The EPS-LKAS V2 board is equipped with a Micro-B USB for flashing. The scope of this document is to get your computer setup with the necessary software to update and modify the firmware on your (Windows) computer.
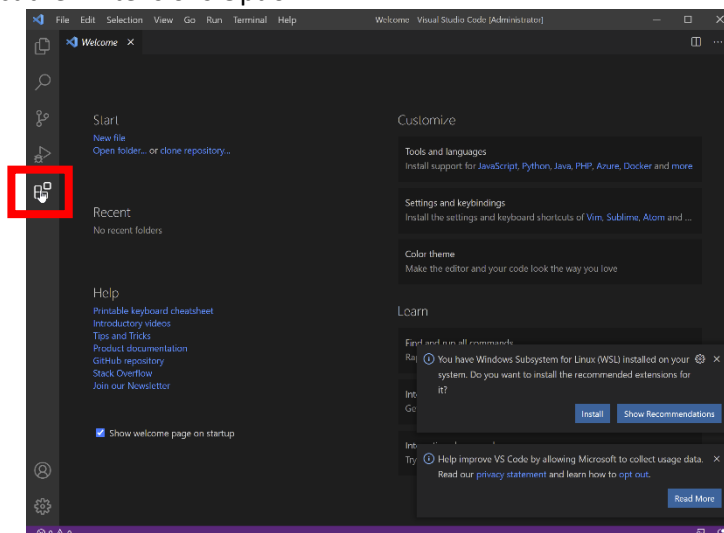
1. Download and install Visual Studio Code. https://code.visualstudio.com/download
   a. Download the program selecting the appropriate OS. Windows 10 will be used as an example for this document.
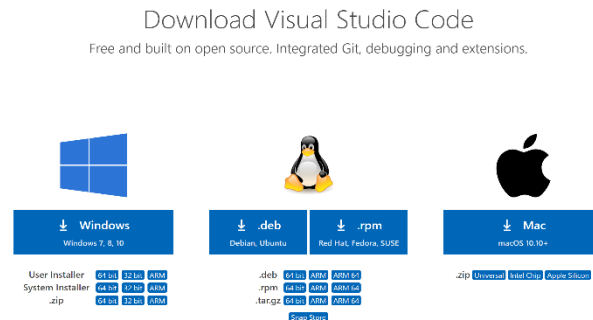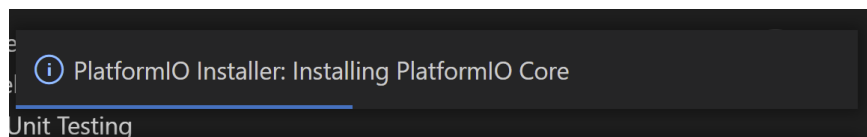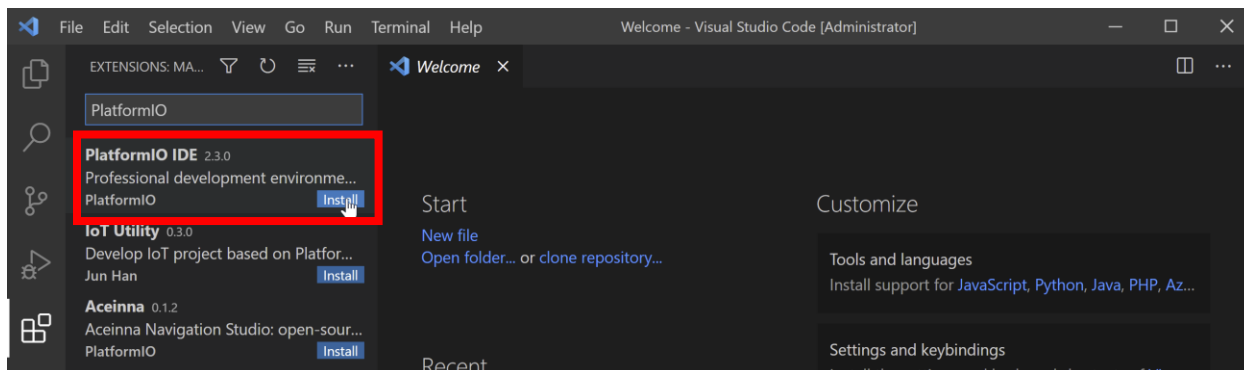

