MICROCHIP

Regional Training Centers

Section 2
IDE, Compiler, MCC & Development Tools Introduction

MPLAB® X IDE

- New generation integrated Development Tools, Support PIC Series MCU, Provide Plug-in function to extend more advance function. Java Based, Cross platform, Current version is v5.10.
- The newest version (5.x) getting started to support AVR and SAM families. and newest tools, like ICD4, PICkit4 & Atmel ICE.

MPLAB XC16

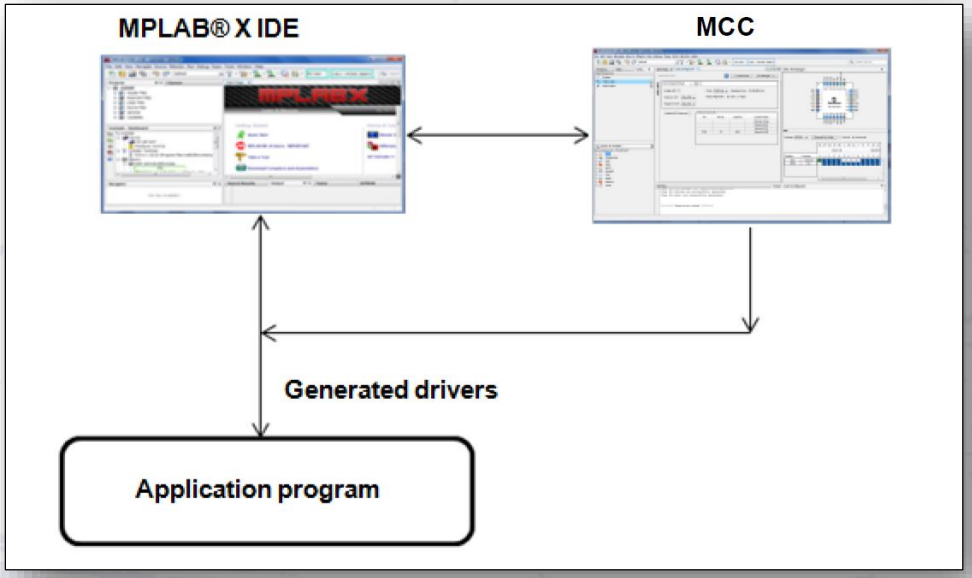
- New Generation Compiler, Support all 16 Bits MCU (PIC24, dsPIC).
- Base on GNU C, apply GPL License (GNU General Public License).
- Provide standard C libraries (printf, strlen, etc..) and Peripheral Libraries (old versions).
- All version you can download from www.microchip.com/xc16

About XC Compiler Version

- There 4 different versions for XC Compiler:
  - **Standard** (Standard Compiler Workstation License)
    Charge. Provide Standard Optimizations function.
    Save 20%~25% memory size (Max.).
  - **Pro** (Pro Compiler Workstation License)
    Charge. Provide Standard Optimizations function.
    Save 50% memory size (Max.).
  - **Lite**
    Free. Provide Basic Optimizations function (Level 1).
  - **Evaluation**
    Free. Provide Standard Optimizations function if you apply trial license.
    Change to Lite version when license expires, automatically.

