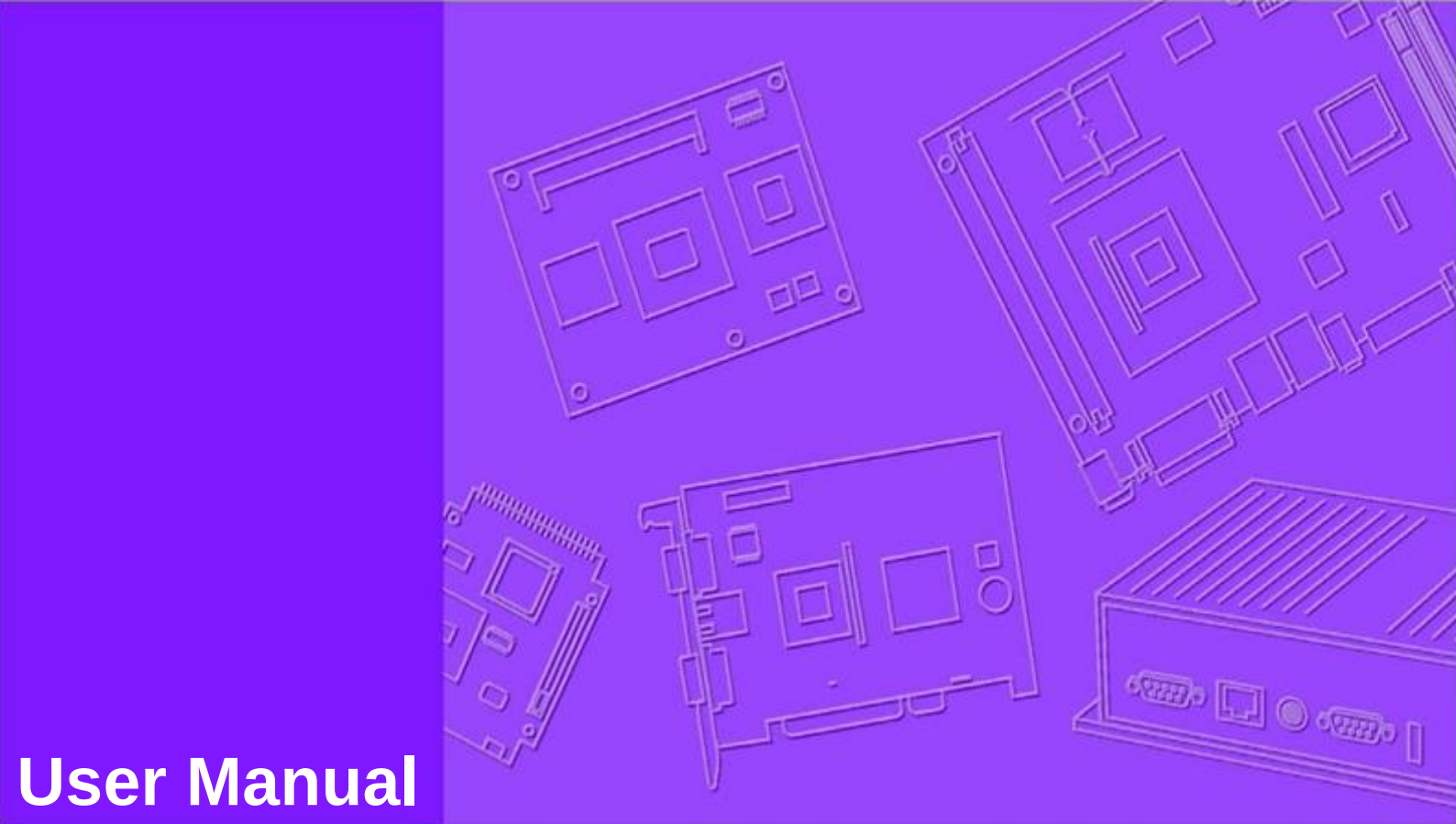




User Manual

WISE-1530

M2.COM WIFI/BLE IoT Node

ADVANTECH

Enabling an Intelligent Planet

Copyright

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Acknowledgements

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase. This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty

service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

FCC Class B

Note: 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.

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.

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.

IMPORTANT NOTE:

FOR MOBILE DEVICE USAGE (>20cm/low power)

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.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

If the labelling area is small than the palm of the hand, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: M82-WISE1530 ".

If the labelling area is larger than the palm of the hand, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

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

As long as **2** 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

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

FOR MOBILE DEVICE USAGE (>20cm/low power)

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: M82-WISE1530". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

NCC

低功率電波輻射性電機管理辦法

- 第十二條 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。
- 第十四條 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。

模組認證：

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤。

2. 系統廠商應於平台上標示「本產品內含射頻模組： CCAH09LP0190T1 XXXyyyLPDzzzz-x」字樣。

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- 1 WISE-1530
- 1 Screw for WISE-1530
- 1 China RoHs Notice

Optional Accessories

Part No.	Description
1750008001-01	Wi-Fi antenna Dipole L=141.5mm, 5dBi 2.4/5GHz
1750008653-01	Antenna Cable RP-SMA to MHF4 L=200mm
1750007965-01	Antenna Cable R/P SMA (M) to MHF4, 300mm
1700015038	FPC Cable 10P-0.5mm 7.9cm for DCU2.0
1931000590	Screw M2.5x5L F/S D=5.3 H=0.8 (1+) ST Ni
1700023619-01	A cable USB-A 4P(M)/micro USB 5P(M) 1m ADAM-T212
1700025876-01	M cable USB-A 4P(M)/Plug-in 2P-5.0 90CM
XRISC-ADP-10HW-AG	ADP A/D 100-240V 10W 5V WM
193A231540	POST F=M3*6L M=M3*6L D=5 d=2.88 B=5 H=15 Cu

Development Board

Part No.	Description
9696150000E	ASS'Y WISE-DB1500 A101-1 M2.COM CARRIER
9696ED2200E	ASS'Y WISE-ED22 A101 Daughter Board

Ordering Information

Part No.	WISE-1530ITB-SDA10
	WISE-1530 M2.COM WIFI/BLE module

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Change Log:

Date	Version	Description / Major change
2017/08/08	V0.1	Draft version

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1. Product Overview

1.1 Introduction

WISE-1530 is a wireless module integrated with ARM Cortex-M4 Processor and Wifi / BLE connectivity. This technology is the best solution for WIFI and BLE combo Applications. For example, we may use BLE to configure device and transfer mass data through wifi connectivity. You may choose the WIFI or BLE to submit your sensor data according to different scenario and purpose, such as the short range with low power consumption or mass data rate to complete the specific task.

Your sensors or applications with low data rate requirement can be achieved years battery lifetime in short range communication BLE. Advantech WISE-1530 also provides multi-interfaces for sensor and I/O control.

With ThreadX v5.6 microprocessor operating system and add-on software stacks, it's convenient to build the application software or sensor algorithm over the OS. Data can be quickly and easily acquired and transformed into a different format to communicate with WISE-PaaS or other cloud services. Developer can build their application backbone faster and focus on their applications, value-added services.

The main features of WISE-1530 are:

- ARM Cortex-M4 Core Processor
- Built-in Wifi / BLE connectivity
- Great for Low Power Energy application
- Rich interfaces for sensor and I/O control
- Support ThreadX v5.6
- Support wide temperature -20 ~ 70 °C

1.2 Specifications

Processor System	MCU	STM32F4 ARM® 32-bit Cortex®-M4 CPU 100MHz
Memory	RAM	256KB
	Flash	1024KB
Form Factor		M2.COM Type A 2230
Spec. Standard		M2 COM Technical SPEC_v1.1
Wireless Network	Standard	IEEE 802.11b/g/n and Bluetooth 4.1
	Frequency	2.4000~2.4840 GHz for Wi-Fi
	Band	2.4000~2.4835 GHz for BLE
	Channels	'1~13 for Wi-Fi and 79 for Bluetooth and 39 for BLE
	Topology	Star network
	Transmit Power	Typ. 14 dBm $\pm$ 2 at 802.11b CCK Mode 1M
		Typ. 12 dBm $\pm$ 2 at 802.11g OFDM Mode 54M
		Typ. 12 dBm $\pm$ 2at 802.11n OFDM Mode MCS0
	Receiver Sensitivity	Max 10 dBm $\pm$ 2 for BLE
		'Typ. -95dBm at 1 Mbps
		Typ. -75 dBm at 54 Mbps
		Typ. -89 dBm at MCS0
	RF Data Rate	Typ. -89 dBm for BLE
		Up to 65Mbps
	Function	End node
	Antenna connector	MHF4 connector
I/O	UART	1 (2 wire support RTS/CTS)
	I2C	1
	GPIO	2
	SPI	1
	I2S	1
	ADC	4
Programming / Debug Port		1 via WISE-ED22 (CN1)
Power		3.3V
Environment	Operational Temperature	-20 ~ 70° C
	Operating Humidity	5% ~ 95% Relative Humidity, non-condensing

Physical	Dimensions	22 x 30 mm
Characteristics	(WxD)	
OS	ThreadX v5.6, SDK 4.1.8	

* Note: Frequency Band can be configurable for Japan or Korea by request.

2. H/W Installation

2.1 Board Connector

- M2.COM Type A Module
- Module size: 22 mm x 30 mm
- PCB thickness: 0.8 mm $\pm$ 10%
- Pin count: 75 pins
- Module input voltage: 3.3V DC-in
- Connector mating force: 30N Maximum
- Connector current rating: 0.5A / Power contact
- Connector operation temperature range: -45 °C to +85 °C

