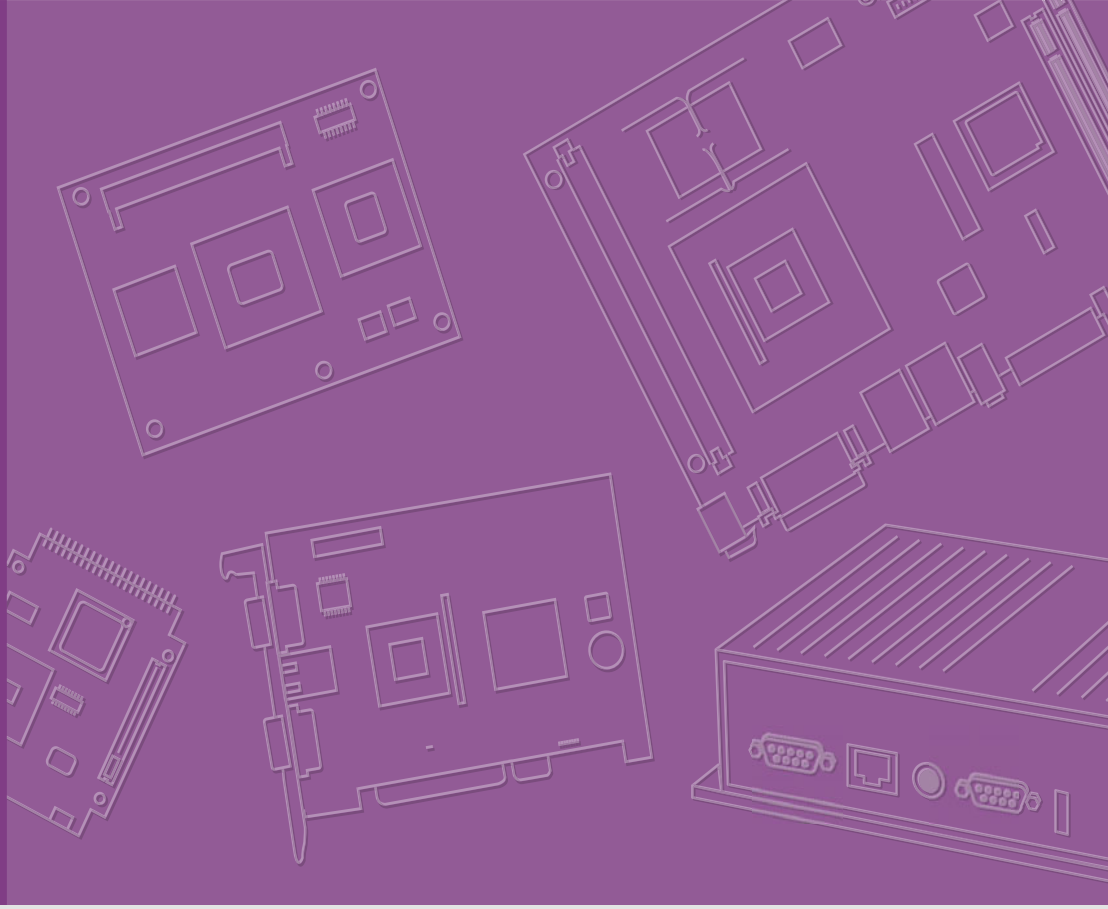

User Manual

WISE-1530

M2.COM WIFI/BLE IoT Node OEM/Integrators Installation Manual

ADVANTECH

Enabling an Intelligent Planet

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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 merchandize 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)

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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.

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 PORTABLE DEVICE USAGE (<20m from body/SAR needed)

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

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.

FOR COUNTRY CODE SELECTION USAGE (WLAN DEVICES)

Note: The country code selection is for non-US model only and is not available to all US model. Per FCC regulation, all WiFi product marketed in US must fixed to US operation channels only.

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.

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 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 1750007965-01	Antenna Cable RP-SMA to MHF4 L=200mm 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.

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Chapter 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 Band	2.4000~2.4840 GHz for Wi-Fi 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 ± 2 at 802.11b CCK Mode 1M Typ. 12 dBm ± 2 at 802.11g OFDM Mode 54M Typ. 12 dBm ± 2 at 802.11n OFDM Mode MCS0 Max 10 dBm ± 2 for BLE
	Receiver Sensitivity	Typ. -95dBm at 1 Mbps Typ. -75 dBm at 54 Mbps Typ. -89 dBm at MCS0 Typ. -89 dBm for BLE
	RF Data Rate	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 Characteristics	Dimensions (WxD)	22 x 30 mm
OS		ThreadX v5.6, SDK 4.1.8

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

Chapter 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 ± 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

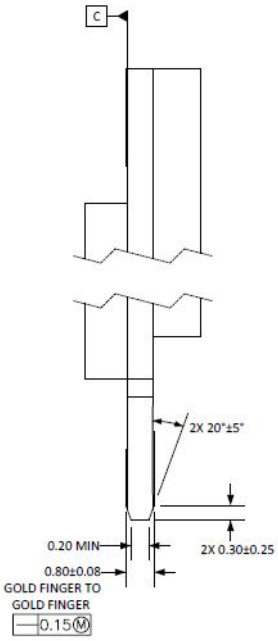


Figure 2.1 Card Edge Bevel

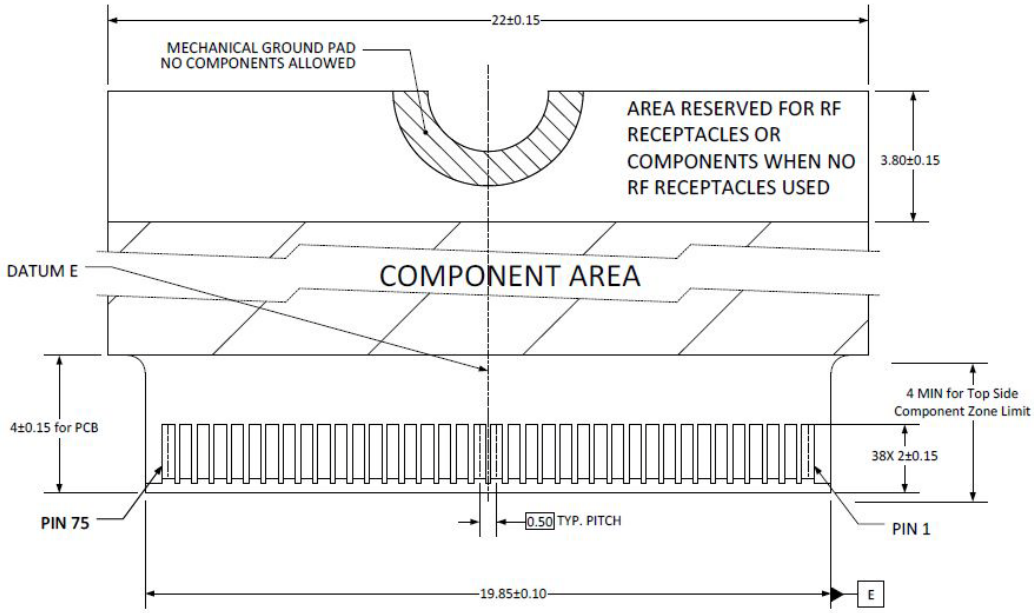


Figure 2.2 Card Edge Outline-Topside

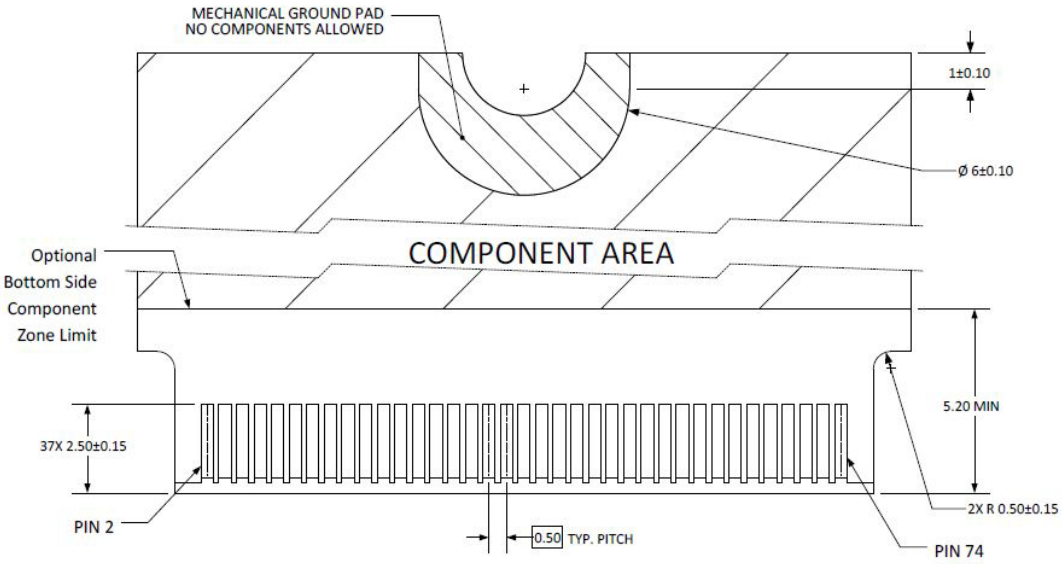


Figure 2.3 Card Edge Outline-Backside

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.

