

CMPE-013/L

MPLAB X Instructions

Max Lichtenstein

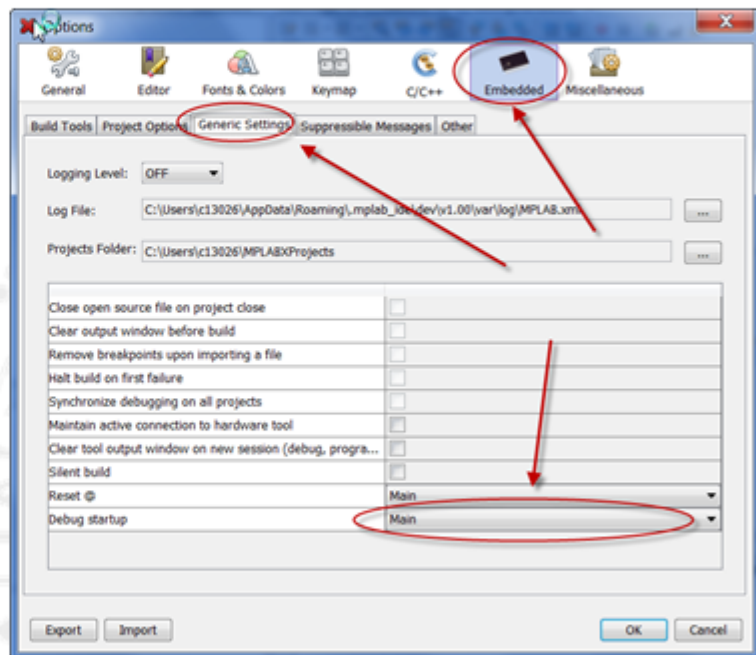
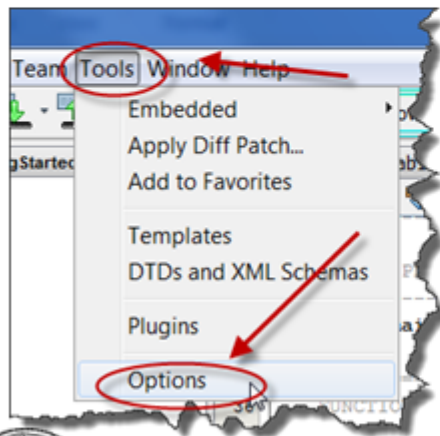
based on slides from Maxwell James Dunne



Setting up the IDE

Configuring the Simulator

Set the Debug simulator to wait at the beginning of the main() function



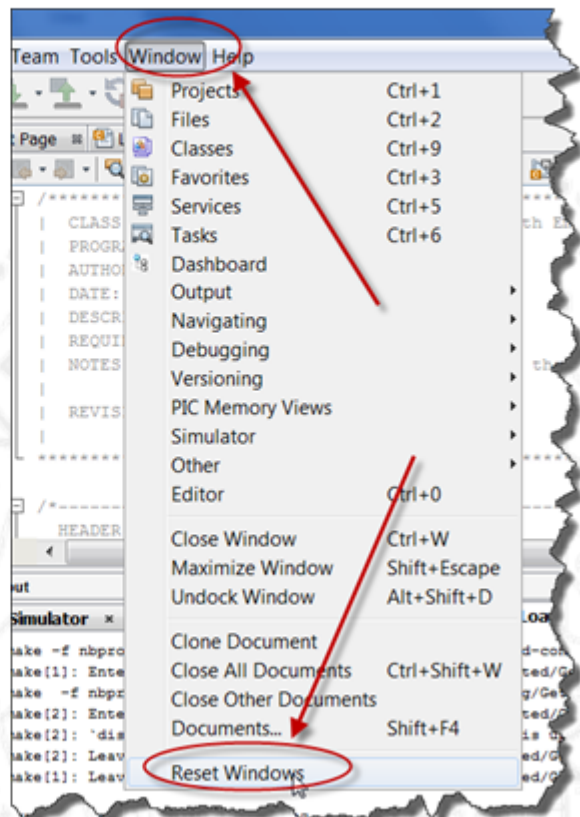
Resetting MPLAB[®] X windows

As you will see MPLABX has numerous adjustable windows. New MPLABX users can get a little confused about where and how to set the windows.

