

Suga Electronics Limited (SugaE)
IEEE 802.11b/g USB WLAN Module
(Model #: SWG25MA)
OEM Manual

Version 1.0

April 2009

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Chapter 1 Introduction

1.1 Product

The 54M Wireless USB Module is a 4 Pins connector support USB 2.0 signaling module supporting IEEE 802.11b/g 2.4GHz radio operation. It provides high-speed wireless connection with data rate up to 54Mbps. Additionally, wireless roaming allows the user to move among different AP without losing the current connection. The adapter provides excellent security features including: TKIP, AES, WPA, and up to 128 bit WEP encryption security make the network almost impenetrable.

1.2 Main Features

- Complies with IEEE802.11g, IEEE802.11b standards
- Supports WPA data security, IEEE802.1x authentication, TKIP/AES encryption, 64/128-bit WEP encryption
- Supports 54/48/36/24/18/12/9/6Mbps or 11/5.5/2/1Mbps wireless LAN data transfer rates
- Provides USB interface
- Supports Ad-Hoc and Infrastructure modes
- Supports roaming between access points when configured in Infrastructure mode
- Eases configuration and provides monitoring information
- Supports Windows 98SE, Me, 2000, XP
- Internal Antenna

1.3 LED Status

The LED on the top of this card indicates Link/Act status. It blinks at green light when sending and receiving data.

Chapter 2 Installation Procedure

2.1 Software Installation

2.1.1 Overview

The Adapter's Setup Wizard will guide you through the installation procedure for Windows 98SE, Me, 2000 and XP. The Setup Wizard will guide you install the Utility and drivers. If you install the hardware before the software, you will be prompted "Found New Hardware Wizard", click the **Cancel** button, and run the Setup Wizard program on the CD-ROM. The Setup steps for Windows 98SE, Me, 2000 and XP are very similar. The following setup steps are for windows 2000.

2.1.2 Software Installation for Windows 2000

1. Insert the Resource CD into your CD-ROM drive, click the **Start** button and choose **Run**. In the field that appears, enter F:\XXX\Setup.exe (if "F" is the letter of your CD-ROM drive; XXX presents the setup program path, which is labeled on the Resource CD), *Figure 2-1* should then appear.

