WMP-N06

User's Guide

FCC Statement :

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.
(2) This device must accept any interference received, including interference that may cause undesired operation.

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 or more 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.

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

FCC RF Radiation Exposure Statement:

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

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

Modular Approval

This device is intended only form OEM integrator under the following conditions:

1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

IMPORTANT NOTE: In the event that these conditions cannot 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 cannot 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 devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ADSL modems, and similar equipment). The final end product must be labeled in visible area with the following:

“Contains RF Module FCC ID: **RRK2005110016-1**

End Product Manual Information

The user manual for end users must include the following information in a prominent location “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 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.”

1.0 Scope

1.1 Document

This document is to specify the product requirements for **802.11b/g MIMO Mini-PCI Card**. This MIMO Mini-PCI Card is based on Atheros AR5008 chipset that complied with 802.11n draft 1.0 standard from 2.4~2.5GHz, and it can be used to provide up to 11Mbps for IEEE 802.11b and 54Mbps for 2.4GHz IEEE 802.11g to connect your wireless LAN.

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

1.2 Product Features

- Compatible with IEEE 802.11b high rate standard to provide wireless 11Mbps data rate
- Compatible with IEEE 802.11g higher speed standard to provide wireless 54Mbps data rateo
- Operation at 2.4 ~ 2.5GHz frequency band to meet worldwide regulations
- Dynamic date rate scaling at 6, 9, 12, 18, 24, 36, 48, 54Mbps for 802.11g
- Dynamic date rate scaling at 1, 2, 5.5, and 11Mbps for IEEE 802.11b
- Compatible with IEEE 802.11n draft 1.0 higher speed standard in High Throughput mode from MCS-0 to MCS-15. The HT data rate refers to Appendix A.
- 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 WPA and AES enhanced security
- Supports VLAN tagging
- Friendly user configuration and utilities
- Drivers support Windows 98SE, ME, 2K, and XP
- Supports Mini-PCI Type IIIA form factor

2.0 Requirements

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

2.1 General Requirements

2.1.1 IEEE 802.11b Section

#	Feature	Detailed Description
2.1.1.1	Standard	• IEEE 802.11b
2.1.1.2	Radio and Modulation Schemes	• DQPSK, DBPSK, DSSS, and CCK
2.1.1.3	Operating Frequency	• 2400 ~ 2497MHz ISM band
2.1.1.4	Channel Numbers	• 11 channels for United States 13 channels for Europe Countries

#	Feature	Detailed Description
		14 channels for Japan
2.1.1.5	Data Rate	• 11, 5.5, 2, and 1Mbps
2.1.1.6	Media Access Protocol	• CSMA/CA with ACK
2.1.1.7	Transmitter Output Power	2dBi Dipole Antenna: Typical 28dBm 3dBi Dipole Antenna: Typical 28dBm
2.1.1.8	Receiver Sensitivity	• Typical –84dBm for 11Mbps @ 8% PER • Typical –90dBm for 2Mbps @ 8% PER

2.1.2 IEEE 802.11g Section

#	Feature	Detailed Description
2.1.2.1	Standard	• IEEE 802.11g
2.1.2.2	Radio and Modulation Schemes	• BPSK, QPSK, 16QAM, 64QAM, and OFDM
2.1.2.3	Operating Frequency	• 2400 ~ 2483.5MHz ISM band
2.1.2.4	Channel Numbers	• 11 channels for United States 13 channels for Europe Countries 13 channels for Japan
2.1.2.5	Data Rate	• 6,9,12,18,24,36,48,54Mbps
2.1.2.6	Media Access Protocol	• CSMA/CA with ACK
2.1.2.7	Transmitter Output Power	• Typical RF Output Power at each RF chain, Data Rate and at room Temp. 25degree C_2dBi/3dBi dipole antenna • 2dBi Dipole Antenna: Typical 29dBm • 3dBi Dipole Antenna: Typical 28dBm •
2.1.2.8	Receiver Sensitivity	• Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% • –86dBm at 6Mbps • –86dBm at 9Mbps • –84dBm at 12Mbps • –82dBm at 18Mbps • –78dBm at 24Mbps • –75dBm at 36Mbps • –71dBm at 48Mbps • –70dBm at 54Mbps

