ALPHA

Installation Guide

For WMP-D18

IEEE 802.11a MiniPCI Card

申請DGT使用手冊必須包含之資訊:

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。

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 transmitter module is authorized only for use in device where the antenna may be installed so that 20 cm may be maintained between the antenna and users.

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

For operation within 5.15 ~ 5.25GHz frequency range, it is restricted to indoor environment.

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

1) This product features the selection of different antennas and adjustments of output power according to the final application and the final product which incorporates this product must be installed by a professional installer who has been properly trained by the supplier. Selling of this product

in public retail store is prohibited.

2) Professional installer must carefully consult the professional installation manual and program the conducted output power no more than tested maximum conducted power for each antenna as documented in the manual

3) The antenna of end product must be installed so that at least 20 cm is maintained between the antenna and users, and

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

5) The module must be completely embedded inside the final product and there is no direct access from outside to remove the module without opening the product chases with a tool.

6) OEM shall not display or instruct the user how to install or remove the module.

As long as 6 conditions above are met, a 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.).

End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains TX FCC ID: RRKWMPD18”.

Manual Information

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 users manual of the end product which integrate this module.

The users manual for OEM integrators must include the following information in a prominent location

(a) RF exposure warning as below:

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements,

the antenna 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.
(b) Manual must include tested maximum compliance eirp power as documented in the manual and FCC filling for each supplied antenna.
(c) Warning to the installer that final eirp radiated power must adjusted to lower or equal to tested maximum eirp as documented in the manual.

If the end product integrating this module is going to be operated in 5.15 ~ 5.25GHz frequency range, the user's manual of end product must include following statement:
"The 5.15~5.25GHz frequency band in US/Canada is restricted to indoor use only."

Industry Canada Statement

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 18 dBi.

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.

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

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with Canada radiation exposure limits set forth for uncontrolled environments. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Ⅰ 本產品將來在台灣販售時僅能使用 5GHz 頻段

Test Utility Installation:

1. Unzip "ART_V52_build58.zip" to "C:\".
2. The utility must run on Win2000 or WinXP.

Hardware Installation:

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

1. **Win2000 OS :**

   Enter in the directory : C:\ ART_V52_build58\art_driver\bin\2000

   Execute the inst_new_drv_2k.bat :

WinXP OS :

Enter in the directory : C:\ ART_V52_build58\ art_driver\bin\XP\

Execute the inst_new_drv_xp.bat

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

Win2000 OS :

C:\ ART_V52_build58\art_driver\bin\2000

WinXP OS :

C:\ ART_V52_build58\ art_driver\bin\XP\

Configuration:

1. Enter the DOS command mode , then change the directory to :

   C:\ ART_V52_build58\art\bin\

2. Input the instruction : art \id=2062

   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.

2. 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 **IEEE 802.11a MiniPCI Card**. This Mini-PCI Card is based on Atheros AR5006X chipset that complied with IEEE 802.11a standard from 5.15~5.85GHz wideband.

With seamless roaming, fully interoperability and advanced security with WEP standard, **IEEE 802.11a MiniPCI Card** offers absolute interoperability with different vendors' 802.11a Access Points through the wireless LAN.

1.2 Product Features

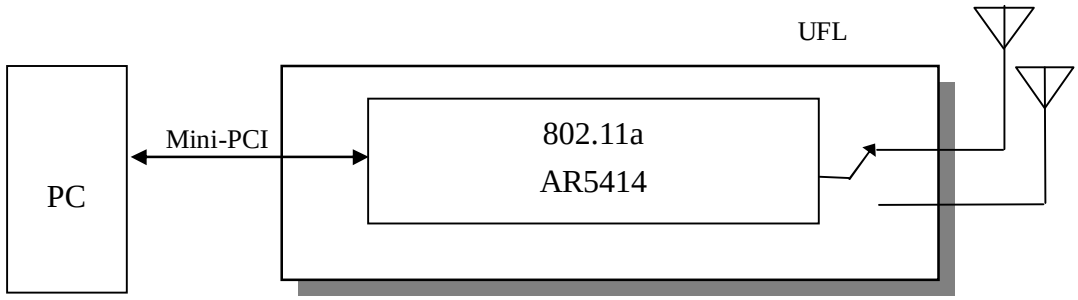
- Compatible with IEEE 802.11a standard to provide wireless 54Mbps data rate.
- Maximum reliability, throughput and connectivity with automatic data rate switching
- Supports wireless data encryption with 64/128/152-bit WEP for security
- Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- Dual UFL antenna connectors for diversity
- Supports DFS/TPC for European operation
- Supports WPA and AES enhanced security
- Support WPA and WPA2 enhanced security
- Supports WMM and Jumpstart function*(Drivers only support Windows XP and 2K)

