802.11g Wireless LAN Mini USB Module

User Manual

Version: 2.0
(August, 2004)

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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 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:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

FCC Caution

This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm spacing must be provided between computer mounted antenna and person’s body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

This device is intended only for OEM integrators which produce host with 4 slots able to match with the pins of the modules. The following conditions have to be met:

The antenna must be installed such that 20 cm is maintained between the antenna and users, and As long as the condition above is met, further transmitter test 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 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. The end proudct using this module can only use the filed antenna and has to label the end product by "Contains Tx Module FCC ID: NDD9573170504".

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)
The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
The ETSI version of this device is also authorized for use in EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.

EU Countries Not intended for use

None.

CONTENTS

1 Introduction

Thank you for purchasing the 802.11g Wireless LAN Mini USB Module. This USB Module is designed to comply with IEEE 802.11g Wireless LAN standard and easy to carry with the Mini size. It is suitable for any Laptop or Desktop computers.

This Module supports 64/128/256-bit WEP data encryption that protects your wireless network from eavesdropping. It also supports WPA (Wi-Fi Protected Access) feature that combines IEEE 802.1x and TKIP (Temporal Key Integrity Protocol) technologies. Client users are required to authorize before accessing to APs or AP Routers, and the data transmitted in the network is encrypted/decrypted by a dynamically changed secret key. This Module has built-in AES engine which ensure the highest degree of security and authenticity for digital information and it is the most advanced solution defined by IEEE 802.11i for the security in the wireless network.

This Module is cost-effective, together with the versatile features; it is the best solution for you to build your wireless network.

1.1 Features

- Complies with the IEEE 802.11b and IEEE 802.11g 2.4GHz standards.
- Up to 54Mbps high data transfer rate.
- Support 64/128/256-bit WEP, WPA (TKIP with IEEE 802.1x) and AES functions for high level of security.
- Supports Software AP function, which turns the wireless station into a wireless AP.
- Complies with IEEE 802.11d country roaming standard.
- Support the most popular operating system: Windows 98SE/Me/2000/XP/Server 2003.
- Supports USB 2.0/1.1/1.0 interface.
- Portable and mini-size design.
- Suitable for Any Notebook or Desktop PC.

1.2 Specifications

- Standard: IEEE 802.11g/b
- Bus Type: USB 2.0 Type A
- Frequency Band: 2.4000~2.4835GHz (Industrial Scientific Medical Band)
- Modulation: OFDM with BPSK, QPSK, 16QAM, 64QAM (11g)
  BPSK, QPSK, CCK (11b)
- Data Rate: 54/48/36/24/18/12/11/9/6/5.5/2/1Mbps auto fallback
- Security: 64/128/256-bit WEP Data Encryption, WPA (IEEE 802.1x with TKIP) and AES
- Antenna: Internal Antenna
- Drivers: Windows 98SE/Me/2000/XP/Server 2003
- LED: Link/Activity

- Transmit Power: 16dBm (Typical)
- Dimension: 9(H) x 27(W) x 87(D)
- Temperature: 32~131°F (0 ~55°C)
- Humidity: 0-95% (NonCondensing)
- Certification: FCC, CE

1.3 Package Contents

Before you begin the installation, please check the items of your package. The package should include the following items:

- One USB Module
- One Quick Guide
- One CD (Driver/Utility/Manual)

If any of the above items is missing, contact your supplier as soon as possible.

2 Installation Procedure

Before you proceed with the installation, please notice following descriptions.

***Note1:** Please do not install the USB Module into your computer before installing the software program from the CD.*

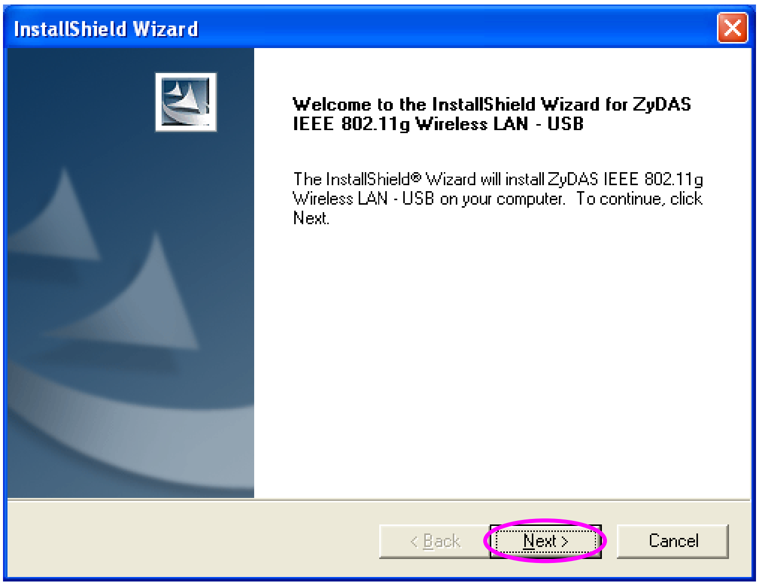
***Note2:** The following installation was operated in Windows XP. (Procedures are similar for Windows 98SE/Me/2000/Server 2003.)*

***Note3:** If you have installed the Wireless PC Card driver & utility before, please uninstall the old version first.*

Please follow below instructions to install the USB Module.

I. Install the Configuration Utility

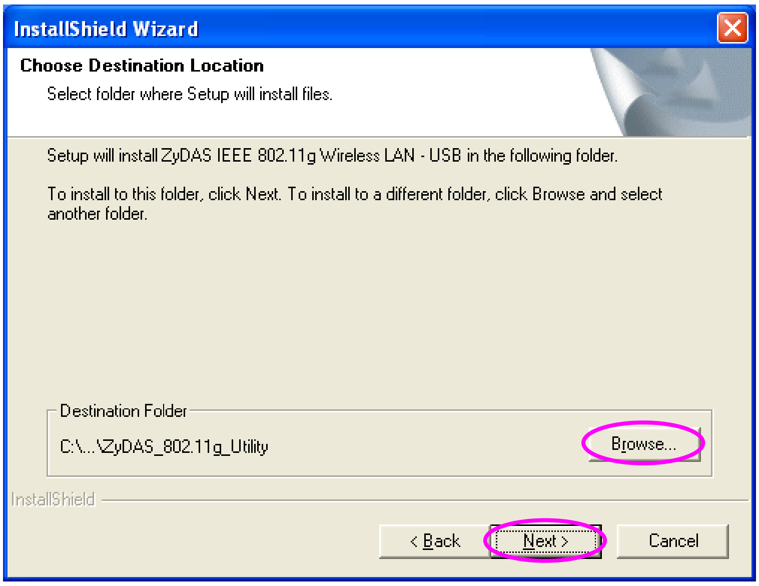
A. Insert the Installation CD to your CD-ROM Drive. Execute the “setup” program.



Welcome to the InstallShield Wizard for ZyDAS IEEE 802.11g Wireless LAN - USB

The InstallShield® Wizard will install ZyDAS IEEE 802.11g Wireless LAN - USB on your computer. To continue, click Next.

B. If you want to install the software program in another location, click “Browser” and select an alternative destination. Then, click “Next”.



