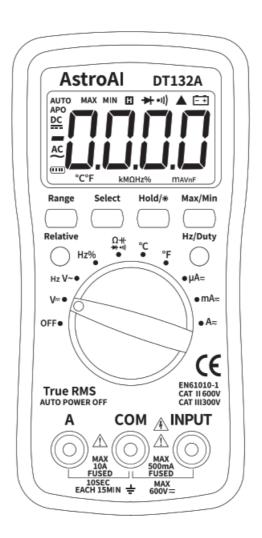


AstroAl DT132A True RMS 4000 Count Digital Multimeter User Manual

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DT132A True RMS 4000 Count Digital Multimeter User Manual



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RMS 4000 Count Digital Multimeter

Thank you for purchasing the True RMS 4000 Count Digital Multimeter from AstroAl. The AstroAl True RMS 4000 Digital Multimeter is designed to be safely and ccurately sed by professionals in a commercial setting or DIYer's who need a little more utility from their standard digital multimeter. The is manual provides all safety information, operation instruction, specifications, and maintenance for the meter. The instrument performs AC/DC Current, AC/DC Voltage, Resistance, Diode, apacitance, Continuity, Frequency, Duty ratio, Temperature measurement. Thank you again for choosing AstroAl, if you have any questions or concerns regarding your product, please contact us via support@astroai.com.



Please fully read and follow this manual before using this product and keep this manual for future reference.





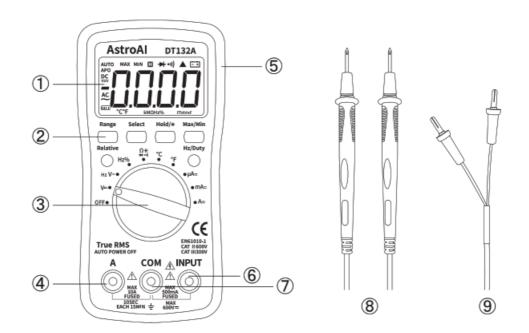
E-Mail: info@apex-ce.com

WARNING

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.

- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The manual rotary switch should be placed in the correct position before measurement and should NOT be moved during measurement to prevent damage to the Meter.
- 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.
- 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.
- 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, or diodes.
- Replace the battery as soon as the battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Remove the connection between the testing leads and the circuit being tested, and 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 at will to avoid damage to the Meter and any accident
- Use a soft cloth and mild detergent to clean 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. Take out the battery when not in use for an extended period. 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.

DIAGRAM



- 1. LCD Screen
- 2. Function Buttons
- 3. Rotary Function Switch
- 4. 10A Terminal
- 5. Rubber sleeve
- 6. INPUT Terminal
- 7. COM Terminal
- 8. Pair of Test Leads
- 9. K-Type Thermocouple

SYMBOLS

	DC (Direct Current)	APO		Automatic Power-Off	
~	AC (Alternating Curren t)	H Data Hold		Hold	
=	AC and DC	MAX	Maximum Reading		
°F	Fahrenheit Temperatur e	MIN	Minimum Reading		
°C	Celsius Temperature	AUTO	Auto-range Mode		
%	Duty Ratio	- +	Low Battery		
Hz	Frequency	-	Negative Reading		
46	Capacitance	A	Relative Mode		
•1))	Continuity Test	\triangle	Warning		
*	Diode Test	Dang		Dangerous Voltage may be present	
Ω	Resistance				

