User Manual

For

WMP-ND03B

無線網路卡

Mini-PCI Card

Version: 1.1

2008/6/12

Revision History

Rev.	Date	Author	Reason for Changes
1.0	2008/3/14	Alfred Chin	• New release
1.1	2008/6/12	Alfred Chin	• Add band 4 (5725~5850MHz) in item 2.2.1.3 and 2.2.4.3

Contents

<p align="center">**Test Operation Manual**</p>

Test Utility Installation:

1. Unzip "ART_V0_5_b25ALL.zip" to "C:\".
2. The utility must run on Win2000 or WinXP.

Hardware Installation:

Before insert the card, please execute the below instruction at first !!

1. **<u>Win2000 OS</u> :**

    Enter in the directory : C:\ v0_5_b25ALL\art_driver\bin\2000

    Execute the uninst_new_drv_2k.bat:

    Execute the inst_new_drv_2k.bat :

    <u>WinXP OS</u> :

    Enter in the directory : C:\ v0_5_b25ALL\art_driver\bin\xp

    Execute the uninst_new_drv_xp.bat:

    Execute the inst_new_drv_xp.bat

2. Insert the card, then install the driver , the driver is located at

    <u>Win2000 OS</u> :

    C:\ v0_5_b25ALL\art_driver\bin\2000

    <u>WinXP OS</u> :

    C:\ v0_5_b25ALL\art_driver\bin\xp

Configuration:

1. Enter the DOS command mode , then change the directory to :
   C:\ v0_5_b25ALL\art_driver\bin\xp
2. Input the instruction: art \id=2082

   Then press enter .

ART TEST MODE:

1. Once utility is executed, a menu with test options will appear. To run a test, press
   the character key that is assigned to the test option.

   For example, press "c" to run the continuous transmit test, or press "r " to run the
   continuous receive test.

   For example: press "o" to change 11g or 11b test mode, Press "c" to continuous
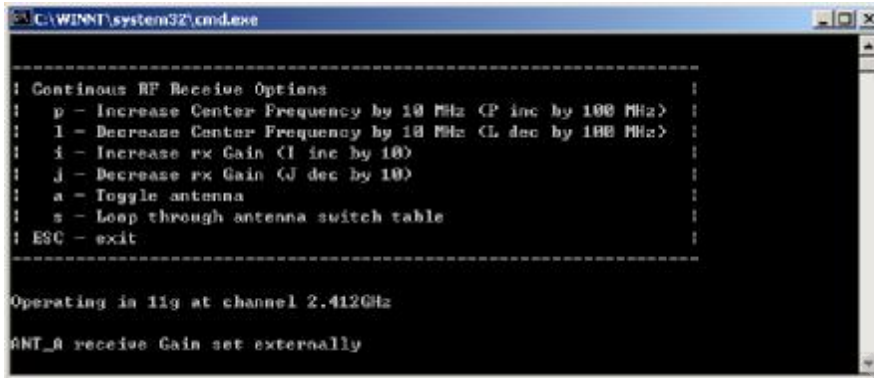   transmit mode .

2. Continuous Transmit Options.

   a. Before the Continuous Transmit test, need to press "e" first

   The command will load the calibrate data to the EEROM, then the card can
   transmit the target power

   b. The channel frequency, data rate and output power could be changed in
   continuous transmit options. Press "c" to increase the output power , 11g Power
   (data rate 6Mbps) is 17dBm, 11b   Power is 17dBm , Press ESC to return to the
   main Test Options menu when finished.

3. Continuous Receive Options

Continuous receive options will put the radio into receive mode to allow for radio measurements. Press ESC to return to the main Test Options menu when finished.

1.0 Scope

1.1 Document

This document is to specify the product requirements for **802.11 a/b/g/n Mini-PCI Card**. This Card is based on Atheros chipset that complied with IEEE 802.11g, IEEE 802.11b, IEEE 802.11n standard from 2.4~2.5GHz, and it can be used to provide up to 54Mbps for IEEE 802.11g, 11Mbps for IEEE 802.11b and 300Mbps for IEEE 802.11n to connect your wireless LAN.

