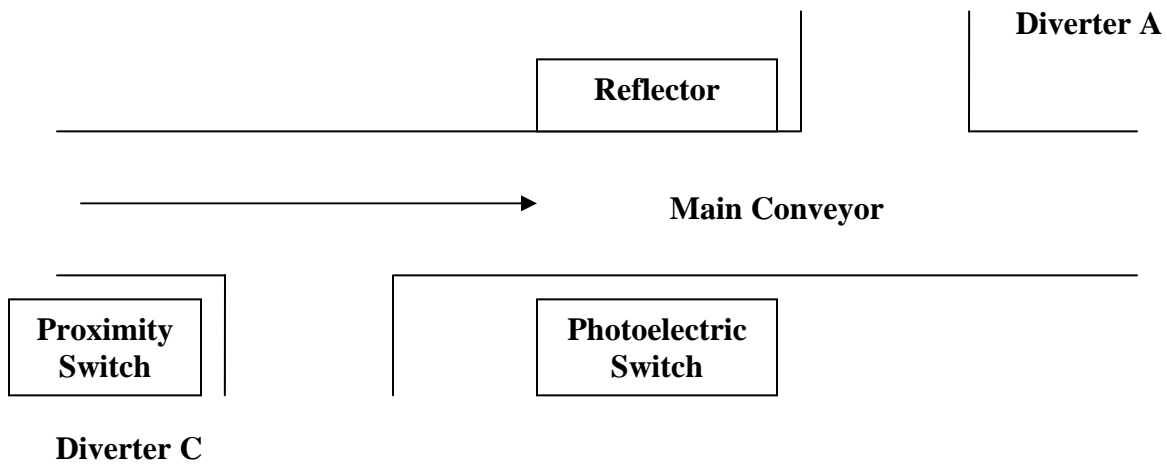


056:132 Introduction to Industrial Robotics

PLC Homework #3

A. The Zoom Company is in the toy business. It produces two types of toy cars: wooden cars and metal cars. A conveyor belt carries the product through the production floor (see diagram). Wood cars are sensed by a photoelectric switch and metal cars are sensed by a proximity switch. Cars are pushed to diverters by means of solenoids. The conveyor belt is activated by a push button. However, in case of an emergency, the whole system is shut down by means of an emergency stop push button. Assume that the wood cars are diverted to Diverter A by means of a Solenoid 1 and that metal cars are diverted to Diverter C by means of Solenoid 3. Draw a ladder diagram for the control of the conveyor system. Be sure to identify and label all inputs and outputs.



B. For the ladder diagram shown below, answer the following questions:

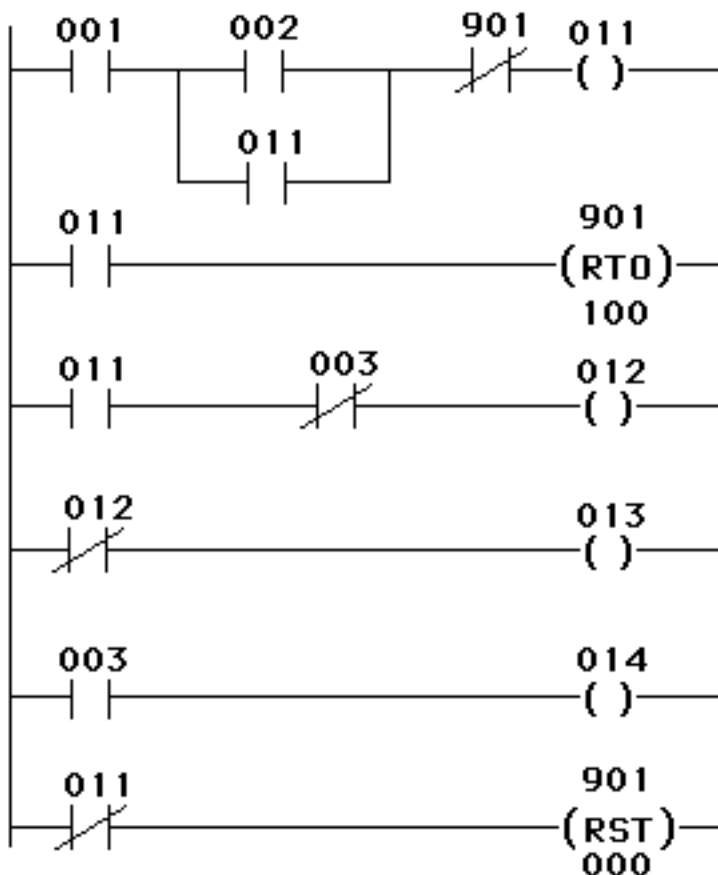
a. List the conditions that are necessary to turn ON the GREEN light.

b. Once turned ON, what holds the GREEN light ON?

c. What conditions are necessary to turn the MOTOR ON?

d. What condition is indicated when the RED light turns on? What happens to the MOTOR when the RED light is ON?

e. Explain what happens to each of the four outputs when the STOP button is pressed while the timer is running.



Inputs:

- 001: Stop
- 002: Start
- 003: Overload switch

Outputs:

- 011: Green light
- 012: Motor
- 013: White light
- 014: Red light

Internals:

- 901: Retentive ON Delay timer