

Unit 4



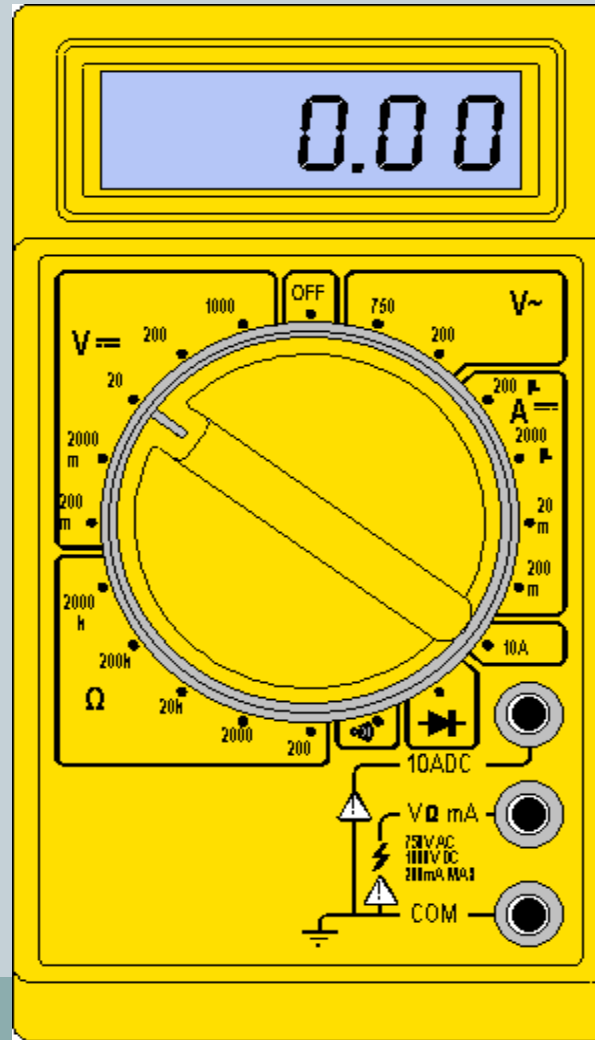
Measuring Instruments

- Digital Voltmeter
- Digital Multimeters
- Oscilloscope

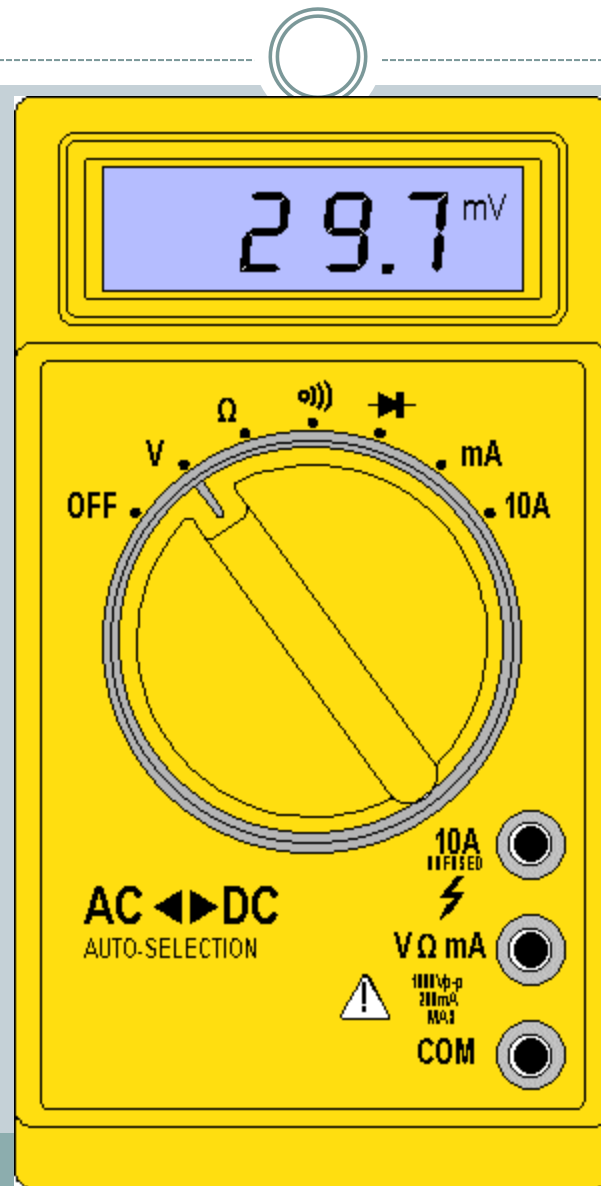


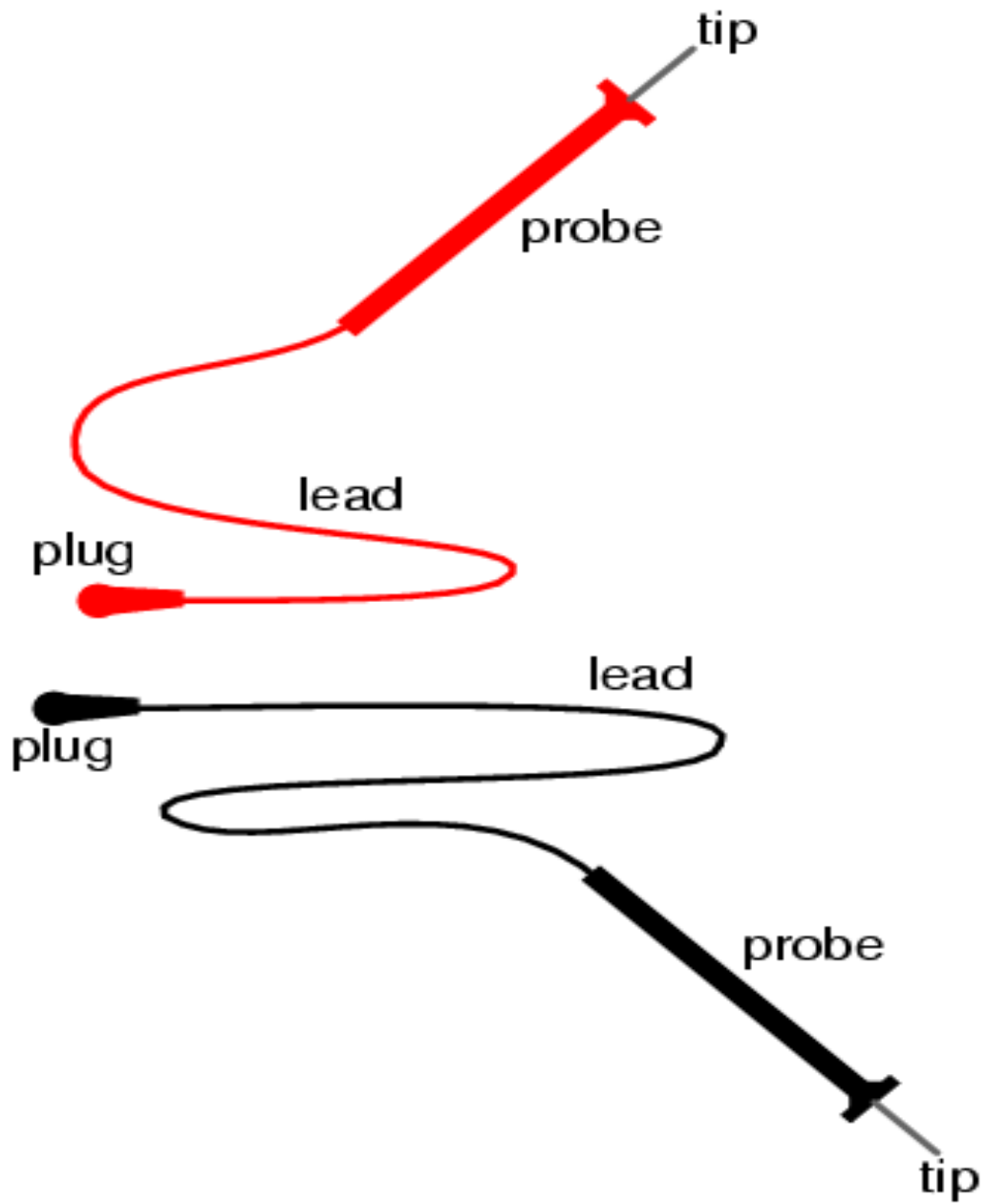
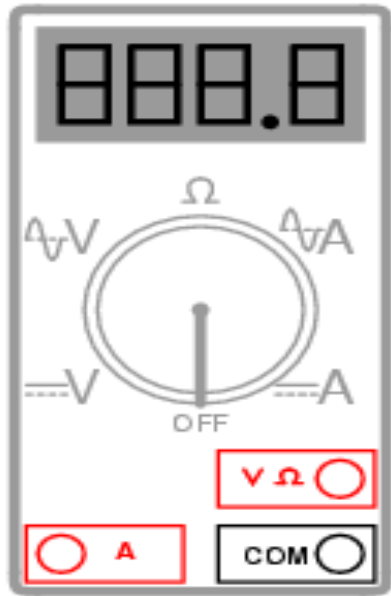
Multimeters are designed and mass produced. The simplest and cheapest types may include features which are not likely to use. Digital meters give an output in numbers, usually on a liquid crystal display.

Switched



Autoranging





What do meters measure?



A meter is a measuring instrument. An **ammeter** measures current, a **voltmeter** measures the potential difference (voltage) between two points, and an **ohmmeter** measures resistance. A **multimeter** combines these functions, and possibly some additional ones as well, into a single instrument.

Multimeter as a Ammeter



- Turn Power Off before connecting multimeter
- Break Circuit
- Place multimeter in series with circuit
- Select highest current setting, turn power on, and work your way down.
- Turn power off
- Disconnect multimeter.
- Reconnect Circuit

Ammeter mode measures current in Amperes. To measure current you need to power off the circuit, you need to *break the circuit* so that the ammeter can be connected in series. All the current flowing in the circuit must pass through the ammeter. Meters are not supposed to alter the behavior of the circuit, so the ammeter must have a very LOW resistance. The diagrams below show the connection of a multimeter to measure current.

