

Debug an Arduino Sketch using MPLAB-X

Board: Digilent Wi-FIRE (Rev C)

MPLAB-X: Must support the specific PIC32 device (e.g., v3.61)

Board Setup

Best to solder right-angle pins into JP1 (ICSP connection) on the Wi-FIRE. Also, remove jumper JP2.

You will use the chipKIT PGM or PicKIT3 programmer to program the bootloader and ELF file. Use USB cable connected to UART J1 for serial port output.

Arduino Setup

Make sure you have changed preferences under File > preferences to show “verbose” output during compilation so you can verify where your ELF file is ultimately created. However, change preferences.txt file under the Arduino directory (typically, the user’s AppData/local/) to use a VERY short build path, e.g., D:\ardo\build by inserting this line anywhere build.path=D:\ardo\build. This so that the gcc compiler in MPLAB-X doesn’t get unhappy.

See this for more detail <https://www.kanda.com/blog/microcontrollers/avr-microcontrollers/find-arduino-hex-files-output-binaries/>

This link may also be useful <https://www.arduino.cc/en/Hacking/BuildProcess>

You will want to store the Digilent bootloader hex file for the Wi-FIRE in the D:\ardo directory and create a mlab directory under D:\ardo for the MPLAB project that will get created.

Building the Sketch

Fire up Arduino, open the sketch, and then select Sketch > Verify/Compile. This will create an ELF file representation of your sketch. You can close the sketch in Arduino if desired, as the build info is located in a non-temporary location), or you can leave it open to use the Serial Monitor. If you close it then you will need to use puTTY or similar to view the serial port output.

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NOTE: If you are using the chipKIT core, rather than the Digilent core, then you might be able to use an MPLAB plugin for loading the ELF file, but I was unsuccessful.

Fire up MPLAB-X and select File > Import > Hex/ELF (prebuilt). Browse to the ELF file under D:\ardo\build to fill in the Prebuild Filename box. Make sure the Device is correct and that the Hardware Tool is the Licensed Debugger.

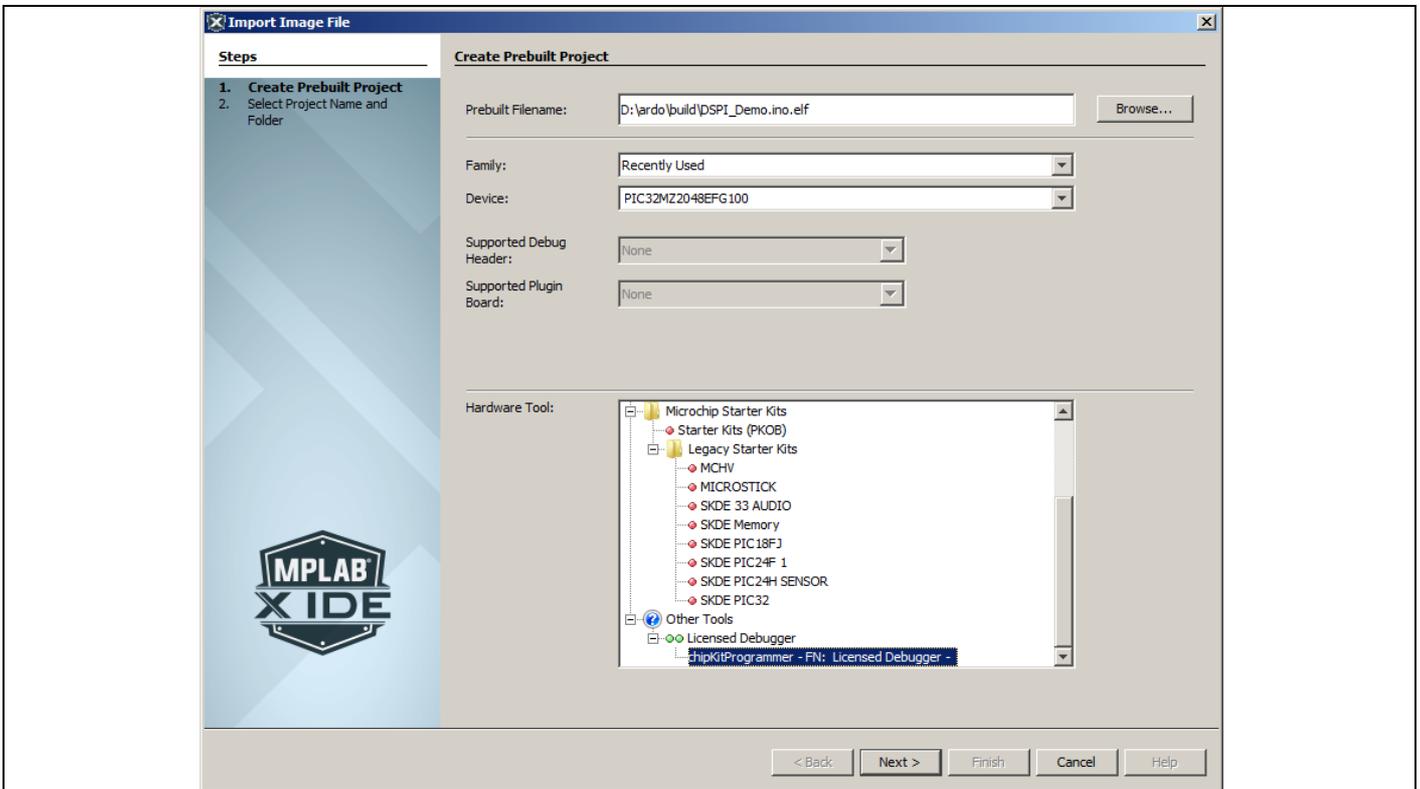


Figure 1: Create Prebuilt Project

Select "Next". Leave the Project Name as is, but you can change the Project Location to D:\ardo\mplab. Select "Finish".

