AW-CM276NF

IEEE 802.11 2X2 MU-MIMO ac/a/b/g/n Wireless LAN + Bluetooth M.2 1216 Module

MFG Tool & Command User Manual

Rev. 0.1

(For Standard)

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Revision History

Version	Revision Date	Description	Initials	Approved
0.1	2020/05/25	● Initial Version	Renton Tao	N.C. Chen

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1. Environment set up and Bridge Mode Tool

The “Manufacturing Bridge” refers to the application that allows a user to send commands between Target platform and Windows 7 platform. The environment enables the user to test performance of the AW-CM276NF.

Manufacturing Bridge mode

1.1 Linux PC set up

(1) Driver Folder Contents

Download the latest driver package release from AzureWave FAE and unzip it. The driver folder should look similar to the figure shown below. The release contains driver folder and FW image.

After opening above folder, you can see the folders as picture below. The working direction is “bin_pcie8997”.

In this folder, it includes pre-built driver file and quick start script as below picture.

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On the given Host Linux system, the following files have to be transferred & reside on the system. (Transfer the files over via flash memory or tftp over the host.)
Place the firmware in /lib/firmware/mrvl/
Ex. pcieuart8997_combo_v2.bin (for PCIE/USB interface)

The user may need to compile the driver per your specific Linux OS and Kernel. This is due to that the driver is dependent on the actual OS and kernel version. This next section will describe the steps needed to be done before you can install the driver and run it.
Go to the subdirectory wlan_src
*Make sure to have kernel headers and kernel libs before executing the “make” commands below.

```
make clean
make build
```

Go up one folder to copy both *.ko files to your directory in where you have the other files in where you want to run the insmod command.

Here is the sample list of files (as a minimum) at 1 location:

```
bridge_init.conf
mfgbridge
mlan.ko
pcie8897.ko
bt8xxx.ko
```

1.2 Windows PC set up

Within the internal folder is the labtool and other folders. For this document’s purpose, only the details of the labtool folder will be discussed. The contents of the labtool folder are shown below.

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MFG-W8997-MF-WIFI-BT-BRG-FC-VS2013-1.1.0.110-A1-16.80.205.p110.zip\bin\release\labtool

The Labtool executable is labeled (DutApiMimoBt.exe)

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2. Start driver installation and DUT testing

Now you can run the following commands to install the driver and firmware and start the Manufacturing bridge application with the following commands.

On the working direction, use the following commands to put the 88W8997 in MFG mode after power on DUT.

./enable

Bring up the ethernet interface and specify an IP address to the Target platform. This address must match the IP for the DUT in which the Host XP is expecting.

Ex. ***ifconfig eth0 192.168.1.10 up***

The next line will start the MFG Bridge application.

>***./mfgbridge***

At this point, the target is ready to receive Labtool commands. On the Windows XP laptop where the Labtool release was downloaded, go to the folder shown below:

MFG-W8997-MF-WIFI-BT-BRG-FC-VS2013-1.1.0.110-A1-16.80.205.p110.zip\bin\release\labtool

- Flash_SPI_header.bin
- GenHeader.bin
- UsbHeader.bin
- DutApi89XXDll.h
- DutBtApi89XXDll.h
- DutWlanApi89XXDll.h
- DutBtApi.hc
- DutWlanApi.hc
- AddCalDLL.lib
- DutApiMimoBtDll.lib
- DutApiMimoBtDllDualIf.lib
- DutApiMimoBtDllUart.lib
- Flash_SPI_header.sbin
- DutApiMimoBt.exe
- DutApiMimoBtDualIf.exe
- DutApiMimoBtUart.exe
- AddCalDLL.dll
- DutApiMimoBtDll.dll
- DutApiMimoBtDllDualIf.dll
- DutApiMimoBtDllUart.dll
- SetUp.ini

Edit the “SetUp.ini” file as shown in the lines highlighted in RED below. The setup of DutIpAddress will be the IP address of your target.

HostIPAddress will be the IP address of the Windows XP Laptop.

[DutIp]
DutIpAddress = 192.168.1.10
HostIpAddress = 192.168.1.100
Protocol = TCP

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Then you can double click “DutApiMimoBt.exe” to enter labtool as below picture.