InstallShield Wizard

Choose Destination Location

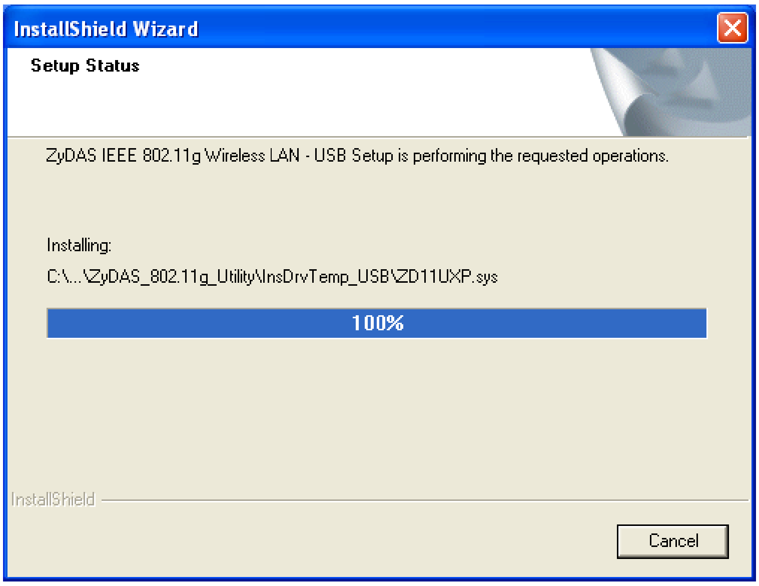
Select folder where Setup will install files.

Setup will install ZyDAS IEEE 802.11g Wireless LAN - USB in the following folder.

To install to this folder, click Next. To install to a different folder, click Browse and select another folder.

Destination Folder

C:\...\ZyDAS_802.11g_Utility



InstallShield Wizard

Setup Status

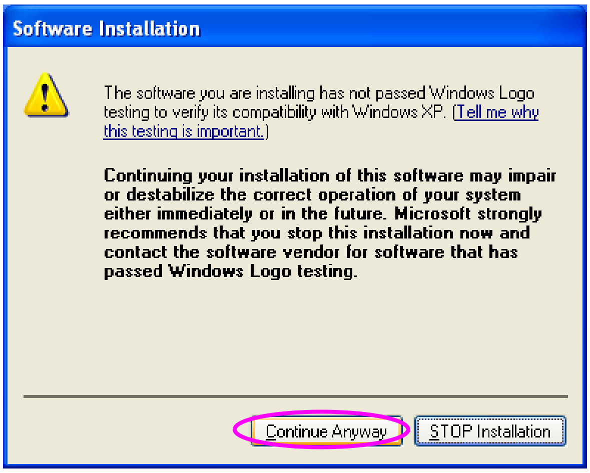
ZyDAS IEEE 802.11g Wireless LAN - USB Setup is performing the requested operations.

Installing:

C:\...\ZyDAS_802.11g_Utility\InsDrvTemp_USB\ZD11UXP.sys

100%

C. Click “Continue Anyway” to finish the installation.

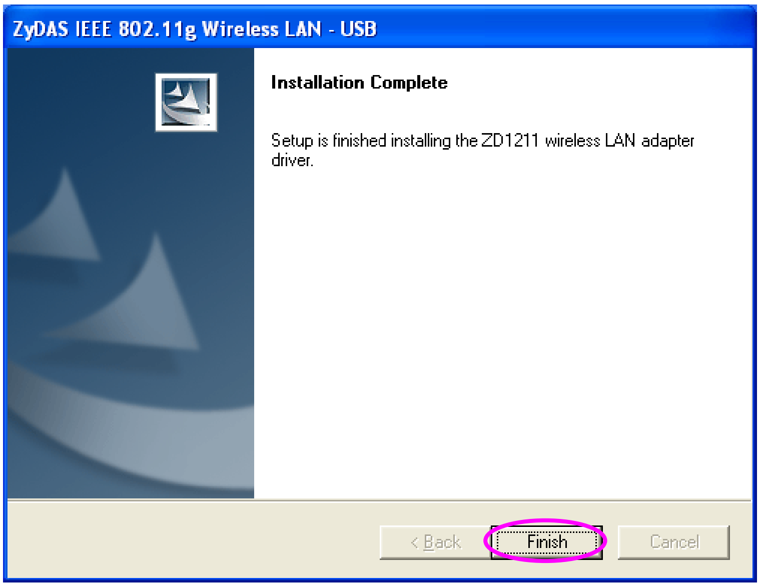


Software Installation

The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.

D. Click “Finish” to complete the installation.


ZyDAS IEEE 802.11g Wireless LAN - USB

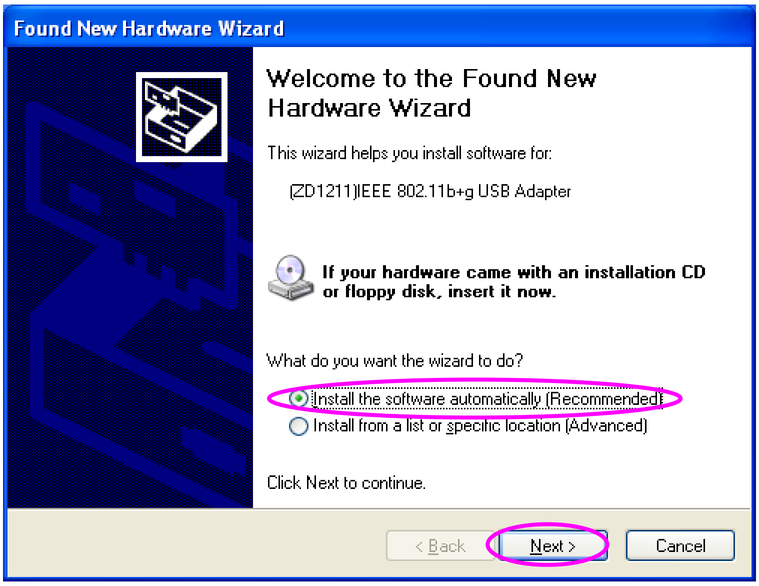
Installation Complete

Setup is finished installing the ZD1211 wireless LAN adapter driver.

II. Install the USB Module

A. Plug the USB Module into the USB port of your computer.

B. The “Found New Hardware Wizard” is displayed, select “Install the software automatically (Recommended)” and click “Next”.


Found New Hardware Wizard

Welcome to the Found New Hardware Wizard

This wizard helps you install software for:

(ZD1211)IEEE 802.11b+g USB Adapter

If your hardware came with an installation CD or floppy disk, insert it now.

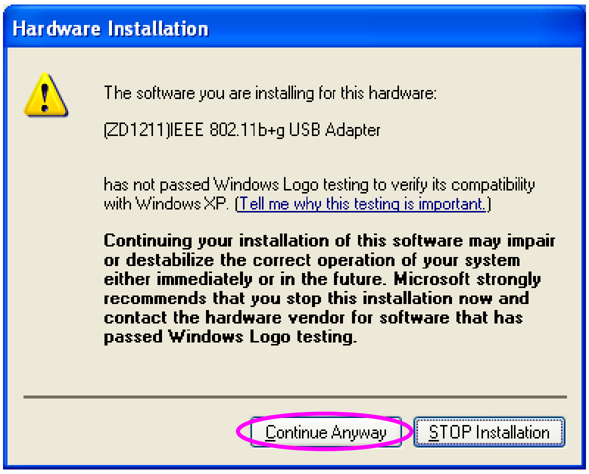
What do you want the wizard to do?

● Install the software automatically (Recommended)

○ Install from a list or specific location (Advanced)

Click Next to continue.

