

PLC120 LAB 2.1: MORE SWITCH CIRCUITS

Student Name: _____

Student ID: _____

LAB OUTCOMES:

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

1. Connect multiple pilot lights in parallel with the DC source.
2. Connect multiple pilot lights in parallel with switches in series with the lights.
3. Measure the voltage across a powered load using a DMM.
4. Connect multiple toggle switches in series with a pilot light.
5. Connect multiple toggle switches in parallel with a pilot light.
6. Troubleshoot a basic series or parallel circuit.

LAB PROCESS:

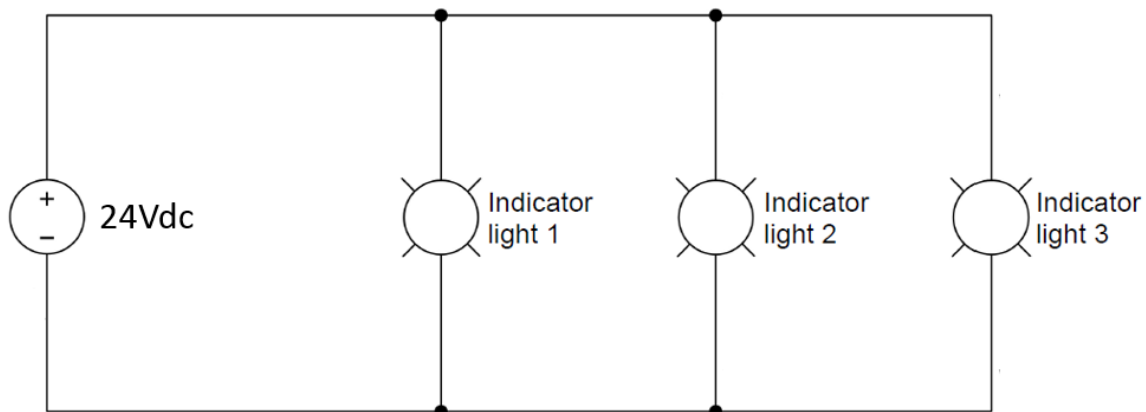
Open the AC/DC Training Unit. Setup the unit on its base, or lay flat on the work table.

Make sure all fault switches are in the 0 position.

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

Circuit 1

Wire the following circuit on the AC/DC training system:



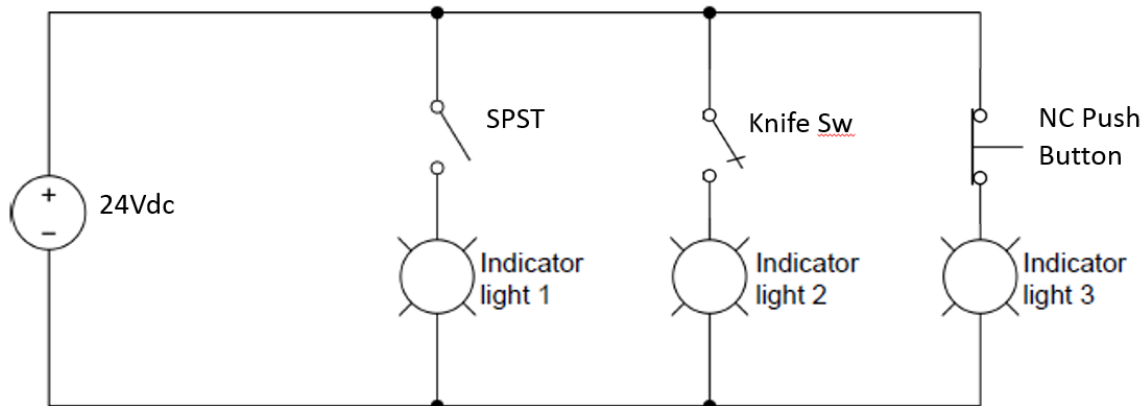
1. Power on the "Power Input" switch (lower right) to power the training unit. Do all three indicator lights turn on?
2. Use the DMM as a DC voltmeter. Put the DMM across the pilot lights.

What is the measured value? _____

3. Pull one lead off of the power supply. Do the pilot lights shut off?
4. Turn off the "Power Input" switch to the training unit.

