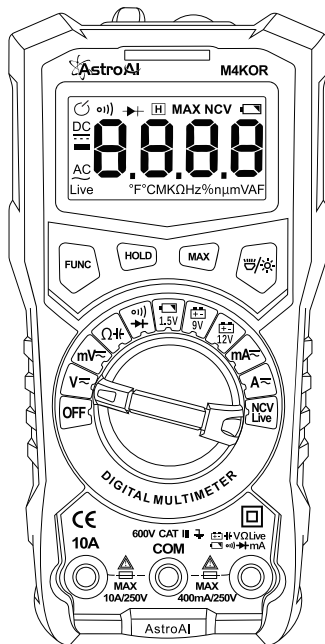




# True RMS 4000 Count Digital Multimeter



Thank you for purchasing the True RMS 4000 Count Digital Multimeter from AstroAI. This DMM is battery-powered, equipped with a 4000-count display and automatic ranging. This instrument performs AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Diode Testing, Continuity Testing, NCV Detection, Live Wire Detection, and Battery Voltage Testing. Thank you again for choosing AstroAI, if you have any questions or concerns regarding your product, please contact us at [support@astroai.com](mailto:support@astroai.com).

**NOTE:** Fully read and understand this manual before using this Digital Multimeter. If you are a beginner to multimeters, please read and keep this manual for reference.










## **WARNING** ///

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment being tested, adhere to the following rules:

- Before using the Meter, inspect the exterior casing. Do not use the Meter if it is damaged or if all or part of the exterior casing is removed. Look for cracks or missing plastic. Pay special attention to the insulation around the connectors.
- Do not use or store the Meter in a high-temperature environment, do not expose to high levels of humidity, or near strong magnetic fields. The performance of the Meter may deteriorate after dampening.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity.
- Pay special attention to the selections when measuring current and voltage. If you attempt to measure in the wrong setting, damage can occur to the Meter.

- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- When the Meter is working at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken because there is a danger of electric shock.
- Use the proper terminals, function, and range for your measurements.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, and diodes.
- Remove the connection between the testing leads and the circuit being tested. Turn the Meter power off before opening the Meter case.
- When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.
- The internal circuit of the Meter shall not be altered to avoid damage of the Meter and any accident.
- Clean using a soft cloth and mild detergent for the surface of the Meter. Do not use abrasive materials or solvents to prevent the surface of the Meter from corrosion and damage.
- Turn the Meter off when not in use and take out the battery when it is not going to be used for an extended period of time. Regularly check the battery as it may leak when it has not been used for some time.
- Replace the battery as soon as leaking appears. A leaking battery will damage the Meter.
- Do not move the multimeter while measuring to avoid inaccurate readings.

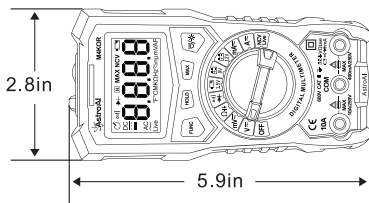
## ELECTRICAL SYMBOLS //

	Warning		Compliant with EU Standards
	AC (Alternating Current)		Earth Ground
	DC(Direct Current)		Fuse
	AC and DC		Double Insulation
	Low Battery Symbol		
CAT III	Category III test equipment is suitable for testing and measurements of circuits connected to the power distribution portion of a low-voltage power supply unit in a building.		

## INCLUDED IN BOX //

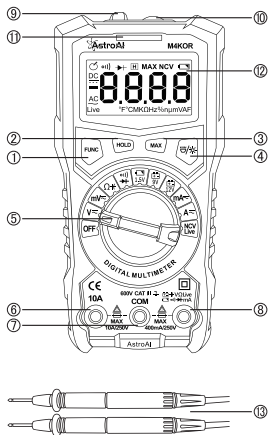
- 1 x Owners Manual
- 1 x Pair of Test Leads
- 1 x AstroAI 4000 Counts Multimeter

## DIMENSIONS //






## MULTIMETER DIAGRAM






- ① FUNC Button
- ② Hold Button
- ③ MAX Button
- ④ Backlight Button / Flashlight Button
- ⑤ Rotary Switch
- ⑥ 10A Terminal
- ⑦ COM Terminal
- ⑧ Input Terminal
- ⑨ NCV Detector
- ⑩ Flashlight
- ⑪ Indicator Light
- ⑫ LCD Screen
- ⑬ Test Leads