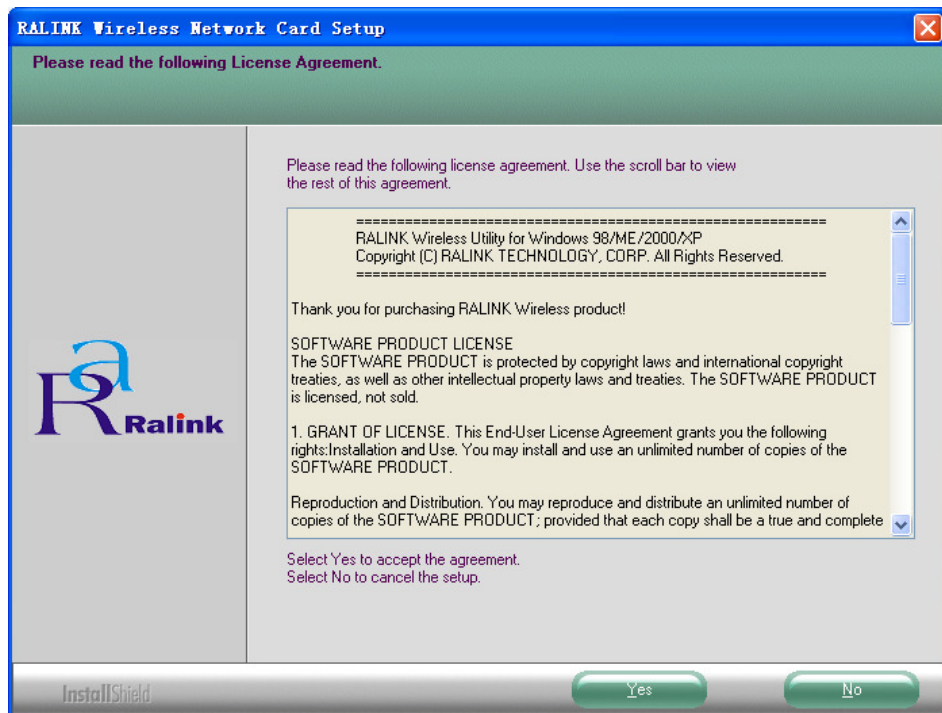


Figure 2-1 Preparing Setup

2. You will see a warning box shown in *Figure 2-1*, click the **No** button to end the installation. Otherwise, click the **Yes** button to install driver, the Setup Wizard will display a screen similar to that shown in *Figure 2-2* after a moment.

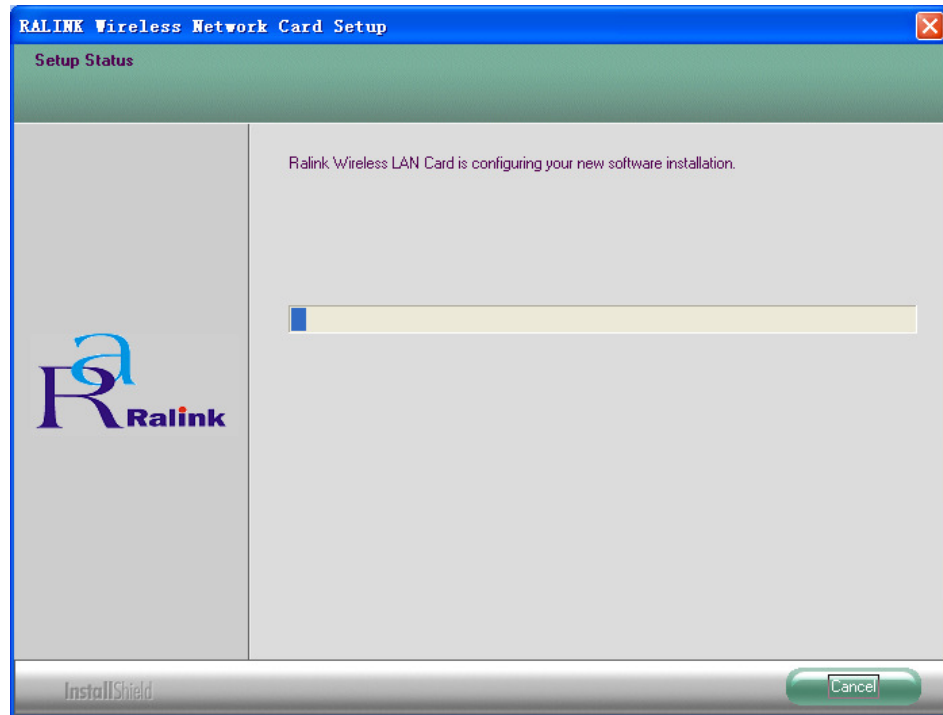


Figure 2-2 Start Setup

3. To continue, please waiting for running automatically for a moment, *Figure 2-2*. Click the **Cancel** button to end the Installation.
4. The soft install automatically in the operating system, and appear a dialog box *Figure 2-3*. Now, only a thing which you can do is Waiting!

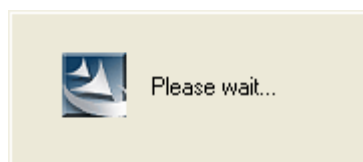


Figure 2-3 waiting state dialog box

5. After the files have been successfully installed, the screen in *Figure 2-4* will appear. Click the **Finish** button to finish the wizard.

