

ARC IoTDK

- Environment Build -

Contents

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- GNU Toolchain
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- Putty

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- Zadig

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Installation - GNU Tollchain

Download Link :

<https://github.com/foss-for-synopsys-dwc-arc-processors/toolchain/releases/tag/arc-2020.03-release>

Version : 2020.03

	Linux x86_64	Windows x86_64	Linux ARC HS	macOS x86_64
Baremetal	Little endian \ Big endian			Little endian \ Big endian
Linux/uClibc ARC700	Little endian \ Big endian			
Linux/uClibc ARC HS	Little endian \ Big endian		Little endian	
Linux/glibc ARC HS	Little endian \ Big endian			
IDE	Download	Download		Download



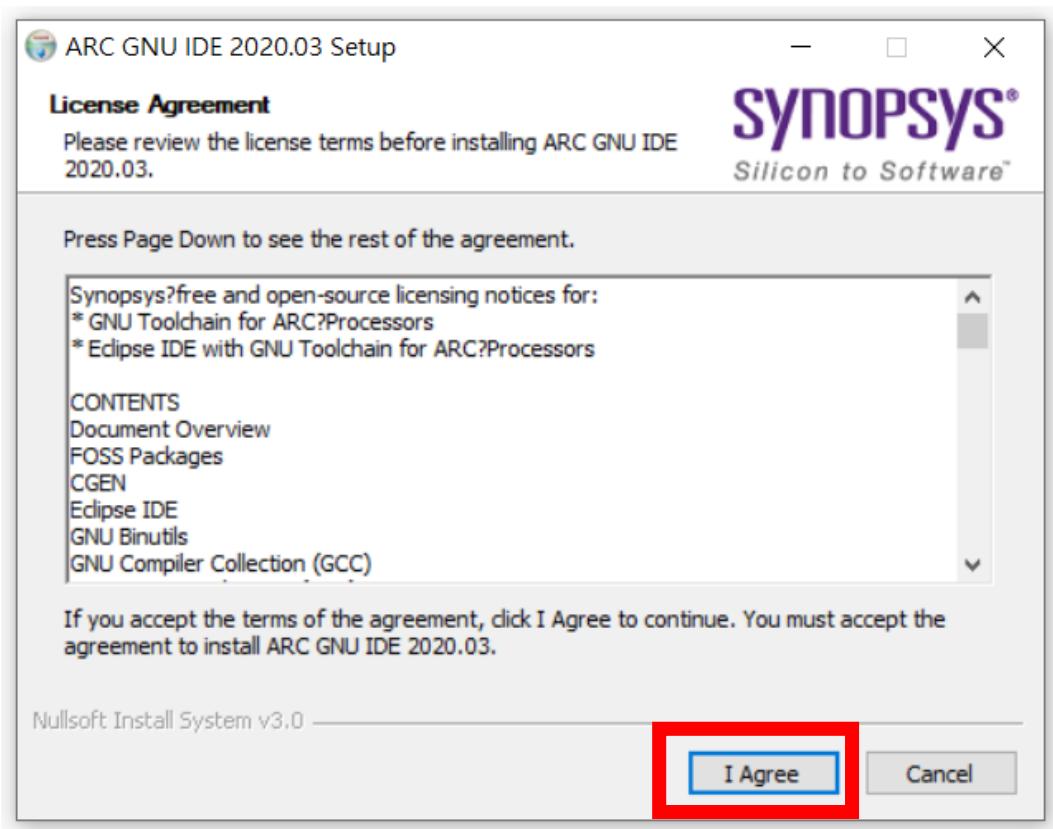
for windows



for mac

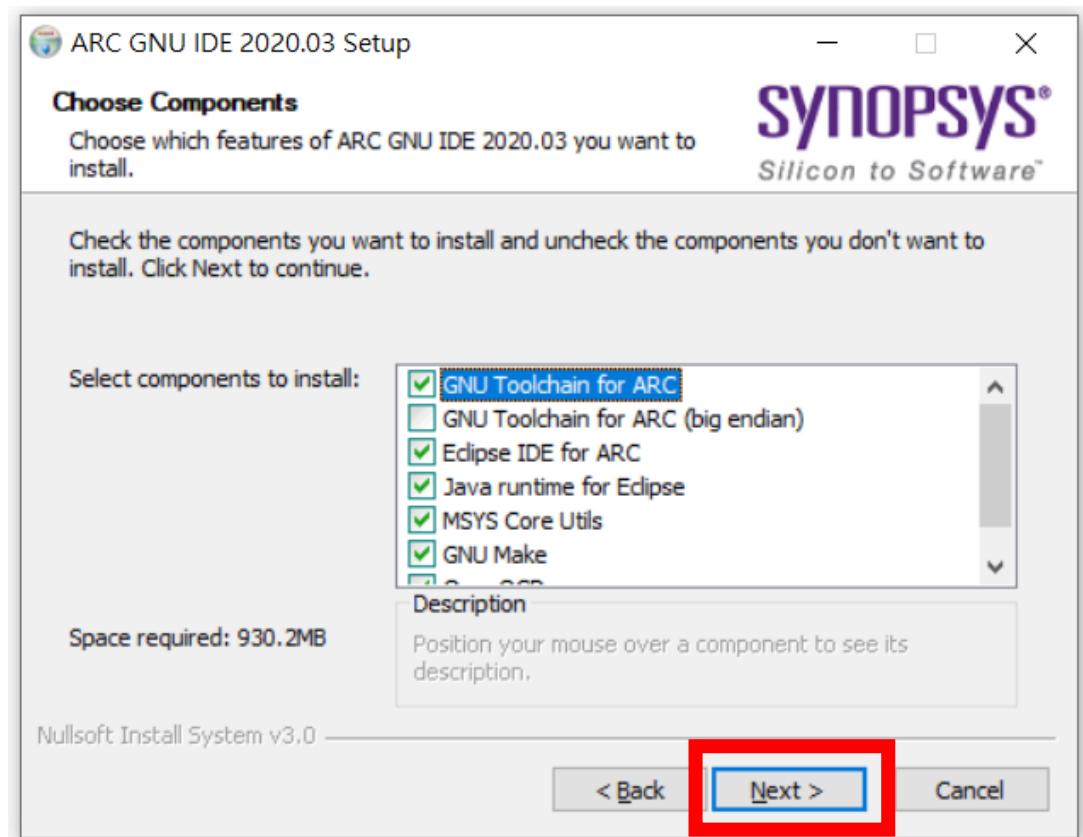
Installation

- GNU Tollchain



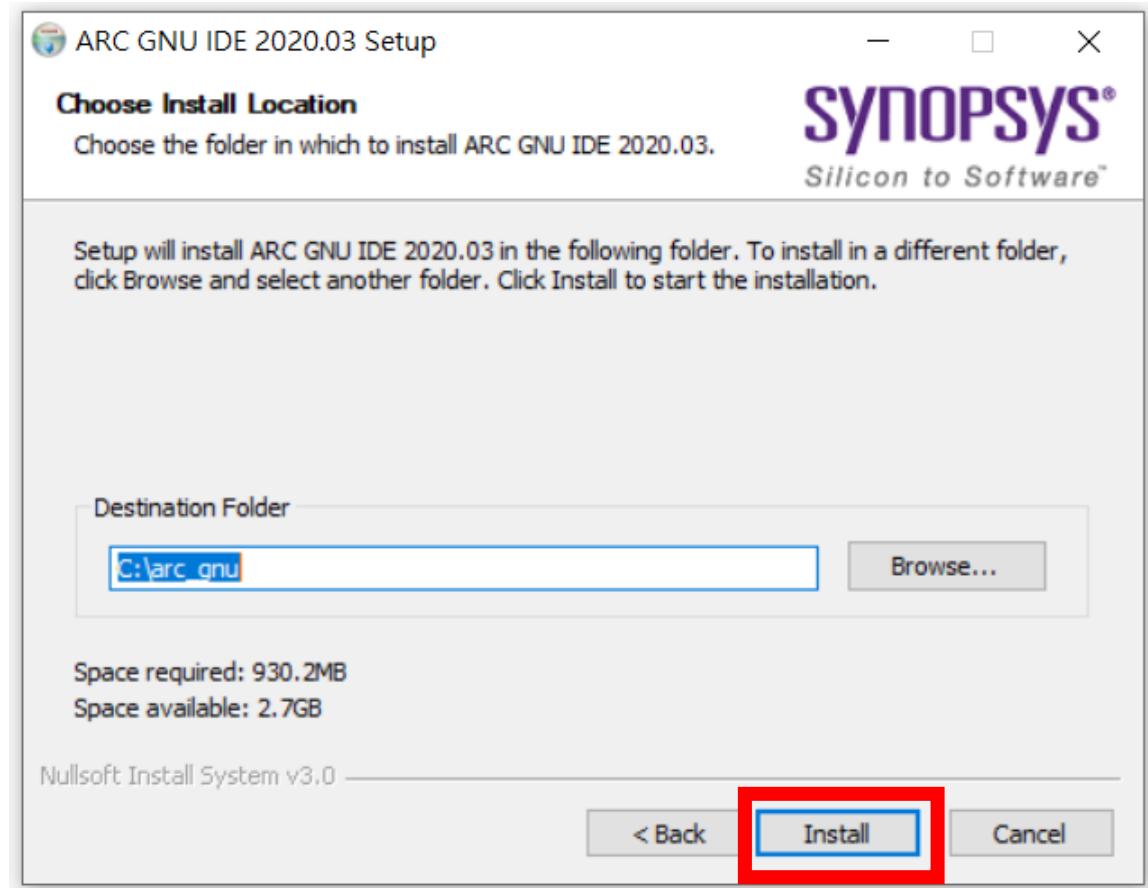
Installation

- GNU Tollchain

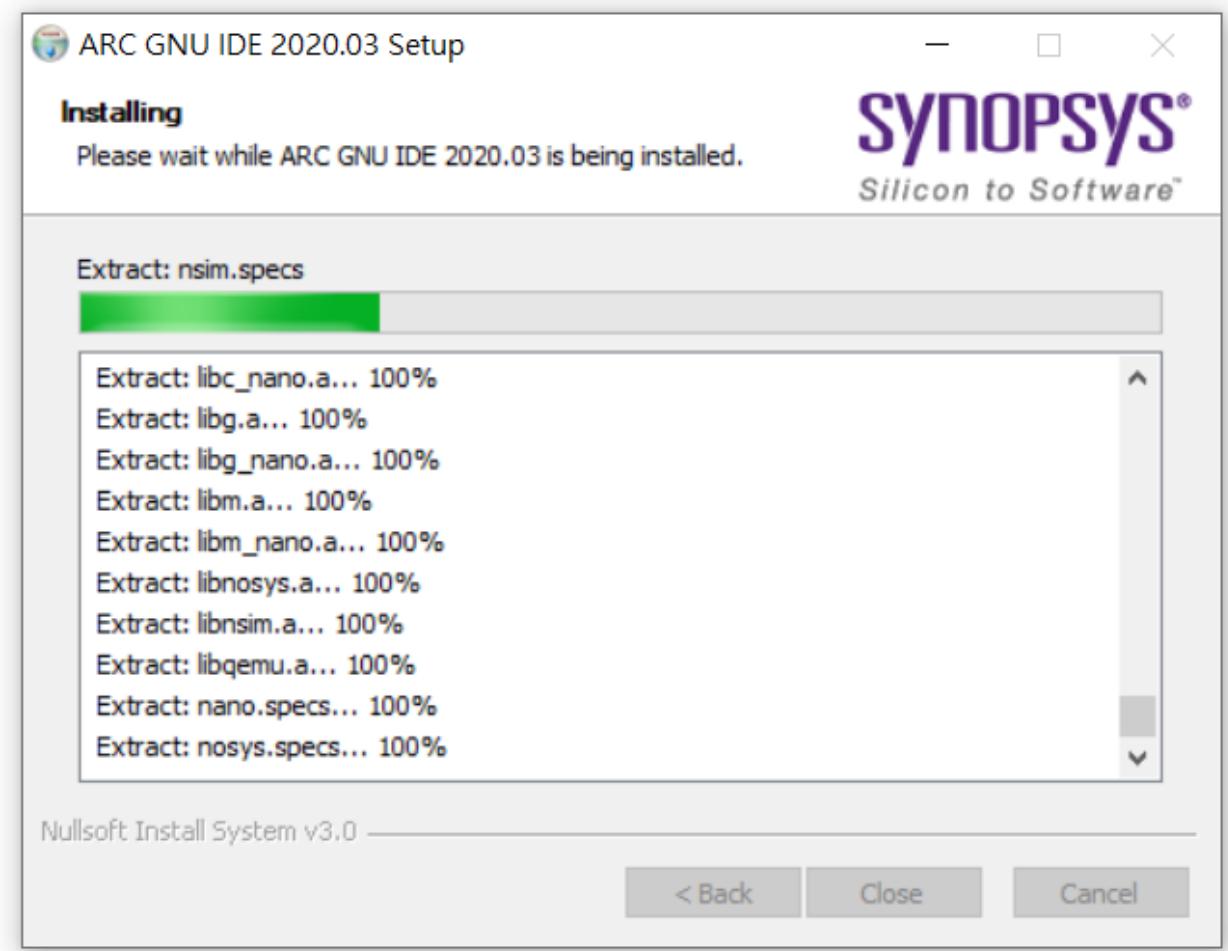


Installation - GNU Tollchain

You can choose your
own Destination Folder