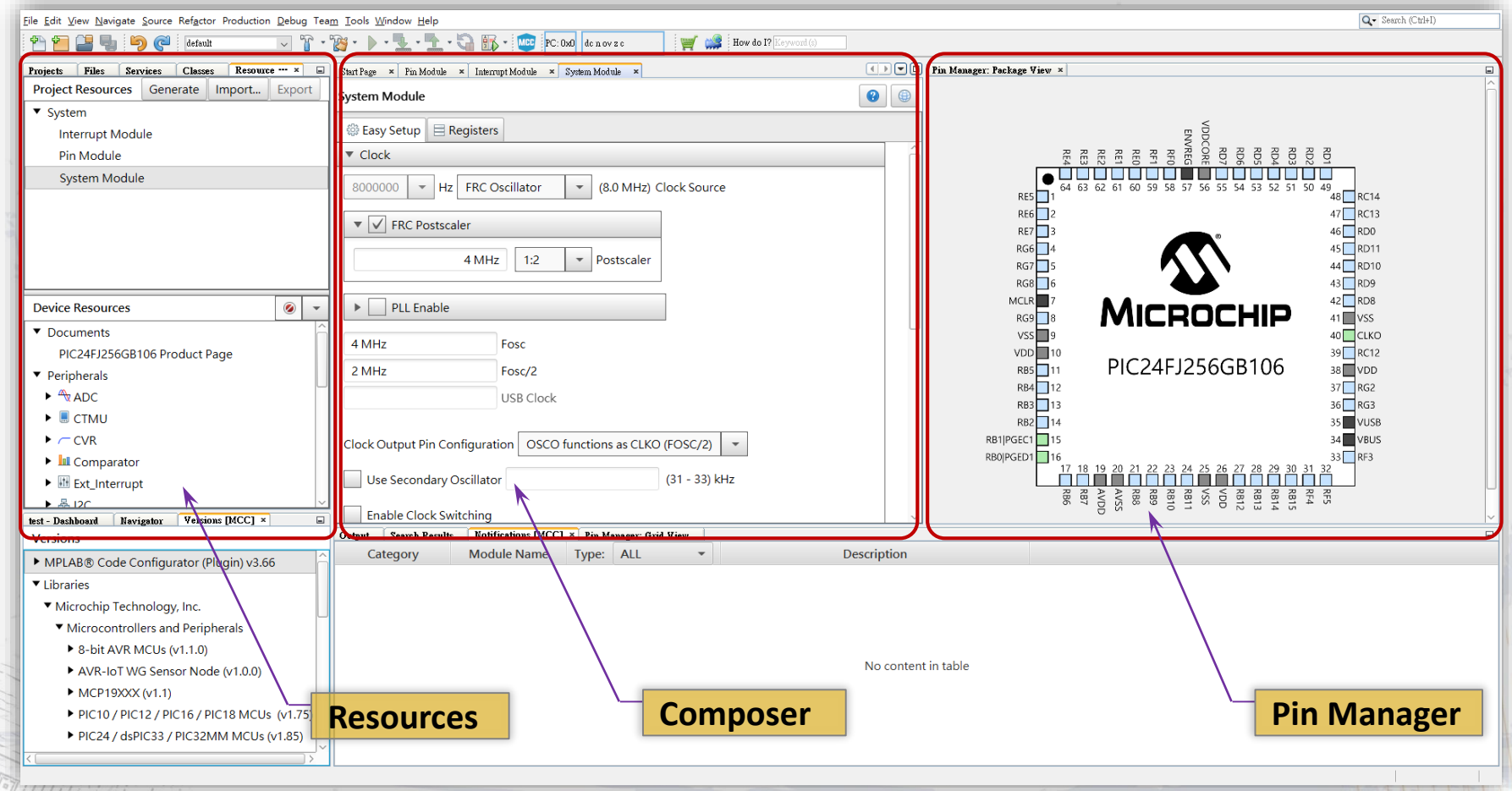
MPLAB® Code Configurator

- MCC (MPLAB Code Configurator) is a free, graphical programming environment that generates seamless, easy-to-understand C code to be inserted into your project.
- Supports 8-bit, 16-bit and 32-bit PIC® microcontrollers.

