

# **WLAN 802.11a+b+g Mini-PCI Module**

**Model**

**EM-500AG**

## **OEM Installation Manual**

1. The OEM integrator couldn't provide any information to end user regarding how to remove or install the device.
2. The module is sold only to the OEM integrators & the manual is valid only for the OEM manufactures.
3. Changes or modifications to this equipment not expressly approved by WNC may void the user's authority to operate this equipment.

**Version: 1.0**

## **Copyright Statement**

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Pentium is trademark of Intel.

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## **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.

### **IMPORTANT NOTE:**

This module is restricted to mobile configuration. 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. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter

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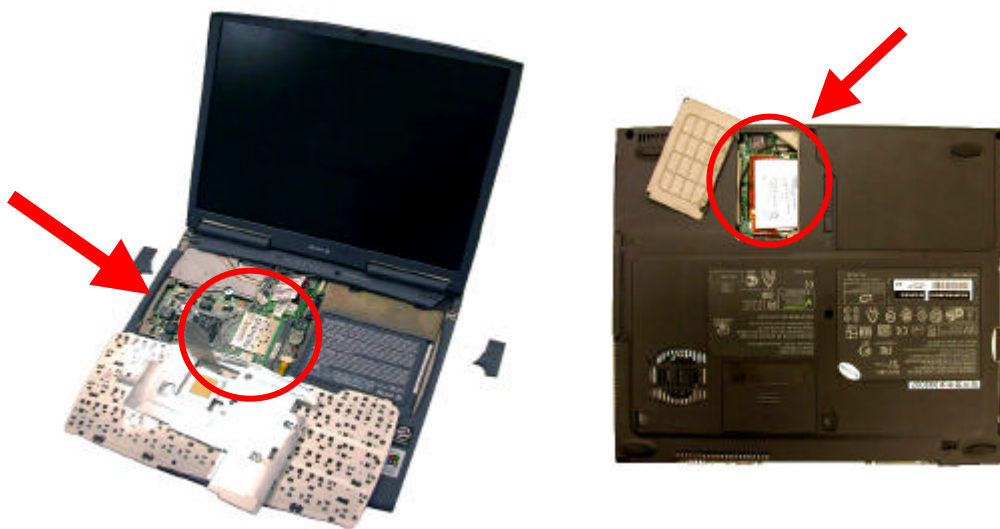
## 1. Introduction

### 1.1 The WLAN 802.11a+b+g mini-PCI Module

Thank you for purchasing the WLAN a+b+g mini-PCI Module that provides the easiest way to wireless networking. This Manual contains detailed instructions in the operation of this product. Please keep this manual for future reference.

### 1.2 Hardware Installation & Antenna Information

- Module is installed in the Personal Computer, located either under the keypad or on the bottom side of the Personal Computer (see the following diagrams).



- Antennas are embedded in the two sides of the panel (see the two antennas shown below)



*Only the DT3 antenna can be used.*

### **Important Note:**

This module is restricted to mobile configuration. The antennas of module should be installed and operated with minimum distance 20cm between the radiator and all persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The module is for OEM installation only and can not be sold to end user directly.

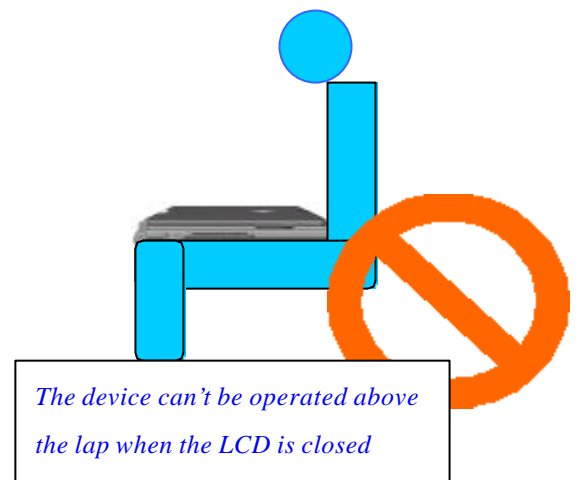
**\*Caution !!**

**(1). This module cannot be bound in a tablet computer for RF exposure issues. (See label 1)**

**(2). Due to the RF exposure issues, this module can be used in a laptop computer in normal operation, but cannot be used when it is put above the lap and the LCD screen is in the closed position. (See label 2)**



**Label 1**



**Label 2**

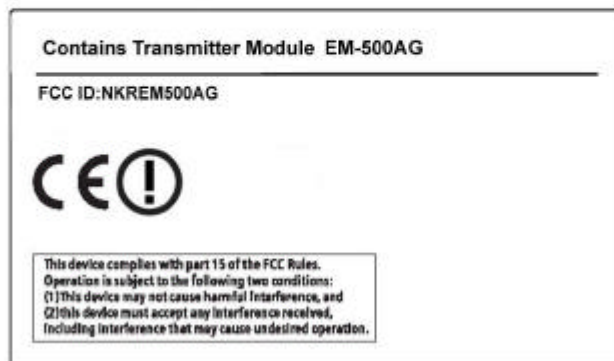
**(3). This module must be labeled with FCC ID. (See label 3)**



**Label 3**

**(4). If the FCC ID is not visible when the module is installed inside another device, then the outside of device must also display a label referring to the enclosed module. The exterior label can be “ Contains Transmitter Module FCC ID: NKREM500AG” or similar wording. (See label 4)**





