

PLC124 LAB 3.3: WIRING AND TROUBLESHOOTING A MULTIPLE START/STOP CONTROL CIRCUIT

Student Name: _____

Student ID: _____

LAB OUTCOMES:

Upon completion of this lab procedure, the student should be able to:

1. Wire a multiple start/stop circuit with a separate emergency stop.
2. Measure the voltage at various test points in the controls circuit
3. Explain the operation of a multiple start/stop control circuit.
4. Troubleshoot a multiple start/stop control circuit.

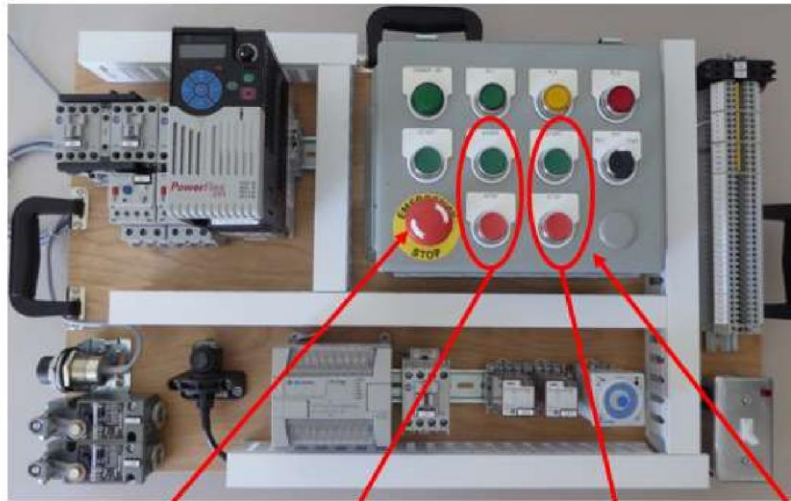
LAB PROCESS:

Set up NSCC 120VAC wiring board. Setup the unit on its base, or lay flat on the work table.

Connect the power cord and turn off the power input switch to make sure the unit is not powered.

Part 1:

1. Make sure power is removed from the wiring board. Identify the IEC motor starter that will be used in this lab as M1. Use one of the contactors from the reversing motor starter as M2. This lab will involve wiring only the control circuit.
2. Use the wire numbers and red MTW wire to construct the following circuit. Apply 120VAC power to the board.