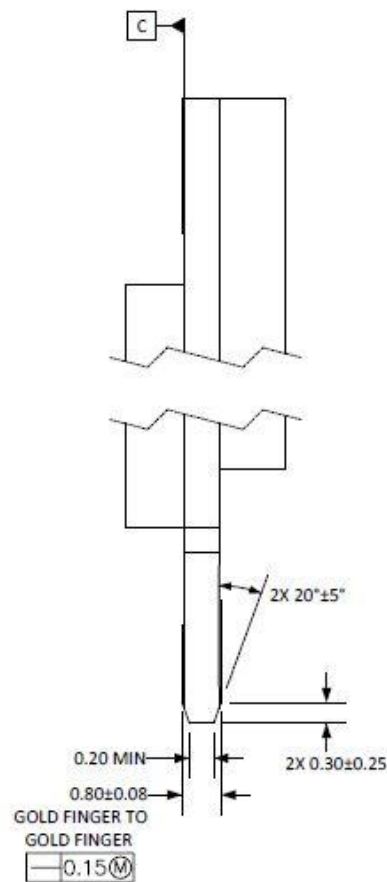


Figure 1 Card Edge Bevel

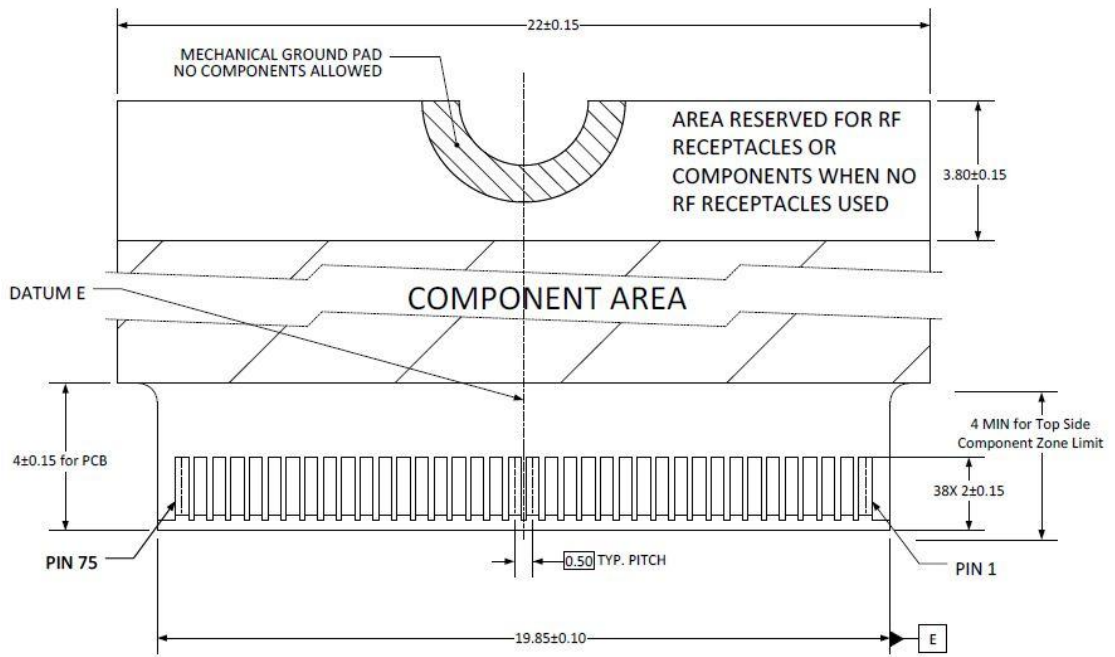


Figure 2 Card Edge Outline-Topside

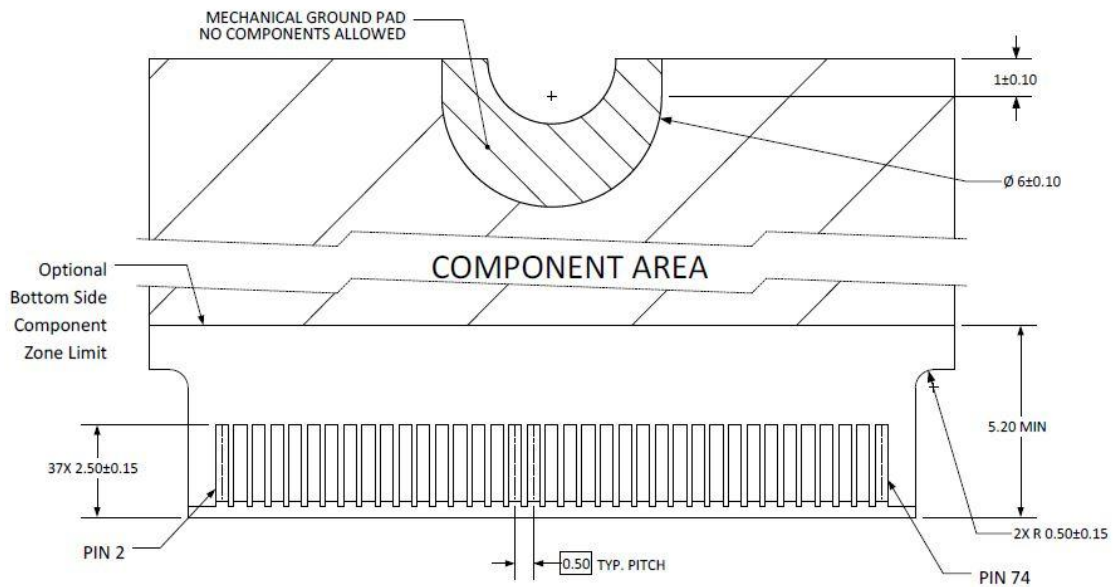


Figure 3 Card Edge Outline-Backside

Reference from PCI Express M.2 Specification Rev 1.0 (Nov 1, 2013) Section 2.3.5 Card PCB Details

2.2 Module Outline

The mechanical dimension information of M2.COM form factor follows the Type A 2230 module size: 22 x 30 mm. Both module types use a 75-position host interface connector and have room to support up to four RF connectors in the upper section.

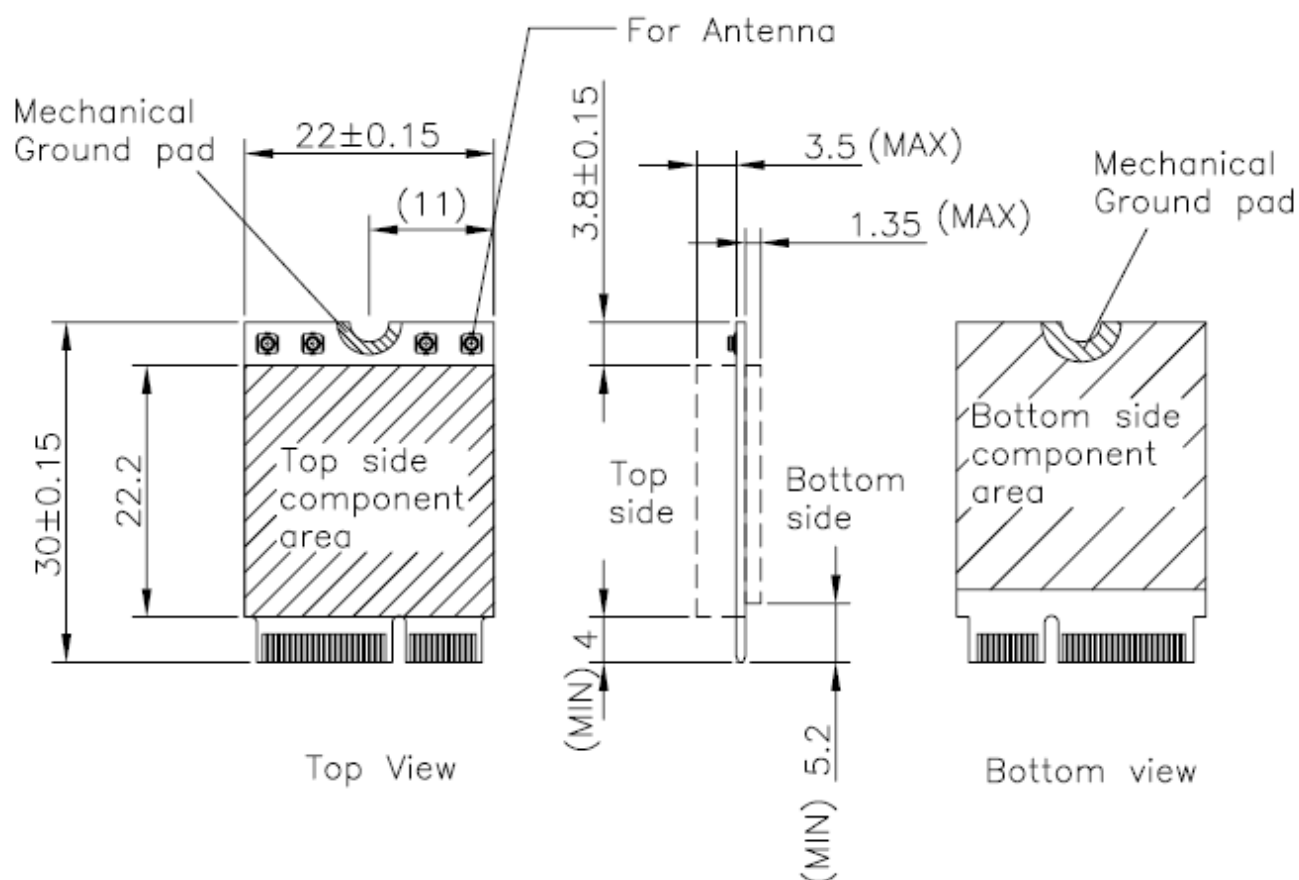


Figure 4 Type A 2230

2.3 Connector Specifications

2.3.1. Top Side Connector Physical Dimensions

The top-side scheme has two connectors that share a common footprint but have different stack-up requirements.

- Length – 22 mm maximum including land pattern
- Width – 9.1 mm maximum including land pattern

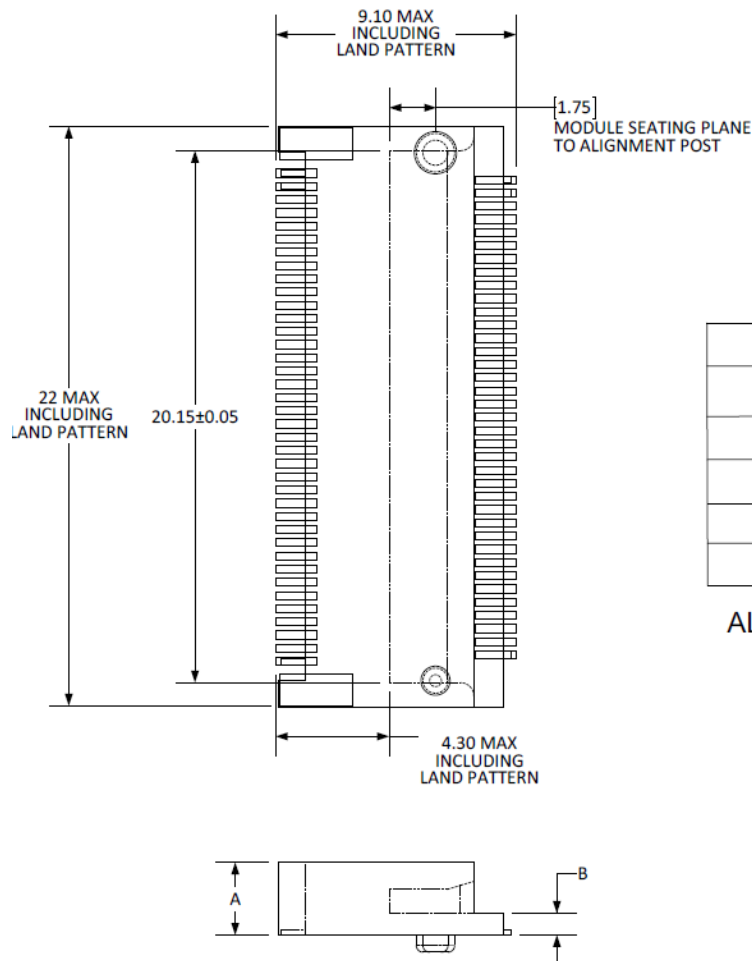


Figure 5 Top Side Connector Physical Dimensions

Reference from PCI Express M.2 Specification, Revision 1.0, November 1, 2013

2.3.2 Carrier Board Connection Length

The carrier board connector of M2.COM follows the Type 2230 M.2 module connector:

- The additional increase in length is 7.05mm maximum for top-side connector to the module length.
- The retention screw adds 2.75 mm maximum.
- The maximum extension, including land pattern, beyond the module leading edge is 4.3 mm.
- M2.COM module lengths are 30 mm and 42 mm.

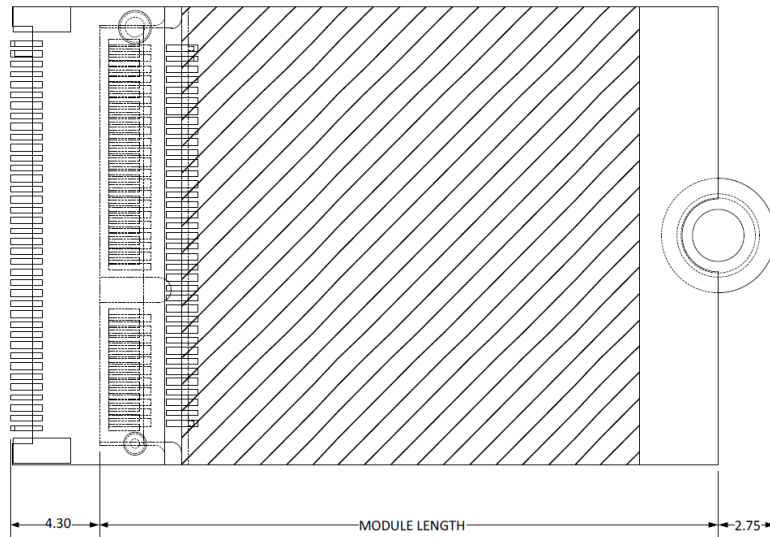


Figure 6 Carrier Board Connection Length

Reference from PCI Express M.2 Specification, Revision 1.0, November 1, 2013

2.3.3 Carrier Board Connector Height

The dimensions of M2.COM form factor follow the Type A 2230 -D3 M.2 module size. Hence, the carrier board connectors must choose H3.2-D3 or H4.2-D5 connector as in the following diagrams.