**Label 4**

***Please put Label 2 & Label 4 to the enclosure of end product to note the end user.***

**(5). The user 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.”**

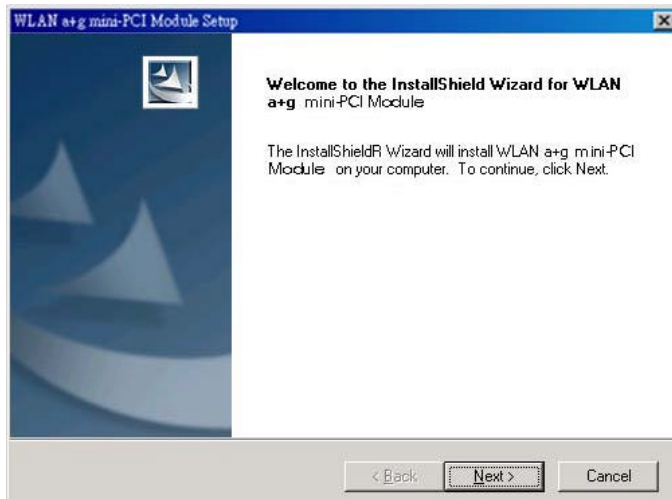
## 2. Driver/Utility Installation / Uninstallation

### 2.1 Installation

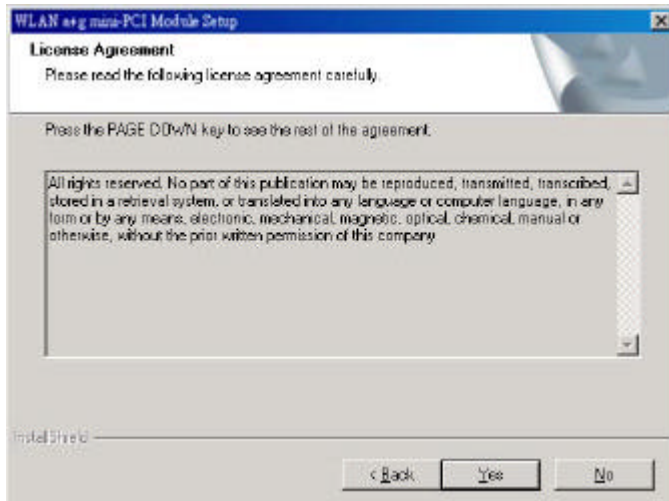
**Note!** The Installation Section in this User Manual describes the first-time installation for Windows. To re-install the driver, please first uninstall the previously installed driver. See Chapter 2.2 “Uninstallation” section in this User Manual.

Follow the steps below to complete the driver/utility installation:

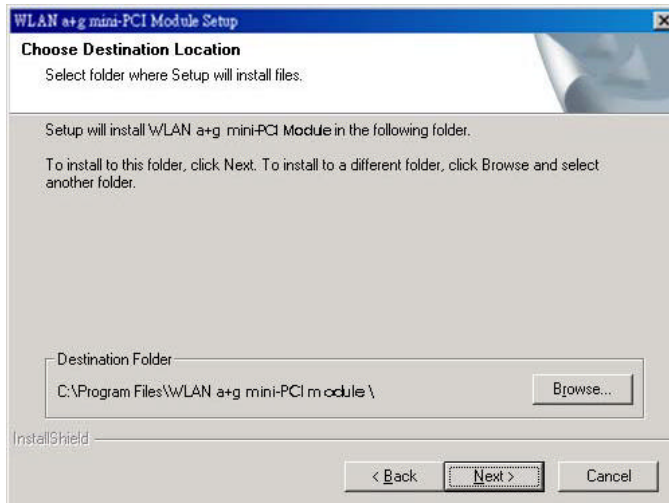
1. Insert the **Installation Software CD** into the CD-Rom Drive.
2. Click “**Next**”.



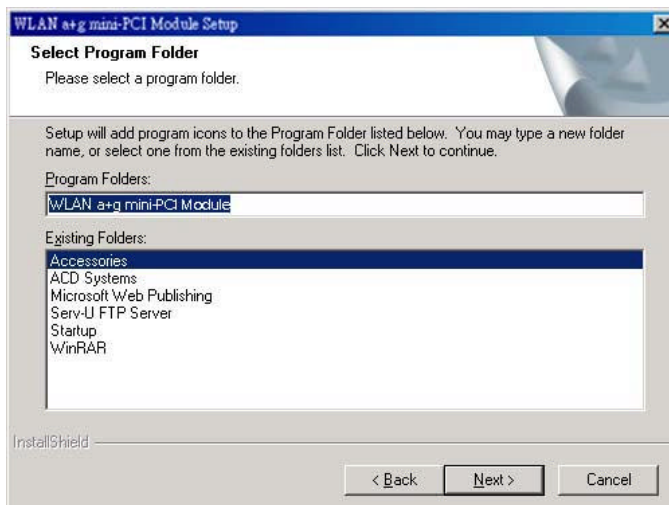
3. Read the **License Agreement** and click **“Yes”**.



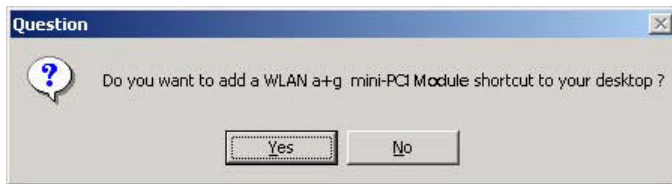
4. Click **“Next”** to continue or click **“Browse”** to choose a destination folder.



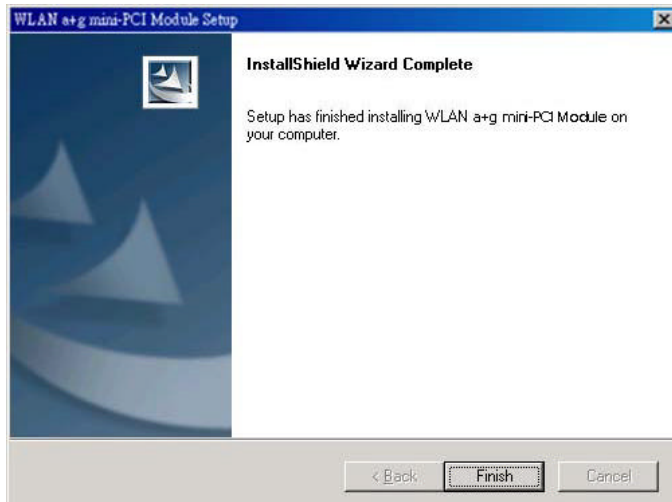
5. Click **“Next”**.