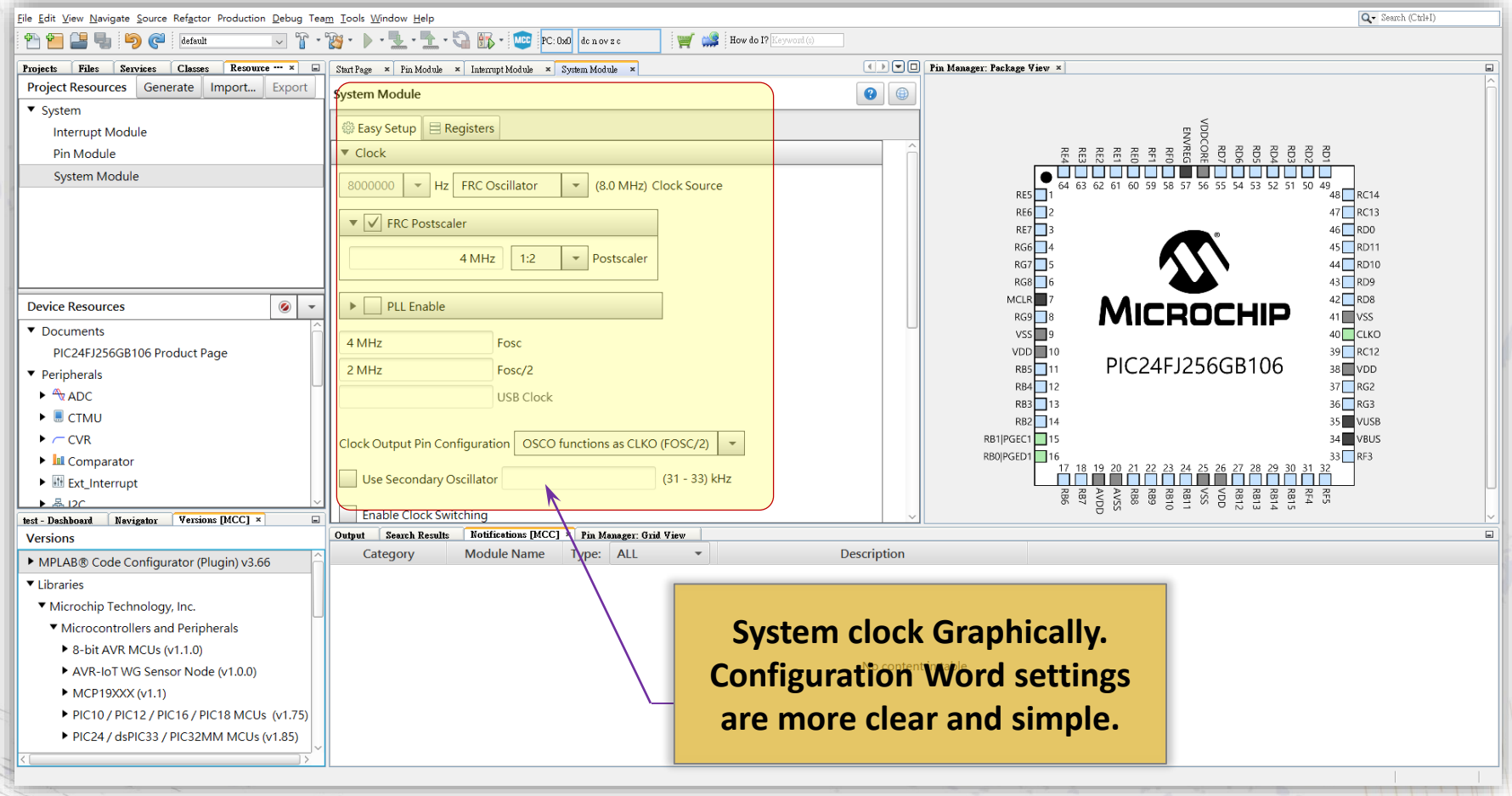


MCC Quick View

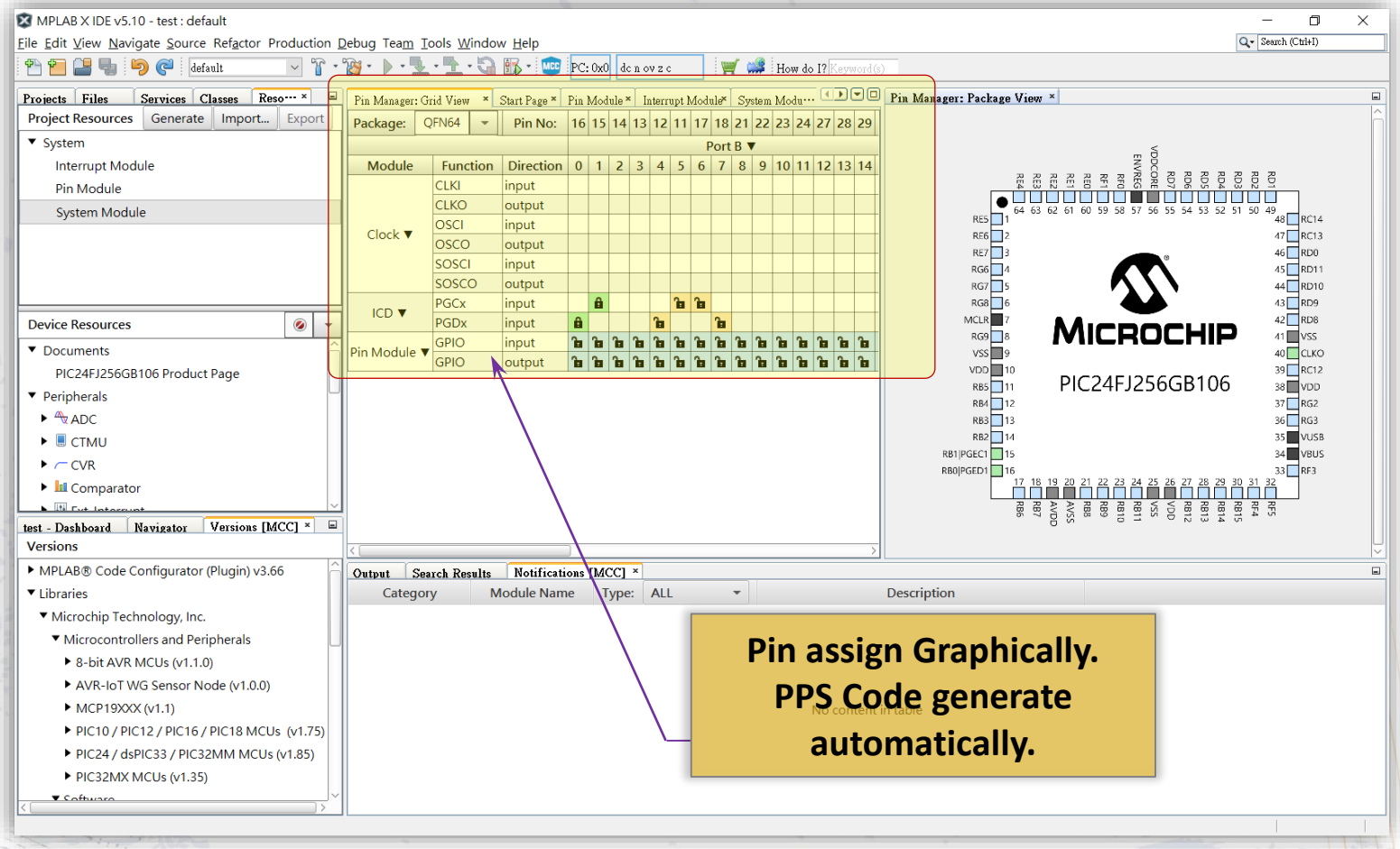
- Operating Areas



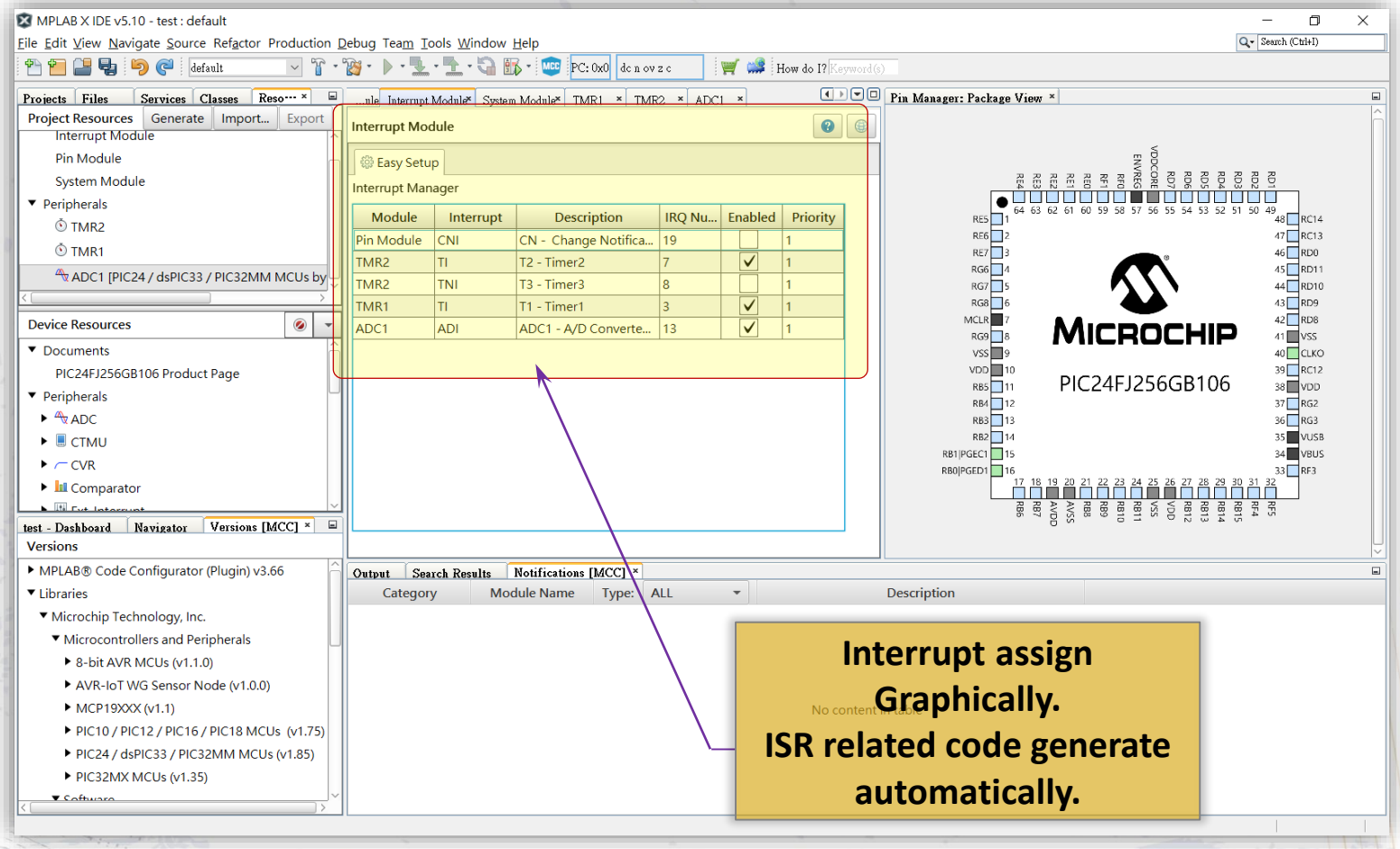
MCC Quick View



MCC Quick View



MCC Quick View



MCC Quick View

More ?

www.microchip.com/mcc

MPLAB® PICkit™ 4

Debugger/Programmer Probe

- Fast programming, increased functionality, at the same price as its predecessor.
- The MPLAB® PICkit™ 4 In-Circuit Debugger/Programmer allows fast and easy debugging and programming of PIC® , dsPIC®, and CEC flash microcontrollers.
- An additional micro SD card slot and the ability to be self-powered from the target means you can take your code with you and Program on To Go.

