# User's manual

## AWN11N-001

**IEEE 802.11n USB2.0 Adapter**

*v.02 draft*

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Revision History

| Edition # | | Reason for revision | Issue date | Written by |
|---|---|---|---|---|
| V 01 | ♦ | Initial Document | Jan 18, 2008 | Katherine Hsieh |
| V02 | ♦ | Remove second LED behavior | Nov 18 2009 | Troy Chen |

# Chapter 1 Introduction

## 1. Introduction

AWN11N-001 is a wireless 1x1 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. AWN11N-001 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.

This Wire 802.11N wireless USB Adapter is for use only with compatible UL Listed Computer that installation Instruction detailing user installation of card cage accessories

## 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.

♦ 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 Button for easy security

## 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

## 2.1   General Overview

♦   USB 2.0 Interface and 802.11 n chipset-on-board design.

♦   Antenna: 1 Internal Antenna on board

## 2.2   Hardware Architecture

Ralink 3070 single chip USB2.0

## 2.3   Main Chipset Information

**RT3070:** An 1T1R MIMO MAC + Baseband processor and RF with fully forward compatible with IEEE

802.11n draft2.0 standard.

## 2.4 PCB dimension

16.5mmx43mm

# Chapter 3  Software

**3.1  Operating System Supported**

♦ Windows 2000 , Windows XP, Windows Vista

**3.2  Wireless Mode Supported**

♦ AP (Infrastructure) mode(Software AP)

♦ 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(TKIP)/PSK or 802.1X/LEAP 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)

♦ WPS Hard Button

# Chapter 4    Appearance

| LED 1 | One Power/Link (Green) |
|-------|------------------------|
| OFF | All others states |
| ON | Radio On and Associated |
| 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 | | 11G | | 11n HT20 | | 11n HT40 | |
|---|---|---|---|---|---|---|---|
| Data Rate (Mbps) | Power (dBm) | Data Rate (Mbps) | Power (dBm) | Data Rate | Power (dBm) | Data Rate | Power (dBm) |
| 1 | 15 | 6 | 15 | MCS0 | 15 | MCS0 | 15 |
| 2 | 15 | 9 | 15 | MCS1 | 15 | MCS1 | 15 |
| 5.5 | 15 | 12 | 15 | MCS2 | 15 | MCS2 | 15 |
| 11 | 15 | 18 | 15 | MCS3 | 15 | MCS3 | 15 |
|  |  | 24 | 14 | MCS4 | 14 | MCS4 | 14 |
|  |  | 36 | 14 | MCS5 | 14 | MCS5 | 14 |
|  |  | 48 | 12 | MCS6 | 12 | MCS6 | 12 |
|  |  | 54 | 12 | MCS7 | 12 | MCS7 | 12 |

♦ Rx Sensitivity:(Typical)

| | data rate | specification |
|---|---|---|
| 11b | 1 | -90 |
| | 2 | -90 |
| | 5.5 | -86 |
| | 11 | -82 |
| 11g | 6 | -86 |
| | 9 | -85 |
| | 12 | -84 |
| | 18 | -82 |
| | 24 | -78 |
| | 36 | -75 |
| | 48 | -68 |
| | 54 | -68 |
| HT20 | MCS0 | -85 |
| | MCS1 | -83 |
| | MCS2 | -80 |
| | MCS3 | -78 |
| | MCS4 | -75 |
| | MCS5 | -71 |
| | MCS6 | -69 |
| | MCS7 | -66 |
| HT40 | MCS0 | -83 |
| | MCS1 | -80 |
| | MCS2 | -78 |
| | MCS3 | -76 |
| | MCS4 | -72 |
| | MCS5 | -68 |
| | MCS6 | -65 |
| | MCS7 | -62 |

♦ Modulation
  DBPSK @1Mbps
  DQPSK@2Mbp
  CCK@5.5/11Mbps
  BPSK@6/9 Mbps

      QPSK@12/18Mbps
      16-QAM@24Mbps
      64-QAM@48/54Mpb

♦   Current consumption(5V DC):
  TX: 200mA (max of all data rate 11b/g/n)
  RX: 200mA (max of all data rate 11b/g/n)
  Idle: 90mA
  Radio off 52mA

♦   Operating Temperature: 0 ~ 40 $^{o}$C ambient
♦   Storage Temperature: -10 ~ 70 $^{o}$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

**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.

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.

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

**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.

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.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.