EET165 Lab #4

Name: _____

Name: _____

Name: _____

Date performed: _____

Title: Latching and Unlatching

Purpose: To introduce the students to using the Latch and Unlatch symbols.

Prelab: There is no prelab for this lab.

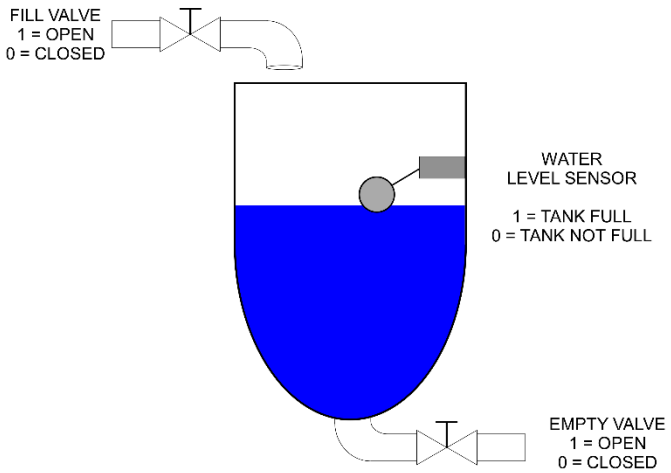
Procedure: Using the equipment and components provided in the lab, complete the lab as described.

Step 1: There is a tank that holds water. The tank has two valves and a sensor.

a. The tank has a level sensor that will send out a 1 if the tank is full and a 0 if it is not full.

b. There is a fill valve that will open up (and let water flow) if it is sent a 1. It will close if it is sent a 0.

c. There is a drain valve that will open up (and empty the tank) if it is sent a 1. It will close if it is sent a 0.

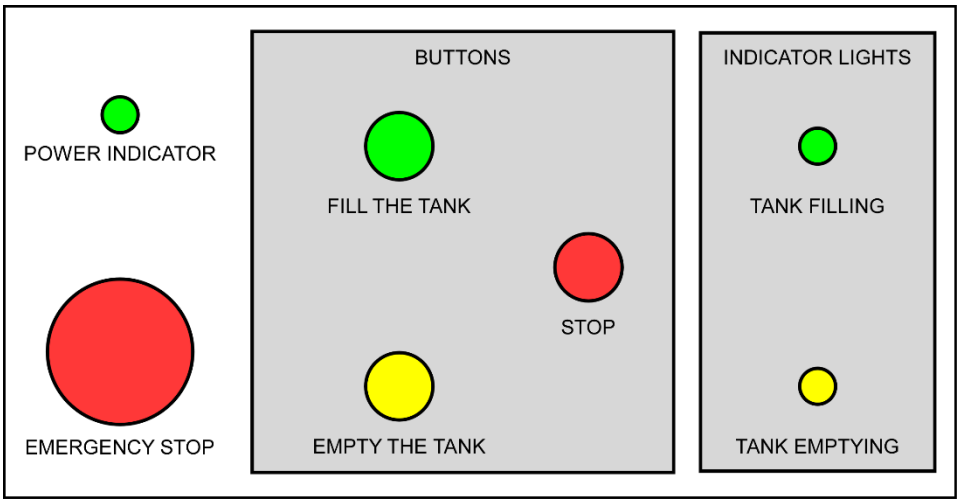


Step 2: Connected to the tank is a control panel. The panel has three buttons and three indicator lamps.

a. There is a power indicator light. It is always on, as long as the system is on. There is also an E-Stop that will cut all power to the system.

b. There are three buttons. One to fill the tank, one to stop button to turn off the valves and indicator lights, and one to empty the tank.

c. There is an indicator light that will light when the tank is filling up. There is also an indicator light that will be lit with the tank is emptying.



Step 3: First list the input addresses and output addresses you are going to use to represent the items in this system.

INPUT	ADDRESS
Water Level Sensor	
“FILL THE TANK” N.O. momentary contact button	
“STOP” N.O. momentary contact button	
“EMPTY THE TANK” N.O. momentary contact button	
“EMERGENCY STOP” N.C. button	

OUTPUT	ADDRESS
Fill Valve	
Empty Valve	
POWER INDICATOR Light	
TANK FILLING Indicator Light	
TANK EMPTYING Light	

Step 4: Write a PLC program that will do all of the following tasks:

a. The POWER INDICATOR light should turn on and stay on.

b. When the EMERGENCY STOP is pressed, the power indicator light will go out, all valves will turn off, all indicator lights will turn off, and the buttons will no longer function.

c. When the "FILL THE TANK" button is pressed:

   i. Open the "FILL VALVE" and turn on the "TANK FILLING" lamp. Latch both outputs so the valve says open and the light stays on when the button is no longer pressed.

   ii. Close the "EMPTY VALVE" and turn off the "TANK EMPTYING" lamp.

d. When the "WATER LEVEL SENSOR" goes high:

   i. Close the "FILL VALVE" and turn off the "TANK FILLING" lamp.

   ii. If the "WATER LEVEL SENSOR" is high, the "FILL THE TANK" button should be disabled.

e. When the "STOP" button is pressed:

   i. Close the "FILL VALVE" and turn off the "TANK FILLING" lamp.

   ii. Close the "EMPTY VALVE" and turn off the "TANK EMPTYING" lamp.

f. When the "EMPTY THE TANK" button is pressed it will:

   i. Close the "FILL VALVE" and turn off the "TANK FILLING" lamp.

   ii. Open the "EMPTY VALVE" and turn on the "TANK EMPTYING" lamp. Latch both outputs so the valve says open and the light stays on when the button is no longer pressed.

g. The PLC should not allow the system to FILL and EMPTY at the same time.

Step 5: Add a comment at the top of your program that includes the names of the people in your lab group, the date, and a brief description of the lab.

Step 6: Add a title over each button rung with the name of the button.

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

Signature: _____

Step 8: Print out the PLC program and attach it the back of this lab.