## GETTING TO KNOW YOUR DEVICE

### • BUTTONS FUNCTIONS







Button	Function
	<ul style="list-style-type: none"> <li>• Use the rotary switch to select a function. Use the FUNC Button to further select the function if there are multiple applications in one rotary setting.</li> <li>• For example: Switching between AC and DC voltage tests; Selecting between diode and continuity tests. NOTE: Pay special attention to the selected setting before performing any tests.</li> </ul>

	<ul style="list-style-type: none"> <li>Press this button while performing a test to hold (freeze) the reading for easy recording. The screen will display “H” when the hold function is activated. Press the button again to cancel the data hold.</li> </ul>
	<ul style="list-style-type: none"> <li>Press this button to display and hold the maximum value the multimeter records during a measurement test. The maximum values will be cleared when the test function changes or the meter is turned off.</li> </ul>
	<ul style="list-style-type: none"> <li>Backlight: Press this button to turn on/off the screen's backlight.</li> <li>Flashlight: Press this button to turn on/off the flashlight.</li> </ul>

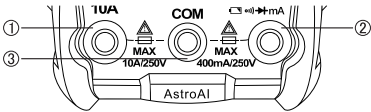
## • SETTING FUNCTIONS



Setting	Function
<p>NOTE: Use the FUNC Button to further select the function if there are multiple functions in one rotary setting.</p>	
V $\approx$	AC/DC Voltage Test: 0.01V~600V
mV $\approx$	AC/DC Voltage Test: 0.1mV~400mV
$\Omega$	Resistance Test: 0.1 $\Omega$ ~40M $\Omega$

	Capacitance Test:0.01NF~4MF
	Audible Continuity Test
	Diode Test
	Battery Voltage Test:1.5V, 9V, 12V
<b>A</b> 	AC/DC Current Test:400mA~10A
<b>mA</b> 	AC/DC Current Test:0.01mA~400mA
<b>NCV</b> <b>Live</b>	NCV Detection Live Wire Detection

## ● LEAD TERMINALS

	
①	Plug the red test lead into this terminal for currents between 400mA and 10A.
②	Plug in the red test lead for all measurements except when current is greater than or equal to 400mA.
③	Plug the black test lead into this terminal.

## ● OTHER FUNCTIONS AND FEATURES

### Auto Shut Off:

- After 15 of standby, the Meter will automatically turn off. To turn it on again, just rotate the range switch or press a button.
- Remove Auto Off: When the multimeter is off, press and hold the "FUNC" button, and then turn the rotary dial until the meter beeps. The "APO" icon on the screen will disappear, which means the auto shut off function is cancelled. It will be restored again after restarting.

### Replacing Batteries:

- If the low battery sign appears on the LCD display, the battery should be replaced. Remove the rubber cover and the screws on the back cover, replace the exhausted battery with fresh batteries. (Size AAA, 1.5V x2).
- NOTE: Replace batteries immediately to prevent inaccurate readings due to the low power. This also prevents potential safety hazards.

### Replacing Fuses:

Fuses rarely need to be replaced and are usually blown due to operator error. To replace the fuses:

- Disconnect the test leads.
- Remove the rubber sleeve and the screws on the back cover of the Meter.
- Open the back of the Meter and replace with fuses of the same rating.

It is crucial that the replacement fuses have the same rating:

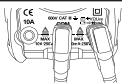
- Fuse 1: F400mA/250V fuse, 5mmX20mm.
- Fuse 2: F10A/250V fuse, 5mmX20mm.

## HOW TO USE THIS MULTIMETER //

This Digital Multimeter is very sensitive. It will be affected by nearby magnetic fields. Without touching any objects, there may be a reading jumping on the screen when it is turned on. This is a normal occurrence of a digital multimeter and it does not affect the measurement results.

### I . MEASURING VOLTAGE :

- Insert the red test lead into the “Input” (red) terminal and the black test lead into the “COM” (black) terminal.



- Turn the rotary dial to the “ $v\approx$ ” setting. When the voltage is below 400mV, turn the dial to the “mV $\approx$ ” setting. Press the “FUNC” button to switch between AC/DC. The screen will indicate “DC” when in the DC setting and “AC” when in the AC setting.



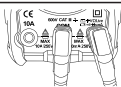
- Connect the two test leads to the neutral and live wires respectively (red to live, black to neutral).
- After the reading stabilizes, record the reading from the LCD screen.
- Turn the rotary switch to the OFF position to turn off the Meter.

