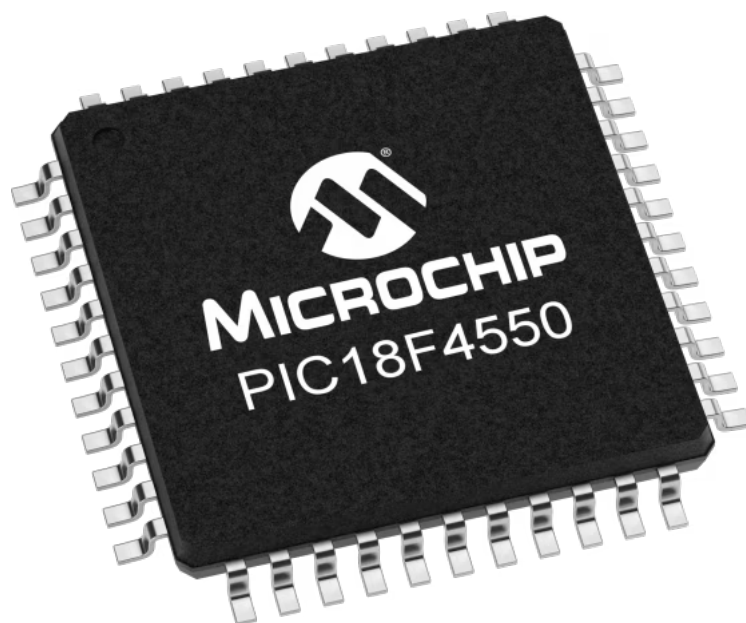


PIC18F4550

Bootloader Installation



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Chapter 1

Getting Started...

1.1 Pre-requisites

Before we start, its always better to collect the tools and other necessary stuff required to achive end result.

- PIC18F4550 Developement Board
- PICKIT-3
- PICKIT-3 PC Application
- Bootloader Hex file
- Bootloader device driver
- PDFSUSB Application [For hex file upload]
- LED blink demo hex file [Optional]

1.2 Brief Procedure

We have provided you the folder with all the *installation* files, *Hex* files and *drivers*. Please Navigate to that folder and then follow the procedure given bellow.

1. Install the *PICKIT-3 PC Application*
2. Connect the *PICKIT-3* with *PIC18F4550* micro-controller.
3. Open the *PICKIT-3 PC Application* installed in Step 1.
4. Upload the *Bootloader hex file* into PIC18F4550 micro-controller.
5. Remove the *PICKIT-3* Programmer from micro-controller.
6. Install the *Bootloader Device Drivers* on the Windows.
7. Put the PIC18F4550 Microcontroller in the program mode.

8. Open the PDFSUSB Application
9. Select the microcontroller
10. Select the LED blink demo hex file or any other hex file you want to upload on the micro-controller.
11. Click on the Program button, and wait for the hex file to get upload in the micro-controller.
12. Reset the micro-controller to observe the output.

This is the brief procedure for power users who are used to the *Microchip's* and *PIC microcontroller's* eco-system.

If you are not familiar with this eco-system or you find the above procedure hard, don't worry, I have given the detailed and stepwise procedure in later part of this document, which will guide you making your PIC bootloader experience buttery smooth.

Chapter 2

Installing PICKIT-3 Application

This chapter guides you step-by-step to install the *PICKIT-3 Application*. Follow the procedure as mentioned bellow and at the end you will end up with *PICKIT-3 Application* installed in your PC succesfully.

2.1 Installation Procedure

1. Navigate to the *PICKIT-3 Application's* setup file location and double click on the exe file. After opening the exe file, a new window will appear as shown in figure 2.1.

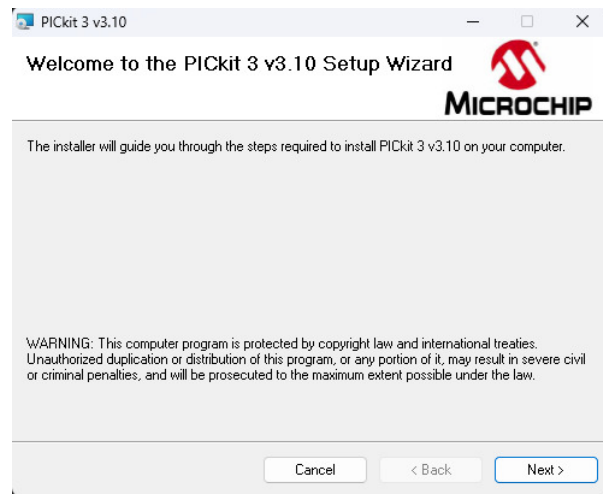


Figure 2.1: Welcome Page

2. On this window, click on the *Next* button.

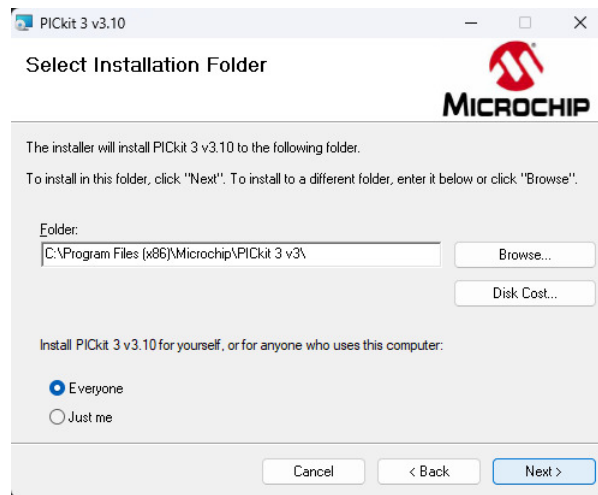


Figure 2.2: Select Installation Location

3. As we don't need to change the default location, just click on the *Next* button, without changing any option shown in figure 2.2.