If you get confused

Windows -> Reset Window

Restores MPLABX Windows back to their original locations



Opening a Project

Getting Started - MPLAB X IDE v1.00

File Edit View Navigate Source Refactor Run Debug Team Tools Window Help

Start Page

Select the Open Project button

IPLABX

Learn & Discover My MPLAB IDE What's New

Getting Started

- Quick Start
- MPLAB IDE v8 Users - IMPORTANT
- Take a Tour
- Release Notes

Dive In

- Open Sample Project
- Create New Project
- Import MPLAB Legacy Project
- Import Hex (Prebuilt) Project

Demos & Tutorials

- Minute Videos
- Differences from MPLAB 8
- All Tutorials >>

Community

- Forums
- MPLAB X IDE Forum
- MPLAB X IDE Wiki

Microchip

Show On Startup

NetBeans



Opening a Project

GettingStarted - MPLAB X IDE v1.0.0

File Edit View Navigate Source Refactor Run Debug Team Tools Window Help

PC: 0x0 dc n ov z c oab sab IP0

Start Page

Open Project

Look in: Getting Started

Recent Items

Desktop

My Documents

Computer

Network

Project Name: GettingStarted

Open as Main Project

Open Required Projects:

File name: C:\MTT\TLS2101\Getting Started\GettingStarted.X

Files of type: Project Folder

Open Project

Cancel

1) Navigate to the Project Directory

2) Select the Project

3) Select Open Project

Microchip

Show On Startup

NetBeans



Opening a Project

The screenshot displays the MPLAB X IDE environment. A yellow callout box with the text "Project will Open in MPLAB X" is positioned over the main workspace. The IDE window title is "GettingStarted - MPLAB X IDE v1.00". The menu bar includes File, Edit, View, Navigate, Source, Refactor, Run, Debug, Team, Tools, Window, and Help. The toolbar contains various icons for file operations and development tasks. The project explorer on the left shows a project named "GettingStarted" with subfolders for Header Files, Library Files, Linker Files, Object Files, Source Files, and Important Files. The navigator pane shows a tree view of the project structure, including the PIC24FJ128GA010 device, compiler toolchain, and memory resources. The main workspace displays the "Getting Started" page with sections for "Getting Started" (Quick Start, MPLAB IDE v8 Users - IMPORTANT, Take a Tour, Release Notes) and "Demos & Tutorials" (Minute Videos, Differences from MPLAB 8, All Tutorials >>). The tasks pane at the bottom shows "<no tasks>".



Building a Project

The screenshot shows the MPLAB X IDE interface. The title bar reads "GettingStarted - MPLAB X IDE v1.00". The menu bar includes "File Edit View Navigate Source Refactor Run Debug Team Tools Window Help". The toolbar contains various icons, with the "Debug Project" icon (a red lightning bolt) circled in red. A red arrow points from this icon to a yellow callout box containing the text: "To build the project and send it to the Debugger select the **Debug Project** Button".

The interface is divided into several panes:

- Projects:** Shows a tree view for the "GettingStarted" project, including folders for Header Files, Library Files, Linker Files, Object Files, Source Files, and Important Files.
- GettingStarted - Navigator:** Shows a detailed view of the project structure, including the device (PIC24FJ128GA010), compiler toolchain, and memory usage (RAM: 8192 bytes, Flash: 44030 words).
- Main Editor:** Displays the "Start Page" with a "My MPLAB IDE" header and various sections like "Demos & Tutorials", "Minute Videos", and "Differences from MPLAB 8".
- Tasks:** A pane at the bottom showing "<no tasks>" and "<no tasks> in currently edited file".



Building a Project

The screenshot displays the MPLAB X IDE v1.00 interface. The main editor shows the source code for `GettingStarted.c` with the following content:

```
33 int main( void );
34
35
36 /*-----
37 FUNCTION:
38 DESCRIPTION: Demo macro
39 PARAMETERS: none
40 RETURNS: nothing
41 REQUIREMENTS: none
42 -----*/
43
44 int main(void)
45 {
46     int localVar1 = 3 ;
47     int localVar2 = 4 ;
48     printf("\n Welcome to the Embedded C Programming Class\n featuring MPLABX IDE\n");
49     while(1);
50 }
```

Annotations in the image include:

- A red circle highlights the control buttons in the top toolbar.
- A yellow box labeled "Control Buttons Appear" has an arrow pointing to the red circle.
- A yellow box labeled "Simulation ready to start" has an arrow pointing to the `int main(void)` line in the code editor.
- A yellow box labeled "Successful Build" has an arrow pointing to the "BUILD SUCCESSFUL" message in the Output window.

The Output window at the bottom shows the following build log:

```
make(2): Leaving directory `C:/MT/TL2101/Getting Started/GettingStarted.X'
make(1): Leaving directory `C:/MT/TL2101/Getting Started/GettingStarted.X'
BUILD SUCCESSFUL (total time: 562ms)
Loading C:/MT/TL2101/Getting Started/GettingStarted.X/dist/default/debug/GettingStarted.X.debug.e1
Loading completed
```

The bottom status bar indicates the debugger is halted at line 43, column 1.