6. Click **“Yes”** to create a shortcut icon on your desktop.



7. Click **“Finish”**.



8. You should now see the shortcut icon on your desktop.



## 2.1.1 Additional Setup Processes

During software installation procedure, each operating system may prompt different specific options:

1. **Windows 98SE:** The system will request the original Windows CD during the installation process. When the installation is finished, you'll have to restart your computer.
2. **Windows Me:** Please restart your computer when the installation is finished.
3. **Windows 2000/XP:** Select "Install the software automatically" when the window with this option appears, and then click "Next" to continue installation.

## 2.1.2 Verifying the Driver

### 1. Windows 98SE/Me:

- Step 1. Right-click "My Computer" icon on the desktop and choose "Properties".
- Step 2. Select "Device Manager" tab and open "Network adapters". You should see your WLAN a+b+g mini-PCI Module in the list. Highlight it and click "Properties" button.
- Step 3. From the "Device status", you should see the line "This device is working properly". If, instead, you see error messages displayed, please remove this Adapter (highlight this Adapter and click "Remove" button). Restart your PC and go through the installation process again.

### 2. Windows 2000:

- Step 1. Right-click "My Computer" icon on the desktop and choose "Properties".
- Step 2. Select "Hardware" tab and click "Device Manager". Open "Network adapters". You should see your WLAN a+b+g mini-PCI Module in the list. Right-click this Adapter and choose "Properties".
- Step 3. From the "Device status", you should see the line "This device is working properly". If, instead, you see error messages displayed, please uninstall this Adapter (right-click this Adapter from the "Network adapters" list and choose "Uninstall"). Restart your PC and go through the installation process again.

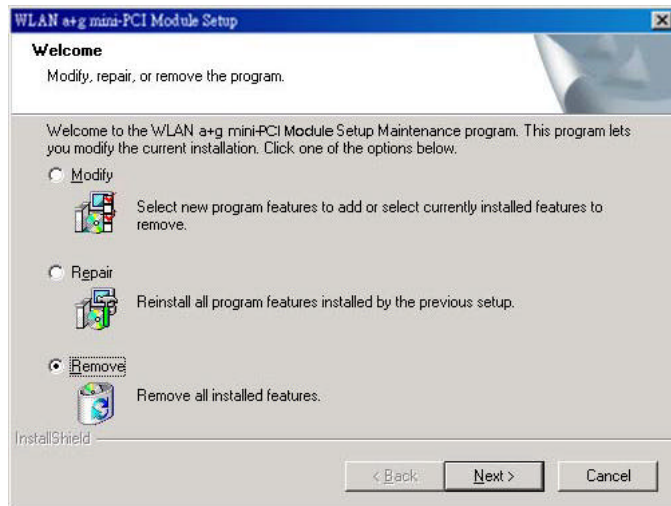
### **3. Windows XP:**

- Step 1. Click Start>Control Panel> System.
- Step 2. Select “Hardware” tab, and click “Device Manager”. Open “Network adapters”. You should see your WLAN a+b+g mini-PCI Module in the list. Right-click this Adapter and choose “Properties”.
- Step 3. From the “Device status”, you should see the line “This device is working properly”. If, instead, you see error messages displayed, please uninstall this Adapter (right-click this Adapter from the “Network adapters” list and choose “Uninstall”). Restart your PC and go through the installation process again.

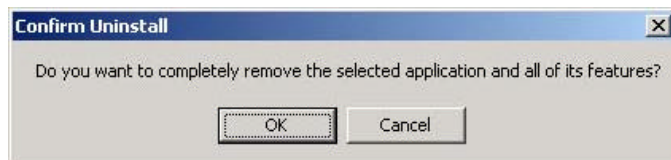
## 2.2 Uninstallation

**Note!** Before uninstallation, please close all running programs.

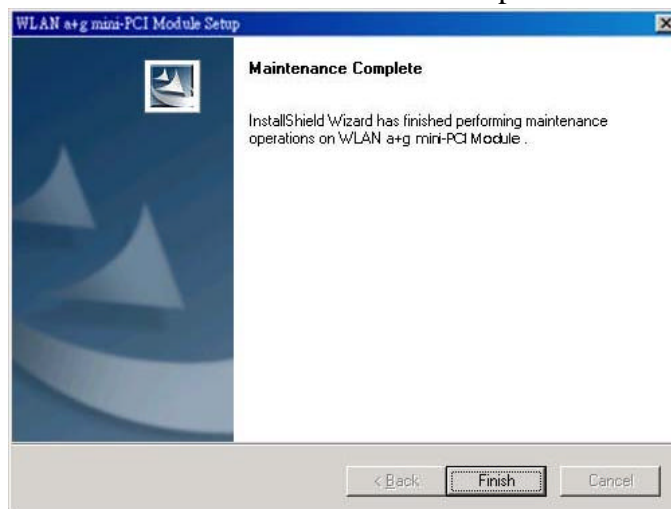
1. Click Start>Programs>WLAN a+b+g mini-PCI Module>UnInstall WLAN a+b+g mini-PCI Module.
2. Choose **“Remove”**. Click **“Next”**.



