

AW-CU300 series

IEEE 802.11 1X1 b/g/n Wireless LAN WLAN Microcontroller LGA Module

User Guide

Rev. 01

(For Standard)

Revision History

Version	Revision Date	Description	Initials	Approved
01	2020/04/23	● Initial Version	Renton Tao	N.C. Chen

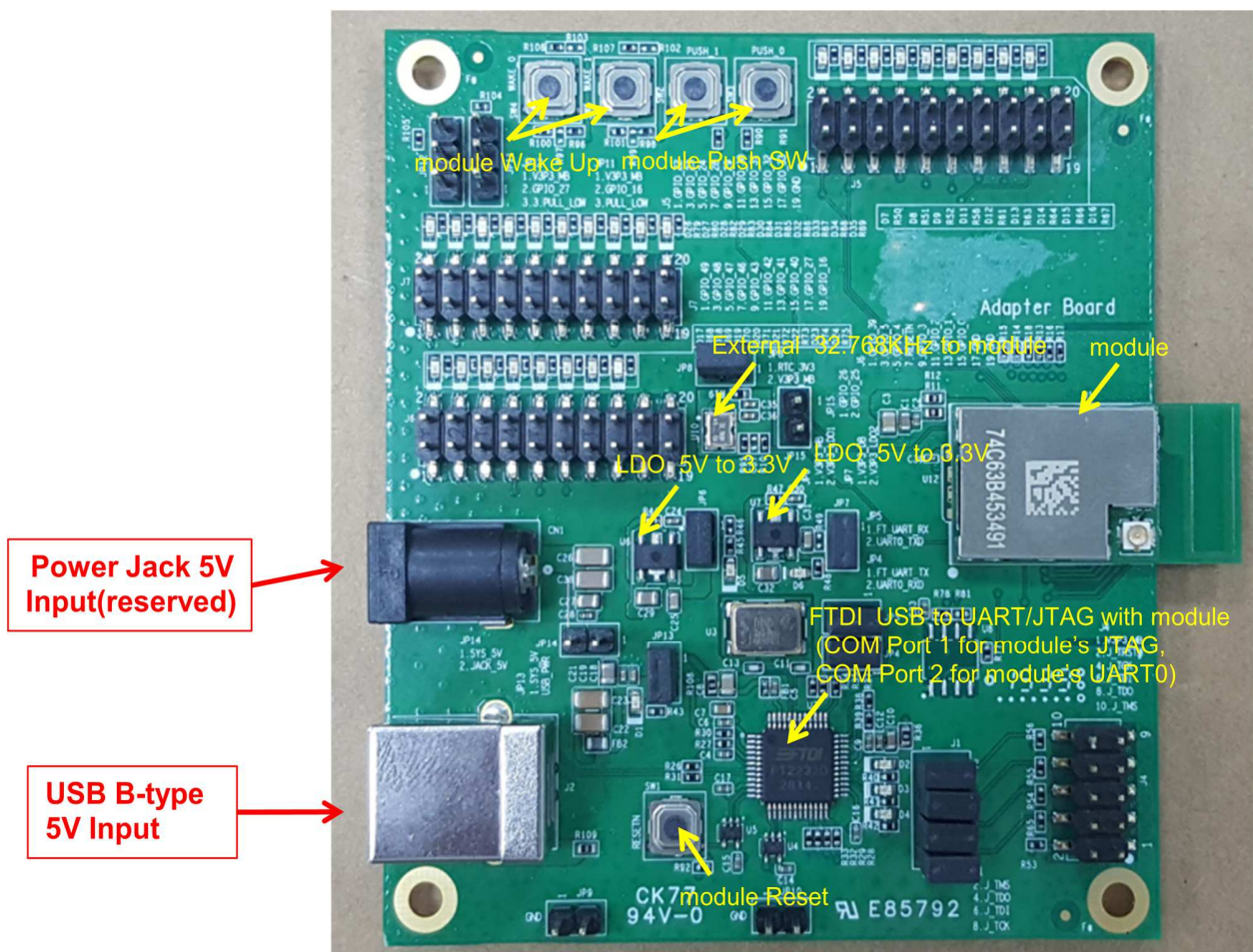
OVERVIEW

This document is used for AW-CU300 and AW-CU300 V2.

1. System Setup

1-1. Hardware Requirements

- AW-CU300 Module test board(EVB)
- Windows system(OS later than Windows XP) for Labtool.
- Vector Signal Analyzer/WLAN analyzer for transmit measurements.
- WLAN signal generator for receiver measurements.
- RF isolation chamber for receive measurements.
- RF attenuators
- RF cable



1-2. Environment set up

1-2-1. Download and Install FTDI VCP Drivers (FT2232D)

Install the driver manually. You can get the driver from FTDI's web site.
<http://www.ftdichip.com/Drivers/VCP.htm>

Currently Supported VCP Drivers:

Operating System	Release Date	Processor Architecture							Comments
		x86 (32-bit)	x64 (64-bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows	2014-02-21	2.10.00	2.10.00	-	-	-	-	-	2.10.00 WHQL Certified Available as setup executable Release Notes

Verifying Driver Installation:

To verify that driver installation has completed successfully, you can open the "Device Manager" (right-click My Computer, select Properties).