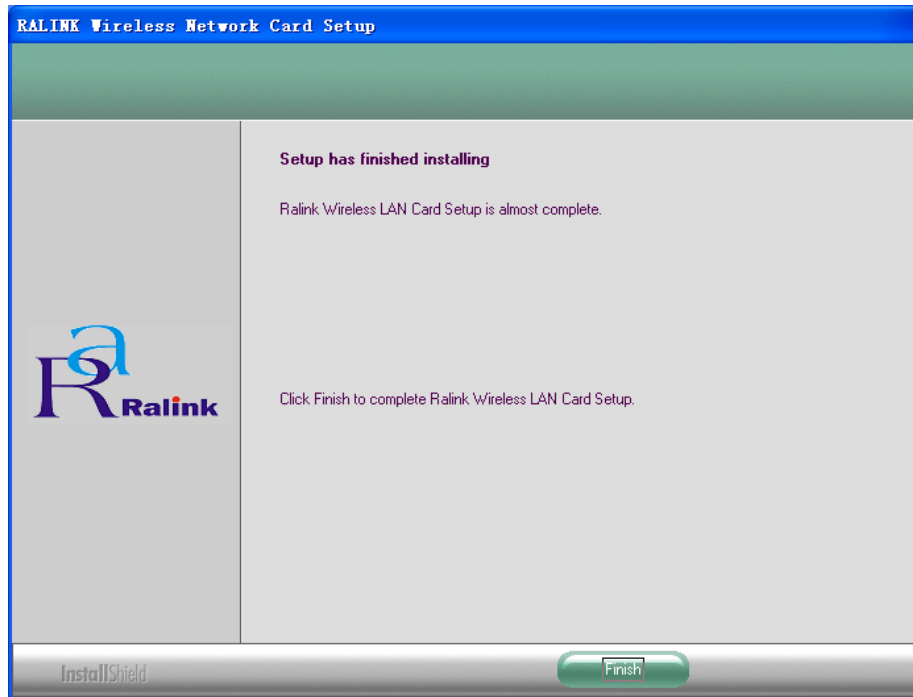



Figure 2-4 Finish installing

6. After installing the software, Please plug the adapter into your PC. If you need instructions as to how to do this, please refer to next section - Hardware Installation. If you have plugged it into you PC already, please unplug it and plug it back in. The OS will automatically detect the adapter and automatically setup the driver for the adapter. If it does not, please follow the setup steps to finish the driver installation.

After installing the driver successfully, you should see an icon  appear in your system icon box.



2.2 Hardware Installation

1. Connect one end of the USB cable to the Adapter.

2. Connect the other end of the USB cable to the USB port on your computer. Because the Adapter gets its power from the host, there is no external power supply. The LED should light up when the Adapter is plugged in and the PC is on.

2.3 Profile

Click the **Profile** tab of the utility and the **Profile** screen will appear, *Figure 2-1*. The **Profile** screen provides tools to:

- Add a Profile
- Delete a profile
- Edit a profile
- Activate a profile

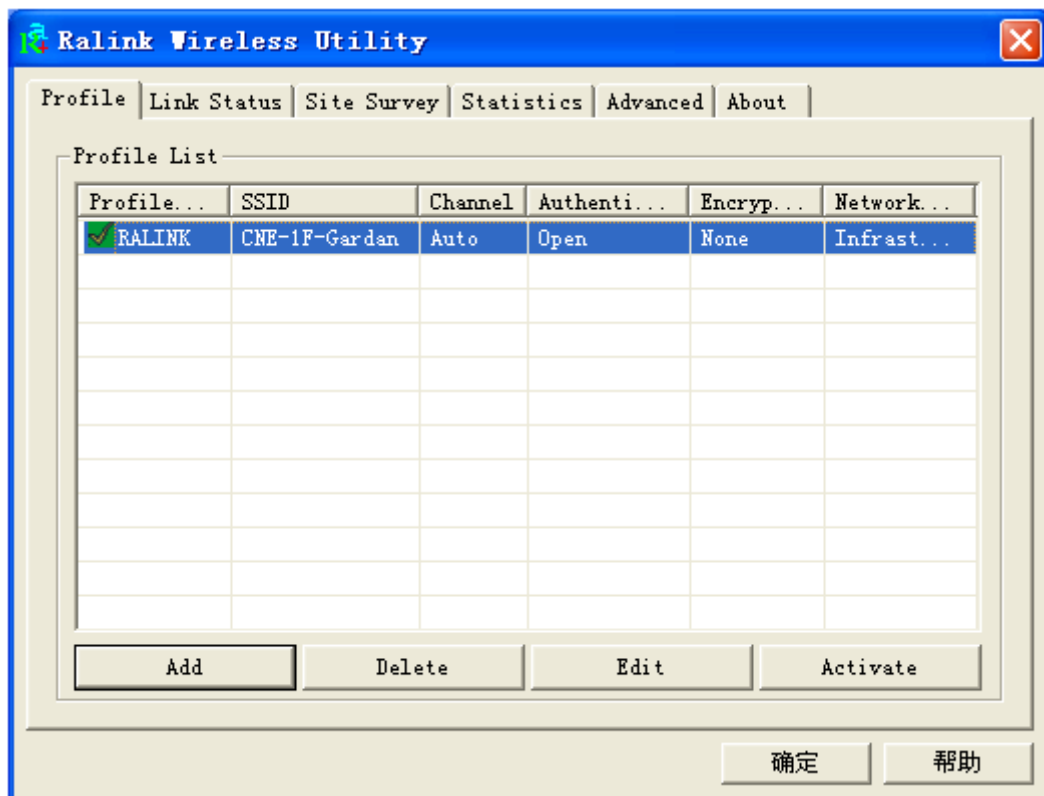


Figure 3-1 Profile Tab

To create a new profile, click the **Add** button on the Profile tab, the **Profile** configuration screen will appear as shown in *Figure 2-2*.

To edit a profile, highlight the desired profile name on **Profile Name** list, and click the **Edit** button, the **Profile** configuration screen will appear shown in *Figure 2-1*.

To delete a profile, highlight the desired profile name on **Profile Name** list, and click the **Delete** button.

To switch to another profile, highlight the desired profile name on **Profile Name** list, and click the **Activate** button.

*** Note:**

Do not forget to click the **Apply** button when you create a new profile for connection.

To add a new configuration profile, click **Add** button on the Profile Management tab. To modify a configuration profile, select the configuration from the Profile list and click **Edit**. The Profile Management dialog box will display a screen similar to that shown in *Figure 3-2*.