Earth Ground		Fuse
Double Insulated	(€	Complies with EU directives

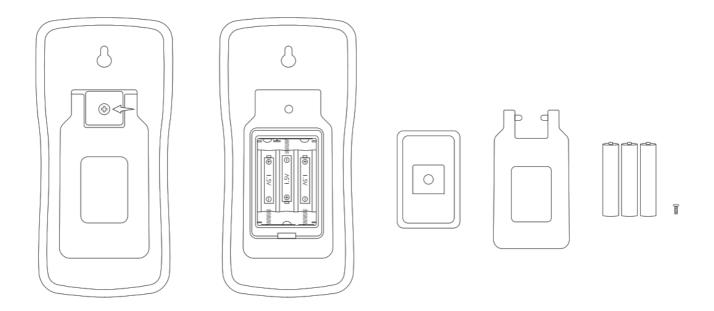
FUNCTIONS

Select Select Bu tton	When using the rotary switch to select a multi-meter function, use the Select Button to further select the function. This applies only to multi-function settings like capacitance, resistance, diode, continuity, AC/DC current.
Relative Relative Button	When taking measurements, you can utilize the Relative Button to get more ccurate re adings by removing the resistance of the test leads, for example. To ctivate this functio n, simply press the Relative Button. A small triangle (delta symbol) ill appear on the di splay and the reading should change to zero.
Range Range B utton	Press the Relative Button again to exit relative mode. AC/DC Voltage, AC/DC Current, and Resistance can all be easured in both Auto and Manual ranging. The multimeter will come set to Auto, but if you desire to select the range anually, press the Range B utton repeatedly to find the desired range. Beware of selecting a range too low, as it wil I verload the device and the multi-meter will not display a reading. Press and hold the Range Button to return to Auto anging.

Max/Min Max/Min Button	When taking a measurement, press this button once to enter 'Max Mode'. In this mode, themultimeter will capture he highest reading it records. Press this button aga in to enter 'Min Mode' which will capture the lowest reading it records. Press and hol d this button to exit the Max/Min Modes.
Hold/* Hold Butto n and backlight functio n button.	When taking a measurement, press this button to hold the data for easier recording. Press the button again to remove he hold function. Press and hold this button to turn on the back- light on the LCD screen. Press and hold he button again to turn off the backlight.
Hz/Duty Hz/Duty B utton	When using the Hz/Duty function on the multi- meter, quickly switch functions by pres sing this button. You can switch to measuring Hz/Duty ratio during the AC voltage measurement.
Type Thermocouple	When measuring the temperature, insert the red test lead into the 'Input' Jack, the bla ck test lead into 'COM' Jack. ote: the leads must not be connected in reverse.
Multi- Function Socket	Use the multi-function socket to measure both Capacitors and Transistors. Be sure to correctly insert the multi- function socket into the COM and INPUT plugs with negative the negative terminal on the multi-function socket on the left side and the positive on the right side. Note: the leads must not be connected inreverse.

INSTALLATION BATTERY REPLACEMENT

If the in + symbol appears on the display, the battery should be replaced immediately.

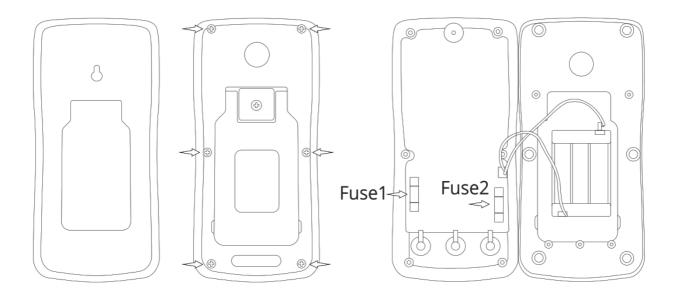


- Turn off the power and remove the test leads plugged into the meter.
- Unscrew the screw and remove the kickstand to replace the battery.
- Replace it with a new battery of the same specification(size MA, 1.5Vx3).
- Put the kickstand in place and fasten it with a screw.

II.FUSE REPLACEMENT

Fuses will rarely need replacement and are normally only blown due to operator error.

- Turn off the power and remove the test leads plugged into the meter.
- Remove the rubber sleeve of the multimeter, unscrew the 6 screws and remove the back cover to replace the fuse.
- Remove the blown fuses and replace them with new fuses of the same specification.
- Put the back cover in place and fasten it with screws.



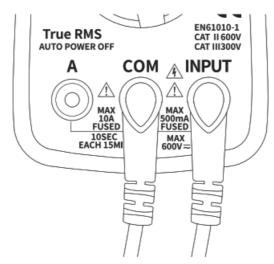
Note: Replace the damaged fuse with a new one with the same ratings.

