

Programming the PIC16F84 Using PICKit2

NOTE: If there are any interconnections between DIP_SW_INPUT_INTER connector X32 and the MCU ports, make sure the DIP switches on S7 are all opened (flipped up) before beginning the programming process.

1. Set the microcontroller unit (MCU) package selection switch (S1) and the operation/programming selection switch (S4).
 - a. For programming and regular operation, set S1, S4, S5, & S5 DIP switches as shown in Figure 1, 2, 3, & 4.

(1) **S1: DIP switches 1-5 OFF and 6-10 ON**

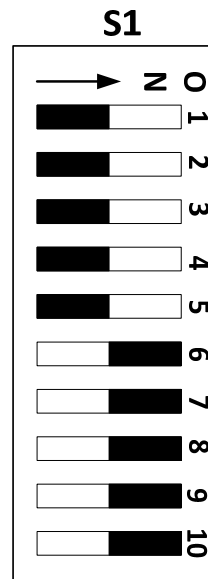


Figure 1. S1 Switch Setting

(2) **S4: SW1 OFF & SW2 ON**

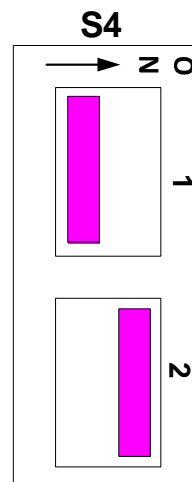


Figure 2. S4 Switch Setting

- (3) **S5: Switches 1-4 ON and 5-8 OFF**

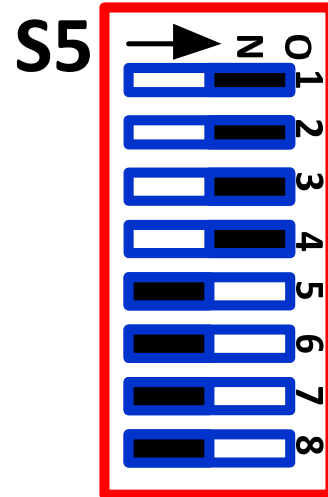


Figure 3. S5 Switch Setting

- (4) **S6: Switches 1-8 OFF**

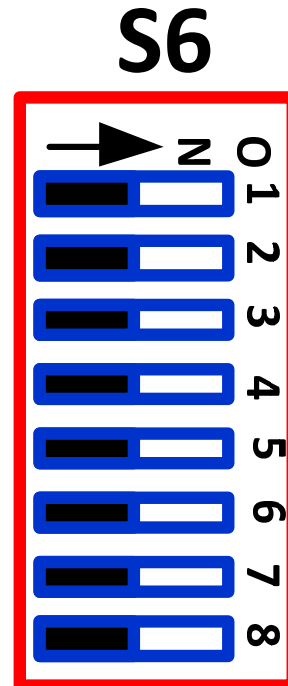


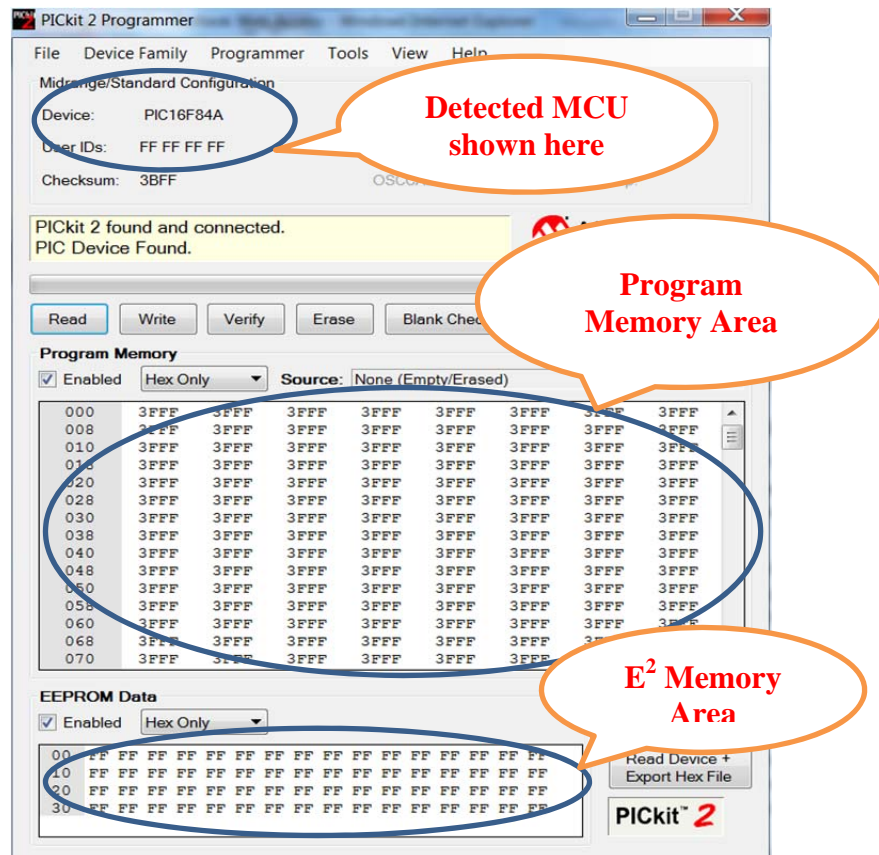
Figure 4. S6 Switch Setting

2. Lift the handle of the Zero Insertion Force (ZIF) socket IC4.
3. Insert the PIC16F84A microcontroller into the ZIF socket. Make sure the notch end of the PIC is facing the handle end of the socket and that the PIC is mounted closest to the handle end of the socket.