2.1.3 High Throughput Section (HT Mode)

#	Feature	Detailed Description
2.1.3.1	Standard	• IEEE 802.11n draft 1.0
2.1.3.2	Radio and Modulation Type	• BPSK, QPSK, 16QAM, 64QAM with OFDM
2.1.3.3	Operating Frequency	• 2400 ~ 2483.5MHz ISM band
2.1.3.4	Channel Numbers	• 11 channels for United States 13 channels for Europe Countries 13 channels for Japan
2.1.3.5	Data Rate	• From MCS – 0 to MCS –15 as shown in Appendix A
2.1.3.6	Media Access Protocol	• CSMA/CA with ACK
2.1.3.7	Transmitter Output Power	• Typical RF Output Power at each RF chain, Data Rate and at room Temp. 25degree C_2dBi/3dBi dipole antenna

#	Feature	Detailed Description
		• 2dBi Dipole Antenna: Typical 29.5dBm • 3dBi Dipole Antenna: Typical 29.5dBm •
2.1.3.8	Receiver Sensitivity	• Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% • –88dBm at BPSK, coding rate 1/2 (MCS-0) • –84dBm at QPSK, coding rate 1/2 (MCS-1) • –81dBm at QPSK, coding rate 3/4 (MCS-2) • –78dBm at 16-QAM, coding rate 1/2 (MCS-3) • –75dBm at 16-QAM, coding rate 3/4 (MCS-4) • –70dBm at 64-QAM, coding rate 2/3 (MCS-5) • –69dBm at 64-QAM, coding rate 3/4 (MCS-6) • –68dBm at 64-QAM, coding rate 5/6 (MCS-7)

2.1.4 General Section

#	Feature	Detailed Description
2.1.4.1	Antenna Connector	• Dual UFL antenna connectors
2.1.4.2	Operating Voltage	• 3.3VDC +/- 10%
2.1.4.3	Current Consumption	• 800mA at continuous transmit mode (2 Tx chains on) • 450mA at continuous receive mode (3 Rx chains on)
2.1.4.4	Form Factor and Interface	• Mini-PCI Type IIIA form factor
2.1.4.5	LEDs	• External LED function supported

2.2 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.

2.2.1 Information

#	Feature	Detailed Description
2.2.1.1	General Information	• General Information shows the name of Wireless Adapter, Adapter MAC Address, Regulatory Domain, Firmware Version, and Utility Version.
2.2.1.2	Current Link Information	• 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.
2.2.1.3	Site survey	• To search the neighboring access points and display the information of all access points.

2.2.2 Configuration

#	Feature	Detailed Description
2.2.2.1	ESS ID	• Input an SSID number if the roaming feature is enabled • Supports for ASCII printable characters.
2.2.2.2	Network Type	• Ad-hoc Mode and 802.11 Ad-hoc Mode for network configurations that do not have any access points • Infrastructure Mode for network configurations with access points
2.2.2.3	Power Save	• Extend the battery life of clients by allowing the client to sleep for short periods of time while the Access Point buffers the messages.
2.2.2.4	RTS Threshold	• Set the number of bytes used for fragmentation boundary for messages
2.2.2.5	Fragment Threshold	• Set the number of bytes used for RTS/CTS boundary
2.2.2.6	Transmission Speed	• This indicates the communication rates. Select appropriate transmission speed to match your wireless LAN settings
2.2.2.7	Roaming	• Support Automatic or Manual Rescan to associate with access point.