This meter uses two fuses: Fusel: 500mA, 600V, 05x2Omm Fusel: 10A, 600V, 05x2Omm.

INSTRUCTIONS

I.VOLTAGE MEASUREMENT

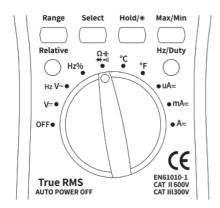
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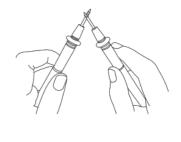
Connect the test leads: Insert the red test lead into the 'Input' Jack and the black test lead into the 'COM' Jack.

· Continuity test:

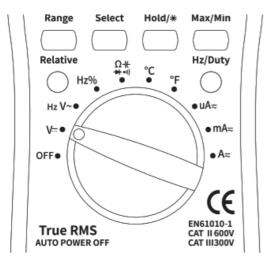
- a. Turn the rotary switch to the '254' setting, choose the 'Select' button, choose continuity Mode. symbol will display on the screen.
- b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.







• Choose functions: Turn the rotary switch to 'V 05' or 'V—' setting according to the measured voltage property.





• Connect the circuit: Connect one end of test leads to the circuit that needs to be measured, in series with the

circuit.

- Reading: Record the reading from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

Note:

a. When a small measuring range is selected, the display of the multimeter may show unstable results if the test leads do not connect to the load. This is a normal event and will not affect the measurement.

b.During the DC voltage measurement, use the '—' symbol on the screen to judge the polarity of the red test lead connection. Without the symbol, that means the red test lead is connected with positive polarity.

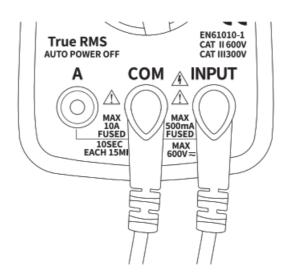
c.To avoid damage to the meter, do not measure voltages exceeding 600V DC or 600V AC.

d.lf necessary, the 'Range' button can be pressed to operate manually (default mode as the Auto range). During manual operation please choose the widest range by pressing the 'Range' Button, then choose a suitable range based on the initial reading access to precise reading. When the 'OL' symbol is displayed on the screen or overranging measurement, users must choose a wider range to get the reading. As for the Auto range, Auto range mode need not choose range.

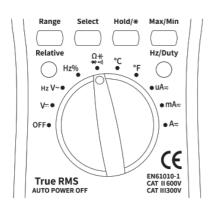
e.Do not use the AC voltage test function to test DC voltage and vice versa. Performing this action has the potential to damage the Meter or any components you are attempting to test.

- f. Press the Hz/Duty button to switch to Frequency or Duty ratio when testing the AC voltage.
- g. How to find a live wire in a socket:
- 1. Switch to the voltage test setting.
- 2. Connect the black test lead to the grounded wire or jack. Connect the red test lead to one of the jacks to be measured.
- 3. Check both jacks. One should have a reading and the other should remain at or near zero. The live wire will have the reading.

II.CURRENT MEASUREMENT



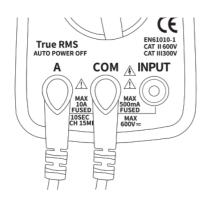
- Connect the test leads:Insert the red test lead into the 'Input' Jack and the black test lead into the 'COM' Jack.
- · Continuity test:
 - a. Turn the rotary switch to the '2",' setting, choose the 'Select' button, choose continuity Mode, '01' symbol will display on the screen.
 - b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.

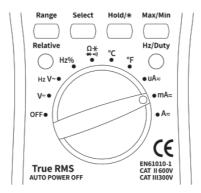






- Re-connect the test leads: Insert the black test lead into the 'COM' jack. If the current is less than 500mA, insert the red test lead into the 'INPUT' jack; if the current ranges from 500mA-10A, insert the red test lead into the 'A jack.
- Choose functions: Turn the rotary switch to 'mAil, or 'Arc' setting according to the estimated value.
- Choose current types: Press the 'Select' button to test DC current test value or AC current test value.







