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This appendix is intended to be a supplement to lab manuals supplied with a Microchip Technical Training class. Although it may be useful on its own, it is not intended to provide complete instructions for using all aspects of the MPLAB X Integrated Development Environment. For more detailed information on the use of MPLAB X IDE, please consult one of the following Microchip Technical Training classes (for additional details, see <a href="http://www.microchip.com/RTC">http://www.microchip.com/RTC</a>): TLS0101—Getting Started with MPLAB X IDE

TLS0999—Transitioning to MPLAB X IDE for users of MPLAB IDE version 8

Or consult the Microchip Developer's Help Center at http://microchip.wikidot.com/mplab:\_start

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# 1. Managing Projects



#### Section 1.1

# How to open a project

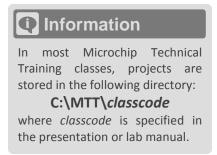
There are two ways to open a project:

#### Method 1:

Navigate to the project's directory and open the "Workspace" (\*.mcw) file by double clicking on it. This will open the workspace associated with the project.

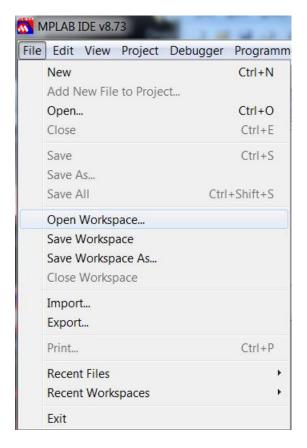
The Workspace file saves everything the Project file (\*.mcp) saves and more. It will save the window position and sizes and watch window contents and settings.

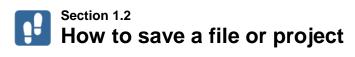
(C:\MTT\classcode\Labx.mcw)



#### Method 2:

- Start MPLAB® 8
- 2 Click on File ▶ Open Workspace
- Navigate to the project's directory and open the "Workspace" (\*.mcw) file.





#### Method 1:

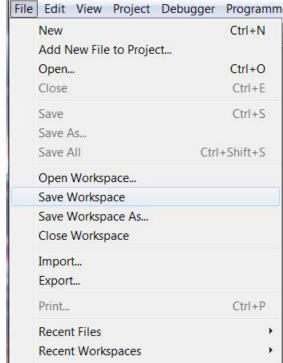
Click on File ▶ Save Workspace



#### Method 2:

Click on the **Save Workspace** icon at the top of the MPLAB IDE



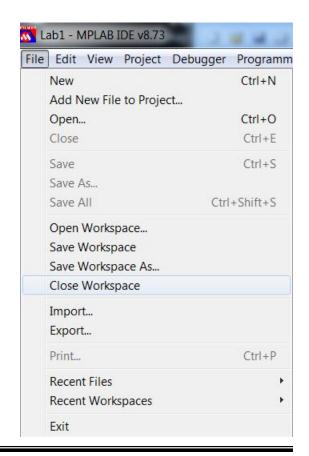


Lab1 - MPLAB IDE v8.73

Exit



Click on File ▶ Close Workspace



# 2. Building Projects



#### Section 2.1

## How to build a project for production (stand-alone)

If you are building a project to run stand-alone (without a debugger) select the "Release" drop down option at the of the MPLAB IDE.

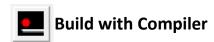
### Method 1:

If you are building an assembly project or using a Microchip C compiler, click on the "Build All" icon at the top of the MPLAB IDE



#### Method 2:

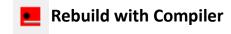
If you are using Microchip's HI-TECH C compiler, click on the "Build with Compiler" icon at the top of the MPLAB IDE



#### Method 3:

If you have a large project (many large source files) and made a change in just one source file you can save time by "Making" the project instead of "Building". "Making" will recompile just the source files that have been changed since the last build. Click on one of these icons at the top of the MPLAB IDE







#### Section 2.2

### How to build a project for debugging

1 If you are building a project to use with a debugger (i.e. MPLAB® ICD3, MPLAB® SIM Simulator or Proteus Simulator) select the "Debug" drop down option at the of the MPLAB® IDE.