4. Lower the handle of the ZIF socket.
5. Place the PIC16F84A into the IC4: ZIF socket.
6. Plug the wall-mounted power supply connector plug into the trainer board Power Jack, J1.
7. Plug the power supply into an outlet.
8. Connect a USB A-B cable between USB_CONN X1 and the computer.

9. Start the PICKit2 application by double clicking the icon at:



10. If everything goes well, you should see that the PICKit2 detected the MCU that was placed in the ZIF socket.

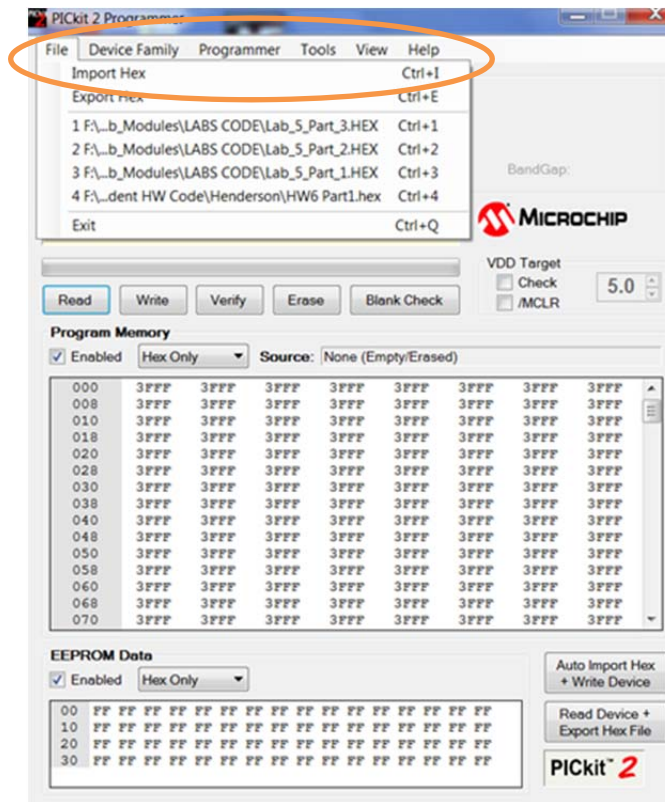


11. If the PICKit 2 cannot detect the MCU, then it will not be able to program the MCU. There may be several reasons for this:
 - a. The S1 and/or S4 switch setting were incorrect.

- i. Solution: change the S1 and S4 switch setting.
- b. The wall-mounted power supply was not providing 12V or more power.
 - i. Solution: replace with a good power supply.
- c. There may be old source code in the MCU that was using the RB6 and RB7 lines.
 - i. Solution: **Press and Hold** the **RESET_18P switch**, S2, and restart the PICkit2 application.