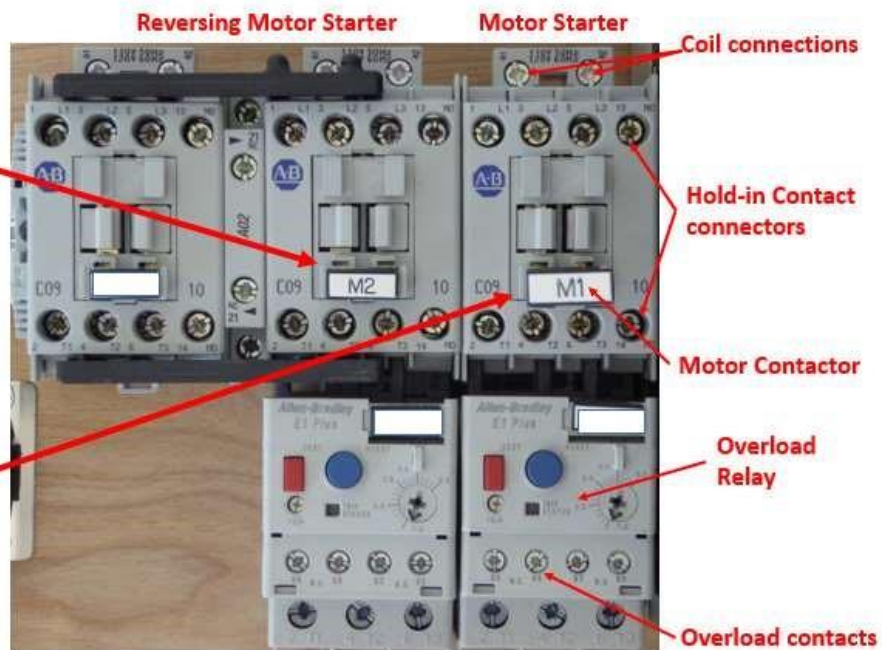


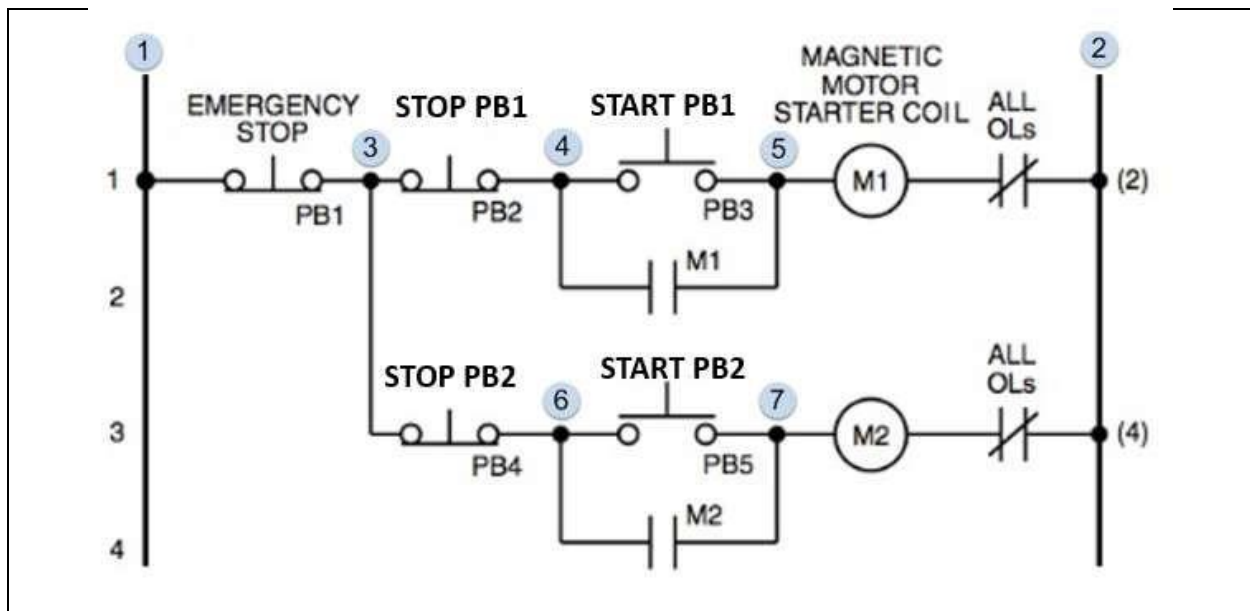
Emergency Stop PB

A multiple start/stop circuit
also requires a main stop
pushbutton, such as an Estop



Use these four
Pushbuttons on the
wiring board to simulate
two pushbutton stations





3. Measure the voltage between electrical nodes 1 & 2 on the terminal strip.

What is the measured value? _____

4. Make sure the E-Stop pushbutton is pulled so it has continuity.
5. With the both motor starters off, what is the voltage that is measure between the following electrical nodes:

a. Voltage between 3 & 2? _____

b. Voltage between 4 & 2? _____

c. Voltage between 5 & 2? _____

d. Voltage between 6 & 2? _____

e. Voltage between 7 & 2? _____

6. Press the START PB1 pushbutton and release. Does the M1 motor starter pull in and stay pulled in?

7. With the M1 motor starter on, what is the voltage that is measured between the following electrical nodes:
 - a. Voltage between 3 & 2? _____
 - b. Voltage between 4 & 2? _____
 - c. Voltage between 5 & 2? _____
8. Press the START PB2 pushbutton and release. Does the M2 motor starter pull in and stay pulled in?
9. With the M2 motor starter on, what is the voltage that is measured between the following electrical nodes:
 - a. Voltage between 3 & 2? _____
 - b. Voltage between 6 & 2? _____
 - c. Voltage between 7 & 2? _____
10. Press the Emergency Stop pushbutton. Do both motor starters drop out?
11. Disassemble the circuit and return the lab equipment to its storage area.

Questions:

1. If both M1 and M2 are energized, what occurs when the emergency stop is pushed?
2. Is the emergency stop pushbutton, momentary or maintained?

3. Is the STOP PB1 and STOP PB2 pushbuttons, momentary or maintained?

4. M1 and M2 are both energized. M1 shuts off. What could have caused this?

5. If both M1 & M2 are shut off, and no pushbuttons are actuated, what voltage should be read between nodes 4 & 5?

6. What would have to be done to change this 120VAC circuit to a 24VDC circuit?

The outcomes of this exercise (listed on page 1) specifies the skills that the Student must demonstrate to the Instructor. Once the Instructor is satisfied with the demonstration of Knowledge & Skills by the individual student, they will sign this document (for the student), then enter a 100% into the Hands-On Lab grade in Sakai.

I verify that this student has completed all of the requirements of this Hands-On Assessment:

Student Name: _____

Faculty Signature: _____ Date: _____

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