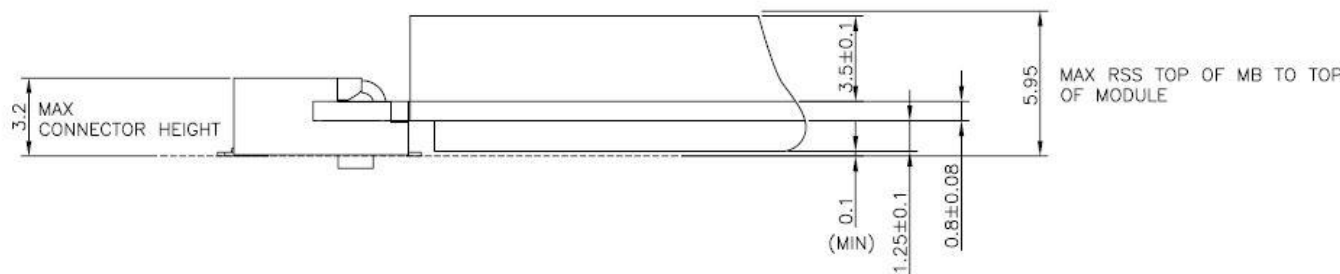


Figure 7 H3.2-D3

Reference from PCI Express M.2 Specification, Revision 1.0, November 1, 2013

2.4 WISE-1530 Pin-Out Map

1	GND	VCC	2
3	MICRO_USB_HS_DP	VCC	4
5	MICRO_USB_HS_DN	NC	6
7	GND	I2S_CK_MICRO	8
9	NC	I2S_WS_MICRO	10
11	NC	I2S_SD_MICRO	12
13	NC	NC	14
15	NC	CB_RESET_OUT#	16
17	NC	GND	18
19	NC	CB_PWR_ON	20
21	NC	UART3_TX (O)(0/3.3V)	22
23	NC	Connector Key	
	Connector Key	Connector Key	
	Connector Key	Connector Key	
	Connector Key	Connector Key	
	Connector Key	UART3_RX (I)(0/3.3V)	32
33	GND	NC	34
35	NC	NC	36
37	NC	GPIO_0_MICRO	38
39	GND	GPIO_1_MICRO	40
41	NC	NC	42
43	NC	GPIO_3_WL	44
45	GND	GPIO_4_WL	46
47	ADC0_MICRO	GPIO_5_WL	48
49	ADC1_MICRO	GPIO_6_WL	50
51	GND	NC	52
53	ADC2_MICRO	NC	54
55	ADC3_MICRO	NC	56
57	GND	I2C0_SDA	58
59	NC	I2C0_SCL	60
61	NC	SPI_MOSI	62
63	GND	SPI_MISO	64
65	+VBAT_R	SPI_SCK	66
67	NC	SPI_CS0#	68
69	GND	NC	70
71	RESET_IN#	VCC	72
73	WAKEUP_MICRO#	VCC	74

75	GND		
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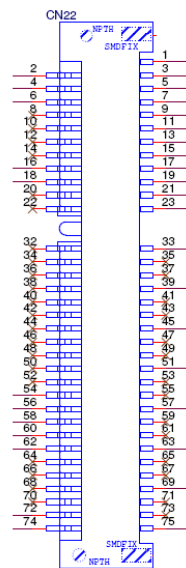


Figure 8 M.2 Connector

2.5 Quick Starter of WISE-1530

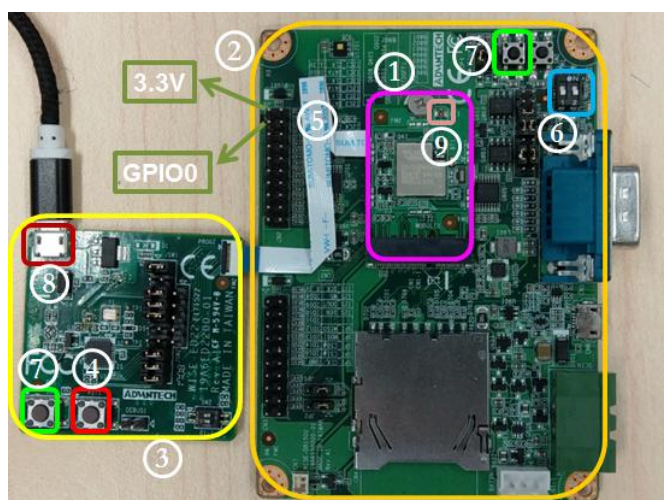
2.5.1 Preparing for Hardware

The user needs to prepare for hardware as following:

- WISE-1530, WISE-1500 and WISE-ED22.
- 802.11b/g/n (2.4 GHz) Wireless Access Point (AP).
- PC Runs on Windows®, Mac® OS X®, and Linux®

Please refer to the following steps for setup a WISE series of boards before using WISE-1530.

Step01: Please prepare boards as below.



- ① WISE-1530
- ② WISE-1500
- ③ WISE-ED22
- ④ WISE-ED22 reset button
- ⑤ CN2 on WISE-1500
- ⑥ SW3 on WISE-1500
 - Please check pin1 and pin2 to “OFF” as default.
 - Switch pin2 to decide whether running “backup to default” while device booting. “ON”: enabled, “OFF”: disable
- ⑦ WISE-1530 reset button, one button on WISE-1500 and the other on WISE-ED22
- ⑧ Micro USB connector
 - Drag-n-drop programming
 - Serial port and debugging
 - Power supplies for UART1 debug port
- ⑨ RF connector
- ⑩ Power connector

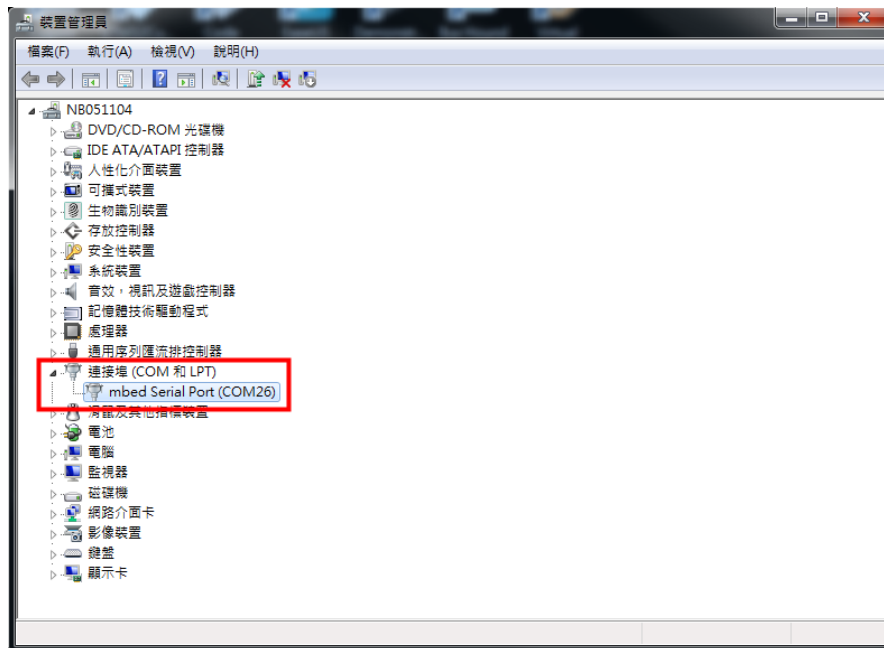
Step02: Connect the WISE-ED22 to PC using micro-USB cable.

(Please refer to

[http://ess-wiki.advantech.com.tw/view/WISE-ED22_User_Manual#Connection with target board](http://ess-wiki.advantech.com.tw/view/WISE-ED22_User_Manual#Connection_with_target_board))

① Install Driver

② The device will be visible in the Device Manager as below, user can use serial tools (putty, tera term ...etc.) to key-in command.



3. Development Environment Setup

3.1 Overview

WISE-1530 is used Cypress's WICED® SDKs to develop Wi-Fi and BLE application. WISE-1530 SDK use C/C++ language Runs on Windows® through Eclipse®-based integrated development environment (IDE).

Single installer package with support for:

- Wi-Fi + Bluetooth combo solution
 - Wi-Fi solutions
 - Bluetooth (Basic Rate, Enhanced Data Rate and Bluetooth Low Energy)
- Sample applications for many popular use cases like
 - Connecting to cloud services
 - Low-power BLE-based sensors and beacons
 - Smart home gateways
 - BLE-WiFi introducer
- Code snippets to understand WICED APIs

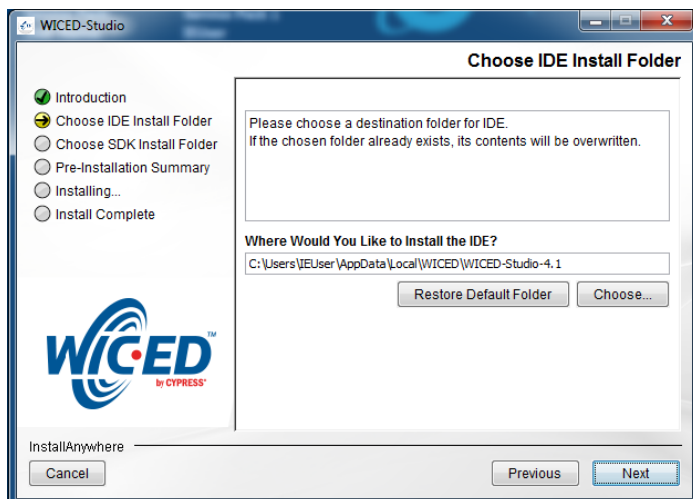
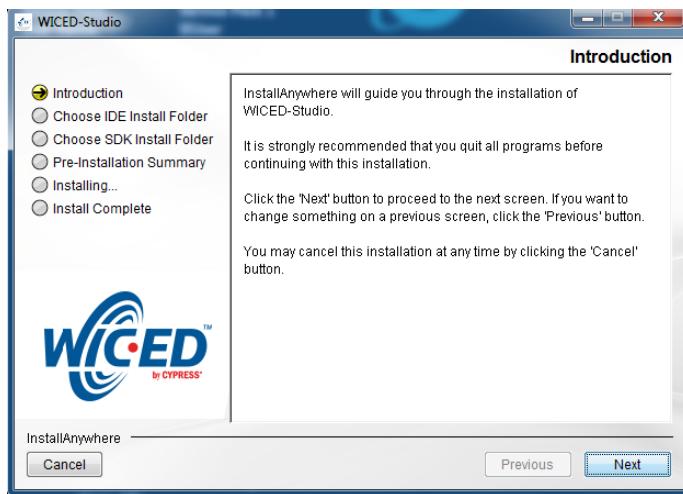
User can refer to [WICED Software](#) to get more information.

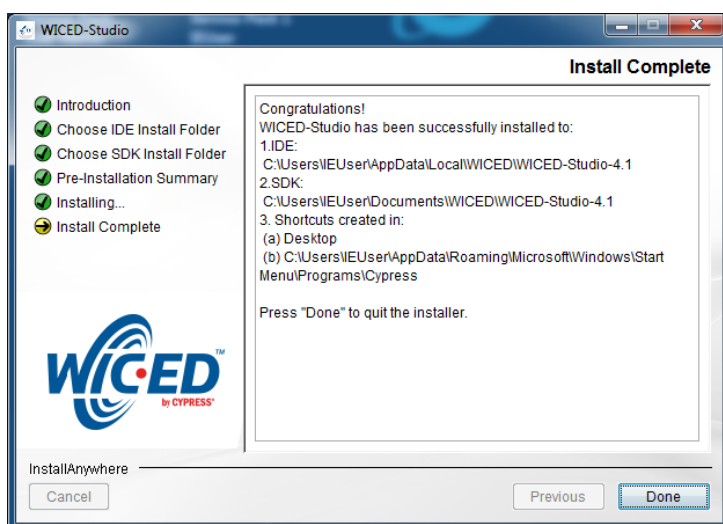
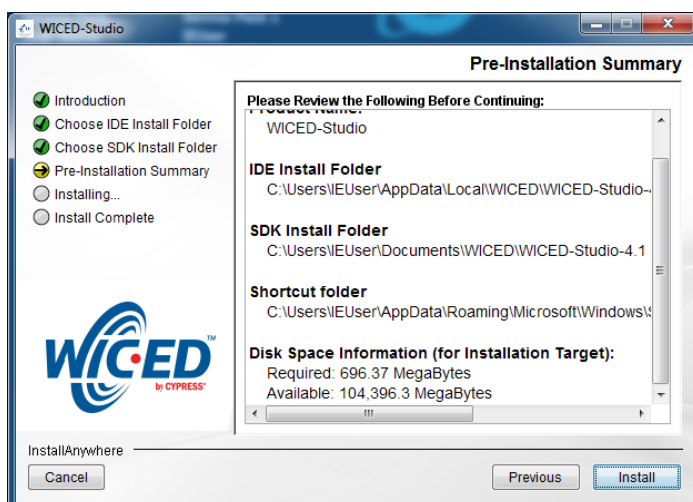
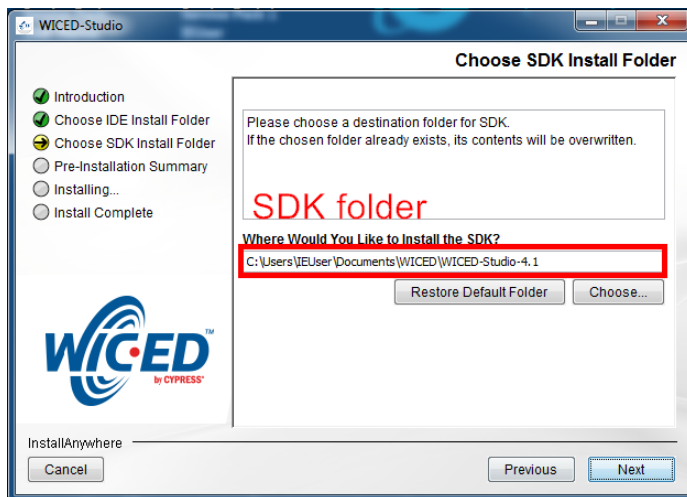
3.2 Installation of WICED Studio

The user can refer to the following steps for setup WICEDStudio with WISE-1530 SDK.