C. Click “Continue Anyway” and the system will start to install the USB Module.



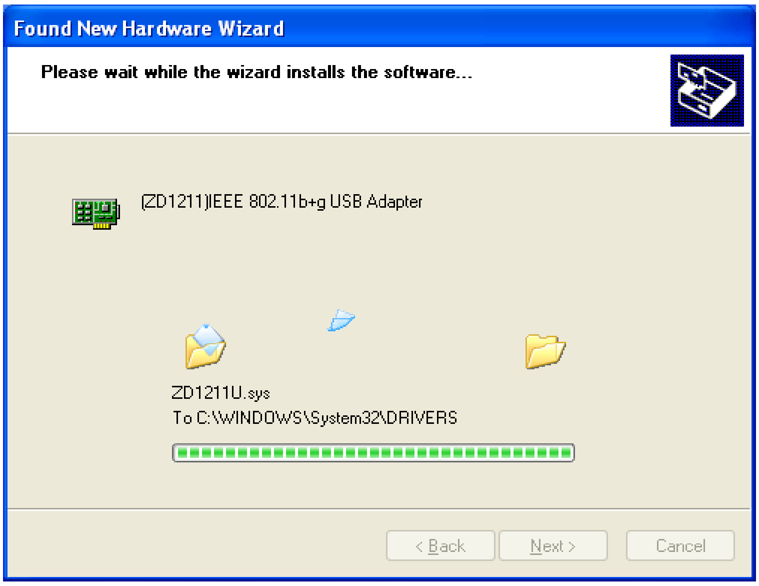
Hardware Installation

The software you are installing for this hardware:

(ZD1211)IEEE 802.11b+g USB Adapter

has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.



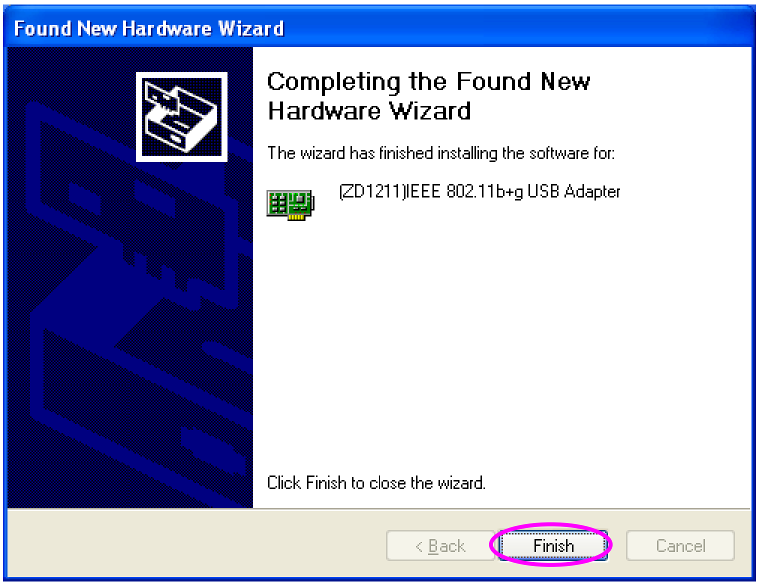
Found New Hardware Wizard

Please wait while the wizard installs the software...

(ZD1211)IEEE 802.11b+g USB Adapter

ZD1211U.sys
To C:\WINDOWS\System32\DRIVERS

D. Click "Finish" to complete the installation.



Found New Hardware Wizard

Completing the Found New Hardware Wizard

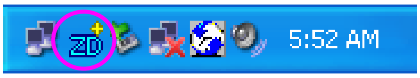
The wizard has finished installing the software for:

(ZD1211)IEEE 802.11b+g USB Adapter

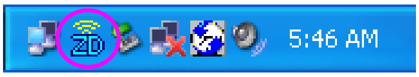
Click Finish to close the wizard.

III. Using the Configuration Utility

To setup the USB Module, double-click the icon in the system tray.

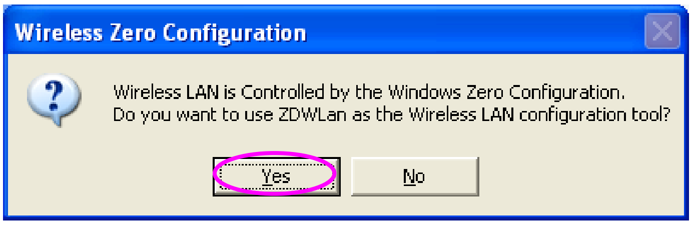


For Windows XP, there is a “Windows Zero Configuration Tool” for you to setup wireless clients. If you want to use the Utility of the USB Module, please follow one of the ways as below.

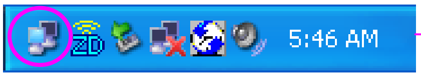


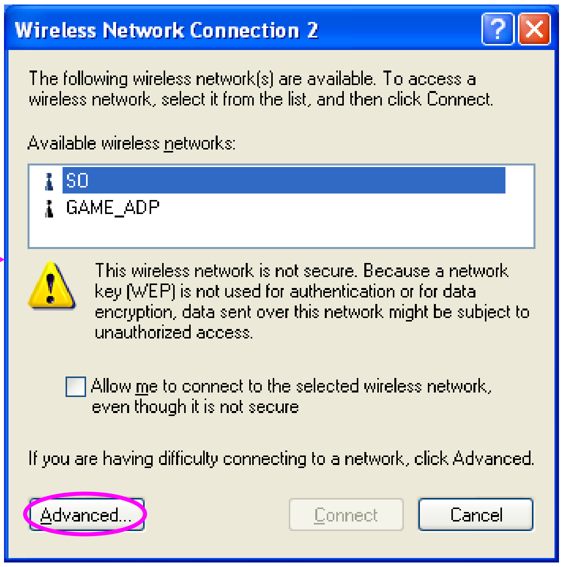
First Way

A. Double-click the utility icon in the system tray.
B. Click “Yes” to use the utility of the USB Module.


Wireless Zero Configuration

Wireless LAN is Controlled by the Windows Zero Configuration.
Do you want to use ZDWLan as the Wireless LAN configuration tool?




Wireless Network Connection 2

The following wireless network(s) are available. To access a wireless network, select it from the list, and then click Connect.

Available wireless networks:

- SO
- GAME_ADP

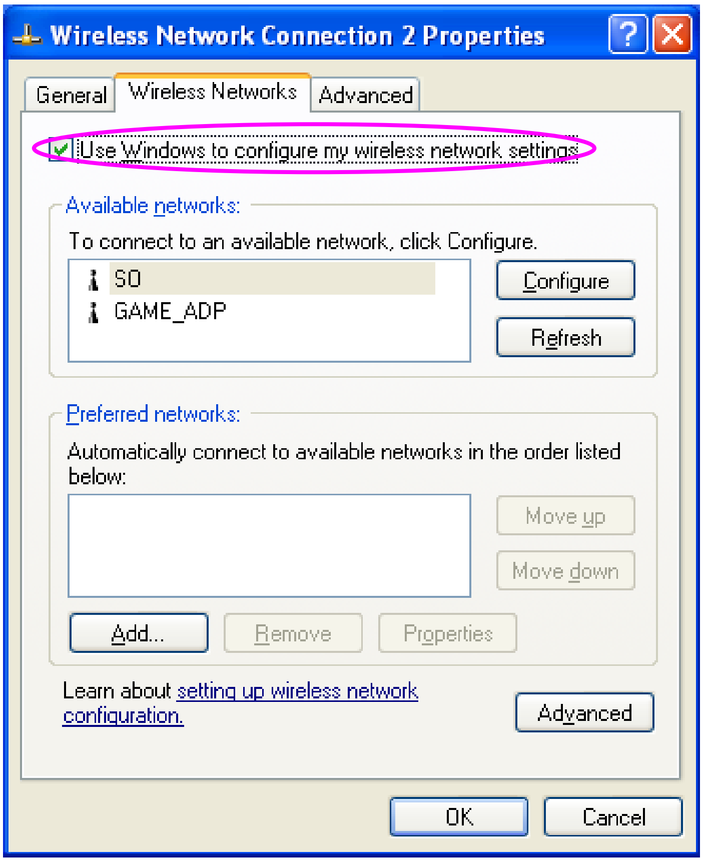
This wireless network is not secure. Because a network key (WEP) is not used for authentication or for data encryption, data sent over this network might be subject to unauthorized access.