In the System Properties windows, select Hardware, Device Manager.

Two "USB Serial Port" should be listed under MY-PC\Ports (COM & LPT)



1-2-2. Download Libusb-win32

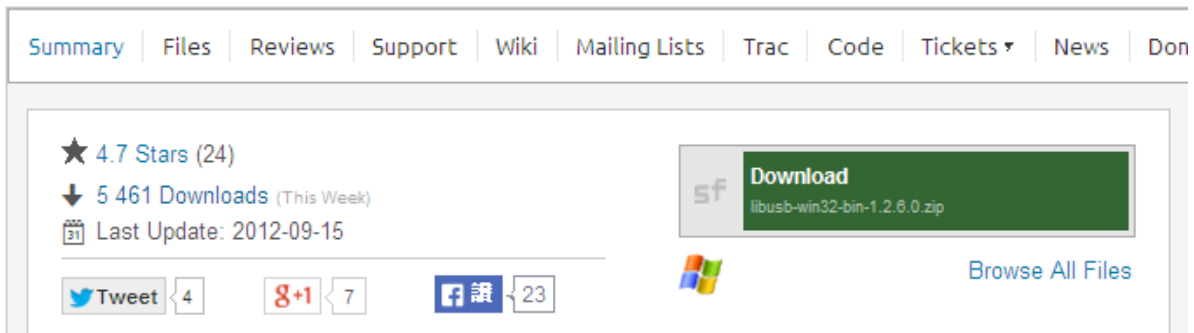
You can get the driver from libusb-win32's web site.

<http://sourceforge.net/projects/libusb-win32>

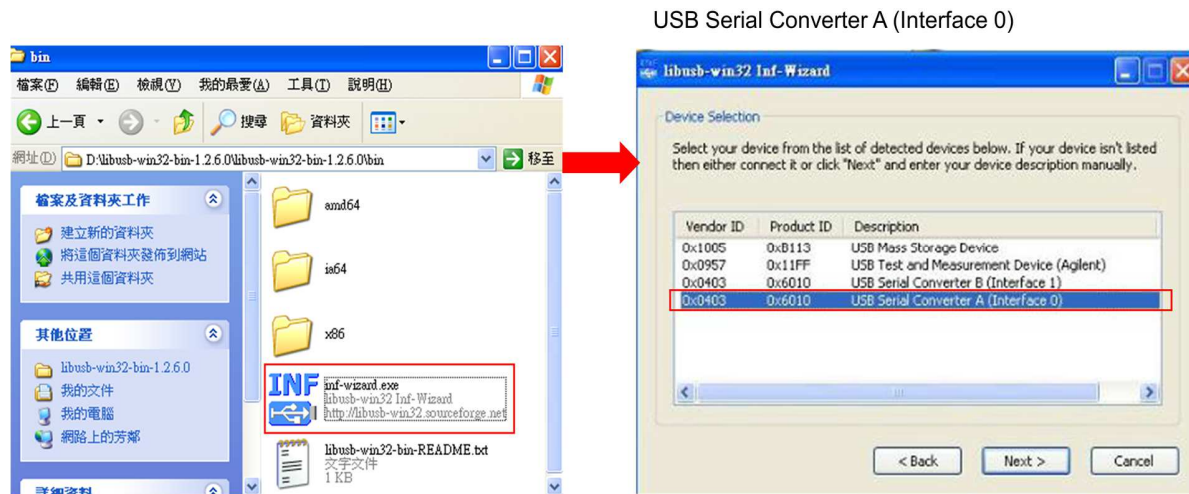
Home / Browse / Software Development / libusb-win32 /

libusb-win32

Brought to you by: ste_meyer, trobinso, xiaofanc



Install Libusb-win32



Vendor ID	Product ID	Description
0x1005	0xB113	USB Mass Storage Device
0x0957	0x11FF	USB Test and Measurement Device (Agilent)
0x0403	0x6010	USB Serial Converter B (Interface 1)
0x0403	0x6010	USB Serial Converter A (Interface 0)

Verifying Driver Installation:

To verify that driver installation has completed successfully, you can open the "Device Manager" (right-click My Computer, select Properties).

In the System Properties windows, select Hardware, Device Manager.