With seamless roaming, fully interoperability and advanced security with WEP standard, **802.11a/b/g/n Mini-PCI Card** offers absolute interoperability with different vendors' 802.11g, 802.11b, 802.11 draft n Access Points through the wireless LAN.

1.2 Product Features

Ÿ Compatible with IEEE 802.11a high rate standard to provide wireless 54Mbps data rate

Ÿ Compatible with IEEE 802.11g high rate standard to provide wireless 54Mbps data rate

Ÿ Compatible with IEEE 802.11b high rate standard to provide wireless 11Mbps

data rate

Ÿ Compatible with IEEE 802.11 draft n standard to provide wireless 300Mbps data rate

Ÿ Maximum reliability, throughput and connectivity with automatic data rate switching

Ÿ Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication

2.0 Requirements

The following sections identify the detailed requirements of the **802.11n/ a or g/b Mini-PCI Card.**

2.1 General Requirements

2.2.1 IEEE 802.11a Section

#	Feature	Detailed Description
2.2.1.1	Standard	Ÿ IEEE 802.11a
2.2.1.2	Radio and Modulation Type	Ÿ BPSK, QPSK, 16QAM, 64QAM with OFDM
2.2.1.3	Operating Frequency	CE: 5150~5350MHz, 5470MHz ~5725MHz C-Tick: 5150~5350MHz, 5470MHz ~5725MHz, 5725MHz ~5850MHz FCC: 5150~5250MHz, 5725MHz ~5850MHz IC: 5150~5250MHz, 5725MHz ~5850MHz Taiwan NCC: 5250~5350MHz, 5725MHz ~5850MHz Japan TELEC: 5150~5350, 5470~5725MHz
2.2.1.4	Data Rate	Ÿ 54, 48, 36, 24, 18, 12, 9 and 6Mbps
2.2.1.5	Media Access Protocol	CSMA/CA with ACK
2.2.1.6	Receiver Sensitivity at Antenna Connector	Ÿ Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% and at room Temp. 25degree C Ÿ −85dBm at 6Mbps Ÿ −85dBm at 9Mbps Ÿ −85dBm at 12Mbps Ÿ −85dBm at 18Mbps Ÿ −80dBm at 24Mbps Ÿ −78dBm at 36Mbps Ÿ −74dBm at 48Mbps Ÿ −73dBm at 54Mbps

2.2.2 IEEE 802.11b Section

#	Feature	Detailed Description
2.2.2.1	Standard	Ÿ IEEE 802.11b
2.2.2.2	Radio and Modulation Schemes	Ÿ DQPSK, DBPSK, DSSS, and CCK
2.2.2.3	Operating Frequency	Ÿ 2400 ~ 2483.5MHz ISM band
2.2.2.4	Channel Numbers	Ÿ 11 channels for United States/ Canada/ Taiwan 13 channels for Europe Countries/ Japan
2.2.2.5	Data Rate	Ÿ 11, 5.5, 2, and 1Mbps
2.2.2.6	Media Access Protocol	Ÿ CSMA/CA with ACK
2.2.2.7	Receiver Sensitivity at Antenna Connector	Ÿ Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 8% and at room Temp. 25degree C Ÿ −92dBm at 1Mbps Ÿ −91dBm at 2Mbps Ÿ −90dBm at 5.5Mbps Ÿ −88dBm at 11Mbps

2.2.3 IEEE 802.11g Section

#	Feature	Detailed Description
2.2.3.1	Standard	Ÿ IEEE 802.11g
2.2.3.2	Radio and Modulation Type	Ÿ BPSK, QPSK, 16QAM, 64QAM with OFDM
2.2.3.3	Operating Frequency	Ÿ 2400 ~ 2483.5MHz ISM band
2.2.3.4	Channel Numbers	Ÿ 11 channels for United States/ Canada/ Taiwan 13 channels for Europe Countries/ Japan
2.2.3.5	Data Rate	6,9,12,18,24,36,48,54Mbps
2.2.3.6	Media Access Protocol	CSMA/CA with ACK
2.2.3.7	Receiver Sensitivity at Antenna Connector	Ÿ Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% and at room Temp. 25degree C Ÿ −87dBm at 6Mbps Ÿ −87dBm at 9Mbps Ÿ −87dBm at 12Mbps Ÿ −87dBm at 18Mbps Ÿ −81dBm at 24Mbps Ÿ −79dBm at 36Mbps Ÿ −75dBm at 48Mbps Ÿ −74dBm at 54Mbps