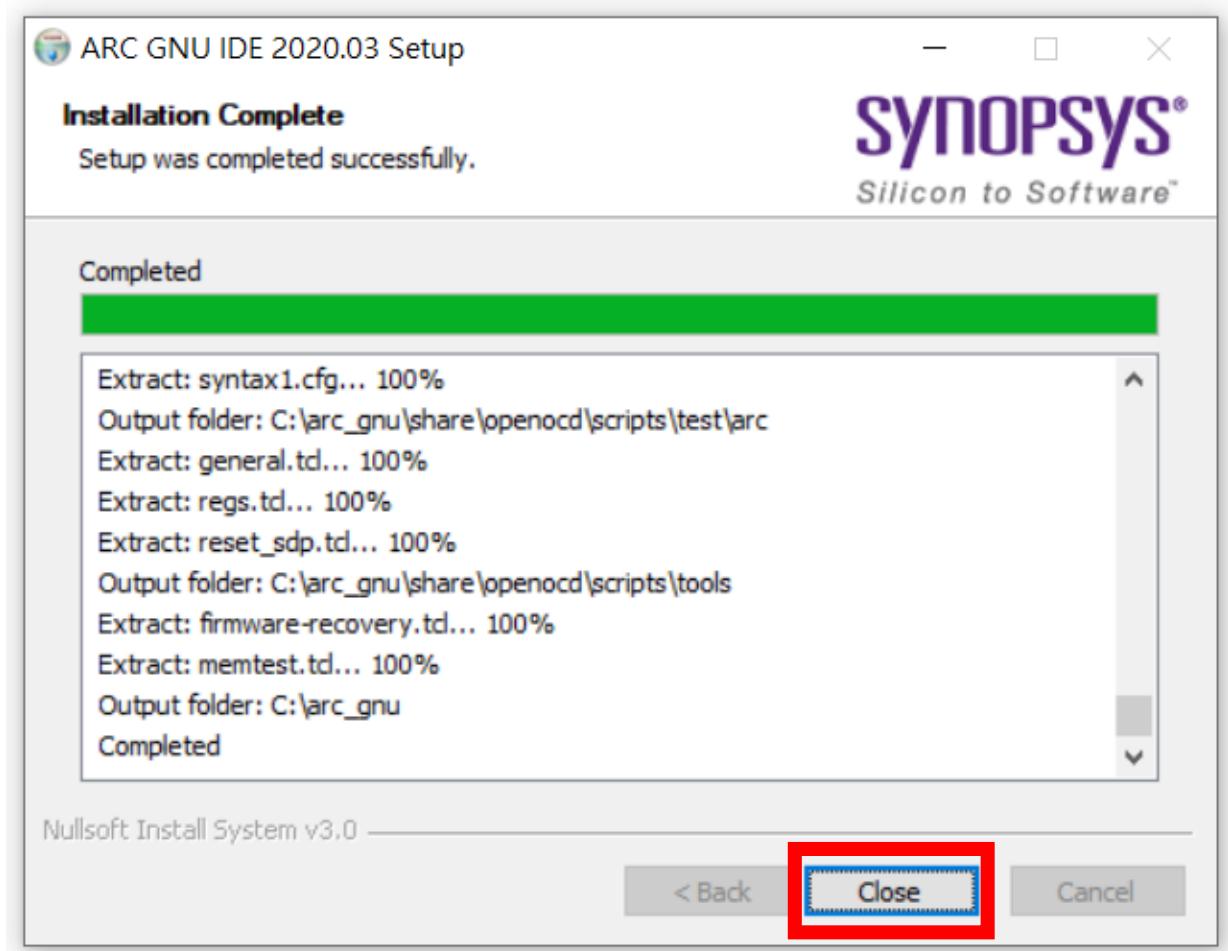


Installation - GNU Tollchain



Installation - GNU Tollchain

Done !



Installation

- VSCode

Download Link :

<https://code.visualstudio.com/#alt-downloads>

The image shows a screenshot of the Visual Studio Code download page. It features three main download sections: Windows, Linux, and Mac. Each section includes a logo, a download link, and supported operating system information.

- Windows:** Shows the Windows logo. Download link: [Windows](#). Supported OS: Windows 7, 8, 10. Options: User Installer (64 bit, 32 bit, ARM), System Installer (64 bit, 32 bit ARM), .zip (64 bit, 32 bit ARM).
- Linux:** Shows the Tux logo. Download links: [.deb](#) (Debian, Ubuntu), [.rpm](#) (Red Hat, Fedora, SUSE). Options: .deb, .rpm, .tar.gz.
- Mac:** Shows the Apple logo. Download link: [Mac](#). Supported OS: macOS 10.10+. Option: Snap Store.

Installation
- VSCode

Please learn how to use **VSCode** by
yourself on the Internet

ex : 改中文介面、常用快捷鍵 ... etc

簡單了解即可

Installation

- Putty

Download Link :

<https://www.puttygen.com/download-putty>

Please follow the steps to install !