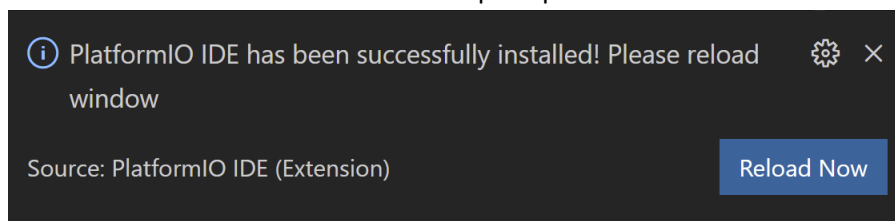   b. The default options should be fine for normal use, however, check options as needed.
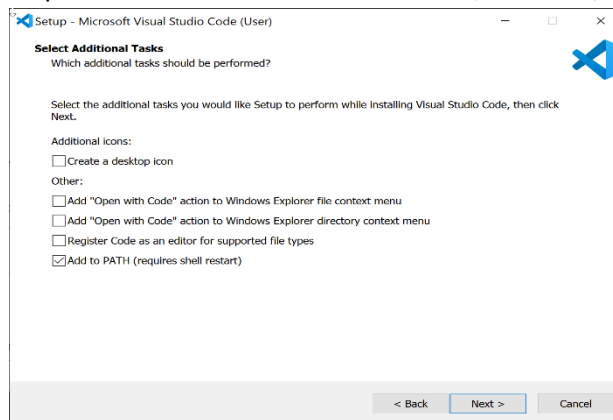
   c. Launch VS Code.
2. Download Platform IO.
   a. Select the "Extensions Option"

b. Search "**PlatformIO**" and press "**Install**". This may take some time.
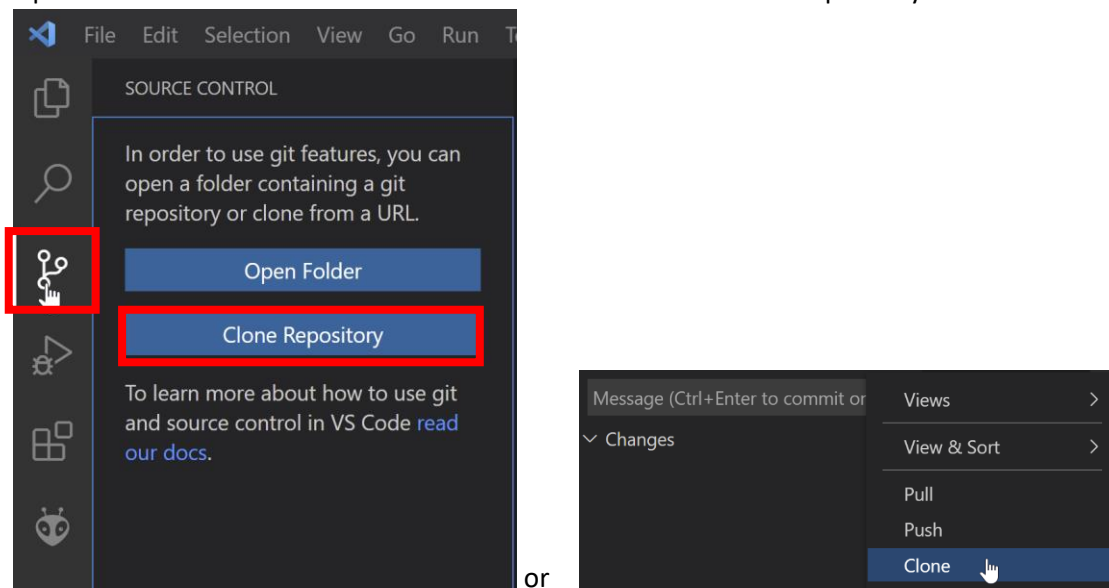

c. Press the "Reload Now" button when prompted.

