

PLC124 LAB 3.1: WIRING AND TROUBLESHOOTING A START/STOP/JOG CONTROL CIRCUIT

Student Name: _____

Student ID: _____

LAB OUTCOMES:

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

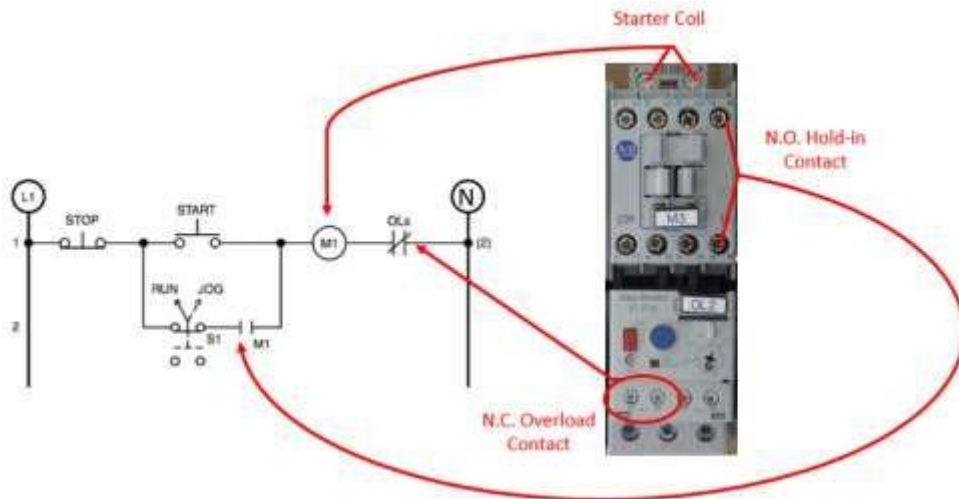
1. Identify all parts of an Allen Bradley IEC motor starter
2. Measure the continuity of all the switches mounted behind the pushbutton heads
3. Measure the resistance of the coil and contacts of an Allen Bradley IEC Starter
4. Wire a 120VAC start/stop/jog, 3-wire control circuit with a motor starter
5. Wiring a circuit using the proper wire colors and wire numbers.
6. Troubleshoot a faulty start/stop/jog 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. Find all of the components on the IEC motor starter that will be used in this lab as shown in the above graphic. Use the Ohmmeter to measure the resistance of these components: a.

Resistance of the coil = _____

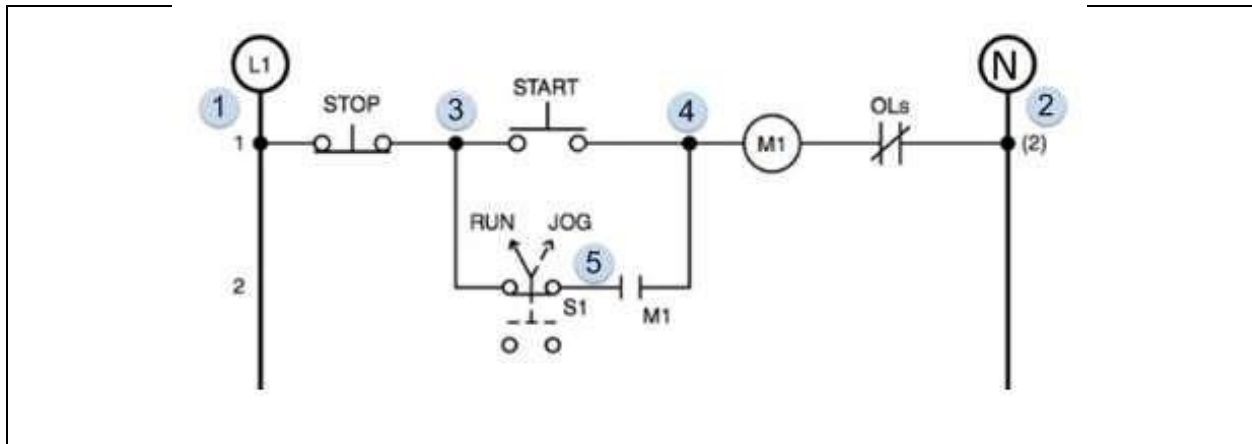
Resistance of the N.C. overload contact = _____

Resistance of the N.O. hold in contact = _____

2. Manually push the contact block of the starter in, which has a spring recoil. Measure the resistance of the N.O. hold in contact when pushing this in = _____

Part 2:

1. Use the wire numbers and red MTW wire to construct the following circuit.



2. With the Ohmmeter, measure the continuity of the Selector Switch contact, that when it is in the left position (Run), it has continuity. When in the right position (Jog), it is open.
3. Wire the circuit up and apply 120VAC power to the board to perform the lab.
4. Measure the voltage between electrical nodes 1 & 2 on the terminal strip. What is the measured value? _____
5. Put the selector switch in the right position (Jog). Press the start pushbutton. Does the motor starter pull in?

Does the motor starter shut off when you release the start pushbutton?
6. With the motor starter 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 (SSW is in the Jog position)? _____
 - d. Voltage between 3 & 4? _____
7. Put the SSW into the Run position.
8. Press the start pushbutton and release. Does the motor starter pull in and stay pulled in?

9. With the 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? _____

d. Voltage between 3 & 4? _____

10. Press and release the stop pushbutton to shut off the motor starter. Manually push in the contact block of the motor starter. The electrical circuit should engage.

Does it remain pulled in when release the contact block? _____

Explain

Part 3:

1. The student should leave the lab and the instructor put a small fault in the circuit for the student to trace down. Start with troubleshooting from the electrical nodes on the terminal strip. The instructor will assist as needed.

Questions:

1. Why is red wire used to wire this circuit?
2. What color is the neutral wire?

3. Is the neutral wire at ground potential?
4. What other wire is at ground potential on this wiring board?
5. If the selector switch is in the Run position, and the motor starter was started and running, what are two common occurrences that would shut off the motor starter?
6. The user is pushing the start pushbutton, but the motor starter does not pull in, then the user takes a voltage check and finds there is 120 VAC between nodes 1 & 2, but there is not voltage between nodes 3 & 2. What could be wrong?

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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