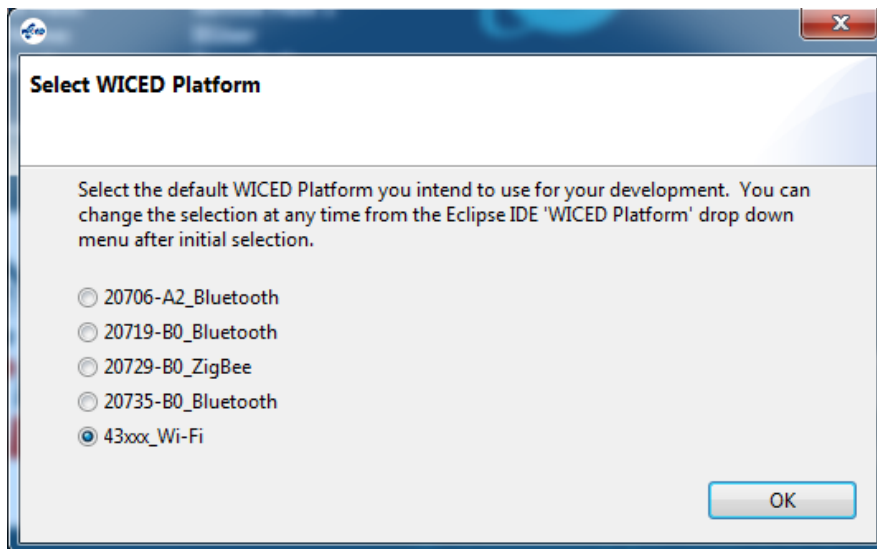
3.2.1 Windows Install

1. Download [WICED-Studio-5.2.0.22-IDE-Installer.zip](#)
2. Extract the installer exe from the zip file to temp folder on your computer; do not execute the installer from the zip file
3. Double click the installer exe to install WICED Studio as below picture





4. After installation is completed, launch WICED Studio IDE from shortcut on desktop
5. When you see the Select WICED Platform page, choose the **43xxx_Wi-Fi** item. You can change in "WICED Platform" in SDK toolbar also.



3.2.2 Copy patch file

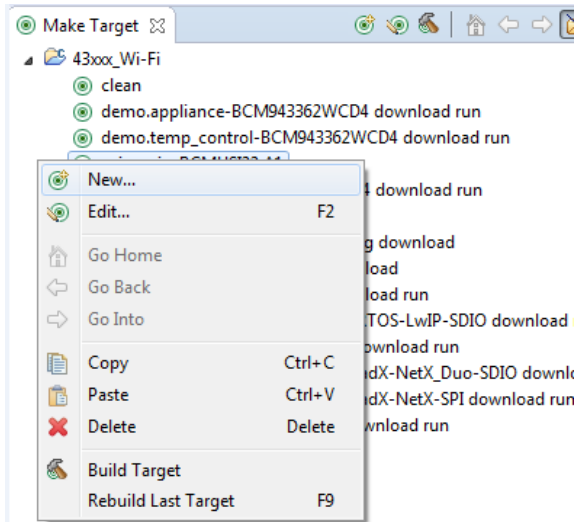
1. Download and unzip [WM-BN-BM-22 SDK 5.1.x platform patch.zip](#)
2. Copy platforms and WICED folders to <SDK folder>\43xxx_Wi-Fi\ and select replace

3.3 Build Source File

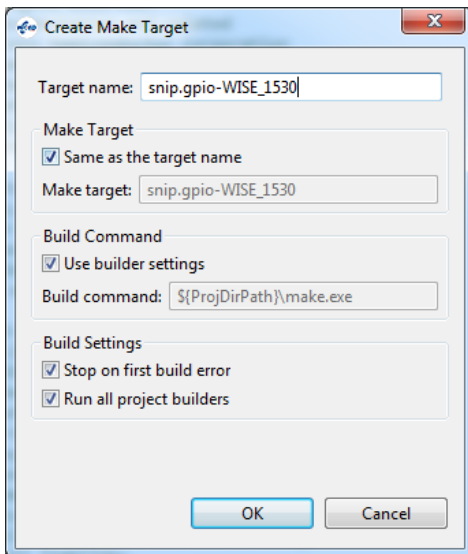
3.3.1 Make a "Make Target" file

Step1: In Make Target window click mouse right button

Step2: Select New...

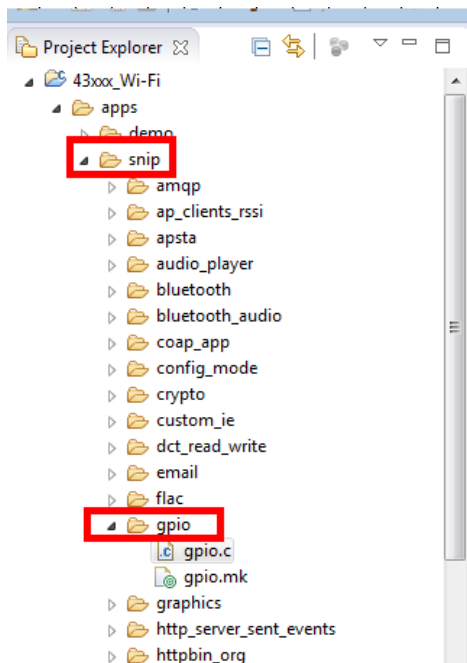


Step3: Type "snip.gpio-WISE_1530"



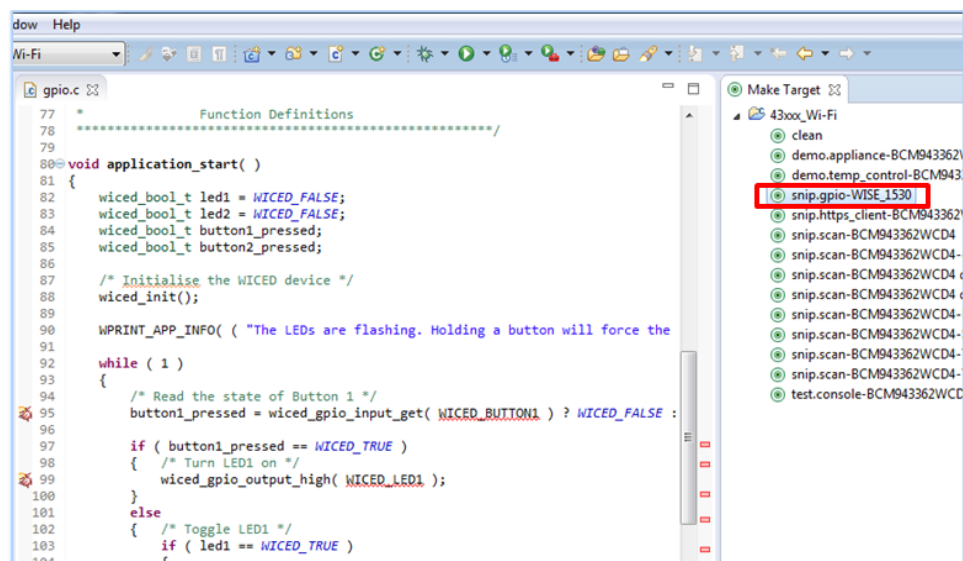
Field explanation: snip.gpio-WISE_1530

- snip.gpio: application project name
- WISE_1530: platform name, for WISE-1530 platform don't change this field



3.3.2 Build Project

Double click "Make Target" file to build project.



It is build complete when you see below

Making snip.gpio-WISE_1530.bin
snip.gpio-WISE_1530

Module	Flash	Static RAM
App	172	0
crc	1060	0
Host MCU-family library	13237	2481
Interrupt Vectors	388	0
libc	23350	3064
Networking	1001	8523
NetX-Duo - Interfaces & Stacks	0	16
Other	3678	92
Packet Buffers	0	23088
platform	1524	252
RAM Initialisation	2324	0
resources	16	0
Ring_Buffer	112	0
Startup Stack & Link Script fill	9	1
ThreadX	7864	396
Wi-Fi Firmware	383156	0
WICED	2919	936
WWD	12686	3059
TOTAL (bytes)	451172	41908

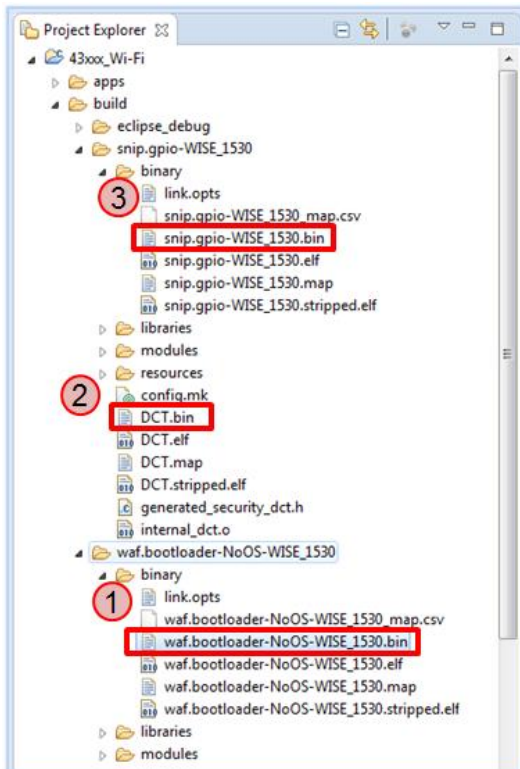
Build complete
Making .gdbinit

14:22:53 Build Finished (took 1m:10s.594ms)

3.4 Generate a Programming File

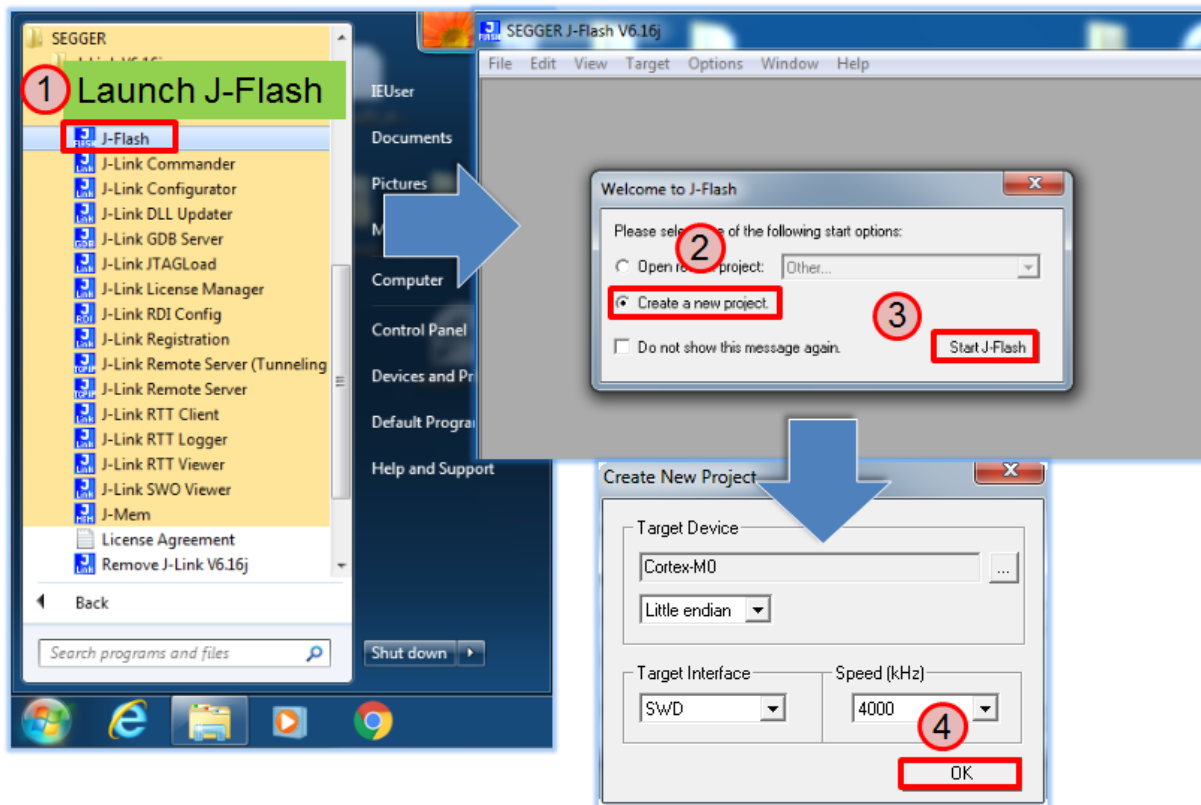
It will generate three bin files in <SDK folder>\43xxx_Wi-Fi\build folder when build complete.