3. Click **“OK”** to start **Uninstall**.

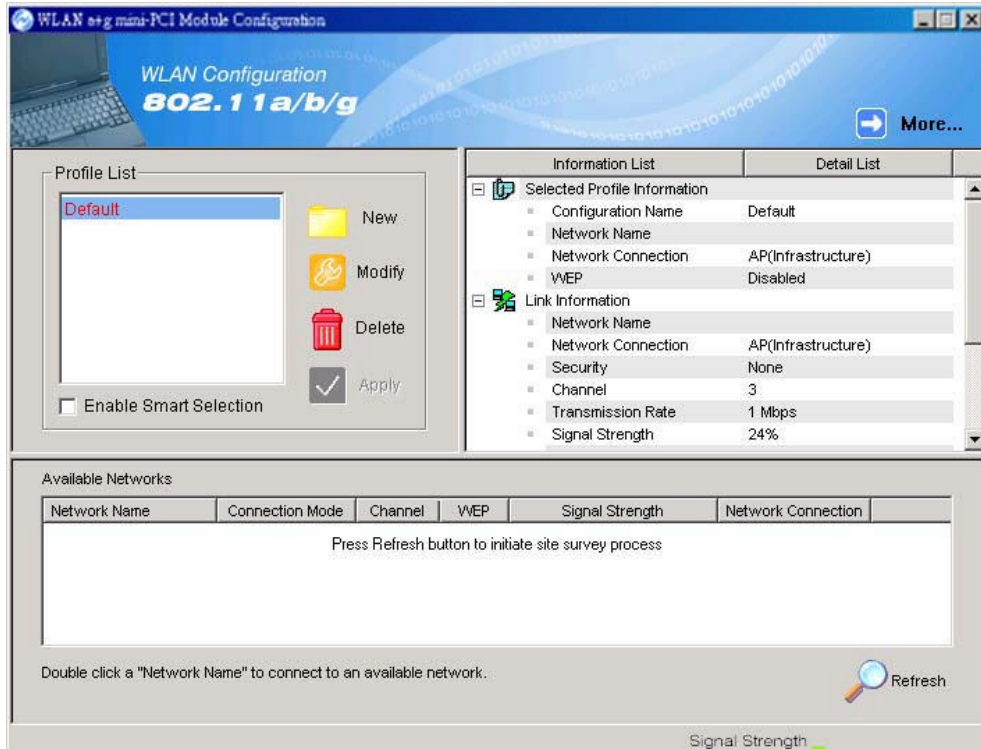


4. Click **“Finish”**. **Uninstall** is now completed.

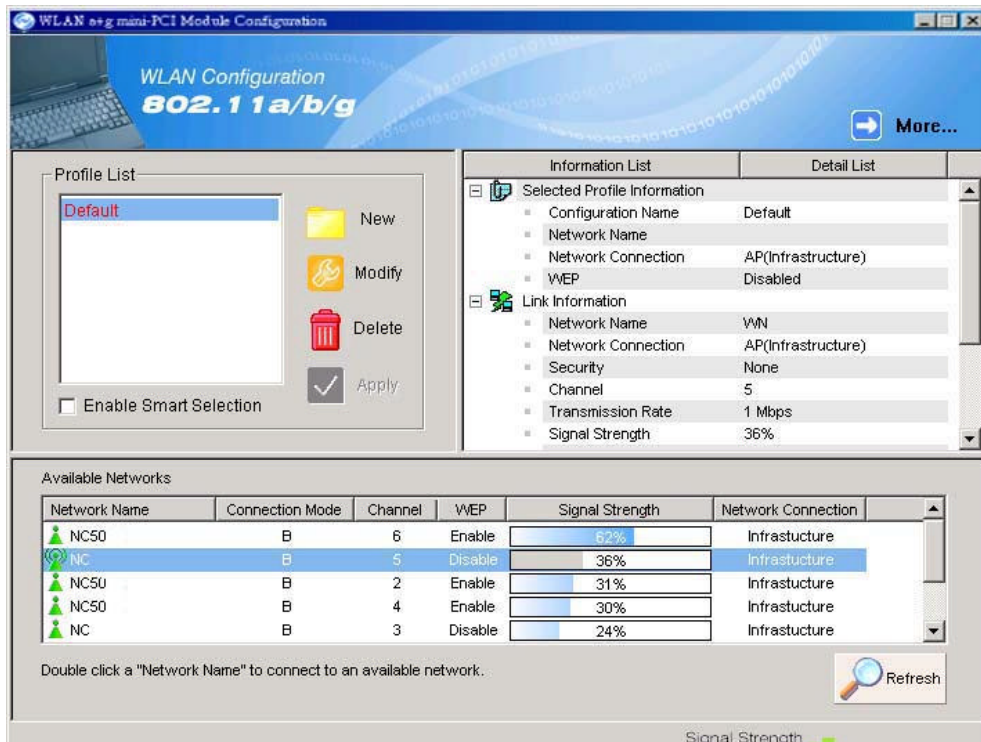


### 3. Connecting to an Existing Network

1. Double click the shortcut icon of “WLAN a+b+g mini-PCI Module” on the desktop, and the “WLAN a+b+g mini-PCI Module Configuration” window will appear.