## VOLTAGE NOTES:

- To avoid damage to the meter, do not measure voltage exceeding 600V DC or 600V AC.
- Pay special attention to the voltage setting of the Multimeter. The LCD screen will indicate whether the setting is in AC. Use the “FUNC” button to choose the correct setting.
- If the AC setting is used to measure DC and vice-versa, there is potential to damage the Meter or any components you are attempting to test.

## II. MEASURING RESISTANCE:

- Insert the red test lead into the “Input” (red) terminal and the black test lead into the “COM” (black) terminal.



- Turn the rotary dial to the “ $\Omega$ ” setting.



- Place the test leads at both ends of the resistance to be measured and maintain a strong contact.

- The results will be displayed on the LCD screen.

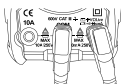
- If the measured value is equal to the nominal resistance of the resistor or within the range of error, the resistor is functioning correctly.  
If there is a large deviation between the nominal resistance and the measured resistance, the resistor is bad.  
If the measured resistance is infinite (open circuit), zero (short circuit), or unstable, it means the resistor is damaged and can no longer be used.

## RESISTANCE NOTES:

- Do not change the resistance while taking a measurement. Doing so may damage the Meter and affect the test results.
- Do not test parallel circuits. The accuracy of the measurement will be affected, and the results may not be accurate.
- Do not directly measure the internal resistance of micrometers, galvanometers, batteries, and other instruments.

## III. MEASURING CAPACITANCE:

- Insert the red test lead into the “Input” (red) terminal and the black test lead into the “COM” (black) terminal.



- Turn the rotary dial to the “ $\Omega$ ” setting. Press the “FUNC” button to switch to Capacitance Test.



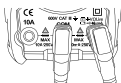
- Create a strong connection between the test leads and both ends of the capacitor.

- Measurement results will be displayed on the LCD screen.

## IV. CONTINUITY TEST:

- Deenergize the circuit you will be testing.

- Insert the red test lead into the “Input” (red) terminal and the black test lead into the “COM” (black) terminal.



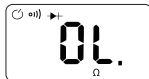
- Turn on the Multimeter by setting it to “ $\rightarrow$ ”.
- Touch the test lead tips together to check if they are connected normally. An audible sound should occur.



- Place the test leads on both sides of the object to be measured.

If the line is connected, the buzzer will beep, and the indicator light will turn green. The screen will also display a resistance reading.

If there is no continuity, the buzzer will not sound, and “OL” will be displayed on the screen, indicating infinite resistance.

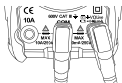


## CONTINUITY NOTES:

- The audible “beep” sound indicates the resistance value of the circuit under test is less than  $30\Omega$ .
- Overload Protection: 250V.

## V. DIODE TEST:

- Insert the red test lead into the “Input” (red) terminal and the black test lead into the “COM” (black) terminal.



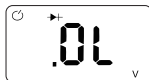
- Turn the rotary dial to the “ $\rightarrow$ ” setting. Press the “FUNC” button to switch to Diode Test.



- Connect the red test lead to the positive end of the diode and the black test lead to the negative end.
- NOTE: Generally, the positive end of the diode is the longer end.



- The LCD will display the reading of the voltage decreased by the diode. If the leads are connected incorrectly to the diode's electrodes, the LCD will display "OL".



## DIODE TEST TIPS:

### Normal Diode Function:

- If the red test lead is connected to the positive pole of the diode and the black lead is connected to negative, then the diode should be in a forward conduction state, and the displayed value is the forward voltage drop.
- Normal diode forward pressure drop: general silicon tubes are 0.5-0.7V, germanium tubes are 0.15-0.3V.
- If "000 "is displayed, the diode is broken.

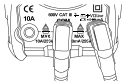
You can also verify that the red test lead is connected to the negative pole of the tested diode and the black test lead is connected to the positive pole if the reading displays "OL".



## POLARITY JUDGMENT METHOD:

- Switch the Multimeter to the Resistance setting.
- Connect the two test leads to the two electrodes of the diode.
- Measure one result, then swap the positions of the test leads, then measure the second result.
- The larger result is the reverse resistance and the smaller result is the forward resistance. The smaller resistance is when the black test lead is connected to the positive end of the diode and the red lead is connected to the negative end.

## VI. BATTERY TEST:

- Insert the red test lead into the "Input" (red) terminal and the black test lead into the "COM" (black) terminal.



- Use the Rotary Dial to select the Battery Test Setting of the battery for testing 1.5, 9, and 12V“   12V” batteries.



