PLC Lab #1
BASIC PLC Programming

Program: Electrician Technician

Course: EL- 180 – Programmable Logic Controls

Objectives: Under the supervision of your instructor, you should be able to do the following:

- Define and describe PLC's and compare them to hardwired systems.
- Explain the difference between momentary and non-retentive latch circuits.
- Explain how an interlock works.
- Describe the various number systems that correspond with the digital operation of PLCs.

Lab Equipment:

- Click PLC
- Computer system

Required Tools:

- N/A

Material:

- N/A

Safety:

- N/A

Resources:

- N/A

Instructors Notes:

- N/A

Required time: 240 minutes.

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility.

Procedures:

Exercise 1 Momentary “Jog” circuit.

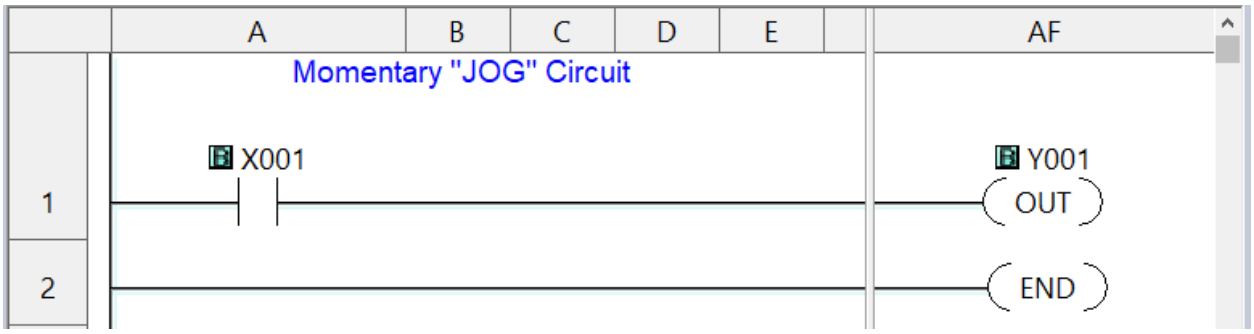
Control Concept Jog

Build this “JOG” circuit logic. Use an N.O. contact to an OUT Instruction.

Write the program so the Green N.O. Push button(X001) turns on the Green Light (Y001).

Ensure the last rung of every program has an END instruction.

Program and test the following:



1. Complete a Truth Table for this circuit.

INPUTS	OUTPUT
A	Y
0	
1	

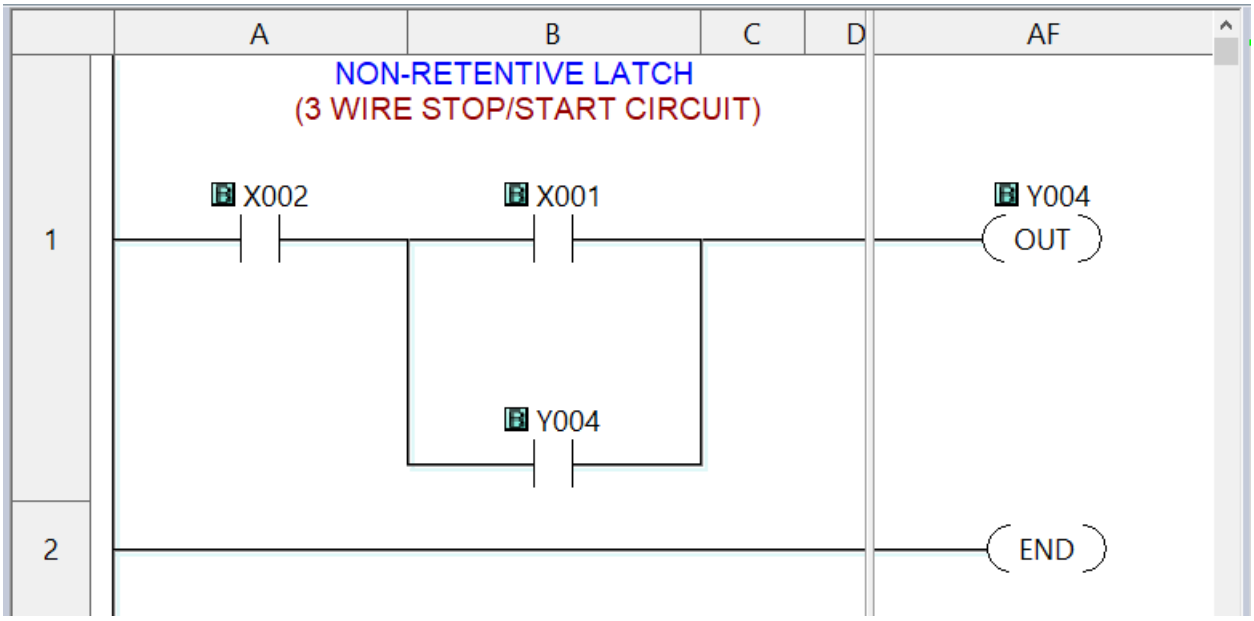
Exercise 2 Build this NON_RETENTIVE LATCH logic circuit.

