

EET165 Lab #3

Name: _____

Name: _____

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Date performed: _____

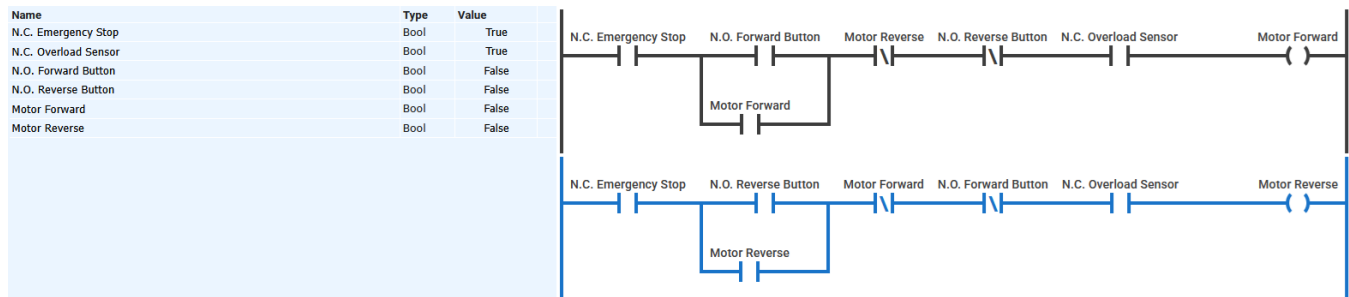
Title: Seal circuits and Latching (Lock-out) circuits

Purpose: To introduce the students to seal in circuits and demonstrate how to prevent two opposite commands from happening at the same time.

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: The following PLC ladder logic program has three buttons and an input sensor. The first button is a normally open button that turns on a motor in the forward direction. The second button is a normally open button that turns on the same motor in the reverse direction. The third button is an Emergency Stop that is normally closed. This button will also be used to turn off the motor. The motor has a normally closed overload sensor.



Step 2: This circuit has two **seal-in circuits**. When the Forward Button is pressed, the motor starts running and creates a logical path around the button so it keeps running when the button is no longer pressed. The same is true with the reverse button.

Step 3: To prevent both motors from running at the same time there are also two **latching circuits**. When the forward motor is running it will disable the reverse direction of the motor. When the reverse motor is running it will disable the forward direction of the motor.

Step 4: Choose four inputs and record them in the chart below. Also choose two outputs and record them in the chart below.

Field Device	Input or Output File Location
Normally open forward button	
Normally open reverse button	
Normally closed emergency stop	
Normally closed overload sensor	
Forward motor movement	
Reverse motor movement	

Step 5: Using the input and outputs you chose above, program PLC shown on the previous page.

Step 6: Test your circuit. Verify it performs each of the following tasks. Put a check in the check box when you verify the task.

✓	Verify this Test
	When the E-Stop is open, the both motor lamps are off. Turn the forward and then the reverse buttons on and off. Verify both motor lamps remain off.
	Turn on the E-Stop. Turn the forward button on and then off (like it was a momentary switch). Verify that forward motor lamp lights and stays lit.
	Turn the reverse button on and then off (like it was a momentary switch). Verify that forward motor lamp turns off and the reverse lamp turns on.
	Turn the forward button on and then off (like it was a momentary switch). Verify that reverse lamp turns off and the forward motor lamp lights.
	Turn off the E-Stop. Verify the motor lamp turns off.

Step 7: When your program is working correctly, call the instructor over and demonstrate it. When it is working, the instructor will sign below.

Signature: _____

Step 8: Print out your PLC program, attach it to the lab, and turn it in.