IEI Technology Corp.

MODEL:

WIFI-RT3593-DB

Wireless LAN Module with RT3593 single chip, 3T3R, dual band, RoHS

User Manual

Rev. 1.00 - 22 December, 2011

RoHS Lead Free

Revision

Date	Version	Changes
22 December, 2011	1.00	Initial release

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Introduction

1.1 Introduction

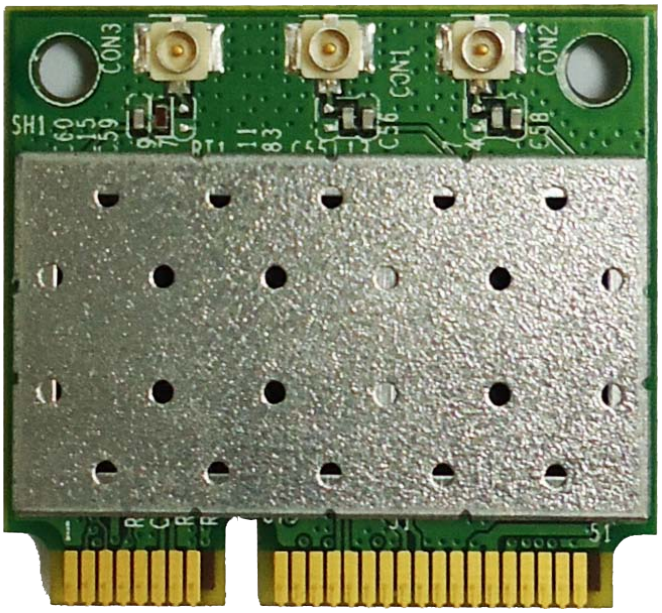

Figure 1-1: WIFI-RT3593-DB

The WIFI-RT3593-DB is a mini PCI-Express half-size wireless LAN module. It complies with the IEEE 802.11a/b/g/n standard and supports 3Tx/3Rx 3-stream MIMO to enable data rates up to 450Mbps for a 40MHz channel.

The integrated PCIE Wi-Fi RT3593 single chip supports 802.11x authentication, WEP 64/128, WPA, WPA2, WAPI encryption and guarantees the wireless network security. This product is compatible with a variety of operating systems, including Windows XP, CE6.0, XPE, 2000, ME, 98SE, Vista 32/64, Windows 7 32/64, Linux and MAC. It has features such as strong signal, long distance transmission, low power consumption, and high performance.

1.2 Features

Some of the WIFI-RT3593-DB wireless LAN module features are listed below:

- PCIe Half-Size Mini card
- Dual band 802.11a/b/g/n supports 3Tx/3Rx 3-stream MIMO to enable data rates up to 450Mbps for a 40MHz channel.
- 20MHz/ 40MHz bandwidth

- Solid design with external antenna diversity
- Low power consumption with advanced power management
- Supports 802.11x authentication, WEP 64/128, WPA, WPA2, WAPI encryption.
- Supports operating systems-Windows XP, CE6.0, XPE, 2000, ME, 98SE, Vista 32/64, Windows 7 32/64, Linux, MAC

1.3 Dimensions

The dimensions of WIFI-RT3593-DB are listed below:

- **Width**: 28 mm
- **Depth**: 30 mm
- **Height**: 4 mm

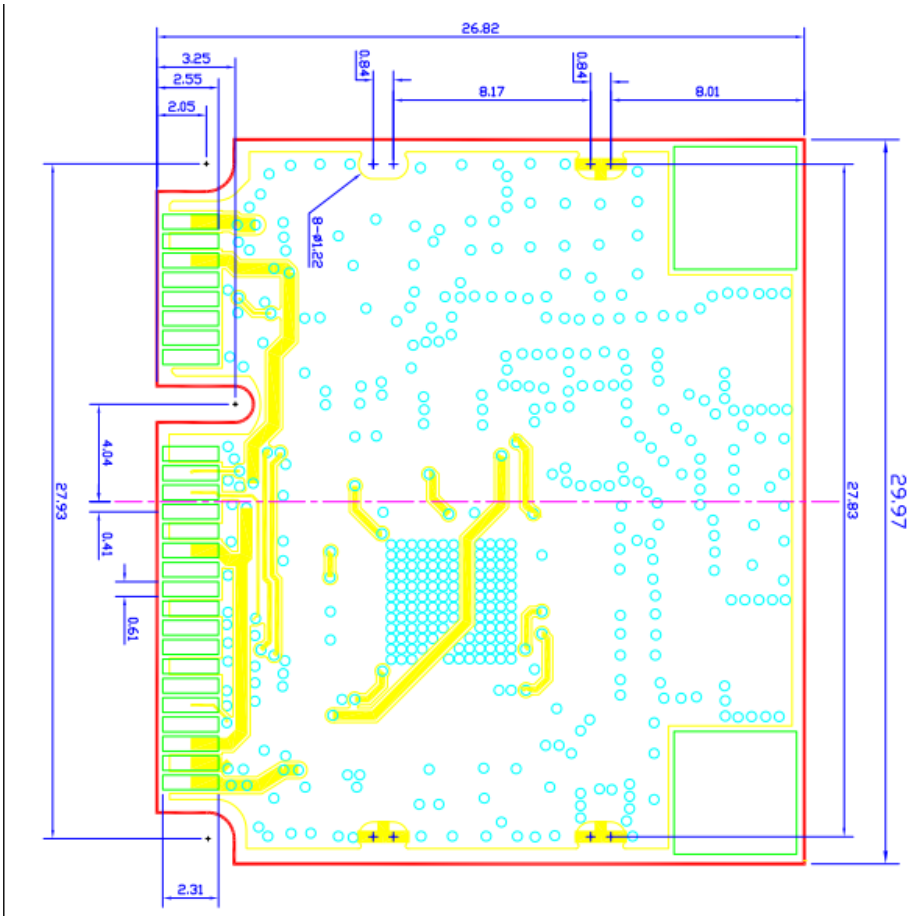

Figure 1-2: WIFI-RT3593-DB Dimensions (mm)

1.4 Technical Specifications

WIFI-RT3593-DB technical specifications are listed in table below.

Model	WIFI-RT3593-DB
Standards	IEEE 802.11a/b/g/n, Wi-Fi compliant
Rate	450 Mbps PHY rate in 3T3R mode
Interface	PCIe Mini card
Controller Chip	Ralink RT3593
Connectors	3 x U.FL (I-PEX) antenna connectors
Security	WEP 64/128, WPA, WPA2, WAPI
Frequency Range	2.4/5GHz
Modulation Type	802.11a (OFDM) 802.11b (DSSS): CCK, DQPSK, DBPSK 802.11g (OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n (OFDM): BPSK, QPSK, 16-QAM, 64-QAM
Supported OS	Windows XP, CE6.0, XPE, 2000, ME, 98SE, Vista 32/64, Windows 7 32/64, Linux, MAC
Receiver Sensitivity	802.11a: -71dBm (Typical) at 54 Mbps 802.11b: -80dBm (Typical) at 11 Mbps 802.11g: -73dBm (Typical) at 54 Mbps 802.11n: -71dBm (Typical) at 450 Mbps
Power Consumption	430mA@3.3V in continuous Tx 460mA@3.3V in continuous Rx
Temperature	Operating: -10°C ~ 70°C, Storage: -40°C ~ 150°C
Humidity	Operating: 10% ~ 90%, non-condensing Storage: 5% ~ 95%, non-condensing
Dimensions (W x D x H)	28 mm x 30 mm x 4 mm
Weight	NW: 11g

Table 1-1: WIFI-RT3593-DB Technical Specifications

1.5 Pin Define

The pinouts of WIFI-RT3593-DB are listed below:

Pin No.	definition	Pin No.	definition
1	NC	2	3.3V
3	BT_DATA	4	GND
5	BT_CHCLK	6	1.5VIN
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCK_P	12	NC
13	REFCK_M	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	RFTXDIS#
21	GND	22	PERST#
23	PETX0_M	24	3.3V
25	PETX0_P	26	GND
27	GND	28	1.5VIN
29	GND	30	NC
31	PERX0_P	32	NC
33	PERX0_M	34	GND
35	GND	36	NC
37	GND	38	NC
39	3.3V	40	GND
41	3.3V	42	NC
43	GND	44	LD2_YN
45	NC	46	NC
47	NC	48	1.5VIN
49	NC	50	GND
51	NC	52	3.3V

Table 1-2: WIFI-RT3593-DB Pinouts

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WIFI-RT3593-DB. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WIFI-RT3593-DB or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Touch any grounded conducting material before handling the board. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the WIFI-RT3593-DB, place it on an antic-static pad. This reduces the possibility of ESD damaging the WIFI-RT3593-DB.