USB Driver Adjustment

- Download Zadig

Download Link :

<https://zadig.akeo.ie>

Download

Updated 2020.03.28:

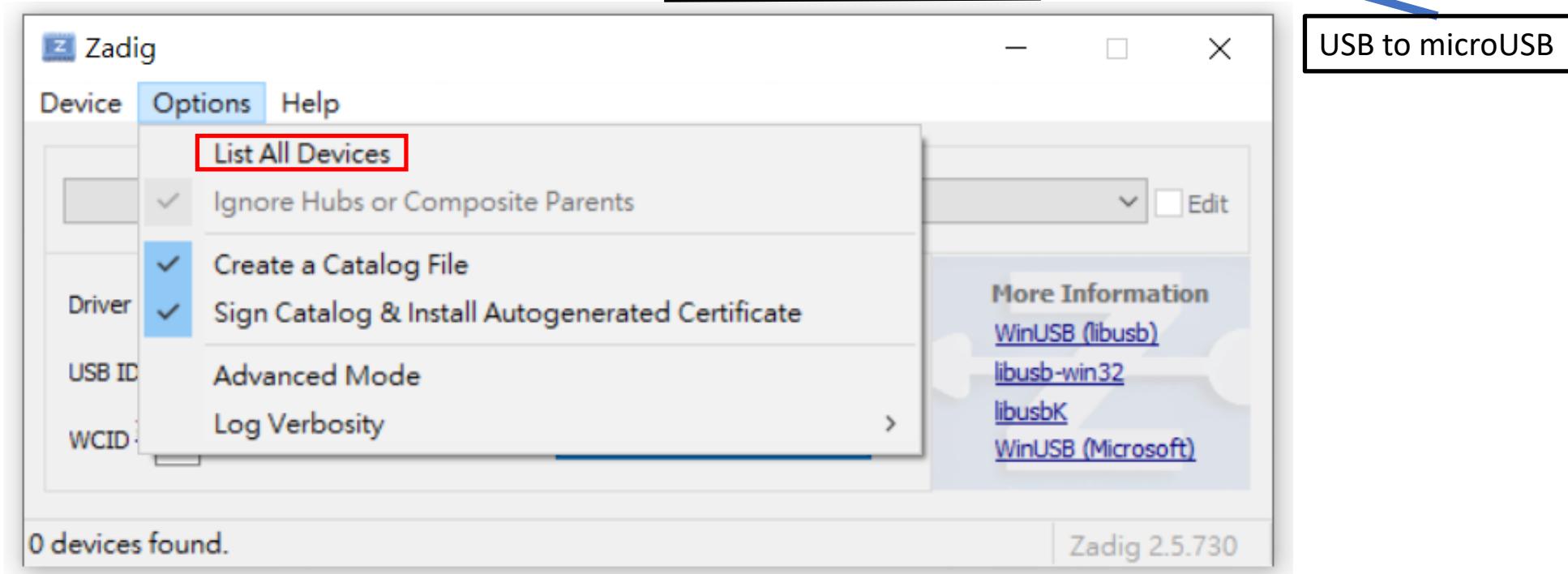
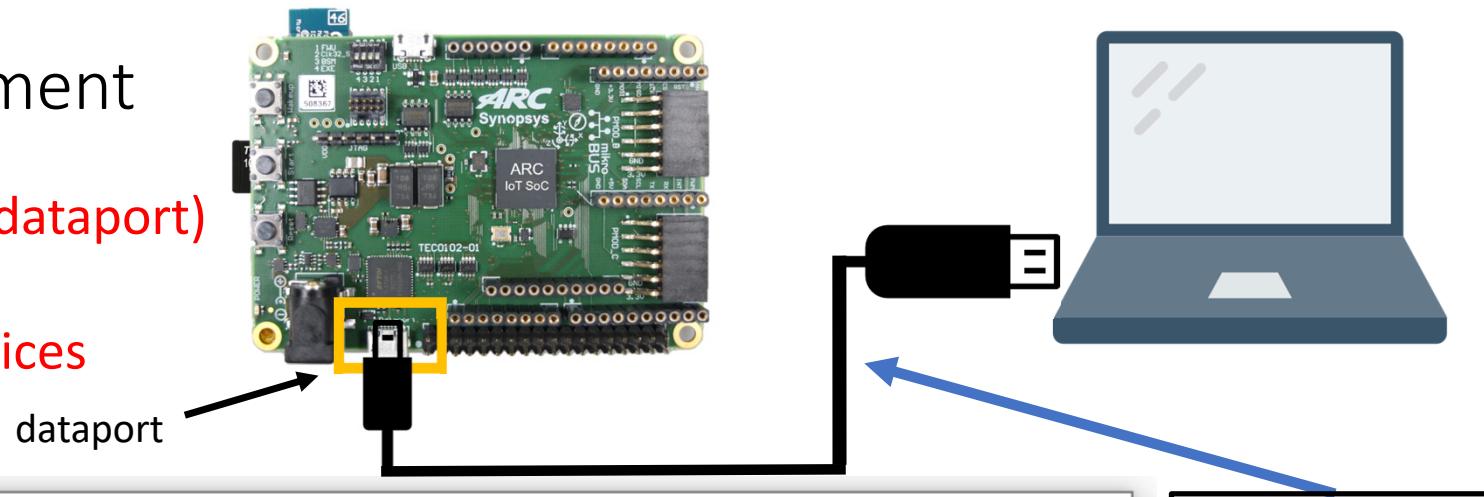
- [Zadig 2.5](#) (4.9 MB)
- [Other versions](#)

System Requirements:

Windows 7 or later.
Windows XP and Windows Vista are **NO LONGER SUPPORTED**.

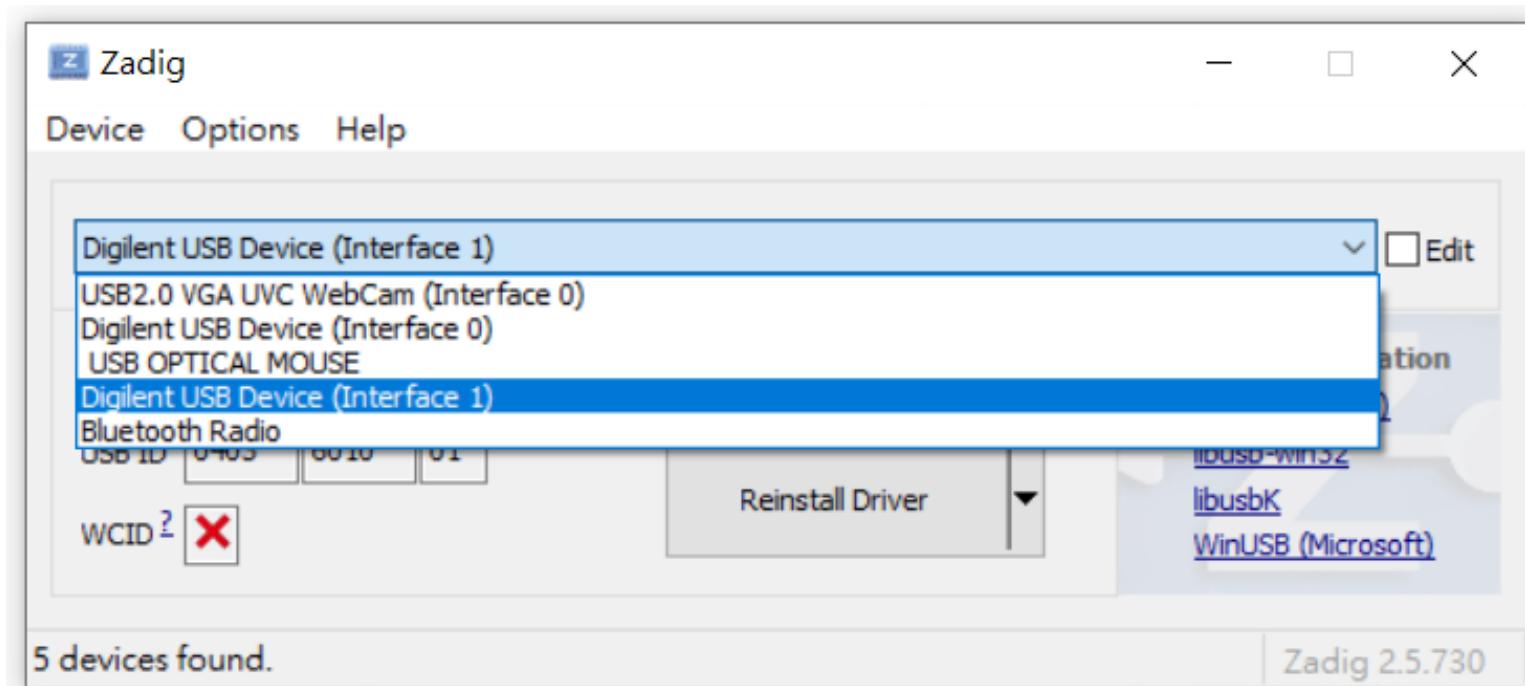
USB Driver Adjustment

1. Connect PC & IoT DK (dataport)
2. Open Zadig-2.5.exe
3. Options -> List All Devices



USB Driver Adjustment

Choose Digilent USB Device(Interface 1)



