ELT 101: Basic Electricity: AC/DC

LAB 11-1: Measuring AC voltage and frequency

Two of the most common measurements a digital multimeter is used for is to measure voltage and current. In this lab, we'll learn how to safely measure each of these.

Objectives

1) Safely measure AC voltage

2) Safely measure AC frequency

3) Observe an oscilloscope in operation to measure voltage and frequency

Equipment and materials

1) Fluke 179 DMM

2) Test leads (located inside the DMM carrying case)

3) Electrical receptacle

4) Oscilloscope (instructor only)

Safety issues

- Follow all lab safety rules: wearing safety glasses at all times in the lab.
- Always turn OFF power before hooking up a meter for measurement.
- Check your meter fuses and check your meter leads.
- Check with your instructor if you're unsure about how to do something

<u>Procedure 1: Safely measure AC voltage</u>

1) Check your DMM fuses and test leads.

2) Set up your meter to read AC voltage. Rotate the selector switch to the sine wave icon as shown at right.

3) Carefully insert the pointed test leads into the two vertical slots in a power receptacle; one lead per slot.

4) Your meter should display approximately 115-1120 volts.

5) What does your meter display?

ACV = _____

Procedure 2: Safely measure AC frequency

1) Without removing the test leads from the receptacle, press the yellow button on the meter to switch it to Hertz.

2) Your meter should read 60 Hertz.

3) What does your meter display?

f = _____

4) Disconnect your test leads from the receptacle.

Procedure 3: Oscilloscope demonstration

1) Have your instructor give you a demonstration on how you can measure voltage and frequency with an oscilloscope.

Questions

1) What advantage does an oscilloscope offer over a DMM?

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2) What advantage does a DMM offer over an oscilloscope?

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