2.2 Unpacking Precautions

When the WIFI-RT3593-DB is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards so the WIFI-RT3593-DB does not fall out of the box.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the WIFI-RT3593-DB was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The WIFI-RT3593-DB is shipped with the following components:

Quantity	Item and Part Number	Image
1	WIFI-RT3593-DB	
1	Utility CD（drivers and user manual）	
1	Quick Installation Guide	

Chapter

3

Software Drivers

3.1 Overview

A CD is shipped with the wireless LAN card. The CD contains a user manual and driver for the wireless LAN card. To be able to use the wireless LAN card, please install the driver. Failure to install the driver means that that wireless LAN card cannot be detected by the system.

3.2 Driver Installation

To install the wireless LAN driver, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

Step 2: Double click the **Setup.exe**  to install the driver.

Step 3: The **License Agreement** screen in **Figure 3-1** appears.

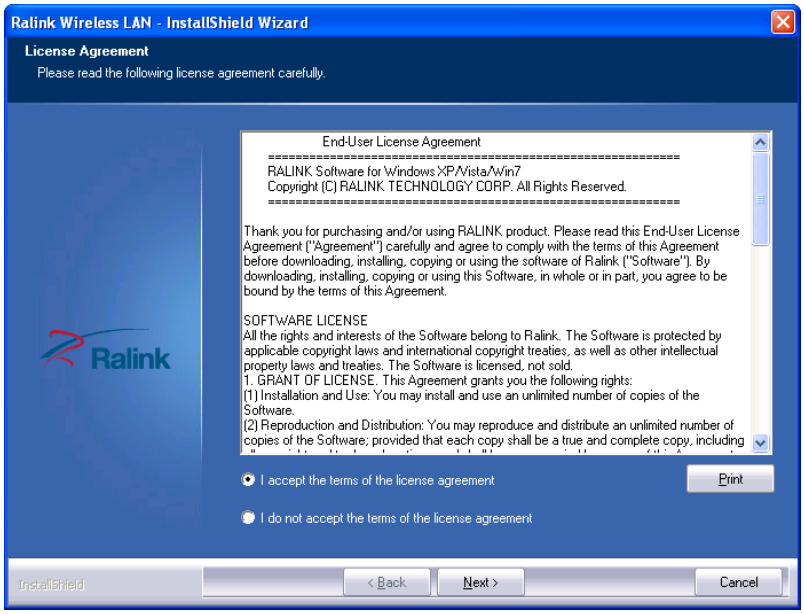

Figure 3-1: License Agreement

Step 4: Accept the conditions of the license agreement and click **NEXT** to continue.

Step 5: The **Setup Type** screen in **Figure 1-2** appears.

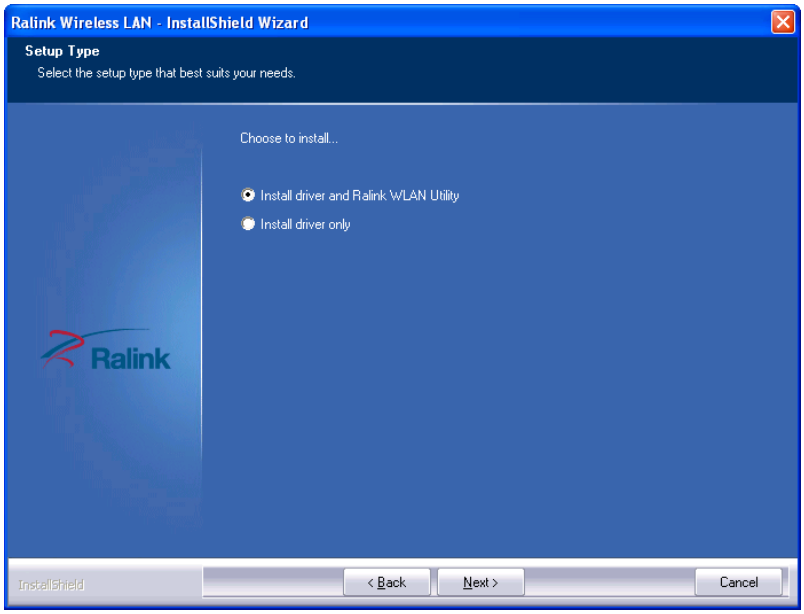

Figure 1-2: Setup Type

Step 6: Select **"Install driver and Ralink WLAN Utility"** and click **NEXT** to continue.

Step 7: The **Configuration Tool** screen in **Figure** 1-3 appears.