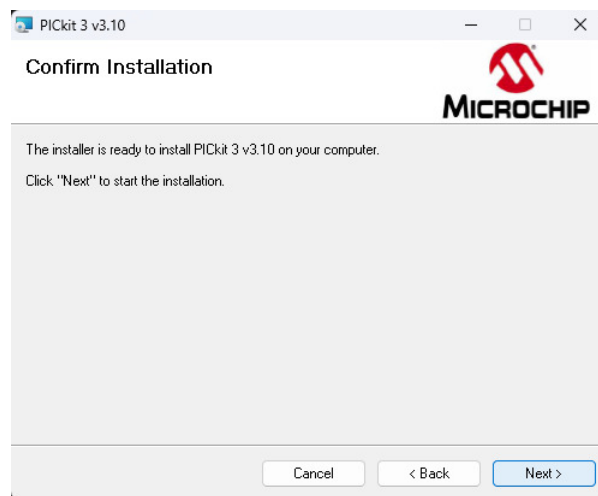


Figure 2.3: Confirm Installtion

4. Here, the installer is all set to install the application on the PC, click on the *Next* button.

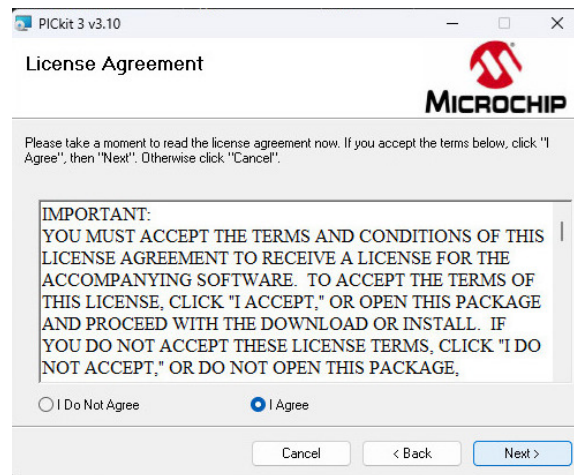


Figure 2.4: License Agreement

5. Next window appeared is of *License Agreement*, Select the *I Agree* radio button and then click on *Next*. [Refer Figure 2.4.]

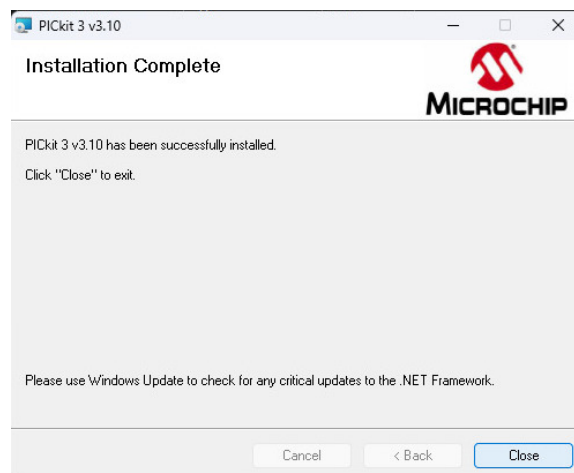


Figure 2.5: Installation Complete

6. We are now at last stage of our installation. At the end of the installation, the installer present you the window as shown in the figure 2.5. Click on the *Close* button to close the installer.

Congratulations !!! ... You have successfully installed the *PICKIT-3 Application* on your PC.

2.2 Uploading Bootloader

Now you have installed the application, it's time to use that application to upload the PIC USB bootloader in to the *PIC18F4550* micro-controller.

Follow the steps given bellow to upload the USB bootloader.

1. If PIC18F4550 micro-controller is powerd ON, turn it OFF.
2. Connect the PICKIT-3 to micro-controller.
3. Now turn ON the micro-controller.
4. Connect the *PICKIT-3* to PC using USB Cable.
5. Open the *PICKIT-3 Application* we have installed in section 2.1. A new Window will appear as shown in Figure 2.6.