1. Edit the Configuration tab

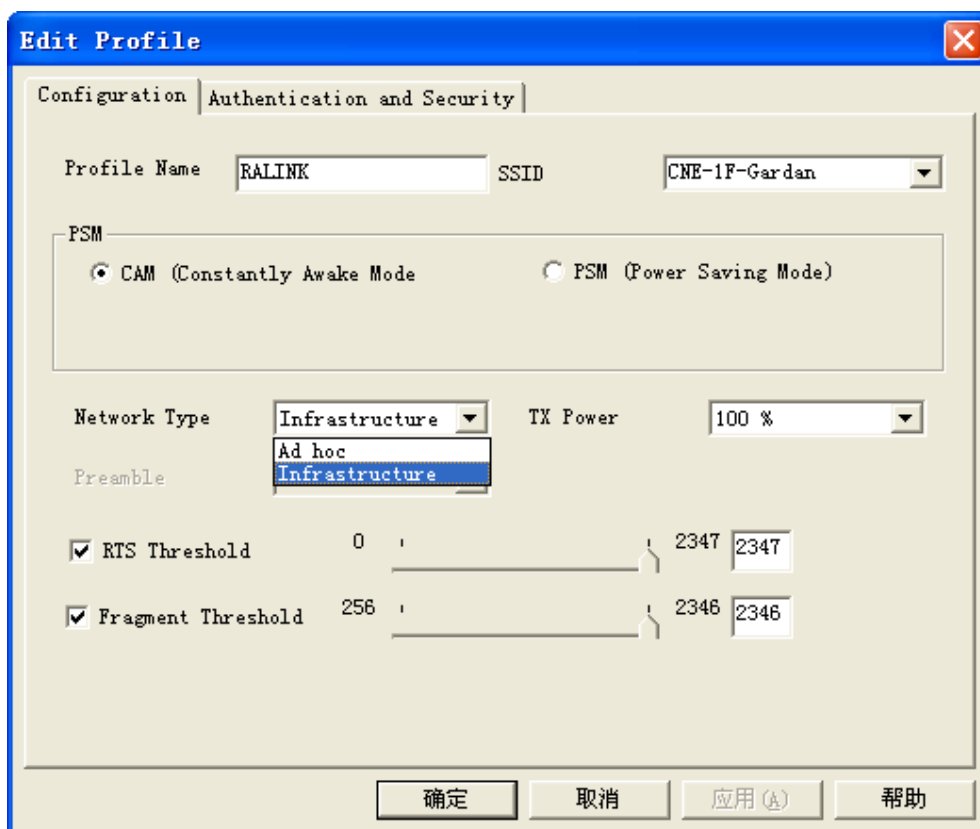


Figure 3-2 Add Profile – configuration

- **Profile Name** - Identifies the configuration profile. This name must be unique. Profile names are not case-sensitive.

- **SSID** - The IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters.

- **PSM (Power Save Mode)**

- ▶ **CAM (Constantly Awake Mode)** – Continuous Access Mode.

- ▶ **PSM (Power Saving Mode)** - Power Saving mode.

- **Network Type** – Displays the wireless mode, either Ad-hoc or Infrastructure mode.

- **Preamble** – Specifies the preamble setting in 802.11b. The default setting is Auto Switch (access point mode), which allows both short and long headers in the 802.11b frames. The adapter can only use short radio headers if the access point supports and uses them.

- **RTS Threshold** – Default is 2312.

- **Fragment Threshold** – Default is 2312.

- **Ad-hoc mode** – Displays the wireless mode, either Only 802.11B or 802.11B/G mode.

- **Channel** – Shows the current channel in use. This field determines which operating frequency will be used.

2. Edit the Authentication and Security tab

Edit Profile

Configuration | **Authentication and Security**

Authentication Type: Open Use 802.1x 802.1x Setting

Encryption: WEP

WPA Preshared Key:

Wep Key

- Key#1 ASCII *****
- Key#2 Hex
- Key#3 Hex
- Key#4 Hex

* WEP 64 Bits Encryption: Please Keyin 5 ASCII characters
* WEP 128 Bits Encryption: Please Keyin 13 ASCII characters

Show Password

确定 取消 应用 (A) 帮助

Figure 3-3 Add Profile – configuration

- **Authentication Type** – Three options, **Open System**, **Shared-Key System** or **LEAP**.
- **802.1x Setting** – It enables when Authentication Type is setting to WPA.
- **Encryption** – Displays which encryption type that the driver is using. When you select **Open System**, **Shared-Key System** as **Network Authentication**, there are two options: **WEP** and **None**. If you select **WPA-PSK** as **Network Authentication**, there are **TKIP** and **AES** options instead of **WEP** and **None**.
- **Wep Key** – Key #1, Key #2, Key #3, Key #4, the Key groups. You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F) or 5 ASCII characters for 64-bit (also called 40bits) encryption. You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F) or 13 ASCII characters for 128-bit (also called 104bits) encryption.

2.4 Link Status

The Link Status tab *Figure 3-4* displays the adapter's current status.