☐ Allow me to connect to the selected wireless network, even though it is not secure

If you are having difficulty connecting to a network, click Advanced.

Second Way

A. Right-click the icon and select “View Available Wireless Networks”.
B. Click “Advanced”.
C. Uncheck “Use Windows to configure my wireless network settings”.



Wireless Network Connection 2 Properties

☑ Use Windows to configure my wireless network settings

Available networks:

To connect to an available network, click Configure.

- SO
- GAME_ADP

Preferred networks:

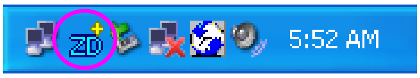
Automatically connect to available networks in the order listed below:

Learn about setting up wireless network configuration.

3 Configuration Utility

The Configuration Utility is a powerful application that helps you configure the 802.11g Wireless LAN Mini USB Module and monitor the link status during the communication process.

The Configuration Utility appears as an icon on the system tray of Windows while the card is running. You can open it by double-click on the icon.



Right click the icon, there are some items for you to operate the configuration utility.

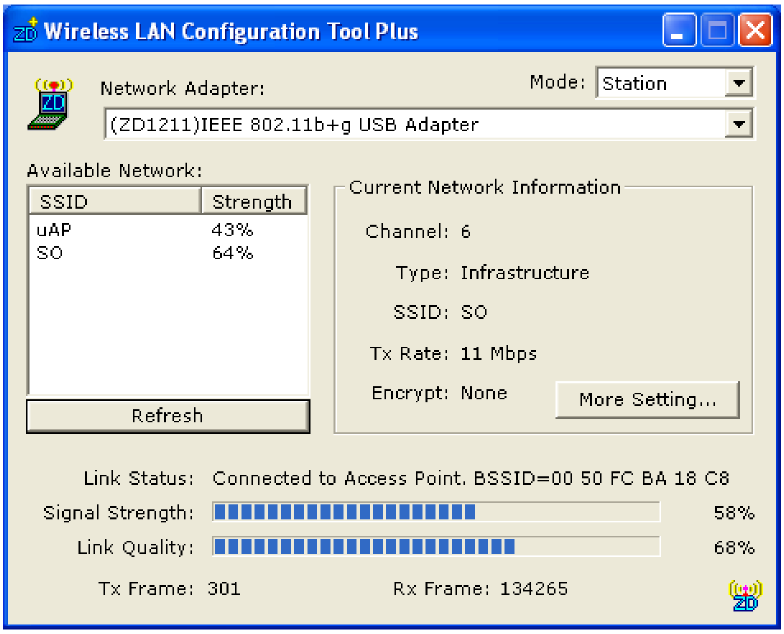
- Open Utility Window
  Select “Open Utility Window” to open the Configuration Utility tool.
- Exit ZDWlan
  Select “Exit ZDWlan” to close the Configuration Utility tool.

Before using the utility, you have to know some restrictions of the utility.

1. If you want to connect to 11g (up to 54Mbps) network, please ensure to install the Module to PC or laptop with USB 2.0 interface. This Module runs at lower performance while you connect it to the USB 1.1/1.0 port of your computer instead.
2. This Module will work in 11b mode when the network type is in Ad Hoc mode. It is defines by Wi-Fi organization. If you want to enable the data rate up to 54Mbps (11g), please follow steps listed below.
   A. Go to “Network Connections”.
   B. Right Click the “Wireless Network Connection” and select “Properties”.
   C. From the pop-up screen, click “Configure”.
   D. Enter into “Advanced” page of the “Properties” screen.
   E. Enable the setting of “IBSS_G_Mode”.

3.1 Wireless Connection Status

When you open the Configuration Utility, the system will scan all the channels to find all the access points/stations within the accessible range of your card and automatically connect to the wireless device with the highest signal strength. From the screen, you may know all the information about the wireless connection.



Network Adapter: (ZD1211)IEEE 802.11b+g USB Adapter

Mode: Station

Available Network:

SSID	Strength
uAP	43%
SO	64%

Current Network Information

Channel: 6

Type: Infrastructure

SSID: SO

Tx Rate: 11 Mbps

Encrypt: None

Link Status: Connected to Access Point. BSSID=00 50 FC BA 18 C8

Signal Strength: 58%

Link Quality: 68%

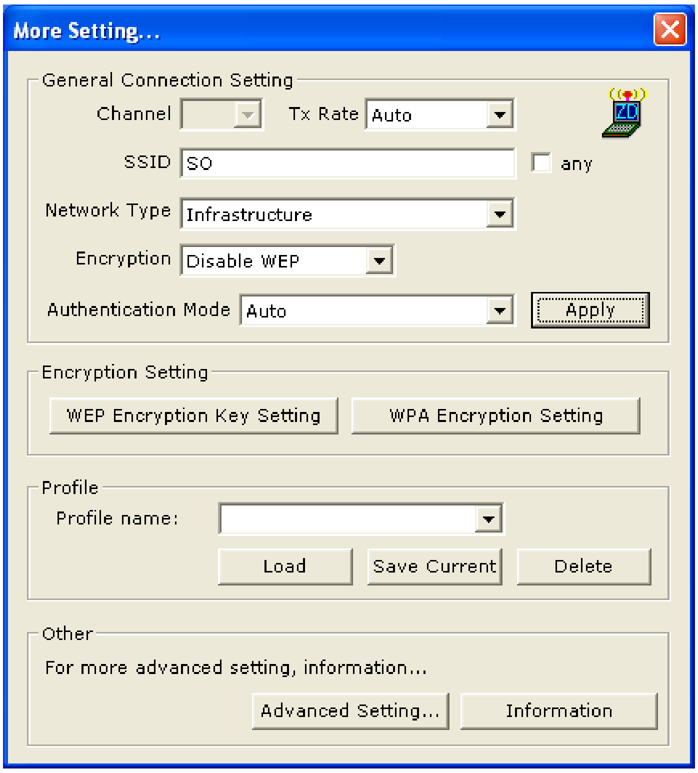
Tx Frame: 301 Rx Frame: 134265

Parameter	Description
Mode	**Station** – Set the USB Module a wireless client. **Access Point** – Turns the USB Module to function as a wireless AP. Please refer to Section 3.5 for the AP settings.
Network Module	Display the product information of the USB Module.
Available Network	Display all the SSID and Signal Strength of wireless devices nearby. To re-survey the available wireless devices please click “Refresh”. There are two ways to automatically make the connection between the USB Module and the wireless device on the list. 1. Double-click the wireless device on the list directly. 2. Select the device you intend to connect and then click “Connect this site“.
Current Network Information	Display the information about the wireless network this Module is connecting to. The information includes Channel, Type, SSID, TX Rate and Encrypt settings. Note: Please refer to Section 3.2 for the description of each item.
More Setting	For setting more functions including disable/enable WEP and Power Saving Mode, etc. Please refer to Section 3.2, 3.3 and 3.4.
Link Status	Display the status of the wireless connection.
BSSID	Display the MAC Address of the network the Module is connecting to.

