# How To Use A Multimeter (??ng h? v?n n?ng)


Introduction

Every fixer should know their way around a multimeter, which has just north of a zillion uses for testing electronic components and circuits. Follow along to master the three most basic functions of a multimeter.

Part 1: Testing Continuity

Part 2: Testing Voltage

Part 3: Testing Resistance

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Step 1 Testing Continuity

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Step 1 Testing Continuity

A continuity test tells us whether two things are electrically connected: if something is continuous, an electric current can flow freely from one end to the other.

If there's no continuity, it means there is a break somewhere in the circuit. This could indicate anything from a blown fuse or bad solder joint to an incorrectly wired circuit.

Continuity is one of the most useful tests for electronics repair.

Step 2

To begin, make sure no current is running through the circuit or component you want to test. Switch it off, unplug it from the wall, and remove any batteries.

Plug the black probe into the COM port on your multimeter.

Plug the red probe into the V?mA port.

Step 3

Switch on your multimeter, and set the dial to continuity mode (indicated by an icon that looks like a sound wave).
Not all multimeters have a dedicated continuity mode. If yours doesn't, that's okay! Skip to Step 6 for an alternate way to perform a continuity test.
Step 4
The multimeter tests continuity by sending a little current through one probe, and checking whether the other probe receives it.
If the probes are connected?either by a continuous circuit, or by touching each other directly?the test current flows through. The screen displays a value of zero (or near zero), and the multimeter beeps. Continuity!
If the test current isn't detected, it means there's no continuity. The screen will display 1 or OL (open loop).
Step 5
To complete your continuity test, place one probe at each end of the circuit or component you want to test.
As before, if your circuit is continuous, the screen displays a value of zero (or near zero), and the multimeter beeps.
If the screen displays 1 or OL (open loop), there's no continuity?that is, there's no path for electric current to flow from one probe to the other.
Continuity is non-directional, meaning it doesn't matter which probe goes where. But there are exceptions?for instance, if there's a diode in your circuit. A diode is like a one-way valve for electricity, meaning it will show continuity in one direction, but not in the other.
Step 6
If your multimeter doesn't have a dedicated continuity test mode, you can still perform a continuity test.
Turn the dial to the lowest setting in the resistance mode.
Resistance is measured in ohms, indicated by the symbol ?.
Step 7
In this mode, the multimeter sends a little current through one probe, and measures what (if anything) is received by the other probe.
Step 8
To complete your continuity test, place one probe at each end of the circuit or component you want to test.
It doesn't matter which probe goes where; continuity is non-directional.
As before, if your circuit is continuous, the screen displays a value of zero (or near zero).
If the screen displays 1 or OL (open loop), there's no continuity?that is, there's no path for electric current to flow from one probe to the other.
If the probes are connected?either by a continuous circuit, or by touching each other directly?the test current flows through. The screen displays a value of zero (or near zero?in this case, 0.8). Very low resistance is another way of saying that we have continuity.
If no current is detected, it means there's no continuity. The screen will display 1 or OL (open loop).
Step 9 Testing Voltage
Plug the black probe into the COM port on your multimeter.
Plug the red probe into the V?mA port.
Step 10
Switch on your multimeter, and set the dial to DC voltage mode (indicated by a V with a straight line, or the symbol ?).
Virtually all consumer electronic devices run on DC voltage. AC voltage?the kind that runs through the lines to your house?is considerably more dangerous, and beyond the scope of this guide.
Most multimeters are not autoranging, meaning you will need to set the correct range for the voltage you expect to measure.
Each setting on the dial lists the maximum voltage it can measure. So for example, if you expect to measure more than 2 volts but less than 20, use the 20 volt setting.
If you're not sure, start with the highest setting.
Step 11
Place the red probe on the positive terminal, and the black probe on the negative terminal.
If your range was set too high, you may not get a very accurate reading. Here the multimeter reads 9 volts. That's fine, but we can turn the dial to a lower range to get a better reading.
If you set the range too low, the multimeter simply reads 1 or OL, indicating that it is overloaded or out of range. This won't hurt the multimeter, but we need to set the dial to a higher range.
Step 12
With the range set correctly, we get a reading of 9.42 volts.

Reversing the probes won't do any harm; it just gives us a negative reading.
Step 13 Testing Resistance
To begin, make sure no current is running through the circuit or component you want to test. Switch it off, unplug it from the wall, and remove any batteries.
Remember that you'll be testing the resistance of the entire circuit. If you want to test an individual component such as a resistor, test it by itself?not with it soldered in place!
Plug the black probe into the COM port on your multimeter.
Plug the red probe into the V?mA port.
Step 14
Switch on your multimeter, and set the dial to resistance mode.
Resistance is measured in ohms, indicated by the ? symbol.
Most multimeters are not autoranging, meaning you will need to set the correct range for the resistance you expect to measure. If you're not sure, start with the highest setting.
Step 15
Place one probe at each end of the circuit or component you want to test.
It doesn't matter which probe goes where; resistance is non-directional.
If your multimeter reads close to zero, the range is set too high for a good measurement. Turn the dial to a lower setting.
If you set the range too low, the multimeter (??ng h? v?n n?ng) simply reads 1 or OL, indicating that it is overloaded or out of range. This won't hurt the multimeter, but we need to set the dial to a higher range.
The other possibility is that the circuit or component you are testing doesn't have continuity?that is, it has infinite resistance. A non continuous circuit will always read 1 or OL on a resistance test. readmore on: fluke.com.vn in dong ho van nang
Step 16
With the multimeter set to a usable range, we get a reading of 1.04k ohms.