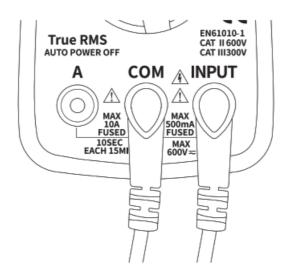
- Connect the circuit: Connect the test lead to the source lead or load to be measured, in series with the circuit.
- Reading: Record the reading from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

· Note:

- a.DO NOT test currents exceeding 10A AC/DC.
- b. When performing DC current measurements, determine the polarity of the red lead connection based on the presence or absence of the '—' symbol display.
- c. When testing a high current, for safety reasons, each measurement time should be less than 10 seconds, and the interval time between tests should be greater than 15 minutes.
- d. 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.
- e.lf necessary, the 'Range' button can be pressed to operate manually (default as Auto range). During manual operation please choose the widest range by pressing the 'Range' button, then choose a suitable range based on the initial reading access to precise reading. When the 'OL' symbol is displayed on the screen or overranging measurement, users must choose a wider range to get results. As for Auto range, Auto range mode need not choose range.
- f.Automotive Parasitic Battery Drain.
- 1. Check if the battery voltage and power generation are within the normal range. The battery voltage is generally around 12.7V and the power generation is around 14V.

- 2. Turn off all electrical accessories inside and outside the car and close the doors.
- 3. Remove the negative electrode of the battery. Set the Multimeter to the maximum current level and connect the Meter in series to the battery.
- 4. Connect the red test lead to the negative line and the black test lead to the battery terminal.
- 5. ,If the drain is larger than SOmA, begin checking fuses individually for which circuit is carrying the excess load.
- 6. Adjust the Meter, if necessary, to a lower range.
- 7. 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 SOmA.
- 8. If a removed fuse reduces the battery draw to below 50mA, it can be determined the corresponding circuit is drawing the excess discharge.

III.RESISTANCE MEASUREMENT



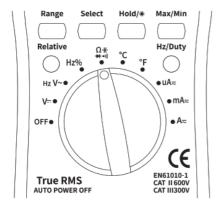
• Connect the test leads: Insert the red test lead into the 'Input' Jack and the black test lead into the 'COM' Jack.

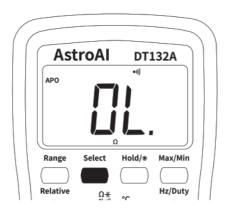
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Continuity test:

a. Turn the rotary switch to the 'setting, choose the 'Select' button, choose continuity Mode, 'symbol will display on the screen.

b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.







Choose functions: Press the 'Select' button to choose the resistance mode.



- Connect load: Place the test leads at both ends of the resistance to be measured.
- Reading: Record the reading from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

· Note:

a.lf the resistance test value exceeds 1MO, the meter may take seconds to stabilize the reading, which is normal for high resistance testing.

b.Do not change the resistance while taking a measurement. Doing so may damage the Meter and affect the test results.

c.Do not test parallel circuits. The accuracy of the measurement will be affected, and the results may not be accurate.

d.Do not directly measure the internal resistance of micrometers, galvanometers, batteries, and other instruments.

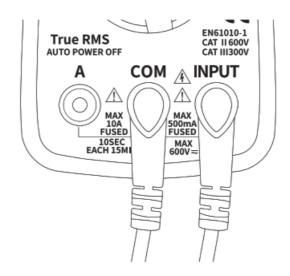
e.In case of disconnection, the symbol 'OL' will be displayed.

f.Before testing the internal resistance of the circuit, please ensure that all power sources are removed from the tested circuit and all capacitors are fully discharged.

g.lf necessary, the 'Range' button can be pressed to operate manually (default as the Auto range). During manual operation please choose the widest range by pressing the 'Range' button, then choose a suitable range based on the initial reading access to precise reading. When the 'OL' symbol is displayed on the screen or over-ranging measurement, users must choose a wider range to get results. As for Auto range, Auto range mode need not choose range.

