## USER'S MANUAL

# T60H656

Mini-PCI Type IIIB WLAN CARD

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#### Section One: Introduction

Ambit Wireless Mini-PCI Module complied with IEEE 802.11b 11Mbps 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 MiniPCI Type III slot. The Wireless MiniPCI 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 MiniPCI Module can allow user to switch to different vendors' Access Points through the wireless networks and to prevent from eavesdropping.

#### **1.1 Features**

Form Factor & Bus Interface	MiniPCI Type IIIB, compliant to MiniPCI
	Specification Rev 1.0
Wireless LAN Compliance	IEEE 802.11b
Radio Technology	Direct Sequence Spread Spectrum
Operating Frequency	2.4 ~ 2.497GHz ISM band
Modulation Schemes	DQPSK, DBPSK and CCK
Channel Numbers	IEEE 802.11b compliant
	1 ~ 11 channels for United States
	1 ~ 13 channels for Europe
	1 ~ 13 or 14 channels for Japan
WLAN Data Rate	11, 5.5, 2, and 1Mbps
Spreading	11-chip Barker Sequence
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power	Typ. 13+/-1 dBm
Receiver Sensitivity	Typ. –82 dBm for 11Mbps @ 8% PER
Antenna Type	Typ. –85 dBm for 1Mbps @ 8% PER Integrated diversity switch with Hirose compliant connectors(U-FL) for connecting dual diversity antennas

#### 1.1.1 Wireless LAN Function

Operating Voltage	3.3VDC
Radio	On / Off
Dynamic Rate Shifting	Automatic fallback
Network Architecture	Ad-hoc, Infrastructure
Operating Systems	Windows 98/Me/2000/XP
Mechanical Requirements	Mini-PCI Type IIIB dimension.

#### **1.2:FCC Notice**

#### 1.2.1 FCC Class B Statement

This equipment has been tasted 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 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 interferencer by one or more of the following measures:

- Reorient or relocate the receiving antenna
- increase the separation between the equipment and the 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

#### **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 transmitter 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.).

The OEM integrator is required to label their end product using this module by the warning statement such as "This product integrate an RF module with FCC ID: MCLT60H656".

The OEM integrator is not allowed to use the antenna which is not included in this authorization. Also the warning statement of the use of the antenna which is not approved in this authorization should be also included in the users manual of the end product.

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not 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.

**Caution:** For your health sake, please keep at least 20 cm away from your Notebook LCD Panel while using wireless LAN.

## Section Two: Wireless Lan Installation

#### **2-1 System Requirements**

In order to install Wireless LAN driver and Utility and use the Wireless LAN card in your notebook computer. Your notebook system must meet the following requirements:

- Ambit Mini-PCI Wireless LAN Card already inserted
- Windows 98SE,2K,ME,XP OS Support

#### **2-2 Installation and Uninstall Process**

#### Install Wireless LAN (Windows 98/2K/ME/XP)

 While power on and open Windows OS at first time, the OS will detect Wireless LAN Card exist and pop up the following dialogue. If you don't want to perform install process now, then press 'Cancel' bottom. If you want to install now, please wait a moment then you can see the next InstallShield Wizard dialogue pop up.

InstallShiel	d Wizard	
2	Wireless LAN Setup is preparing the InstallShield will guide you through the rest of the setup proce	R Wizard, which ss. Please wait.
		Cancel

If you press 'Cancel' Bottom at the above dialogue, but you want to start install process later. Execute the program 'Setup.exe' in the CD. Windows displays the dialog as below. Press '**Next**' button to continue.