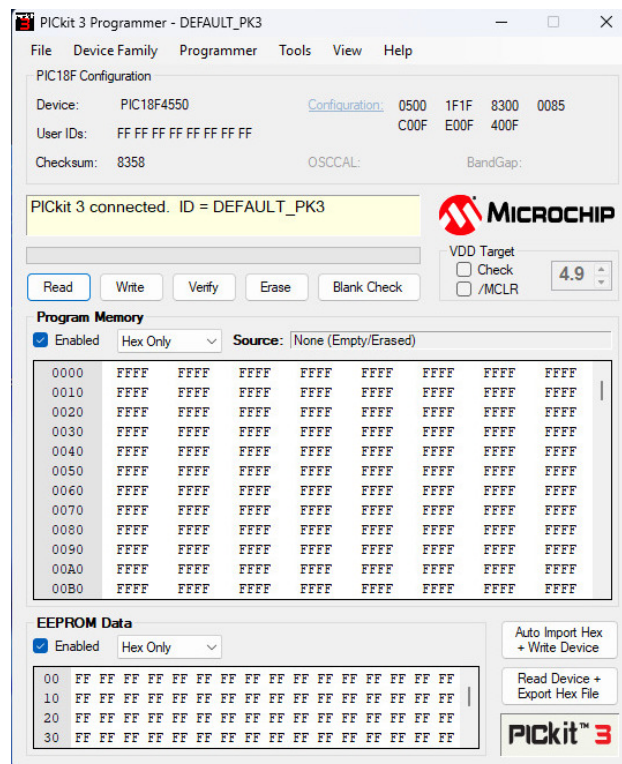


Figure 2.6: PICkit-3 Application

6. Now Navigate to **Tools -> Check Communication** as shown in the Figure 2.7.

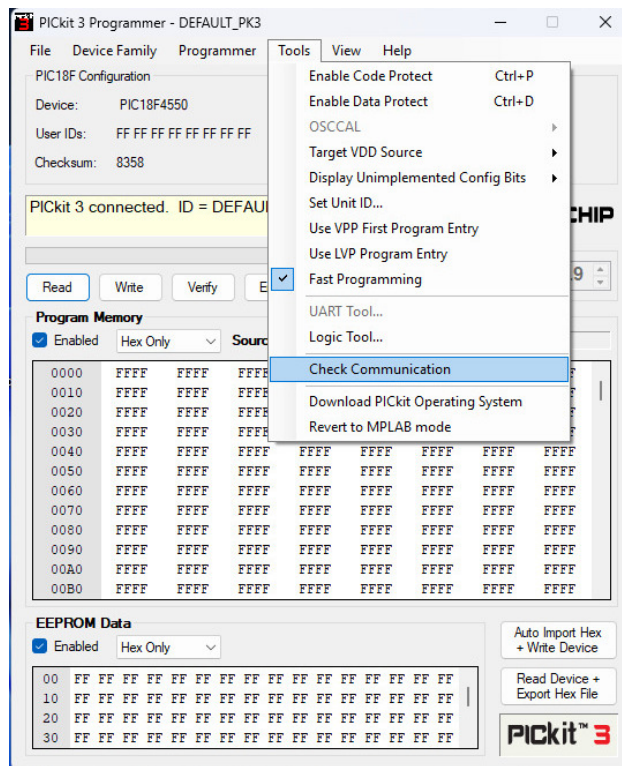


Figure 2.7: Check Connected Devices

7. The application will detect the PICKIT-3 and the micro-controller connected through it as shown in the Figure 2.8.

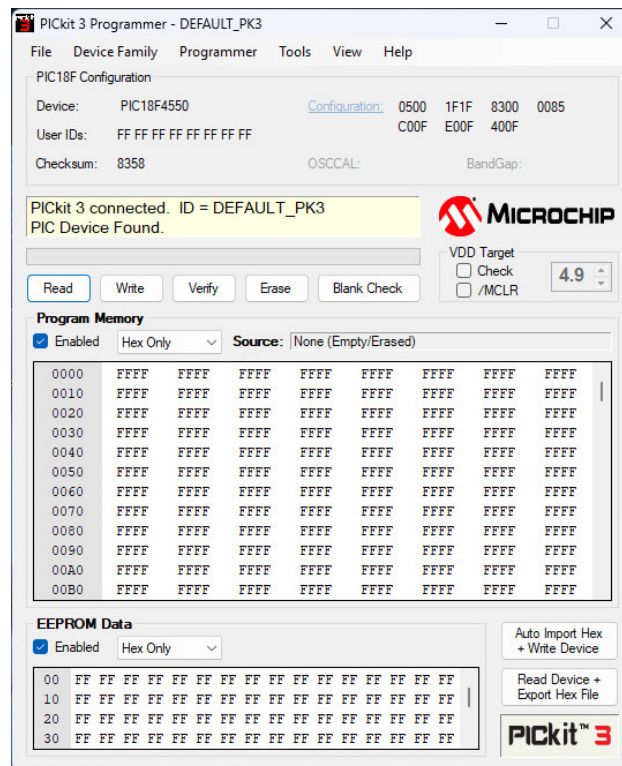


Figure 2.8: Device Detected

8. Now We need to select the hex file of the bootloader. To do so, navigate to File -> Import File Add image here(Pending)
9. Now navigate to the location where you have stored the bootloader's hex file and select the hex file as shown in the Figure 2.9. Here the filename of the hex file is PIC-USB-4550-BOOT.hex