1. Bootloader: waf.bootloader-NoOS-WISE_1530.bin
2. DCT(Device Configuration Table): DCT.bin:
3. Application: snip.gpio-WISE_1530.bin

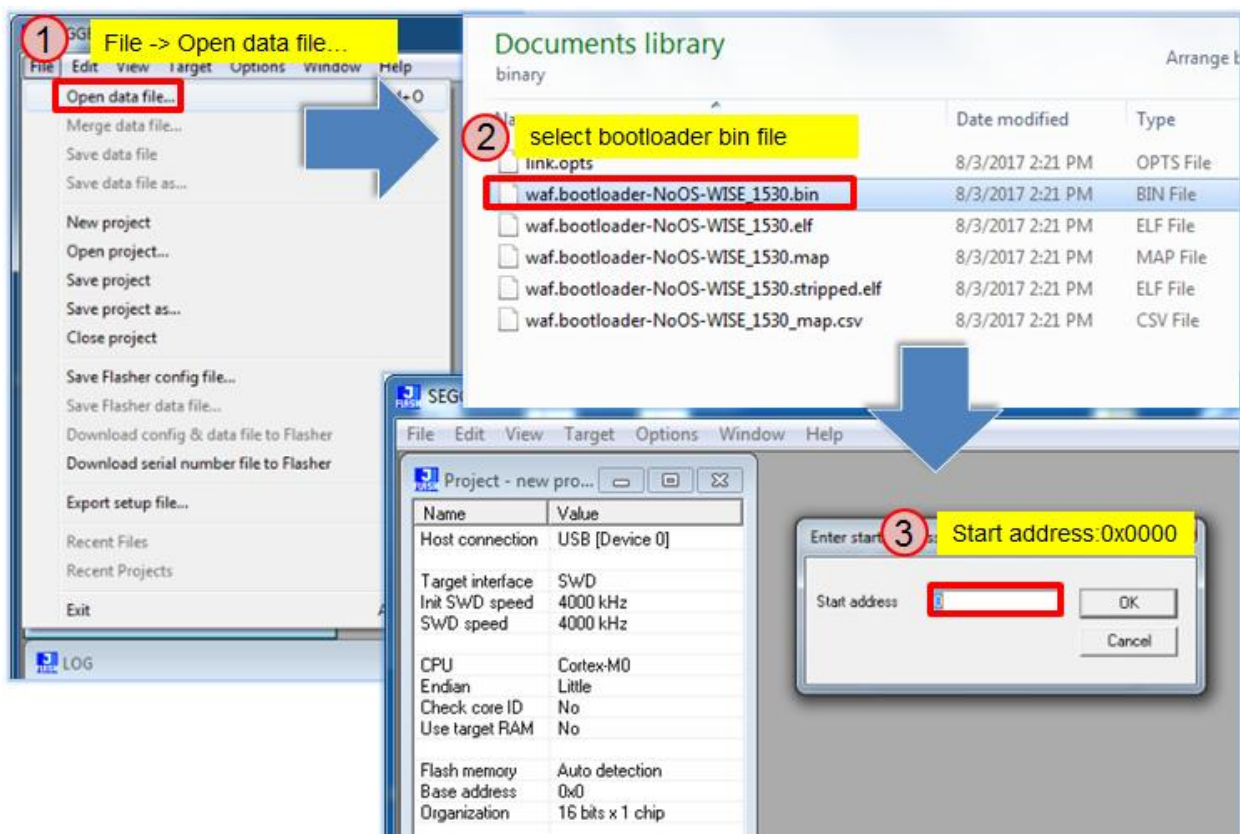


Download and install [J-Link](#) software, we need J-Flash tool to combine three bin files for programming.