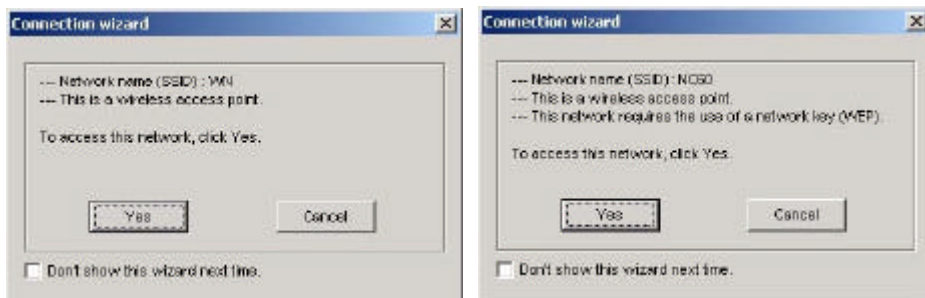


2. Click “Refresh” button  and all available networks will be listed.

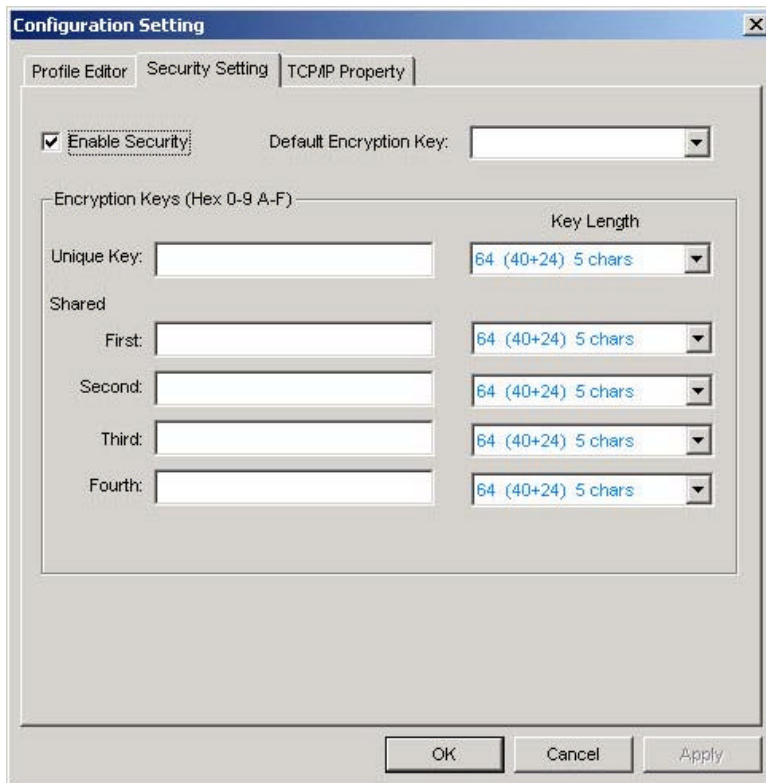







- From the list of “Available Networks”, choose one network by double clicking the **Network Name**. One of the following dialog boxes appears. Click “**Yes**” to continue.



- If the WEP of the chosen network is enabled, the “Security Setting” tab is displayed. Enter the correct **Encryption Keys** and click “OK”. You need to contact the network administrator for the values the **Encryption Keys**.




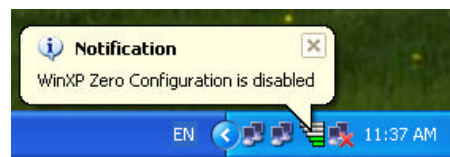
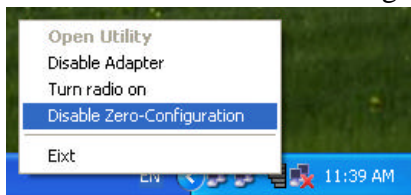
- Once connected (when you see the icon  or  in front of the name of the Connected Network), you can check the signal strength from the icon  in the Windows System Tray.

## 3.1 Additional Note for Windows XP

In Windows XP, it is recommended that you use the WLAN a+b+g mini-PCI Module Configuration Utility. Before using the Utility, please follow the steps below to disable the Windows XP Zero Configuration:

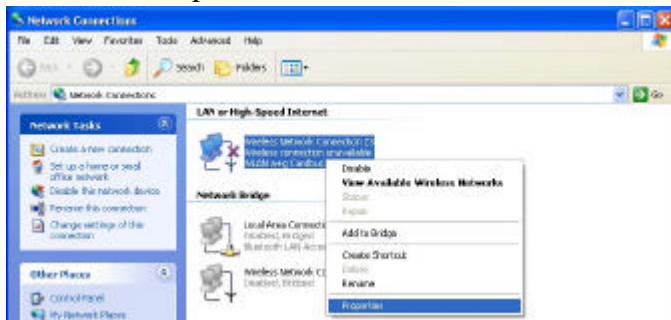
### Option 1:

1. Double click the shortcut icon  to open the Utility.
2. From the Windows System Tray, you should see the signal icon. Right-click it and select “Disable Zero-Configuration”.

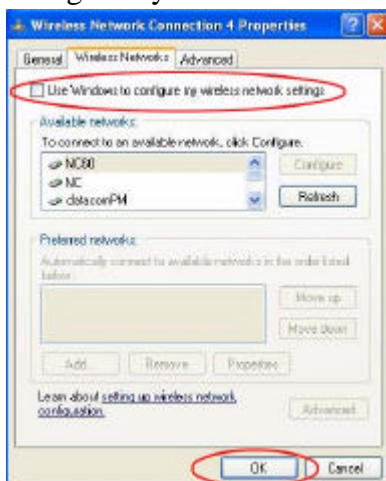


### Option 2:

1. Go to “Control Panel” and double click “Network Connections”.
2. Right-click “Wireless Network Connection” of “WLAN a+b+g mini-PCI Module”, and select “Properties”.