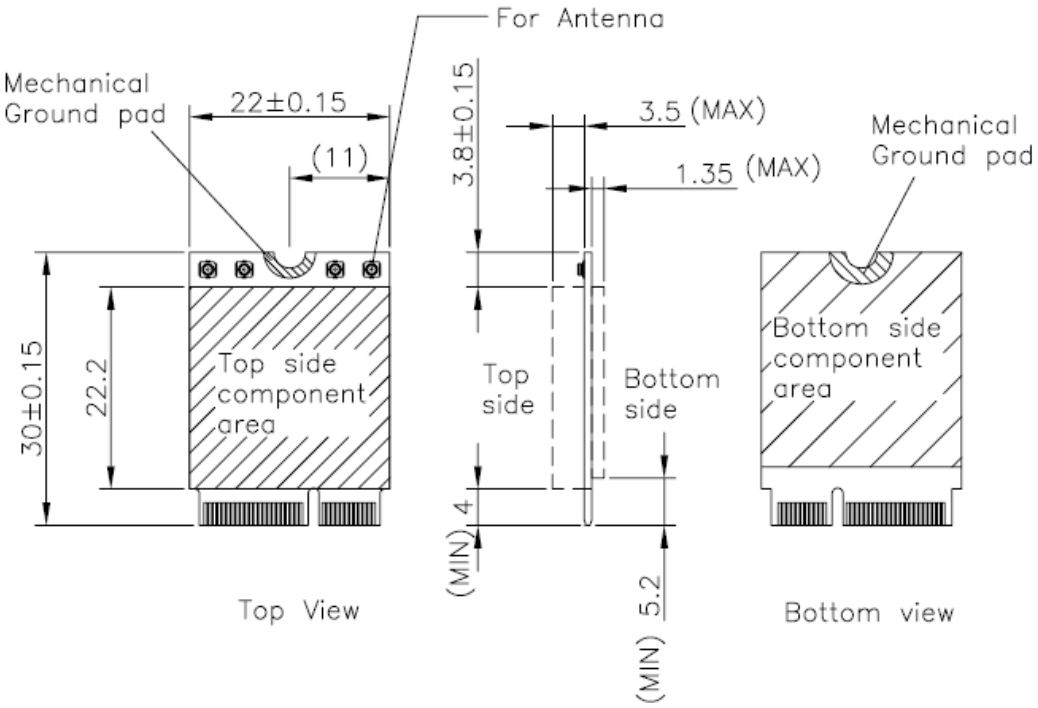


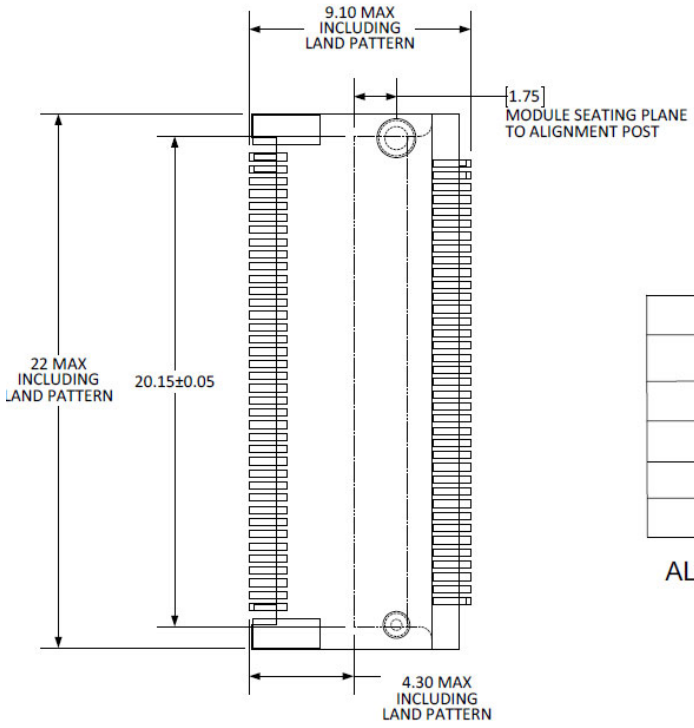
Figure 2.4 Type A 2230

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



Height	A (MAX)	B (MAX)
H2.3	2.25	0.41
H2.5	2.45	0.61
H2.8	2.75	0.89
H3.2	3.20	1.54
H4.2	4.20	2.54

ALL DIMENSIONS mm

Figure 2.5 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 p 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.

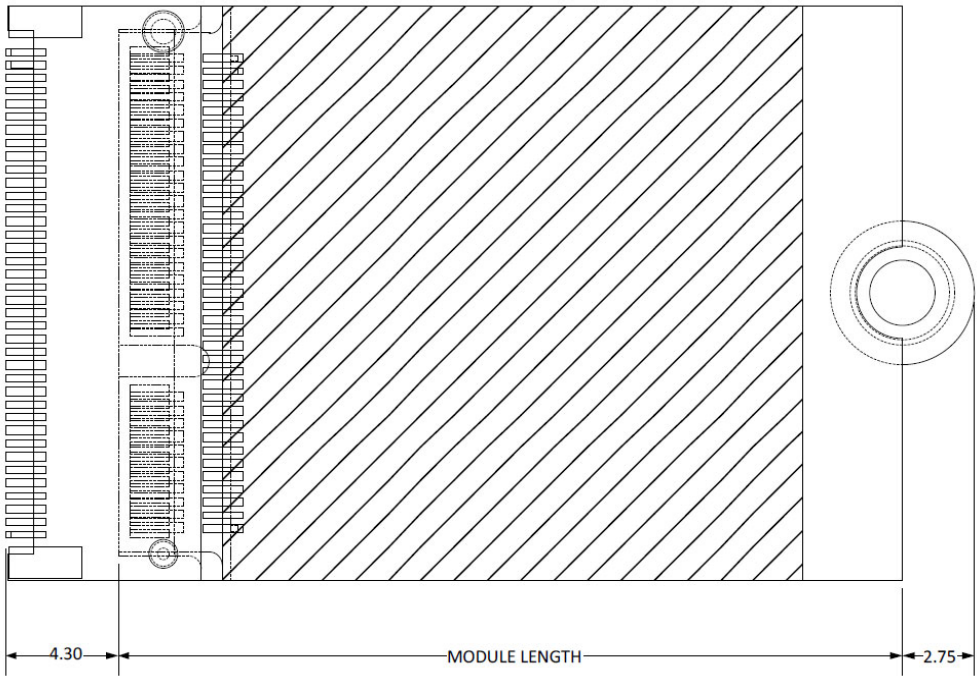


Figure 2.6 Carrier Board Connection Length

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.

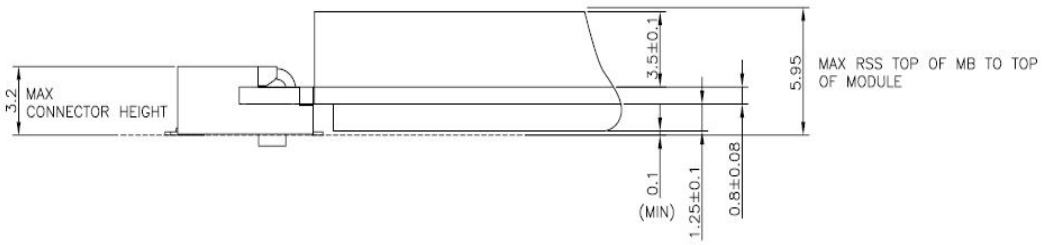


Figure 2.7 H3.2-D3

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

2.4 WISE-1530 Pin-Out Map

PIN	M2.COM Signal name	STM32L443RCI6 MCU Pin Name		M2.COM Signal name	PIN
1	GND	GND	3.3V	VCC	2
3	MICRO_USB_HS_DP	PA12	3.3V	VCC	4
5	MICRO_USB_HS_DN	PA11		NC	6
7	GND	GND	PB12	I2S_CK_MICRO	8
9	NC		PA4	I2S_WS_MICRO	10
11	NC		PC12	I2S_SD_MICRO	12
13	NC			NC	14
15	NC		PB14	CB_RESET_OUT#	16
17	NC		GND	GND	18
19	NC		PC9	CB_PWR_ON	20
21	NC		PA9	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		PA10	UART3_RX (I)(0/3.3V)	32
33	GND	GND		NC	34
35	NC			NC	36
37	NC		PA5	GPIO_0_MICRO	38
39	GND	GND	PB0	GPIO_1_MICRO	40
41	NC			NC	42
43	NC		PB13	GPIO_3_WL	44
45	GND	GND	PB0	GPIO_4_WL	46
47	ADC0_MICRO	PA6	PB2	GPIO_5_WL	48
49	ADC1_MICRO	PA7	PB1	GPIO_6_WL	50
51	GND	GND		NC	52
53	ADC2_MICRO	PC4		NC	54
55	ADC3_MICRO	PC5		NC	56
57	GND	GND	PB7	I2C0_SDA	58
59	NC		PB6	I2C0_SCL	60
61	NC		PC3	SPI_MOSI	62
63	GND	GND	PC2	SPI_MISO	64
65	+VBAT_R	VBAT(3.3V)	PB13	SPI_SCK	66
67	NC		PB9	SPI_CS0#	68
69	GND	GND		NC	70
71	RESET_IN#	NRST	3.3V	VCC	72
73	WAKEUP_MICRO#	PC0	3.3V	VCC	74
75	GND	GND			

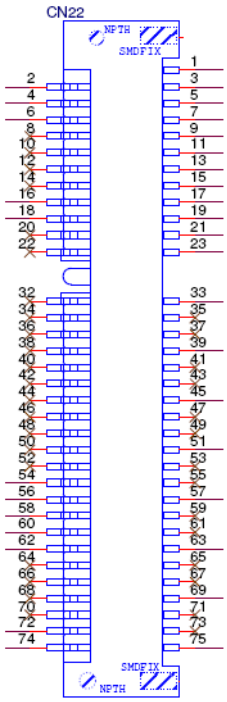


Figure 2.8 M.2 Connector

2.5 Quick Starter of WISE-1530

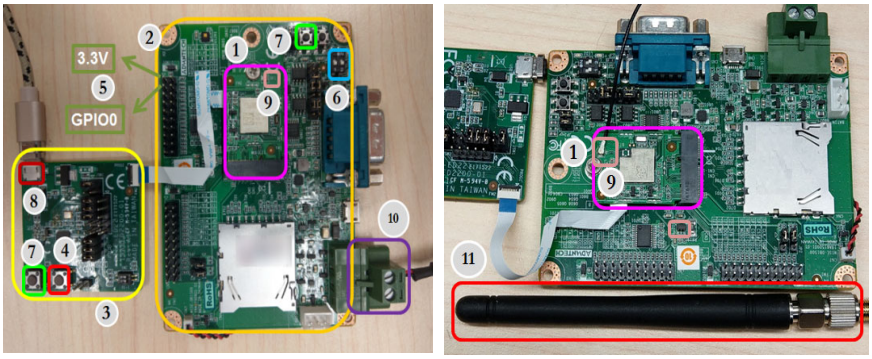
2.5.1 Preparing for Hardware

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.