2.2.3 Security

#	Feature	Detailed Description
2.2.3.1	Encryption	• RC4 encryption algorithm • Support 64/128/152 bit WEP encryption • Support open system and shared key authentication
2.2.3.2	WEP Management	• Four WEP keys can be selected • STA with WEP off will never associate any AP with WEP enabled • WEP Key Format: Option for Hex format
2.2.3.3	802.1x	• Support EAP-TLS, EAP-TTLS, and EAP-PEAP
2.2.3.4	WPA	• Support WPA-PSK and WPA-EAP • Support Cipher Mode AES and TKIP

2.3 Mechanical Requirements

#	Feature	Detailed Description
2.3.1	Length	• 50.8mm
2.3.2	Width	• 59.59mm
2.3.3	Height	• 0.99mm

2.4 Compatibility Requirements

This device passes the following compatibility requirements.

#	Feature	Detailed Description
2.4.1	Wi-Fi	• Meet Wi-Fi certification for IEEE 802.11 product
2.4.2	WHQL	• Meet applicable WHQL certification requirements
2.4.3	Physical Layer and Functionality	• Meet ALPHA Engineering Test Plan and Test Report

2.5 Requirements of Reliability, Maintainability and Quality

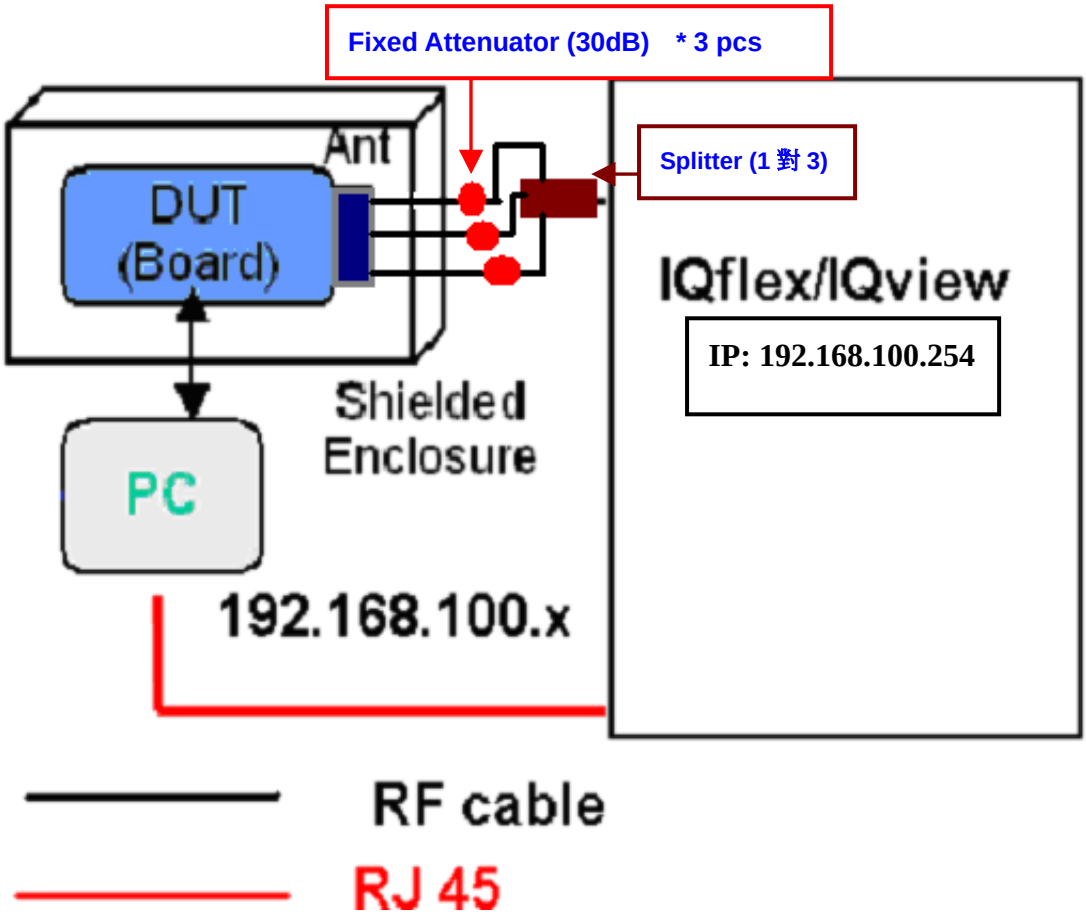
#	Feature	Detailed Description
2.5.1	MTBF	• Mean Time Between Failure > 30,000 hours
2.5.2	Maintainability	• There is no scheduled preventive maintenance required