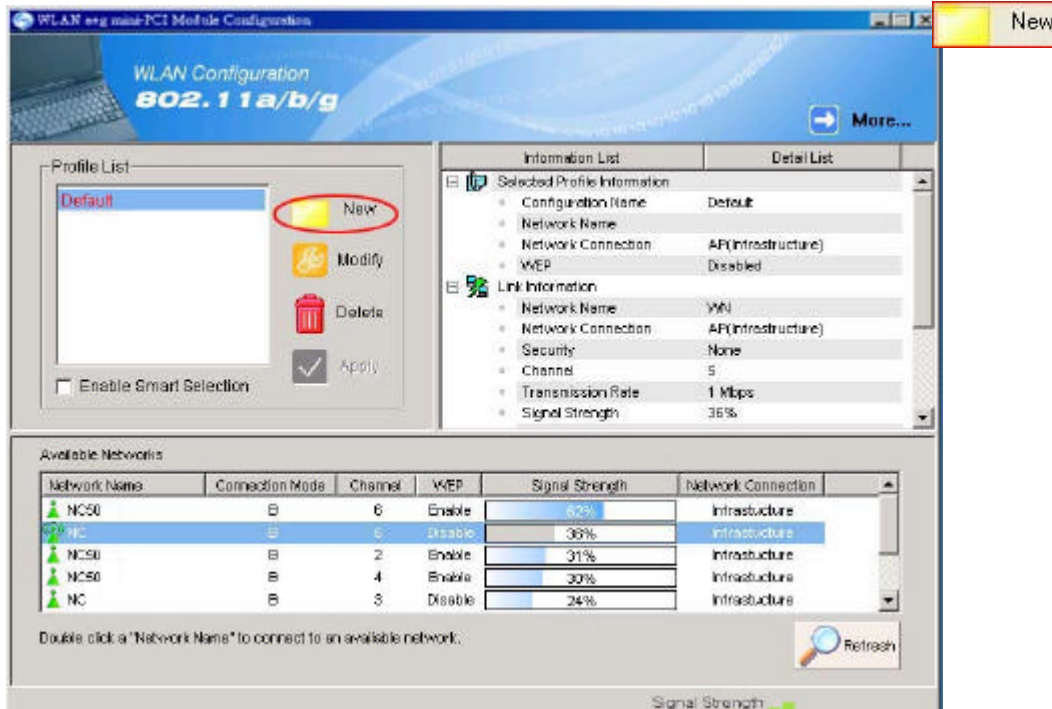


3. Select “Wireless Networks” tab, and uncheck the check box of “Use Windows to configure my wireless network settings”, and then click “OK”.

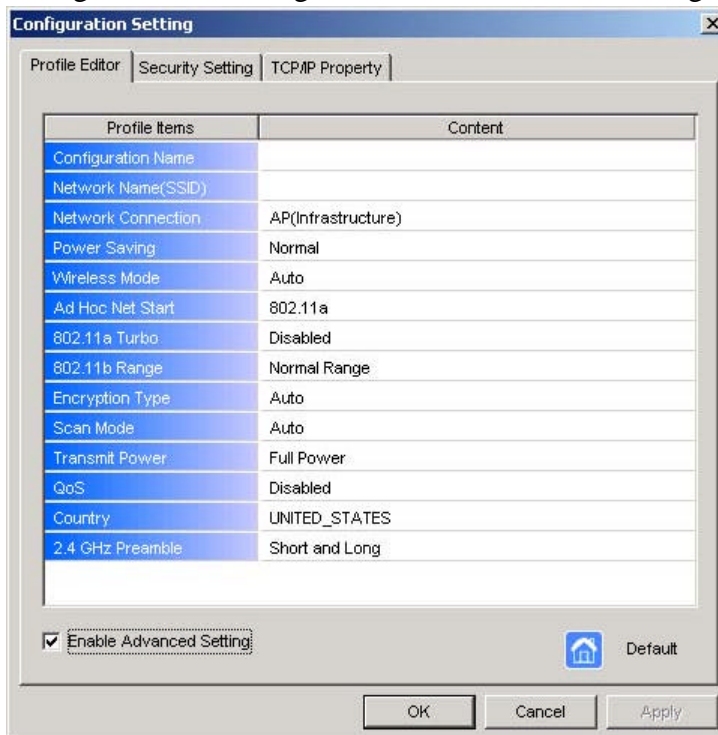


## 4. Creating a New Network

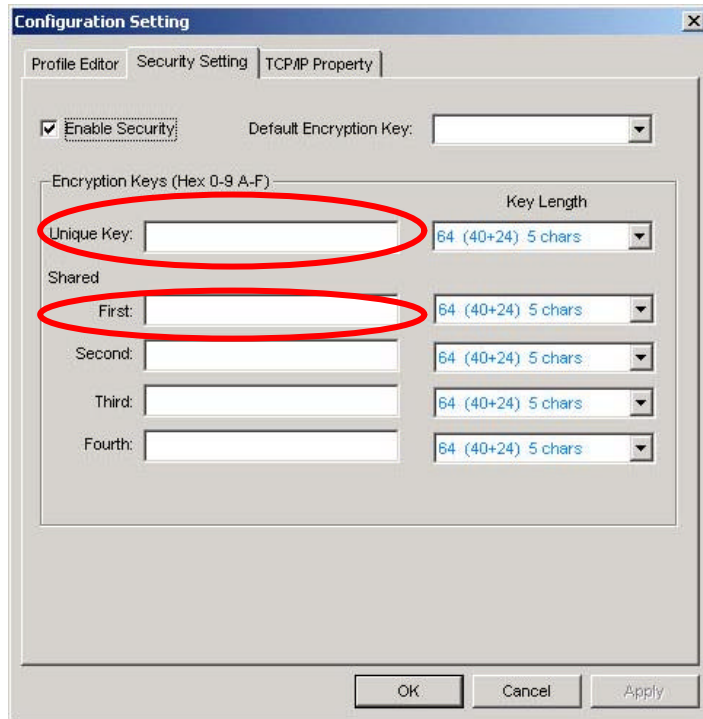
1. In “WLAN a+b+g mini-PCI Module Configuration” window, click “New” ..



2. Select the “Profile Editor” tab and check the check box of “Enable Advanced Setting” to edit all settings. Click “OK” to save the settings.



- Click the “Security Setting” tab and set the **Encryption Keys**. Click “OK” to save the settings. When you are creating an **Infrastructure mode and IEEE802.11b** standard network, please enter a passkey in “**Shared Keys: First**” field. For **Infrastructure mode and IEEE802.11a** standard network, you may enter a passkey in either “**Unique Key**” field or “**Shared Keys: First**” field. If you are creating an **Ad-Hoc mode** network, enter a passkey in “**Shared Keys: First**” field.



- The new **Network Name** is then listed in the **Profile List**.

