

LAB # 5

INTERFACING A SEVEN-SEGMENT DISPLAY TO THE PIC18F4321 USING PIC18F ASSEMBLY AND PROGRAMMED I/O

1. Title: Design and implement hardware and software (PIC18F assembly-program) for inputting a 4-bit number entered via DIP Switches and display the result (0-9) on a Seven-Segment Display.

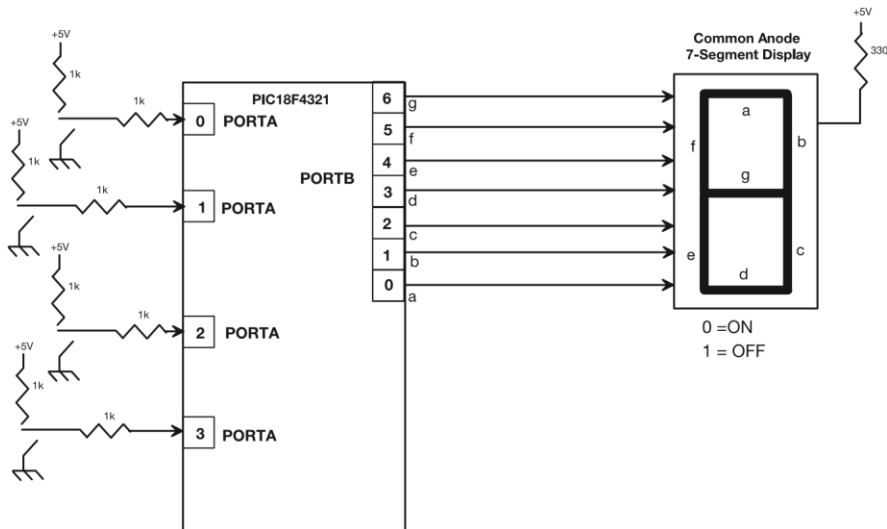
2. Objective:

The purpose of this lab is to build hardware and write a PIC18F assembly language program for displaying aBCD number (0-9) on a common cathode seven-segment display based on four DIP switch inputs.

3. Prelab:

The PIC18F4321 microcontroller is required to input a BCD number (0-9) via four switches connected to bits 0 through 3 of PORTA, and then output the BCD digit to a common-anode seven segment display connected to bits 0 through 6 of PORTB. Write a PIC18F at address 0x70 to accomplish this by storing seven-segment codes in data memory starting at address 0x100.

The figure for the lab is provided below:



4. Equipment, Software, and Components required:

- Microchip's MPLAB C18 Compiler /Debugger
- Parts List
- PICKit3 and PIC18F4321 chip from Microchip
- DIP Switches, Seven-segment Display, and a push button
- Breadboard
- Resistors
- Power Supply

5. Description (corresponding topics covered in the textbook):

Section 8.2.4 (Pages 215-216), Problem 8.12 (Page 229), Appendix F, Appendix H)

6. Prerequisites:

Example 8.3 (Pages 218-220)

7. Procedure:

-Assemble the PIC18F assembly language program using the MPLAB.

-Download the assembled program into the PIC18F4321 on the breadboard from your Personal Computer or Laptop using the PICKit3™ and MPLAB following the steps provided in Appendix H of the book.

-Use the default clock of the PIC18F4321 and connect the appropriate RESET circuit to the PIC18F4321 \overline{MCLR} pin.

-Connect the DIP switches to port A and the seven-segment display to port B , and demonstrate the lab as a PIC18F4321-based stand-alone system.

8. Deliverables:

i) Postlab

Write a C language program to write the program for the prelab except that the program will input a number from 0 to 15 at PORTA, and output to the single seven-segment display using standard symbols for 10 through 15.

ii) Lab report

- Submit a final Lab report (Staple Signed prelab, postlab, and the schematic (if any) using Word, p-spice, Wordpro or other software tools, at the end of the quarter or semester).

9. Concluding remarks:

- Complete each prelab before coming to the lab. Please get it signed.