One "USB Serial Converter A" should be listed under MY-PC\Ports (lib usb-win32 devices)



1-2-3. Download and Install Cygwin

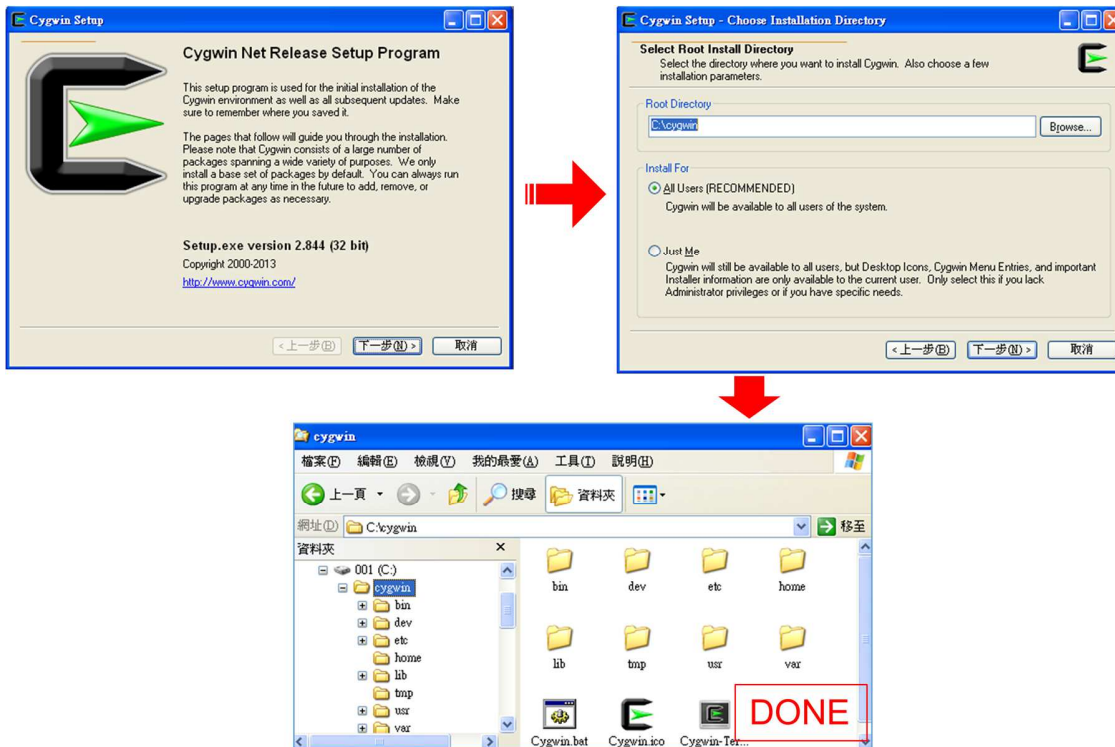
Install Cygwin:

1. Download Cygwin from: <http://www.cygwin.com/setup-x86.exe> (for x86 32-bit systems) or http://www.cygwin.com/setup-x86_64.exe (for x86 64-bit systems)
2. Select the option Install from Internet
3. Use default installation path: c:\cygwin. If you chose an alternate installation directory, please make sure that there are no spaces in the path.
4. Pick the Local Package Directory (this is the download cache directory)
5. Select the option Direct Connection
6. Select any mirror you want to use
7. Add additional packages to the default selection:

Click "Next". The Cygwin Setup window will show the progress as each package gets installed.

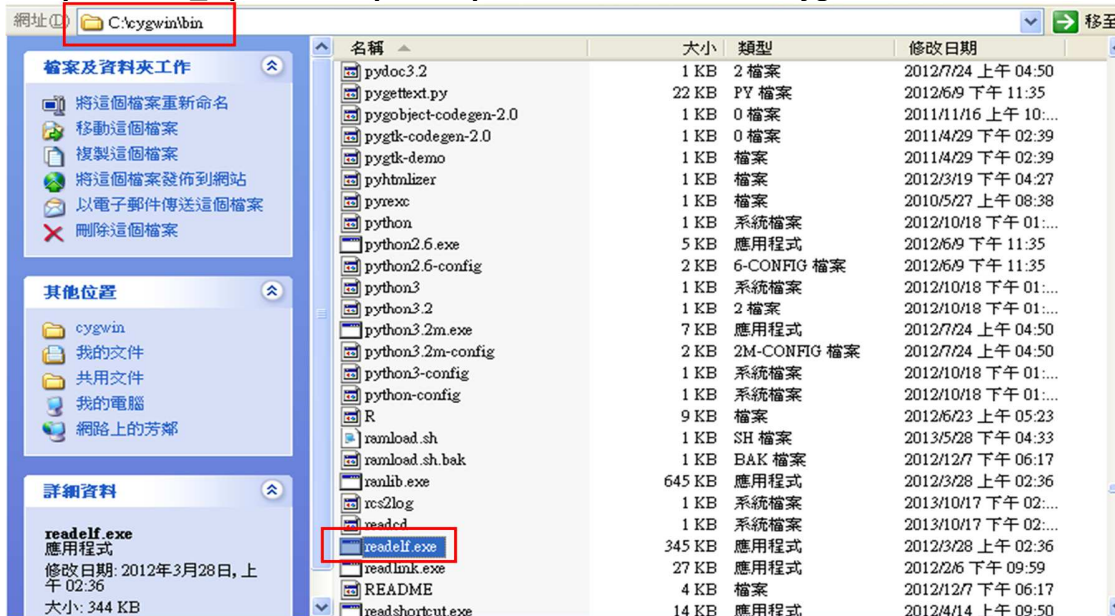
Note:

If you are not familiar with cygwin, please visit <http://cygwin.com/> for additional information and details. In particular, the Cygwin User Guide (<http://cygwin.com/cygwin-ug-net/>) is a good resource for new users.

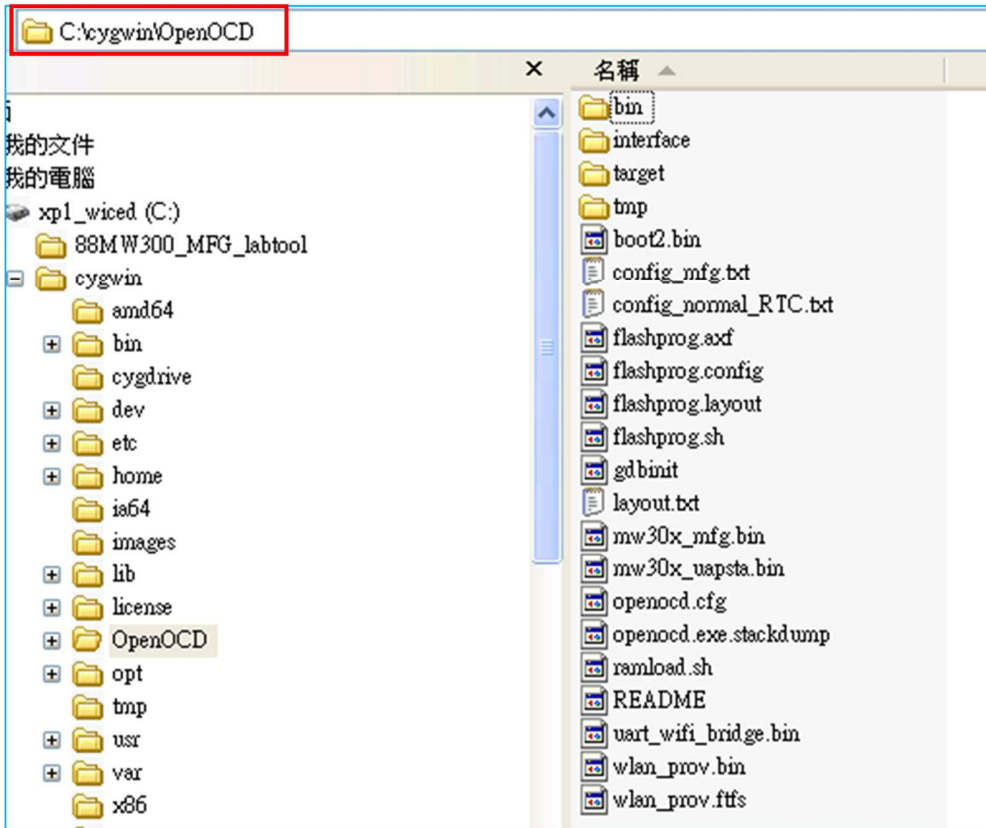


1-2-4 Insert file "OpenOCD.zip" for FW burn in.

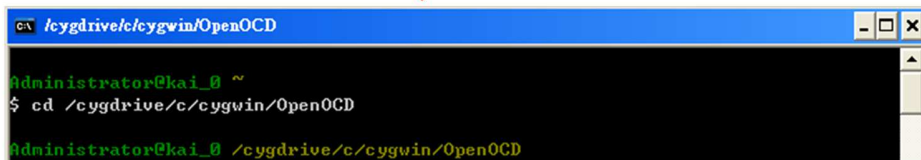
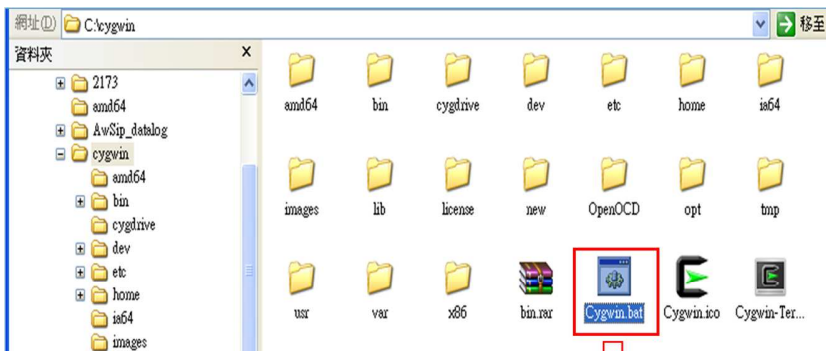
Unzip "CU300_OpenOCD.zip" and put "readelf.exe" to C:\cygwin\bin