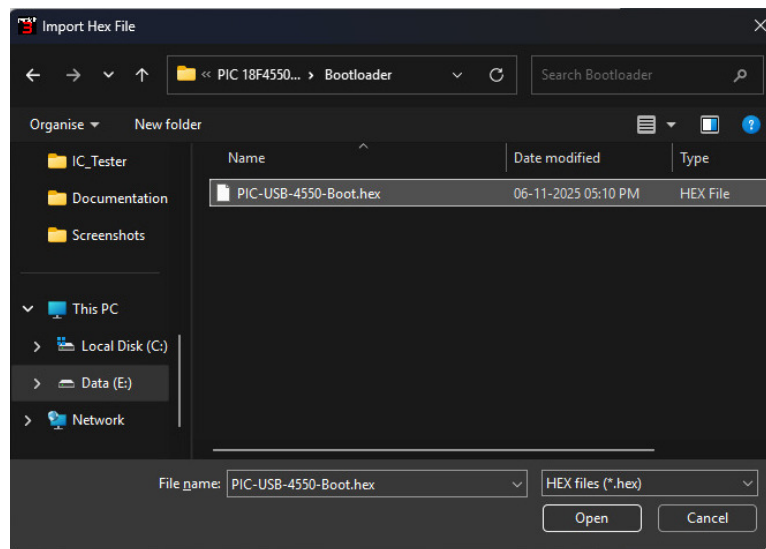


Figure 2.9: Select bootloader hex file

10. Now Click on the *Write* button as shown in the figure 2.10.

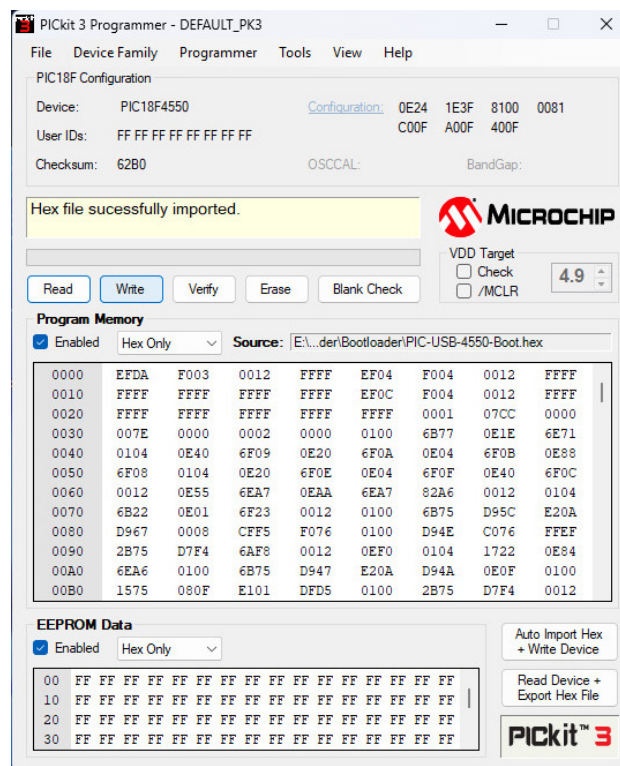


Figure 2.10: Write Hex File

- PICKit 3 Programmer - DEFAULT_PK3

File Device Family Programmer Tools View Help

PIC18F Configuration

Device: PIC18F4550 [Configuration...](#) OE24 1E3F 8100 0081
 User IDs: FF FF FF FF FF FF FF FF C00F A00F 400F
 Checksum: 62B0 OSCCAL: BandGap:

Programming Successful.

MICROCHIP

VDD Target
☐ Check ☒ /MCLR 4.9

Read Write Verify Erase Blank Check

Program Memory
☒ Enabled Hex Only Source: [E:\...deri\Bootloader\PIC-USB-4550-Boot.hex]

0000	EFDA	F003	0012	FFFF	EF04	F004	0012	FFFF
0010	FFFF	FFFF	FFFF	FFFF	EF0C	F004	0012	FFFF
0020	FFFF	FFFF	FFFF	FFFF	FFFF	0001	07CC	0000
0030	007E	0000	0002	0000	0100	6B77	0E1E	6E71
0040	0104	0E40	6F09	0E20	6F0A	0E04	6F0B	0E88
0050	6F08	0104	0E20	6F0E	0E04	6F0F	0E40	6F0C
0060	0012	0E55	6EA7	0EAA	6EA7	82A6	0012	0104
0070	6B22	0E01	6F23	0012	0100	6B75	D95C	E20A
0080	D967	0008	CFF5	F076	0100	D94E	C076	FFFF
0090	2B75	D7F4	6AF8	0012	0E0F	0104	1722	0E84
00A0	6EA6	0100	6B75	D947	E20A	D94A	0E0F	0100
00B0	1575	080F	E101	DFD5	0100	2B75	D7F4	0012

EEPROM Data
☒ Enabled Hex Only

00	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
10	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
20	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
30	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Auto Import Hex + Write Device
 Read Hex File + Export Device File

PICKit™ 3

Chapter 3

Installing MCHPFSUSB v2.2 USB Framework

In this chapter we are going to install the MCHPFSUSB USB Framework of version 2.2. This Framework provides USB bootloader drivers as well as firmware hex file upload tool.

Following steps guide you to install the MCHPFSUSB USB Framework on your PC.