**Note!** For details of each setting, please read Chapter 5 “Configuration”.

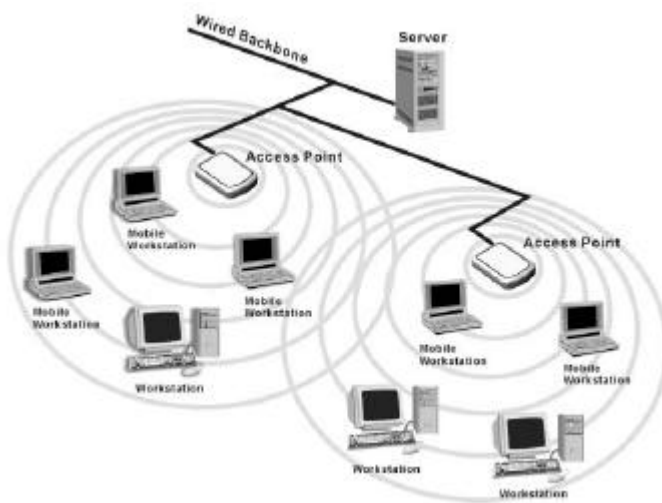
## 5. Configuration

### 5.1 Device Configuration

You can set the Wireless Network Adapter to work in either “infrastructure” mode or “ad hoc” mode.

#### **Infrastructure Mode**

In infrastructure mode, devices communicate with each other by first going through an Access Point (AP). Wireless devices can communicate with each other or can communicate with a wired network. When one AP is connected to wired network and a set of wireless stations, it is referred to as a BSS (Basic Service Set).



#### **Ad Hoc Mode**

Ad-hoc mode is also called “peer-to-peer mode” or “Independent Basic Service Set (IBSS)”. In ad hoc mode, devices communicate directly with each other without using an Access Point (AP).

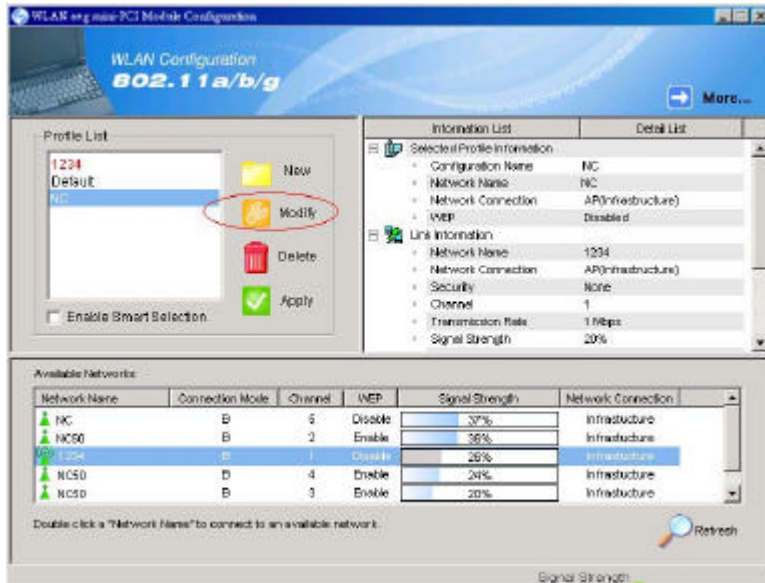


## 5.1.1 Non-Default Settings Configuration

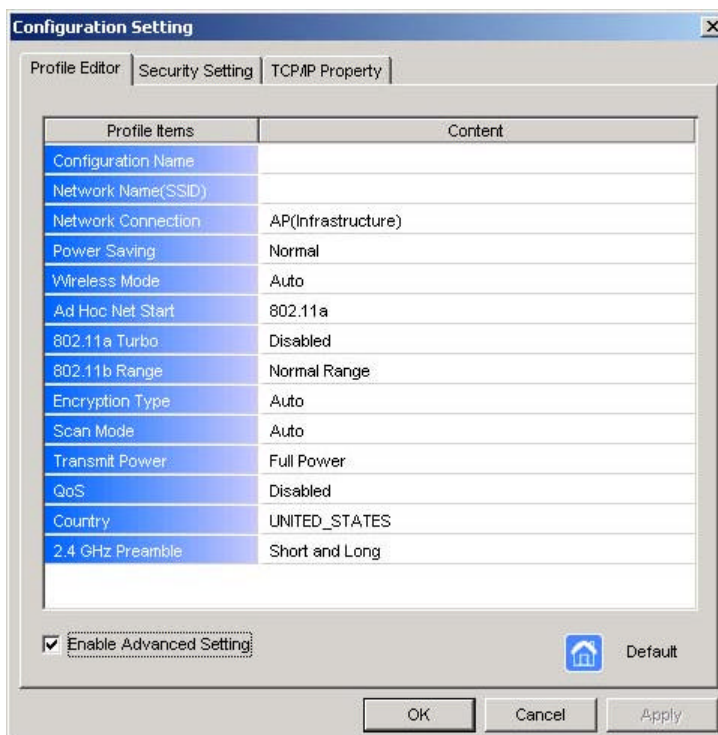
1. Open “WLAN a+b+g mini-PCI Module Configuration” by double clicking the shortcut icon on the desktop.

**Note!** If there’s no network name listed in the “Profile List”, click “Refresh” button and double click a Network Name from “Available Networks”. The chosen Network Name will then be listed in the Profile List.