#	Feature	Detailed Description
2.5.3	Quality	• The product quality is followed-up by ALPHA factory quality control system

2.6 Environmental Requirements

#	Feature	Detailed Description
2.6.1	Operating Temperature Conditions	• The product is capable of continuous reliable operation when operating in ambient temperature of 0 ℃ to +55℃.
2.6.2	Non-Operating Temperature Conditions	• 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	• 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	• The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

Test Environment Diagram/測試環境圖示



（Note：For IQ-View / IQ-Flex）

Normal Test Operating Procedure/一般作業用測試操作程序

1. Testing Steps: 8 steps in total

1. 測試步驟: 共 8 個步驟

註 1:測試前請先安裝待測物之 driver.

註 2:測試前請先依照附錄(Test Programming Setup / 測試程式設定說明)設定

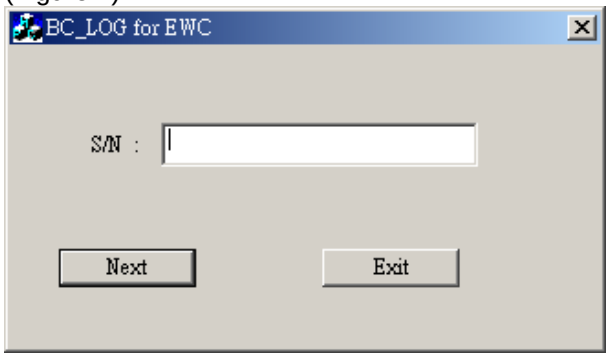
[Step 1] Run " BC_LOG.exe " at DUT (see Figure 1) to open test window (see Figure 2).

[步驟 1] 執行 DUT 端上的" BC_LOG.exe "(如圖 1)開啟如圖 2 測試畫面。

Ex: C:\Program Files\LitePoint\IQfact\ART_MIMO_1WMPN06…B1G\MINIPCI_2071\ BC_LOG.exe