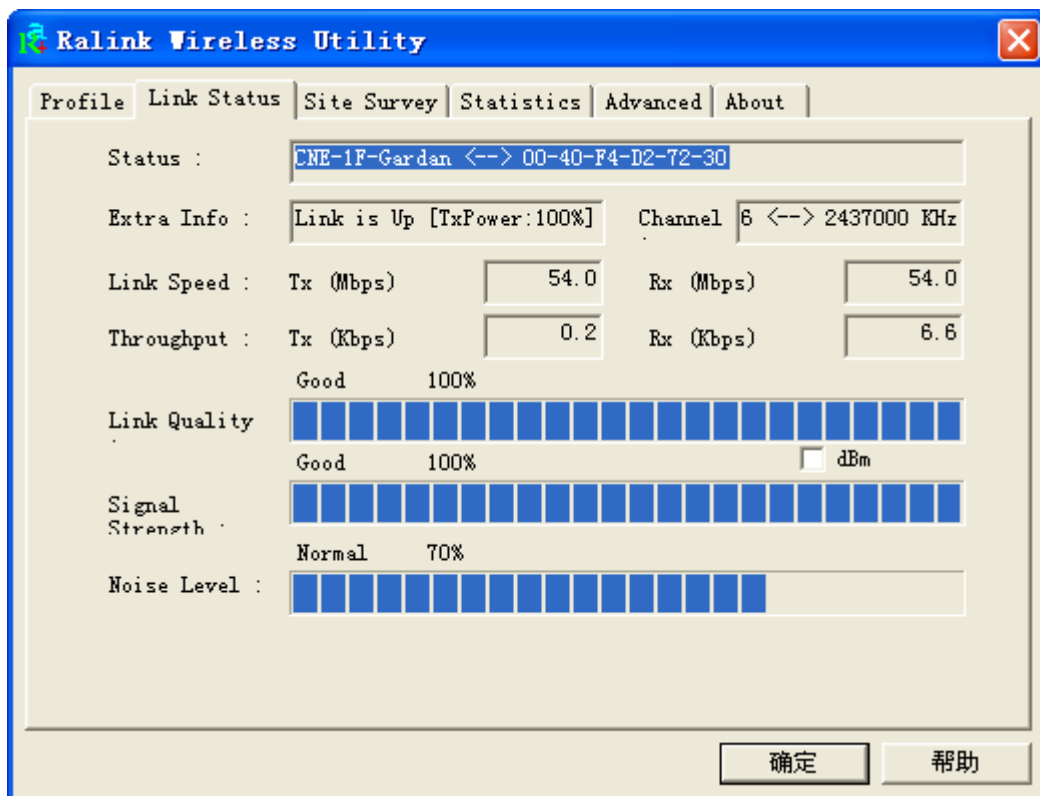


Figure 3-4 Link Status

The following table describes the items found on the Network Status screen.

2.6 Statistics

The **Statistics** tab as *Figure 3-6* shows receiving and transmitting statistical information for the following receive and transmit diagnostics for frames received by or transmitted to the wireless network adapter.

Click the **Reset Counter** button to reset the count of the statistics information.