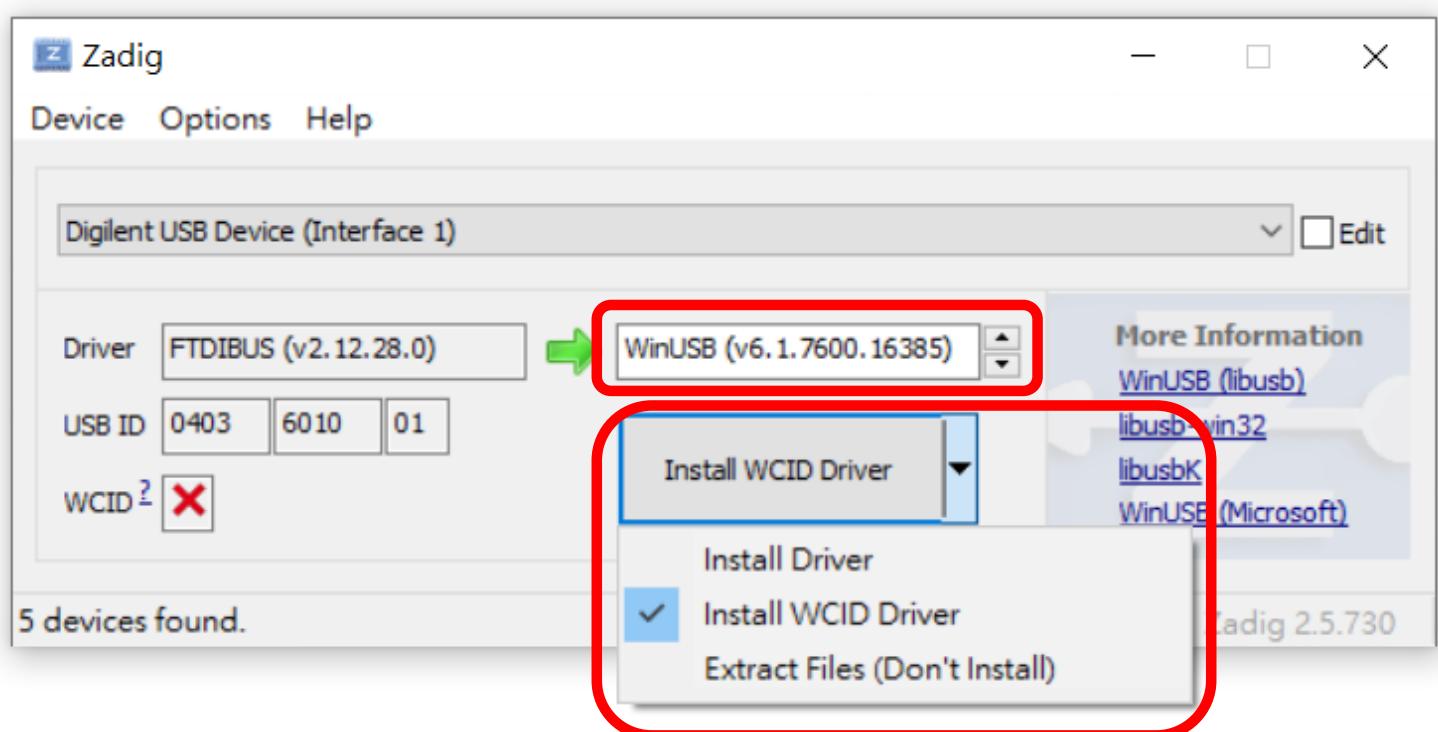
USB Driver Adjustment

1. Choose WinUSB (v6.1.7600.16385)

2. Install Driver or Install WCID Driver

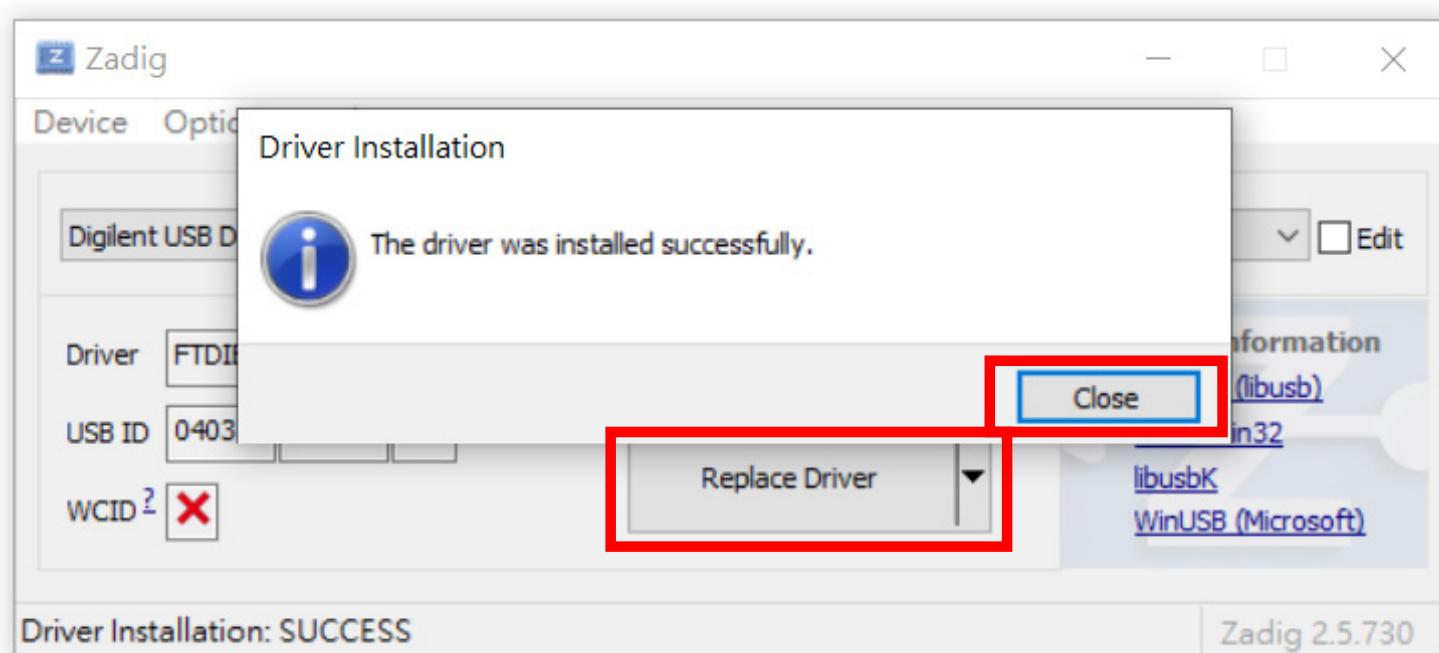
(※if you have installed this driver before, it will display Replace Driver, just click it)

3. Then, wait a second



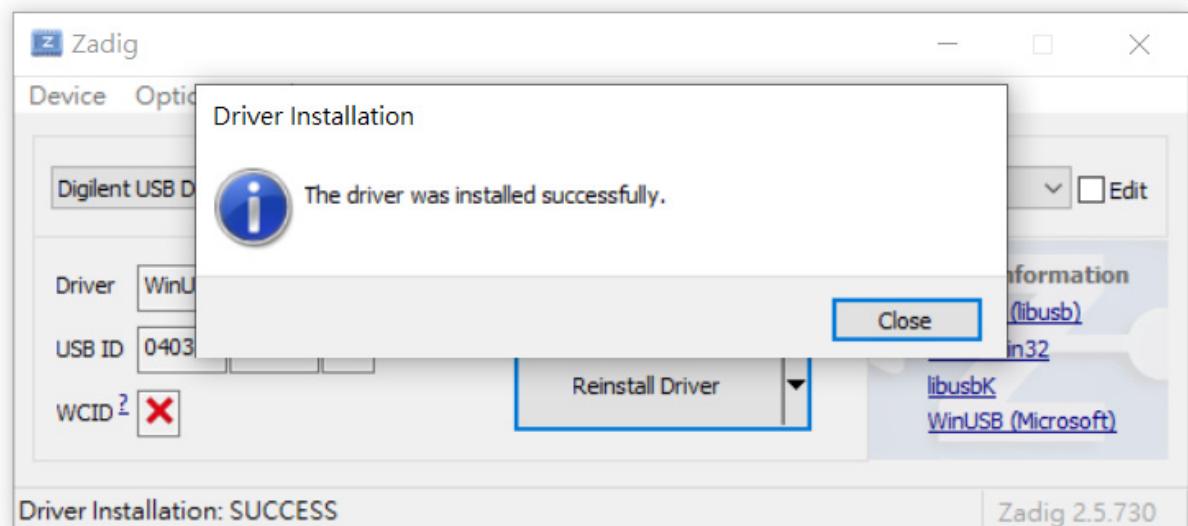
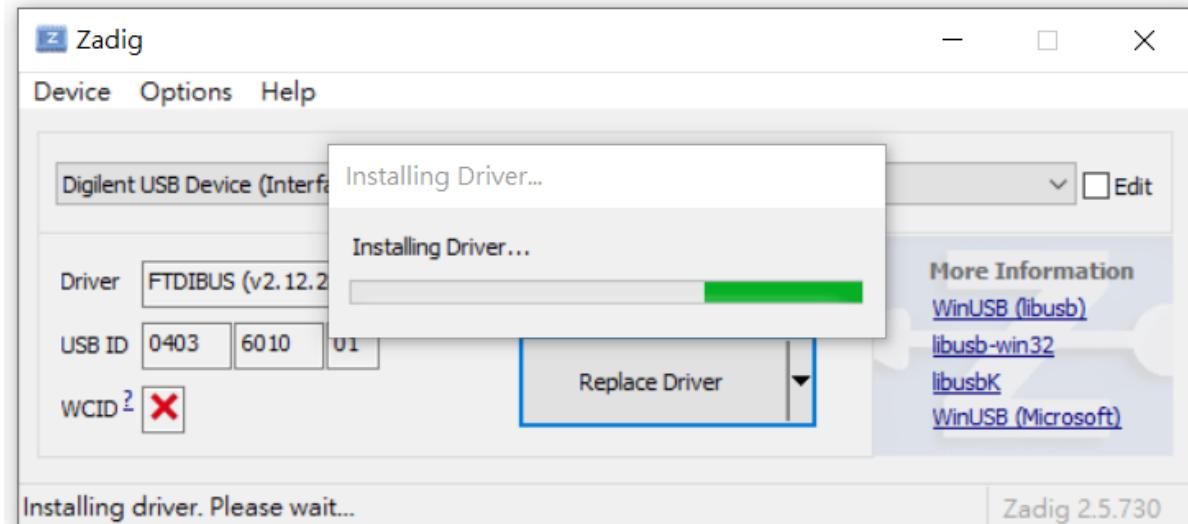
USB Driver Adjustment