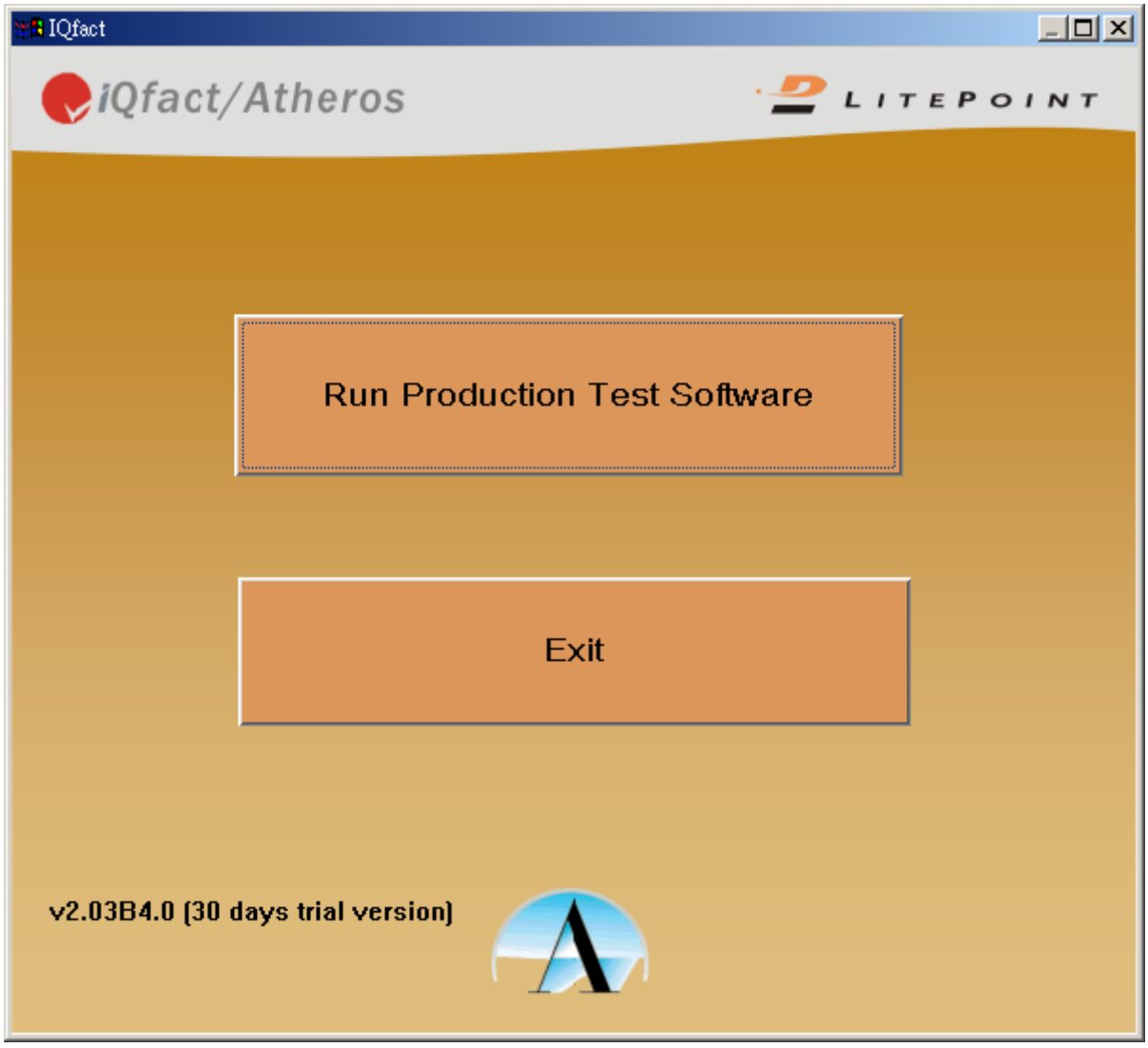
(Figure 1)

(Figure 2)



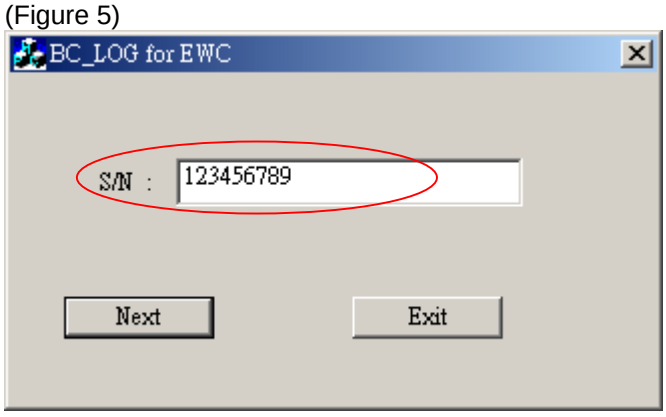
[Step 2] Run ” GUI.exe ” at DUT (see Figure 3) to open test window (see Figure 4).
[步驟 2] 執行 DUT 端上的” GUI.exe ”(如圖 3)開啟如圖 4 測試畫面。
Ex: C:\Program Files\LitePoint\IQfact\ART_MIMO_1WMPN06…B1G\MINIPCI_2071\ GUI.exe
(Figure 3)