2. From the Profile List, select one Profile and click “Modify” button .



3. Select “Profile Editor” tab and edit the settings. Click “OK” to save the modifications.



- **Configuration Name:** This name identifies the configuration. This name should be unique.
- **Network Name (SSID):** The name of the wireless network. This name cannot be longer than 32 characters. If the field is set to be “ANY” or is left blank, your computer will connect to an AP with the best signal strength.
- **Network Connection:** Specifies the mode of the network. Two options are “Infrastructure” and “Ad Hoc”.
- **Power Saving:** Three power management options are “Off”, “Normal” and “Maximum”. In **Ad Hoc** mode, **Power Savings** function cannot be enabled.
- **Wireless Mode:** Three options are “802.11b”, “802.11a” or “Auto”. “Auto” allows the use of either 802.11a or 802.11b mode.
- **Ad Hoc Net Start:** Specifies a band to establish an Ad Hoc network if no matching SSID is found. Four options are available: 802.11b, 802.11a, 802.11aTurbo and 802.11g (Pure g).
- **802.11a Turbo:** Disables or enables the 802.11a Turbo mode.
- **802.11b Range:** Two options are “Normal Range” and “Extended Range”.
- **Encryption Type:** Three options are “WEP”, “AES” and “Auto”. WEP stands for Wired Equivalent Privacy, and AES stands for Advanced Encryption Security. AES provides much higher level of security. “Auto” allows the **Adapter** and AP to negotiate the encryption type. If AES is not available, WEP is used. By default, the **Adapter** is set to “Auto” and will attempt to use AES first. If the AP supports WEP only or is configured for WEP only, the **Adapter** will automatically use WEP.
- **Scan Mode:** Three options are “Active Scan”, “Passive Scan” and “Auto”.
- **Transmit Power:** Five options are “Full Power”, “50% Power”, “25% Power”, “12% Power” and “Lowest Power”.
- **QoS:** Stands for Quality of Service. Disables or enables the **Adapter** to cooperate in a network using QoS.
- **Country:** Select the country where you are. Different countries have different regulations. Please do not illegally use the un-licensed channel.
- **2.4 GHz Preamble:** Allows **Ad Hoc** compatibility with other 2.4 GHz devices. Two options are “Short and Long” and “Long only”.

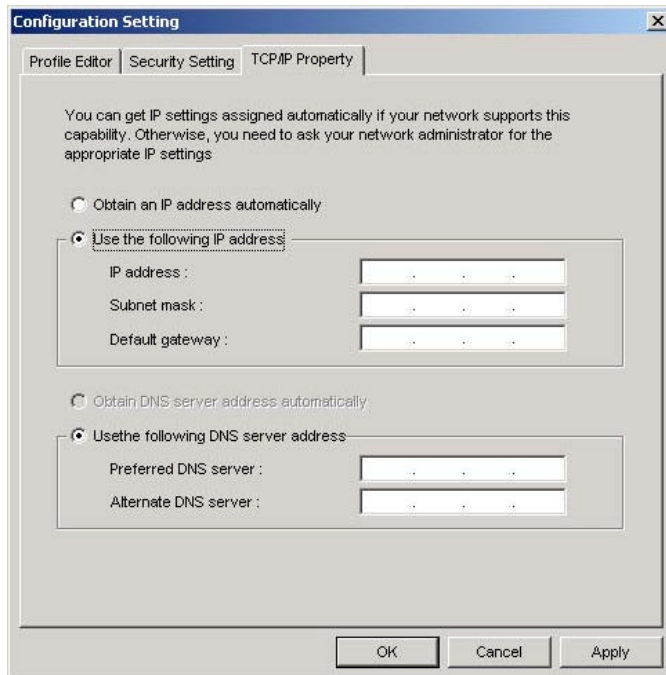
4. Select “Security Setting” tab and edit the settings. Click “OK” to save the settings.

The screenshot shows a dialog box titled "Configuration Setting" with three tabs: "Profile Editor", "Security Setting", and "TCP/IP Property". The "Security Setting" tab is active. It features a checked checkbox labeled "Enable Security". To its right is a "Default Encryption Key:" dropdown menu. Below this is a section titled "Encryption Keys (Hex 0-9 A-F)". This section contains a "Unique Key:" text field and a "Key Length" dropdown menu. Underneath, there is a "Shared" section with four rows, each containing a text field (labeled "First:", "Second:", "Third:", and "Fourth:") and a "Key Length" dropdown menu. All "Key Length" dropdowns are currently set to "64 (40+24) 5 chars". At the bottom of the dialog are three buttons: "OK", "Cancel", and "Apply".

- **Enable Security:** Enables the WEP security when the check box is checked, and disables the WEP security when the check box is cleared.
- **Default Encryption Key:** Allows you to choose one type of encryption key to be used (Unique, First, Second, Third, or Fourth) from the drop down menu.
- **Unique Key:** Defines the unique encryption key for security for the current network configuration. Not used in **Ad-Hoc** mode. To use **Unique Key** for security, this field should be populated. To use AES, you must specify a **Unique Key**.
- **Shared Keys:** Defines four shared encryption keys. To use **Shared Keys** for security, at least one **Shared Key** should be populated.
- **Key Length:** Defines the length of each encryption key. When the length is changed to be a smaller number after a key is entered, the key is automatically truncated to fit. If the length is increased again, the key will not be automatically updated to the previous value.



5. Select “TCP/IP Property” tab. Enter the settings and click “OK” to save the settings.



- If the network uses DHCP server, choose “Obtain an IP address automatically”.
- If the network does not use DHCP server, choose “Use the following IP address” to set the relative settings. For the IP configuration information, please contact the network administrator.

### 5.1.2 Default Settings Windows XP Zero-Configuration

You may also choose the default parameters and directly proceed to Windows XP zero-configuration through the steps below:

1. Go to “Control Panel” and open “Network Connections”.
2. Right-click the Wireless Network Connection of “WLAN a+b+g mini-PCI Module”, and make sure this connection is **Enabled**.
3. Right-click the Wireless Network Connection of “WLAN a+b+g mini-PCI Module”, and then click “Properties”.
4. Select “Wireless Networks” tab and select “Use Windows to configure my wireless network settings” check box.

**Note!** Clear the check box of “Use Windows to configure my wireless network settings” will disable automatic wireless network configuration.