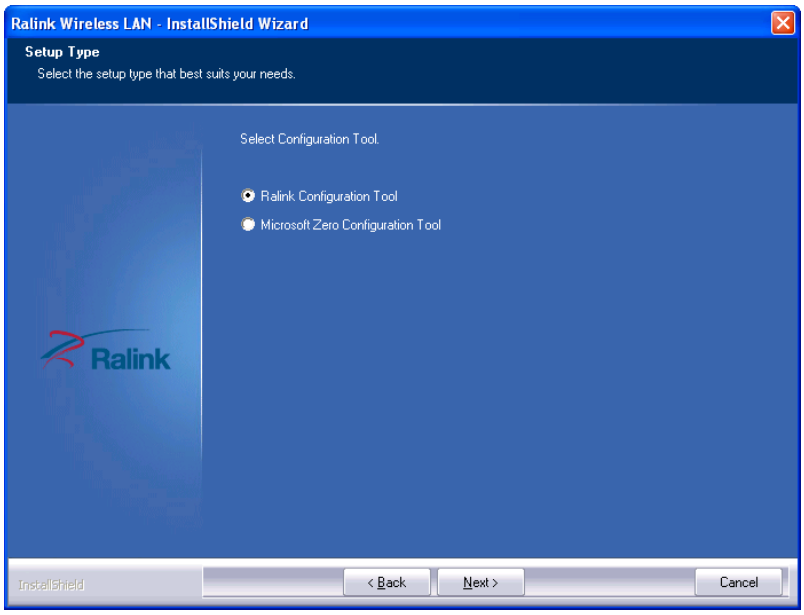

Figure 1-3: Configuration Tool

Step 8: Select "**Ralink Configuration Tool**" and click **NEXT** to continue.

Step 9: The **Ready to Install the Program** screen in **Figure 1-4** appears.

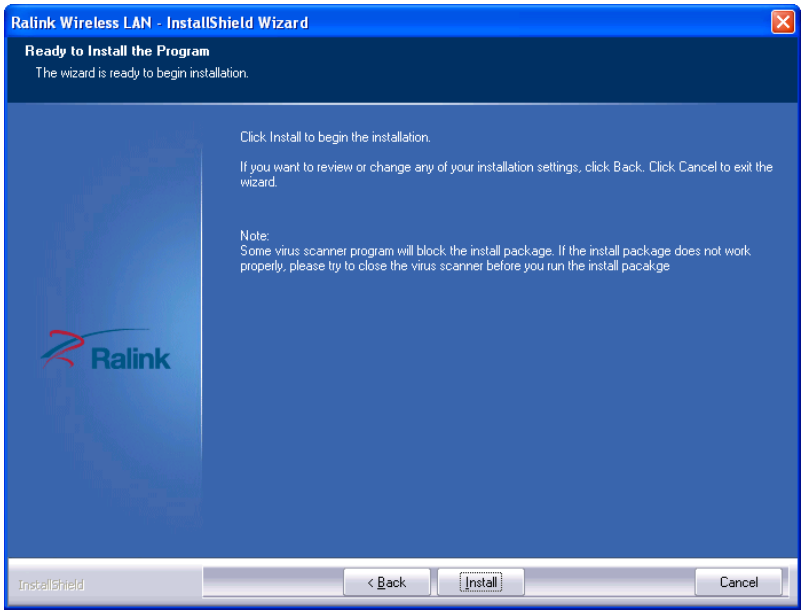

Figure 1-4: Ready to Install the Program

Step 10: Click **Install** to proceed with the installation.

Step 11: The **Setup Status** screen in **Figure 1-5** appears and displays the progress of the installation.