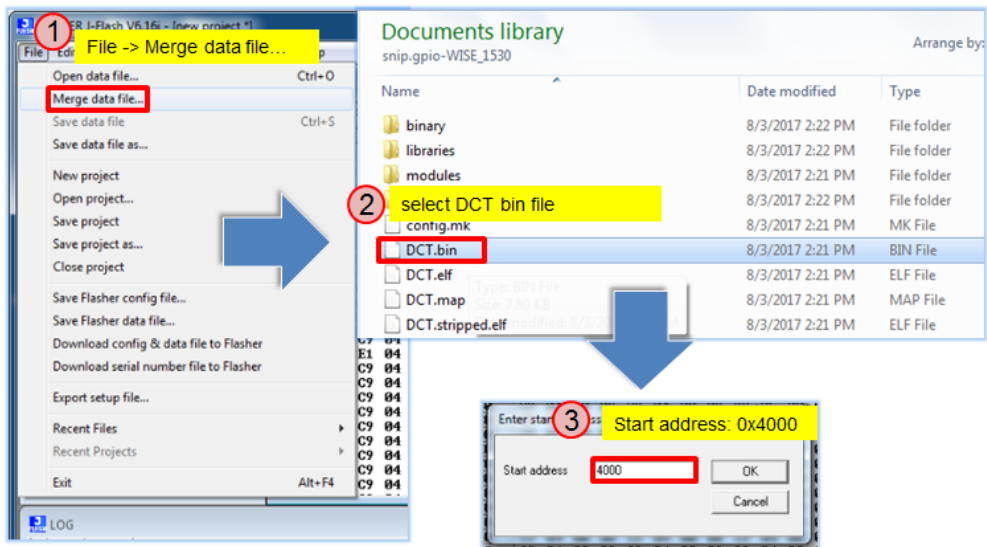
3.4.1 Launch J-Flash



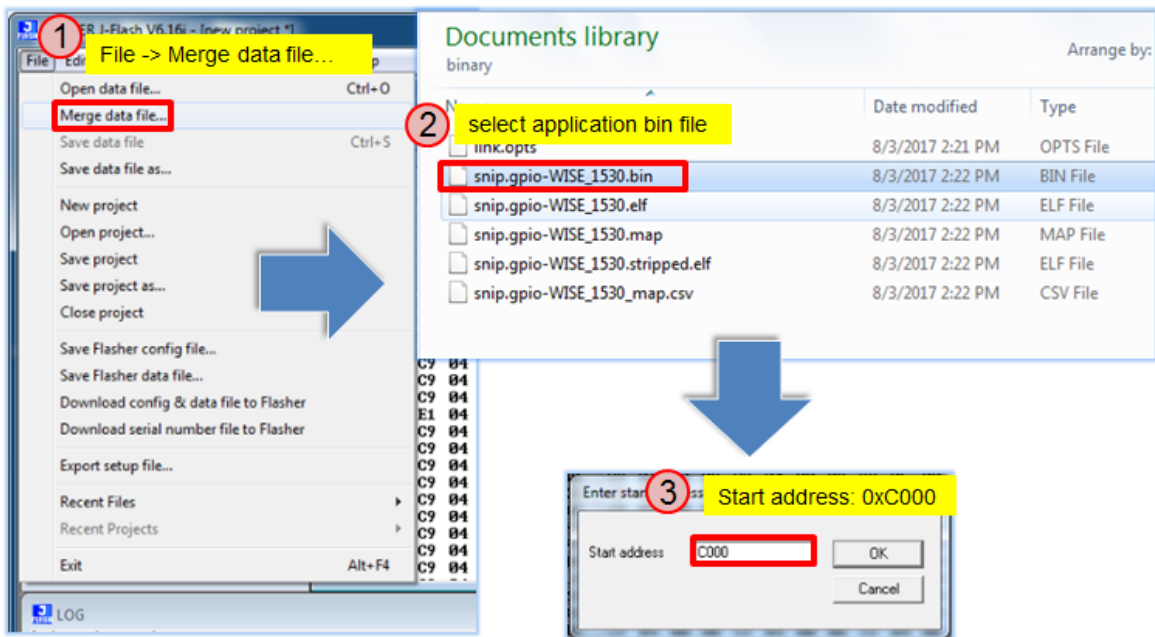
3.4.2 Open bootloader bin file



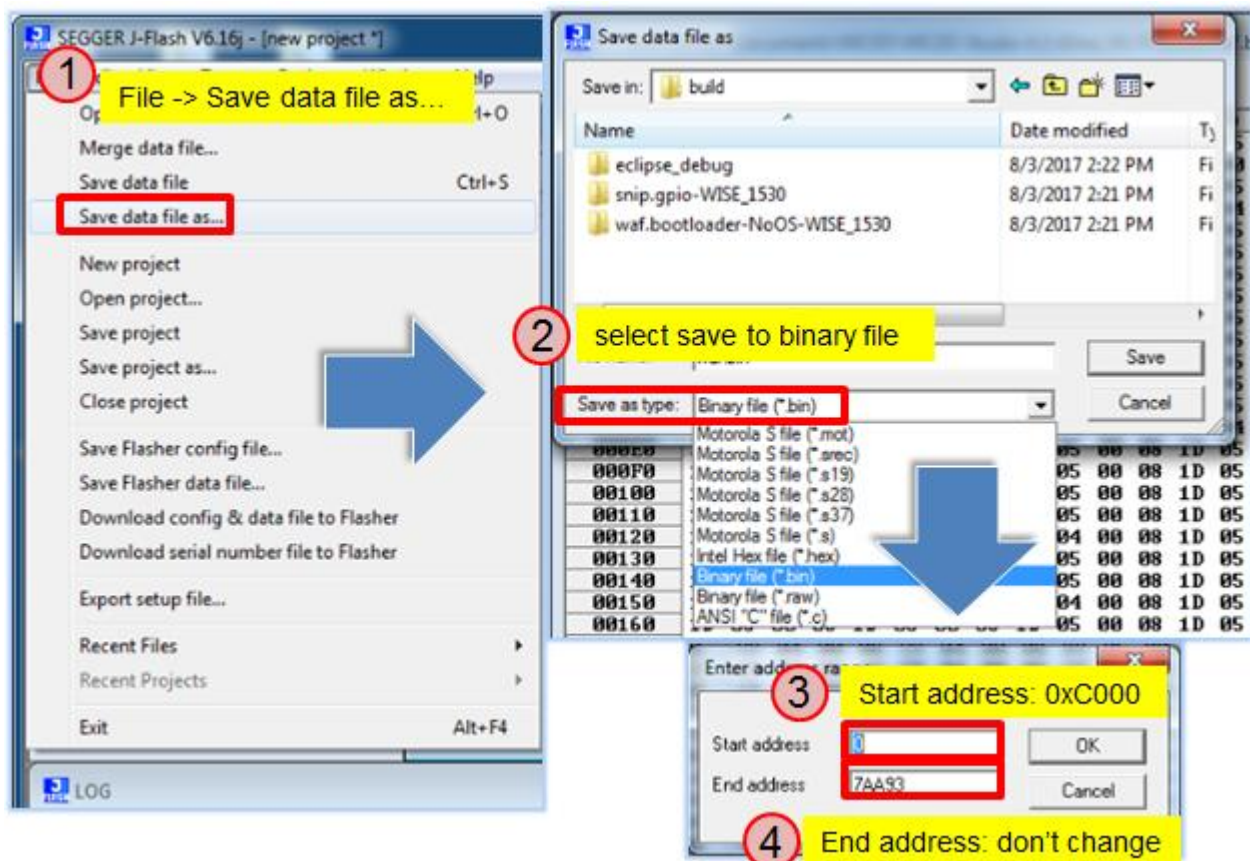
3.4.3 Merge DCT bin file



3.4.4 Merge application bin file



3.4.5 Save as a final bin file



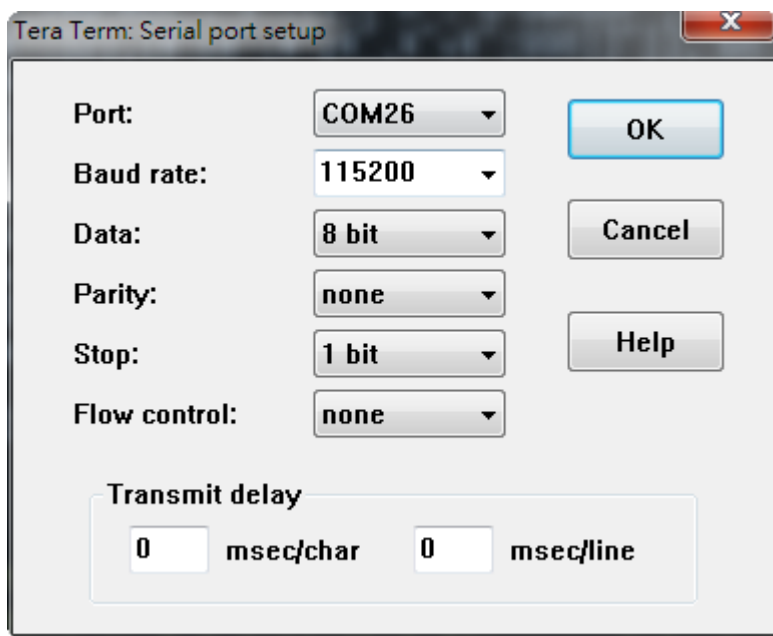
上圖有誤，已和 Erick 告知，Erick 之後會修改

3.5 Programming

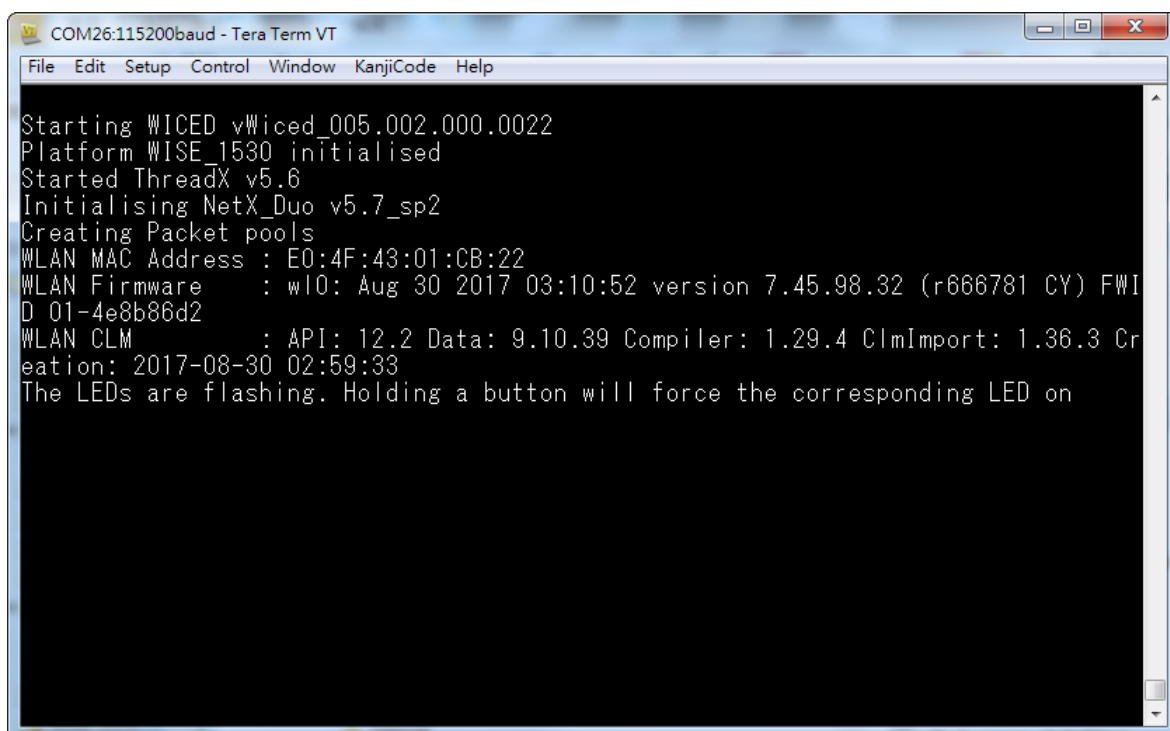
Generate a programming file then use [WISE-ED22](#) to program WISE-1530. User can refer [WISE-ED22 Drag-n-drop Programming](#) section

3.5.1 Debug Setting

Launch a serial port tool (use Tera Term in this), then setting as below.



Press WISE-1530 reset button, the screen will show as below.



4. Example: WISE-1530 Demo(StartKit)

4.1 Introduction

The Demo application has two main function. One is an BLE and WiFi introducer example. It demonstrates GATT database initialization, DCT configuration, processing read/write requests from a BLE client, and sending data to the client. The BLE WiFi Introducer has two components, an app running on a WICED devices, and an app(BLE Scanner) running on Android device. The other is [AgentLite](#) example. It demonstrates how to get the sensor value from WISE-1500 sensors and upload data to cloudserver.

4.2 Detailed about WISE-1530 Demo

The detailed behavior about this example is explained as following:

- System initiation.

Initiation hardware, Wi-Fi wlan connectivity, button1 thread...etc.

- BLE and WiFi introducer

WISE-1530 will attempt use default SSID and password connection to AP. If success, WISE-1530 will Loop in [AgentLite](#). Otherwise BLE will advertising for set SSID and password. The manipulation follow as below [Step by step usage guide](#) .

- Initiation sensor and access data from it.

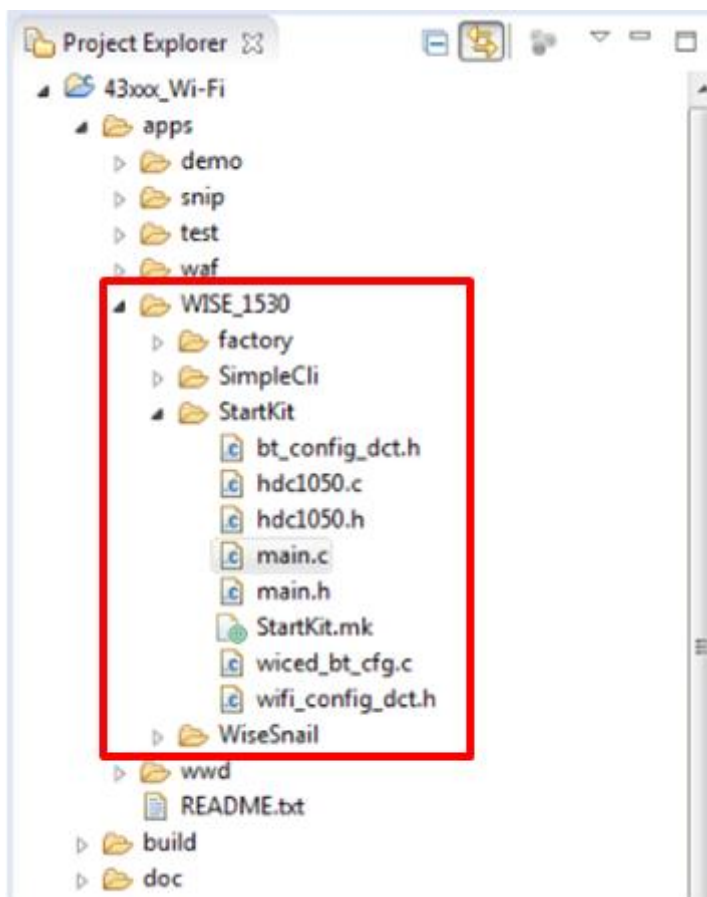
The TI HDC1050 has been design-in on WISE-1500. It's a digital humidity sensor with integrated temperature sensor. The HDC1050 is initialized in example and the user can get data of humidity and temperature from it.

- Loop in AgentLite or web service.

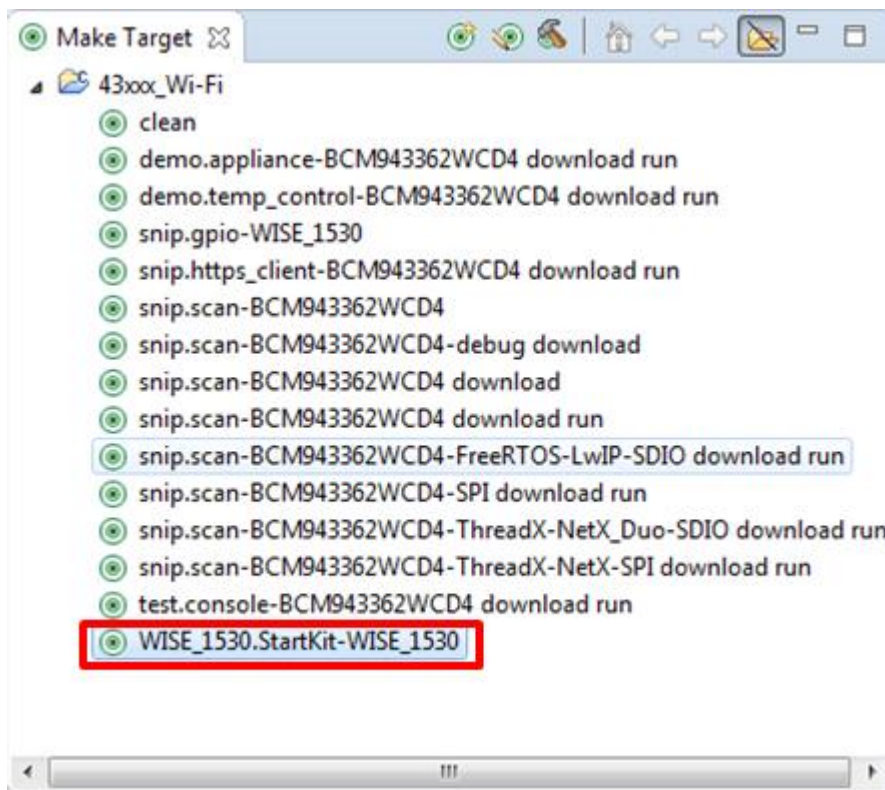
When device connect to AP, there are many things needed to do including connected to WISE-PaaS server, keep getting data from sensor and data exchanged through AgentLite. It is going to infinite loop for cloud service.

4.2 Step by step usage guide

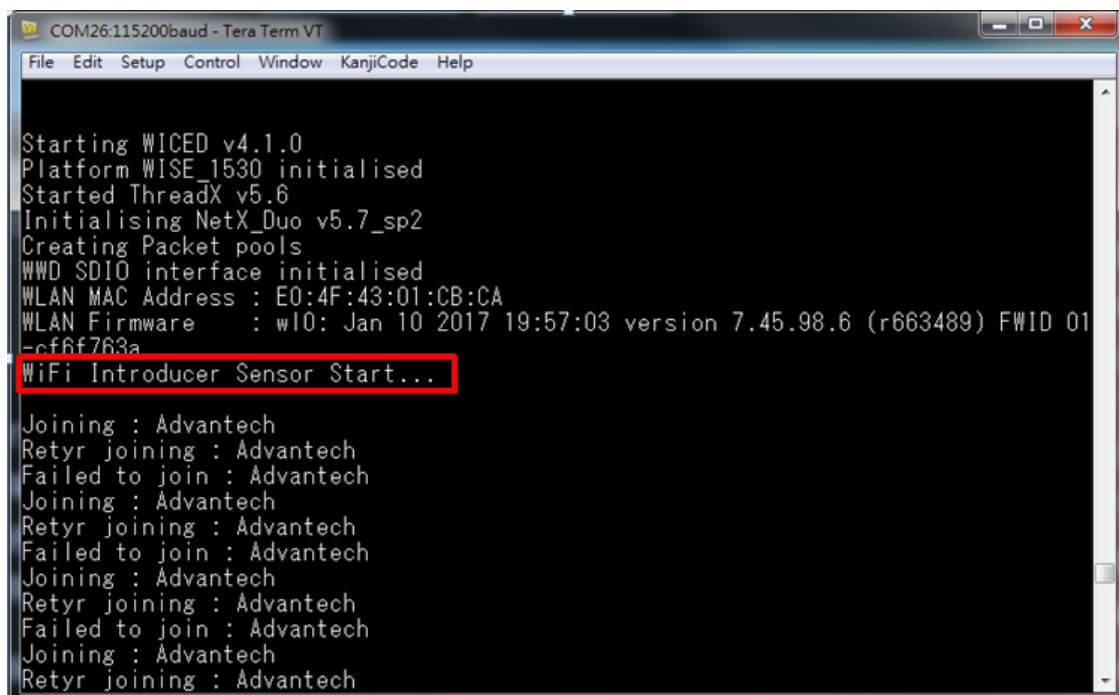
Step 1: Download and unzip [WISE_1530_patch.zip](#), then copy WISE_1530 folder to <SDK folder>\43xxx_Wi-Fi\apps. Project Explorer window will appear WISE_1530 folder. You can press 'F5' to refresh if you do not see.



Step 2: Create a "WISE_1530.StartKit-WISE_1530" target file and build the application.



Step 3: Follow "[Generate a Programming File](#)" to generate a bin file, then download bin file to WISE-1530. You will see below message in console screen if success.

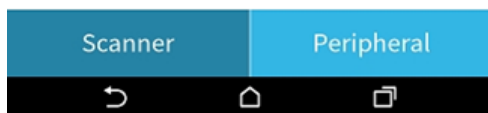
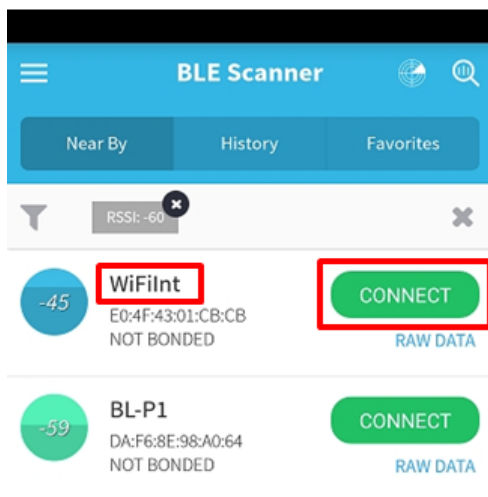


Step 4 to step 8 are manipulated in cell phone.

