

Lab 3.1.1 Safe Handling and Use of a Multimeter



Objective

- Learn how to use and handle a multimeter correctly.

Background

A multimeter is a powerful electrical testing tool that can detect voltage levels, resistance levels, and open or closed circuits. It can check both alternating current (AC) and direct current (DC) voltage. Open and closed circuits are indicated by resistance measurements in Ohms. Each computer and networking device consists of millions of circuits and small electrical components. A multimeter can be used to debug electrical problems within a computer or networking device, or with the media between networking devices.

Prior to starting the lab, the teacher or lab assistant should have one multimeter available for each team, and various batteries for testing. Work in teams of two. The following resources will be required:

- A digital multimeter. A Fluke 110 Series, 12B or similar for each team
- A manual for the multimeter
- A battery for each team to test. For example, a 9v, 1.5V or lantern.

Note: The multimeter is a sensitive piece of electronic test equipment. Do not drop it or handle it carelessly. Be careful not to accidentally nick or cut the red or black wire leads, called probes.

Because it is possible to check high voltages, extra care should be taken to avoid electrical shock.

Step 1

Insert the red and black leads into the proper jacks on the meter.

- a. The black probe should go in the COM jack and the red probe should go in the + (plus) jack.

Step 2

Turn on the multimeter. Click or turn to the on button.

- a. What is the model of multimeter?

- b. What action must be taken to turn the meter on?

Step 3

Switch or turn to different measurements. For example, voltage, and ohms.

- a. How many different switch positions does the multimeter have? _____
- b. What are they?

Step 4

Switch or turn the multimeter to the voltage measurement.

- a. What is the symbol for this? _____

Step 5

Put the tip of the red, positive lead on the positive side of a battery. Put the tip of the black, negative, lead on the other end of a battery.

- a. Is any number showing up on the multimeter? _____ If not, make sure to switch to the correct type of measurement. For example Vol, voltage, or V. If the voltage is negative, reverse the leads.

Reflection:

1. Name one thing that should not be done to a multimeter. _____
2. Name one important function of a multimeter. _____
3. If a voltage is negative when measuring a battery, what is wrong? _____