Unzip "CU300_OpenOCD.zip" and put them to C:\cygwin\



Execute Cygwin.bat



Move to working folder

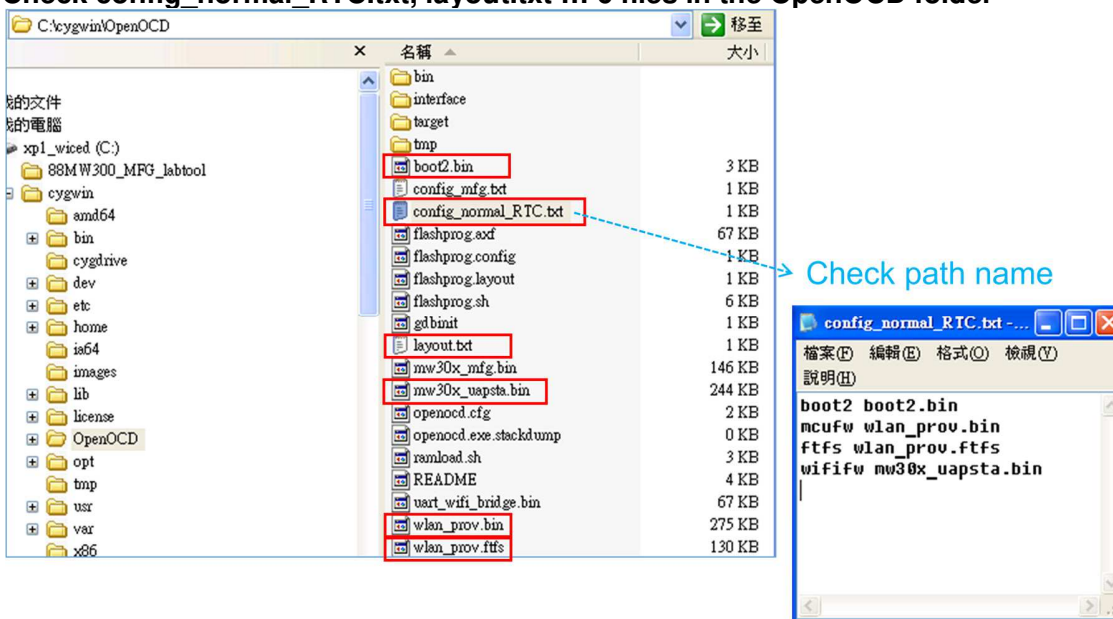
```

C:\ /cygdrive/c/cygwin/OpenOCD
Administrator@kai_0 ~
$ cd /cygdrive/c/cygwin/OpenOCD
Administrator@kai_0 /cygdrive/c/cygwin/OpenOCD
  
```

1-2-5 Burn in Normal/MFG FW for RF testing

1-2-5-1 Normal FW:

Check config_normal_RTC.txt, layout.txt ... 6 files in the OpenOCD folder



Key in cmd to burn in normal FW.

```

kai@kai-0 ~
$ cd /cygdrive/c/cygwin/OpenOCD
kai@kai-0 /cygdrive/c/cygwin/OpenOCD
$ ./flashprog.sh -l layout.txt -b config_normal_RTC.txt
  