1. Click Close
2. Click Replace Driver



USB Driver Adjustment

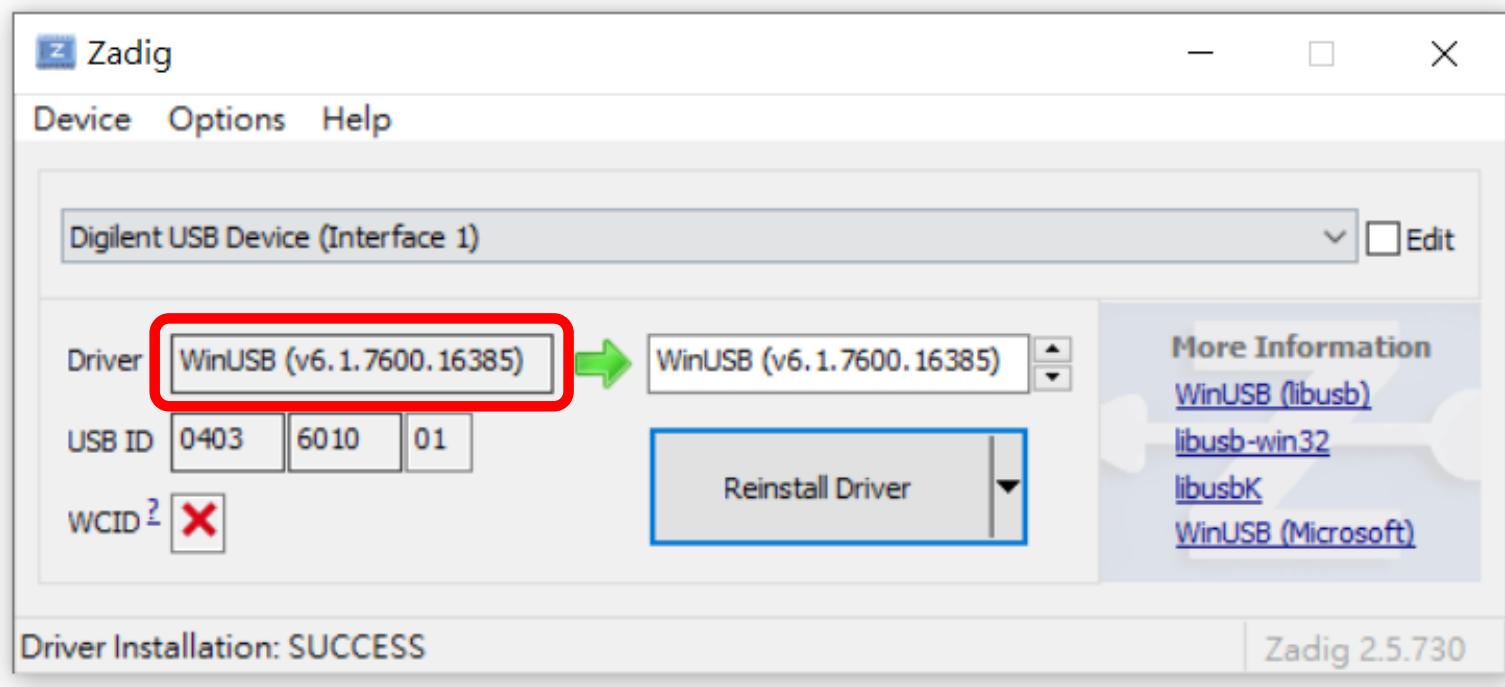
Wait a second



USB Driver Adjustment

Then you can find Driver is changed to WinUSB

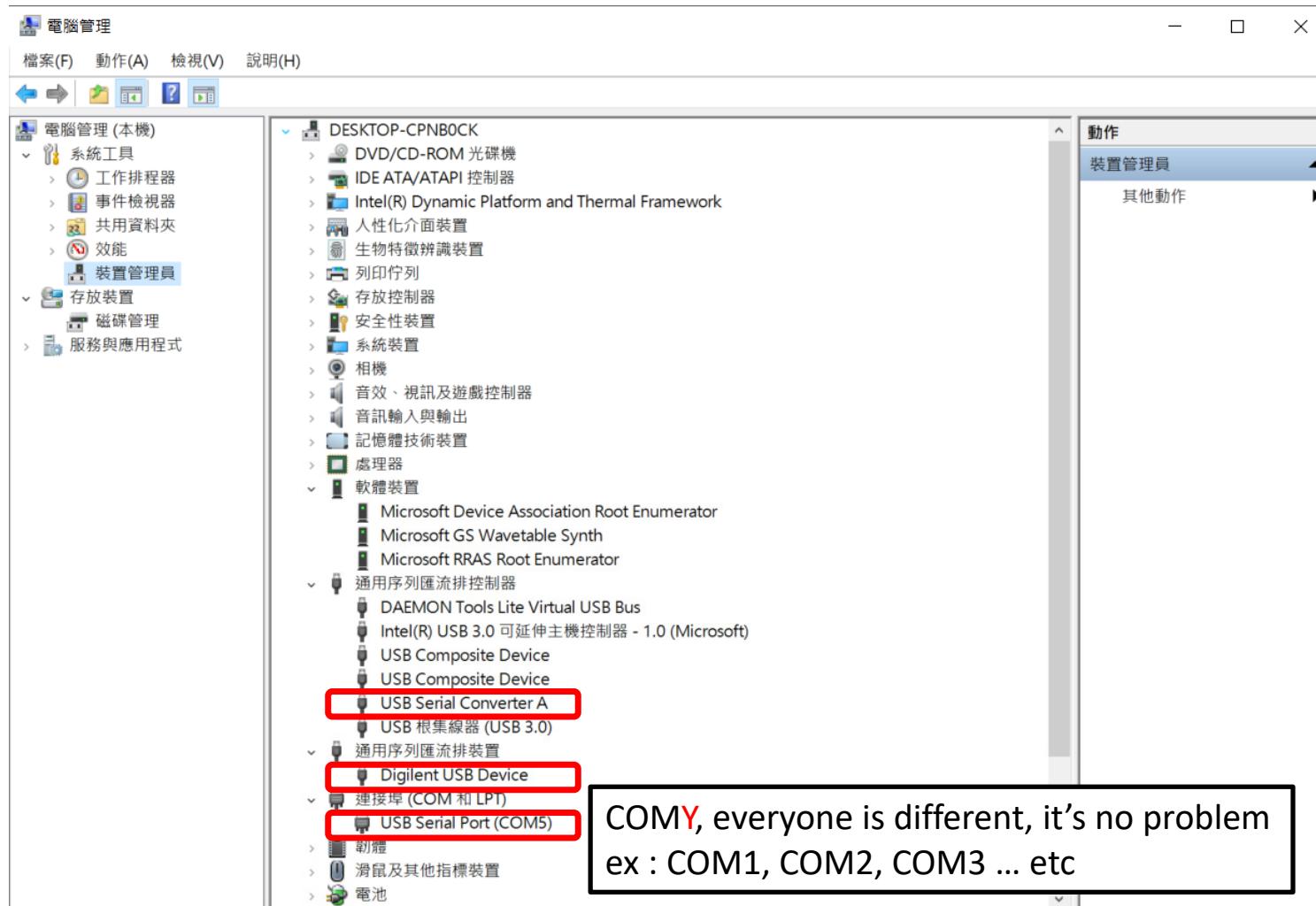
Now, please restart your pc



USB Driver Adjustment

After restart,
you can check your USB
Driver in “Device Manager”

Done !



Test

- Download embarc_osp

Download Link :

https://github.com/foss-for-synopsys-dwc-arc-processors/embarc_osp

The screenshot shows the GitHub repository page for 'embarc_osp'. At the top right, there are buttons for 'Watch' (28), 'Star' (35), 'Fork' (44), and 'Code'. A red arrow labeled '1. Click here' points to the 'Code' button. A context menu is open over a commit message, with a red box around the 'Download ZIP' option, and a red arrow labeled '2. Click here' points to it. The commit list includes:

- YuguoWH Improve documents and makefile, expose linker script makefile option
- .astyle tool: update the code style rule
- .ci travis: Secureshield examples don't support
- .github Update CONTRIBUTING.md
- arc arc: timer: fix divu instruction bug
- board board: nsim: remove nsim_isa_host_timer options
- device doc: modify punctuation and spelling
- doc Improve documents and makefile, expose linker script makefile option
- example example: bootloader: fix unclear document
- inc arc: fix the bug caused by typos
- library Merge pull request #100 from BabaYB/ss_appl_gen

