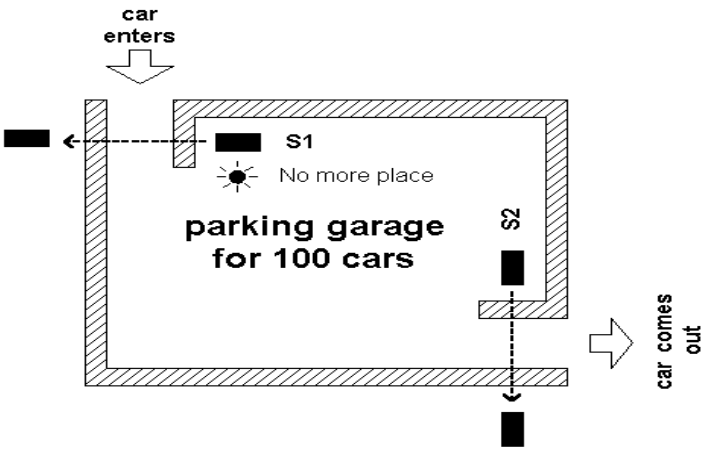
Practical 1. (Automation of parking garage)

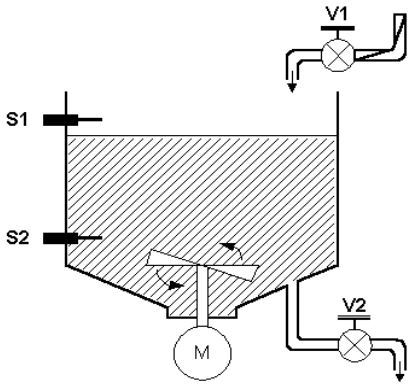
We are dealing with a simple system that can control 100 car at the maximum. Each time a car enters, PLC automatically adds it to a total sum of other cars found in the garage. Each car that comes out will automatically be taken off. When 100 cars park, a signal will turn on signalizing that a garage is full and notifying other drivers not to enter because there is no space available.

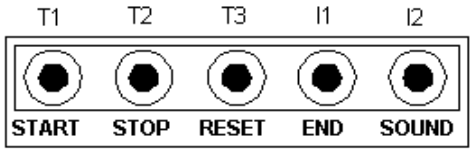


Practical 2 (Operating a charge and discharge process)

Charge and discharge of a reservoir is a common process in industry as well as a need for mixing two or more substances. By using automated valves this process can be completely automated. Let's say that fluid used in the example is water, and that a reservoir has to be filled up and emptied four times.

When you push T1 on the operating panel, valve V1 opens and a reservoir starts filling up with water. At the same time, motor M of the mixer starts working. When the reservoir fills up, water level goes up and reaches the level set by a sensor S1. V1 valve closes and motor of the mixer stops. Valve V2 opens then, and a reservoir starts emptying. When water level falls below the level set by a sensor S2, valve V2 closes. By repeating the same cycle four times, lamp that indicates end of a cycle is activated. Pressing T1 key will start a new cycle.

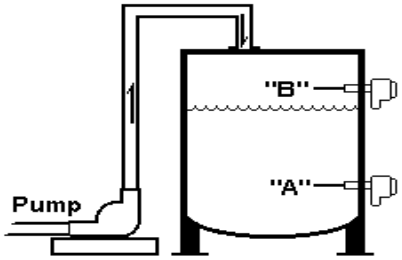




OPERATING PANEL

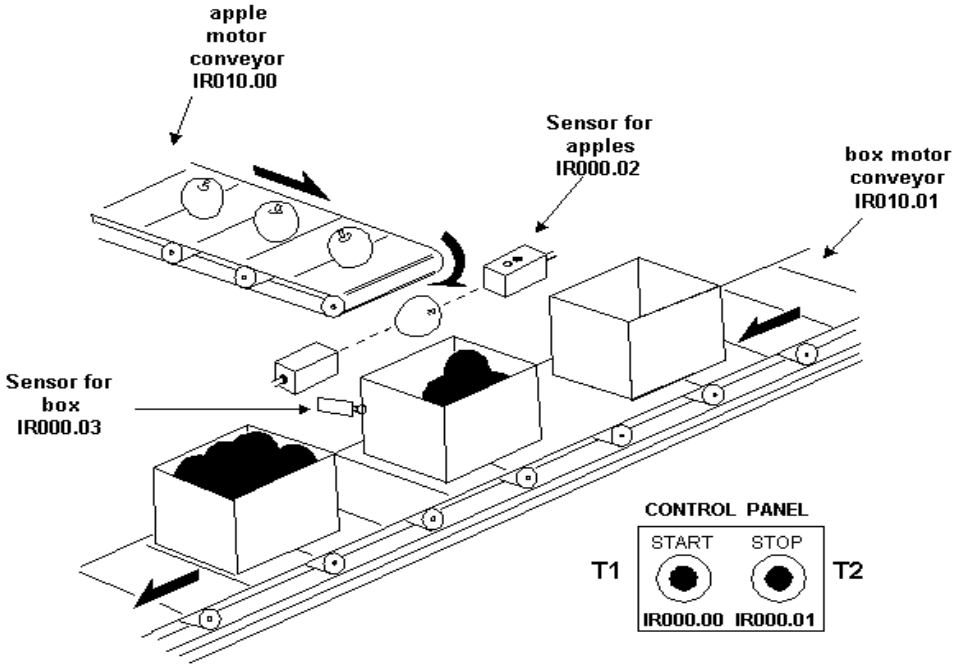
Practical 3 (pump control system)