Step 01: Please prepare boards as below.



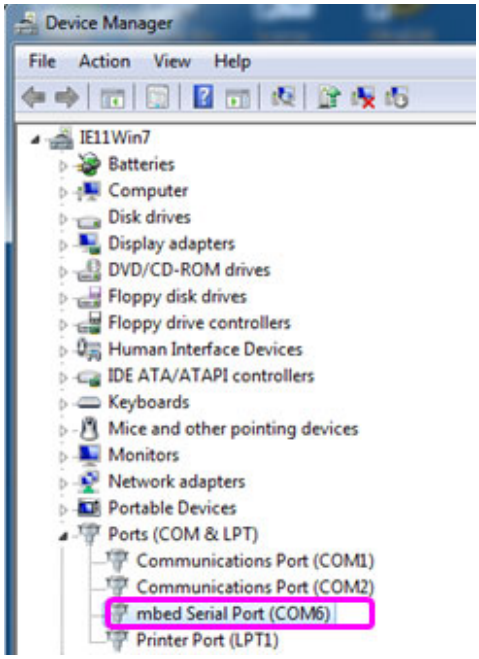
1.WISE-1530
2.WISE-1500
3.WISE-ED22
4.WISE-ED22 reset button
5.CN2 on WISE-1500

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 (connect to an antenna)	
10.Power connector	
11.Antenna (connect to RF 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)

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.



Chapter 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

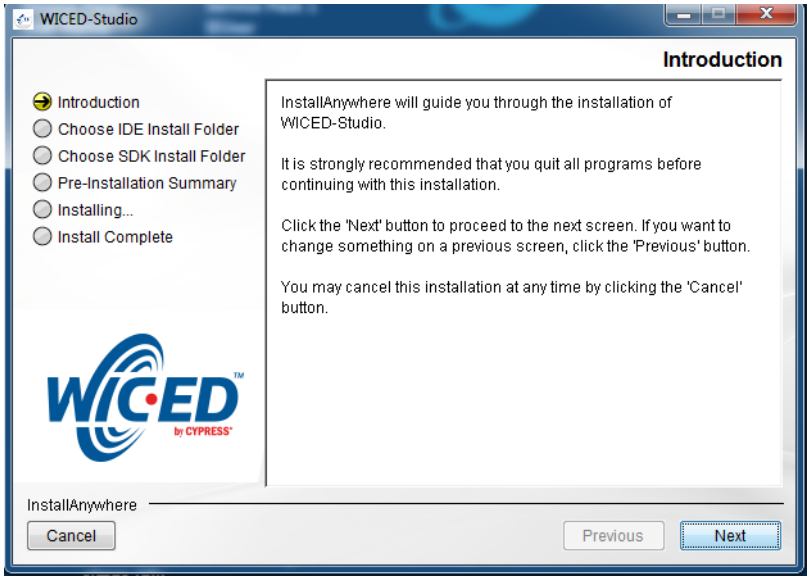
User can refer to WICED Software(http://www.cypress.com/products/wiced-software) to get more information.

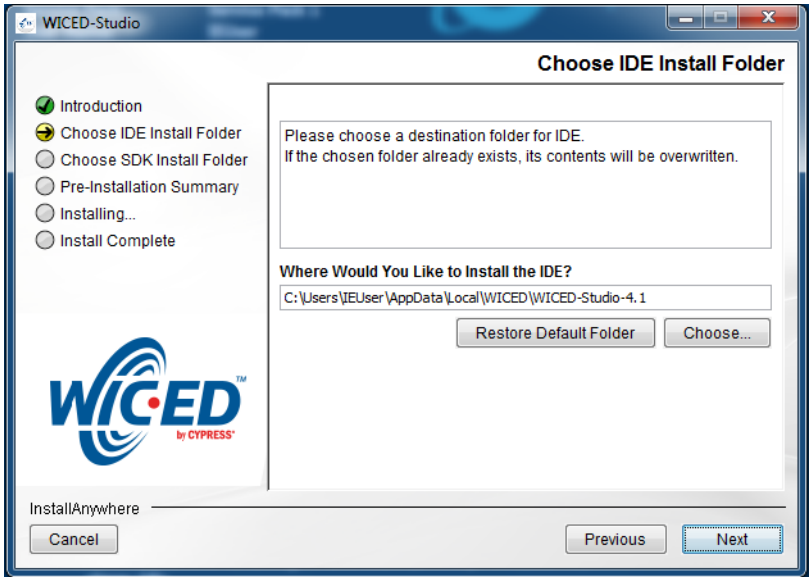
3.2 Installation of WICED Studio

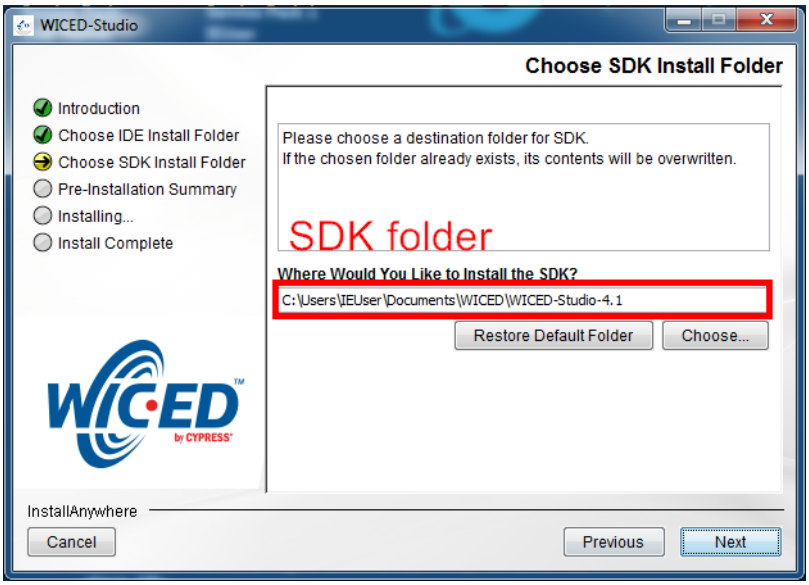
The user can refer to the following steps to setup WICED Studio with WISE-1530 SDK.

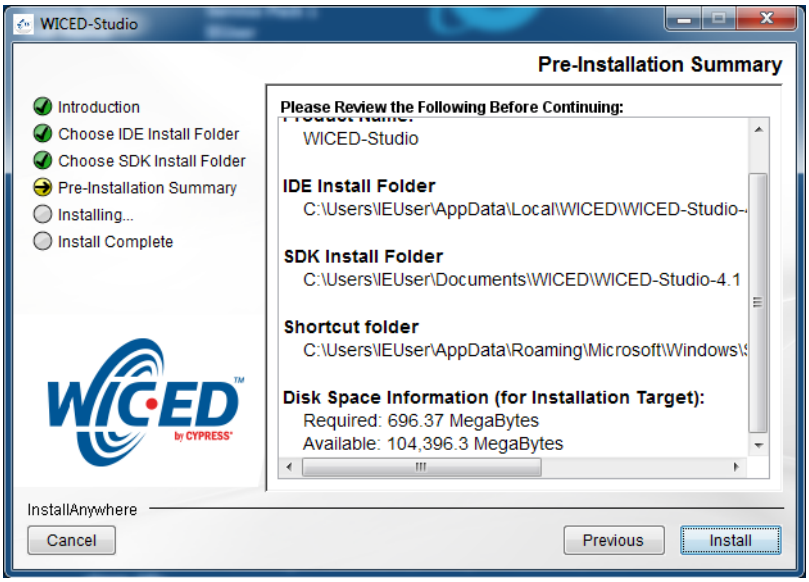
3.2.1 Windows Install

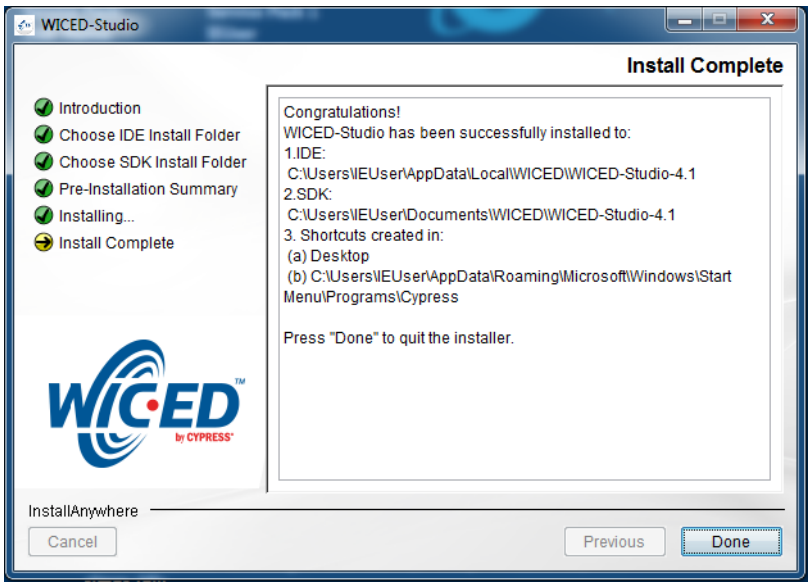
1. Download WICED-Studio-5.2.0.22-IDE-Installer.zip(https://community.cypress.com/servlet/JiveServlet/downloadBody/13651-102-1-14558/WICED-Studio-5.2.0.22-IDE-Installer.zip)
2. Extract the installer exe from the zip file to temp folder on your computer; do not execute the installer from the zip file
3. Double click the installer exe to install WICED Studio as below picture