2.2.4 IEEE 802.11 Draft n Section

#	Feature	Detailed Description				
2.2.4.1	Standard	Ÿ Draft n				
2.2.4.2	Radio and Modulation Type	Ÿ BPSK, QPSK, 16QAM, 64QAM with OFDM				
2.2.4.3	Operating Frequency	n CE: 240 ~2483.5MHz , 5150~5350MHz, 5470MHz ~5725MHz n C-Tick: 2400~2483.5MHz , 5150~5350MHz, 5470MHz ~5725MHz, 5725MHz ~5850MHz n FCC: 2400~2483.5MHz , 5150~5250MHz, 5725MHz ~5850MHz n IC: 2400~2483.5MHz , 5150~5250MHz, 5725MHz ~5850MHz n Taiwan NCC: 2400~2483.5MHz , 5250~5350MHz, 5725MHz ~5850MHz n Japan TELEC: 2400~2483.5MHz , 5150~5350, 5470~5725MHz				

#	Feature	MCS	GI=800ns		GI=400ns	
2.2.4.4	Data Rate		20MHz	40MHz	20MHz	40MHz
		0	6.5	13.5	7.2	15
		1	13	27	14.4	30
		2	19.5	40.5	21.7	45
		3	26	54	28.9	60
		4	39	81	43.3	90
		5	52	108	57.8	120
		6	58.5	121.5	65.0	135
		7	65	135	72.2	150
		8	13	27	14.444	30
		9	26	54	28.889	60
		10	39	81	43.333	90
		11	52	108	57.778	120
		12	78	162	86.667	180
		13	104	216	115.556	240
		14	117	243	130.000	170
		15	130	270	144.444	300

#	Feature	Detailed Description
2.2.4.5	Media Access Protocol	Ÿ CSMA/CA with ACK
2.2.4.6	Receiver Sensitivity at Antenna	Ÿ Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% and at room Temp. 25degree C

#	Feature	Detailed Description	
	Connector	**n** 5GHz Band/HT-20 Ÿ −84dBm at MCS0/8 Ÿ −84dBm at MCS1/9 Ÿ −82dBm at MCS2/10 Ÿ −79dBm at MCS3/11 Ÿ −77dBm at MCS4/12 Ÿ −73dBm at MCS5/13 Ÿ −72dBm at MCS6/14 Ÿ −69dBm at MCS7/15	**n** 5GHz Band/HT-40 Ÿ −81dBm at MCS0/8 Ÿ −81dBm at MCS1/9 Ÿ −79dBm at MCS2/10 Ÿ −76dBm at MCS3/11 Ÿ −74dBm at MCS4/12 Ÿ −70dBm at MCS5/13 Ÿ −69dBm at MCS6/14 Ÿ −66dBm at MCS7/15
		n 2.4GHz Band/HT-20 Ÿ −85dBm at MCS0/8 Ÿ −85dBm at MCS1/9 Ÿ −83dBm at MCS2/10 Ÿ −80dBm at MCS3/11 Ÿ −78dBm at MCS4/12 Ÿ −74dBm at MCS5/13 Ÿ −73dBm at MCS6/14 Ÿ −70dBm at MCS7/15	**n** 2.4GHz Band/HT-40 Ÿ −82dBm at MCS0/8 Ÿ −82dBm at MCS1/9 Ÿ −80dBm at MCS2/10 Ÿ −77dBm at MCS3/11 Ÿ −75dBm at MCS4/12 Ÿ −71dBm at MCS5/13 Ÿ −70dBm at MCS6/14 Ÿ −67dBm at MCS7/15

2.2.5 General Section

#	Feature	Detailed Description
2.2.5.1	Antenna Connector	Ÿ R-SMA connectors
2.2.5.2	Operating Voltage	Ÿ 3.3VDC +/- 10%
2.2.5.3	Current Consumption	Ÿ 880 mA at transmit mode Ÿ 440 mA at receive mode
2.2.5.4	Form Factor and Interface	Ÿ Mini-PCI type III A form factor

删除: TBD

2.3 Compatibility Requirements

This device passes the following compatibility requirements.

