



# User's Manual For

WUS-G09V  
WUGC-100

Model Number: WUS-G09V, WUGC-100  
Revision: 1.0

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# Contents

<b>1.0 SCOPE .....</b>	<b>1</b>
1.1 DOCUMENT .....	1
1.2 PRODUCT FEATURES .....	1
<b>2.0 REQUIREMENTS .....</b>	<b>1</b>
2.1 FUNCTIONAL BLOCK DIAGRAM .....	1
2.2 GENERAL REQUIREMENTS .....	2
2.2.1 IEEE 802.11b Section .....	2
2.2.2 IEEE 802.11g Section .....	2
2.2.3 General Section .....	3
2.3 SOFTWARE REQUIREMENTS .....	3
2.3.1 Information .....	3
2.3.2 Configuration .....	3
2.3.3 Security .....	4
2.4 PCBA MECHANICAL REQUIREMENTS .....	4
2.5 COMPATIBILITY REQUIREMENTS .....	4
2.7 REQUIREMENTS OF RELIABILITY, MAINTAINABILITY AND QUALITY .....	4
2.8 ENVIRONMENTAL REQUIREMENTS .....	4

## 1.0 Scope

### 1.1 Document

This document is to specify the product requirements for **802.11g USB module**. This USB module is based on Conexant chipset that complied with IEEE 802.11b and 802.11g standards from 2.4~2.5GHz, and it can be used to provide up to 11Mbps for IEEE 802.11b and 54Mbps to connect your wireless LAN.

With seamless roaming, fully interoperability and advanced security with WEP standard, **802.11g USB module** offers absolute interoperability with different vendors' 802.11b/g Access Points through the wireless LAN.