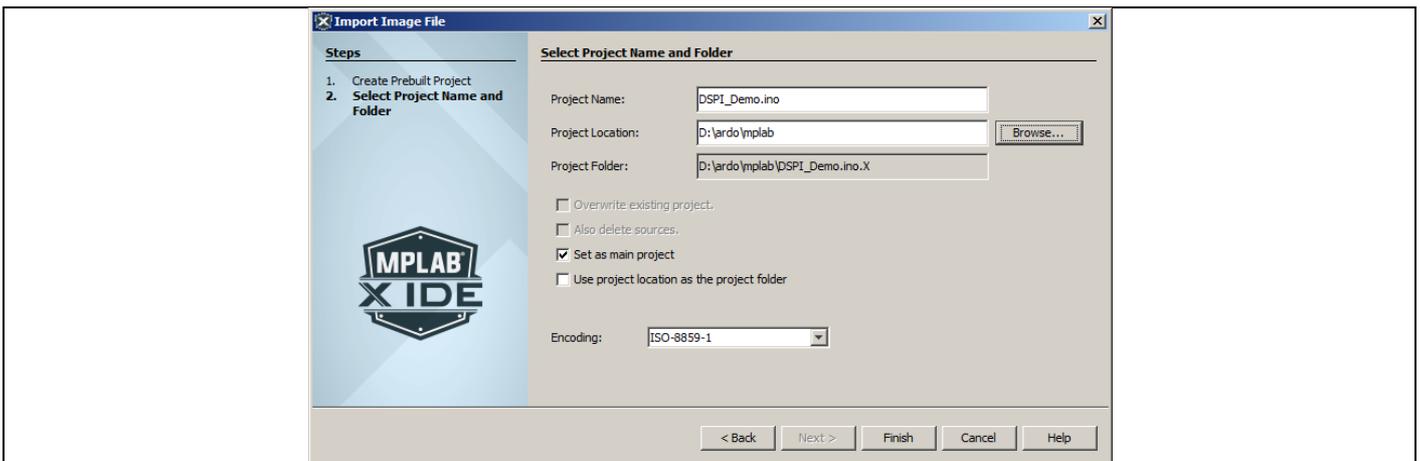


Figure 2: Select Project Name and Folder

This will create the MPLAB project. Expand the project tree so that you can see the various folders. Right-click on "Loadables" and select "Add loadable file", then browse to the bootloader hex file for the Wi-FIRE. Finish by selecting "Add".

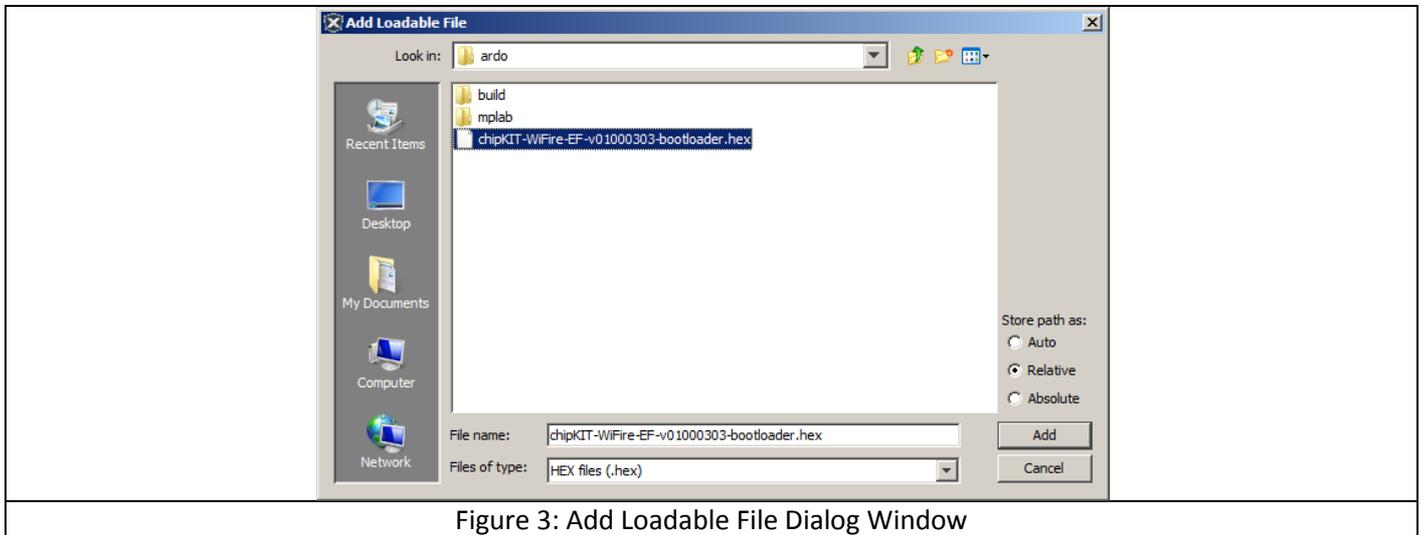


Figure 3: Add Loadable File Dialog Window

Open up the ino for the sketch (not the cpp version) and set breakpoints. Select the “Debug Project” button to build the project. Then select the green arrow to run it.