

Lab 7 – Instructions

Synchronous Serial Port, LED Display, Shift Registers, Keypad Scanning, Finite Arithmetic, Watchdog Timer

This lab familiarizes the student with the use of the synchronous serial port (SSP) of the Microchip PIC microcontroller in SPI mode, shift registers, alphanumeric LED displays, keypad scanning, integer arithmetic, and the watchdog timer.

1. Connect the 74164 shift register and the LED display to your PIC as shown in the Lab 7 slides. You will need three 10k ohm resistors.

Create a new project using lab07_SPI.asm. When you run the program, the PIC will transmit data to the shift register and then to the LED display using the SPI serial communication mode. You should see the eight LED segments turning on and off, one segment at a time, once per second, in the order A-B-C-D-E-F-G-DP. This will confirm that your wiring is correct for the homework questions.

2. Use the same circuit as above to connect a standard 12-button keypad to the PIC using PORTD and the schematic in the Lab 7 slides. Create a new project using lab07_keypad.asm. When you run the program and press the '1' key on the keypad, the 'A' segment on the LED should turn on and remain on until you press another key. When you press the 1, 2, 3, 4, 5, 6, 7, 8 keys on the keypad in sequence, you should see the LED segments turn on in the order A-B-C-D-E-F-G-DP. When you press one of the other keys, the LED segments should all turn off. This will confirm that your wiring is correct for the homework questions.
3. Check the homework questions for instructions for the graded portion of the lab.