



CMPE-118/L TIPS AND TRICKS

OVERVIEW:

This document has a collection of tips and tricks for various software and hardware that is used in the labs for CMPE-118/L. These are usually documented within the manuals of the programs, however this collection is intended to aggregate the more useful ones in a single place. Note that this document will have sections added to it as the quarter progresses. Check it often to see if the version has changed.

DS30LOADER

INTRODUCTION:

The ds30Loader is the bootloader interface and serial port we use with the Uno32 hardware. A new Uno32 can be flashed with the new firmware to work with the ds30Loader. It is currently only supported under Windows.

GENERAL TIPS:

- Set the Terminal tab radio check box to “Switch to after write” to automatically turn on the serial port once the flash is programmed and the processor reset.
- In the basic window, the down arrow on the hex files keeps a list of your previously loaded HEX files for quick access. This is very useful when working on multiple parts of project simultaneously.
- F2 writes the HEX file to the processor but will only work if the serial terminal is closed (using the close button).

MPLAB-X




INTRODUCTION:

MPLAB X is quite the competent IDE for coding in C for the PIC processors. The following outlines some of the features available within it.

GENERAL TWEAKS:

- Enable parallel compilation under Tools->Options->Embedded->Projects by selecting “Use parallel make”. This can speed up compilation for projects with many source files.
- Change the default font to something more readable under Tools->Options->Fonts & Colors->Font by selecting either Consolas or Lucida Console. These fonts are much more readable, so you may choose to decrease the font size to 10pt as well.
- Set the default code formatting to follow the style guidelines we've provided.
- Set Tools->Options->Formatting->Language (C)->Style to K&R and specify the proper line length by setting “Editor” -> “Formatting” -> “Right Margin” to 100.

USEFUL SHORTCUTS:

- CTRL+SPACE opens the auto-completion window. It will search system libraries and the current project for functions, macros, constants, and variables that start with what you've typed. Note that it is case-sensitive. This will also display the associated documentation from the header file for functions.
- CTRL+p inside function parenthesis will show the argument list.
- CTRL+LEFT-MOUSE-CLICK will take you to the declaration of a function.
- Right-clicking on elements in a source file provides several useful options:
 - Navigate->Go to: takes you directly to the declaration, implementation, or header
 - Navigate->View macro expansion: Brings up a sub-window that shows what all the macros will be replaced with
 - Navigate->Refactor: Gives several options for altering your code. Most useful is using the Rename function to rename all instances of a variable if you think of a better name.
 - Find usages: Searches projects and libraries for all usages of a variable, function, or constant.
- Hovering over the named tab for a source file will show the complete path of that file. Similarly hovering over the project name will show its file location
- MPLAB X saves the history of edits to files (will not be preserved across sessions on the lab computers) that can save you some effort if something is accidentally deleted. It is accessed by opening the file in the editor and then accessing the Team->Local History->Show local history menu option.
- CTRL+SHIFT+a switches the editor between the source file and the corresponding header file.
Also accessible in the editor toolbar: 
- CTRL+/ comments or uncomments the current line in the editor. Also available in the editor toolbar: 
- Clicking on the blue-underlined errors in the Output window will show that line in the editor.
- ALT+SHIFT+LEFT/ALT+SHIFT+RIGHT unindents and indents lines in the editor.
- CTRL+SHIFT+f searches the entire project for text.
- CTRL + E deletes the current line
-  Move backwards and forward through each line that has been selected with the cursor. If you navigate to a new file, clicking the back button will take you to the old file.

SOLIDWORKS

INTRODUCTION:

SolidWorks is a very full featured computer automated design (CAD) tool, and is widely used in industry (along with its competitors, AutoCAD and ProE). It is extremely full featured, and has a simulation engine for finite element analysis for structural, fluid flow dynamics, and electromagnetic fields. The vast bulk of its capability will not be used in CMPE-118, however there are certain shortcuts which are useful.

GENERAL TWEAKS:

- Turn off Anti-Aliasing (unless you are running on a desktop with a very good graphics card). Tools->Options->Display/Selection uncheck the Anti-Alias sketches/edges only.