InstallShield Wizard		×
	Welcome to the InstallShield Wizard for Wireless LAN The InstallShieldR Wizard will install Wireless LAN on your computer. To continue, click Next.	
	< Back Next > Cancel	

2. It displays a License Agreement dialog. Press 'Next' to continue.

InstallShield Wizard	×
License Agreement Please read the following license agreement carefully.	
Press the PAGE DOWN key to see the rest of the agreement.	
LICENSE AGREEMENT	
THE FOLLOWING TERMS GOVERN YOUR USE OF THE ENCLOSED SOFTWARE FILE(S) UNLESS YOU HAVE A SEPARATE WRITTEN AGREEMENT WITH AMBIT.	-
THE SOFTWARE IS OWNED AND COPYRIGHTED BY AMBIT OR ITS THIRD PARTY SUPPLIERS. YOUR LICENSE CONFERS NO TITLE OR OWNERSHIP IN THE SOFTWARE AND SHOULD NOT BE CONSTRUED A SALE OF ANY RIGHT IN THE	-
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install AMBIT Wireless LAN, you must accept this agreement.	
InstallShield	
< <u>B</u> ack <u>Y</u> es <u>N</u> o	

3. Select the destination folder that you want to place the files.

InstallShield Minard	
Choose Destination Location Select folder where Setup will install files.	
Setup will install Wireless LAN in the following ro	nder.
To install to this folder, click Next. To install to a another folder.	different folder, click Browse and select
Destination Folder	
D:\Program Files\AMBIT\Wireless	Browse
InstallShield	
	< <u>B</u> ack <u>Next</u> > Cancel

4. Wait for the install program to do the installation.

InstallShield Wizard		×
Setup Status		
AMBIT Wireless LAN Setup is performing t	the requested operations.	
Installing:		
C:\\{1DAEF119-493B-11D5-AE90-00D0	0590FFE27}\setup.inx	
	45%	
InstallShield		
		Cancel

5. Congratulations! Wireless LAN has been installed successfully. Please click '**Finish**' to go to the next step.

InstallShield Wizard	
InstallShield Wizard	InstallShield Wizard Complete Setup has finished installing Wireless LAN on your computer.
	< <u>B</u> ack <b>[Finish</b> ] Cancel

6. Please remove any disks from any drives before your click 'Finish'.

Then click '**Finish**' to complete setup.

InstallShield Wizard	
	InstallShield Wizard Complete The InstallShield Wizard has successfully installed Wireless LAN. Before you can use the program, you must restart your computer. Yes, I want to restart my computer now No, I will restart my computer later. Remove any disks from their drives, and then click Finish to complete setup.
	< <u>B</u> ack <b>Finish</b> Cancel

## Uninstall Wireless LAN (Windows 98/2K/ME/XP)

1. One can remove the Wireless LAN via the 'Add/Remove Programs' in the 'Control Panel'. Select 'Wireless LAN' and click 'Add/Remove' button, the dialog as below displays.

InstallShield Wiza	billion and the second s
<b>Welcome</b> Modify, repair	r, or remove the program.
Welcome to modify the cu	the AMBIT Wireless LAN Setup Maintenance program. This program lets you irrent installation. Click one of the options below.
C Modify	Select new program components to add or select currently installed components to remove.
C R <u>e</u> pair	Reinstall all program components installed by the previous setup.
Eemove     InstallShield	Remove all installed components.
	< <u>B</u> ack <u>N</u> ext > Cancel

2. Select 'Remove' and then click the 'Next' button to perform the un-installation. Click 'OK' button if you really want to remove the Wireless LAN.



3. Wait for the un-installation to do its work.



4. Click 'Finish' to complete the un-Installation.



## Section Three: 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.

#### 3-1 Windows 98/ME/2000 Wireless Utility

After installation is completed, a Wireless LAN Utility icon will appear in Desktop 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**

🚰 Wirel	ess LAN Card Uti	lity for Windows			×
		Wireless LAN Ada	pter (0).LAN-Express IEE	E 802.11 PCI Adapter	-
Card St	atus   Profile   Site	Survey About		H	elp
Cor	nnected with AP In	formation			
E		А		Rescan	
	5510]		_ Throughput (byte/	'sec)	7
E	BSSID :	00:60:1D:F7:65:8E	Tx: 0	Rx: 600	
(	Current Channel:	9	Current Tx Rate:	11 Mbps	
Car	rd Information				
h	MAC Address:	00:D0:59:0	4:B2:6D		
F	Firmware Version:	1.04.09			
				Radio On Radio (	)n/Off
WEP.	Link Quality:	100%		Н	ide
OFF	Signal Strength:	96%			xit

You can see the AP information that your card connected. In this page you also can find Firmware Version, 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 Link Quality and Signal Strength, you can tell the wireless transmission quality.