Running the Simulation

GettingStarted - MPLAB X IDE v1.00

File Edit View Navigate Source Refactor Run Debug Team Tools Window Help

Projects: GettingStarted

- Header Files
- Library Files
- Linker Files
- Object Files
- Source Files
- GettingStarted.c.c
- Important Files

Start Page: GettingStarted.c.c

```
33 int main( void );
34
35
36 /*
37 FUNCTION:    main()
38 DESCRIPTION: Demos macro
39 PARAMETERS: none
40 RETURNS:    nothing
41 REQUIREMENTS: none
42 */
43
44 int main(void)
45 {
46     int localVar1 = 3 ;
47     int localVar2 = 4 ;
48     printf("\n Welcome to the Embedded C Programming Class\n featuring MPLABX IDE\n");
49     while(1);
50 }
```

To run the project push the **Continue** button

Variables | Call Stack | Breakpoints | Output | Tasks

Debugger Console

```
make[2]: Leaving directory 'C:/MTT/TL82101/Getting Started/GettingStarted.X'
make[1]: Leaving directory 'C:/MTT/TL82101/Getting Started/GettingStarted.X'

BUILD SUCCESSFUL (total time: 562ms)
loading C:/MTT/TL82101/Getting Started/GettingStarted.X/dist/default/debug/GettingStarted.X.debug.e1
loading completed
```

GettingStarted (Build, Load, ...) | debugger halted | 43 | 1 | IHS



Pausing the Simulation

GettingStarted - MPLAB X IDE v1.00

File Edit View Navigate Source Refactor Run Debug Team Tools Window Help

...ngStarted : def... PC: 0x0 dc n ov z c oab sbb IP0

Projects: GettingStarted

- Header Files
- Library Files
- Linker Files
- Object Files
- Source Files
- GettingStarted.c.c
- Important Files

Start Page: GettingStarted.c.c

```
33 int main( void )
34
35 /*
36 FUNCTION: main
37 DESCRIPTION: Demo
38 PARAMETERS: none
39 RETURNS: none
40 REQUIREMENTS: none
41 */
42 int main(void)
43 {
44     int localVar1 = 3 ;
45     int localVar2 = 4 ;
46     printf("\n Welcome to the Embedded C Programming Class\n featuring MPLAB X IDE\n");
47     while(1);
48
49 }
50
```

GettingStarted - Navigator

- GettingStarted
- Device
- PIC24FJ128GA010
- Checksum: Debug Image
- Compiler Toolchain
- C30 (v3_31) [C:\Program Files\Micr...
- Memory
 - RAM 8192 (0x2000) bytes
 - 2%
 - RAM Used: 130 (0x82) Free: 80
 - RAM Reserved: None
 - Flash 44030 (0xABFE) words
 - 1%
 - Flash Used: 620 (0x26C) Free: 43410
 - Flash Reserved: None
- Resources
 - Program BP Used: 0 Free: 1000
 - Data BP Used: 0 Free: 1000

Variables Call Stack Breakpoints Output Tasks

Debugger Console: Simulator x GettingStarted (Build, Load, ...) x Debugger Console x UART 1 Output x

```
make[2]: Leaving directory 'C:/MT/TL2101/Getting Started/GettingStarted.X'
make[1]: Leaving directory 'C:/MT/TL2101/Getting Started/GettingStarted.X'

BUILD SUCCESSFUL (total time: 542ms)
Loading C:/MT/TL2101/Getting Started/GettingStarted.X/dist/default/debug/GettingStarted.X.debug.e1
Loading completed
```