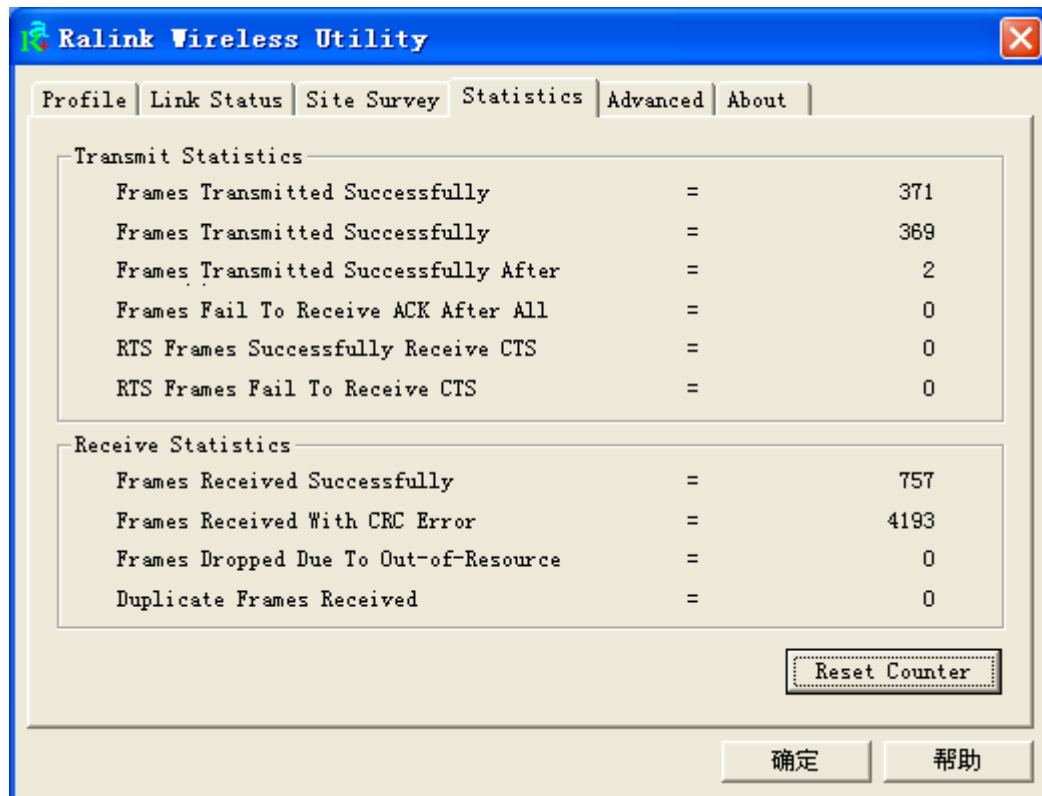
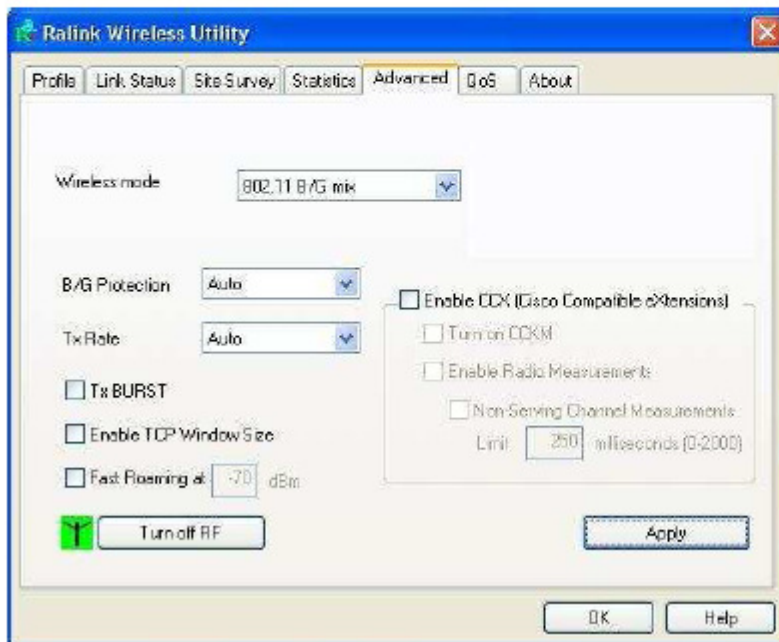


Figure 3-6 Statistics tab

2.7 Advanced



- Advance



The Configuration Utility also offers the advanced configuration for user to set the Wireless Adapter under certain network environment. These advanced options include **Wireless mode**, **B/G Protection**, **Tx Rate**, and **Turn On/Off RF**.