```

Check if all files are burn in correctly

```

C:\cygdrive\c\cygwin\OpenOCD
requesting target halt and executing a soft reset
target state: halted
target halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000
30848 bytes written at address 0x00100000
downloaded 30848 bytes in 0.250000s (120.500 KiB/s)
verified 30848 bytes in 0.406250s (74.154 KiB/s)
semihosting is enabled

Flashprog version: 2.0.5
Erasing primary flash...done
Writing new flash layout...done
Writing "boot2" @0x0 (primary)...done
Writing "mcufw" @0x7000 (primary).....done
Writing "ftfs" @0xb7000 (primary)....done
Writing "wififw" @0x117000 (primary).....done
Please press CTRL+C to exit.
Exiting.

Terminated

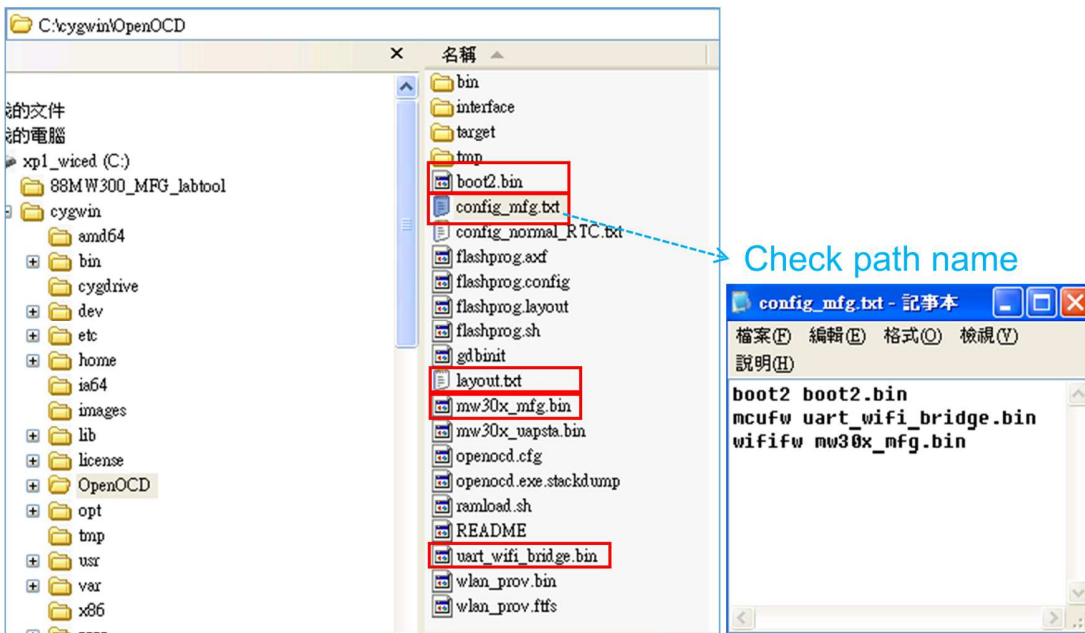
kai@kai-0 /cygdrive/c/cygwin/OpenOCD
$

```

Now you can perform normal link testing. (Needs to re-boot the EVB after burning in)

1-2-5-1 MFG FW:

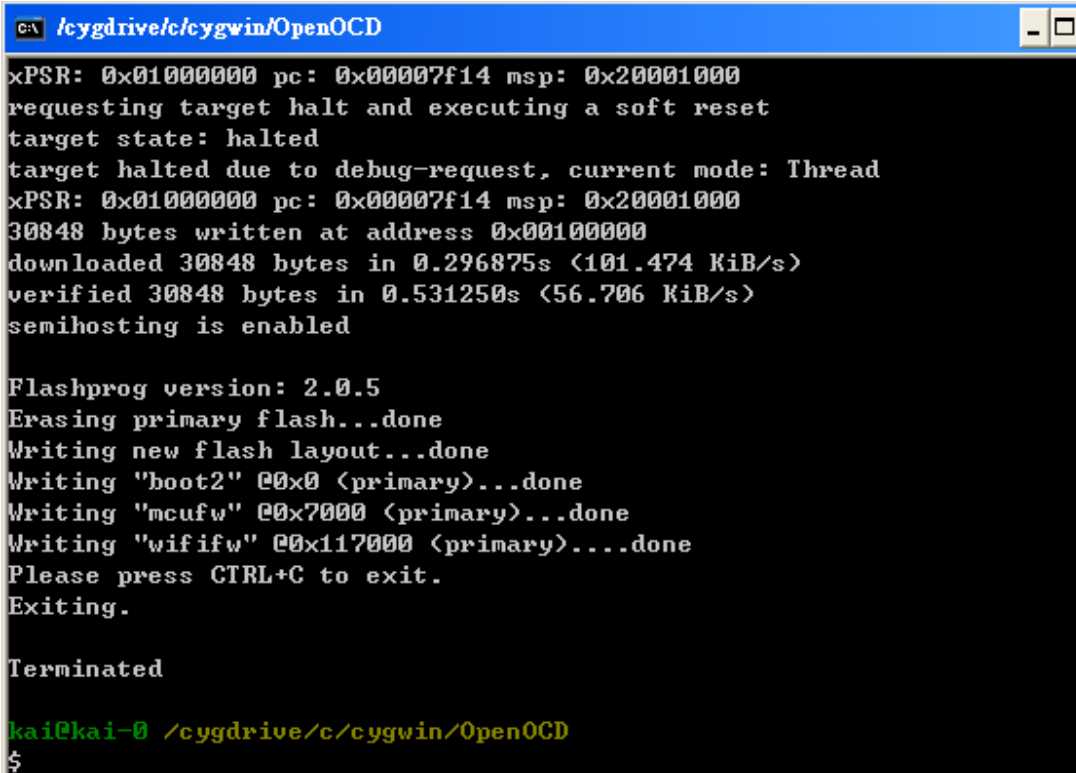
For RF testing with MFG FW, you needs to re-burn in the FW as below.
Check config_mfg.txt, layout.txt ... 5files in OpenOCD folder