1. Navigate to the MCHPFSUSB installer folder and run the setup file as shown in the Figure .

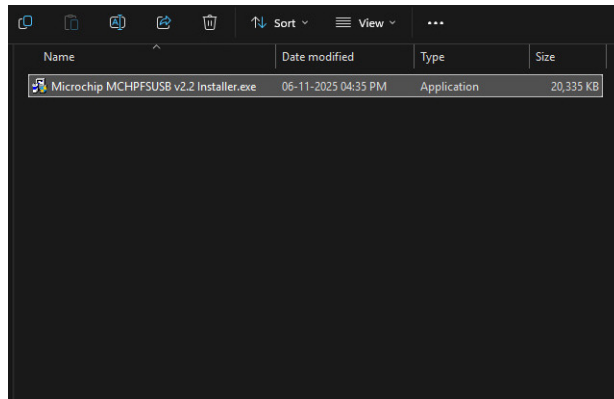


Figure 3.1: Select Setup File

2. Installer will invoke and ask you for the License Agreement as shown in the Figure 3.2. Click on '*I Accept*'.

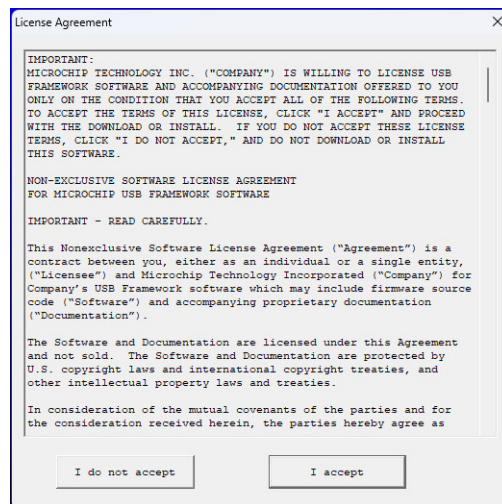


Figure 3.2: License Agreement

[Note]: There are two different license agreement and similar window appears for two times and every time you have to Accept the Agreement

3. Then the installer presents you the welcome window as shown in Figure 3.3. Which warns you to close any other open window before proceeding in installation. So close all other windows as instructed in the installer and then click on *Next* button.

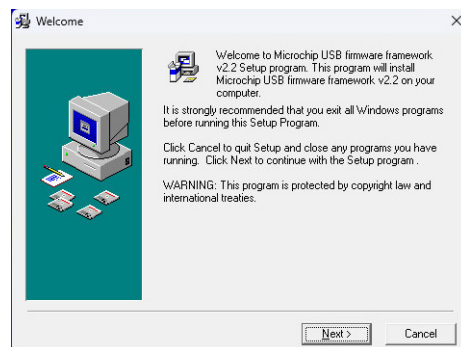


Figure 3.3: Welcome Window

4. In the next window of the installer you have to choose the destination location. Don't change anything and click on the *Next* button. [Ref. Figure 3.4.

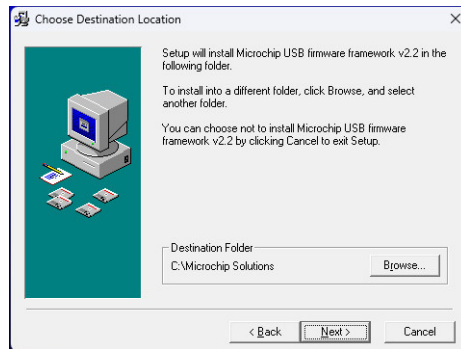


Figure 3.4: Choose Installtion Location

5. It's good practice to keep the backup of the files which are already present on the computer and will get replace in further installation process. The setup is asking whether to take backup or not. By default *Yes* option is selected, which is a good choice so we will not change anything on this page and click on *Next* to move ahead. [Ref. Figure 3.5]

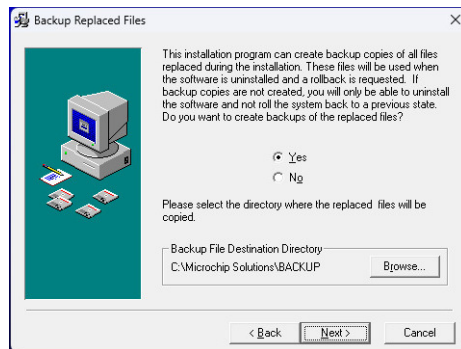


Figure 3.5: Take a Backup

6. At this point installer is ready to install the **MCHPFSUSB Framework** on your PC. In this window it will take confirmation from you as shown in the Figure 3.6. Click on *Next* button.

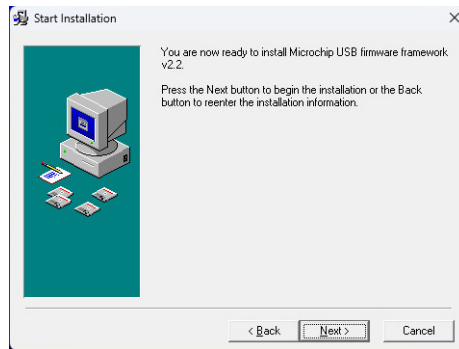


Figure 3.6: Setup Confirmation

7. The installation is now started and will install the all necessary files and tools on your PC. [Ref. Figure 3.7]

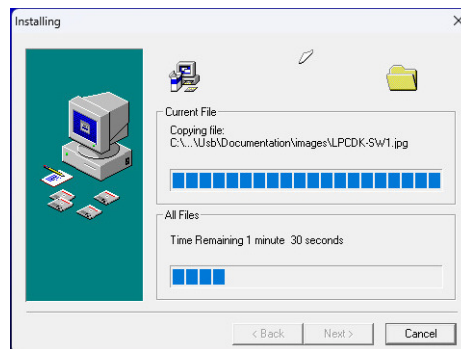


Figure 3.7: Installation in Progress

8. After installation process gets completed, the installer will present you the finishing window as shown in the Figure 3.8.