Parameter	Description
Signal Strength	This bar shows the signal strength level. The higher percentage shown in the bar, the more radio signal been received by the Module. This indicator helps to find the proper position of the Module for quality network operation.
Link Quality	This bar indicates the quality of the link. The higher the percentage, the better the quality.
TX Frame	It shows the number of data frames which are transmitted by the Module successfully.
RX Frame	It shows the number of data frames which are received by the Module successfully.

3.2 General Connection Setting

Click “More Setting”, users are allowed to setup the wireless connection setting, Encryption Setting of the USB Module and other advanced functions.



More Setting...

General Connection Setting

Channel:

Tx Rate: Auto

SSID: SO ☐ any

Network Type: Infrastructure

Encryption: Disable WEP

Authentication Mode: Auto

Profile name:

For more advanced setting, information...

Parameter	Description
General Connection Setting	
Channel	Select the number of the radio channel used for the networking. The channel setting of the wireless devices within a network should be the same.
Tx Rate	There are several options including Auto/1/2/5.5/11/6/9/12/18/24/36/48/54Mbps for you to select. When the “Auto” is selected, the device will choose the most suitable transmission rate automatically. The higher data rate you designated in the network, the shorter distance is allowed between the Module and the wireless devices. When the Module works in 11b mode, the maximum data rate is 11Mbps so that there are only “Auto/1/2/5.5/11Mbps” options you can select.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. You may specify a SSID for the Module and then only the device with the same SSID can interconnect to the Module.
Any	If “Any“ check box is enabled, the Module will survey and connect to one of the available wireless devices without checking the consistency of channel and SSID with the wireless device.
Network Type	**Ad-Hoc** – This mode enables wireless network Modules interconnecting without through AP or Router. Select this mode if there is no AP or Router in the network. **Infrastructure** – This operation mode requires the presence of an 802.11 Access Point. All communication is done via the Access Point or Router.
Encryption	If you want to encrypt the data transmitted or received in the network, select one of the encryption ways from the pull-down list. **Disable** – Disable encryption function. **WEP** – Enable the WEP Data Encryption. When the item is selected, you have to continue setting the WEP Encryption keys. **TKIP** – TKIP (Temporal Key Integrity Protocol) changes the temporal key every 10,000 packets. This insures much greater security. than the standard WEP security.

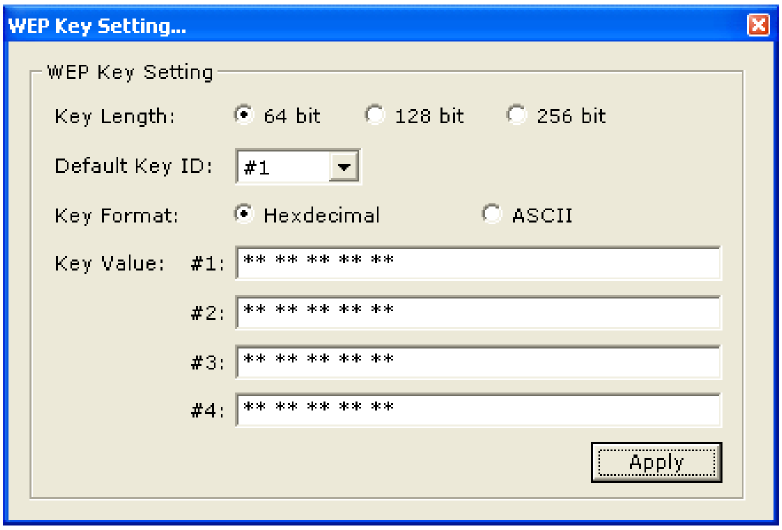
Parameter	Description
Encryption	**AES** – AES has been developed to ensure the highest degree of security and authenticity for digital information and it is the most advanced solution defined by IEEE 802.11i for the security in the wireless network. Note: All devices in the network should use the same encryption method to ensure the communication.
Authentication Mode	This setting has to be consistent with the wireless networks that the Module intends to connect. **Open System** – No authentication is needed among the wireless network. **Shared Key** – Only wireless devices using a shared key (WEP Key identified) are allowed to connect each other. **Auto** – Auto switch the authentication algorithm depending on the wireless networks that the Module is connecting to. **WPA** – This mode is for enterprise with an authentication server (Radius Server), a Certificate Server, WPA-enabled access poin/router, and a WPA-enabled wireless station. Once WPA is enabled, all stations and access points on the network must be WPA-enabled in order to access the network. WPA mode only supports encryption ways including TKIP and AES. **WPA-PSK** – It is a special mode designed for home and small business users who do not have access to network authentication servers. In this mode, known as Pre-Shared Key, the user manually enters the starting password in their access point or router, as well as in each station on the wireless network. WPA takes over automatically from that point, keeping unauthorized users that don't have the matching password from joining the network, while encrypting the data traveling between authorized devices. WPA-PSK mode only supports encryption ways including TKIP and AES. Note: WPA and WPA-PSK modes do not enable in Ad Hoc network.
Change/Apply	Click “Change“ will enable you to setup the parameters of “General Connection Setting“. In the meantime, the button will change to “Apply“ for you to confirm your settings.

Parameter	Description
Encryption Setting	In the block, users setup WEP and WPA functions. Please refer to Section 3.3 for more description.
WEP Encryption Key Setting	Click this button to setup the WEP key. Please refer to Section 3.3 for the details.
WPA Encryption Setting	Click this button to setup the WPA function. Please refer to Section 3.3 for the details.
Profile	
Profile Name	You can save the network setting as a profile. To connect to the network without making additional configuration, you can load the profile.
Load	Load the setting values from the file in the "Profile Name" list. The new settings will be activated immediately.
Save Current	Input a file name and click "Save Current" to write the current setting values to be a profile in the "Profile Name" list.
Delete	Delete the profile you select.
Other	
Advanced Setting	For more advanced setting, please click it. To know more of the setting, please refer to Section 3.4.
Information	To view the version of the driver, firmware and the MAC Address of the Module, click the button.

3.3 WEP and WPA Encryption

WEP is an data encryption algorithm, which protects Wireless LAN data in the network against eavesdropping. WEP has been found that it has some security problems. The Module supports WPA (Wi-Fi Protected Access) that combines IEEE 802.1x and TKIP (Temporal Key Integrity Protocol) technologies. Client users are required to authorize before accessing to Aps or AP Routers, and the data transmitted in the network is encrypted/decrypted by a dynamically changed secret key. This Module has built-in AES engine which ensure the highest degree of security and authenticity for digital information and it is the most advanced solution defined by IEEE 802.11i for the security in the wireless network.