Control Concept = Non-retentive Latch.

This is the heartbeat of ALL automation. This is the same control concept as the 3 wire stop/start in relay logic motor control.

Ensure the last rung of every program has an END instruction.

Program and test the following:



1. Q: Explain why X002 is a N.O. Contact and not a N.C. contact in this logic circuit.

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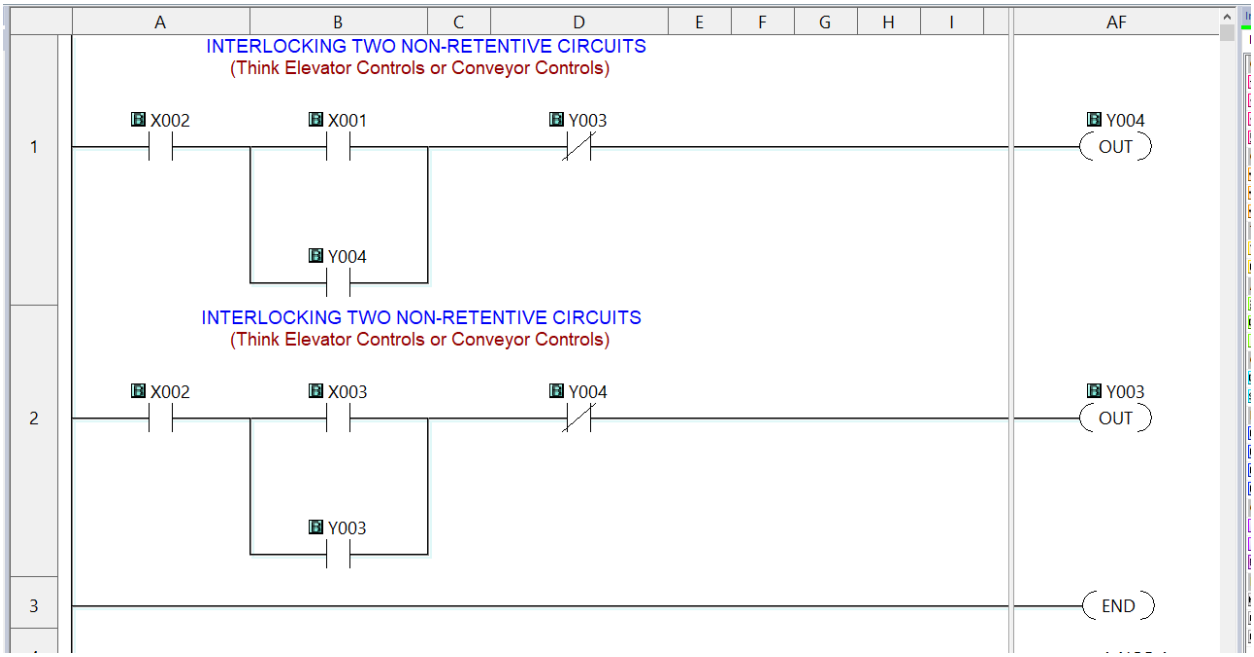
Exercise 3 Add another NON_RETENTIVE LATCH and INTERLOCK.

Control Concept(s) = Interlocking and Non-retentive Latch.

Interlocking is frequently used in motor control. Think elevators!

Ensure the last rung of every program has an END instruction.

Program and test the following:



1. Explain how the N.C. contacts interlock the circuit in exercise 3.3. And WHY is this Control Concept so important?

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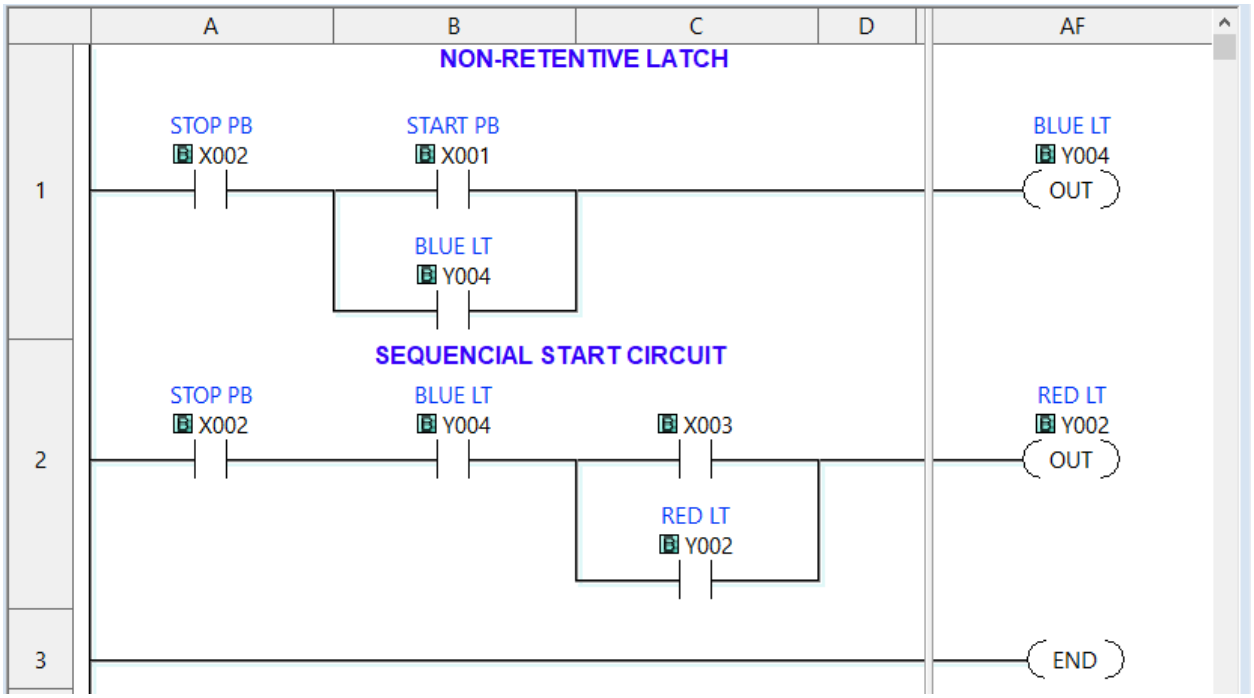
Exercise 4 Build this Non-Retentive Latch using a SEQUENTIAL START logic.