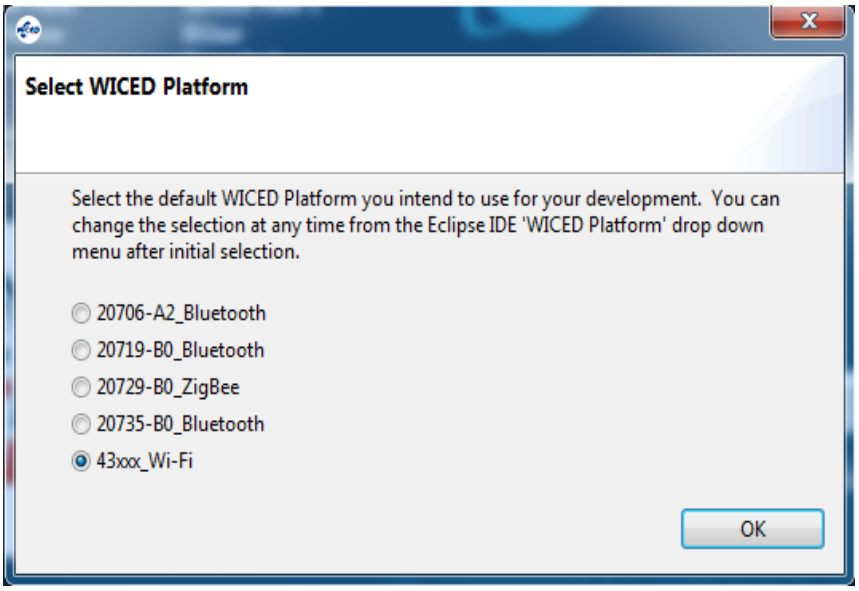



WICED-Studio
Choose SDK Install Folder
Introduction
Choose IDE Install Folder
Choose SDK Install Folder
Pre-Installation Summary
Installing...
Install Complete
Please choose a destination folder for SDK.
If the chosen folder already exists, its contents will be overwritten.
SDK folder
Where Would You Like to Install the SDK?
C:\Users\IEUser\Documents\WICED\WICED-Studio-4.1
Restore Default Folder
Choose...
InstallAnywhere
Cancel
Previous
Next


WICED-Studio
Pre-Installation Summary
Introduction
Choose IDE Install Folder
Choose SDK Install Folder
Pre-Installation Summary
Installing...
Install Complete
Please Review the Following Before Continuing:
WICED-Studio
IDE Install Folder
C:\Users\IEUser\AppData\Local\WICED\WICED-Studio-
SDK Install Folder
C:\Users\IEUser\Documents\WICED\WICED-Studio-4.1
Shortcut folder
C:\Users\IEUser\AppData\Roaming\Microsoft\Windows\
Disk Space Information (for Installation Target):
Required: 696.37 MegaBytes
Available: 104,396.3 MegaBytes
InstallAnywhere
Cancel
Previous
Install


WICED-Studio
Install Complete
Introduction
Choose IDE Install Folder
Choose SDK Install Folder
Pre-Installation Summary
Installing...
Install Complete
Congratulations!
WICED-Studio has been successfully installed to:
1.IDE:
C:\Users\IEUser\AppData\Local\WICED\WICED-Studio-4.1
2.SDK:
C:\Users\IEUser\Documents\WICED\WICED-Studio-4.1
3. Shortcuts created in:
(a) Desktop
(b) C:\Users\IEUser\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Cypress
Press "Done" to quit the installer.
InstallAnywhere
Cancel
Previous
Done

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 as well.



3.2.2 Copy patch file

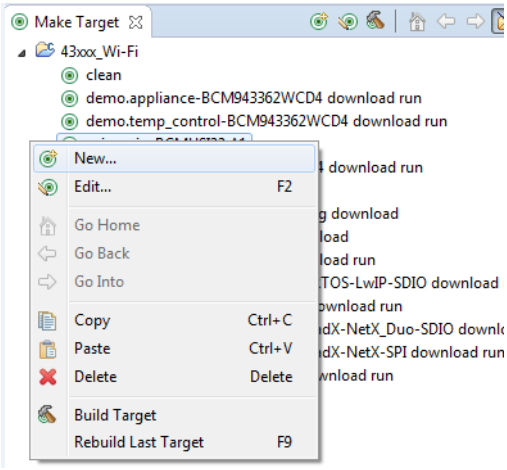
1. Download and unzip WM-BN-BM-22_SDK_5.1.x_platform_patch.zip(http://ess-wiki.advantech.com.tw/wiki/images/c/c1/WM-BN-BM-22_SDK_5.1.x_platform_patch_v1.2.zip)
2. Replace the folders under WICED directory <SDK folder>\43xxx_Wi-Fi\ with patch folders.

3.3 Build Source File

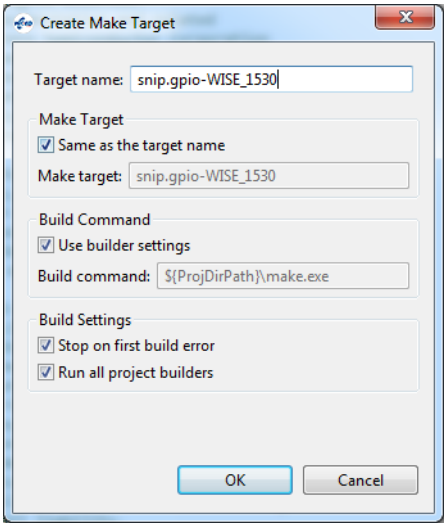
3.3.1 Make a "Make Target" file

Step1: In Make Target window click mouse right button

Step2: Select New...

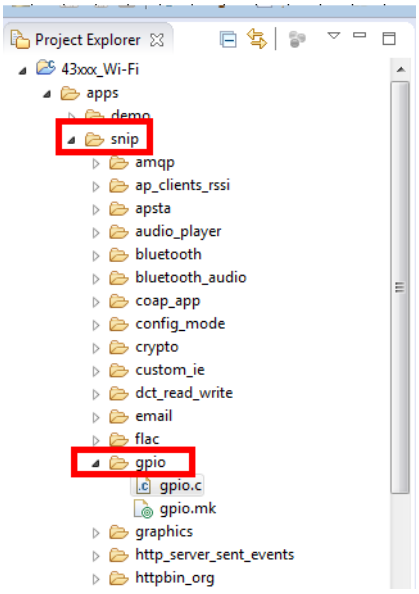


Step3: Type "snip.gpio-WISE_1530"



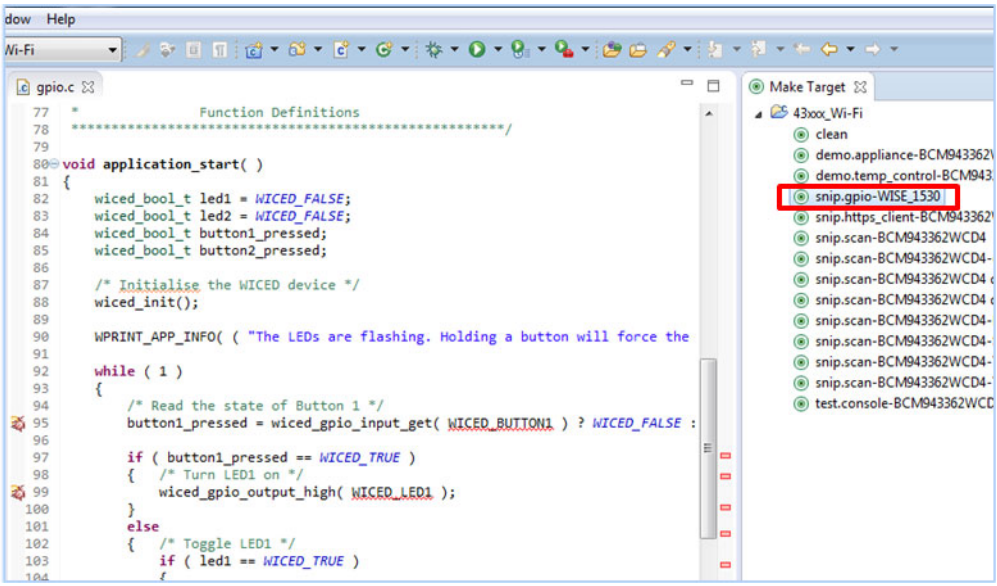
Field explanation: **snip.gpio-WISE_1530**

- 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.