3.3.1 WEP Setting



WEP Key Setting

Key Length: ● 64 bit ○ 128 bit ○ 256 bit

Default Key ID: #1

Key Format: ● Hexdecimal ○ ASCII

Key Value: #1: ** ** ** ** **

#2: ** ** ** ** **

#3: ** ** ** ** **

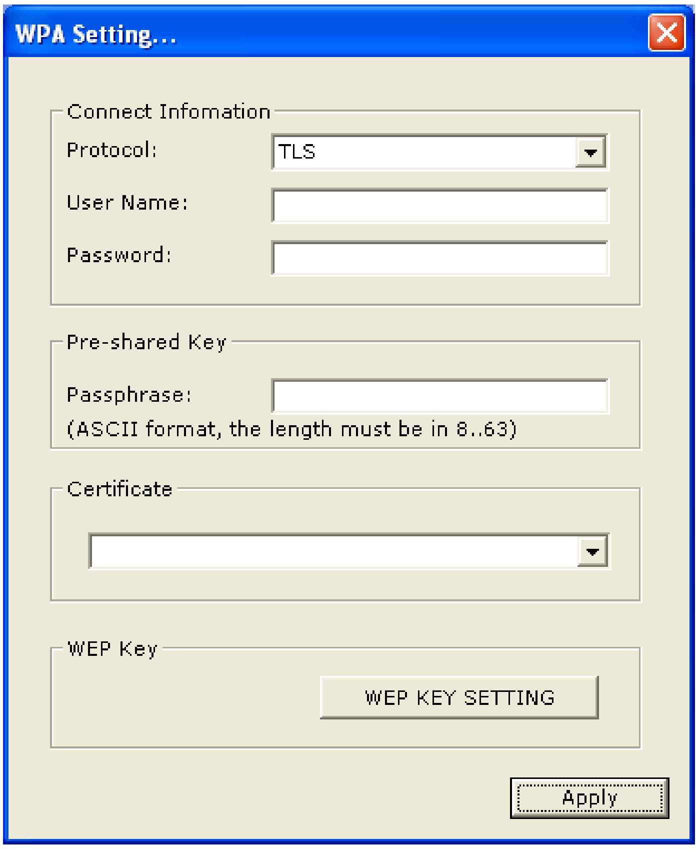
#4: ** ** ** ** **

Parameter	Description
Key Length	You may select the 64-bit, 128-bit or 256-bit to encrypt transmitted data. Larger key length will provide higher level of security, but the throughput will be lower.
Default Key ID	Select one of the keys (1~4) as the encryption key.
Key Format	**Hexdecimal** – Only “A-F“, “a-f“ and “0-9“ are allowed to be set as WEP key. **ASCII** –Numerical values, characters or signs are allowed to be the WEP key. It is more recognizable for user.
Key1 ~ Key4	The keys are used to encrypt data transmitted in the wireless network. Fill the text box by following the rules below. **64-bit** – Input 10-digit Hex values or 5-digit ASCII values as the encryption keys. For example: “0123456aef“ or “Guest“. **128-bit** – Input 26-digit Hex values or 13-digit ASCII values as the encryption keys. For example: “01234567890123456789abcdef“ or “administrator“. **256-bit** – Input 58-digit Hex values or 29-digit ASCII values as the encryption keys.
Change/Apply	Click “Change“ will enable you to setup the WEP key. In the meantime, the button will change to “Apply“ for you to confirm your settings.

3.3.2 WPA Setting

The Module can automatically detect the WPA setting of the AP which the Module chooses to connect from the “Available Network“ list. To connect to the AP, you should setup the same settings with the AP.

There are two kinds of WPA mode: WPA and WPA-PSK. WPA is designed for enterprise which requires a RADIUS Server and Certificate Server for the authentication. WPA-PSK is a special mode designed for home and small business users who do not have access to network authentication servers. In this mode, the user manually enters the starting password in their access point or router, as well as in each wireless station in the network. WPA takes over automatically from that point, keeping unauthorized users that don't have the matching password from joining the network, while encrypting the data traveling between authorized devices.


WPA Setting...

Connect Infomation

Protocol: TLS

User Name:

Password:

Pre-shared Key

Passphrase:

(ASCII format, the length must be in 8..63)

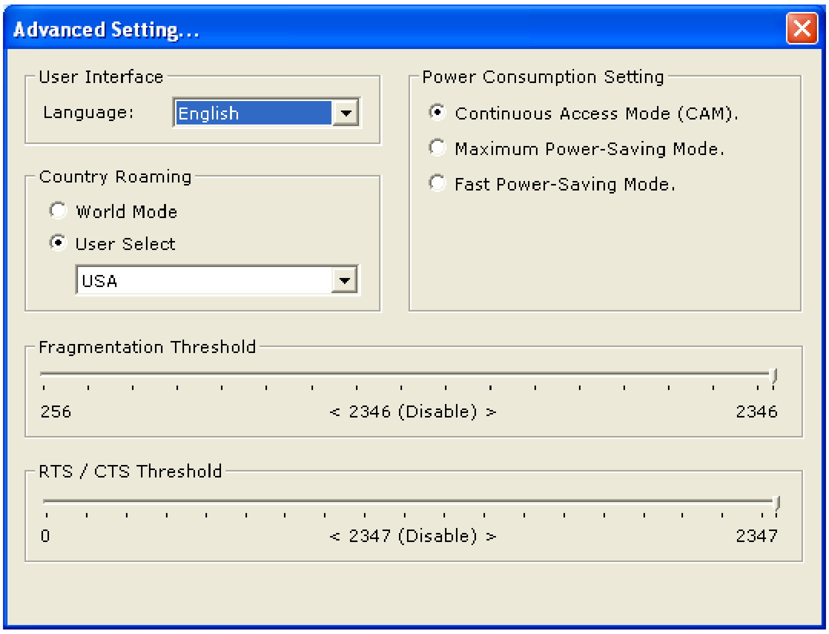
Certificate

WEP Key

Parameter	Description
Connect Information	It is the setting for WPA or WPA-PSK mode.
Protocol	This Module supports two kind of protocol for authentication including TLS and PEAP. TLS and PEAP requires a certificate which is provided by the Certificate Server. PEAP requires a set of user name and password in addition. To get the certificate and the personal user name and password, please contact with your administrator. **TLS** – Select a certificate from the "Certificate" list. **PEAP** – Input the "User Name" and "Password" and also select a certificate from the "Certificate" list.
User Name	It is the setting for PEAP protocol. The "User Name" should be set in RADIUS Server.
Password	It is the setting for PEAP protocol. The "Password" should be set in RADIUS Server.
Pre-shared Key	It is the setting for WPA-PSK mode. Enter 8 to 63 digits of ASCII format to be the password for the authentication within the network.
Certificate	All the available certificates for TLS or PEAP will display in the list. Please select a proper certificate for the wireless authentication. Note that the certificate of wireless station should be imported to the Browser such as Internet Explorer. To review if the certificate has been imported properly, please follow the steps below. 1. Open "Internet Explorer". 2. Select "Tools" from menu bar and then select "Internet Options". 3. Click "Content" tab and then click "Certificates".
WEP Key	If the AP uses WEP data encryption function, please Click "WEP KEY SETTING" to setup the WEP key.
WEP KEY SETTING	Setup the four sets of WEP key by clicking the button.
Change/Apply	Click "Change" will enable you to setup the WPA setting. In the meantime, the button will change to "Apply" for you to confirm your settings.

3.4 Advanced Setting

The “Advanced Setting” allows user to enable/disable country roaming, setup power consumption, fragmentation threshold and RTS/CTS threshold of the Module.