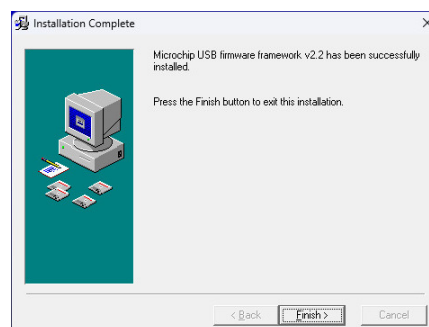


Figure 3.8: Installation Complete

Click on the *Finish* button to close the installer.

Chapter 4

Installing Driver

In last chapter 3 we have completed the **MCHPFSUSB Framework**. Now it's time to install the drivers required to use *PIC USB Bootloader*.

For this you will required to connect the PIC18F4550 micro-controller to PC on which we have uploaded the bootloader's hex file, previously. [Refer section 2.2]

1. Connect the PIC18F4550 microcontroller to the PC using USB cable. Also connect the Power supply to controller board and turn the board ON.
2. Now we need to put the controller into bootloader mode / Programming mode.
3. To put the board into the Programming moed, press and hold the User button connected to **PB4** pin, and then press and release the **Reset** button. then release the **User button**.
4. Now right click on *This PC*, click on *Manage*, then select *Device Manager*.