- Friendly user configuration and utilities
- Drivers support Windows 98SE, ME, 2K, and XP
- Supports Mini-PCI Type IIIB form factor

2.0 Requirements

The following sections identify the detailed requirements of the **IEEE 802.11a MiniPCI Card.**

2.1 Functional Block Diagram



2.2 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, OFDM
2.2.1.3	Frequency Range & Channels	802.11a： 5.15~5.25 GHz (FCC/IC/CE) .4 Chs 5.25~5.35 GHz (FCC/IC/Taiwan/CE) 4 Chs 5.470~5.725 GHz (FCC/CE).11Chs 5.725~5.850 GHz (FCC/IC/Taiwan) .5Chs
2.2.1.4	Data Rate	Ÿ 54, 48, 36, 24, 18, 12, 9, and 6Mbps
2.2.1.5	Media Access Protocol	Ÿ CSMA/CA with ACK
2.2.1.6	Receiver Sensitivity	Ÿ Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% Ÿ –87dBm at 6Mbps Ÿ –86dBm at 9Mbps Ÿ –85dBm at 12Mbps Ÿ –83dBm at 18Mbps Ÿ –80dBm at 24Mbps Ÿ –76dBm at 36Mbps Ÿ –71dBm at 48Mbps Ÿ –66dBm at 54Mbps

2.2.3 General Section

#	Feature	Detailed Description
2.2.3.1	Antenna Connector	Ÿ Dual UFL antenna connectors
2.2.3.2	Operating Voltage	Ÿ 3.3VDC +/- 10%
2.2.3.3	Current Consumption	Ÿ 520mA at continuous transmit mode Ÿ 260mA at continuous receive mode Ÿ 15mA at sleep mode

2.2.3.4	Form Factor and Interface	Ÿ Mini-PCI Type IIIB form factor
2.2.3.5	LEDs	Ÿ External LED function supported

2.3 Software Requirements

The Configuration Software supports Microsoft Windows 98SE, ME, 2000, and XP. This configuration software includes the following functions:

- **Information**
  Information allows you to monitor network status.
- **Configuration**
  Configuration allows you to configure parameters for wireless networking.
- **Security**
  Supports enhanced security WEP, 802.1x,WPA,WPA2.

2.3.1 Information

#	Feature	Detailed Description
2.3.1.1	General Information	Ÿ 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	Ÿ 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), Signal Strength, and Link Quality.
2.3.1.3	Site survey	Ÿ 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	Ÿ Input an SSID number if the roaming feature is enabled Ÿ Supports for ASCII printable characters.
2.3.2.2	Network Type	Ÿ Ad-hoc Mode and 802.11 Ad-hoc Mode for network configurations that do not have any access points Ÿ Infrastructure Mode for network configurations with access points
2.3.2.3	Power Save	Ÿ Extend the battery life of clients by allowing the client to sleep for short periods of time while the Access Point buffers the messages.
2.3.2.4	RTS Threshold	Ÿ Set the number of bytes used for fragmentation

#	Feature	Detailed Description
		boundary for messages
2.3.2.5	Fragment Threshold	Ÿ Set the number of bytes used for RTS/CTS boundary
2.3.2.6	Transmission Speed	Ÿ This indicates the communication rates. Select appropriate transmission speed to match your wireless LAN settings
2.3.2.7	Roaming	Ÿ Support Automatic or Manual Rescan to associate with access point.