3. Download the latest firmware available on reddn's Github:
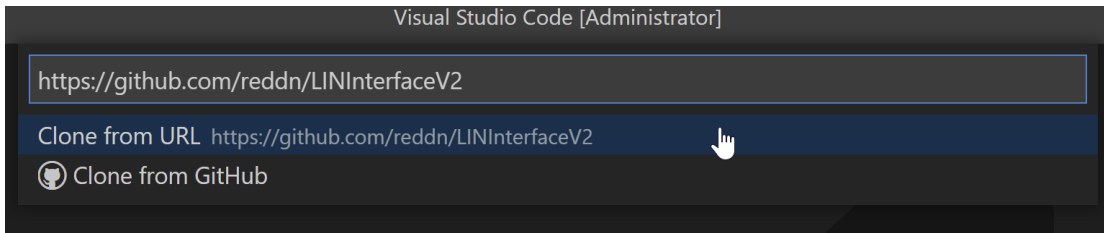
a. Open the "Source Control" tab from the task bar and click "Clone Repository".

 or
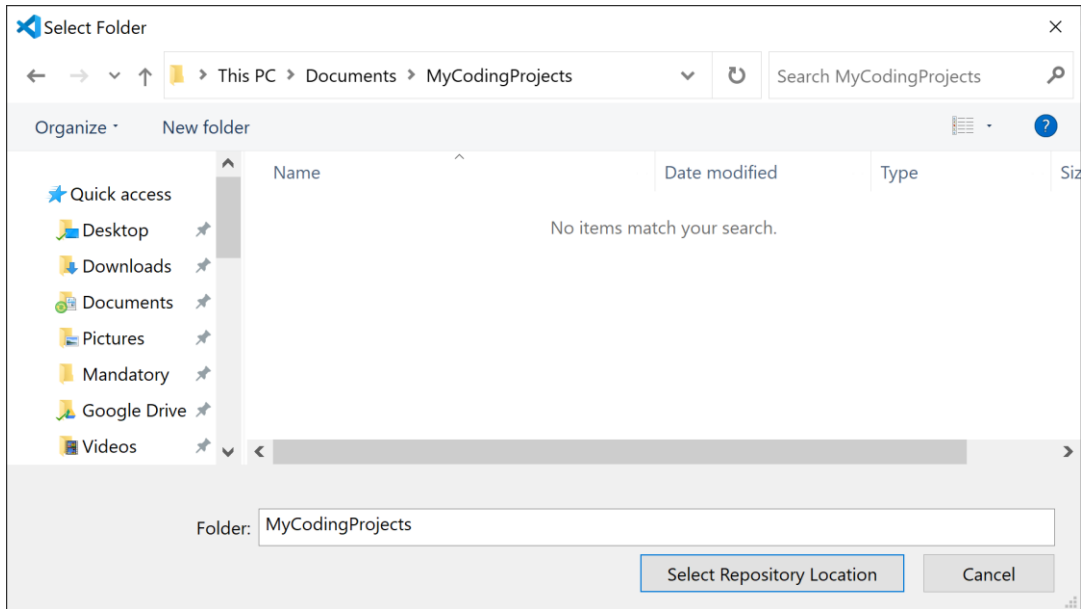
b. Type (or copy/paste) the following repository source:
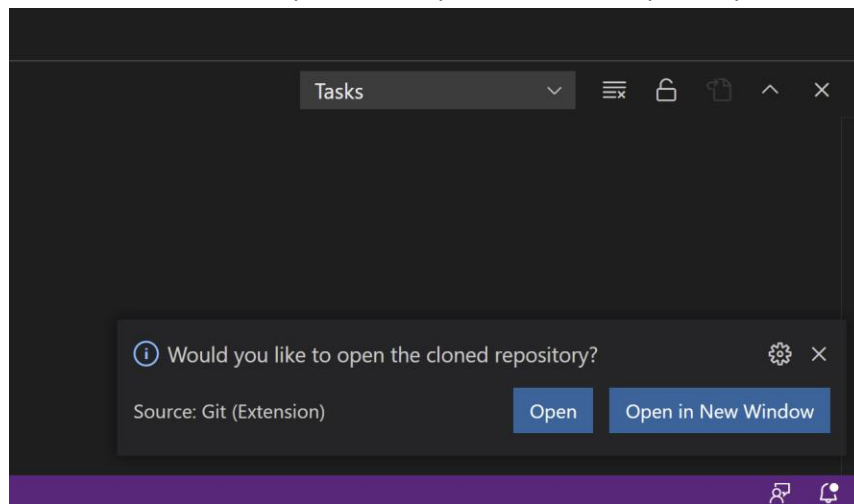
https://github.com/reddn/LINInterfaceV2

c.   Click the "Clone from URL" option.

d.   Select a location you can remember. Press "Select Repository Location".

e.   VScode will ask "Would you like to open the cloned repository?". Select "**Open**"

f.   Allow PlatformIO to rebuild the IntelliSense Index. This might take some time.