#	Feature	Detailed Description
2.3.1	Wi-Fi	Ÿ Meet Wi-Fi certification for IEEE 802.11a/b/g/draft n product
2.3.2	WHQL	Ÿ Meet applicable WHQL certification requirements
2.3.3	Physical Layer and Functionality	Ÿ Meet Alpha Networks Engineering Test Plan and Test Report

2.4 Regulatory Requirements

#	Feature	Detailed Description
2.4.1	United States	IEEE 802.11a/n: EMI: FCC Part 15.407(b) Power Limits: FCC Part 15.407(a) IEEE 802.11b/g/n: FCC part 15.247, 15.205, 15.209 Safety: UL1950-3 for CSA mark
2.4.2	Europe	IEEE 802.11a/n: Ÿ EMC: EN 301 489-1 and –17, EN 60950 Ÿ DFS/TPC: 301 893 IEEE 802.11b/g/n: Ÿ EMC: EN 300 328, EN 300 826, EN 60950
2.4.3	Japan	IEEE 802.11a/n: Ÿ ARIB STD-T71 IEEE 802.11b/g/n: Ÿ ARIB STD-T66 EMI: Ÿ VCCI
2.4.4	Taiwan	IEEE 802.11a/b/g/n: Ÿ NCC LP0002
2.4.5	Canada	IEEE 802.11a/b/g/n: Ÿ Power Limits: RSS-210 6.2.2 (91) Safety: Ÿ CSA

2.5 Requirements of Reliability,

Maintainability and Quality

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

2.6 Environmental Requirements

#	Feature	Detailed Description
2.6.1	Operating Temperature Conditions	Ÿ The product is capable of continuous reliable operation when operating in ambient temperature of 0 ℃ to +40℃.
2.6.2	Non-Operating Temperature Conditions	Ÿ 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 ℃ to +75 ℃.
2.6.3	Operating Humidity conditions	Ÿ The product is capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 90% non-condensing.
2.6.4	Non-Operating Humidity Conditions	Ÿ The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

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.

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.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only

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: RRK-WMPND03B".

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.

<div align="center">Industry Canada Statement</div>

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 device has been designed to operate with an antenna having a maximum gain of 6.63dBi (Peak Gain, exclude cable loss)

Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the EIRP is not more than required for successful communication.

Caution:

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

Because high power radars are allocated as primary users (meaning they have priority) in 5250-5350 MHz and 5650-5850 MHz, these radars could cause interference and/or damage to license exempt LAN devices.

In order to protect Environment Canada weather radars operating in the band 5600-5650 MHz, this device will not transmit on any channels operating in the band 5600-5650 MHz,

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC 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 device is intended only for OEM integrators

under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna.

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 CANADA, 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.).

As long as conduction 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 IC authorization is no longer considered valid and the IC 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 IC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains TX IC : 4833A-WMPND03B".

Manual Information That Must be Included:

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 user's manual for OEM Integrators must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter".

If the end product integrating this module is going to be operated in 5.15 ~ 5.25GHz frequency range, the warning statement in the user manual of the end product should include the restriction of operating this device in indoor could void the user's authority to operate the equipment.

以下警語適用台灣地區

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。

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，指依電信法規定作業之無線電通信。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。

在5.25-5.35秭赫(GHz)頻帶內操作之無線資訊傳輸設備，限於室內使用。

本模組於取得認證後將依規定於模組本體標示審合格籤，並要求平台上標示「本產品內含射頻模組：ID編號」