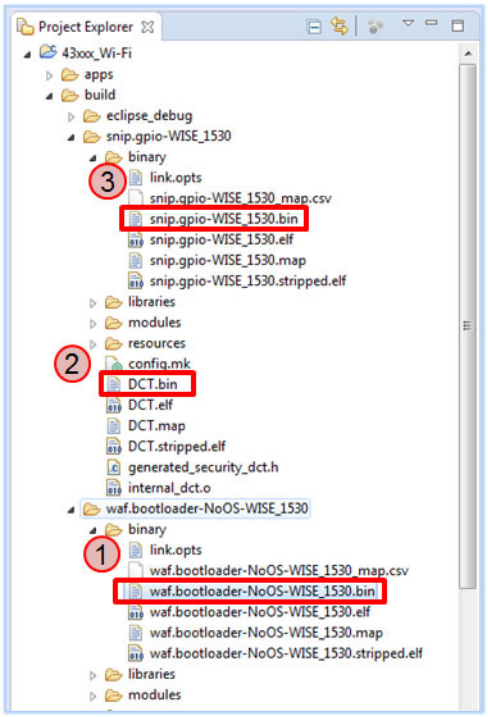
You see below message when image is built successfully.

```
Making snip.gpio-WISE_1530.bin
snip.gpio-WISE_1530
-----------------------------------|---------|---------|
                                   |         |  Static |
             Module                |  Flash  |   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

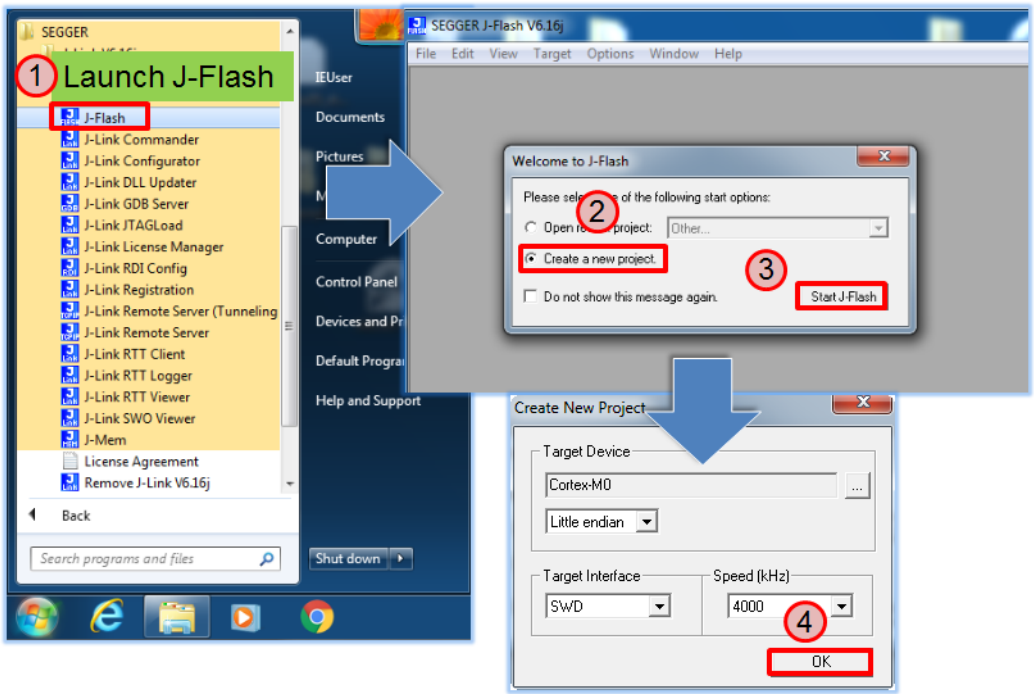
It will generate three bin files in <SDK folder>\43xxx_Wi-Fi\build folder when build complete.

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

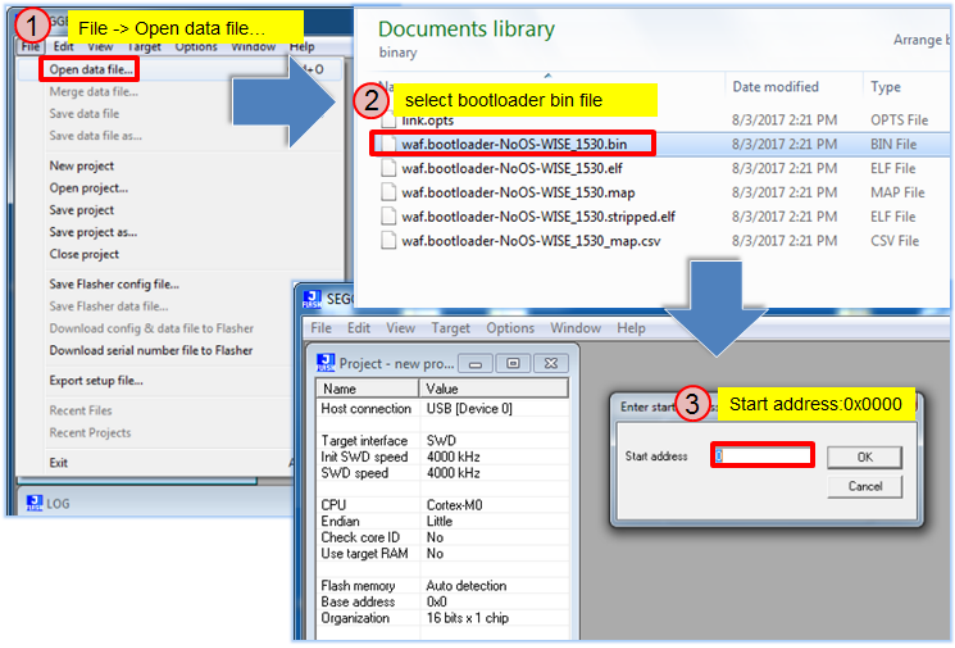


Download and install J-Link(https://www.segger.com/downloads/jlink/JLink_Windows_V616j.exe)software, we need J-Flash tool to combine three bin files for programming.

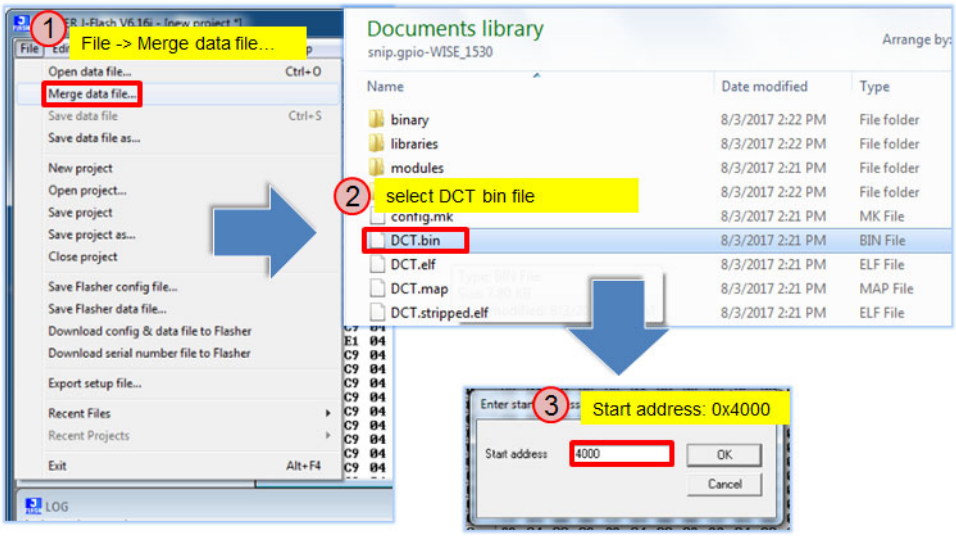
3.4.1 Launch J-Flash



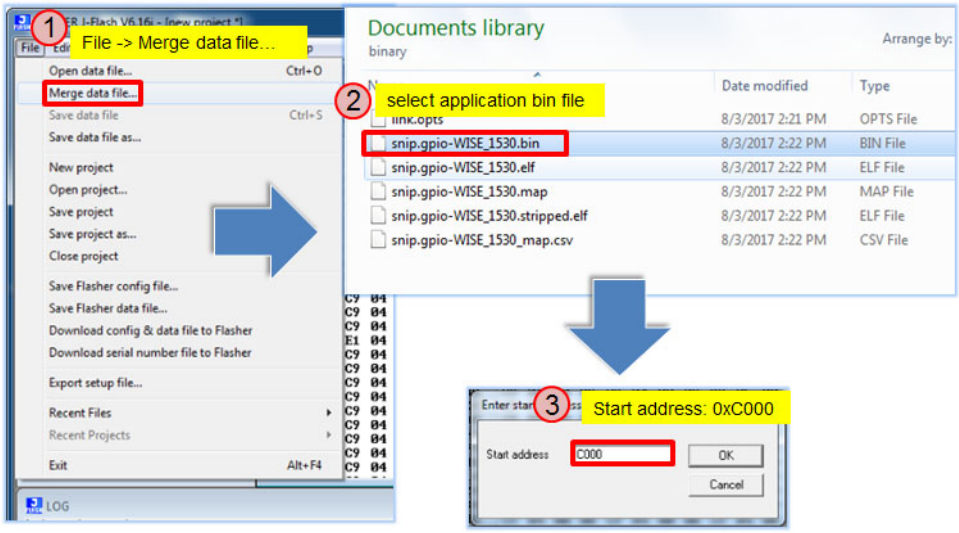
3.4.2 Open bootloader bin file



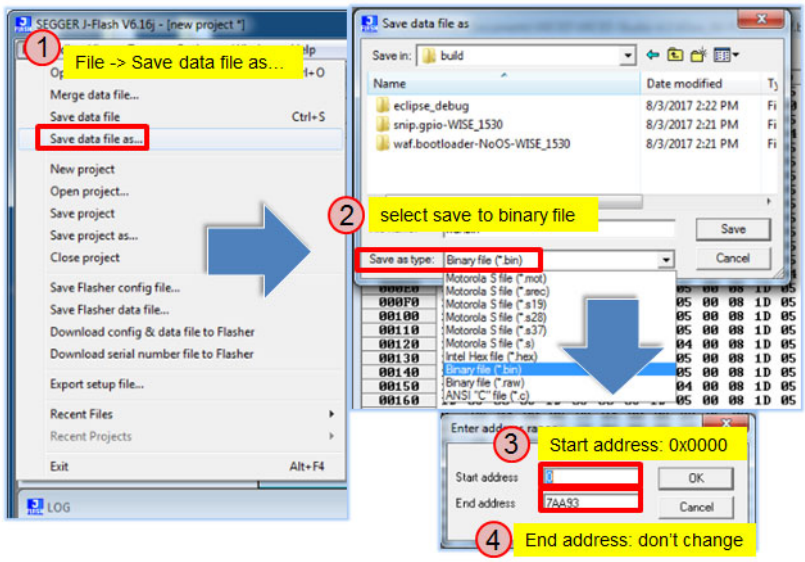
3.4.3 Merge DCT bin file



3.4.4 Merge application bin file



3.4.5 Save as a final bin file

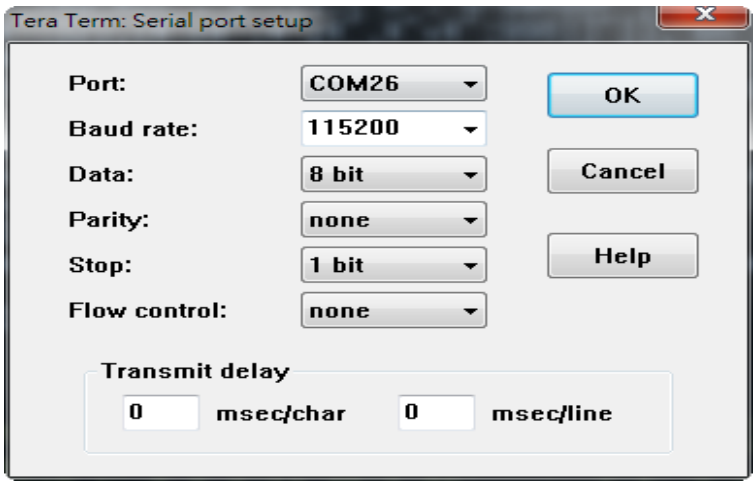


3.5 Programming

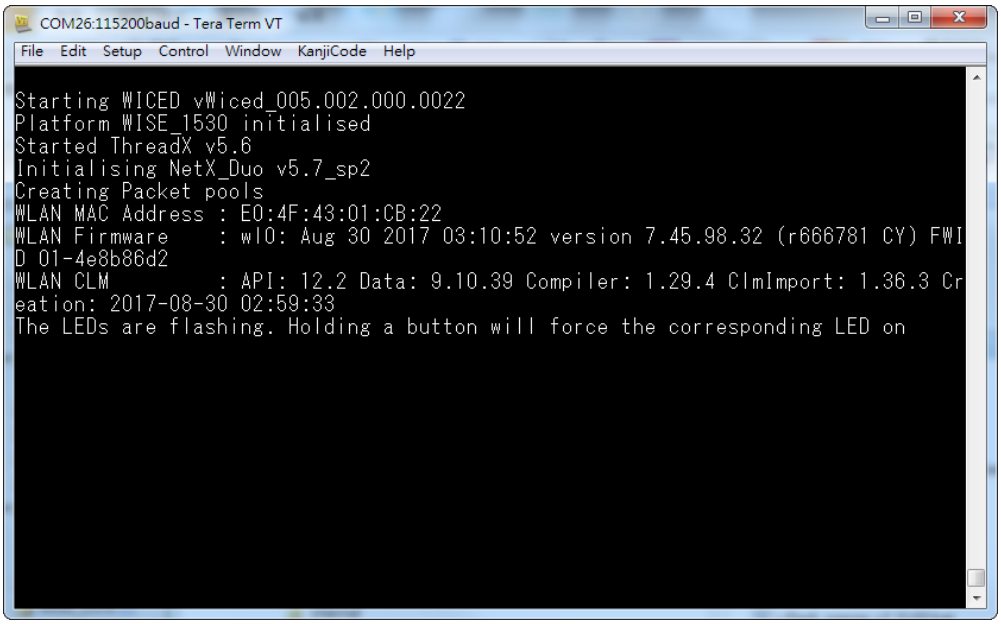
Generate a programming file then use WISE-ED22(http://ess-wiki.advantech.com.tw/view/WISE-ED22_User_Manual)to program WISE-1530. User can refer WISE-ED22 Drag-n-drop Programming(http://ess-wiki.advantech.com.tw/view/WISE-ED22_User_Manual#Drag-n-drop_Programming)section

3.5.1 Debug Setting

Launch a serial port tool (Take Tera Term for example), then setting is as below.



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



Chapter 4

Example: WISE-1530 Demo(StartKit)

4.1 Introduction