- Connect the red test lead to the positive electrode and the black test lead to the negative electrode.

- After the reading is stable, get the reading from the LCD screen. If the battery voltage is low, the indicator light will turn red.

## BATTERY TEST TIPS:

How to tell if a car battery is aging:

- Set the Multimeter to the appropriate Battery Test setting.
- Connect the test leads to the positive and negative terminals of the battery.
- Start the car and turn on the air conditioner in the car. Check the voltage indication.
- If the voltage drops severely, the battery is aging. If the battery voltage is significantly lower than 12V during this test, it means the car battery needs to be replaced.

How to tell if a common battery has power:

- Set the Multimeter to the appropriate Battery Test setting.
- If it is greater than or equal to the voltage marked on the battery, it has normal power.
- If the measured voltage is lower than the voltage marked, it means the battery is aging or needs to be changed.

- If the measured value is 0, it means the battery has a large internal resistance or the battery is broken.

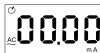
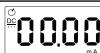
NOTE: Do not directly test the battery with the Current or Resistance Settings.

## VII. MEASURING CURRENT:

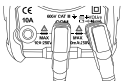
- Turn the rotary dial to the “mA $\approx$ ” or “A $\approx$ ” setting, according to the current level.



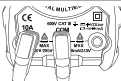
- Press the “FUNC” button to switch between AC/DC. When the screen displays “DC” the Meter is in the DC function, when “AC” is displayed, the Meter is in the AC function.



- Under the “mA $\approx$ ” setting, connect the red test lead to the “VΩV<sub>LINE</sub> mA” (red input) terminal and the black test lead to the COM (black) terminal.



- Under the “A $\approx$ ” setting, connect the red test lead to the 10A (red) terminal and the black test lead to the COM (black) terminal.



- Disconnect the power supply of the circuit under test. Connect the Meter to the circuit under test in series, and then turn on the power supply of the circuit.

- The reading will be displayed on the LCD screen.

## AUTOMOTIVE PARASITIC BATTERY DRAIN:

- Check if the battery voltage and power generation are within normal range. The battery voltage is generally around 12.7V and the power generation is around 14V.
- Turn off all electrical accessories inside and outside the car and close the doors.
- Remove the negative electrode of the battery. Set the Multimeter to the maximum current level and connect the Meter in series to the battery. Connect the red test lead to the negative line and the black test lead to the battery terminal.
- Adjust the Meter, if necessary, to a lower range.
- Wait for about 30 minutes; after all the modules of the vehicle enter the sleep state, read the accurate static discharge current. The discharge current is generally 0.02A (20mA), however, this can vary depending on the vehicle. Generally, it is normal to not exceed 50mA.
- If the drain is larger than 50mA, begin checking fuses individually for which circuit is carrying the excess load. If a removed fuse reduces the battery draw to below 50mA, it can be determined the corresponding circuit is drawing the excess discharge.

## CURRENT NOTES:

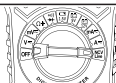
- If you insert the red test lead into the 10A jack, be sure to insert the test lead back into the "Input" jack after the test to avoid forgetting to switch the jack for the next operation and burn the Multimeter.
- When testing a high current, for safety reasons, each measurement should not exceed 10 seconds, and the interval time between tests should be greater than 15 minutes.

- When testing the current, there must be a load in the circuit. Do not connect the multimeter in series with the circuit without a load to measure; doing so can potentially damage the Meter.
- Do not apply a current exceeding the Meter's range to avoid damaging the Meter.

## VIII. NON-CONTACT VOLTAGE (NCV):

The NCV function detects AC voltage without the use of test leads.

- Set the Rotary Dial to the NCV function "NCV Live".



- Move the NCV detector close to the point to be tested.

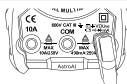
- When the Meter senses a weak AC signal, the green indicator light will turn on and the buzzer will emit a slow, audible beep.

- When the Meter senses a strong AC signal, the red indicator light will turn on and the buzzer will emit a quick beep.

NCV NOTE: This function does not affect the Meter's measurement after exiting the NCV setting. If the range switch is not in the NCV position, the Meter will operate normally.

## IX. LIVE WIRE DETECTION:

- Insert the red test lead into the “Input” (red) terminal. Do not insert the black test lead into any terminal.



- Turn the Rotary Dial to the “ $\overline{N}CV$  Live” setting. Press the “FUNC” button to switch to Live Wire Detection and the screen will show “Live”.



- Touch the point to be measured with the tip of the red test lead.

