

Lesson 10a (AA0ZZ)

Installing and Running the PICKit2 App

1. Installing PICKit2 Programming Application (PICKit2 App)

The PICKit2 App software is on the CD that is supplied with the PIC-EL III kit in the PICKit2 directory. Otherwise you can download a workable version of PICKit2 App from the “DOWNLOADS” section of my web site: <http://www.cbjohns.com/aa0zz> or from the PIC-EL YAHOO group.

Note that PICKit2 App requires the installation of Microsoft .NET (“DotNet”) Framework. This is a set of files that is freely distributed by Microsoft and is a basic element of many widely used applications so you may well have it installed already. (It takes about 90 MB of disk space.) DotNet is automatically included in Windows Vista but is easily installable on the earlier versions of Windows. You can see if you already have it installed on your computer by running the little application (on the CD) called **DetectDotNet.exe**. For more detailed look you can unzip and run the VersionCheck utility. Or you can manually check by doing the following:

- Open My Computer and navigate to **C:\Windows\Microsoft.NET\Framework** folder. If the folder cannot be found, you do not have any version of DotNet installed.
- If you have more than one version of DotNet installed you will see multiple directories listed. You need DotNet version 2.0 or later for PICKit2 App.

The CD contains two versions of the PICKit2 App installation files. **If you already have DotNet installed**, go to the “Microchip PICKit2 App” directory on the CD and then to the “PICKit2 only” directory. Unzip the files from the ZIP file called “PICKit2 Setup.zip”. Then execute the **setup.exe** file and follow the installation prompts to install PICKit2 programming application on your PC. (The executable file for the PICKit2 App is called **PICKit2V2.exe**. You can ignore the other files in the installation directory.)

If you want to install DotNet AS WELL as PICKit2 App, go to the “Microchip PICKit2 App” directory on the CD and then to the “PICKit2 plus DotNet” directory and unzip the files from the ZIP file called “PICKit2 Setup plus DotNet.zip”. Go to the “dotnetfx” directory and execute the file called **dotnetfx.exe**. Follow the prompts to install DotNet on your PC. Then back up to the “PICKit2 plus DotNet” directory, execute the **setup.exe** file and follow the installation prompts to install PICKit2 programming application on your PC. (The executable file for the PICKit2 App is called **PICKit2V2.exe**. You can ignore the other files in the installation directory.)

If you are using Windows 2000 you must be on Service Pack 3 or beyond. (An update to SP3 or beyond are downloadable from the Microsoft Update web site, www.update.microsoft.com.) Before installing DotNet you will have to install the Microsoft Windows Installer 3.0. It is also in the “dotnetfx” directory.

The CD also contains Microchip’s User guide for the PICKit2 application. You can refer to it for details regarding the usage of this application.

Although it is not necessary, please note that you can get updated versions of the PICKit2 App from the Microchip web page (www.microchip.com). However, please note that the version of the PICKit2 App that you use *must* be synchronized with the “operating system” code that is loaded into the 18F2550 PIC in the PIC-EL III. If you load a new version of PICKit2 App you will need to load the new “operating system” code also. Fortunately, you can update the PIC18F255 “in place” by clicking on the Tools tab of the PICKit2 App and then selecting “Download PICKit 2 Operating System”. You will then be prompted to select an “operating system” file that you have previously downloaded from Microchip and stored on your hard drive (for example, PK2V023200.hex). The PICKit2 App will load this code into the 18F2550 PIC in the PIC-EL, reset it to activate the new operating system, and then the programmer will be full functional.

2. Programming a PIC with PICKit2 App

The following steps should be followed to program a PIC in the PIC-EL.

- 1) **Install the PIC in the PIC-EL**
- 2) **Power up the PIC-EL**
- 3) **Slide mode switch S1 of the PIC-EL to PGM Position**

You need to move the slide switch S1 to the **PGM** position in order to put the PIC-EL board into the **Program** Mode. LED4, next to the switch, will illuminate when you do this.

- 4) **Connect the USB cable from the PC to the PIC-EL**

Use an A-Male to B-Male USB cable to connect the PC to the PIC-EL.

If this is the first time you have connected the PIC-EL III to this computer, you will see a series of messages appear on the PC screen as the PICKit2 is detected and the appropriate drivers are automatically loaded. Wait until you see the message that says the hardware is ready to use. The next time(s) you connect the USB cable between the PC and the PIC-EL III you will not see the messages but you will simply hear the two tones (low then high) indicating the USB connection was made.

NOTE: If you do not hear the PC put out the two tones (low then high) indicating “USB Connected” you may have to reboot the PC. It’s rare but sometimes the USB interface of the PC gets hung up and can be fixed by a reboot. You can check to see if the USB connection to the PICKit2 “clone” (i.e, the 18F2550 PIC and associated circuitry) in the PIC-EL III is working by going to your PC’s Device Manager (Control Panel -> System -> Hardware -> Device Manager) and looking for the line called Human Interface Devices. With the PIC-EL attached and properly “connected” you should see this item. Under Human Interface Devices, double-click on the USB Human Interface Device and the Location designator should say “Location 0 (PICKit 2 Microcontroller Programmer)”. If you don’t see this line, try rebooting your PC.

- 5) **Start the PICKit2 Application**
- 6) **Check the VDD Voltage on the PICKit2 App screen**

You should see 5.0v. If not, the PIC-EL programmer is not working correctly and needs to be diagnosed.