There are two main functions in Demo application. 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 main function is WISESnail exapmle. It demonstrates how to get the sensor value from WISE-DB1500 carrier board and upload data to WISE-PaaS/RMM cloud server.

4.2 Detailed about WISE-1530 Demo

The detailed behavior about Demo example is introduced as following:

- System initiation.

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

- BLE and WiFi introducer

  WISE-1530 will try to connect to WiFi AP with default SSID and password at first. If success, WISE-1530 will Loop in WISESnail. Otherwise, BLE will be used for setting SSID and password. User can scan WISE-1530 as BLE device via mobile app. The compile procedures please follow Chapter 4.2 Step by step usage guide .

- Initiation sensor and access data from it.

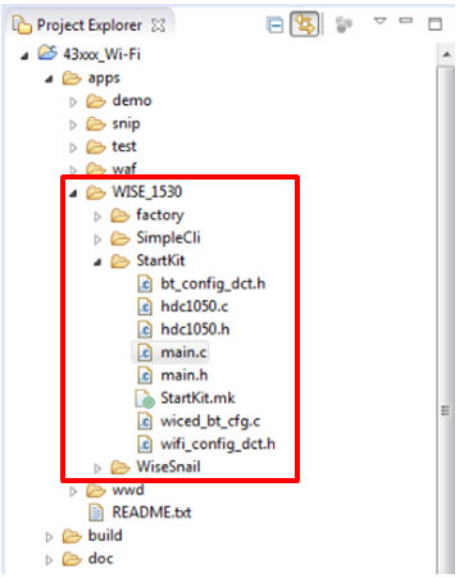
  The TI HDC1050 sensor has been designed-in on WISE-DB1500 carrier board. It's a digital humidity sensor with integrated temperature sensor. The HDC1050 is initialized in example and the user can get data of humidity and temperature.

- Loop in WISESnail or web service.

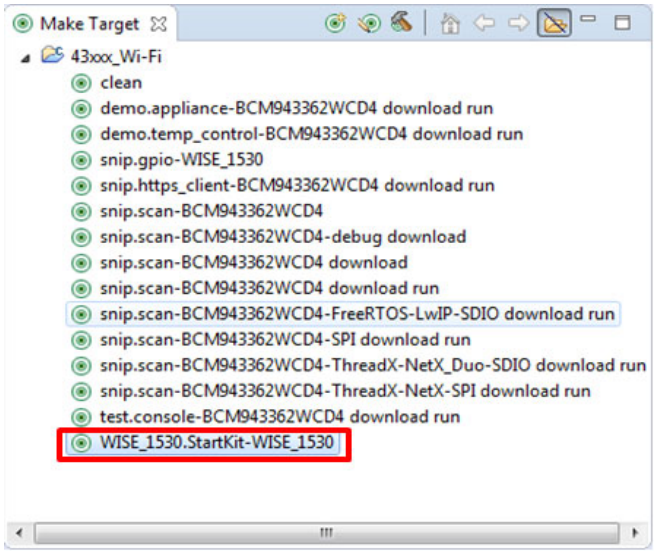
  When device connect to AP and get IP, it will connect to WISE-PaaS/RMM server, keep getting sensor data and do the data exchang through WISESnail. It is an infinite system for cloud service.

4.3 Step by step usage guide

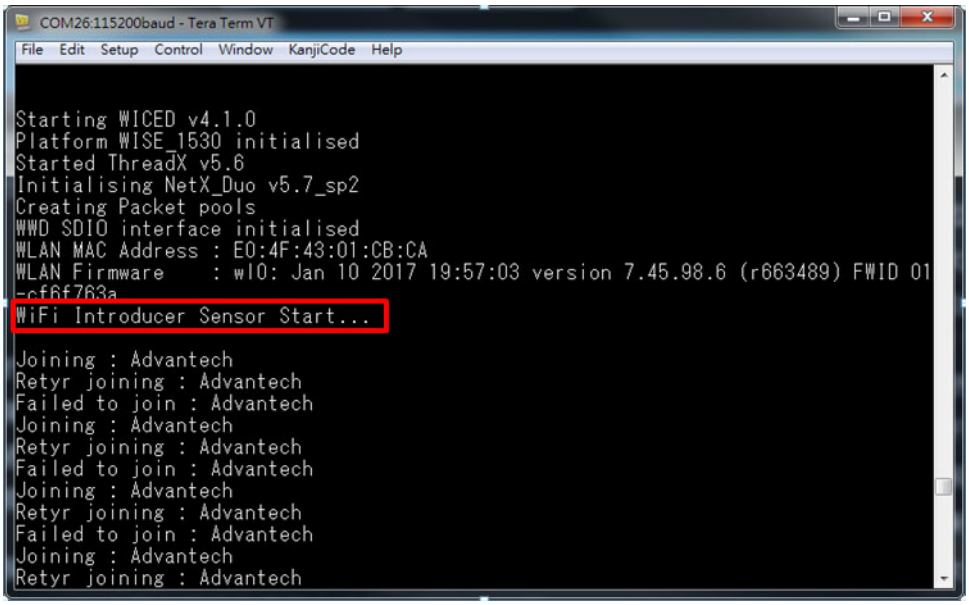
Step 1: Download and unzip WISE_1530_patch.zip(http://ess-wiki.advantech.com.tw/wiki/images/5/51/WISE_1530_patch_v06.zip), then copy WISE_1530 folder to <SDK folder>\43xxx_Wi-Fi\apps. Project Explorer window will appear WISE_1530 folder. You can press 'F5' to refresh if you do not see.



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

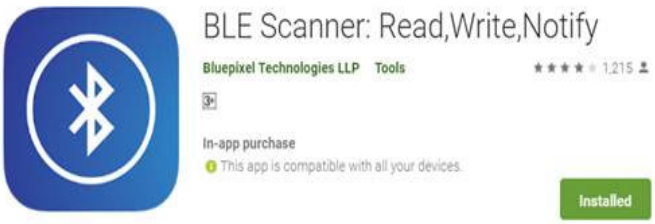