Key in cmd to burn in MFG FW.

```
kai@kai-0 ~  
$ cd /cygdrive/c/cygwin/OpenOCD  
  
kai@kai-0 /cygdrive/c/cygwin/OpenOCD  
$ ./flashprog.sh -l layout.txt -b config_mfg.txt
```

Check if all files are burn in correctly



```
c:\ /cygdrive/c/cygwin/OpenOCD  
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000  
requesting target halt and executing a soft reset  
target state: halted  
target halted due to debug-request, current mode: Thread  
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000  
30848 bytes written at address 0x00100000  
downloaded 30848 bytes in 0.296875s (101.474 KiB/s)  
verified 30848 bytes in 0.531250s (56.706 KiB/s)  
semihosting is enabled  
  
Flashprog version: 2.0.5  
Erasing primary flash...done  
Writing new flash layout...done  
Writing "boot2" @0x0 (primary)...done  
Writing "mcufw" @0x7000 (primary)...done  
Writing "wififw" @0x117000 (primary)...done  
Please press CTRL+C to exit.  
Exiting.  
  
Terminated  
  
kai@kai-0 /cygdrive/c/cygwin/OpenOCD  
$
```

Now you can perform MFG RF testing. (Needs to re-boot the EVB after burning in)

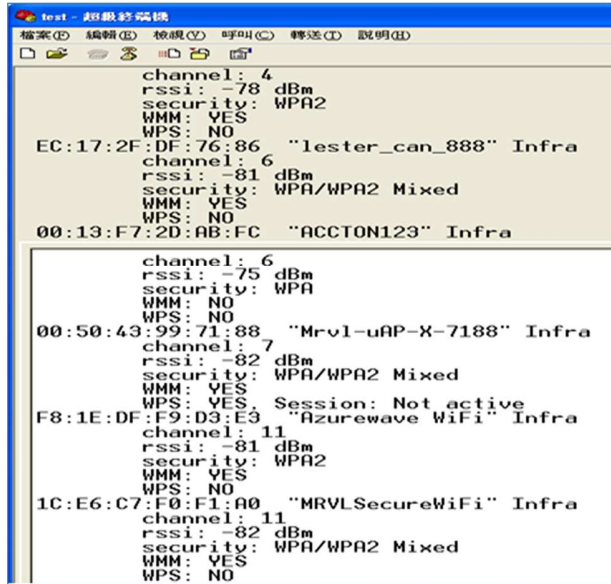
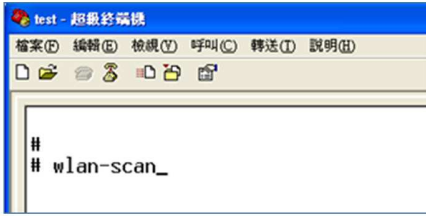
2. Normal link Test(w/ normal FW)

Open OS terminal and set USB comport (reference to the page9), set baud-rate as 115200