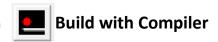
## Method 1:

If you are building an assembly project or using a Microchip C compiler, click on the "Build All" icon at the top of the MPLAB  $^{\circ}$  IDE



#### Method 2:

If you are using Microchip's HI-TECH C compiler, click on the "Build with Compiler" icon at the top of the MPLAB DE



#### Method 3:

If you have a large project (many large source files) and made a change in just one source file you can save time by "Making" the project instead of "Building". "Making" will recompile just the source files that have been changed since the last build. Click on one of these icons at the top of the MPLAB IDE



Make



**Rebuild with Compiler** 

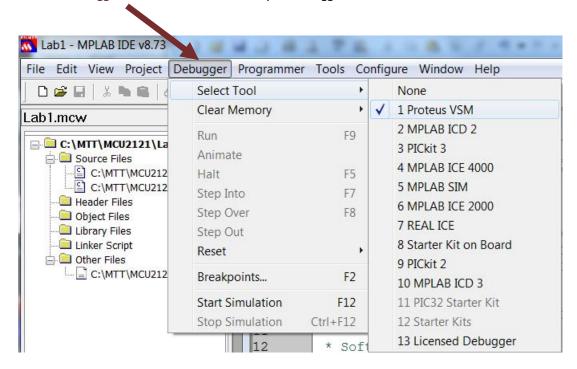
# 3. Debugging Projects



Section 3.1

## How to set or change the debugger

Click on **Debugger Select Tool** and choose your debugger from the list.





Section 3.2

# How to control program execution when debugging

#### **Debug Toolbar Buttons**



- Step into or single step (F7) Execute the next instruction
- Step Over (F8) Execute each line without stepping into functions (functions are executed without stepping through each line)
- **Step Out** Execute all instructions in the current function or sub routine then stop program execution





When you hover the mouse pointer over a toolbar button a tool tip will be displayed explaining the function of the button.



#### Section 3.3

# How to set and clear breakpoints

Standard line breakpoints may be set or cleared by clicking on the line number in the glyph margin.

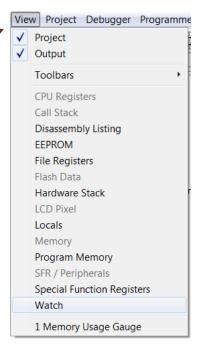
```
Lab1_Solution.c*
92
        □void main(void)
93
94
              char counter = 0;
                                        // Initialize count to zero
95
                                        //### Step 1: Clear the PORTA \,
96
              LATB = 0x00;
97
              LATA = 0x00;
                                        //###
                                                         output latches
98
99
100
101
              TRISB = 0x00;
                                        //### Step 2: Configure Port B
              TRISAbits.TRISA4 = 1;
                                       //### Step 3: Configure Port A
        while (1)
102
103
104
                  LATB = 0x00;
                                                //### Step 4: Write 0x00
105
106
107
                  while (SwitchPressed (&PORTA, 4)) // SwitchPressed deb
108
                           LATB = counter++;
                                                //### Step 5:
109
110
                                                //###
                                                                 the resu
                           Delay();
111
112
113
              // End Main
```

More advanced breakpoint features may be accessed by opening the breakpoints window. From the main menu select **Debugger** ▶ **Breakpoints**.

# Section 3.4

# How to display and use Watches

To view the contents of a data memory location click on View Watch to open a watch window.



- To add a variable to the watch window highlight the variable you want to watch in the editor
- Then drag-and-drop it into the watch window

```
- D X
■ Watch
Add SFR | ADCON0
                 ▼ Add Symbol __config_0
                                                                //
                                                 Binary
 Symbol Name
                  Value
                              Нех
                                     Decimal
  count
                                                                 *sw
Watch 1 Watch 2 Wat
                  3 Watch 4
                    COUNT <= count) && (count <= MAX COUNT))
            if (!
                      & (1 << bitnum)))
                           > MAX COUNT) return 1;
 else
                count--;
                if (count < MIN_COUNT) return 0;</pre>
```

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