(Figure 4)



[Step 3] Then Kevin Serial number (see Figure 5)
[步驟 3] 鍵入 Serial Number (如圖 5

(Figure 5)



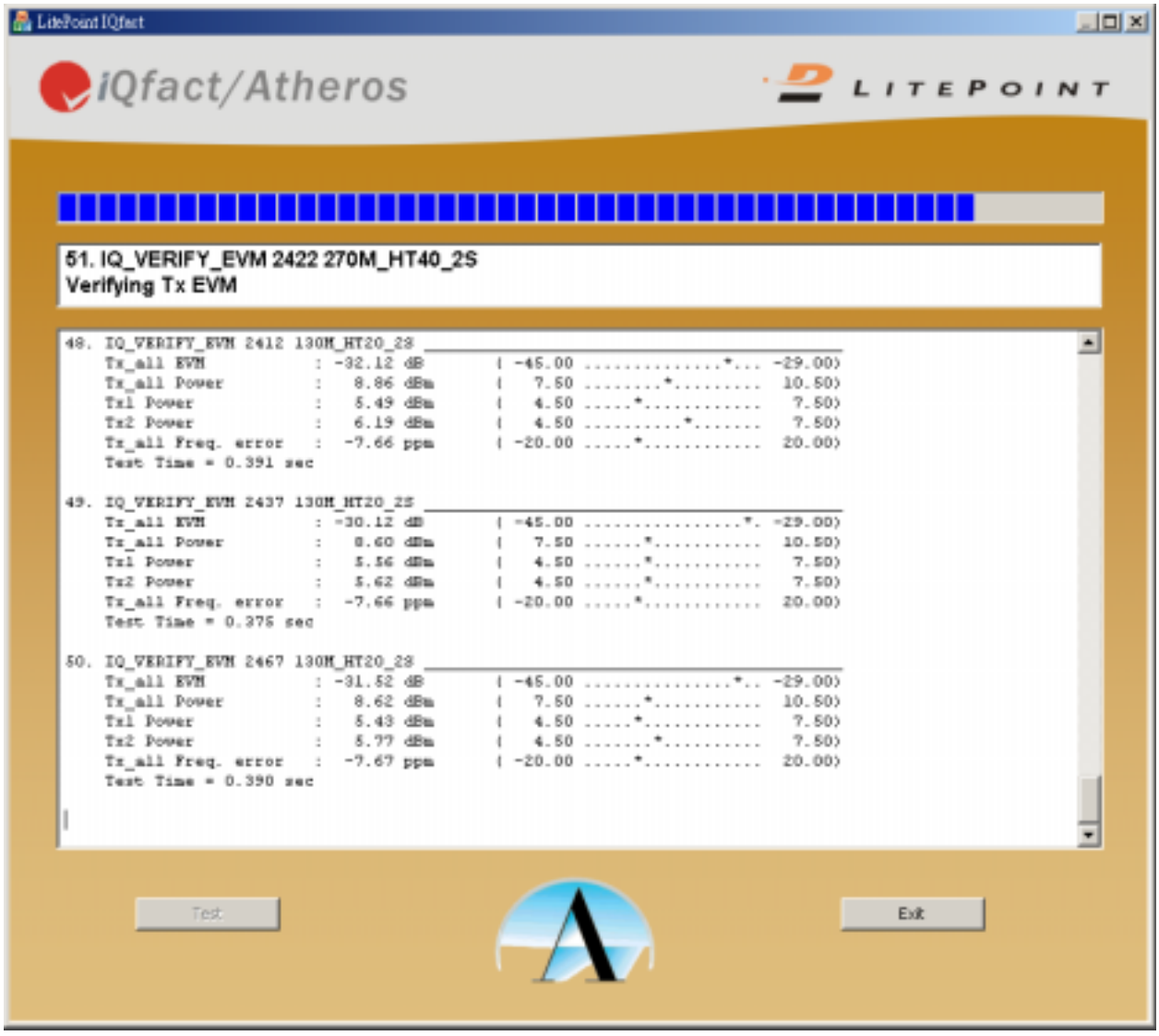
[Step 4] (a) Plug DUT into MINI PCI / CARD BUS Interface
(b) Plug RF Cable on DUT antenna three point and user a special line
(MAIN-From Left to Right 0.1.2)
[步驟 4] (a) 將待測物插入 MINI PCI / CARD BUS Interface 介面。
(b) 將待測物接上測試線於三個天線端,請使用專用測試線。**(MAIN-由左至右 0.1.2)**