Design a pump control system for a pump. Press start p/b pump comes on. When water level reaches to high level switch in the tank, pump is switched off. Now water is manually discharged to a feeder unit manually. When water level reaches to low level switch, motor again comes on.



Practical 4 (pump control system)

Product packaging is one of the most frequent cases for automation in industry. It can be encountered with small machines (ex. packaging grain like food products) and large systems such as machines for packaging medications. Small inputs and outputs provides for the use PLC controller which represents simple and economical solution.

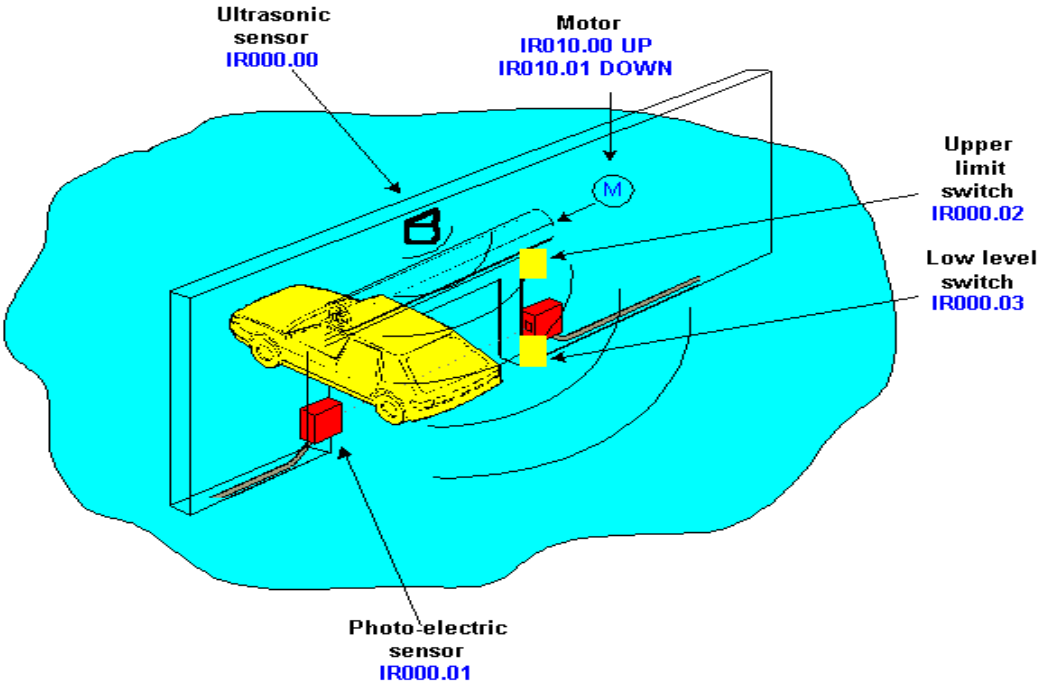


By pushing START key motor of an conveyor for boxes is activated. The conveyor takes a box up to the limit switch, and a motor stops. Condition for starting a conveyor with apples is actually a limit switch for a box. When a box is detected, a conveyor with apples starts moving. Presence of the box allows counter to count 10 apples through a sensor used for apples and to generate counter flag which is a condition for new activation of a conveyor with boxes . When the conveyor with boxes has been activated, limit switch resets counter which is again ready to count 10 apples. Operations repeat until STOP key is pressed.

