

Using a Multimeter to Measure DC Current

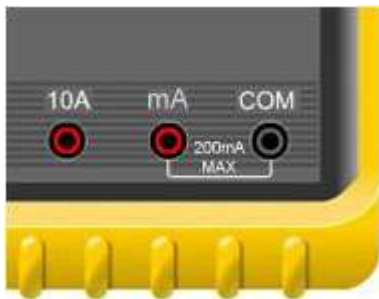
Help Sheet

The following steps illustrate how to measure DC current using a digital multimeter (DMM). DC current is measured in amps (A), milliamps (mA), or microamps (μA).

$$1,000 \text{ mA} = 1 \text{ A}$$

$$1,000,000 \mu\text{A} = 1 \text{ A}$$

Connecting the Test Leads



1. All DMMs have a general-purpose socket for measuring small currents in microamps or milliamps. Most will also have a dedicated socket for measuring larger currents.

The general-purpose socket will typically be labeled **mA** or **A**. The maximum current rating for the socket will usually be shown alongside it (for example, 200 mA max). Using the general-purpose socket will give the most accurate results, but it is important not to exceed the maximum current rating.

If you think the current you are about to measure may exceed the maximum current rating for the general-purpose socket, or if you are not sure, then you should use the high current socket instead. This will usually be labeled 10 A or 20 A.

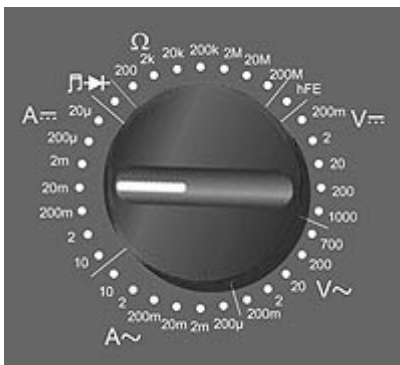


2. To take a measurement, the DMM must be connected to the circuit using a pair of test leads; one red, one black. Each test lead has a fine pointed probe at one end to 'probe' the circuit. At the other end is a plug for connecting the lead to the DMM.



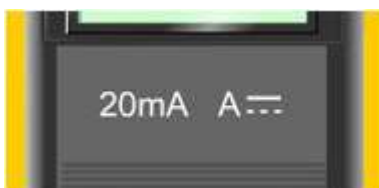
3. Connect the black test lead to the COM socket and the red test lead to the chosen current socket.

Setting the Range



4. The DMM is set to the required range using the range selector. The type of range selector will depend on the make and model of the DMM you are using, but typically it will be a selector dial or a set of buttons.

This symbol $A \text{ ---}$ is often used to identify the DC current range on the range selector.



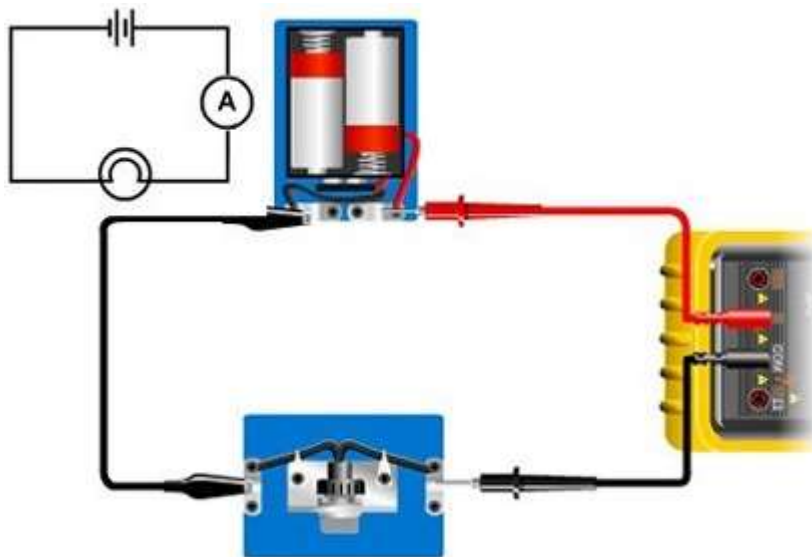
5. Switch the range selector to the required position. If it has more than one DC current range position, you will need to select the required setting.

If you are measuring current using the general purpose DMM socket, the setting you choose will depend on the maximum current that is to be measured. For example, a 20 mA DC setting can be used to measure currents of up to 20 mA DC.

If you are not sure which setting to choose, start with a high setting.

Note that if you are using the high current socket, you must use the highest available current setting.

Making a Measurement



6. Ensure the DMM is switched on.

7. When measuring current, the circuit must be broken and the DMM connected to form part of the circuit loop.

Reading the Display



8. The display on the DMM will show the measured current. If there is a negative sign on the display, then you probably have the probes connected to the circuit the wrong way round.



9. If the range setting you choose is much bigger than the measured value, then the displayed result may not be very accurate. You can make it more accurate by reducing the range setting.



If the range setting you choose is too small, the DMM will display an out-of-range indication. This is typically shown by a 1. or an OL on the left side of the display. When this happens you should step up to the next highest range setting.



Remember that if you change to, or from, the high current setting, you may need to also change the socket to which the red test lead is connected.