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LIBODD ET8104

LIBODD ET8104 Digital Multimeter User Manual

Model: ET8104

1. INTRODUCTION

Thank you for choosing the LIBODD ET8104 Digital Multimeter. This high-precision, 9999-count True RMS multimeter is designed for accurate measurements in various electrical applications, including home appliance and car repair. This manual provides essential information for safe and effective operation, setup, maintenance, and troubleshooting of your device. Please read this manual thoroughly before use and retain it for future reference.

2. SAFETY INFORMATION

WARNING: To avoid electric shock or personal injury, and to prevent damage to the meter or the equipment under test, please read and follow these safety instructions carefully.

- Always ensure the multimeter is set to the correct function and range before making measurements.
- Do not measure voltages exceeding 1000V DC or 750V AC.
- Do not measure currents exceeding 10A.
- Use caution when working with voltages above 30V AC RMS, 42V peak, or 60V DC. Such voltages pose a shock hazard.
- Always use insulated test leads in good condition. Inspect them for damage before each use.
- Ensure the battery cover is securely closed before operation.
- Do not operate the meter if it appears damaged or if the casing is open.
- Remove test leads from the circuit before changing functions or ranges.
- When measuring current, ensure the meter is connected in series with the load.
- When measuring voltage, ensure the meter is connected in parallel with the load.
- Do not use the meter in explosive gas, vapor, or dusty environments.
- Replace batteries promptly when the low battery indicator appears to ensure accurate readings.

3. PRODUCT OVERVIEW

The LIBODD ET8104 is a compact and versatile digital multimeter. Familiarize yourself with its components for effective use.



Figure 3.1: Front View of the ET8104 Multimeter. This image displays the main components including the LCD screen, function buttons, rotary switch, and input terminals.



Figure 3.2: Labeled Components of the ET8104 Multimeter. This diagram highlights the LCD display, function selection key (SELECT), data hold button (HOLD), range/relative measurement key (RANGE/REL), maximum/minimum measurement key (MAX/MIN), gear function selection keys, COM input (negative), 10A input port, and the $V\Omega Hz$ input port for voltage, resistance, diode, capacitance, temperature, and frequency measurements.



Figure 3.3: Overview of ET8104 Measurement Functions. This image illustrates the various measurement capabilities of the multimeter, including AC/DC current, AC/DC voltage, resistance, capacitance, frequency, temperature (Celsius/Fahrenheit), non-contact voltage (NCV), duty ratio, diode test, buzzer continuity, True RMS, and flashlight function.



Figure 3.4: ET8104 Multimeter in Hand. This image demonstrates the compact and portable size of the multimeter, making it convenient for various applications.



Figure 3.5: ET8104 Multimeter with Integrated Kickstand. The multimeter features a built-in kickstand on its back, allowing for convenient hands-free operation and easy viewing of the display on a workbench.

3.6. Key Features

- **9999 Counts Display:** High-resolution LCD for precise readings.
- **True RMS:** Accurate measurement of non-sinusoidal AC waveforms.
- **Auto Range:** Automatically selects the appropriate measurement range.
- **Temperature Measurement:** Includes K-type thermocouple for temperature readings.
- **NCV & Neutral/FireWire Test:** For non-contact voltage detection and live wire identification.
- **Compact & Portable:** Easy to carry for on-the-go measurements.
- **Backlit Display:** Clear reverse display for easy reading in various lighting conditions.
- **Integrated Kickstand:** For convenient hands-free use.
- **Auto Power Off (APO):** Conserves battery life.

4. SETUP

4.1. Battery Installation

The ET8104 multimeter requires two 1.5V AAA batteries (not included) for operation.

1. Ensure the multimeter is turned OFF and disconnect all test leads.
2. Locate the battery compartment cover on the back of the device.
3. Use a screwdriver to loosen the screw(s) on the battery cover.
4. Remove the battery cover.

5. Insert two 1.5V AAA batteries, observing the correct polarity (+ and -) as indicated inside the compartment.
6. Replace the battery cover and secure it with the screw(s).

Note: Replace batteries when the low battery indicator appears on the display to ensure measurement accuracy.

4.2. Test Lead Connection

Proper connection of test leads is crucial for accurate and safe measurements.

- Always connect the black test lead to the **COM** (Common) input jack.
- For voltage, resistance, capacitance, frequency, temperature, diode, and continuity measurements, connect the red test lead to the **VΩHz** input jack.
- For current measurements up to 10A, connect the red test lead to the **10A** input jack.

Always ensure test leads are fully inserted into the correct input jacks before making any measurements.