#### **Profile**

😹 Wireless LAN Card Utility for Windows	
Wireless LAN Adapter (0).1	AN-Express IEEE 802.11 PCI Adapter
Card Status Profile Site Survey About	
Profile name : DEFAULT 💌	
Transmission Rate : Fully Auto	Key format ASCII mode
ANY Scan	Default Key 1
Power Save     Network Type       © Disable     © Infrastructure       © Zeable     © Ad Hoc	Key 2 Key 3
	Delete Undo Apply
	Radio On Radio On/Off
WEP Link Quality: 100%	Hide
OFF Signal Strength: 91%	Exit

If you want to use default Profile setting, then choose the DEFAULT at profile name. If you want to setup your own profile, then select PROFILE1 and you can change this PROFILE1 name to the one you like.

There are two network types:

**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.

**ESSID:** You can either choose specific AP or connect to any AP in the nearby area. **Power Save:** enable it, so it will be triggered when your computer system is inactive.

🚔 Wireless LAN Card Htility for Windows		X
Wireless LAN Adapter (0).1	LAN-Express IEEE	802.11 PCI Adapter
Card Status Profile Site Survey About		Help
Profile name : PROFILE1  Transmission Rate : Fully Auto ESSID A Scan Bourge State - Metwork Type	- WEP Key Entry- WEP Key Key format Default Key Key 1 Key 2	104bits / 128bits       ASCII mode       Key 1
Disable     C Enable     C Enable	Key3 Key4	
	Delete	Undo Apply
	R	adio On Radio On/Off
VEP Link Quality: 90%		Hide
ON Signal Strength: 80%		Exit

**WEP Key:** Wired Equivalent Privacy, WEP is an encryption scheme used to protect your wireless data communications. WEP uses a combination of 40-bit keys,128-bit keys to provide data encryption for your wireless network. AP and wireless card should use the same WEP key in order to communication.

**KEY Format:** You can choose to enter ASCII Characters (0~9, a~z, A~Z) or Hexadecimal number (0~9, a~f, A~F)

Default Key: The current KEY you choose.

**KEY1~4:** If you choose 40-bit keys, then you must enter 5 ASCII Characters or 10 Hexadecimal numbers. If you choose 128-bit keys, then you must enter 13 ASCII Characters or 26 Hexadecimal numbers.

## **Site Survey**

Use the Site Survey Tool. You can identify each channel transmission quality.

€ <sup>tel</sup> ₩	ireless LAN Ca	rd Utility for '	₩indows					×
		W	/ireless LAN A	.dapter (0).L	AN-Express	IEEE 80:	2.11 PCI Adapter	
Car	d Status   Profile	Site Survey	About					Help
	ESSID A B C	BSSID 00:D2:59 00:60:1D 00:D0:59	:00:08:D2 :F7:65:8E :3C:07:8C	Channel 5 9 2	Signal S -70 dbm -65 dbm -69 dbm	WE Yes No No	Network Type Infrastructure Infrastructure Infrastructure	
	D	ouble click left	mouse button	to add speci	fic item to pr	ofile.	S	can
WFP	_ Link Quali	ty:	100%			Rad	io On Radi	o On/Off Hide
OFF	Signal Street	ength:	90%					Exit

## About

Use the About, you can see the information of Network Driver, Configuration Utility and Firmware Version.