IV.CONTINUITY TEST

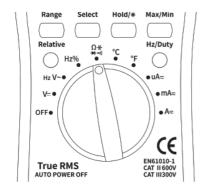
• Connect the test leads: Insert the red test lead into the 'Inpunack and the black test lead into the 'COM' Jack.



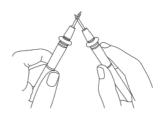
· Continuity test:

a. Turn the rotary switch to the '≯ • □ ' setting, choose the 'Select' button, choose continuity Mode, ' • □ ' symbol will display on the screen.

b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.

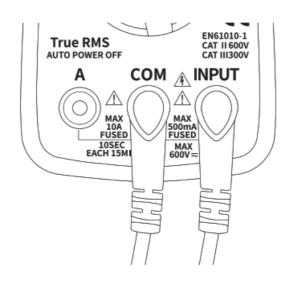






- Connect load: Place the test leads at both ends of the load to be measured.
- Reading: If the circuit load is less than 300, the buzzer will buzz. If it exceeds 300, the LCD screen will display
 the load reading.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

V. DIODE TEST

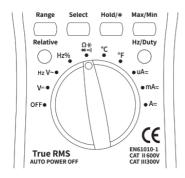


Connect the test leads: Insert the red test lead into the 'INPUT' Jack and the black test lead into the 'COM'
Jack.

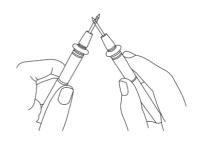
· Continuity test:

a. Turn the rotary switch to the 'setting, choose the 'Select' button, choose continuity Mode, symbol will display on the screen.

b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.







• Choose functions: Press the' Select' button to choose the diode mode.





- Connect diode: Connect the red test lead to the positive end of the diode and the black test lead to the negative end.
- Reading: The meter will display the approximate value of positive voltage. If the leads are incorrectly
 connected to the diode electrodes, the LCD will display '01:, the solution is to change the test leads position,
 vice versa
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

• Note:

a.ls the diode functioning correctly: If the red test lead is connected to the positive pole of the diode and the black lead is connected to the negative, then the diode should be in a forward conduction state, and the displayed value is the forward voltage drop.

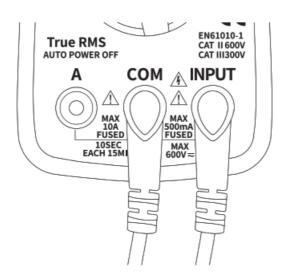
b.Normal diode forward pressure drop: the general silicon tube is 0.5- 0.7V, germanium tube is 0.15-0.3V. c.Polarity Judgment Method.

- 1. Switch the Multimeter to the Resistance setting.
- 2. Connect the two test leads to the two electrodes of the diode.
- 3. Measure one result, then swap the positions of the test leads, then measure the second result.
- 4. 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.CAPACITANCE MEASUREMENT

Connect the test leads: Insert the red test lead into the 'INPUT Jack and the black test lead into the 'COM'
Jack.



· Continuity test:

a. Turn the rotary switch to the setting, choose the 'Select' button, choose continuity Mode, will display on the screen.

b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.



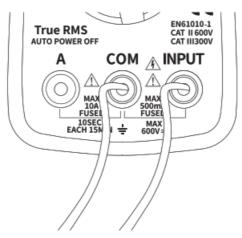
• Choose functions: Press the 'Select' button, choose the capacitance function.



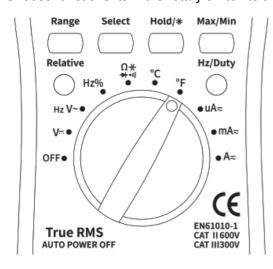
- Connect Capacitance: Connect the capacitance that is to be measured.
- Reading: Record the reading from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

VII.TEMPERATURE MEASUREMENT

• Insert the negative (-) plug of the K-type thermocouple to the 'COM' jack and the positive (+) plug to the 'INPUT jack.



• Choose functions: turn the rotary switch to the "C" or "F" setting.