4. The STM32duino USB drivers must be installed. Download the files from rogerclarkmelbourne's github.
    a. Download the entire repo here using the link below:
       https://github.com/rogerclarkmelbourne/Arduino_STM32/archive/master.zip
        i. Alternatively, use a website to download the drivers only.
           1. i.e. Use "gitzip" and paste the linkw:
              https://github.com/rogerclarkmelbourne/Arduino_STM32/tree/master/drivers
    b. Unzip the file and navigate to the drivers/win/ folder.
    c. Run "install_drivers.bat" as administrator.

Name	Date modified	Type	Size
src	3/14/2021 3:24 PM	File folder	
win_xp_legacy	3/14/2021 7:22 PM	File folder	
install_drivers.bat	3/14/2021 3:24 PM	Windows Batch File	1 KB
install_STM_COM_drivers.bat	3/14/2021 3:24 PM	Windows Batch File	1 KB
wdi-simple.exe	3/14/2021 3:24 PM	Application	6,255 KB

    d. Allow the command line to install the drivers and once done "Press any key to continue …" message appears.


```
C:\WINDOWS\system32\cmd.exe

Installing Maple DFU driver...
Extracting driver files...
  Success
Installing driver(s)...
  Success

Installing Maple Serial driver...
Extracting driver files...
  Success
Installing driver(s)...
  Success

Press any key to continue . . . _
```
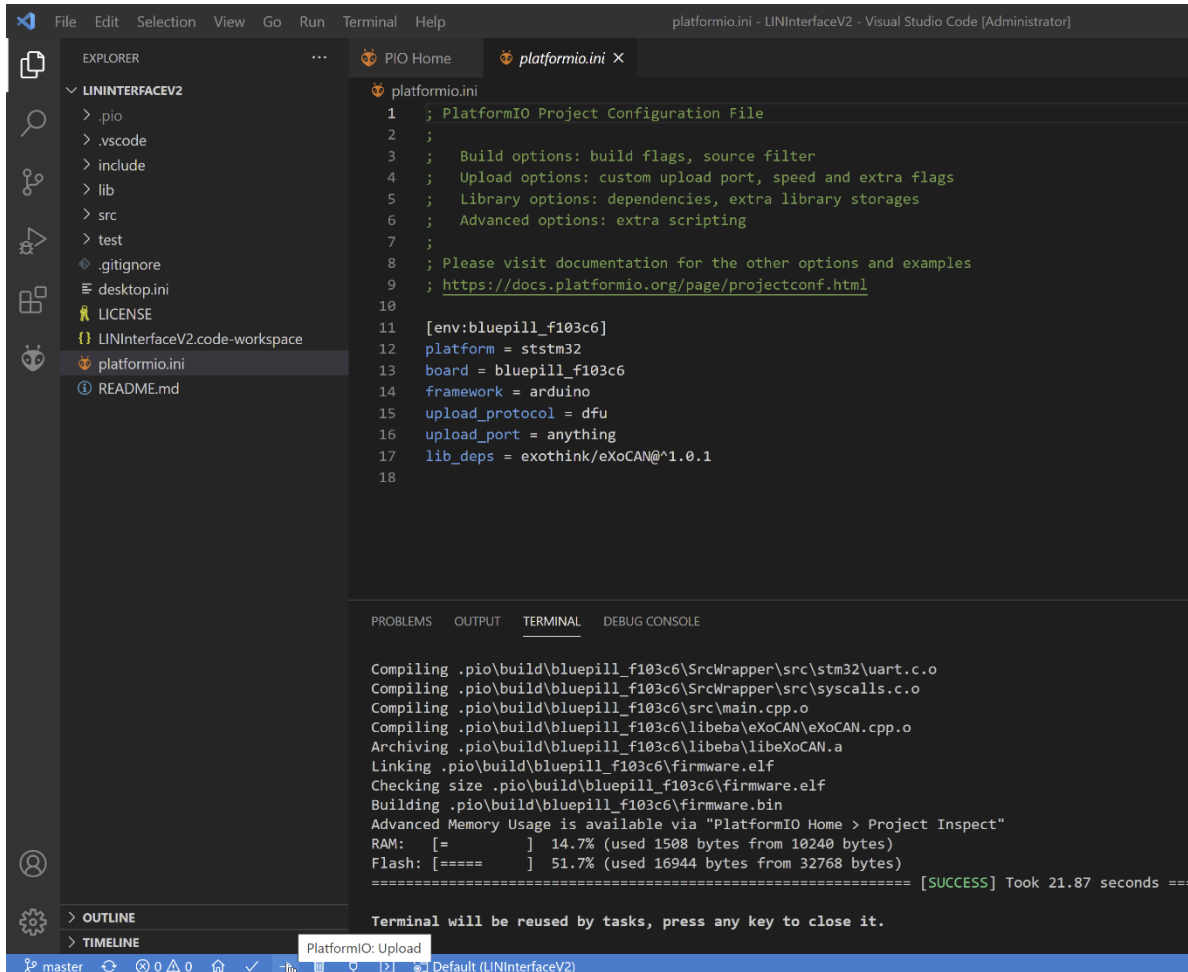
5. Flashing the board.
    a. Plug the Micro-B USB able into the circuit board.
        i. Do **NOT** plug the other end of the cable into the computer yet.