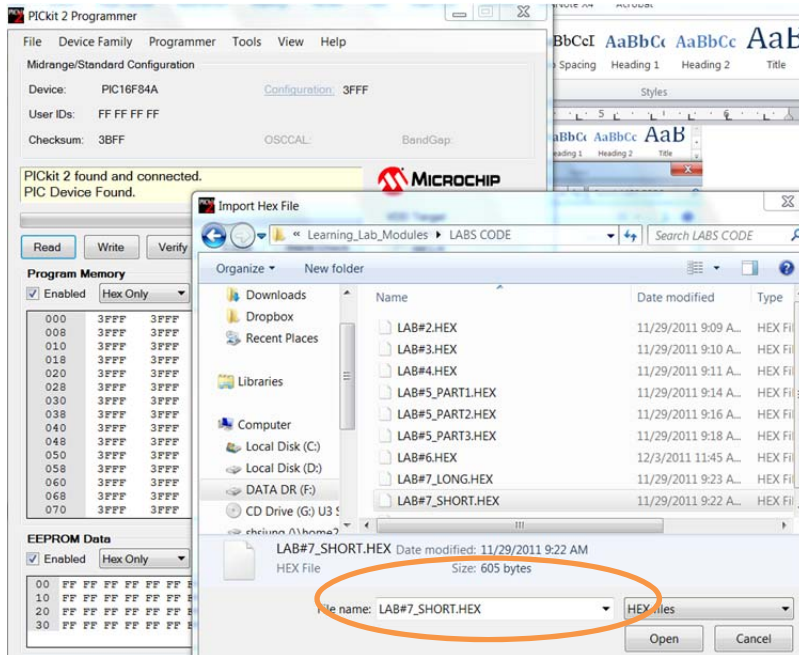
12. If the PICkit2 detected the MCU, then programming is allowed.