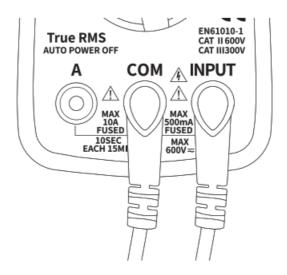




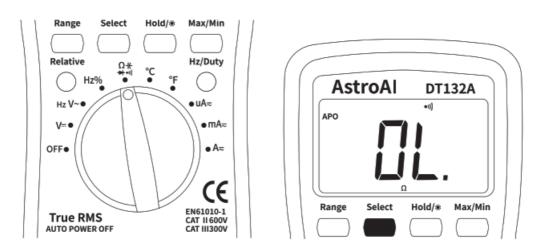
- Method: Carefully use the end of the K -Type thermocouple to touch the object being measured.
- Reading: Record the stable result from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

VIII .FREQUENCY MEASUREMENT

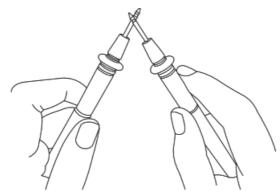
Connect the test leads: Insert the red test lead into the 'INPUT Jack and the black test lead into the 'COM'
Jack.



· Continuity test:

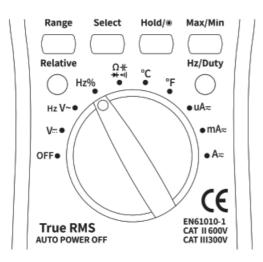


a. Turn the rotary switch to the '23' setting, choose the 'Select' button, choose continuity Mode, 'on 'symbol will display on the screen.



b. Touch the red test lead and the black test lead to check whether they are normal. The buzzer will beep if the test leads are normal.

• Press the 'Hz/Duty' button to switch frequency measurement or duty ratio measurement.





- Connect signal source: Connect the test leads to the two ends of the circuit to be measured.
- Reading: Record the reading from the LCD screen.
- After measurement, turn the rotary switch to the OFF position to turn off the Meter.

SPECIFICATIONS

Digital Display	33/4 , 3999
Sampling Speed	2 times per second
LCD Size	55x31mm/2.17×1.22in
Range Selection	Auto or Manual
Polarity Indication	'-' displayed
Overload Indication	IOU displayed
Low Battery Indication	Yes

Operating Environment	32°F-104°F (0°C-40°C); <80% RH
Storage Temperature	14°F-122°F (-10°C-50°C); <85% RH
Power	3×1.5V, MA battery
Dimensions	145x70x35mm/5.71×2.76×1.38in
Weight	Approx157g/0.351b
Temperature Test	Yes
Diode Test	Yes
Continuity Test	Yes
Frequency	Yes

DETAILED SPCICATIONS

Range	Resolution	Accuracy
400mV	0.1 mV	± (0.8% of rdg + 5 dgts)
4V	1mV	
40V	10mV	± (0.8% of rdg + 3 dgts)
400V	100mV	
600V	1N/	± (1.0% of rdg + 5 dgts)

• Input Impedance: 10M0

• Overload Protection: 600V DC or 600V AC RMS

• (200mV range: 250V DC/AC RMS)

• Max. Input Voltage: 600V DC

II .AC VOLTAGE (AUTO RANGING)

Range	Resolution	Accuracy	
400mV	lmV	± (1.2% of rdg + 5 dgts)	
4V	1mV		
40V	10mV	± (1.0% of rdg + 8 dgts)	
400V	100mV		
600V	1V	± (1.2% of rdg + 5 dgts)	

• Input Impedance: 10MC1

• Frequency Range: 40Hz - 400Hz

Overload Protection: 600V DC or 600V AC RMS
Response: Average, calibrated in rms of sine wave

• Max. Input Voltage: 600V AC RMS

III.TEMPERATURE

Range	Resolution	Accuracy
-40-1370°C	1°C	-40°C-150°C: ± (2.5% + 4)
-40-1370°C		150°C-1370°C: ± (2.5% + 4)
-40-2000°F	1°F	-40°F-302°F: ± (2.5% + 4)
		302°F-2000°F: ± (2.5% + 4)

NOTE: Different temperature sensors are configured in different temperature test ranges and normal temperature sensors are provided for standard configuration.