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3. RF cmd

As the information showed on your screen, please enter these commands below to start your test. (Figure 9)

Command: 1 Wi-Fi testing
Command: 2 BT testing

3.1. Generate 802.11ac/a/b/g/n Packet commands

a. Tx on CH 6 at 10 dBm with a CCK-11Mbps data rate in 20 MHz BW mode on path A

25	// Stop Tx
10 1 1	// Set Path A Only
30 0	// Set to 2.4 GHz Band
112 0	// Set to 20 MHz BW
22 0 6 10 0	// Set to CH 6 at 10 dBm Output Power with CCK/BPSK Data Rate on Path A
25 1 4	// Tx at 11 Mbps

---

b. Tx on CH 6 at 10 dBm with a CCK-11Mbps data rate in 20 MHz BW mode on path B

25	// Stop Tx
10 2 2	// Set Path B Only
30 0	// Set to 2.4 GHz Band
112 0	// Set to 20 MHz BW
22 1 6 10 0	// Set to CH 6 at 10 dBm Output Power with CCK/BPSK Data Rate on Path B
25 1 4	// Tx at 11 Mbps

---

c. c. Tx on CH 6 at 10 dBm with a OFDM-54Mbps data rate in 20 MHz BW mode on path B

25	// Stop Tx
10 2 2	// Set Path B Only
30 0	// Set to 2.4 GHz Band
112 0	// Set to 20 MHz BW
22 1 6 10 1	// Set to CH 6 at 10 dBm Output Power with OFDM(a mode or g mode) Data

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//Rate on Path B
25 1 4 // Tx at 11 Mbps

---

d. d. Tx on CH 36 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on Path A

25 // Stop Tx
10 1 1 // Set Path A
30 1 // Set to 5 GHz Band
112 0 // Set to 20 MHz BW
22 0 36 8 2 // Set to CH 36 at 8 dBm Output Power with OFDM(n or ac mode)
// Data Rate on Path A
25 1 22 // Tx at MCS 7

---

e. e. Tx on CH 36-40 at 12 dBm with a MCS7 Data rate in 40 MHz BW Mode on Path A

25 // Stop Tx
10 1 1 // Set Path A
30 1 // Set to 5 GHz Band
112 1 // Set to 40 MHz BW
22 0 36 12 2 // Set to CH 36-40 at 12 dBm Output Power with OFDM(n or ac mode)
// Data Rate on path A
25 1 22 // Tx at MCS 7

---

f. f. Tx on CH 42(5210MHz) at 11 dBm with a MCS9 Data rate in 80 MHz BW Mode on Path A

25 // Stop Tx
10 1 1 // Set Path A
30 1 // Set to 5 GHz Band
112 4 // Set to 80 MHz BW
22 0 36 11 2 // Set to CH 42 at 11 dBm Output Power with OFDM(n or ac mode)
// Data Rate on path A
25 1 110 // Tx at MCS 9

3.2. Data rate set up

B mode & G mode:

1Mbps	5.5Mbps	11Mbps	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps
1	3	4	6	7	8	9	10
36Mbps	48Mbps	54Mbps					
11	12	13					

N mode:

MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	
15	16	17	18	19	20	21	22	

AC mode:

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VHT Data Rates:

101 for VHT_SS1_MCS0
102 for VHT_SS1_MCS1
103 for VHT_SS1_MCS2
104 for VHT_SS1_MCS3
105 for VHT_SS1_MCS4
106 for VHT_SS1_MCS5
107 for VHT_SS1_MCS6
108 for VHT_SS1_MCS7
109 for VHT_SS1_MCS8
110 for VHT_SS1_MCS9
111 for VHT_SS2_MCS0
112 for VHT_SS2_MCS1
113 for VHT_SS2_MCS2
114 for VHT_SS2_MCS3
115 for VHT_SS2_MCS4
116 for VHT_SS2_MCS5
117 for VHT_SS2_MCS6
118 for VHT_SS2_MCS7
119 for VHT_SS2_MCS8
120 for VHT_SS2_MCS9

After you type above command, you can measure the 802.11b/g/n packet by your RF test instrument (exp: Agilent 4010, IQview…).

3.3. Generate 802.11a/b/g/n/ac continuous symbol Commands

a. Cont. Tx on CH 36 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on Path A

```
17              // Stop Cont. Tx
25              // Stop Tx
10 1 1          // Set Path A
30 1            // Set to 5 GHz Band
112 0           // Set to 20 MHz BW
22 0 36 8 2     // Set to CH 36 at 8 dBm Output Power with OFDM Data Rate on Path A
25 1 22         // Tx at MCS 7
25              // Stop Tx
17 1 22         // Cont. Tx at MCS7
17              // Stop Cont. Tx
```

3.4. Test RX sensitivity Commands

a. Rx on CH 157 in 20 MHz BW Mode on both Path A

```
25              // Stop Tx
10 1 1          // Set to Path A
30 1            // Set to 5 GHz Band
112 0           // Set to 20 MHz BW
12 100          // Set to CH 100
31              // Clear all the received packets
```


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32 // Get Rx Packet Count and then clear the Rx packet counter

3.5. Others Commands

(1) **Command 45→** Check the MAC
(2) **Command 99→** Quit the test mode/ Quit the MFG tool

3.6. BT test mode Commands

This is how we test our BT: let BT enter test mode, then connect to tester for testing.
(1) Command 45→Check BT MAC.
(2) Command 78 1→BT enter test mode.

After you type above command, you can measure BT signal both TX/RX and the other BT test items by your BT instrument.

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