Advanced Setting...

User Interface

Language: English

Country Roaming

○ World Mode

● User Select

USA

Power Consumption Setting

● Continuous Access Mode (CAM).

○ Maximum Power-Saving Mode.

○ Fast Power-Saving Mode.

Fragmentation Threshold

256 < 2346 (Disable) > 2346

RTS / CTS Threshold

0 < 2347 (Disable) > 2347

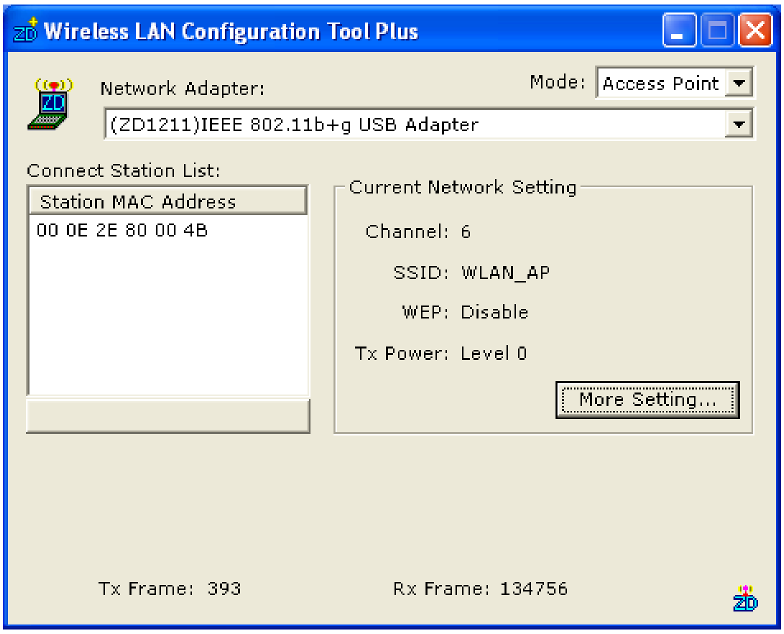
Parameter	Description
User Interface	Select the display language of the utility. Two languages are enabled including English and Traditional Chinese.
Country Roaming	IEEE 802.11d (Country Roaming) is a standard that enable the wireless devices work at the proper transmission power and radio channel regulated by the country where the user is located. **World Mode** – Enable the country roaming function, the Module will follow the setting of the connecting AP automatically. **User Select** – Disable the country roaming function, users can select the country where they are located. The available channel differs from country user selected.
Power Consumption Setting	**Continuous Access Mode (CAM)** – The Module will always set in active mode. **Maximum Power-Saving Mode** – Enable the Module in the power saving mode when it is idle. **Fast Power-Saving Mode –** Enable the Module in the power saving mode when it is idle, but some components of the Module is still alive. In this mode, the power consumption is larger than “Max“ mode.

Parameter	Description
Fragementation Threshold	The value defines the maximum size of packets, any packet size larger than the value will be fragmented. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Select a setting within a range of 256 to 2346 bytes. Minor change is recommended.
RTS / CTS Threshold	Minimum packet size required for an RTS/CTS (Request To Send/Clear to Send). For packets smaller than this threshold, an RTS/CTS is not sent and the packet is transmitted directly to the WLAN. Select a setting within a range of 0 to 2347 bytes. Minor change is recommended

3.5 Software AP Mode

This Module can run as a wireless AP. The relative configurations of the AP including channel, SSID, MAC Address Filtering, WEP encryption and so on are described as follows.

3.5.1 AP Connection Status



Wireless LAN Configuration Tool Plus

Network Adapter: (ZD1211)IEEE 802.11b+g USB Adapter

Mode: Access Point

Connect Station List:

Station MAC Address
00 0E 2E 80 00 4B

Current Network Setting

Channel: 6

SSID: WLAN_AP

WEP: Disable

Tx Power: Level 0

Tx Frame: 393

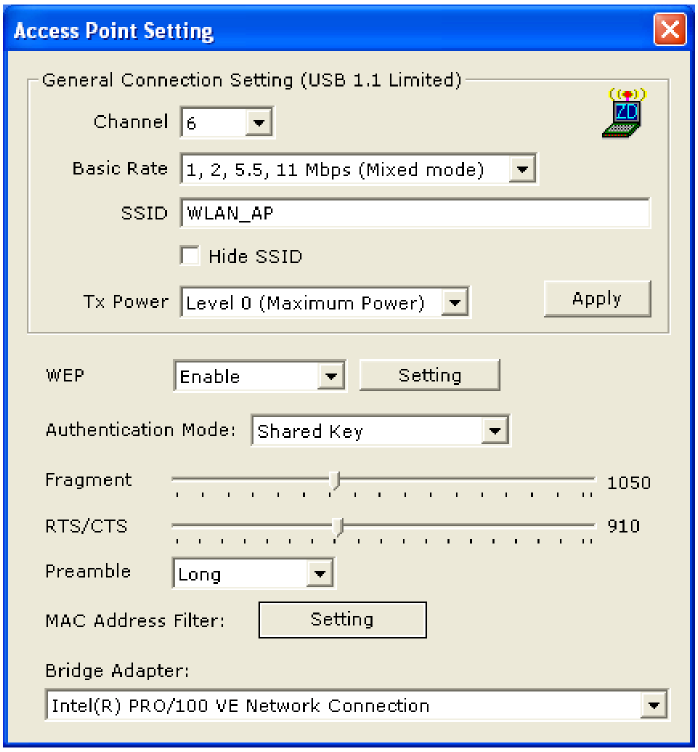
Rx Frame: 134756

Parameter	Description
Mode	**Station** – Set the USB Module a wireless station. **Access Point** – Turns the USB Module to function as a wireless AP.

Parameter	Description
Network Module	Display the product information of the USB Module.
Connect Station List	Display all the MAC Addresses of the wireless stations connecting to the AP.
Current Network Setting	Display the connection setting of the current network. It includes Channel, SSID, WEP and TX Power Level.
More Setting	For setting more functions including disable/enable WEP, MAC Address Filter and Bridge Module, etc. Please refer to Section 3.5.2.
TX Frame	It shows the number of data frames which are transmitted by the AP successfully.
RX Frame	It shows the number of data frames which are received by the AP successfully.

3.5.2 AP General Connection Setting

Click “More Setting”, users are allowed to setup the AP connection setting, Encryption Setting and other advanced functions.