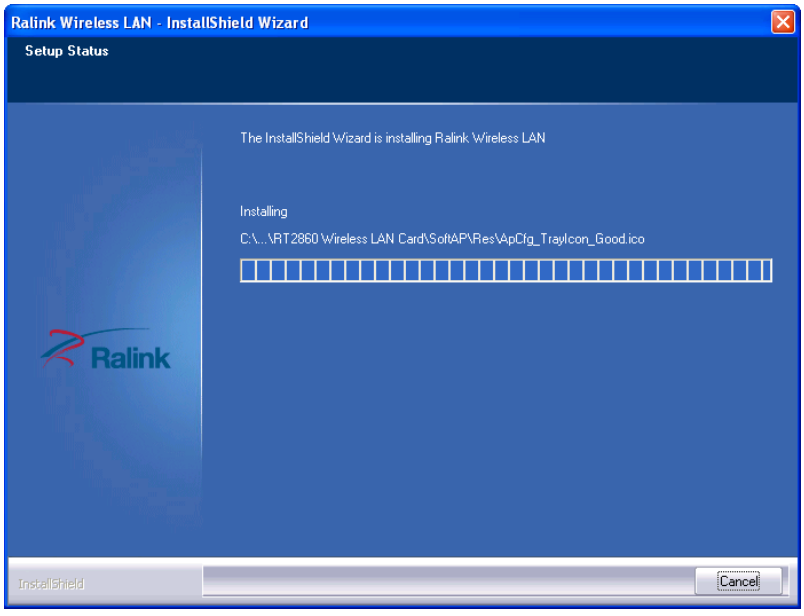

Figure 1-5: Setup Status

Step 12: When the driver installation is complete, the screen in **Figure 1-6** appears.

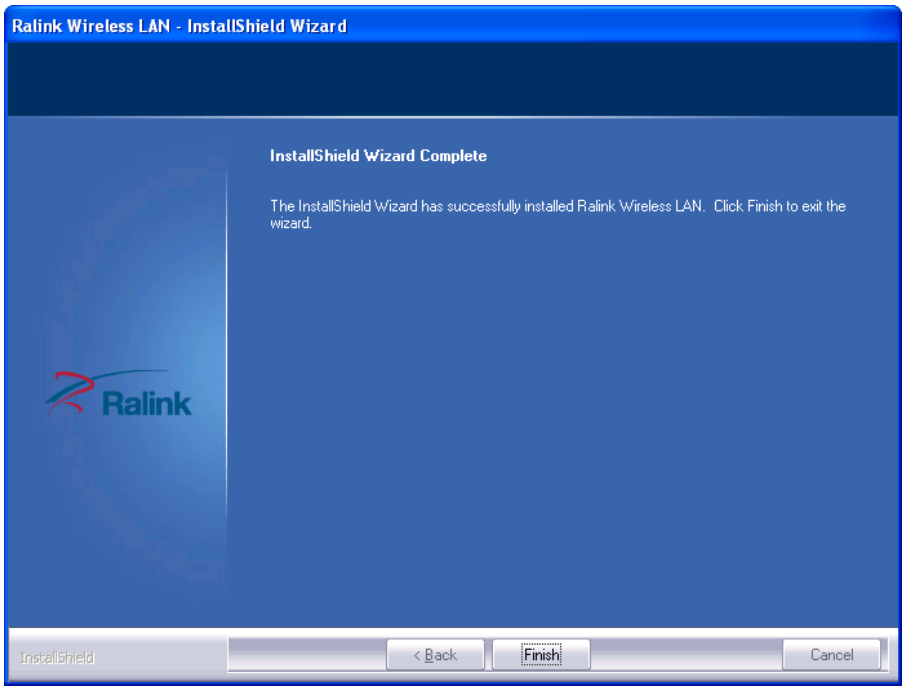

Figure 1-6: Installation Complete

Step 13: Click **FINISH** to complete installation.

3.3 Wireless Configuration

After the driver installation is complete, an icon appears at the right down corner of the screen.

Step 1: Double click the icon at the right down corner of the screen to open the configuration tool, as shown in **Figure 1-7**.

Figure 1-7: Main Menu

Step 2: Click the search button to search the available wireless networks, as shown in **Figure 1-8**.

