

# User Manual

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# ***WL-167G V3 1-LF-ASU***

**IEEE 802.11n USB2.0 Adapter**

*v 01.draft*

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## Revision History

<i>Edition #</i>		<i>Reason for revision</i>	<i>Issue date</i>	<i>Written by</i>
V 01	◆	Initial Document	Feb 12 2010	Troy Chen
	◆			

# Chapter 1 Introduction

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## 1. Introduction

WL-167G V3 is an industrial wireless 802.11n USB Adapter which enables wireless networking systems to attain data communication speeds up to 150 megabits-per-second (Mbps), while remaining backward compatible to the existing installed base of Wi-Fi systems worldwide. It supports operation to the IEEE 802.11b and IEEE 802.11g ,and draft IEEE 802.11n standards. WL-167G V3 will enable a next generation of high-data-rate platforms for operation in the 2.4 GHz band that deliver a five-fold speed increase. The cost and performance advantages will make it an ideal solution for high bandwidth enterprise applications, such as wireless video conferencing and large file transfers. It is compatible with 802.11g standard's mandatory modulation schemes—Complementary Code Keying (CCK), which is used in 802.11b, and Orthogonal Frequency Division Multiplexing (OFDM), used in 802.11g and draft 802.11n. Using CCK ensures backward-compatibility with the installed Wi-Fi 802.11b base, while OFDM provides the speed required for today's high-bandwidth applications.

### 1.1 Product Features

- ◆ High speed for wireless LAN connection, RX up at 150 Mbps data rate.
- ◆ Backward compatible to the existing IEEE 802.11b/g WLAN infrastructure.
- ◆ An user-friendly utility to configure SSID, security setup and site survey.
- ◆ Wireless data encryption with 64, 128 encryption for security.
- ◆ Internal antenna
- ◆ Support USB v2.0
- ◆ Key type housing
- ◆ WPS support (Pin code)

### 1.2 Applications

- ◆ Home networking for device sharing.
- ◆ Wireless multimedia.
- ◆ Wireless office for extension Ethernet range.
- ◆ Mobile networking for notebook PC, Desktop PC, Monitor, PDA with USB port ready device.

## Chapter 2 Hardware

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### 2.1 General Overview

- ◆ USB 2.0 Interface and 802.11n chipset-on-board design.
- ◆ Antenna: 2 Internal Antenna (MIFA antenna on USB connector ).
- ◆ 1 LED

### 2.2 Hardware Architecture

Realtek 8188SU

### 2.3 Main Chipset Information

**RTL8188SU:** a highly integrated Wireless LAN (WLAN) USB 2.0 network interface controller compatible with the IEEE802.11n Draft specification 2.0. It combines a MAC, 1T1R capable baseband and RF in a single chip.

### 2.4 PCB dimension

19mm x 44mm (TBD)

### 2.5 Antenna

MIFA antenna design on USB connector

## Chapter 3 Software

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### 3.1 Operating System Supported

- ◆ Windows 2000 , Windows XP, Windows Vista, Win7, Linux, Mac

### 3.2 Wireless Mode Supported

- ◆ AP (Infrastructure) Client mode
- ◆ Ad-hoc mode

### 3.3 Security

- ◆ AP (Infrastructure) mode supports
  - ◆ Static WEP that support both 64 and 128 bit keys.
  - ◆ WPA (TKIP) with PSK
- ◆ Ad-hoc mode supports
  - ◆ None (plaintext)
  - ◆ Static WEP that supports both 64 and 128 bit keys.

### 3.4 Configuration

- ◆ User should be able to select
  - ◆ Mode of operations: AP or ad-hoc mode
  - ◆ Different security modes: none (plaintext), static WEP, WPA/WPA2(TKIP)/PSK as supported by the respective operating mode.
  - ◆ Channel to operate on
- ◆ User should be able to perform key management on WPA/PSK and static WEP as supported by the respective operating mode
- ◆ A Utility to set SSID, WEP key, site survey, profile manager and dynamically view configuration and receiving signal quality.
- ◆ Support for transmitting power configurable.
- ◆ Support for extended range.
- ◆ WPS support(Pin code)

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## Chapter 4 Appearance

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LED	One Power/Link/WPS (Green)
OFF	All others states
ON	Radio On and Associated WPS Associating when WPS button pressed
Blink	Radio On and Scanning
Flash	Radio On and Associated and TX/RX Data



## Chapter 5 Specifications

### ◆ Frequency Band:

Draft 802.11n Radio: 2.4 GHz

802.11g Radio: 2.4 GHz

802.11b Radio: 2.4 GHz

USA – FCC	2412~2462MHz (Ch1~Ch11)
Canada – IC	2412~2462MHz (Ch1~Ch11)
Europe – ETSI	2412~2472MHz (Ch1~Ch13)
Japan – STD-T66/STD-33	2412~2484MHz (Ch1~Ch14)

### ◆ Operating Channels:

IEEE 802.11b/g/n compliant:

11 channels (US, Canada)

13 channels (ETSI)

14 channels (Japan)

### ◆ Transmit Power and Sensitivity:

TX Output Power:(Typical)

11b 17 +/- 1 dBm

11g 15 +/- 1 dBm@54Mbps

11n 13 +/- 1 dBm

Rx Sensitivity:(Typical)

-84 dBm @ 11 Mbps

-70 dBm @ 54 Mbps

-67 dBm @ 64-QAM, 20MHz channel spacing

-64 dBm @ 64-QAM, 40MHz channel spacing

### ◆ Modulation

DBPSK @ 1Mbps

DQPSK@2Mbp

CCK@5.5/11Mbps

BPSK@6/9 Mbps

QPSK@12/18Mbps

16-QAM@24Mbps

64-QAM@48/54Mpb and above, RX up to 300Mbps



- ◆ Current consumption(5V DC):
  - TX: 227mA Max (TBD)
  - RX: 185mA Max (TBD)
- ◆ Operating Temperature: 0 ~ 40 °C ambient
- ◆ Storage Temperature: -10 ~ 70 °C ambient
- ◆ Humidity: 5 ~ 90% and must be non-condensing
  
- ◆ Regulation and certification compliance available:
  - ◆ WHQL
  - ◆ ETSI/CE
  - ◆ ESD: EN61000-4-2, which specifies 4kV contact and 8kV air discharge.

## References

- ◆ Ralink Reference Design Functional Specification
- ◆ IEEE 802.11b Standard Specification
- ◆ IEEE 802.11g Standard Specification
- ◆ IEEE 802.11n draft Standard Specification

## NCC Statement

依據 低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

## FCC 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.

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.

**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.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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

2.4GHz operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

This EUT is compliance with SAR for general population/uncontrolled exposure limits in ANSI/IEEE C95.1-1999 and had been tested in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C.

SAR compliance has been established in typical laptop computer(s) with USB slot, and product could be used in typical laptop computer with USB slot. Other application like handheld PC or similar device has not been verified and may not compliance with related RF exposure rule and such use shall be prohibited. This equipment should be installed and operated with minimum distance 0.5 cm between the radiator & your body.

### **Industry Canada Statement**

This device complies with RSS-210 of the Industry Canada Rules.

Operation is subject to the following two conditions:

- 1) this device may not cause interference and
- 2) this device must accept any interference, including interference that may cause undesired operation of the device

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numerique de la class B est conforme a la norme NMB-003 du Canada.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

### **IMPORTANT NOTE:**

#### **IC Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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

2.4GHz operation of this product in Canada is firmware-limited to channels 1 through 11.

This EUT is compliance with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528. This equipment should be installed and operated with minimum distance 0.5cm between the radiator & your body.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that permitted for successful communication.

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