Figure 15 shows the Microchip PICKit2 Application connected to the PIC-EL III and ready to read/write the PIC.

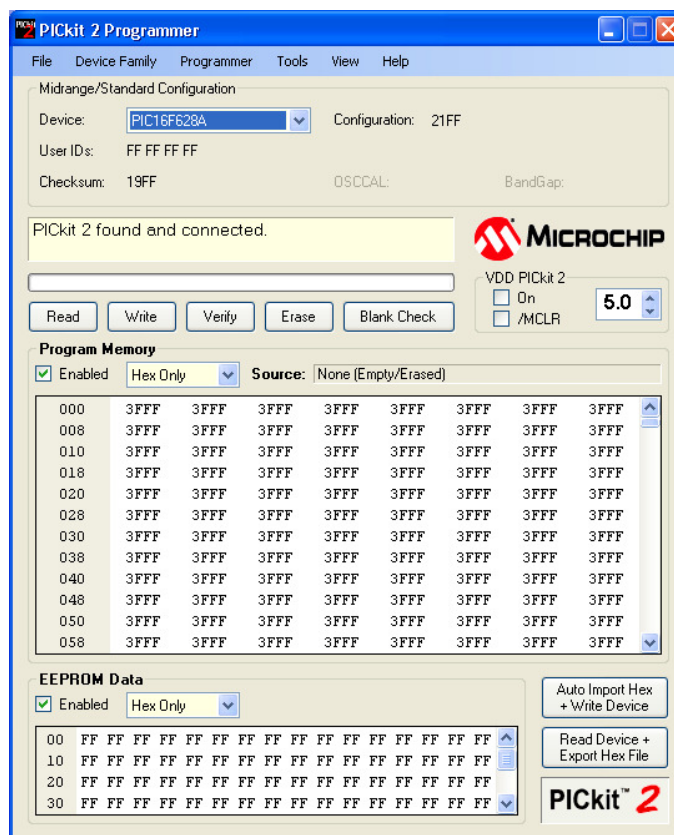


Figure 15 – PicKit2 Programmer Application Connected to PIC-EL III

7) Erase the PIC currently plugged into the PIC-EL board (optional)

You MAY want to "erase", or clear out the software program currently in the PIC's flash memory before you burn a new program into the PIC. Click the **Erase** button and wait for the "Erasing device.... Complete" message.

8) Import the .HEX file into PICKit2 Application

The HEX file is the new software you will be burning into the PIC. For example, you can get the PIC-EL III diagnostic program on the CD or you can download it from my web page or the FILES section of the PIC-EL YAHOO group. The file "USBDiag1-1.HEX" contains the test program in "HEX ASCII" format. This file format is the standard output produced by PIC assembly programs and is a specific data format which is expected by the programming software.

Click on the **File** tab, then click on "Import Hex" and navigate to wherever you have the unzipped the PIC-EL III diagnostic file on your PC. Double-click on the USBDiag1-x.HEX file and the HEX ASCII code will load into the PICKit2 App buffer. You will see that code in the PICKit2 App window.

9) Write the new code to the PIC

Now you are all set to burn the program into the PIC. Click on the **Write** button and wait while status window displays "Writing Device: Program Memory...EE... UserIDs... Config... Done". Then click on the **Verify** button and wait for the display to indicate "Verify Device... Program Memory...EE... UserIDs... Config". Then the status box will turn green and display "Verification Successful".

If it says "Programming failure", you obviously have a problem that you need to diagnose. See the PICKit2 User Guide for details. If this is the first time you have tried to program a PIC in the PIC-EL, there are several diagnostics built into PICKit2 App that may be useful. For example, click on the **Tools** tab and then click on "Check Communications". You should see a status message appear which says "PICKit 2 found and connected". If it does not appear, you need to check the programmer components and solder connections.

Assuming you get the "PICKit 2 found and connected" message but get error messages when trying to Read or Write the target PIC in the PIC-EL, you can use some of the PICKit2 App diagnostic capabilities. Click on the **Tools** tab and then select "Troubleshoot". You can click on Verify VDD and see that the VDD voltage is close to 5.0v. Then, on the next screen, you can check the VPP voltage by clicking on the test button. It should be close to 12v. You can check the MCLR voltage by clicking on the /MCLR ON button and checking the voltage on pin 4 of the PIC. It should be approximately near zero. The /MCLR OFF test is not important. Clicking on /MCLR OFF button will yield a non-zero voltage on Pin 4 but it will not be +5v because the PIC-EL doesn't pull it up to 5v. That's OK, since Pin 4 will get +5v when the PGM/RUN switch is switched to RUN position. (Try it.) On the next screen you will be able to toggle the clock line or the data line at a speed of 30 kHz. This is very handy for checking the connections to the target PIC. (You will need an oscilloscope to see these pulses at the target PIC.) You can also check to see if the voltages on the clock and data lines go from full +5v when turned ON to zero when turned OFF. If these pulses are not seen or the voltages are not correct on the appropriate PIC pins you need to find out why.

10) Slide the mode switch UP to go into RUN MODE

Now that the programming is complete, you next need to put the PIC-EL board back into **RUN** Mode. Do this by sliding Mode Switch S1 to the RUN position and the PGM LED will turn off once again.

11) RESET the PIC-EL to start up the new program

Although not always necessary, press the **RESET** pushbutton on the PIC-EL board to start up the new program just programmed into the PIC.