Chapter 3 Configuration

SugaE 802.11b/g Wireless USB Adapter can be configured by its utility. This section describes how to configure your Wireless USB Adapter for wireless connectivity on your Wireless Local Area Network (WLAN) and use the data security encryption features.

After the Adapter's driver and utility has been installed, the adapter's tray icon  or  will appear in your system tray. It means the utility is running on your system. If the utility does not run, you can run the utility by clicking: **Start> Program>RaLink Wireless> RaLink Wireless Utility**. If the icon still does not appear, the driver or utility may be installed incorrectly or the adapter is unplugged, please try again.

Icon  means the connection has been established. Icon  means there is no connection.

Double-click the icon  and the configuration screen of the utility will appear. You can also run the utility by clicking: **Start> Program>RaLink Wireless> RaLink Wireless Utility**.

The utility provides a complete and easy to use set of tools to:


- Display current status information
- Edit and add configured profiles
- Display current diagnostics information

The section below introduces these above capabilities.

* **Note:**

If your OS is Windows XP, you can use Windows XP to configure the wireless network settings. (To use this function, you must upgrade the OS with sp1).

If you want to use Windows XP to configure wireless network settings, just exit the utility.

Right-click the icon  at the bottom of the screen, and click **Exit** to exit the utility.

Chapter 4 Regulatory Information

4.1 FCC Information to User

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

4.2 FCC Guidelines for Human Exposure

Warning:

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 co-located or operating in conjunction with any other antenna or transmitter.

4.3 FCC Electronic Emission Notices

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.

4.4 OEM installation Guide

This device is intended only form OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

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.

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ADSL modems, and similar equipment). The final end product must be labeled in visible area with the following:

Contains FCC ID: VZFSWG25MAF

Manual Information to The End User

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. The device complies with RF FCC radiation between exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or Transmitter.

The inplex connector is not for connecting any antenna

Chapter 5 Technical Specifications

Appendix A: Specifications

General	
Interface	A-type USB 2.0 Connector
Standards	IEEE 802.11b; IEEE 802.11g
Operating System	Windows 98SE, ME, 2000, XP
Transmission Distance	In door up to 100m, out door up to 300m (It is limited to the environment).
Frequency	2.412 ~ 2.462 GHz
Sensitivity	54M -70dBm
	11M -83dBm
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Wireless	
Radio Data Rate	54/48/36/24/18/12/9/6 Mbps 11g OFDM · 11/5.5/2/1 Mbps 11b DSSS,(Auto Rate Sensing)
Modulation	11g OFDM , 11b CCK/DSSS
Media Access Protocol	CSMA/CA with ACK
Data Security	WPA, 64/128 bit WEP, TKIP/AES, IEEE 802.1X authentication
Physical Environmental	
Working Temperature	0°C ~ 55°C (32°F ~ 104°F)
Storage Temperature	-10°C ~ 70°C (-40°F ~ 158°F)
Humidity	10%~90% RH, Non-condensing
Dimensions	60m (L) x 19mm (W) x 6.5mm (H)

Appendix B: Glossary

- * **802.11b** - The 802.11b standard specifies a wireless product networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- * **802.11g** - specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- * **Ad-hoc Network** - An ad-hoc network is a group of computers, each with a wireless adapter, connected as an independent 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.
- * **DSSS (Direct-Sequence Spread Spectrum)** - DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver 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. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).
- * **FHSS (Frequency Hopping Spread Spectrum)** - FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.
- * **Infrastructure Network** - An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.
- * **Spread Spectrum** - Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications 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).

- * **SSID** - A **S**ervice **S**et **I**dentification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.
- * **WEP** (**W**ired **E**quivalent **P**rivacy) - A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- * **Wi-Fi** - A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standards group promoting interoperability among 802.11b devices.
- * **WLAN** (**W**ireless **L**ocal **A**rea **N**etwork) - A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.
- * **WPA** (**W**i-Fi **P**rotected **A**ccess) - A wireless security protocol use TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.