Step 3: Follow "Generate a Programming File(http://ess-wiki.advantech.com.tw/view/WISE-1530_SDK#Generate_a_Programming_File)" to generate a bin file, then download bin file to WISE-1530. You will see below message in console screen if success.

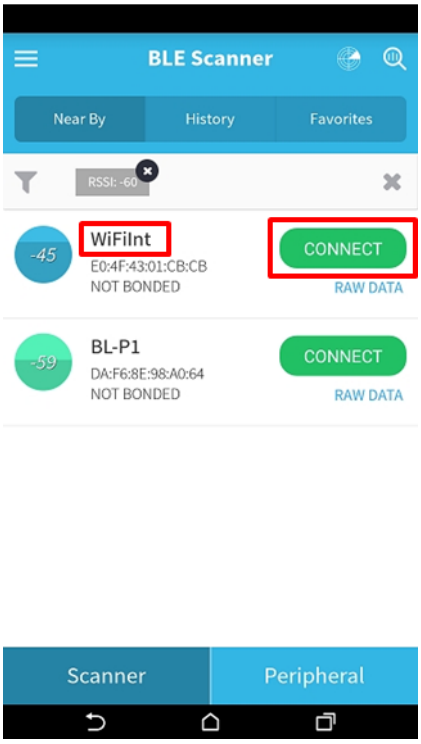


Step 4 to step 8 Please install BLE scanner app in your mobile phone.

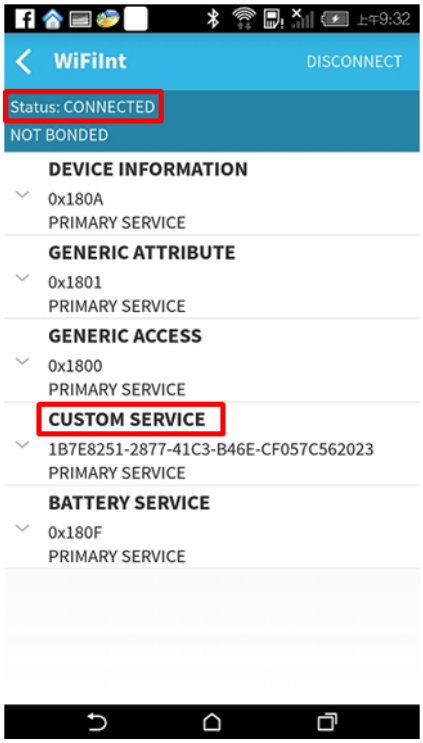
Step 4: Install and launch the BLE Scanner app.



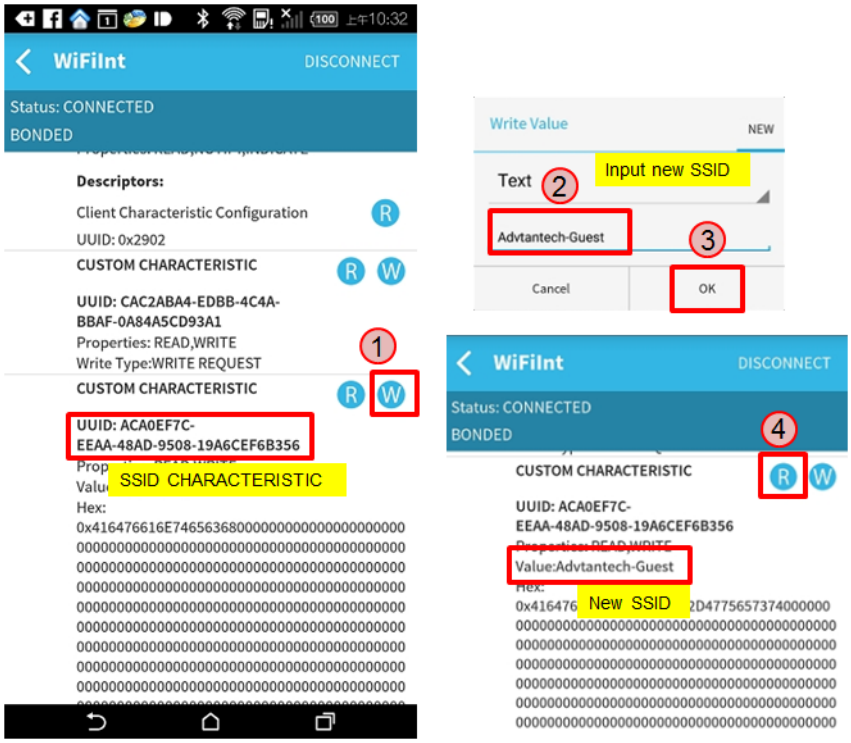
Step 5: Launch BLE Scanner and click on scan device, it will list all the BLE devices nearby. Find the **WiFiInt** device and press CONNECT button.



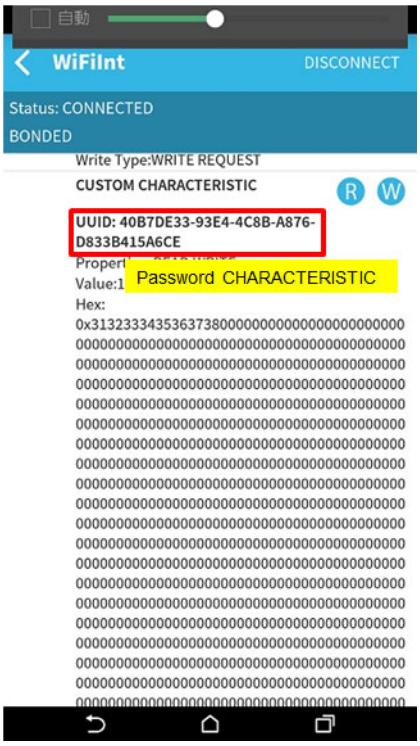
Step 6: If the connection between mobile phone and WISE-1530 is successful, you will access configuration page and select "CUSTOM SERVICE" to modify SSID and PASSWORD of WiFi AP.



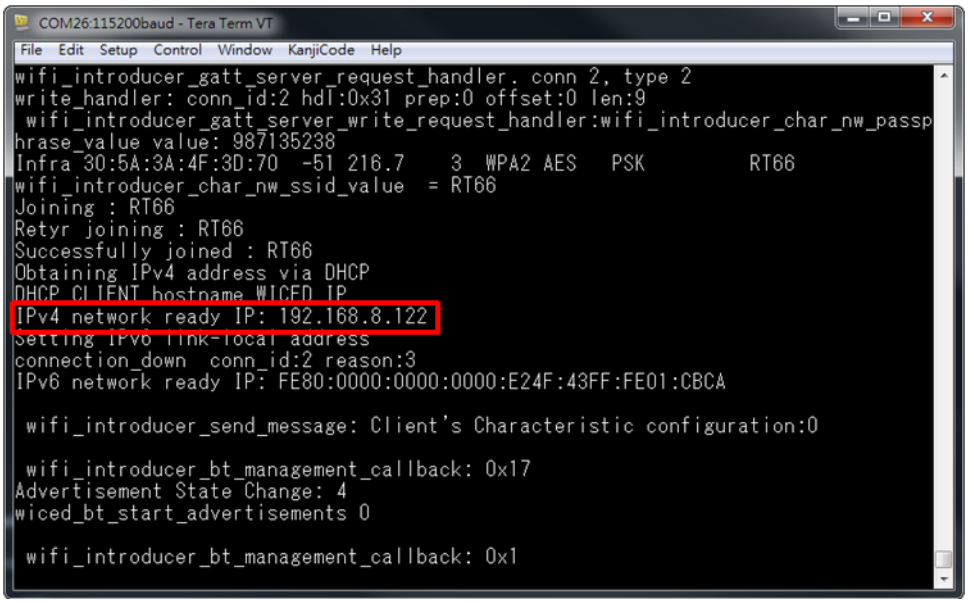
Step 7: Find the UUID: **ACA0EF7C-EEAA-48AD-9508-19A6F6B356** for **SSID** characteristic. Press the "W" button to enter input window. Input new SSID name then press the OK button. Last, user can press "R" button to check new SSID name.



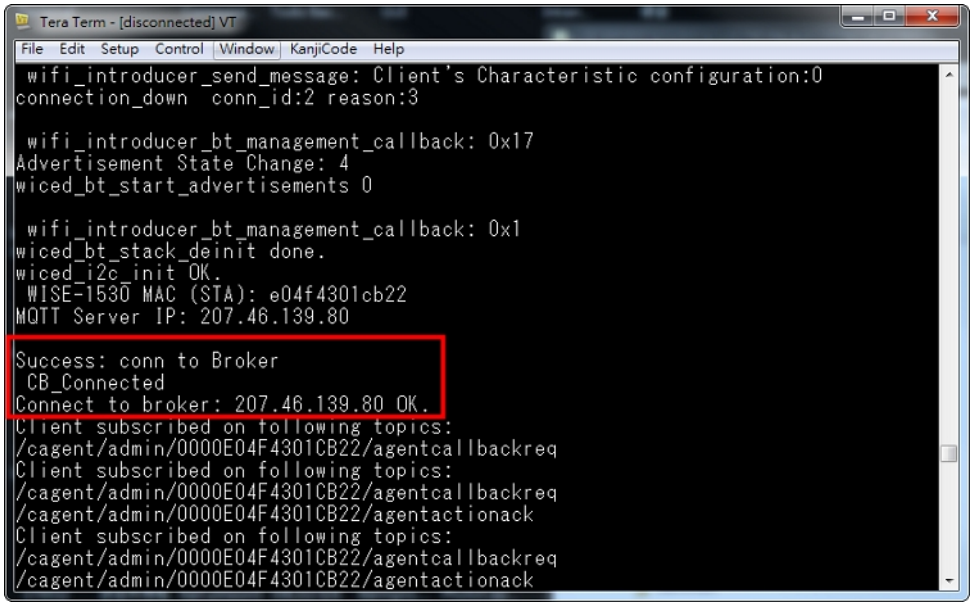
Step 8: Find the UUID: **40B7DE33-93E4-4C8B-A876-D833B415A6CE** for **Password** characteristic then procedure as Step5.

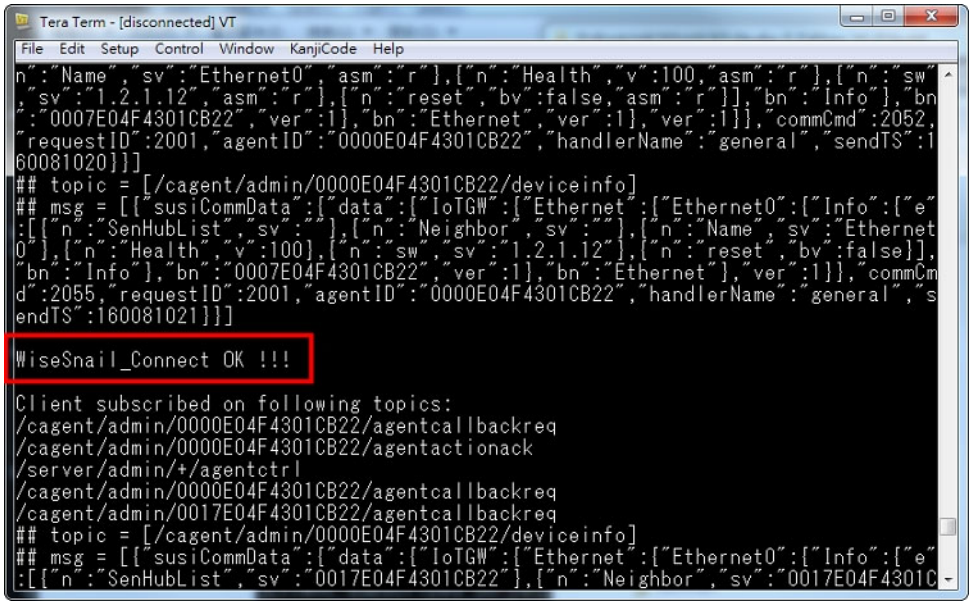


Step 9: If it succeed to access WiFi AP, WISE-1530 will get network IP. The console message is as below.



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





4.4 memory/flash usage

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

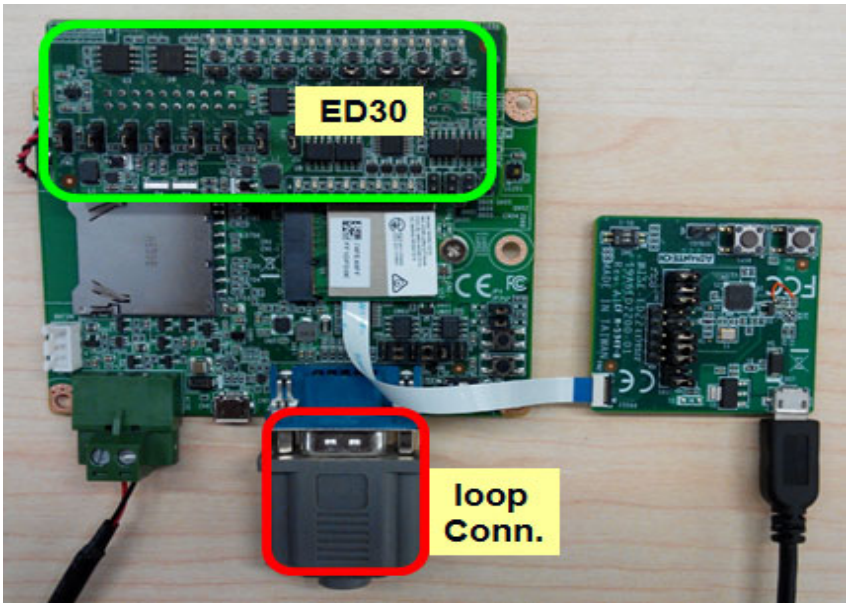
Module	Flash	Static RAM
Adv_WiseSnail	18284	27096
Bluetooth_Embedded_Low_Energy_Stack	154	57