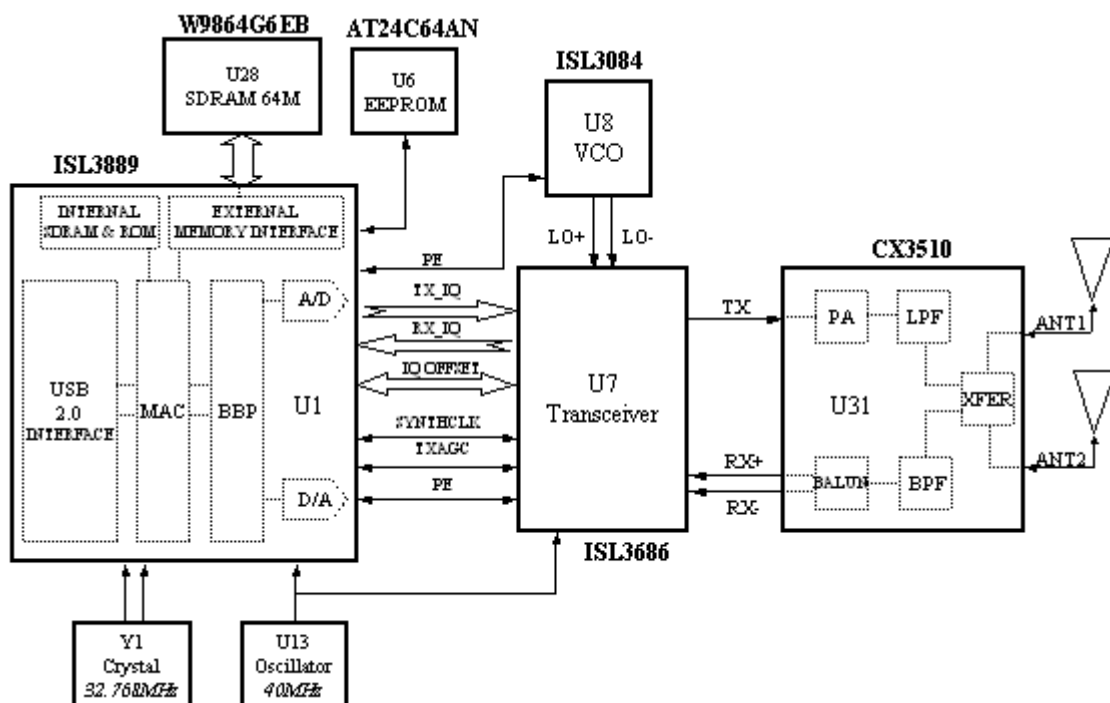
### 1.2 Product Features

- ÿ Compatible with IEEE 802.11b high rate standard to provide wireless 11Mbps data rate
- ÿ Compatible with IEEE 802.11g higher speed standard to provide wireless 54Mbps data rate
- ÿ Operation at 2.4 ~ 2.5GHz frequency band to meet worldwide regulations
- ÿ Dynamic data rate scaling at 6, 9, 12, 18, 24, 36, 48, and 54Mbps for 802.11g
- ÿ Dynamic data rate scaling at 1, 2, 5.5, and 11Mbps for IEEE 802.11b
- ÿ Maximum reliability, throughput and connectivity with automatic data rate switching
- ÿ Supports wireless data encryption with 64/128 WEP, AES and TKIP for security
- ÿ Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- ÿ Supports WPA enhanced security
- ÿ Friendly user configuration and diagnostic utilities
- ÿ High speed USB 2.0 interface

## 2.0 Requirements

The following sections identify the detailed requirements of the **802.11g USB module**

### 2.1 Functional Block Diagram



## 2.2 General Requirements

### 2.2.1 IEEE 802.11b Section

#	Feature	Detailed Description
2.2.1.2	Standard	Y IEEE 802.11b
2.2.1.2	Radio and Modulation Schemes	Y DQPSK, DBPSK, DSSS, and CCK
2.2.1.3	Operating Frequency	Y 2400 ~ 2497MHz ISM band
2.2.1.4	Channel Numbers	Y 11 channels for United States 13 channels for Europe Countries 14 channels for Japan
2.2.1.5	Data Rate	Y 11, 5.5, 2, and 1Mbps
2.2.1.6	Media Access Protocol	Y CSMA/CA with ACK
2.2.1.7	Transmitter Output Power	Y Typical 17(+/- 2)dBm at 11, 5.5, 2, and 1Mbps at room temperature.
2.2.1.8	Receiver Sensitivity	Y Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 8% at room temperature. Y -84dBm for 11Mbps @ 8% PER Y -88dBm for 5.5Mbps @ 8% PER Y -89dBm for 2Mbps @ 8% PER Y -90dBm for 1Mbps @ 8% PER

### 2.2.2 IEEE 802.11g Section

#	Feature	Detailed Description
2.2.2.1	Standard	Y 2.4GHz OFDM (IEEE 802.11g )
2.2.2.2	Radio and Modulation Schemes	Y BPSK, QPSK, 16QAM, 64QAM, and OFDM
2.2.2.3	Operating Frequency	Y 2400 ~ 2497MHz ISM band
2.2.2.4	Channel Numbers	Y 11 channels for United States 13 channels for Europe Countries 13 channels for Japan
2.2.2.5	Data Rate	Y 54, 48, 36, 24, 18, 12, 9, and 6Mbps
2.2.2.6	Media Access Protocol	Y CSMA/CA with ACK
2.2.2.7	Transmitter Output Power	Y Typical RF Output Power at each Data Rate Y +14(+/-2)dBm at 54, 48 Mbps at room temperature Y +16(+/-2)dBm at 6~36 Mbps at room temperature
2.2.2.8	Receiver Sensitivity	Y Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% at room temperature. Y -86dBm at 6Mbps Y -86dBm at 9Mbps Y -81dBm at 12Mbps Y -80dBm at 18Mbps Y -76dBm at 24Mbps Y -74dBm at 36Mbps Y -70dBm at 48Mbps Y -68dBm at 54Mbps

### 2.2.3 General Section

#	Feature	Detailed Description
2.2.3.1	Antenna Type	Y Two IPEX connector for external antenna
2.2.3.2	Operating Voltage	Y 5VDC +/- 5%
2.2.3.3	Power Consumption	Y 400 mA at transmit mode Y 250 mA at receive mode with receiving packet
2.2.3.4	Form Factor and Interface	Y High Speed USB2.0 Interface
2.2.3.5	LEDs	Y Act. LED Blink: Transmit data Y Link LED On: Link with Access Point

## 2.3 Software Requirements

This configuration software includes the following functions however it depends on the software implement of platform.

