

Introduction to C Programming with Embedded Systems Part I



ME430: MECHATRONICS

First, open the workspace for
your “First ICD2 Program”



ME430: MECHATRONICS

Comments

// Single line comments

/*

Comment out
multiple
Lines

*/

```
.....
* FileName:      (change filename of template).c
* Processor:    PIC18F4520
* Compiler:     MPLAB C18 v.3.06
*
* This file does the following...|
*
*
* Creation and Revisions:
*   Author      Date      Comments
* (Your name here)
...../

/** Header Files *****/
#include <p18f4520.h>

/** Configuration Bits *****/
#pragma config OSC = EC // EC = External 4MHz Crystal for PICDEM board only
#pragma config MDT = OFF
#pragma config LVP = OFF
#pragma config BOREN = OFF

/** Define Constants Here *****/
#define SAMPLE 100

/** Local Function Prototypes *****/
void sampleFunction(void);

/** Global Variables *****/
int sampleVariable = 0;

.....
* Function:      void main(void)
...../
#pragma code
void main (void)
{
    // This area happens once
    // Good for initializing and things that need to happen once

    while (1)
    {
        // This area loops forever
    }
}

.....
* Additional Helper Functions
...../

.....
* Function:      void sample(void)
* Input Variables: none
* Output Return: none
* Overview:      Use a comment block like this before functions
...../
void sampleFunction()
{
    // Some function that does a specific task
}
```



Preprocessor Directives

```
/** Header Files *****/
#include <p18f4520.h>
```

- Standard 18F4520 header plus others
 - #include “aHeaderInCurrentFolder.h”

```
/** Configuration Bits *****/
#pragma config OSC = EC // EC = External 4MHz Crystal for PICDEM board only
#pragma config WDT = OFF
#pragma config LVP = OFF
#pragma config BOREN = OFF
```

- Configurations for PIC (that you won't change for now)

```
/** Define Constants Here *****/
#define SAMPLE 100
```

- Constants
- Help code readability



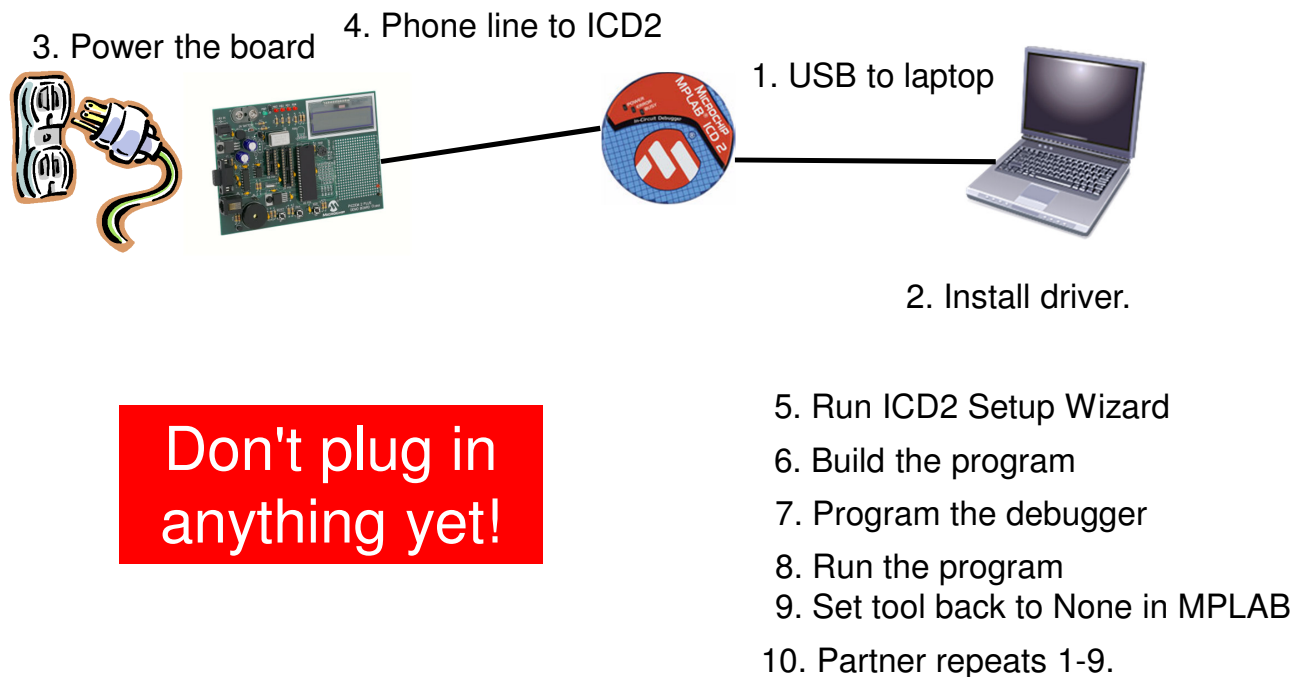
The Main Function

- Code starts running here

```
/* *****  
 * Function:      void main(void)  
 * ***** */  
#pragma code  
void main (void)  
{  
    // This area happens once  
    // Good for initializing and things that need to happen once  
  
    while (1)  
    {  
        // This area loops forever  
    }  
}
```



Overview



Puck (ICD2) Connections

- Connect *just* the puck (ICD2) to your computer with *just* the USB cable.
- Note: Each USB port is independent. If you plug your ICD2 to a different USB port on your laptop, you'll need to re-install the driver.



Puck (ICD2) Connections, cont.

- In MPLAB, go to Help -> Driver Installation
- On the menu that appears, click on MPLAB ICD2 USB Device Driver Installation and *follow those instructions*.
- Once you have completed those instructions you can go on. Get help if you run into trouble.



Connecting the Green Board

- Connect the power to the green board
- Connect the green board to the ICD2 puck with the short telephone-type cable
- In MPLAB, go to Debugger -> Select Tool -> MPLAB ICD2
- The MPLAB ICD2 Setup Wizard should start automatically
- If it doesn't start, manually go to Debugger -> MPLAB ICD2 Setup Wizard



ICD2 Setup Wizard Settings

- Com Port – USB
- Target has own power supply
- MPLAB IDE automatically connects to the MPLAB ICD2 (check box)
- MPLAB ICD2 automatically downloads the required operating system (check box)



Debugger Programming Process

- Set debugger to ICD2 (already done today)
 - Debugger -> Select Tool -> MPLAB ICD 2
- To make a program run on the board
 - Click Build button (fix any errors)
 - Click Program Target Device button(downloads program to green board)
 - Click Run button



Light an LED on the Green Board

In your “.c” file you should

- Comment out the printf statements
- Uncomment the TRISB, ADCON1, and PORTB lines
- Build -> program target device -> run
- See the LED light!
- Now change the code to light a different LED and re-download it. See it work!
- If ambitious, do Kitt Lights (google it and grab a [YouTube](#) video)



Your Partner's Turn

- Go to Debugger -> Select Tool -> None
- *NOW* unplug and give to your partner
- Go through the entire install and lighting thing again
- Call me over to get checked off on the front of Lab 3!

