

Laboratory 6: Delay Loops and Subroutines

Problem 9:

We want to realize a delay loop with a delay of $N \cdot 100$ ms in the form of a subroutine. Assume that the oscillator frequency is 4 Mhz.

- a. Write and compile the blinking LED application from the lecture in MPLAB. Implement the delay loop for a delay of $N \cdot 100$ ms as a subroutine.
- b. Simulate your program in MPLAB. What is the maximum number of entries in the stack? Which entries do you find in the stack?
- c. Setup the circuit for the blinking LED experiment in the ISIS environment.
- d. Test your program in ISIS for different values of $N = 1, 5, 10$.
- e. Now change the oscillator frequency to 20 Mhz and test your program for $N = 10$.

Problem 10:

We want to realize the running LED application on the test card.

- a. Write and compile the running LED application from the lecture in MPLAB. Use the delay loop for a delay of $N \cdot 100$ ms from Problem 9 **a** as a subroutine.
- b. Run the moving LED application on the test card for different values of $N = 1, 5, 10$
 - Setup the test card. Make sure that jumper JMP3 is in the LED position and the power cable is NOT plugged in.
 - Load your program to a PIC16F84A using the program "usburn". Place the PIC in the correct orientation!
 - Place the PIC on the test card. Place the PIC in the correct orientation!
 - Plug in the power cable.
- c. Modify your program such that the LEDs are turned on in the reverse direction. Run your modified program on the test card.