

EET165 Lab #9

Name: _____

Name: _____

Name: _____

Date performed: _____

Title: Math Calculations

Purpose: To teach the students how to perform calculations in a PLC program.

Prelab: There is no prelab for this lab.

Procedure: Using the equipment and components provided in the lab, complete the lab as described.

Step 1: Switch 8 of the test panel will be used to select if you want to convert from **Fahrenheit to Celsius** or if you want to convert from **Celsius to Fahrenheit**.

Step 2: When the switch is OFF, call a subroutine that will convert from **Fahrenheit to Celsius**.

- a. The subroutine will get the value on the thumb wheel and convert the BCD value into a base 10 value. To get all of the values from the thumb wheel you will need to access I:3.0 to get all 16 values at the same time.
- b. The value will need to be stored in either a float or an integer.
- c. Convert the Fahrenheit value into Celsius using the equation:

$$\text{Celsius} = (\text{Fahrenheit} * 1.8) + 32$$

- d. You can save the Celsius value in either a float or an integer.
- e. The value will then be converted into BCD and the value displayed on the 7-segmented display. The address O:4.0 can write to all 16 bits that feed the 4 BCD display values.

Step 3: When the switch is ON, call a subroutine that will convert from **Celsius to Fahrenheit**.

- a. The subroutine will get the value on the thumb wheel and convert the BCD value into a base 10 value. To get all of the values from the thumb wheel you will need to access I:3.0 to get all 16 values at the same time.
- b. The value will need to be stored in either a float or an integer.
- c. Convert the Celsius value into Fahrenheit using the equation:

$$\text{Fahrenheit} = (\text{Celsius} - 32) * (.556)$$

- d. You can save the Celsius value in either a float or an integer.
- e. The value will then be converted into BCD and the value displayed on the 7-segmented display. The address O:4.0 can write to all 16 bits that feed the 4 BCD display values.

Step 4: When the program is working, call the instructor over and demonstrate the working PLC program. When the program is working correctly, the instructor will sign the lab below.

Signature: _____

Step 5: Print out the PLC program and attach it to the back of this lab.