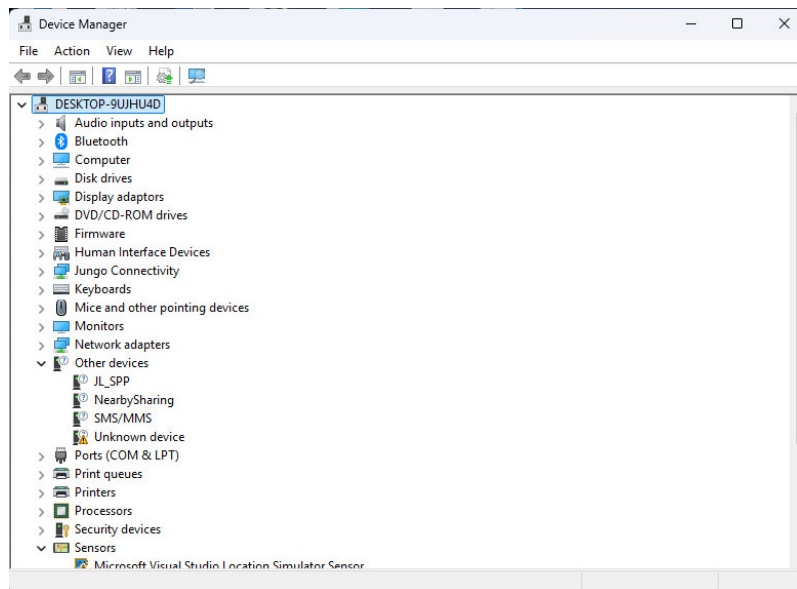


Figure 4.1: Device Manager

5. The device manager will show unknown device as shown in figure 4.1. as we have not installed the driver yet.

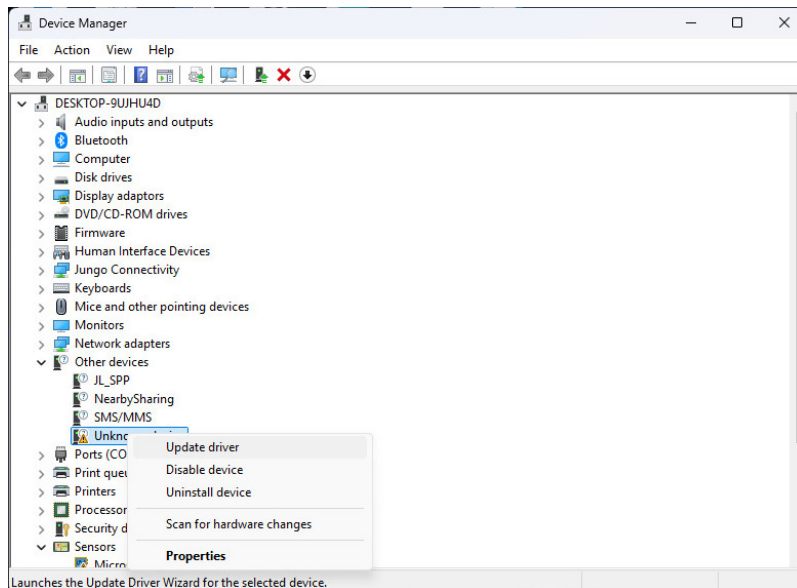


Figure 4.2: Update Driver

6. Right click on the *Unknown Device* and select *Update Driver* as shown in figure 4.2.

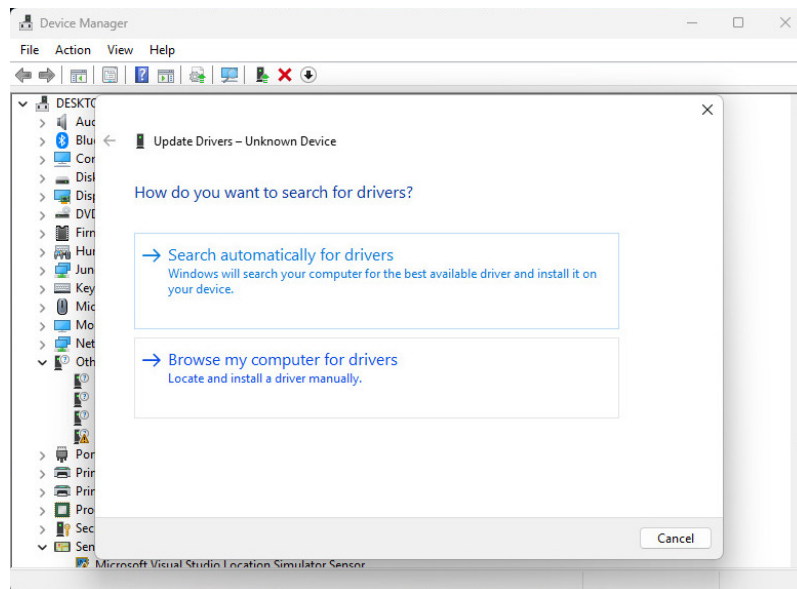


Figure 4.3: Browse Folder

7. On next window select *Browse my computer for drivers*, as shown in figure 4.3.

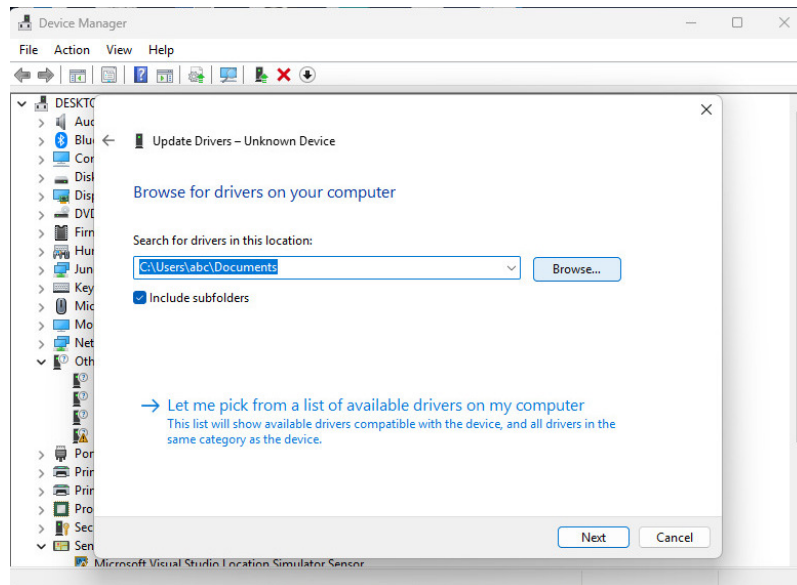


Figure 4.4: Driver Location

8. Now *Device Manager* asks for the driver location. to select the driver folder, click on *Browse* button as shown in the figure 4.4.