[Step 5] Click "**Run Production Test Software**" to begin test. (See Figure 6)
[步驟 5] 按下" **Run Production Test Software"**開始測試(如圖 6)。

(Figure 6)

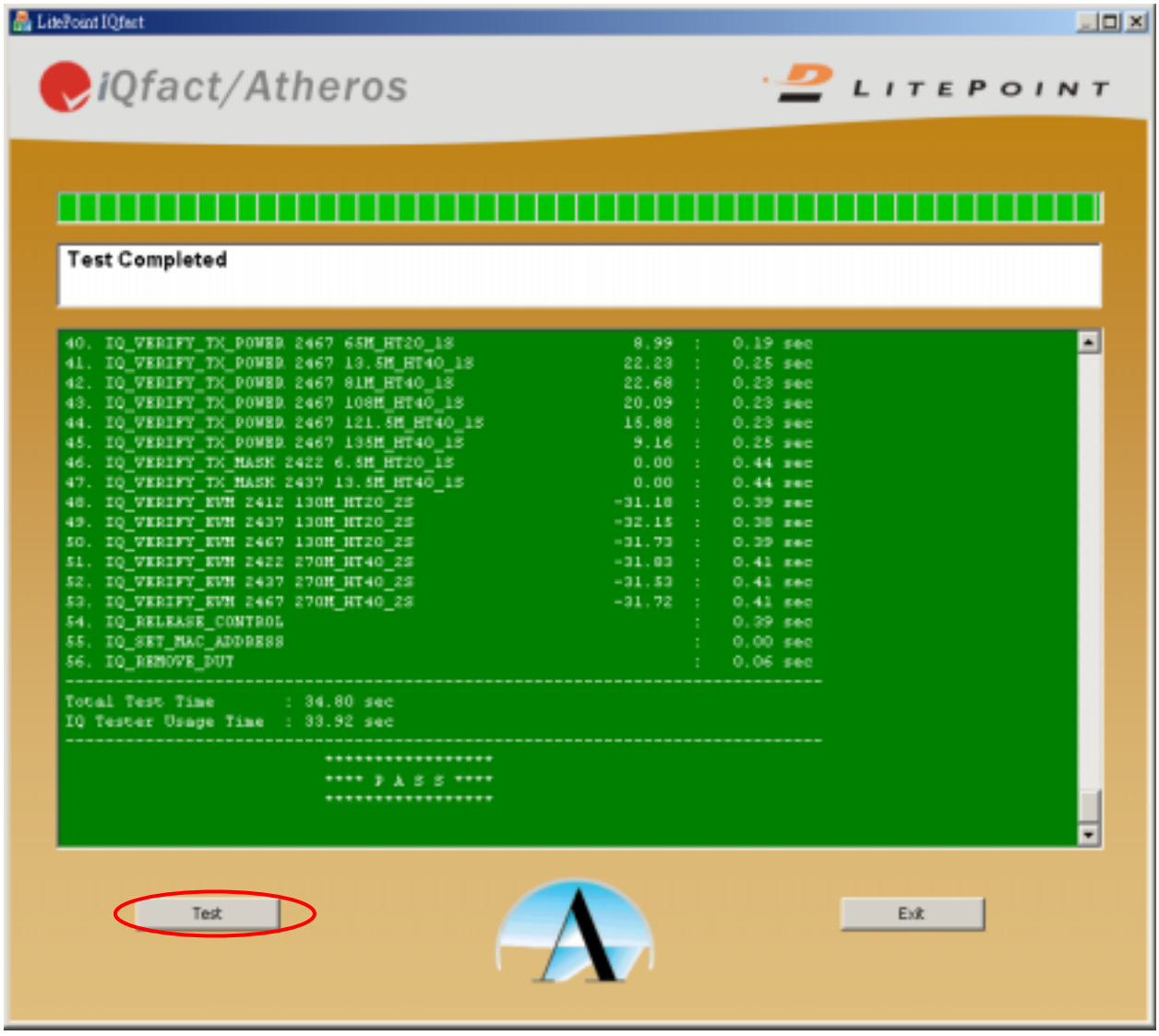
[Step 6] Testing. (See Figure 7)
[步驟 6] 測試中(如圖 7)。