GettingStarted (Build, Load, ...) 43 | 1 IN5



Windows used in Examples

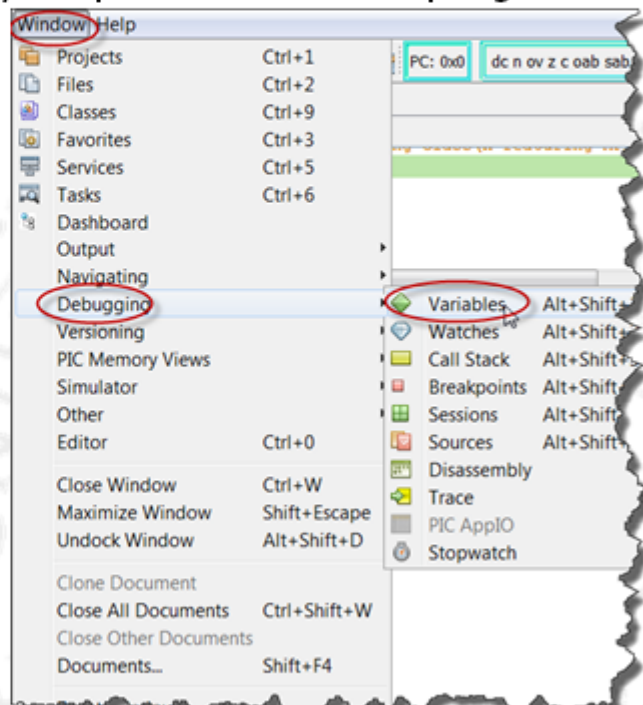
Variables Window

Variable Window displays a particular set of program variables

To Open the Variables window:

Select:

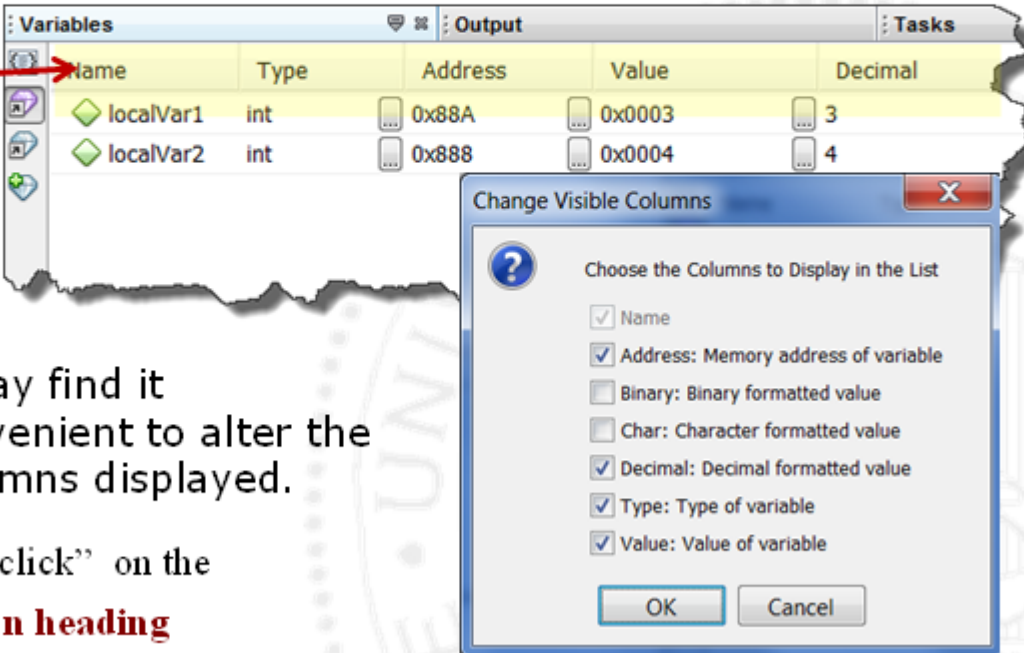
Windows->Debugging->Variables



Windows used in Examples

Variables Window

Variable Window displays several columns of data



The screenshot shows the 'Variables' window with a table of variables. A red arrow points to the 'Name' column header. A dialog box titled 'Change Visible Columns' is open, showing a list of columns to display with checkboxes. The 'Name' column is highlighted in yellow in the table.

Name	Type	Address	Value	Decimal
localVar1	int	0x88A	0x0003	3
localVar2	int	0x888	0x0004	4

Change Visible Columns

Choose the Columns to Display in the List

- Name
- Address: Memory address of variable
- Binary: Binary formatted value
- Char: Character formatted value
- Decimal: Decimal formatted value
- Type: Type of variable
- Value: Value of variable

OK Cancel

You may find it convenient to alter the columns displayed.

“right click” on the **column heading**



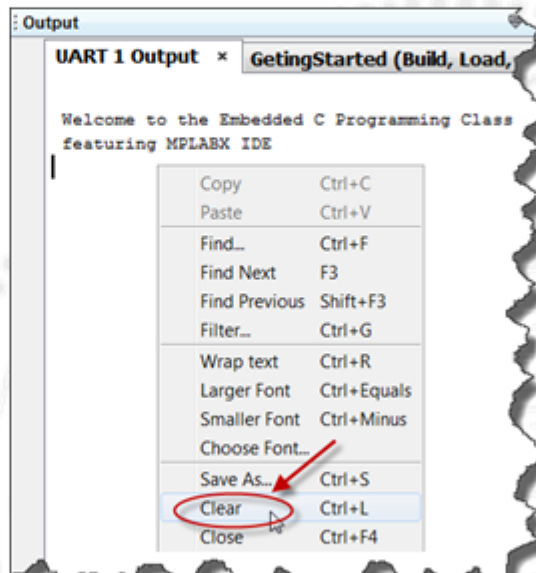
Windows used in Examples

UART1 Output

UART1 Output Window prints out text from C programs

To clear this window:

Right click *inside* of the window then select **Clear**



Windows used in Examples

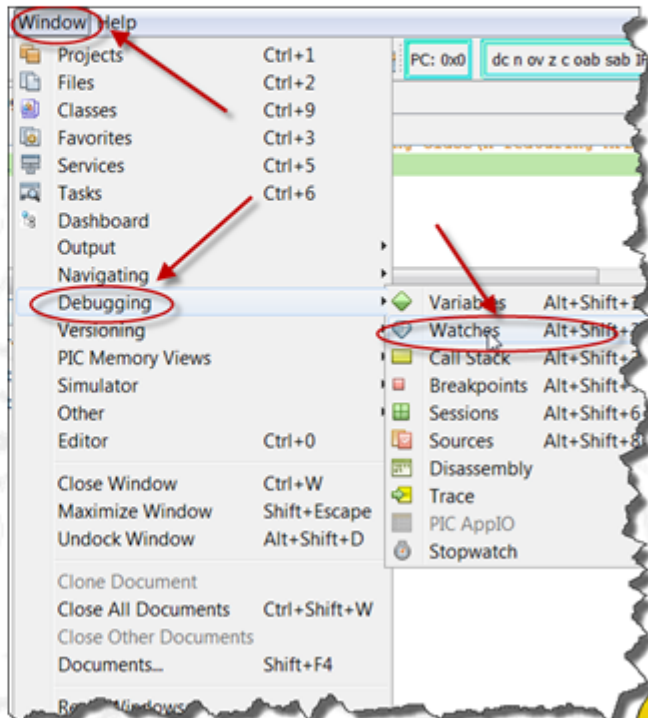
Watches Window

Watches Window is similar to the Variables window but displays a different set of data

To Open the Watches Window:

Select:

Windows->Debugging->Watches



Windows used in Examples

Watches Window

Watches Window needs to be 'told' what data to watch

Name	Type	Address	Decimal	Value
globalVar1	int	0x850	1	0x0001
globalVar2	int	0x852	2	0x0002
<Enter new wat				

“Right click” while in the Watches Window to add or delete watches

** Column configuration is identical to Variables Window



Closing a Project

GettingStarted - MPLAB X IDE v1.00

File Edit View Navigate Source Refactor Run Debug Team Tools Window Help

GettingStarted.c

```
33 in
34
35 /-
36
37
38
39 RETURNS: nothing
40 REQUIREMENTS: none
41 -----
42 int main(void)
43 {
44     int localVar1 = 3;
45     int localVar2 = 4;
46     printf("\n Welcome to the Embedded C Programming Class\n featuring MPLABX IDE\n");
47     while(1);
48
49 }
50
```

1 Stop the simulation by pushing Finish Debugger Session button

Variables Call Stack Breakpoints Output Tasks

Debugger Console

```
make(2): Leaving directory `C:/MT/TL82101/Getting Started/GettingStarted.X'
make(1): Leaving directory `C:/MT/TL82101/Getting Started/GettingStarted.X'

BUILD SUCCESSFUL (total time: 562ms)
Loading C:/MT/TL82101/Getting Started/GettingStarted.X/dist/default/debug/GettingStarted.X.debug.e1
Loading completed
```

GettingStarted (Build, Load, ...) | debugger halted | 47 | 1 | IN5



Closing a Project

The screenshot shows the MPLAB X IDE interface. The 'Projects' tree on the left has a context menu open over the 'GettingStarted' project. The 'Close' option at the bottom of the menu is circled in red. A yellow callout box with the text '2) "Right Click" on the project name then select Close' has two red arrows: one pointing to the project name in the tree and another pointing to the 'Close' option in the menu. The main editor window shows the C code for 'GettingStarted.c.c'. The bottom status bar indicates 'GettingStarted (Build, Load, ...) | debugger halted | 47 | 1 | IN5'.

```
main( void );  
  
FUNCTION:      main()  
DESCRIPTION:  Demos macros  
PARAMETERS:   none  
RETURNS:      nothing  
REQUIREMENTS: none  
  
main(void)  
  
int localVar1 = 3 ;  
int localVar2 = 0 ;  
printf("Getting Started\n");  
while(1)
```

2) "Right Click" on the project name then select **Close**



Questions?



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