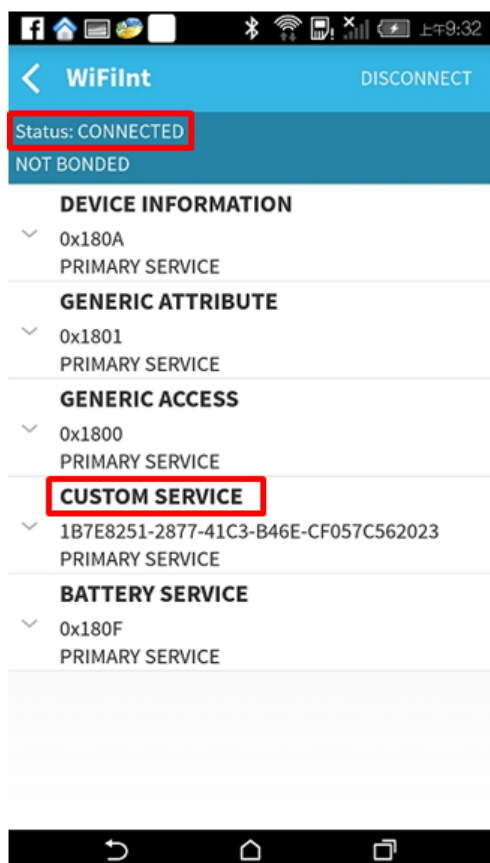
Step 4: Install and launch the BLE Scanner app.



Step 5: Drop the screen to rescan device, it will list out BLE device nearby. Find the **WiFilnt** device and press CONNECT button.



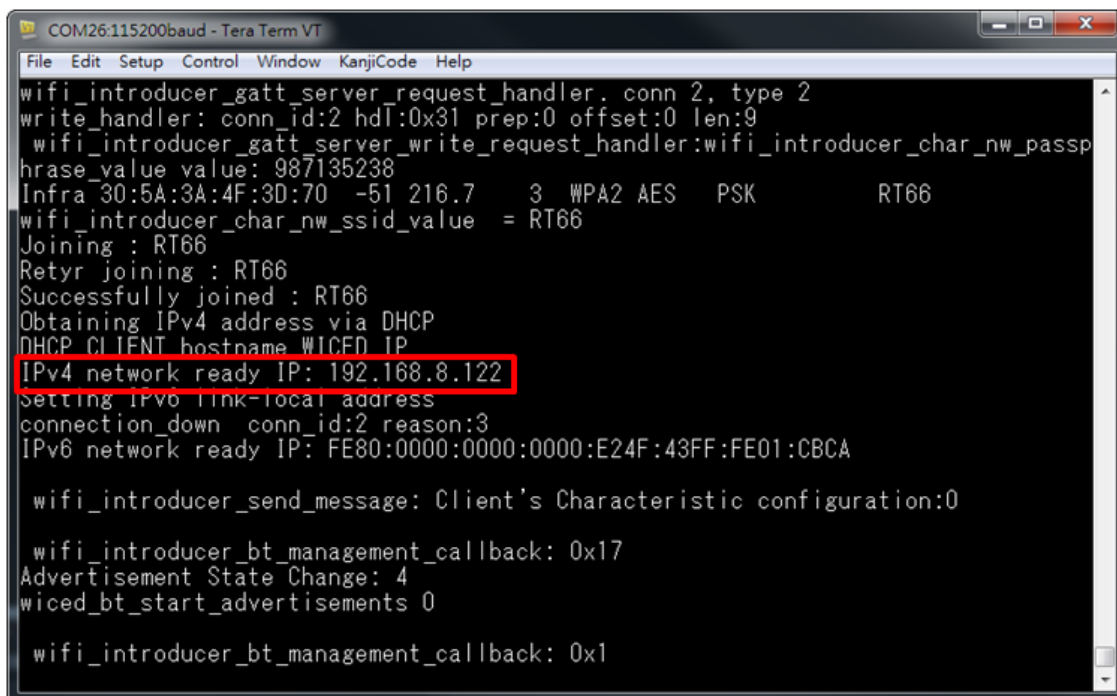
Step 6: If the connection is successful can see the below picture then press "CUSTOM SERVICE" button.



Step 7: Find the UUID: ACA0EF7C-EEAA-48AD-9508-19A6F6B356 for SSID characteristic.
Press the "W" button to enter input window. Input new SSID name then press the OK button. Last, user can press "R" button to check new SSID name.

[illegible]

Step 9: If the join is successful, you can see network IP on the console screen.



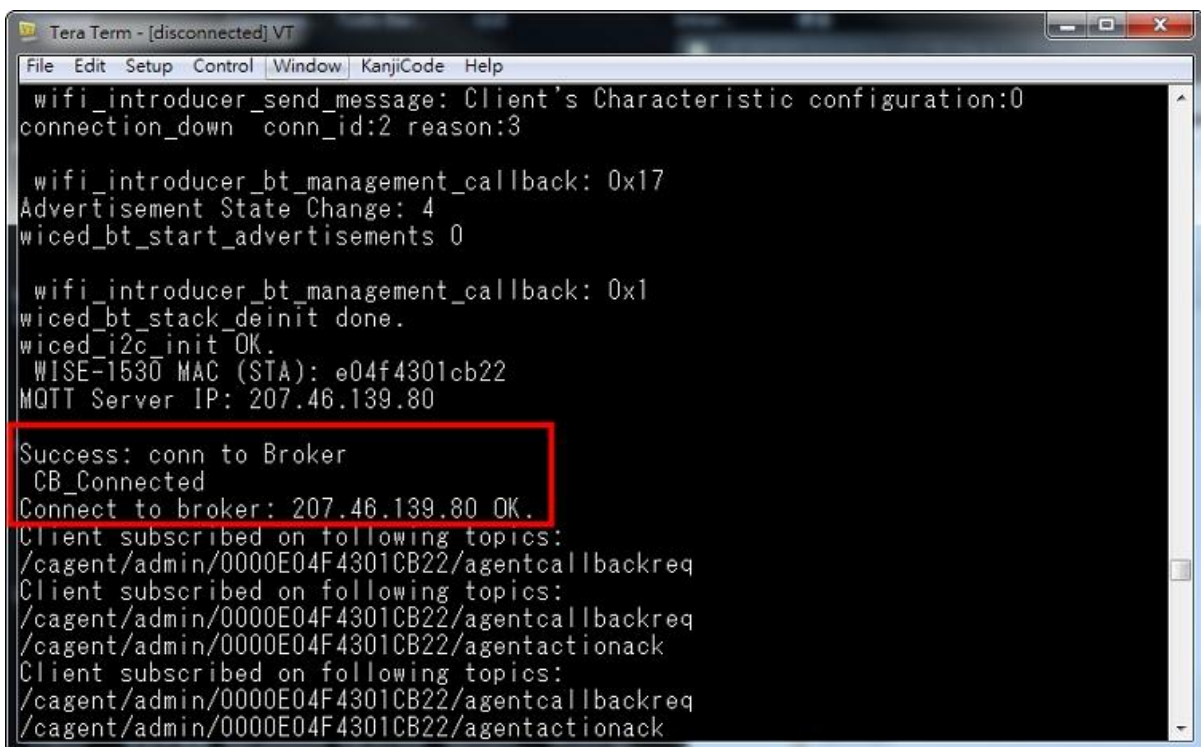
```
COM26:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
wifi_introducer_gatt_server_request_handler: conn 2, type 2
write_handler: conn_id:2 hdl:0x31 prep:0 offset:0 len:9
wifi_introducer_gatt_server_write_request_handler:wifi_introducer_char_nw_passp
hrase_value value: 987135238
Infra 30:5A:3A:4F:3D:70 -51 216.7 3 WPA2 AES PSK RT66
wifi_introducer_char_nw_ssid_value = RT66
Joining : RT66
Retyr joining : RT66
Successfully joined : RT66
Obtaining IPv4 address via DHCP
DHCP CLIENT hostname WICED IP
IPv4 network ready IP: 192.168.8.122
Setting IPv6 link-local address
connection_down conn_id:2 reason:3
IPv6 network ready IP: FE80:0000:0000:0000:E24F:43FF:FE01:CBCA

wifi_introducer_send_message: Client's Characteristic configuration:0

wifi_introducer_bt_management_callback: 0x17
Advertisement State Change: 4
wiced_bt_start_advertisements 0

wifi_introducer_bt_management_callback: 0x1
```

Step 10: If Connect to broker and WISESnail success, user can see temperature, humidity, GPIO1 and GPIO2 on cloud server.



```
Tera Term - [disconnected] VT
File Edit Setup Control Window KanjiCode Help
wifi_introducer_send_message: Client's Characteristic configuration:0
connection_down conn_id:2 reason:3

wifi_introducer_bt_management_callback: 0x17
Advertisement State Change: 4
wiced_bt_start_advertisements 0

wifi_introducer_bt_management_callback: 0x1
wiced_bt_stack_deinit done.
wiced_i2c_init OK.
WISE-1530 MAC (STA): e04f4301cb22
MQTT Server IP: 207.46.139.80
Success: conn to Broker
CB_Connected
Connect to broker: 207.46.139.80 OK.
Client subscribed on following topics:
/cagent/admin/0000E04F4301CB22/agentcallbackreq
Client subscribed on following topics:
/cagent/admin/0000E04F4301CB22/agentcallbackreq
/cagent/admin/0000E04F4301CB22/agentactionack
Client subscribed on following topics:
/cagent/admin/0000E04F4301CB22/agentcallbackreq
/cagent/admin/0000E04F4301CB22/agentactionack
```

```

Tera Term - [disconnected] VT
File Edit Setup Control Window KanjiCode Help
n":{"Name","sv":"Ethernet0","asm":"r"},{"n":"Health","v":100,"asm":"r"},{"n":"sw","sv":"1.2.1.12","asm":"r"},{"n":"reset","bv":false,"asm":"r"}],{"bn":"Info"},"bn":"0007E04F4301CB22","ver":1},"bn":"Ethernet","ver":1},"ver":1},"commCmd":2052,"requestID":2001,"agentID":"0000E04F4301CB22","handlerName":"general","sendTS":160081020}}]
## topic = [/cagent/admin/0000E04F4301CB22/deviceinfo]
## msg = [{"susiCommData":{"data":{"IoTGW":{"Ethernet":{"Ethernet0":{"Info":{"e":{"n":"SenHubList","sv":""},"n":"Neighbor","sv":""},"n":"Name","sv":"Ethernet0"},"n":"Health","v":100},"n":"sw","sv":"1.2.1.12"},"n":"reset","bv":false},"bn":"Info"},"bn":"0007E04F4301CB22","ver":1},"bn":"Ethernet","ver":1},"commCmd":2055,"requestID":2001,"agentID":"0000E04F4301CB22","handlerName":"general","sendTS":160081021}}]
WiseSnail_Connect OK !!!
Client subscribed on following topics:
/cagent/admin/0000E04F4301CB22/agentcallbackreq
/cagent/admin/0000E04F4301CB22/agentactionack
/server/admin/+/agentctrl
/cagent/admin/0000E04F4301CB22/agentcallbackreq
/cagent/admin/0017E04F4301CB22/agentcallbackreq
## topic = [/cagent/admin/0000E04F4301CB22/deviceinfo]
## msg = [{"susiCommData":{"data":{"IoTGW":{"Ethernet":{"Ethernet0":{"Info":{"e":{"n":"SenHubList","sv":"0017E04F4301CB22"},"n":"Neighbor","sv":"0017E04F4301C

```

4.3 memory/flash usage

The WISE-1530 has 1 MBytes flash and 256 KBytes RAM. The Start kit flash and memory usage is as below.