Control Concept = Sequential Start and Non-retentive Latch.

This is a very common and important control scheme**.**

Ensure the last rung of every program has an END instruction.

Program and test the following:



1. Q: In RUNG 2, what makes this a Sequential Start**.** _____

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2. Q: Describe a condition that would require the use of sequential start control concept.

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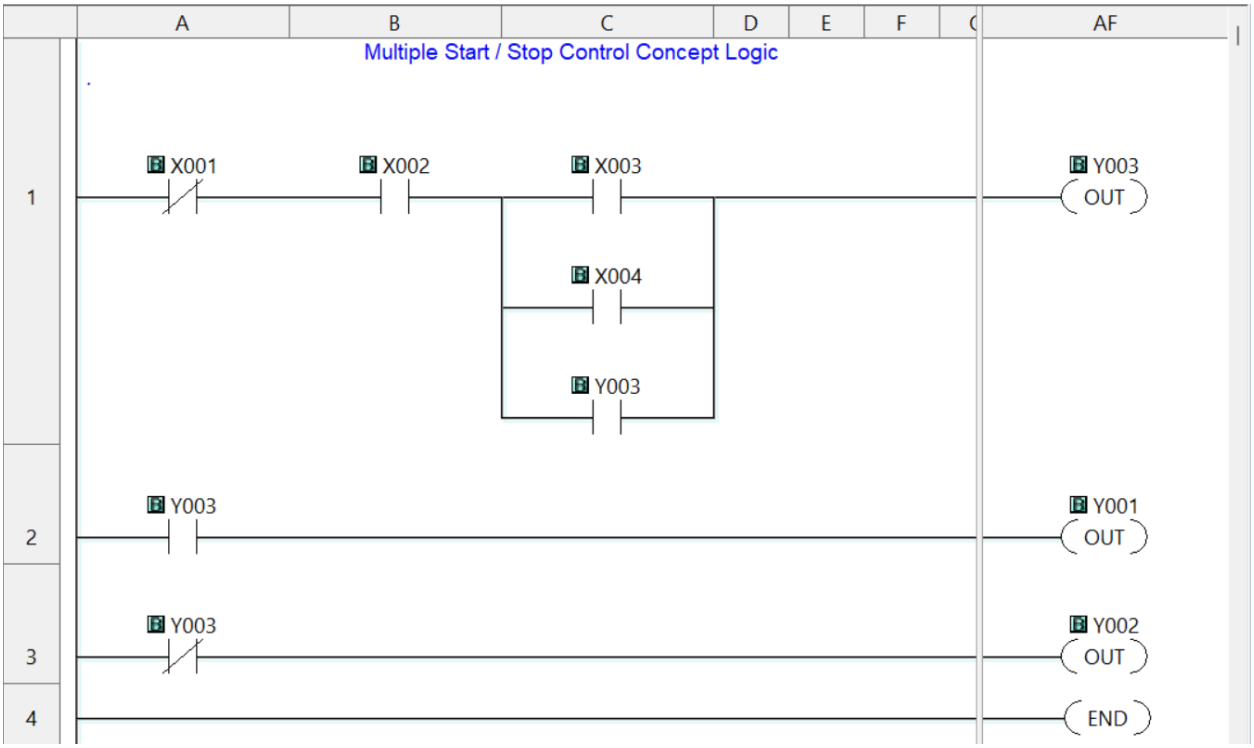
Exercise 5 Multiple Start/Stop Circuit.

Control Concept = Multiple Start/Stop

This is a very commonly used control scheme in process control.

Ensure the last rung of every program has an END instruction.

Program and test the following:



1. Q: Where would this circuit be used?

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