University of Jordan
School of Engineering
Department of Mechatronics Engineering
Automation and Process Control Lab (0908462)
Silo Simulation

Objective

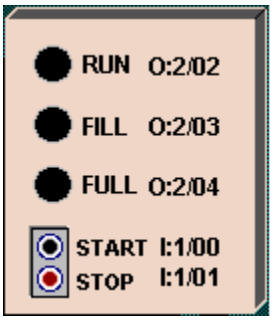
To be familiar with basic relay logic.

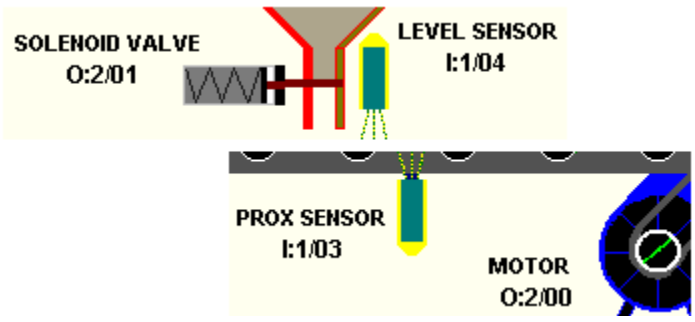
Pre-lab Preparation:

1- Read Chapter 3

Procedure:

From the Simulations Menu at the top of the screen, Select the Silo Simulation





Exercise #1 -- Continuous Operation

Completely design and de-bug a ladder control circuit which will automatically position and fill the boxes which are continuously sequenced along the conveyor. Ensure that the following details are also met:

- The sequence can be stopped and re-started at any time using the panel mounted Stop and Start switches.
- The RUN light will remain energized as long as the system is operating automatically.
- The RUN light, Conveyor Motor and Solenoid will de-energize whenever the system is halted via the STOP switch.
- The FILL light will be energized while the box is filling.
- The FULL light will energize when the box is full and will remain that way until the box has moved clear of the prox-sensor.

Exercise #2 -- Container Filling with Manual Restart

Alter or re-write your program so that it incorporates the following changes:

- Stop the conveyor when the right edge of the box is first sensed by the prox-sensor.
- With the box in position and the conveyor stopped, open the solenoid valve and allow the box to fill. Filling should stop when the Level sensor goes true.
- The FILL light will be energized while the box is filling.
- The FULL light will energize when the box is full and will remain that way until the box has moved clear of the prox-sensor.
- Once the box is full, momentarily pressing the Start Switch will move the box off the conveyor and bring a new box into position. Forcing the operator to hold the Start button down until the box clears the prox-sensor is not acceptable.

Exercise #3 -- Selectable Mode of Operation

Alter or re-write your program so that the panel mounted Selector switch can be utilized to select one of 3 different modes of operation. The 3 modes shall operate as follows:

- When the selector switch is in position "A", the system shall operate in the "Continuous" mode of operation. This is the mode of operation which was used in Exercise #1.
- When the selector switch is in position "B", the system shall operate in the "Manual Restart" mode of operation. This is the mode of operation which was used in Exercise #2.
- When the selector switch is in position "C", the system shall operate in the "Fill Bypass" mode of operation. In this mode, the boxes will simply move down the conveyor continuously and bypass the fill operation. As in the other modes, the Start and Stop pushbuttons will control the conveyor motion and the Run Lamp will operate as expected.