(Figure 7)



[Step 7] When test finish, it will show “PASS”(see Figure 8).
[步驟 7] 當測試完成,會出現”PASS”的視窗(圖 8)。

(Figure 8)



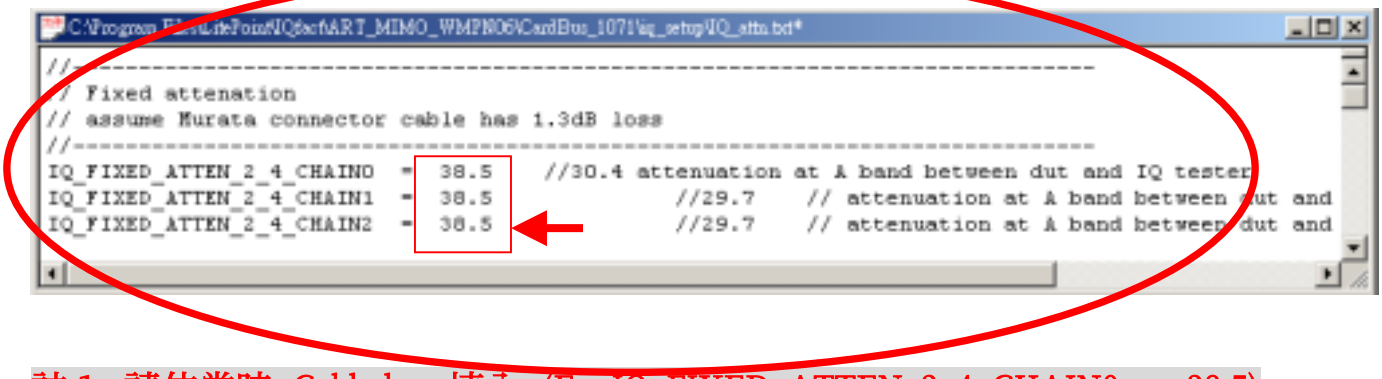
[Step 8] When show “**PASS**”, click “ Test ” and change the next one to continue (see Figure 8).
[步驟 8] 出現 **PASS** 畫面，按” Test “鍵並換下一片繼續[步驟 3]到[步驟 8]。(如圖 7)。

Test Program setup / 測試程式設定

[步驟 1] 尋找程式中" **IQ_attn.txt** " 檔案(如圖 1),

(Ex: Ex: C:\Program Files\LitePoint\IQfact\ART_MIMO_1WMPN06…B1G\MINIPCI_2071\iq_setup\ IQ_attn.txt)

(Figure 1)



註 1: 請依當時 Cable loss 填入: (Ex: IQ_FIXED_ATTEN_2_4_CHAIN0 = 38.5)

(Ex: IQ_FIXED_ATTEN_2_4_CHAIN1 = 38.5)

(Ex: IQ_FIXED_ATTEN_2_4_CHAIN2 = 38.5)

[步驟 2] 測試 Fail (如圖 2),

(Figure 2)