Enter cmd “help” on the screen to see a full list of commands available for use

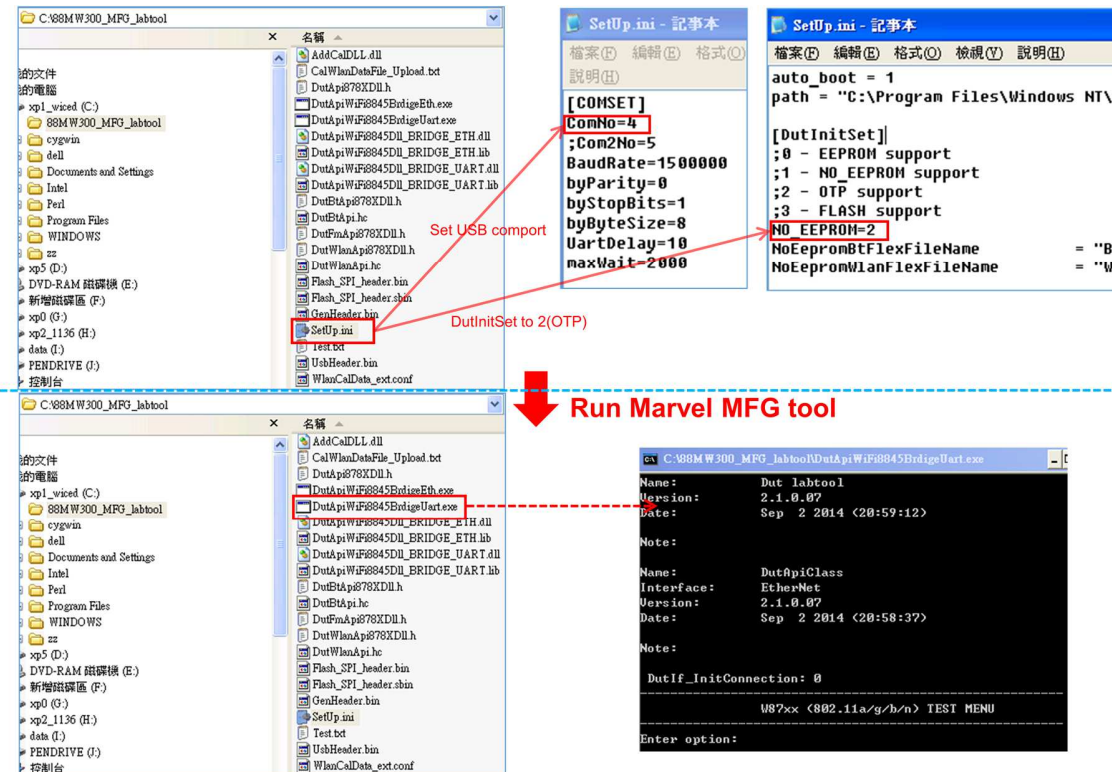
EX:
wlan-scan

That will scan around AP



3. RF Test(w/MFG FW)

Run Lab tool in Windows OS.



The image illustrates the process of running the Marvel MFG tool in Windows OS. It shows the following steps:

- File Explorer:** The directory `C:\88M W300_MFG_labtool` is shown, containing various files like `AddCaDLL.dll`, `CalWlanDataFile_Upload.bat`, and `DutApiWiFi8845BridgeUart.exe`. A red box highlights `Setup.ini` with the annotation "Set USB comport".
- Setup.ini (Notepad):** The configuration file is shown with the following settings:


```
[COMSET]
ComNo=4
;Com2No=5
BaudRate=1500000
byParity=0
byStopBits=1
byByteSize=8
UartDelay=10
maxWait=2000
```

 A red box highlights `ComNo=4` with the annotation "Set USB comport".
- Setup.ini (Notepad):** The initialization settings are shown:


```
[DutInitSet]
;0 - EEPROM support
;1 - NO EEPROM support
;2 - OTP support
;3 - FLASH support
NO EEPROM=2
NoEepromBtFlexFileName = "Bt
NoEepromWlanFlexFileName = "Wl
```

 A red box highlights `NO EEPROM=2` with the annotation "DutInitSet to 2(OTP)".
- Terminal Window:** The command `C:\88M W300_MFG_labtool\DutApiWiFi8845BridgeUart.exe` is executed. The output shows:


```
Name:      Dut_labtool
Version:   2.1.0.0?
Date:      Sep 2 2014 <20:59:12>

Note:

Name:      DutApiClass
Interface: EtherNet
Version:   2.1.0.0?
Date:      Sep 2 2014 <20:58:37>

Note:

DutIf_InitConnection: 0

W87xx <802.11a/g/h/n> TEST MENU

Enter option:
```

A red arrow labeled "Run Marvel MFG tool" points from the file explorer to the terminal window.

3-1 Generate 802.11b/g/n Packet commands

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

```
25 // Stop Tx
112 0 // Set to 20 MHz BW
12 6 // Set to CH 6
22 6 10 0 // Set to CH 6 at 10 dBm Output Power with CCK/BPSK Data Rate on WiFi
25 1 4 // Tx at 11 Mbps
```

b. Tx on CH 100 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on WiFi

```
25 // Stop Tx
112 0 // Set to 20 MHz BW
12 13 // Set to CH 13
22 13 8 1 // Set to CH 13 at 8 dBm Output Power with OFDM Data Rate on WiFi
25 1 22 // Tx at MCS 7
```

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	

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

3-2 Generate 802.11 b/g/n continuous symbol Commands

a. Cont. Tx on CH 7 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on WiFi

```
17 // Stop Cont. Tx
25 // Stop Tx
112 0 // Set to 20 MHz BW
12 7 // Set to CH 36
22 7 8 1 // Set to CH 36 at 8 dBm Output Power with MCS Data Rate on WiFi
25 1 22 // Tx at MCS 7
25 // Stop Tx
17 1 22 // Cont. Tx at MCS7
17 // Stop Cont. Tx
```


3-3 Test RX sensitivity Commands

a. Rx on CH 7 in 20 MHz BW Mode on WiFi

```
25           // Stop Tx
112 0       // Set to 20 MHz BW
12 7        // Set to CH 7
31          // Clear all the received packets
32          // Get Rx Packet Count and then clear the Rx packet counter
```

3-4 Others Commands

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