IV .DC Current

Range	Resolution	Accuracy	
400pA	0.1pA		
4000pA	1pA	± (1.2% of rdg + 8dgts)	
40mA	10pA	± (1.2 % 01 rug + ougis)	
400mA	100pA		

4A	1mA	± (1.2% of rdg + 8dgts)
10A	10mA	1 (1.270 of rug + ougis)

- Overload Protection: pA and mA ranges: F0.5A/600V fuse
- 4A and 10A ranges: F10A/600V fuse
- Max. Input Current: 'INPUT' Terminal: 200mA
- 'A' Terminal: 10A . (For measurements >5A: only measure in durations less than 10 seconds, in intervals greater than 15 minutes.)
- Voltage Drop: 400pA, 40mA and 4A ranges: 40mV
- 4000pA, 400mA and 10A ranges: 400mV

V.AC CURRENT

Range	Resolution	Accuracy	
400pA	0.1 pA		
4000pA	1 pA	+ (1.5% of rdg + 8date)	
40mA	1 OpA	± (1.5% of rdg + 8dgts)	
400mA	1 00pA		
4A	1mA	± (2.0% of rdg +10dgts)	
10A	10mA	± (2.0 % 01 Tug + Tougis)	

- Overload Protection: pA and mA ranges: F0.5A/600V fuse
- 4A and 10A ranges: F10A/600V fuse
- Max. Input Current: 'INPUT' Terminal: 200mA
- 'A Terminal: 10A
- (For measurements >5A: only measure in durations less than 10 seconds, in intervals greater than 15 minutes.)
- Voltage Drop: 400pA, 40mA and 4A ranges: 40mV
- 4000pA, 400mA and 10A ranges: 400mV
- Frequency Range: 40Hz-400Hz
- · Response: Average, calibrated in rms of sine wave

VI .RESISTANCE (AUTO RANGING)

Range	Resolution	Accuracy
4000	0.10	± (1.5% of rdg + 3dgts)
4Kil	10	
40K0	100	
400K0	1000	
4M0	1K.0	
Lionin	10K0	

• Open Circuit Voltage: -0.2W

• Overload Protection: 250V DC/AC rms

VII .DIODE AND CONTINUITY

Range	Description	Remark
→	The approximate forward voltage drop will be dis played	Open circuit voltage: about 1.5V
-11	The built-in buzzer will i sound if the resistance is less than ab out 300	Open circuit voltage: about 0.5V

• Overload Protection: 250V DC/AC rms

• For continuity test: When the resistance is between 500 and 1000, the buzzer may sound or may not sound. When the resistance is more than 1000, the buzzer will not sound.

VIII.CAPACITANCE

Range	Resolution	Accuracy
40nF	10pF	± (8% of rdg + 10 dgts)
400nF	100pF	± (5% of rdg + 5 dgts)
4uF	1nF	

IX .FREQUENCY

40uF 10nF, 100uF-2mF 100nF	± (5% of rdg + 5 dgts)
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Range	Accuracy
5/50/500/5K/501Q5001Q5MHz	± (1.0% of rdg + 3dgts)

PACKAGE INCLDED

- 1 x Owners Manual .1 x Pair of Test Leads
- 1 x K-Type Thermocouple
- 1 x AstroAl 4000 Counts Multimeter

RECYCLIMG

You may dispose of the product when its service life has ended, please recycle the recyclable parts according to local guidelines.

WARRANTY PERLOD

3- Year Warranty Limited Warranty From AstroAl.

Each AstroAl True RMS 4000 Count 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 AstroAl Customer Sup-port at support@astroai.com.



Web: <u>www.astroai.com</u>
E- mail: <u>support@astroai.com</u>

Documents / Resources



<u>AstroAl DT132A True RMS 4000 Count Digital Multimeter</u> [pdf] User Manual DT132A True RMS 4000 Count Digital Multimeter, DT132A, DT132A True RMS 4000, True RMS 4000, RMS 4000, Count Digital Multimeter, RMS 4000 Multimeter, Digital Multimeter, Multimeter

Manuals+,