

The Basics of a Multimeter

What is a Multimeter?

A multimeter is an instrument used for troubleshooting a circuit, or electrical device. It has the ability to measure electricity in a variety of ways, such as resistance, voltage, current and sometimes more depending on the model of the multimeter. (Think of it like a utility multi-tool for testing electricity.) There are two different types of multimeters. Analog multimeters, which use a moving pointer to display a reading, and digital multimeters which use a numeric display screen. In the commercial vehicle industry a multimeter can effectively help identify a problem within the electrical system to avoid costs associated with unnecessary maintenance and product replacement. While some multimeters are a little more advanced than others, there are some very basic features and components that are standard for any multimeter.

Every multimeter is comprised of three key components and uses two detachable probes to be able to perform a diagnostic.

Three Key Components

1. Display – Digitally displays reading. (Analog multimeters use a moving pointer to display a reading.)
2. Rotary Knob/Dial to Select Settings – Rotate to select the type of measurement voltage (V), current (A), resistance (Ω), etc., and the parameter ranges within that measurement. (Some advanced models use buttons instead of a rotary dial.)
3. Ports – Location to plug the test probes/leads into to the multimeter. (Note: The 10ADC is only used when the rotary dial is set to 10A.)

Test Probes/Leads

Black/Ground Probe/Lead – Always plugged into the COM (COM for common) port for ground (-). The tip of this probe will make contact with the ground (-) source when running a test.

Red/Positive Probe/Lead – The red/positive (+) probe is plugged into one of two optional ports on the multimeter. This probe should be plugged into either the 10ADC port when the rotary dial is set to 10A ONLY, or the $V\Omega mA$ port when selecting any other measurement on the dial. Since the 10A setting is rarely used, especially in the commercial vehicle industry, the red probe will almost always be plugged into the $V\Omega mA$ port.



Digital Display

Rotary Knob/Dial for Selecting Electrical Measurement Settings

10ADC Port for Red/Positive (+) Test Probe

When to Use This Port: Only when 10A is selected
Note: Not a commonly used part

Port for Black/Ground (-) Test Probe COM (COM for common)

$V\Omega mA$ Port for Red/Positive (+) Test Probe

When to Use This Port: For all measurement settings on the multimeter except for 10A
Note: This is the most commonly used part



Black/Negative/Ground (-) Probe/Lead

Red/Positive (+) Probe/Lead

The above touched on the basic anatomy of a multimeter. Next month's article will focus more on the dial measurement settings and their relation to electricity.

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TIPS

- Using a multimeter can effectively help troubleshoot and identify a problem within the electrical system of a commercial vehicle, helping to avoid the costs associated with unnecessary maintenance and repair/product replacement.
- Digital multimeters, which have a numeric display, are the most common type of multimeter used in the automotive industry.
- Every multimeter is comprised of three key components and uses two detachable probes to be able to perform a diagnostic.

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