bluetooth_low_energy	78493	9348
button_manager	588	4
command_console	3688	404
command_console_wifi	11146	0
crc	1060	0
DHCP_Server	1524	132
DNS	1724	44
GPIO_button	120	4
Host MCU-family library	15718	2492
Interrupt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

4.5 I/O Test (factory)

4.5.1 Introduction

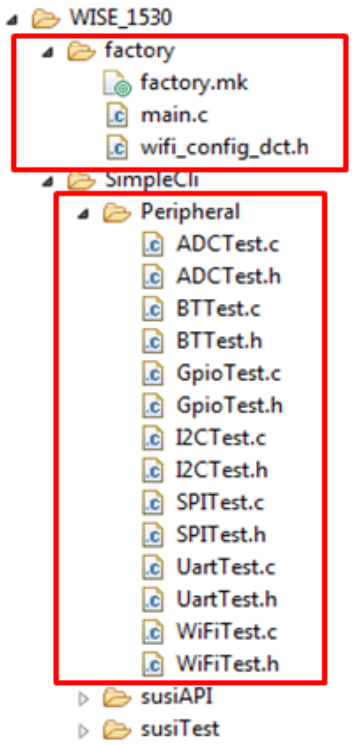
The I/O Test application is a WISE-1530 I/O testing example. It's need extra I/O board(WISE-ED30) to plug in to WISE-1500. The hardware setup as below. This instance could test m2.com I/O that WISE-1530 supported(M2.COM Pinout(http://ess-wiki.advantech.com.tw/view/MCU/WISE-1530)), include GPIO, ADC,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



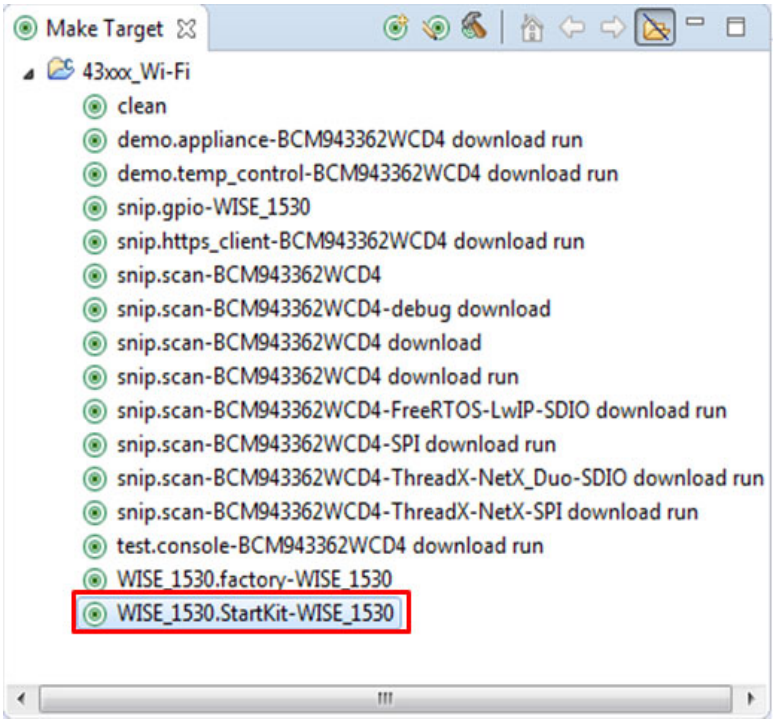
4.5.2 I/O Test Use WICED API

Step 1: Download and unzip WISE_1530_patch.zip(http://ess-wiki.advantech.com.tw/wiki/images/5/51/WISE_1530_patch_v06.zip), then copy WISE_1530 folder to <SDK folder>\43xxx_Wi-Fi\apps.

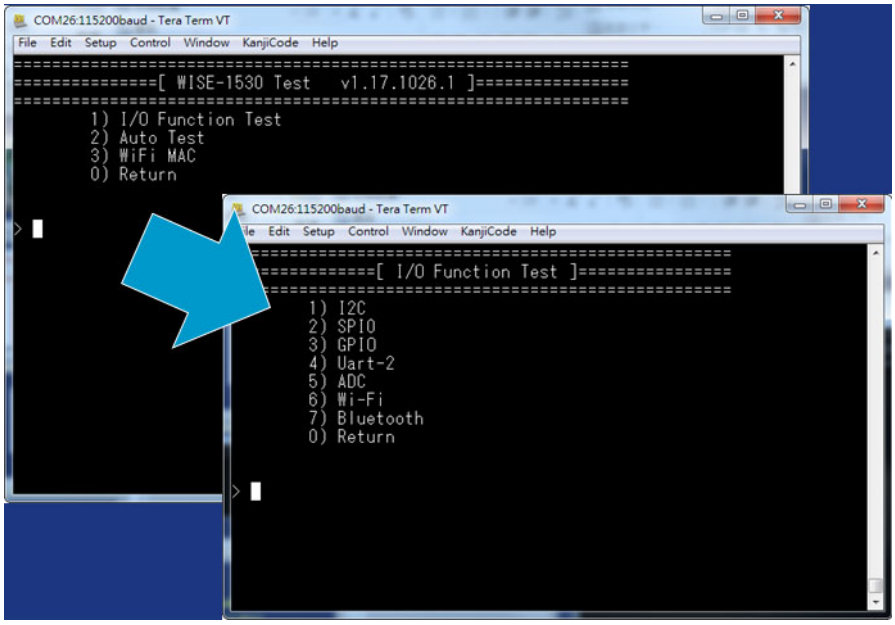
Step 2: I/O test source code please refer as below files.



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



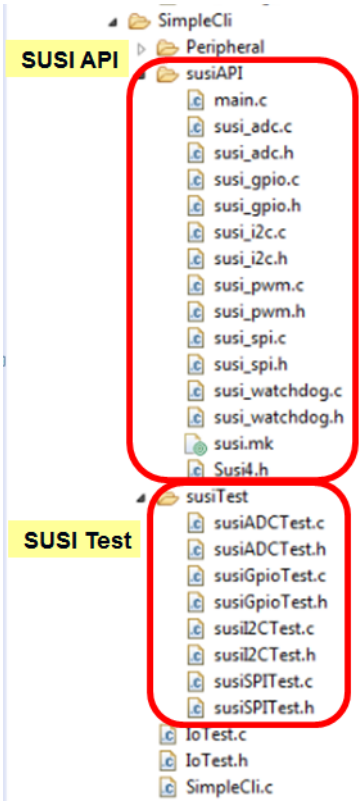
Step 4: You will see below message in console screen if success. Input '1' to select I/O Function Test, the screen will show I/O test items.Input 1~7 to test I/0 and 0 to return previous page.



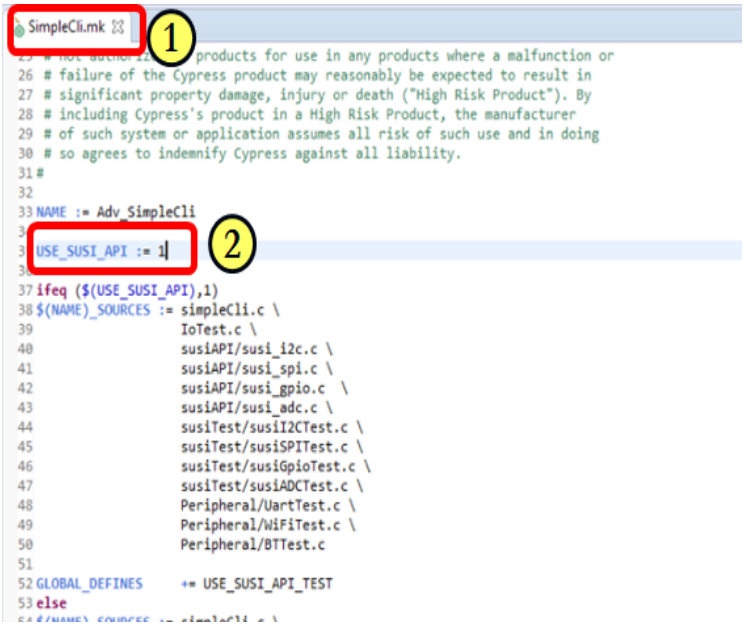
4.5.3 I/O Test Use SUSI API

The I/O Test example also support SUSI API (please refer SUSI_API(http://ess-wiki.advantech.com.tw/wiki/images/5/51/WISE_1530_patch_v06.zip)).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.



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.

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