Circuit 2

Wire the following circuit on the AC/DC training system:



1. Power on the "Power Input" switch (lower right) to power the training unit.
2. Open the SPST switch and the knife switch. Do not actuate (push) the NC pushbutton.

Which output indicator is on? _____

Explain:

3. Measure the DC voltage across the open SPST switch.

What is this value? _____

4. Close the SPST switch. Indicator light 1 should come on.
5. Measure the DC voltage across the closed SPST switch.

What is this value? _____

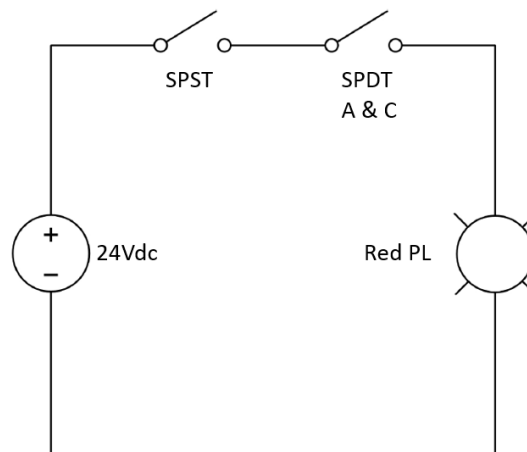
6. Measure the DC voltage across Indicator light 1.

What is this value? _____

7. Power off the "Power Input" switch to power off the training unit.

Circuit 3

Wire the following circuit on the AC/DC training system:



Note that the second switch in the circuit is two of the three terminals of the SPDT switch.

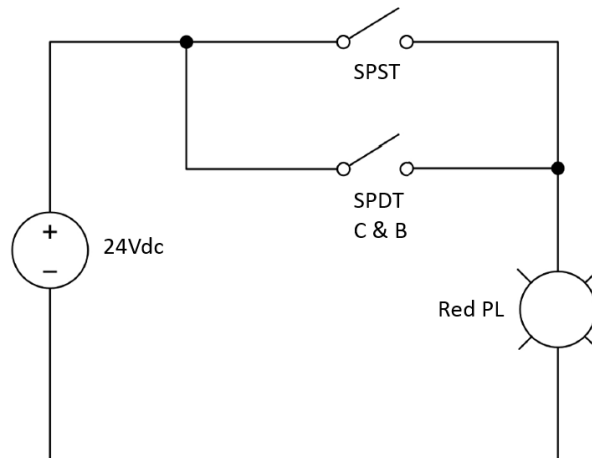
1. Power on the "Power Input" switch (lower right) to power the training unit.
2. Turn both switch bats (switch levers) in the down position (off state).
3. Turn on the SPDT switch (up position). Does the Red PL come on?
4. Turn the SPST switch (up position). Does the Red PL come on?
5. Measure the DC voltage across the Red PL.

What is the measured value? _____

6. Power off the "Power Input" switch to power off the training unit.

Circuit 4

Wire the following circuit on the AD/DC training system:



Notice that the second switch in the circuit is two of the three terminals of the SPDT switch.

1. Power on the "Power Input" switch (lower right) to power the training unit.
2. Turn both switch bats (switch levers) to the down position (off state).
3. Turn on the SPDT switch (up position). Does the Red PL come on?
4. Turn off the SPDT switch (down position). Does the Red PL shut off?
5. Turn on the SPST switch (up position). Does the Red PL come on?
6. Power off the "Power Input" switch to power off the training unit.

Questions

1. In the Part 1 circuit, are the pilot lights connected in series or parallel?
2. In the Part 1 circuit, what would be the voltage measured across each pilot light?
3. In the Part 2 circuit, if the SPST switch and the Knife switch are open, and the NC Pushbutton is not activated, what outputs will be on?
4. True or False: In the Part 2 circuit, if the SPST switch closes, turning on Indicator light 1, there will be more of a current draw on the DC power supply.

5. True or False: In the Part 3 circuit, both switches have to be closed to turn on the Red PL.
6. True or False: In the Part 3 circuit, if the Red PL is on and the SPST opens, the PL will remain on.
7. True or False: In the Part 4 circuit, both switches have to be closed in order to turn the Red PL on.

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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