Access Point Setting

General Connection Setting (USB 1.1 Limited)

Channel: 6

Basic Rate: 1, 2, 5.5, 11 Mbps (Mixed mode)

SSID: WLAN_AP

□ Hide SSID

Tx Power: Level 0 (Maximum Power)

WEP: Enable

Authentication Mode: Shared Key

Fragment: 1050

RTS/CTS: 910

Preamble: Long

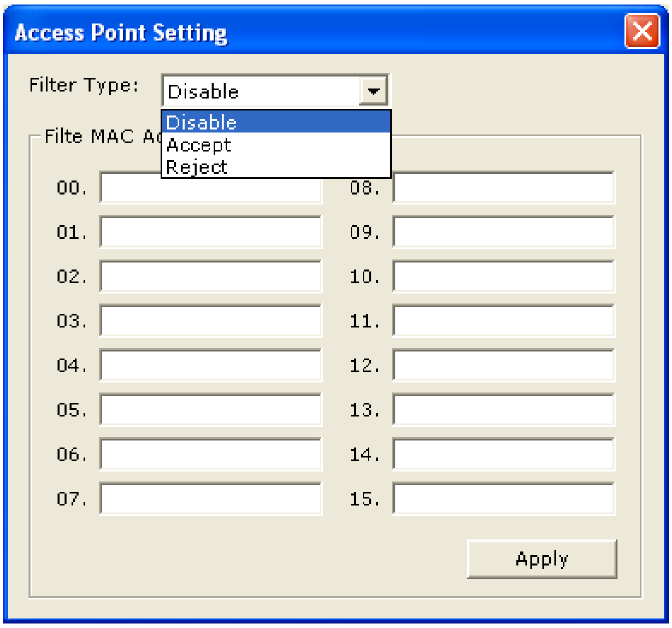
MAC Address Filter:

Bridge Adapter: Intel(R) PRO/100 VE Network Connection

Parameter	Description
General Connection Setting	
Channel	Select the number of the radio channel used by the AP. The wireless stations which connect to the AP should set up the same channel.
Basic Rate	Select the basic data transmission speed supports by the AP. When the AP works in 11b mode, the maximum data rate is 11Mbps so that there are two options including “1, 2 Mbps (Mixed Mode)“ and “1, 2, 5.5, 11Mbps (Mixed Mode)” you can select.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. The default SSID of the AP is “WLAN_AP“. Wireless stations connect to the AP should set up the same SSID as the AP.
Hide SSID	If “Hide SSID“ check box is enabled, the AP will not appear in the site survey list of any wireless stations. It means only the wireless stations set the same SSID can connect to the AP. It avoids the AP being connected by unauthorized users.
Tx Power	There are four levels for you to setup the transmission power of the AP. The higher transmission power, the larger transmission distance and wireless coverage.
Change/Apply	Click “Change“ will enable you to setup the parameters of “General Connection Setting“. In the meantime, the button will change to “Apply“ for you to confirm your settings.
WEP	Enable or disable WEP encryption function. If the WEP function is enabled, only wireless stations with the same default key and WEP key setting can connect to the AP.
Setting	Click “Setting“ to setup the WEP key. Please refer to Section 3.3 for more description.
Authentication Mode	**Open System** – No authentication is needed for connecting to the AP. **Shared Key** – Only wireless stations using a shared key (WEP Key identified) are allowed to connecting to the AP.

Parameter	Description
Fragement	The value defines the maximum size of packets, any packet size larger than the value will be fragmented. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Select a setting within a range of 256 to 2346 bytes. Minor change is recommended.
RTS / CTS	Minimum packet size required for an RTS/CTS (Request To Send/Clear to Send). For packets smaller than this threshold, an RTS/CTS is not sent and the packet is transmitted directly to the WLAN. Select a setting within a range of 0 to 2347 bytes. Minor change is recommended.
Preamble	The preamble defines the length of the CRC block for communication among the wireless networks. There are two modes including Long and Short. High network traffic areas should use the shorter preamble type.
MAC Address Filter	This AP can protect from the unauthorized users by MAC Address filtering. Please refer to Section 3.5.3.
Bridge Module	Wireless stations connect to the AP can access to the wired network through the bridge Module. You can select an Ethernet Module in the list be the bridge between the wireless and wired networks.

3.5.3 MAC Address Filter



Access Point Setting

Filter Type: Disable

Parameter	Description
Filter Type	**Disable** – Disable the MAC Address filter function. **Accept** – Only the wireless stations with the MAC Addresses setup in the table can connect to the AP. **Reject** – The wireless stations with the MAC Addresses setup in the table will be rejected to connect to the AP.
Filter MAC Address	MAC Address is a unique identification for hardware devices in the network. It is a 12-digit hexadecimal values. There are fifteen sets of MAC Addresses can be setup in the table. Fill the MAC Addresses of wireless stations you want to accept or reject to access the AP in this table.
Change/Apply	Click “Change“ will activate the setting of MAC Address Filter. In the meantime, the button will change to “Apply“ for you to confirm your settings.

4 Troubleshooting

This chapter provides solutions to problems usually encountered during the installation and operation of the Module.

1. **What is the IEEE 802.11g standard?**

   802.11g is the new IEEE standard for high-speed wireless LAN communications that provides for up to 54 Mbps data rate in the 2.4 GHz band. 802.11g is quickly becoming the next mainstream wireless LAN technology for the home, office and public networks. 802.11g defines the use of the same OFDM modulation technique specified in IEEE 802.11a for the 5 GHz frequency band and applies it in the same 2.4 GHz frequency band as IEEE 802.11b. The 802.11g standard requires backward compatibility with 802.11b.

   The standard specifically calls for:

   A. A new physical layer for the 802.11 Medium Access Control (MAC) in the 2.4 GHz frequency band, known as the extended rate PHY (ERP). The ERP adds OFDM as a mandatory new coding scheme for 6, 12 and 24 Mbps (mandatory speeds), and 18, 36, 48 and 54 Mbps (optional speeds). The ERP includes the modulation schemes found in 802.11b including CCK for 11 and 5.5 Mbps and Barker code modulation for 2 and 1 Mbps.

   B. A protection mechanism called RTS/CTS that governs how 802.11g devices and 802.11b devices interoperate.

2. **What is the IEEE 802.11b standard？**

   The IEEE 802.11b Wireless LAN standard subcommittee, which formulates the standard for the industry. The objective is to enable wireless LAN hardware from different manufactures to communicate.

3. **What does IEEE 802.11 feature support？**

   The product supports the following IEEE 802.11 functions:

   ●CSMA/CA plus Acknowledge Protocol
   ●Multi-Channel Roaming
   ●Automatic Rate Selection
   ●RTS/CTS Feature
   ●Fragmentation
   ●Power Management

4. **What is Ad-hoc？**

   An Ad-hoc integrated wireless LAN is a group of computers, each has a Wireless LAN Module, Connected as an independent wireless LAN. Ad hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

5. **What is Infrastructure**？

   An integrated wireless and wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

6. **What is BSS ID**？

   A specific Ad hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

7. **What is WEP**？

   WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40 bit shared key algorithm, as described in the IEEE 802 .11 standard.

8. **What is TKIP?**

   TKIP is a quick-fix method to quickly overcome the inherent weaknesses in WEP security, especially the reuse of encryption keys. TKIP is involved in the IEEE 802.11i WLAN security standard, and the specification might be officially released by early 2003.

9. **What is AES?**

   AES (Advanced Encryption Standard), a chip-based security, has been developed to ensure the highest degree of security and authenticity for digital information, wherever and however communicated or stored, while making more efficient use of hardware and/or software than previous encryption standards. It is also included in IEEE 802.11i standard. Compare with AES, TKIP is a temporary protocol for replacing WEP security until manufacturers implement AES at the hardware level.

10. **Can Wireless products support printer sharing**？

    Wireless products perform the same function as LAN products. Therefore, Wireless products can work with Netware, Windows 2000, or other LAN operating systems to support printer or file sharing.

11. **Would the information be intercepted while transmitting on air**？

    WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, WLAN series offer the encryption function (WEP) to enhance security and Access Control. Users can set it up depending upon their needs.

12. What is DSSS？What is FHSS？And what are their differences？

Frequency-hopping spread-spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct-sequence spread-spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip is, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without-the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

13. What is Spread Spectrum？

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communication systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread –spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).