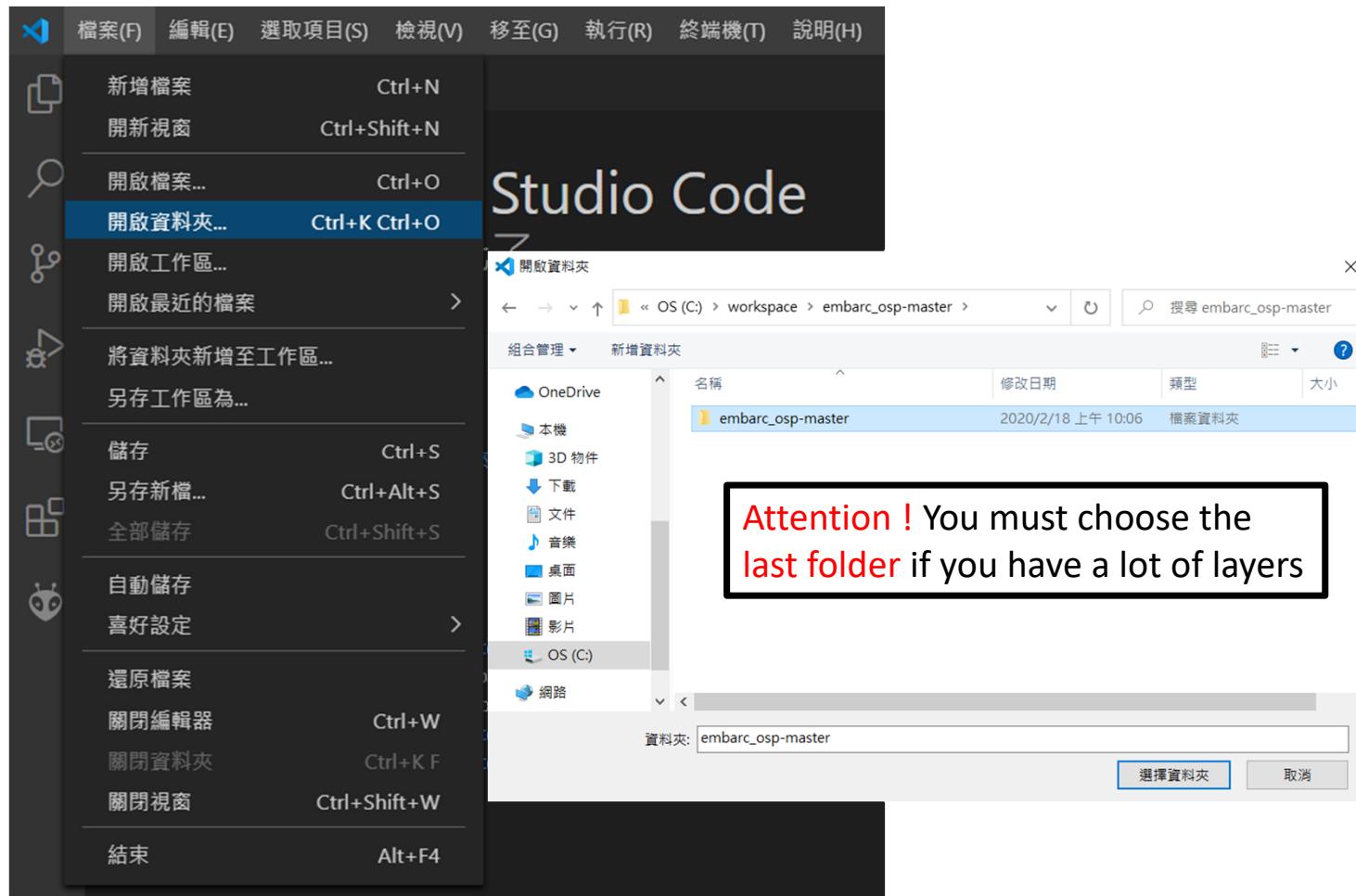
On the right side, there is an 'About' section for 'embARC Open Software Platform (OSP)' with links to the website and GitHub organization, and a 'Releases' section with a link to the latest version.

Test

1. unzip `embarc_osp-master.zip`
2. Open with VSCode

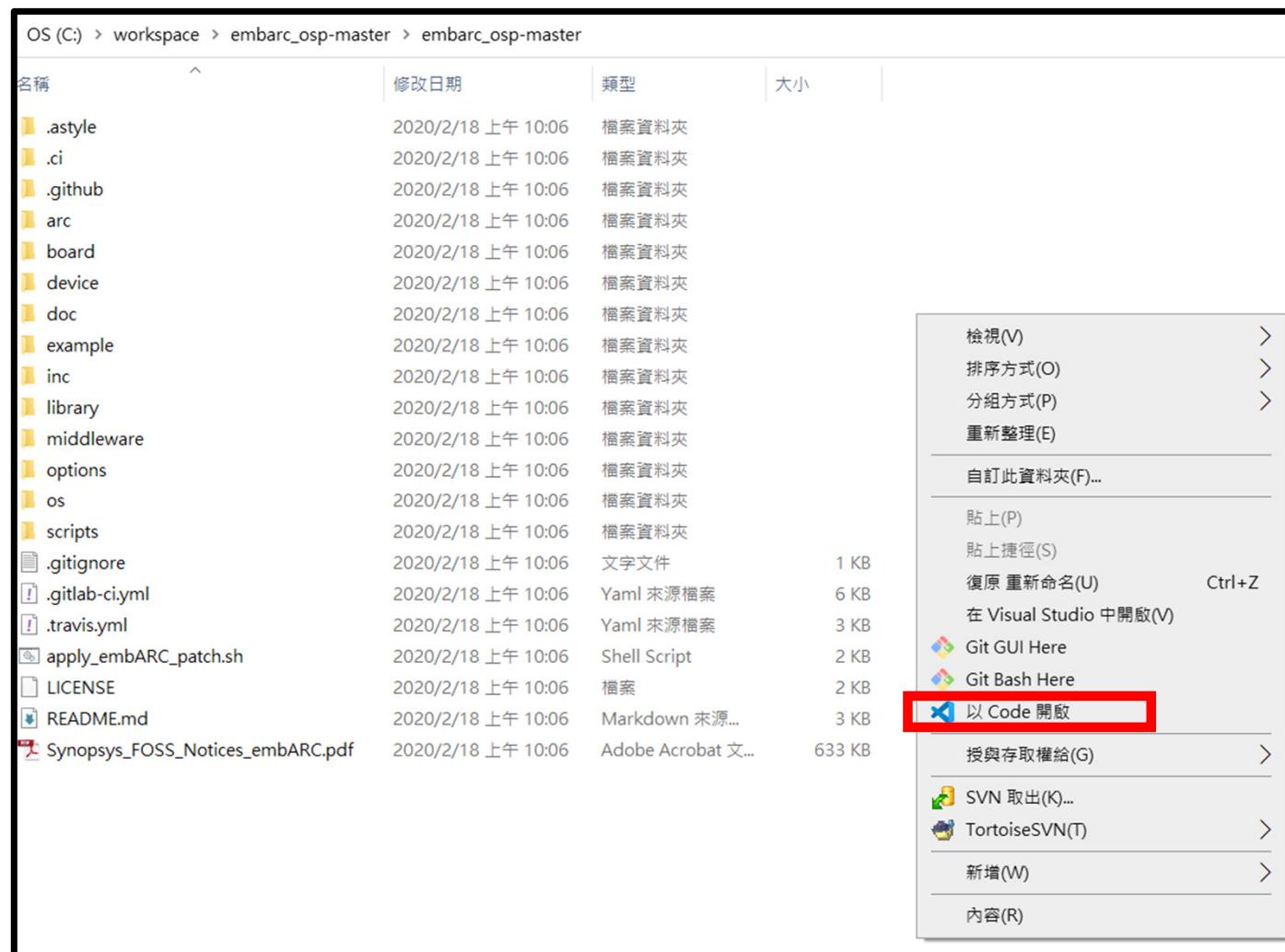
Open with VSCode

First way :



Test

Open with VSCode
Second way :