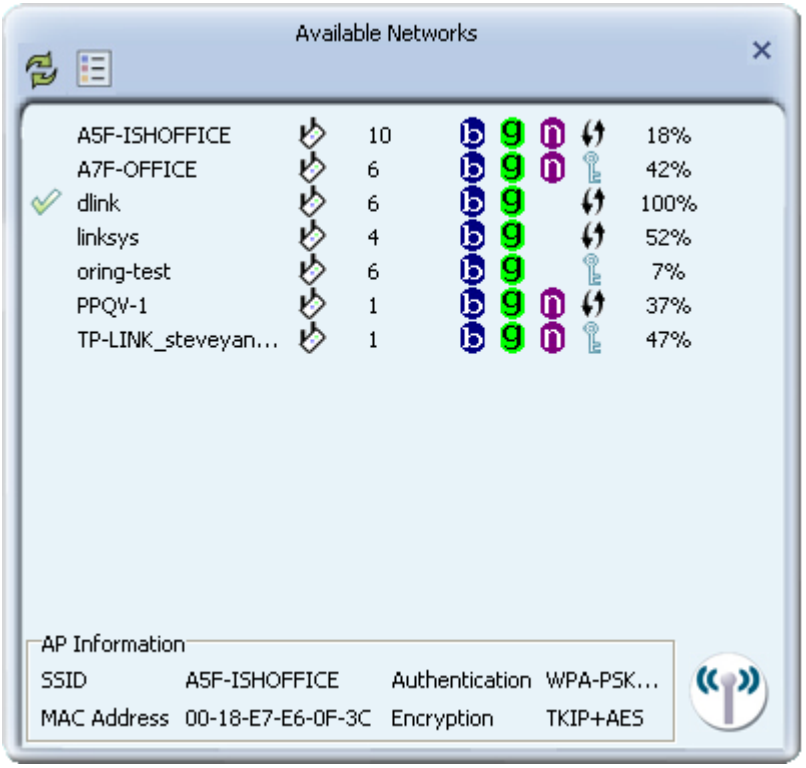

Figure 1-8: Available Networks

Step 3: Double click the wireless network name that with the best signal and the known password to open the Profile Settings screen, as shown in **Figure 1-9**.

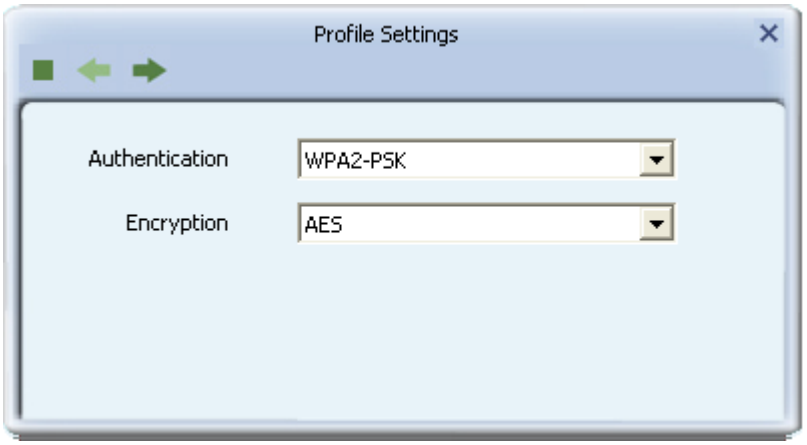

Figure 1-9: Authentication and Encryption

Step 4: Click  to continue, as shown in **Figure 1-10**.

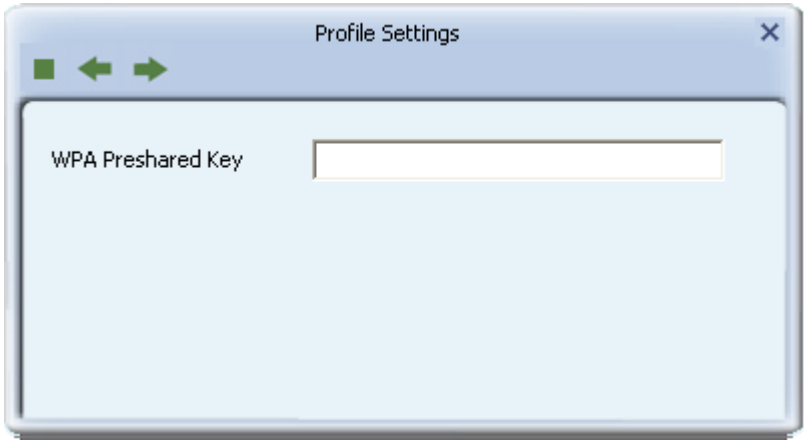

Figure 1-10: WPA Preshared Key

Step 5: Enter the password and click  to complete the connection setting.

Appendix

A

Hazardous Materials Disclosure

A.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

ppendix

B

FCC Standards

B.1 Compliance Information

FCC Compliance Statement:

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. This device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

FCC Caution*:*

(1) Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

(2) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

(3) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

(4) Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

(5) Outdoor Operations in the 5.15~5.25GHz band is prohibited.

NOTE:

(1) This device is approved for OEM installation with specified antennas as listed in this Manual. It is the responsibility of the Installer to comply with the separation distance for satisfying RF exposure compliance.

(2) This device only could work when being installed into “client devices” which could not transmit automatically, such as Notebook P.C., with the software driver limit.

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.

WARNING: This Wireless Mini PCI Adapter does not support ad-hoc mode Function.