13. Under the main menu, click on File, then select Import Hex

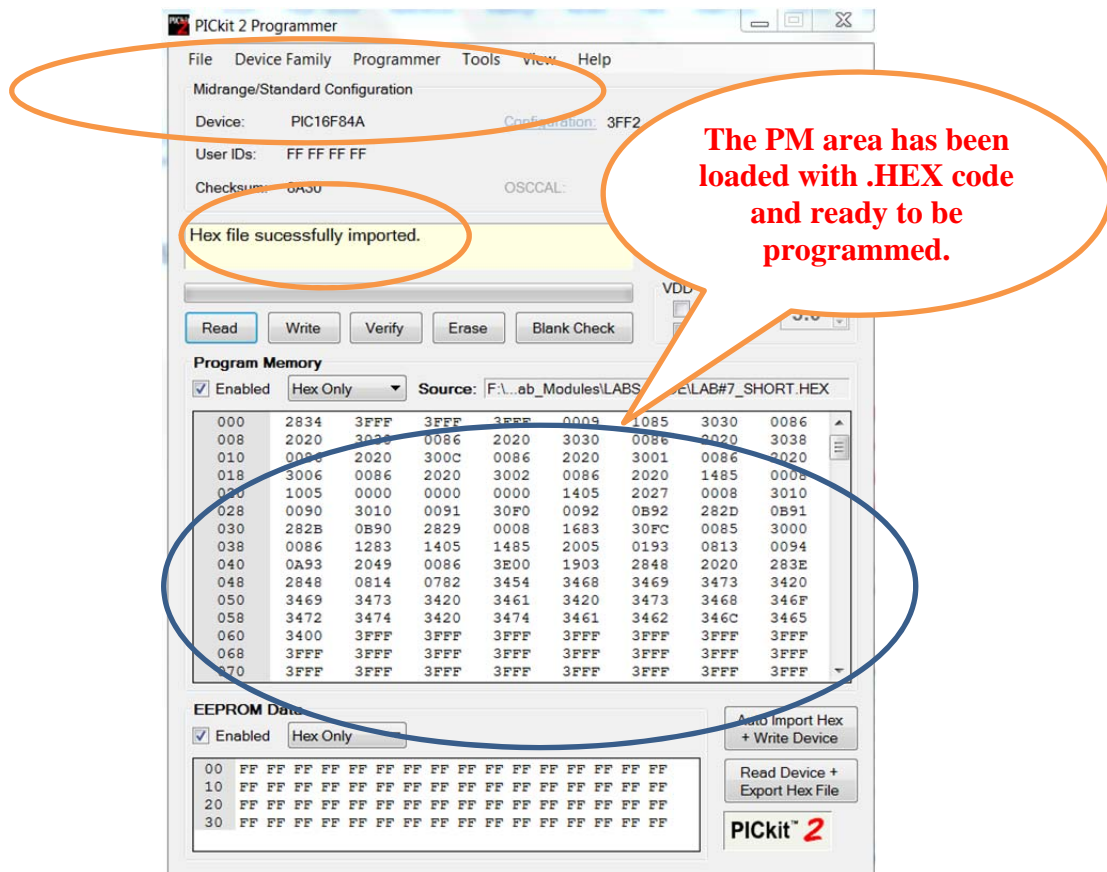


14. This will lead you to next window where you should direct it to the folder that has the compiled/assembled .HEX file.

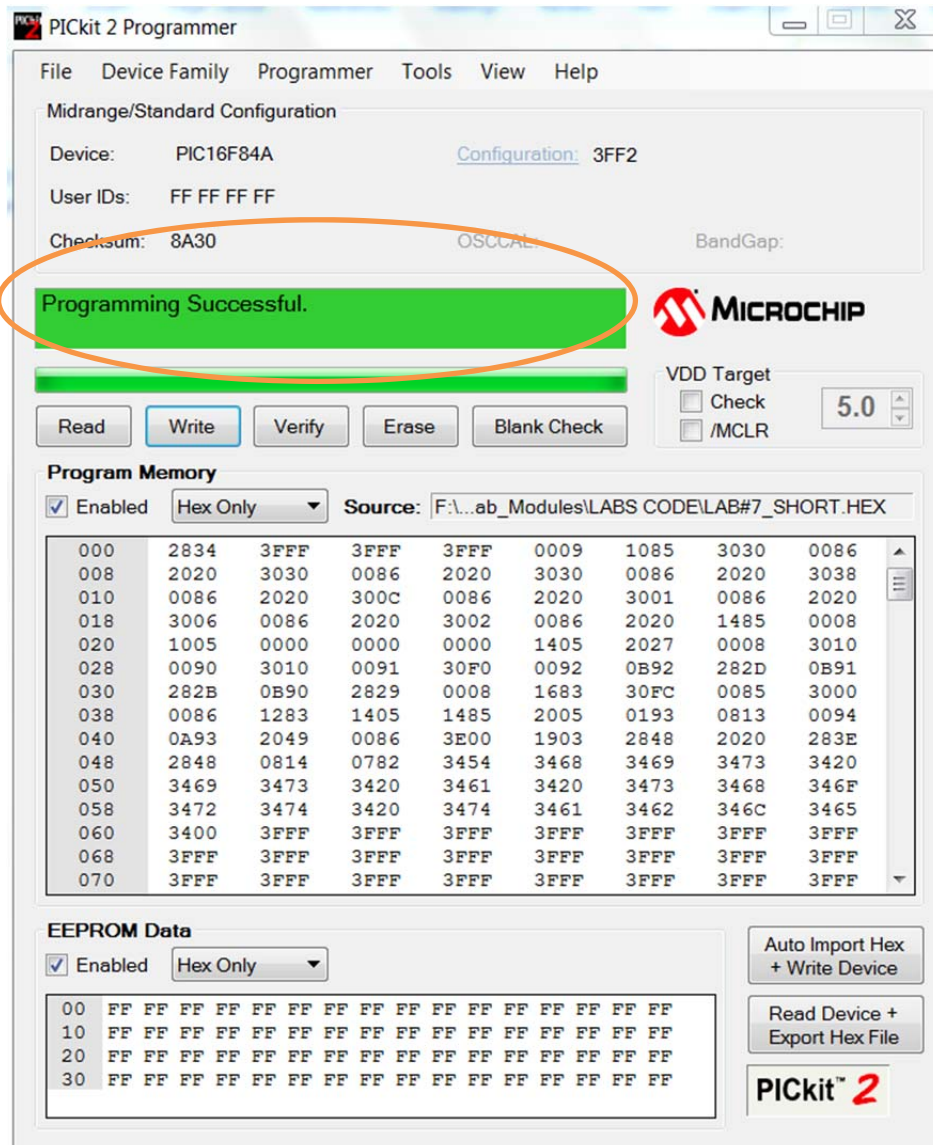
15. Double click or highlight the .HEX file, then click Open.