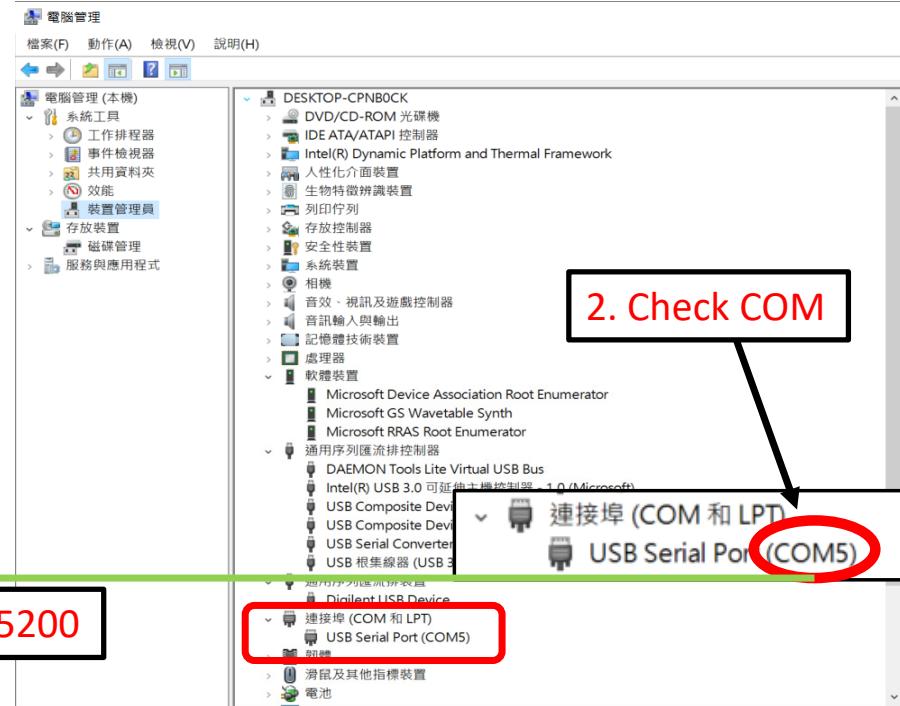
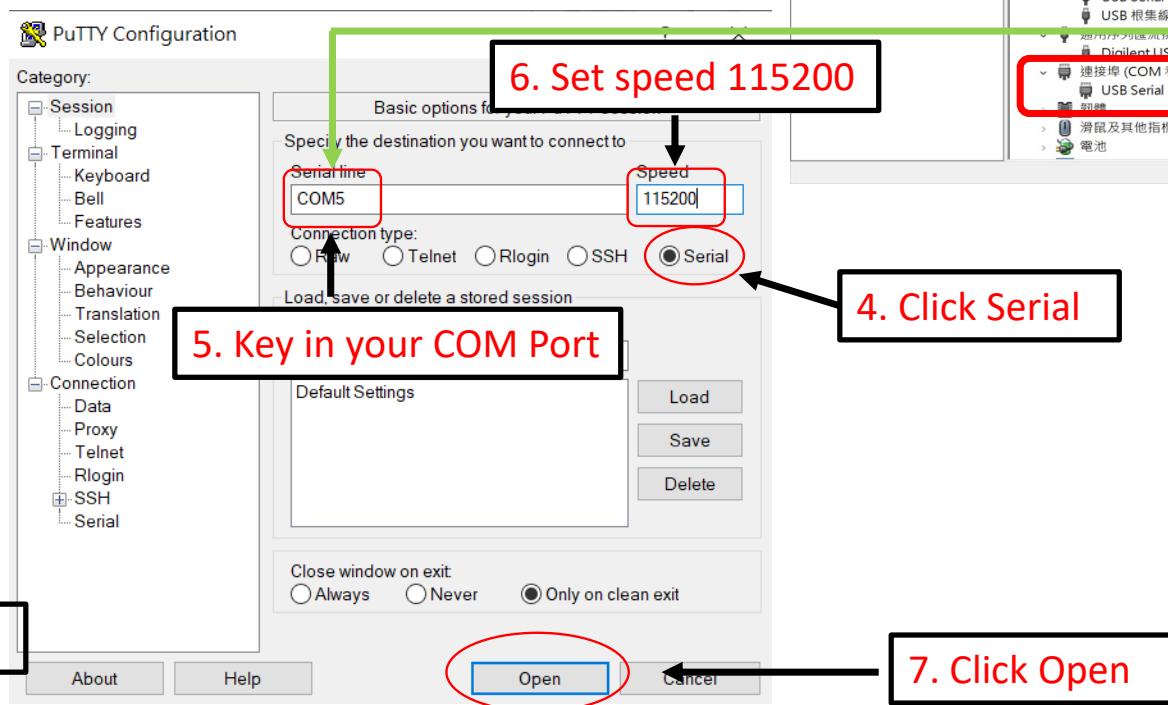
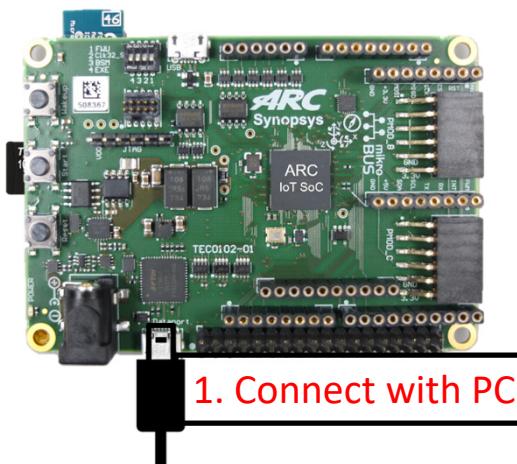
Test

This is begin page, you can see `embarc_osp` file at left side



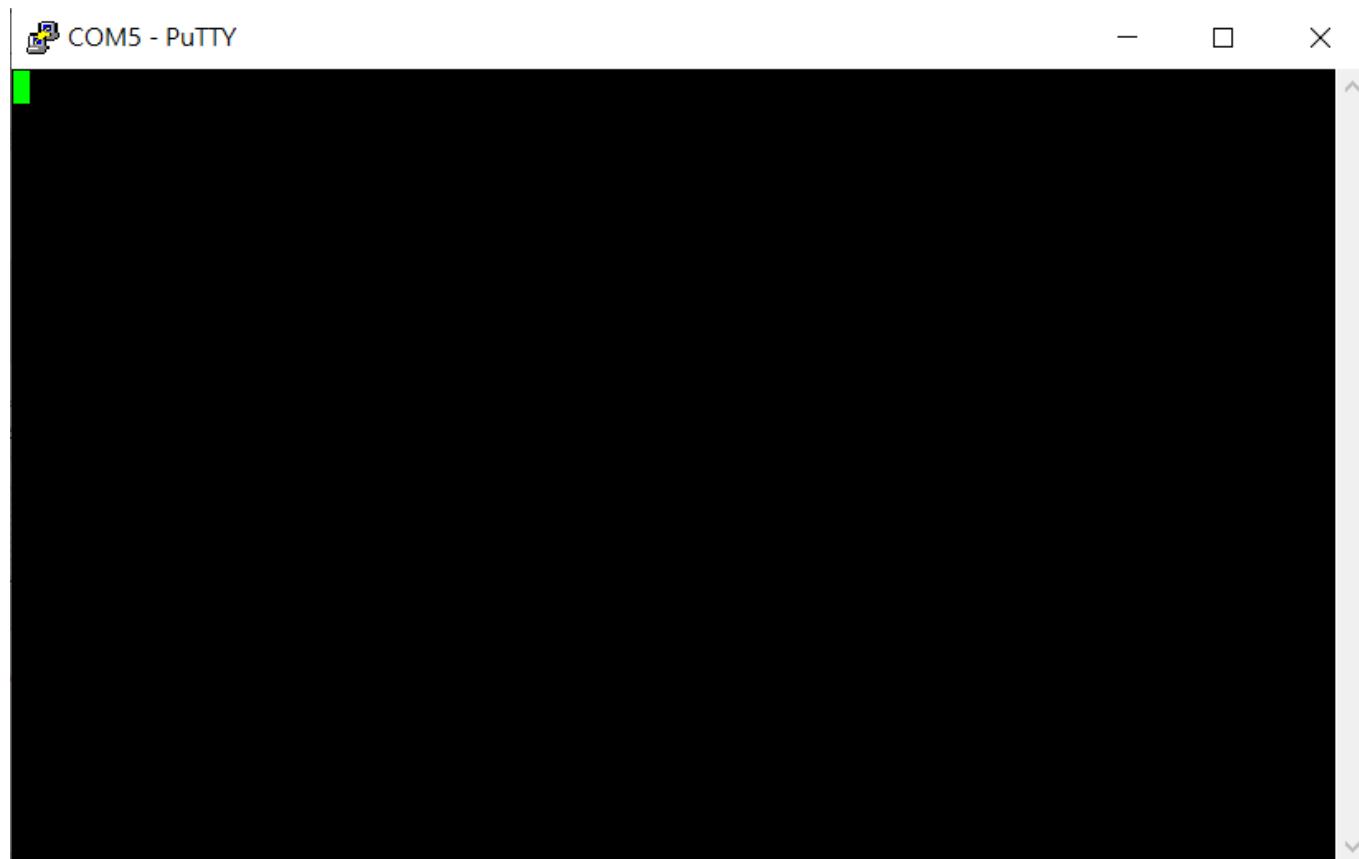
Test

1. Connect PC & IoT DK (dataport)
2. Check COM Port Number in "Device Manager"
3. Open Putty
4. Click Serial
5. Key in your COM Port Number
6. Set Speed to 115200
7. Click Open



Test

You will see this window
Then turn back to VSCode



Test

The screenshot shows the Visual Studio Code interface with the following details:

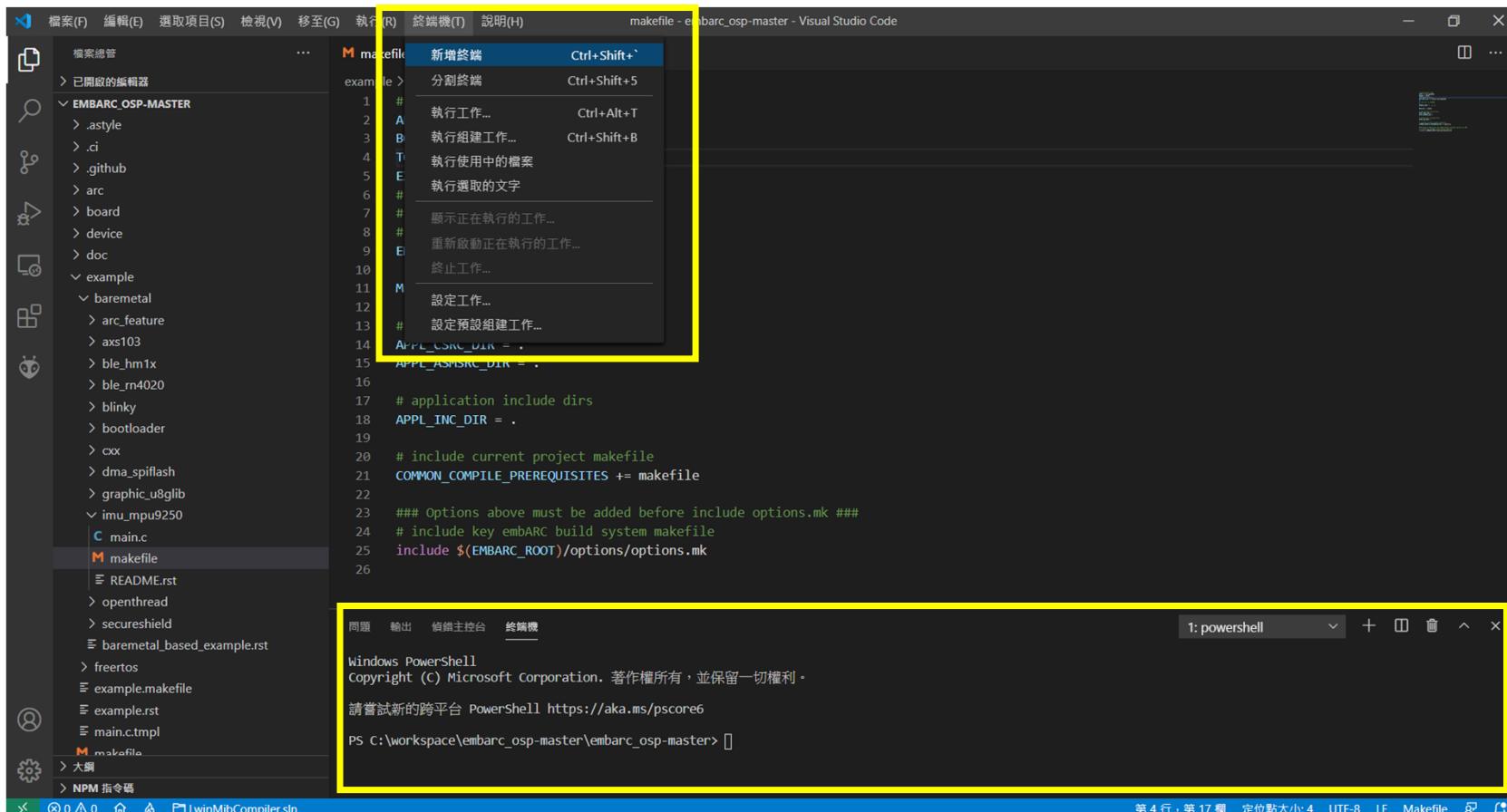
- File Explorer:** On the left, it shows the project structure under "EMBARC_OSP-MASTER". The "example" folder is expanded, showing subfolders like "baremetal", "imu_mpu9250", and "main.c". A yellow arrow points to the "baremetal" folder.
- Code Editor:** The main area displays a "makefile" with the following content:

```
1 # Application name
2 APPL ?= imu_mpu9250
3 BOARD = iotdk
4 TOOLCHAIN ?= gnu
5 EXT_DEV_LIST += sensor/imu/mpu9250
6 #
7 # root dir of embARC
8 #
9 EMBARC_ROOT = ../../..
10 MID_SEL = common
11
12 # application source dirs
13 APPL_CSRC_DIR =
14 APPL_ASMSRC_DIR =
15
16
17 # application include dirs
18 APPL_INC_DIR =
19
20 # include current project makefile
21 COMMON_COMPILE_PREREQUISITES += makefile
22
23 ### Options above must be added before include options.mk ###
24 # include key embARC build system makefile
25 include $(EMBARC_ROOT)/options/options.mk
26
```
- Yellow Box Annotations:** A yellow box highlights the following steps:
 1. Click example->baremetal->imu_mpu9250->makefile
 2. Add “TOOLCHAIN ?= gnu”
 3. Save file : Ctrl + s
- Bottom Status Bar:** Shows file navigation icons (back, forward, search), the file name "LwipMibCompiler.sln", and status information: 行 4, 第 17 欄, 定位點大小: 4, UTF-8, LF, Makefile.

Test

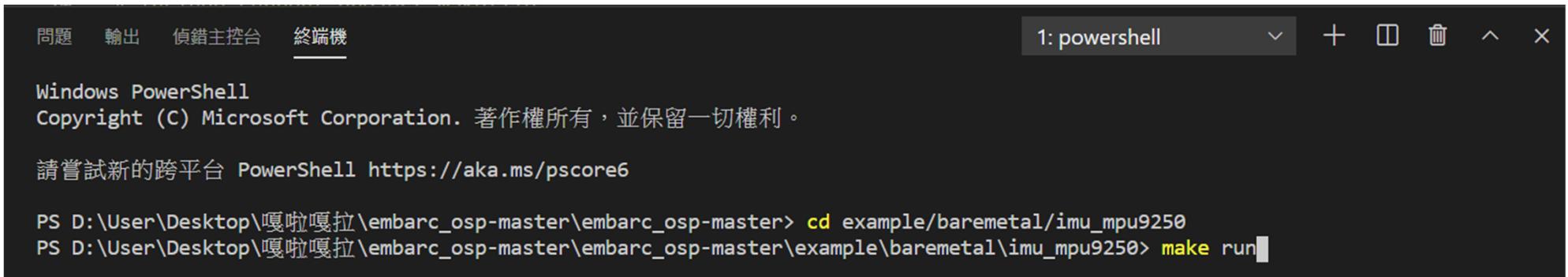
Hot Key : Ctrl + Shift + `

Then you can find a new terminal appearing at bottom



Test

1. Key in “cd example/baremetal imu_mpu9250”
2. Key in “make run”
3. Wait a second, it is compiling file and preparing to run now



A screenshot of a Windows PowerShell terminal window. The window title bar says "1: powershell". The menu bar includes "問題", "輸出", "偵錯主控台", and "終端機" (which is underlined). The terminal window displays the following text:

```
Windows PowerShell
Copyright (C) Microsoft Corporation. 著作權所有，並保留一切權利。

請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

PS D:\User\Desktop\嘎啦嘎拉\embarc_osp-master\embarc_osp-master> cd example/baremetal imu_mpu9250
PS D:\User\Desktop\嘎啦嘎拉\embarc_osp-master\embarc_osp-master\example\baremetal\imu_mpu9250> make run
```

Test

1. If you see the line

--Type <RET> for more, q to quit, c to continue without paging--
just key in “Enter”



```
問題 輸出 偵錯主控台 終端機 1: gmake ▾ + ×
GNU gdb (ARCompact/ARCV2 ISA elf32 toolchain 2020.03) 10.0.50.20200307-git
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "--host=i686-w64-mingw32 --target=arc-elf32".
Type "show configuration" for configuration details.
--Type <RET> for more, q to quit, c to continue without paging--
```

Test

After a lot of “Enter” (about two or three), you will see “Continuing.”
Then, Open Serial COM Port window, you will see like below

The screenshot shows a terminal window and a serial port window. The terminal window (left) displays the boot process of a Linux kernel, including loading sections (.vector, .text, .rodata, .data) and setting up memory (start address 0x20000004, transfer rate 429 KB/sec). It ends with the command "Continuing.". The serial port window (right, titled "COM5 - PuTTY") shows repeated sensor readings from a device named "dmp": "pitch=0000.0, roll=0000.5, yaw=0036.1" through "yaw=0036.6". A red arrow points from the text "If you see a lot of 'dmp: ...' is printed in the window, this is that you succeed!" to the serial port window.

```
問題 輸出 偵錯主控台 終端機
Loading section .vector, size 0x400 lma 0x20000400
Loading section .text, size 0xf400 lma 0x20000800
Loading section .rodata, size 0x2668 lma 0x2000fc00
Loading section .data, size 0xfb4 lma 0x20012268
--Type <RET> for more, q to quit, c to continue without paging--
Start address 0x20000004, load size 77872
Transfer rate: 429 KB/sec, 9734 bytes/write.
Continuing.

dmp: pitch=0000.0, roll=0000.5, yaw=0036.1
dmp: pitch=0000.0, roll=0000.5, yaw=0036.2
dmp: pitch=0000.0, roll=0000.5, yaw=0036.2
dmp: pitch=0000.0, roll=0000.5, yaw=0036.3
dmp: pitch=0000.0, roll=0000.5, yaw=0036.3
dmp: pitch=0000.0, roll=0000.5, yaw=0036.4
dmp: pitch=0000.0, roll=0000.5, yaw=0036.4
dmp: pitch=0000.0, roll=0000.5, yaw=0036.5
dmp: pitch=0000.0, roll=0000.5, yaw=0036.5
dmp: pitch=0000.0, roll=0000.5, yaw=0036.6
dmp: pitch=0000.0, roll=0000.5, yaw=0036.6
```

If you see a lot of “dmp: ...” is printed
in the window, this is that you succeed !

If not, please ask TA for help

Thanks ~

Test

If you want to stop the program

1. Go back to terminal
2. Hot Key : Ctrl + c, then you will see (gdb)

```
問題 輸出 偵錯主控台 終端機 1: gmake ▾ + ×

Loading section .data, size 0xfb4 lma 0x20012268
--Type <RET> for more, q to quit, c to continue without paging--
Start address 0x20000004, load size 77872
Transfer rate: 429 KB/sec, 9734 bytes/write.
Continuing.

Program received signal SIGINT, Interrupt.
0x2000ea74 in __udivdi3 ()
(gdb) █
```

3. Key in “q”

```
(gdb) q █
```

4. Key in “y”

```
quit anyway? (y or n) y █
```

5. Key in “y”

```
要終止批次工作嗎 (Y/N)? y █
```

6. You will see bellow represented that you stop the program succeed !

```
gmake: *** [run] Error 255
PS C:\workspace\embarc_osp-master\embarc_osp-master\example\baremetal\imu_mpu9250> █
```

Done !

If you have any question,
please ask TA for help ~