    b. Have the source code open and press the "Upload" to build and upload the code.

i.   **Tip**: Try building the code to make sure there are no issues when building

c.   The terminal will show the message below. Plug the board in within a few seconds on seeing this message.

     d.   The board should flash if plugged in at the right time (within 5 seconds of seeing this message).

        i. **Failed Programming**

```
Searching for DFU device [1EAF:0003]...
Reset via USB Serial Failed! Did you select the right serial port?
Assuming the board is in perpetual bootloader mode and continuing to attempt dfu programming..

dfu-util - (C) 2007-2008 by OpenMoko Inc.
Couldn't find the DFU device: [1EAF:0003]
This program is Free Software and has ABSOLUTELY NO WARRANTY


timeout waiting for anything serial
```

        ii. **Successful Programming**

```
PROBLEMS    OUTPUT    TERMINAL    DEBUG CONSOLE                                                                2: Task - Upload
Configuring upload protocol...
AVAILABLE: blackmagic, cmsis-dap, dfu, jlink, serial, stlink
CURRENT: upload_protocol = dfu
Looking for upload port...
Use manually specified: anything
Uploading .pio\build\bluepill_f103c6\firmware.bin
maple_loader v0.1
Resetting to bootloader via DTR pulse
Searching for DFU device [1EAF:0003]...
Reset via USB Serial Failed! Did you select the right serial port?
Assuming the board is in perpetual bootloader mode and continuing to attempt dfu programming...

Found it!

Opening USB Device 0x1eaf:0x0003...
Found Runtime: [0x1eaf:0x0003] devnum=1, cfg=0, intf=0, alt=2, name="STM32duino bootloader v1.0  Upload to Flash 0x8002000"
Setting Configuration 1...
Claiming USB DFU Interface...
Setting Alternate Setting ...
Determining device status: state = dfuIDLE, status = 0
dfuIDLE, continuing
Transfer Size = 0x0400
bytes_per_hash=344
Starting download: [#################################################] finished!
state(8) = dfuMANIFEST-WAIT-RESET, status(0) = No error condition is present
Done!
Resetting USB to switch back to runtime mode
error resetting after download: usb_reset: could not reset device, win error: A device which does not exist was specified.
```

6. Other Notes
   a. The board enters "bootloader mode" or "USB DFU" for several seconds when powered on. This is noted by the 6 flashed on bootup.
   b. After bootup, the board goes into the main program and cannot be flashed.
   c. The board needs to "reset" to enter bootloader mode, which is why the board must be plugged when the "Assuming the board is in perpetual…. Attempt dfu programming.." message appears.