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Tools Download

- **At this courses, you should install MPLAB X IDE, MCC & XC16 Compiler for all hands-on exercises.**
  - MPLAB X IDE v5.10, MCC v3.66, XC16 v1.35.
- **You can download development tools from below link.**
  http://www.microchip.com.tw/Data_CD/

Tools Install

- **For MPLAB X IDE & XC16 Compiler installation, it's very easy. You just need next, next, next then finished.**
- **For MCC installation, it's a X IDE plug-in, you need install MPLAB X IDE before MCC.**
- **There are two way to install MCC.**
  - On Line Installation.
  - Off Line Installation.

MCC Installation

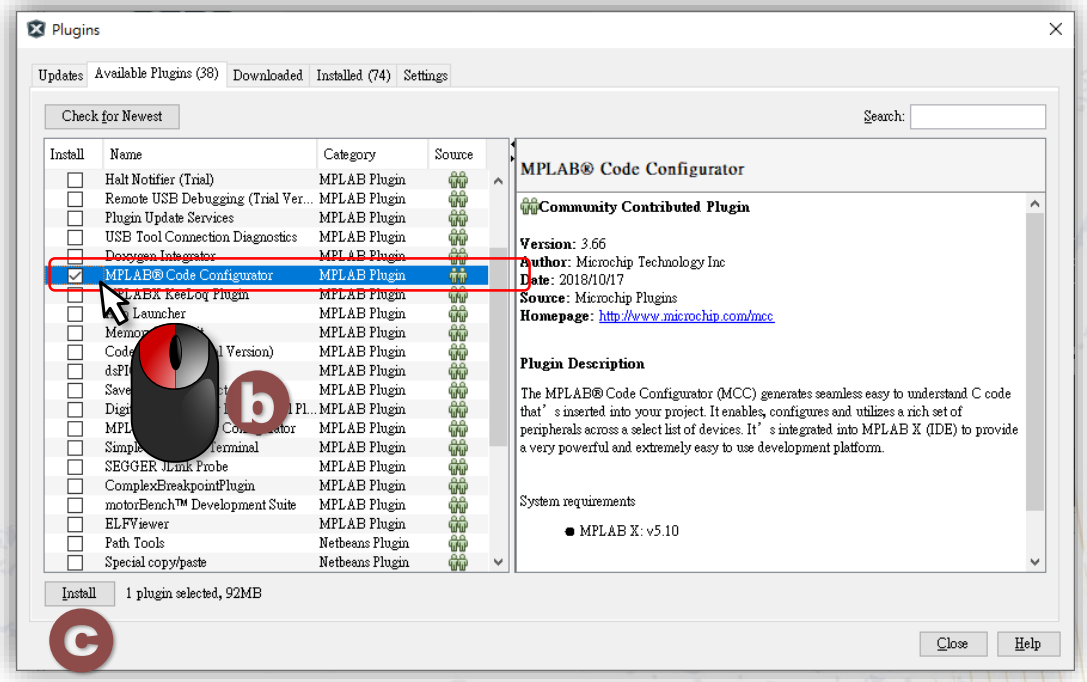
On Line Installation

a. **Menu**
   - ▸ Tools ▸ Plugins
   - ▸ Available Plugins

b. **Select**
   - ▸ MPLAB Code Configurator

c. **Select▸**

Install



MCC Installation

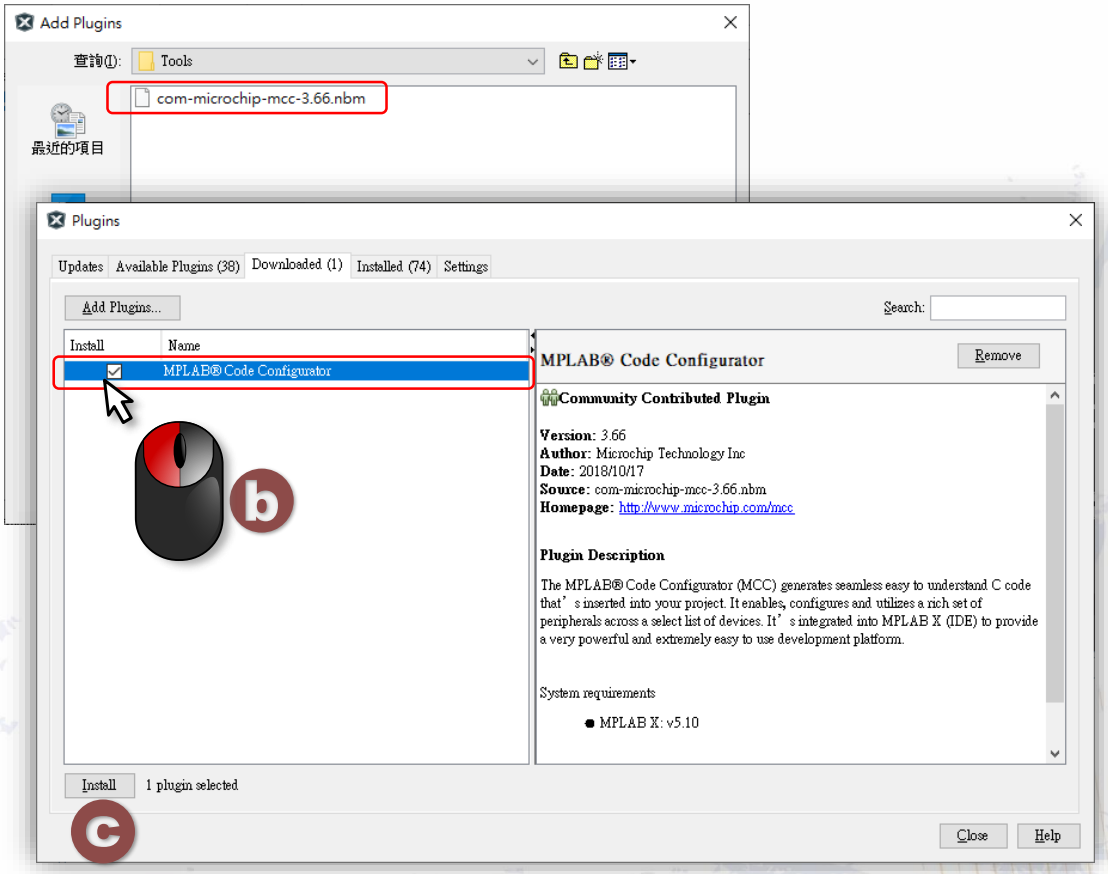
Off Line Installation

a Menu
- ▸ Tools ▸ Plugins
- ▸ Download

b Select
- ▸ Add Plugins
- ▸ Select mccxxx.nbm

c Select▸

Install



MPLAB XC16's Data Type

- Data type is first thing you need know, about compiler.
- The same data type has different definition at different platforms.

Integer Data Type

Type	Bits	Min	Max
char, signed char	8	-128	127
unsigned char	8	0	255
short, signed short	16	-32768	32767
unsigned short	16	0	65535
int, signed int	16	-32768	32767
unsigned int	16	0	65535
long, signed long	32	-2^{31}	$2^{31}-1$
unsigned long	32	0	$2^{32}-1$
long long**, signed long long**	64	-2^{63}	$2^{63}-1$
unsigned long long**	64	0	$2^{64}-1$

** ANSI-89 extension

Float Data Type

Type	Bits	E Min	E Max	N Min	N Max
float	32	-126	127	2^{-126}	2^{128}
double*	32	-126	127	2^{-126}	2^{128}
long double	64	-1022	1023	2^{-1022}	2^{1024}

E = Exponent
N = Normalized (approximate)
* double is equivalent to long double if -fno-short-double is used.

Thinking !!

- What kind differ when same code execute at different platform?

```
unsigned int i = 0;
main()
{
   for( i= 0 ; i < 100000 ; i++ );
   // Here ?
}
```

http://www.qmo.tw/security20180108027