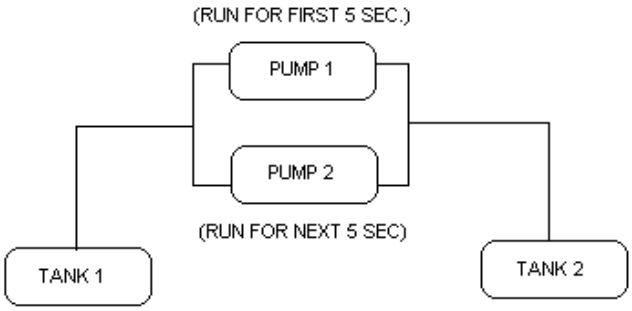
Practical 5 (Automation of storage door)

Storage door or any door for that matter can be automated, so that man does not have to be directly involved in their being opened or closed. By applying one three-phased motor where you can change direction of its movement, doors can be lifted up and lowered back down. Ultrasonic sensor is used in recognizing presence of a vehicle by the doors, and photo-electric sensor is used to register a passing vehicle. When a vehicle approaches, the doors move up, and when a vehicle passes through the door (a ray of light is interrupted on photo-electric sensor) they lower down.

Doors are lifted until they come to the upper limit switch which is represented in a condition as normally closed, doors are lowered until they come to the bottom limit switch which is represented in a condition as normally closed. With oncoming new vehicle, cycle is repeated.



Practical 6 (Pump Sequence operation)

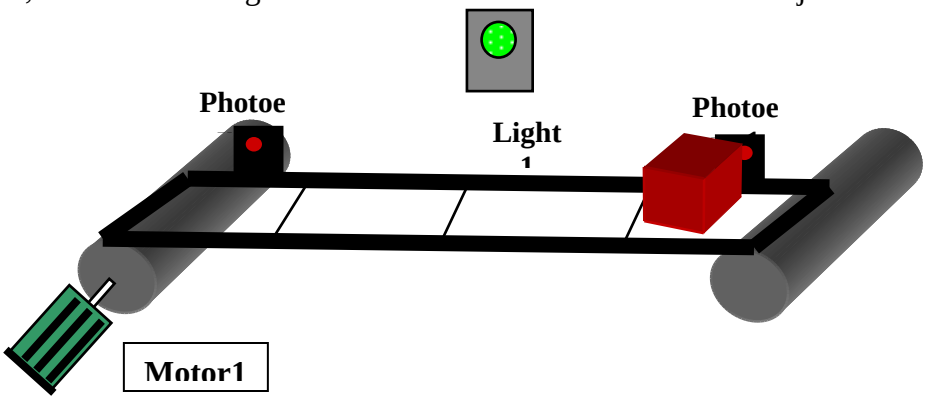


Conditions:

1. Pump 1 & pump 2 should run alternatively each for 5 mins.
2. If one of the pump stops working then other pump should run continuously.

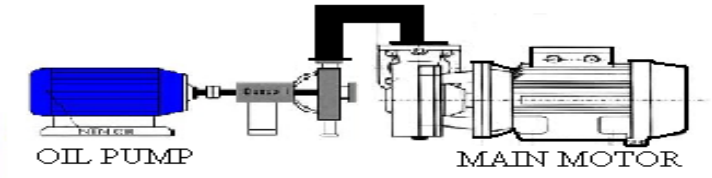
Practical 7 (Automation of storage door)

When a box is placed on the conveyor in front of Photo sensor 1, Light 1 and Motor 1 will turn on, causing the box to move down the conveyor to the left. When the box passes Photo sensor 2, Motor 1 & Light 1 turn off, stopping the conveyor. If the box does not pass by Photo sensor 2 in 30 seconds, the motor and light are shut off . This is the indication of a jam condition.



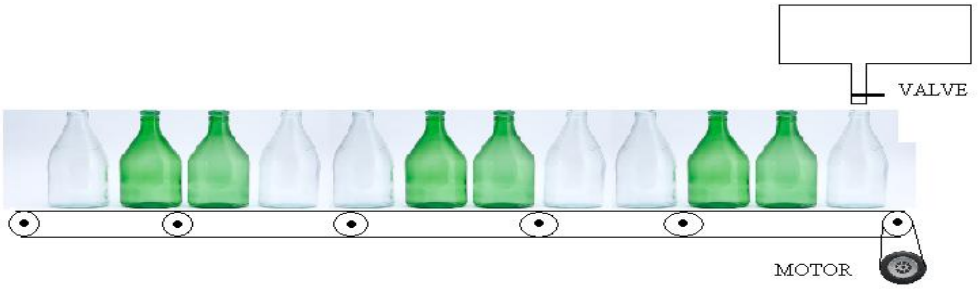
Practical 8 (Oil Pump & Motor)

An oil pump should start up after pressing Start push button and the main motor will start automatically after 15 sec .Pressing Stop push button, main motor will stop immediately and the oil pump will stop automatically after 15 sec.



Practical 9 (filling Application)

A bottle takes 10 seconds to be completely filled. If the filling is interrupted then the filling will resume from the same level of the liquid filled earlier .When the filling of one bottle is completed then a motor should run for 2 seconds for changing the bottle.



Practical 10 (Analog Signal)

Analog input signal 4-20 ma is coming from the field. When input signal is between 8-14ma motor should run otherwise off.