini-PCI provides the same 32bit 33MHz performance that you have come to expect from the PCI bus. Mini-PCI is still pretty much an OEM product, as you are not yet able to go to a store and purchase a Mini-PCI card.

Roaming - A function that allows one to travel with a mobile end system (wireless LAN mobile station, for example) through the territory of a domain (an ESS, for example) while continuously connecting to the infrastructure.

Wired Equivalent Privacy (WEP) - To prevent access from the unauthorized wireless stations to the data that is transmitting through the network, the Wireless LAN card provides the WEP (Wired Equivalent Privacy) level of security that was part of the original 802.11 standard. The wireless LAN card supports both 64 bits WEP and 128 bits data encryption based on the RC4 algorithm.

SSID - Short for Service Set Identifier. The SSID differentiates one WLAN from another, so all access points and all devices attempting to connect to a specific WLAN must use the same SSID. A device will not be permitted to join the BSS unless it can provide the unique SSID.