### Y Information

Information allows you to monitor network status.

### Y Configuration

Configuration allows you to configure parameters for wireless networking.

### Y Security

Supports enhanced security WEP, 802.1x and WPA.

### 2.3.1 Information

#	Feature	Detailed Description
2.3.1.1	General Information	Y General Information shows the name of Wireless Adapter, Adapter MAC Address, Regulatory Domain, Firmware Version, and Utility Version.
2.3.1.2	Current Link Information	Y Current Link Information shows the Current Setting ESSID, Channel Number, Associated BSSID, Network Type (infrastructure or Ad-hoc network), WEP Status (enable or disable), Link Status (Connect or Dis-connect), 802.11g Transmit Speed (6, 9, 12, 18, 24, 36, 48, 54Mbps), 802.11b Transmit Speed (1, 2, 5.5, 11Mbps), Signal Strength, and Link Quality.
2.3.1.3	Site survey	Y To search the neighboring access points and display the information of all access points.

### 2.3.2 Configuration

#	Feature	Detailed Description
2.3.2.1	ESS ID	Y Input an SSID number if the roaming feature is enabled Y Supports for ASCII printable characters.
2.3.2.2	Network Type	Y Ad-hoc Mode and 802.11 Ad-hoc Mode for network configurations that do not have any access points Y Infrastructure Mode for network configurations with access points
2.3.2.3	RTS Threshold	Y Set the number of bytes used for fragmentation boundary for messages
2.3.2.4	Fragment Threshold	Y Set the number of bytes used for RTS/CTS boundary
2.3.2.5	Transmission Speed	Y This indicates the communication rates. Select appropriate transmission speed to match your

#	Feature	Detailed Description
		wireless LAN settings
2.3.2.6	Roaming	Y Support Automatic or Manual Rescan to associate with access point.

### 2.3.3 Security

#	Feature	Detailed Description
2.3.3.1	Encryption	Y RC4 encryption algorithm Y Support 64 /128 bit WEP encryption Y Support open system (OSA) and shared key authentication (SKA)
2.3.3.2	WEP Management	Y Four WEP keys can be selected Y STA with WEP off will never associate any AP with WEP enabled Y WEP Key Format: Option for Hex format
2.3.3.3	802.1x	Y Support EAP-TLS, EAP-TTLS, and EAP-PEAP
2.3.3.4	WPA	Y Support WPA/WPA-PSK and WPA/WPA-EAP Y Support Cipher Mode AES and TKIP

### 2.4 PCBA Mechanical Requirements

#	Feature	Detailed Description
2.4.1	Length	Y 80 mm
2.4.2	Width	Y 40 mm
2.4.3	Height	Y 1mm

### 2.5 Compatibility Requirements

This device passes the following compatibility requirements.

#	Feature	Detailed Description
2.5.1	Physical Layer and Functionality	Y Meet Alpha Networks Engineering Test Plan and Test Report

### 2.7 Requirements of Reliability, Maintainability and Quality

#	Feature	Detailed Description
2.7.1	MTBF	Y Mean Time Between Failure > 30,000 hours
2.7.2	Maintainability	Y There is no scheduled preventive maintenance required
2.7.3	Quality	Y The product quality is followed-up by Alpha Networks factory quality control system

### 2.8 Environmental Requirements

#	Feature	Detailed Description
2.8.1	Operating Temperature Conditions	Y The product is capable of continuous reliable operation when operating in ambient temperature of 0 °C to +40°C.
2.8.2	Non-Operating Temperature Conditions	Y Neither subassemblies is damaged nor the operational performance is degraded when restored to the operating temperature after exposing to storage temperature in the range of -20 °C to +75 °C.
2.8.3	Operating Humidity	Y The product is capable of continuous reliable operation when subjected to relative humidity in the

#	Feature	Detailed Description
	conditions	range of 20% and 80% non-condensing.
2.8.4	Non-Operating Humidity Conditions	Y The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

I Environmental factors may affect actual range

## U.S. Regulatory Wireless Notice

### 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:** 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:

##### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,
- 3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are 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.

### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: RRK2005070154-1".

### **Manual Information To the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.