2.3.3 Security

#	Feature	Detailed Description
2.3.3.1	Encryption	Ÿ RC4 encryption algorithm Ÿ Support 64/128/152 bit WEP encryption Ÿ Support open system and shared key authentication
2.3.3.2	WEP Management	Ÿ Four WEP keys can be selected Ÿ STA with WEP off will never associate any AP with WEP enabled Ÿ WEP Key Format: Option for Hex format
2.3.3.3	802.1x	Ÿ Support EAP-TLS, EAP-TTLS, and EAP-PEAP
2.3.3.4	WPA	Ÿ Support WPA/WPA2-PSK and WPA/WPA2-EAP Ÿ Support Cipher Mode AES and TKIP

2.4 Mechanical Requirements

#	Feature	Detailed Description
2.4.1	Length	Ÿ 44.6mm
2.4.2	Width	Ÿ 50.75mm
2.4.3	Height	Ÿ 5mm

2.5 Compatibility Requirements

This device passes the following compatibility requirements.

#	Feature	Detailed Description
2.5.1	Wi-Fi	Ÿ Meet Wi-Fi certification for IEEE 802.11a/b/g product
2.5.2	WHQL	Ÿ Meet applicable WHQL certification requirements
2.5.3	Physical Layer and Functionality	Ÿ Meet ALPHA Engineering Test Plan and Test Report

2.6 Requirements of Reliability, Maintainability and Quality

#	Feature	Detailed Description
2.6.1	MTBF	Ÿ Mean Time Between Failure > 30,000 hours
2.6.2	Maintainability	Ÿ There is no scheduled preventive maintenance required
2.6.3	Quality	Ÿ The product quality is followed-up by ALPHA factory quality control system

2.7 Environmental Requirements

#	Feature	Detailed Description
2.7.1	Operating Temperature Conditions	Ÿ The product is capable of continuous reliable operation when operating in ambient temperature of 0 ℃ to +55℃.
2.7.2	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 ℃.
2.7.3	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.
2.7.4	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

FCC ANTENNA USAGE AND TRANSMIT POWER

To comply with FCC/Canada telecommunication regulation, the conducted output power of this transmitter, when use with each specific antenna supplied, cannot exceed the maximum limit indicated in the following tables.

Wireless Mode	Antenna Gain	Certified Antenna Configurations Maximum Conducted Transmit Power			
		5180MHz	5200Hz	5220MHz	5240MHz
802.11a	SAA04-220080, 5dBi, Dipole	16.52 dBm	16.52 dBm	16.87 dBm	16.87 dBm

Wireless Mode	Antenna Gain	Certified Antenna Configurations Maximum Conducted Transmit Power				
		5500 MHz	5520 MHz	5540 MHz	5560 MHz	5580 MHz
802.11a	, SAA04-220080, 5dBi, Dipole	16.54dBm	16.54dBm	16.54dBm	16.54dBm	16.54dBm

Wireless Mode	Antenna Gain	Certified Antenna Configurations Maximum Conducted Transmit Power					
		5600 MHz	5620 MHz	5640 MHz	5660 MHz	5680 MHz	5700 MHz
802.11a	, SAA04-220080, 5dBi, Dipole	16.67dBm	16.67dBm	18.06dBm	18.06dBm	18.06dBm	18.06dBm

Wireless Mode	Antenna Gain	Certified Antenna Configurations Maximum Conducted Transmit Power				
		5745 MHz	5765 MHz	5785 MHz	5805 MHz	5825 MHz
802.11a	SAA04-220080, 5dBi, Dipole	19.2 dBm	19.2 dBm	19.2 dBm	19.5 dBm	19.5 dBm

Wireless Mode	Antenna Gain	Certified Antenna Configurations Maximum Conducted Transmit Power	
		5760 MHz	5800 MHz
802.11a (With Turbo mode)	SAA04-220080, 5dBi, Dipole	21.5 dBm	21.5 dBm