<b>∰</b> ,₩irele	ss LAN Card Utility for V	Vindows			×
	W	fireless LAN Ada	pter (0).LAN-Ex	press IEEE 802.11 PCI Adapter	<b>•</b>
Card Sta	itus Profile Site Survey	About			Help
	– Network Driver – – – –				
	Version: 1.07.29		Date:	Mar 8 2002	
	Configuration Utility				
	Version: 4.1.1.1		Date:	Aug 5 2002	
	NIC Firmware Version: 1.04.09		Address:	00:D0:59:04:B2:6D	
				Radio On Radio	o On/Off
<u>WEP</u>	Link Quality:	100%			Hide
OFF	Signal Strength:	92%			Exit

## Section Four: Windows XP Wireless Utility and Configuration

#### 4-1 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.

★ Wireless Network Connection Status	? 🛛
General Support	
Connection	
Status:	Connected
Duration:	00:07:43
Speed:	11.0 Mbps
Signal Strength:	☜∎000
Activity Sent — 🔍 —	Received
Packets: 72	20
Properties Disable	

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.

🕹 Wireless Network Connection Properties 👘 🛛 🔀
General Wireless Networks Authentication Advanced
Connect using:
LAN-Express IEEE 802.11 PC Card Adapter(425v)
<u>C</u> onfigure
This connection uses the following items:
Client for Microsoft Networks
I <u>n</u> stall <u>U</u> ninstall P <u>r</u> operties
Allows your computer to access resources on a Microsoft network.
Show icon in notification area when connected
OK Cancel

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.

🕹 Wireless Network Connection Properties 🛛 🔹 🔀
General Wireless Networks Authentication Advanced
Use Windows to configure my wireless network settings
Available networks:
Y MIS     Configure
AP13 AP16 Refresh
Preferred networks: Automatically connect to available networks in the order listed below:
Move up       Move down
Add <u>R</u> emove <u>Properties</u>
Learn about <u>setting up wireless network</u> <u>configuration.</u> Ad <u>v</u> anced
OK Cancel

#### 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'** 

Wireless Network Prop	erties ? 🔀		
Network <u>n</u> ame (SSID):	MIS		
Wireless network key (WE			
This network requires a ke	ey for the following:		
Data encryption [WEP enabled]			
Network <u>A</u> uthentical	tion (Shared mode)		
Network <u>k</u> ey:			
Key <u>f</u> ormat:	ASCII characters		
Key length:	104 bits (13 characters) 💌		
Key inde <u>x</u> (advanced):	0		
▼ T <u>h</u> e key is provided fo	r me automatically		
This is a <u>c</u> omputer-to-cor access points are not us	nputer (ad hoc) network; wireless ed		
	OK Cancel		

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!

🕹 Wireless Network Connection Properties 🛛 🕐 🔀
General Wireless Networks Authentication Advanced
Select this option to provide authenticated network access for wired and wireless Ethernet networks.
EAP type: Smart Card or other Certificate
Properties
Authenticate as computer when computer information is available
Authenticate as guest when user or computer information is unavailable
OK Cancel

The 'Advanced' window offers Firewall and Internet Connection Sharing functions. Depends on your networking environment, you can select below functions.

🕹 Wireless Network Connection Properties 👘 🛛 🔀
General Wireless Networks Authentication Advanced
Internet Connection Firewall Protect my computer and network by limiting or preventing access to this computer from the Internet Learn more about Internet Connection Firewall.
Internet Connection Sharing
Allow other network users to connect through this computer's Internet connection
Allow other network users to control or disable the shared Internet connection
Learn more about Internet Connection Sharing.
If you're not sure how to set these properties, use the <u>Network Setup Wizard</u> instead.
OK Cancel

## **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.

**Ethernet** - A popular local area data communications network, originally developed by Xerox Corp., which accepts transmission from computers and terminals. Ethernet operates on 10/100 Mbps transmission rate over shielded coaxial cable or over shielded twisted pair telephone wire.

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

**MINI-PCI TYPE III** - Personal Computer Memory Card International Association, which develops standards for PC cards, formerly known as MINI-PCI TYPE III cards, are available in three "types" which are about the same length and width as credit cards, but range in thickness from 3.3 mm (Type I) to 5.0 mm (Type II) to 10.5 mm (Type III). These cards can be used for many functions, including memory storage, as landline modems and as wireless LAN.

**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.