- When the Meter senses a weak AC signal, the green indicator light will turn on, and the buzzer will emit a slow, audible beep.

- When the Meter senses a strong AC signal, the red indicator light will turn on, and the buzzer will emit a quick beep.

## TROUBLESHOOTING ///

The reading does not stabilize

- Check the test leads for damage.
- Check the contact between test leads and object being measured.
- Check the connection between the test leads and the Meter.

Reading is not accurate	<ul style="list-style-type: none"> <li>• Check the test leads for damage.</li> <li>• Check if the battery needs to be replaced.</li> </ul>
A certain range is not available	<ul style="list-style-type: none"> <li>• Adjust the setting of the Rotary Dial to the required setting.</li> </ul>
Range error is large	<ul style="list-style-type: none"> <li>• The variable value of shunt resistance needs to be adjusted or replaced.</li> </ul>
No reading	<ul style="list-style-type: none"> <li>• Check whether the fuse is intact.</li> <li>• Check the test leads for damage.</li> </ul>

## DC VOLTAGE //

Range	Resolution	Accuracy
400mV	0.1mV	$\pm(0.5\% \text{ of rdg} + 5\text{dgt})$
4V	0.001V	
40V	0.01V	
400V	0.1V	
600V	1V	

- Input Impedance: 10M $\Omega$
- Overload Protection: 600V
- Max. Input voltage: 600V

## AC VOLTAGE //

Range	Resolution	Accuracy
400mV	0.1mV	$\pm(1.0 \% \text{ of rdg} + 5\text{dgt})$
4V	0.001V	
40V	0.01V	
400V	0.1V	
600V	1V	

- Input Impedance: 10M $\Omega$
- Overload Protection: 600V
- Max. Input voltage: 600V
- Frequency Range: 40Hz ~ 1KHZ
- Response: True RMS

## DC CURRENT //

Range	Resolution	Accuracy
40mA	0.01mA	$\pm(1.2\% \text{ of rdg} + 5\text{dgt})$
400mA	0.1mA	
10A	0.01A	

- Overload Protection:  
mA:F400mA/250V fuse  
A:F10A/250V fuse  
(For measurements >5A: duration <10 seconds, interval >15 minutes)



## AC CURRENT ///

Range	Resolution	Accuracy
40mA	0.01mA	$\pm(1.5\% \text{ of rdg} + 5\text{dgt})$
400mA	0.1mA	
10A	0.01A	

- Overload Protection:  
mA:F400mA/250V fuse  
A:F10A/250V fuse

(For measurements >5A: duration <10 seconds, interval >15 minutes)

- Frequency Range: 40Hz ~ 1KHz
- Response: True RMS

## RESISTANCE ///

Range	Resolution	Accuracy
400 $\Omega$	0.1 $\Omega$	$\pm(1.0\% \text{ of rdg} + 5\text{dgt})$
4k $\Omega$	0.001k $\Omega$	
40k $\Omega$	0.01k $\Omega$	
400k $\Omega$	0.1k $\Omega$	
4M $\Omega$	0.001M $\Omega$	
40M $\Omega$	0.01M $\Omega$	

- Overload Protection: 250V

## CAPACITANCE ///

Range	Resolution	Accuracy
4nF	0.001nF	$\pm(4.0\% \text{ of rdg} + 5\text{dgt})$
40nF	0.01nF	
400nF	0.1nF	
4 $\mu$ F	0.001 $\mu$ F	
40 $\mu$ F	0.01 $\mu$ F	
400 $\mu$ F	0.1 $\mu$ F	
4mF	0.001mF	

- Overload Protection: 250V

## BATTERY TEST ///

Range	Resolution	Load Resistance
1.5V	0.001V	30 $\Omega$
9V	0.01V	300 $\Omega$
12V	0.01V	300 $\Omega$

### 3 YEAR WARRANTY LIMITED WARRANTY FROM ASTROAI //

Each AstroAI Digital Multimeter will be free from defects in material and workmanship. This warranty does not cover fuses, disposable batteries and damage from neglect, misuse, contamination, alteration, accident, or abnormal conditions of operation or handling, including overvoltage failures caused by use outside the Multimeter's specified rating, or normal wear and tear of mechanical components. This warranty covers the original purchaser only and is not transferable. If this product is defective, please contact AstroAI Customer Support at [support@astroai.com](mailto:support@astroai.com).



Web: [www.astroai.com](http://www.astroai.com)

■ E-mail: [support@astroai.com](mailto:support@astroai.com)