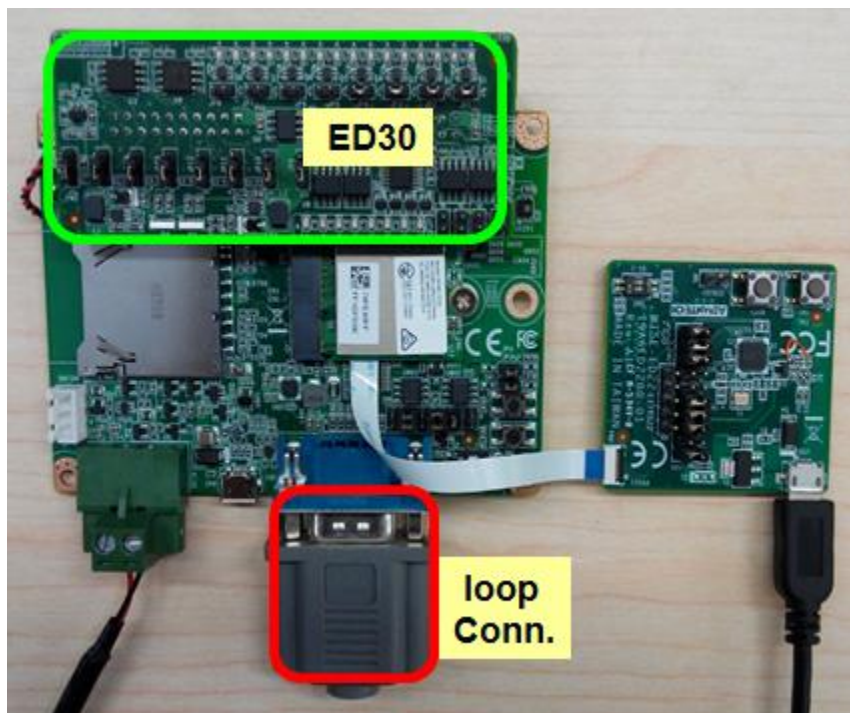
Module	Flash	Static RAM
Adv_WiseSnail	18284	27096
Bluetooth_Embedded_Low_Energy_Stack	154	57
bluetooth_low_energy	78493	9348
button_manager	588	4
command_console	3688	404
command_console_wifi	11146	0
crc	1060	0
DHCP_Server	1524	132
DNS	1724	44
GPIO_button	120	4
Host MCU-family library	15718	2492
Interrupt Vectors	388	0

libc	48018	3364
MQTT_Client	5643	736
Networking	5113	13280
NetX-Duo - Interfaces & Stacks	0	16
Other	170044	2930
Packet Buffers	0	23088
platform	1620	308
RAM Initialisation	4028	0
resources	385936	0
Ring_Buffer	112	0
Startup Stack & Link Script fill	144	25
Suppllicant - BESL	3470	812
ThreadX	8596	400
TLV	28	0
WICED	5452	1040
WICED_Bluetooth_Firmware_Driver	36692	0
wiced_log	290	1104
wifi_utils	1082	36
WWD	20429	3176
TOTAL (bytes)	825556	89896

4.4 I/O Test (factory)

4.4.1 Introduction

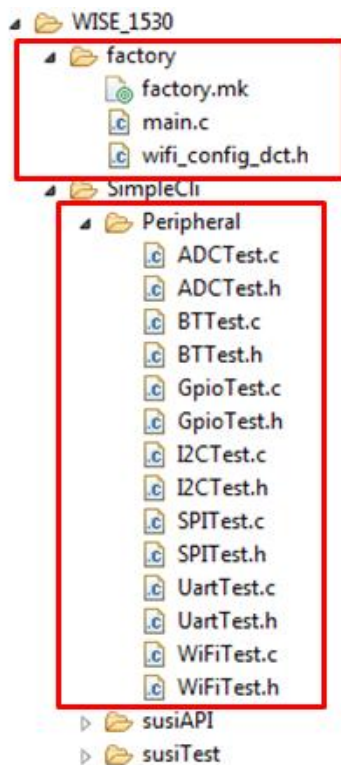
The I/O Test application is a WISE-1530 I/O testing example. It's need extra I/O board(WISE-ED30) to plug in to WISE-1500. The hardware setup as below. This instance could test m2.com I/O that WISE-1530 supported([M2.COM Pinout](#)), include GPIO, ADC, I2C, SPI...etc interface. It used WICED SDK API to read and write I/O.



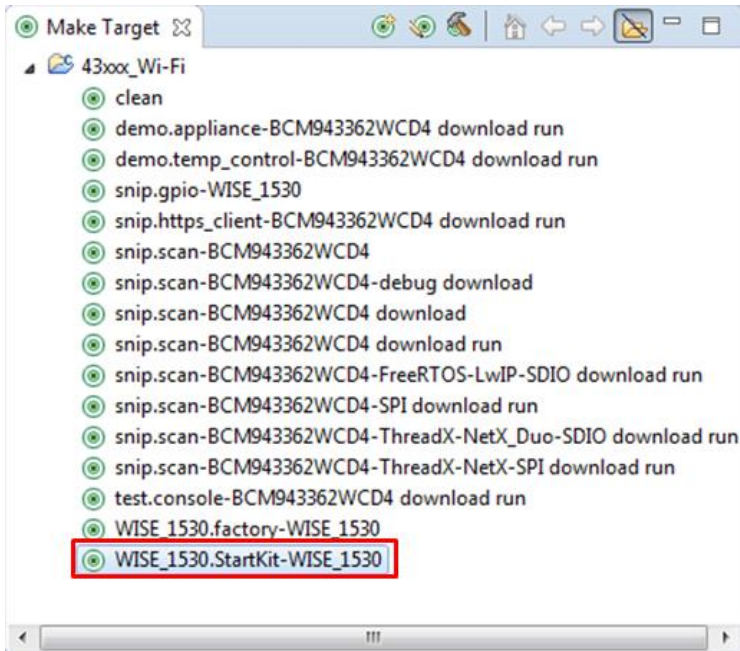
4.4.2 I/O Test Use WICED API

Step 1: Download and unzip [WISE_1530_patch.zip](#), then copy WISE_1530 folder to <SDK folder>\43xxx_Wi-Fi\apps.

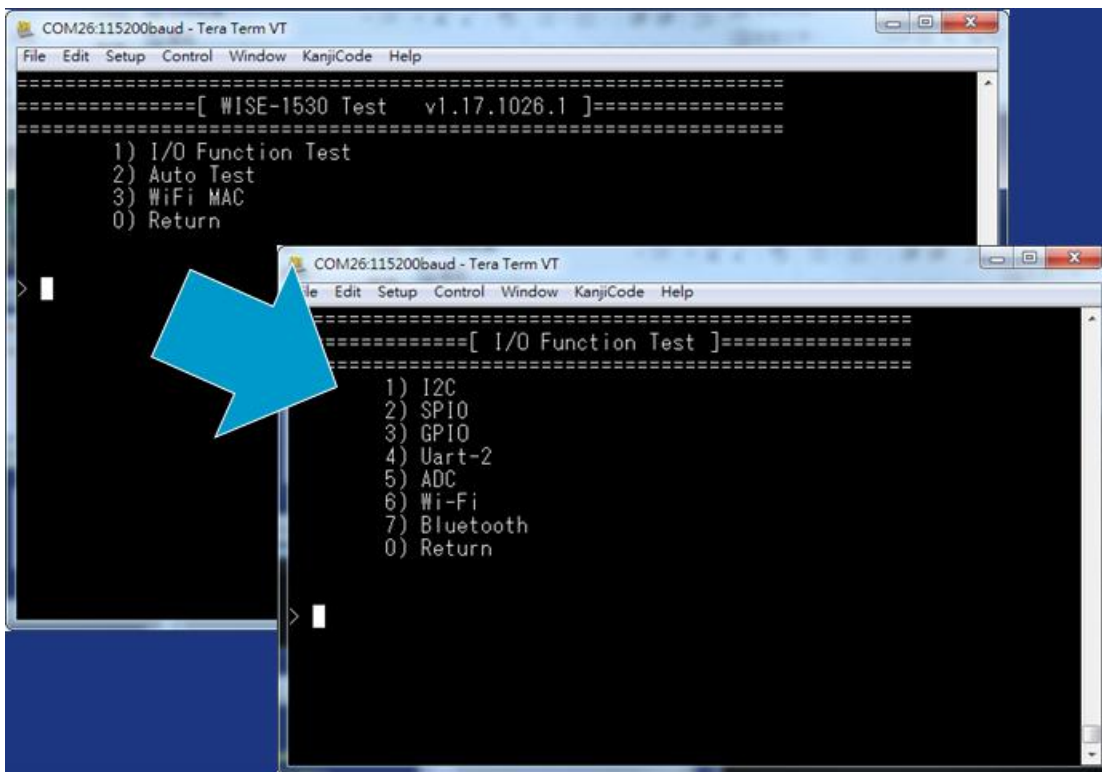
Step 2: I/O test source code please refer as below files.



Step 3: Create a "WISE_1530.factory-WISE_1530" target file and build the application. Download firmware to WISE-1530 then press reset button.



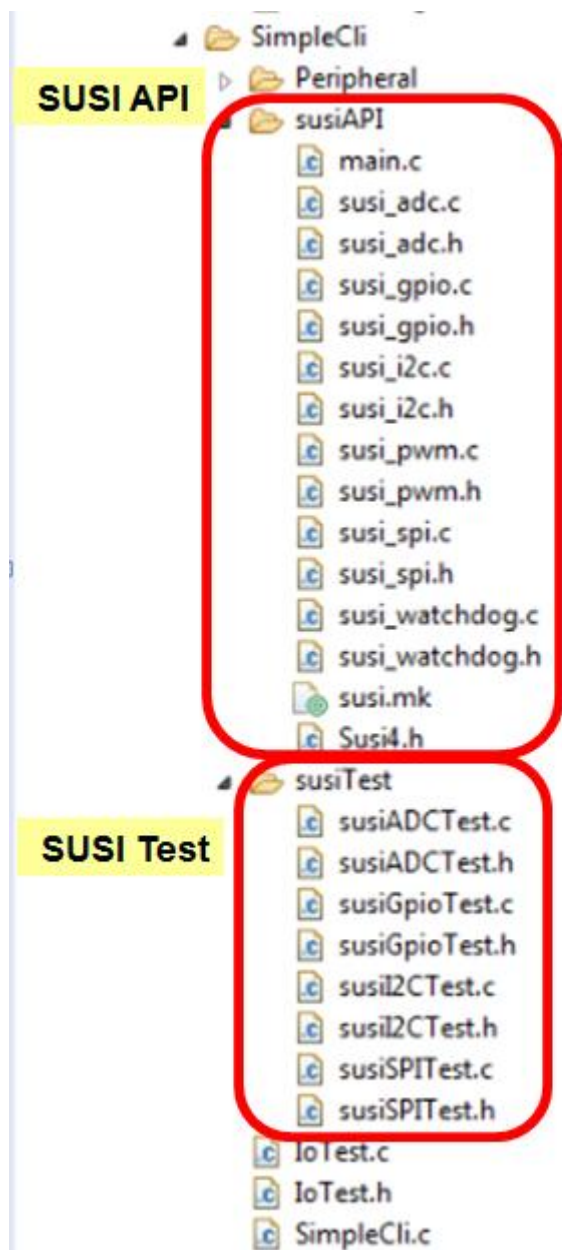
Step 4: You will see below message in console screen if success. Input '1' to select I/O Function Test, the screen will show I/O test items. Input 1~7 to test I/O and 0 to return previous page.



4.4.3 I/O Test Use SUSI API

The I/O Test example also support SUSI API (please refer [SUSI_API](#)).The SUSI support GPIO, I2C, SPI, ADC and PWM APIs.You can simple revise setting to accomplish SUSI API I/O Test.

Step 1: The SUSI API I/O test source code are as below files.



Step 2: Open SimpleCli.mk and change USE_SUSI_API to 1.

```
25 # not authorized to use in any products where a malfunction or
26 # failure of the Cypress product may reasonably be expected to result in
27 # significant property damage, injury or death ("High Risk Product"). By
28 # including Cypress's product in a High Risk Product, the manufacturer
29 # of such system or application assumes all risk of such use and in doing
30 # so agrees to indemnify Cypress against all liability.
31 #
32
33 NAME := Adv_SimpleCli
34
35 USE_SUSI_API := 1
36
37 ifeq ($(USE_SUSI_API),1)
38 $(NAME)_SOURCES := simpleCli.c \
39                     IoTest.c \
40                     susiAPI/susi_i2c.c \
41                     susiAPI/susi_spi.c \
42                     susiAPI/susi_gpio.c \
43                     susiAPI/susi_adc.c \
44                     susiTest/susiI2CTest.c \
45                     susiTest/susiSPITest.c \
46                     susiTest/susiGpioTest.c \
47                     susiTest/susiADCTest.c \
48                     Peripheral/UartTest.c \
49                     Peripheral/WiFiTest.c \
50                     Peripheral/BTTest.c
51
52 GLOBAL_DEFINES += USE_SUSI_API_TEST
53 else
54 $(NAME)_SOURCES := simpleCli.c \
```

Step 3: Double click "WISE_1530.factory-WISE_1530" target file and build the application. Then download the firmware to WISE-1530, you can see the screen that same as I/O Function Test.