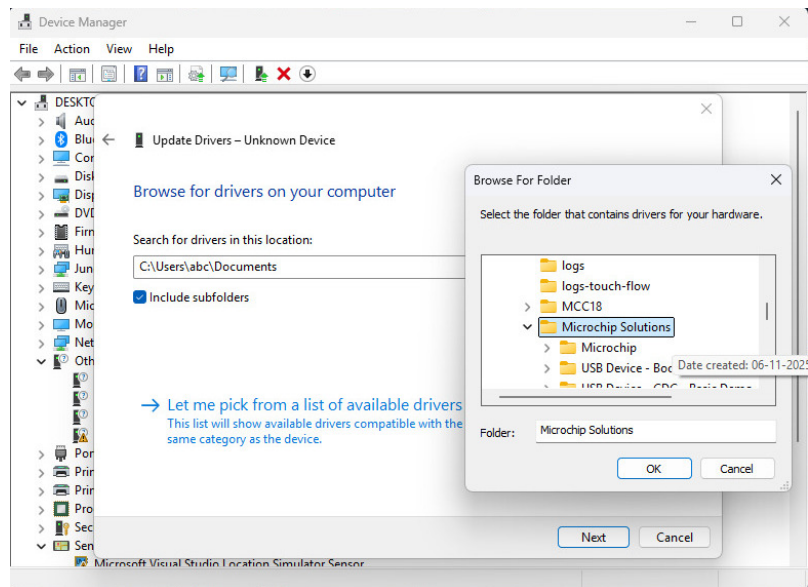


Figure 4.5: Select Folder

9. After clicking on *Browse* button, navigate to C:\Microchip Solutions as shown in figure 4.5.

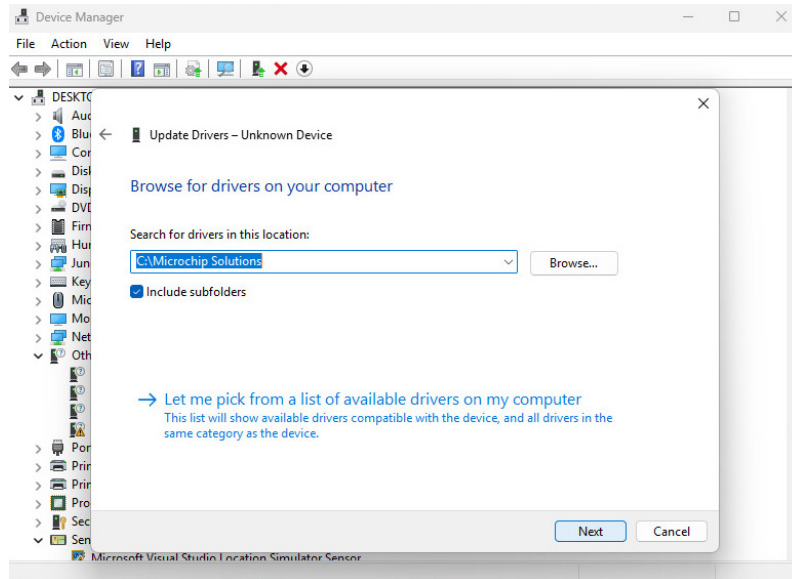


Figure 4.6: Include Subfolders

10. Make sure that *Include Subfolders* option is selected as shown in the figure 4.6 and then click on *Next* button.

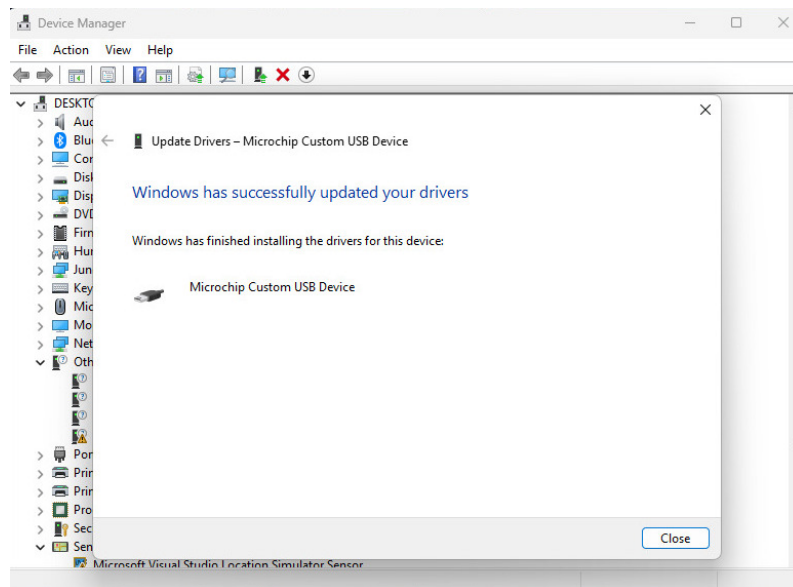


Figure 4.7: Driver Installed

11. Now wait for some time to driver gets installed. Once the drivers get installed on the PC, the device manager will show you the window as shown in figure 4.7. Click on the *Close* button to close the driver installer window.

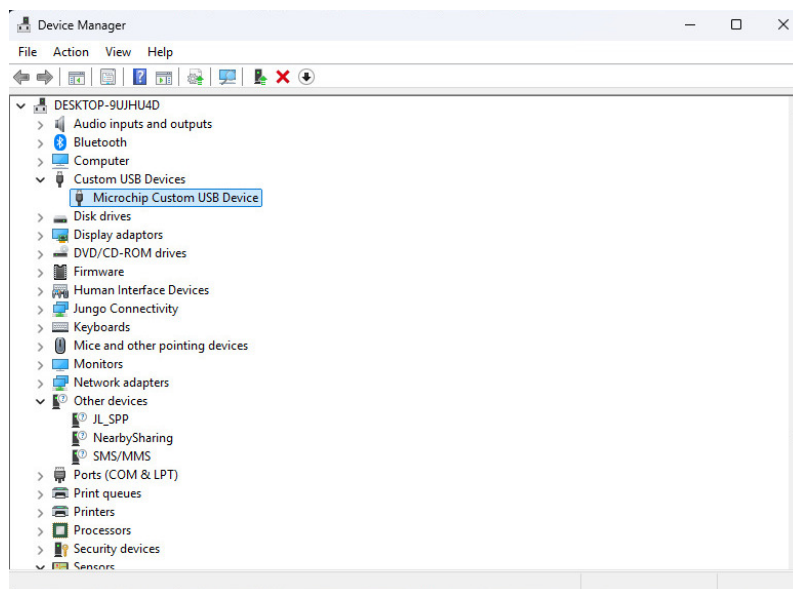


Figure 4.8: Confirm the installed driver

12. you can now see the controller is detected by *Device Manager* as Microchip

Custom USB Device as shown in figure 4.8. Which confirms that driver installation is succesfull.

Chapter 5

Uploading firmware hex file

Appendix A

Schematic