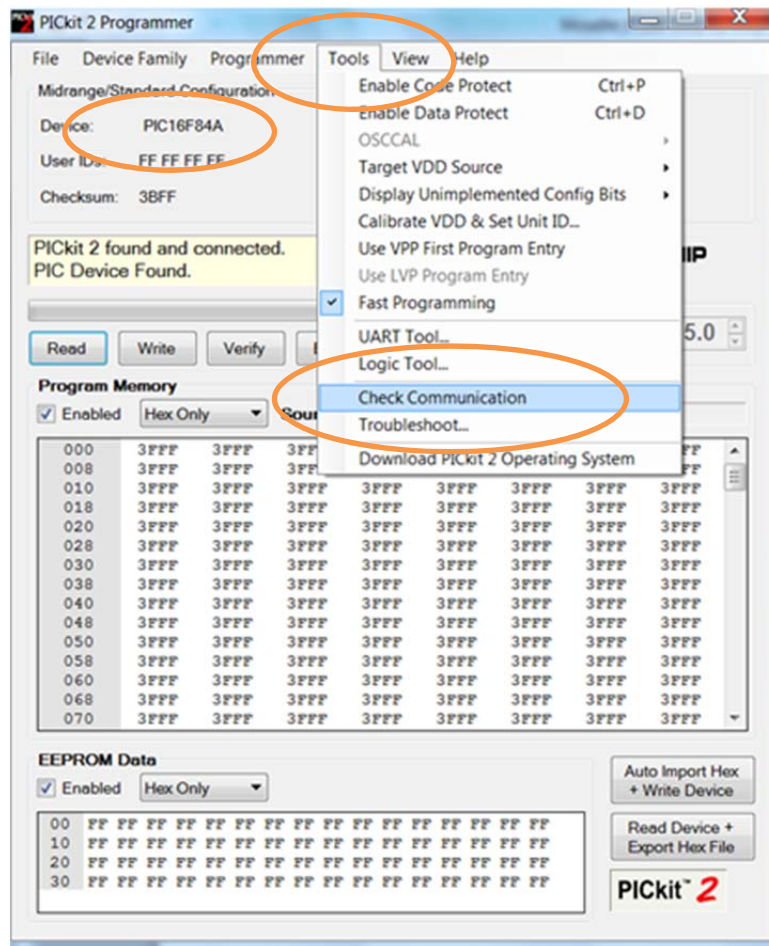
16. The machine code (.HEX) will be displayed in PIKkit2 Program Memory area.



17. Under the middle menu, click on Write. The PICkit2 will program the .HEX code to the target MCU and display “Programming Successful.” to represent that programming has completed and has been verified. While in the programming process the **Yellow** LED1 (LED near IC1 on PIC trainer board) should be flashing to signal computer-to-PIC trainer board communication.



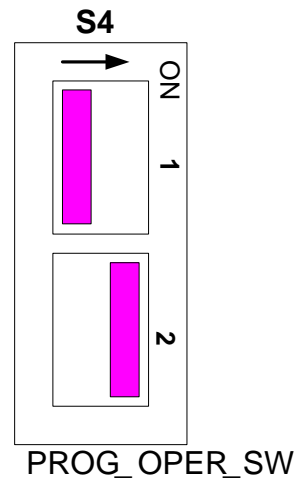
18. If there is any problem during the programming or re-programming process, a re-establishing of the communication between the computer and the PIC trainer board is needed. To do this, select Tools in the main menu and then click on Check Communication. The Yellow LED1 should flash and the MCU detected.
- a. If this does not re-establish communication, the computer may need to be restarted to clear a blocked in USB connection.



Running the Program

1. There is no need to change S4 switches setting in this Rev2 trainer board. This means keep them untouched in programming and operational.

S4: SW1 OFF & SW2 ON



2. If the MCU operations did not perform where was designed, then go back to the MPLAB to check the software design and also make sure the hardware connections match the software design, then repeat the compilation and programming process again.

Note: If there is any problem/issue with the programming or the PIC trainer board, please contact Dr. Steve Hsiung (shsiung@odu.edu)(757-683-4606) or Mr. Richard Seriani (rseriani@tcc.edu)(757-410-7889) for assistance.