5. OPERATING INSTRUCTIONS

This section details how to use your ET8104 multimeter for various measurements.

5.1. General Operation

- **Power ON/OFF:** Rotate the central rotary switch to any desired measurement function to turn the meter ON. Rotate back to "OFF" to turn it OFF.
- **Function Selection (SELECT button):** In some rotary switch positions (e.g., AC/DC voltage, resistance/diode/continuity), press the **SELECT** button to toggle between different measurement modes within that position.
- **Data Hold (HOLD button):** Press **HOLD** to freeze the current reading on the display. Press again to release. Press and hold for 3 seconds to turn the backlight ON/OFF.
- **Range/Relative Measurement (RANGE/REL button):**
 - **RANGE:** In auto-ranging mode, press **RANGE/REL** to switch to manual ranging. Press repeatedly to cycle through available ranges. Press and hold to return to auto-ranging.
 - **REL (Relative Measurement):** When measuring capacitance, press **RANGE/REL** to store the current reading as a reference value. Subsequent measurements will display the difference from this reference. Press again to exit REL mode.
- **Maximum/Minimum Measurement (MAX/MIN button):** Press **MAX/MIN** to enter MAX/MIN recording mode. The meter will display the maximum (MAX) or minimum (MIN) value measured since entering the mode. Press again to toggle between MAX and MIN. Press and hold to exit. Press and hold for 2 seconds to turn the flashlight ON/OFF.
- **Auto Power Off (APO):** The meter will automatically power off after a period of inactivity to save battery. Press any button or rotate the switch to wake it up.

5.2. Specific Measurement Functions

5.2.1. DC Voltage Measurement (V=)

1. Set the rotary switch to the **V=** position.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads in parallel across the circuit or component to be measured.
4. Read the DC voltage value on the display.

5.2.2. AC Voltage Measurement (V~)

1. Set the rotary switch to the **V~** position.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads in parallel across the circuit or component to be measured.
4. Read the AC voltage value on the display. The meter will display True RMS values.

5.2.3. DC Current Measurement (A=)

CAUTION: Never connect the meter in parallel with a voltage source when measuring current. This can blow the fuse or damage the meter.

1. Set the rotary switch to the **A=** position.
2. Connect the black test lead to the **COM** jack.
3. For currents up to 10A, connect the red test lead to the **10A** jack.
4. Open the circuit and connect the meter in series with the load.
5. Read the DC current value on the display.

5.2.4. AC Current Measurement (A~)

CAUTION: Never connect the meter in parallel with a voltage source when measuring current. This can blow the fuse or damage the meter.

1. Set the rotary switch to the **A~** position.
2. Connect the black test lead to the **COM** jack.
3. For currents up to 10A, connect the red test lead to the **10A** jack.
4. Open the circuit and connect the meter in series with the load.
5. Read the AC current value on the display. The meter will display True RMS values.

5.2.5. Resistance Measurement (Ω)

CAUTION: Ensure the circuit is de-energized and all capacitors are discharged before measuring resistance.

1. Set the rotary switch to the **Ω** position.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads across the component to be measured.
4. Read the resistance value on the display.

5.2.6. Capacitance Measurement (≡)

CAUTION: Ensure the capacitor is fully discharged before measurement to prevent damage to the meter.

1. Set the rotary switch to the **≡** position.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads across the capacitor.
4. Read the capacitance value on the display. Use the **RANGE/REL** button for relative measurements if needed.

5.2.7. Frequency Measurement (Hz)

1. Set the rotary switch to the **Hz** position.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads in parallel across the signal source.

4. Read the frequency value on the display.

5.2.8. Temperature Measurement (TEMP)

1. Set the rotary switch to the **TEMP** position.
2. Connect the K-type thermocouple to the **VΩHz** and **COM** jacks, observing polarity.
3. Place the thermocouple tip on or near the object whose temperature is to be measured.
4. Read the temperature value on the display. Press **SELECT** to switch between Celsius (°C) and Fahrenheit (°F).

5.2.9. Non-Contact Voltage (NCV) Detection

1. Set the rotary switch to the **NCV** position.
2. Move the top end of the multimeter near a live conductor.
3. The meter will emit an audible beep and the NCV indicator light will flash, with the intensity of the beeps and flashes increasing as it gets closer to the voltage source.

5.2.10. Neutral/FireWire Test

1. Set the rotary switch to the **NCV** position.
2. Use the red test lead (connected to VΩHz) to touch the conductor.
3. If it's a live wire (FireWire), the display will show "LIVE" and the meter will beep. If it's a neutral wire, there will be no indication or a very weak one.

5.2.11. Diode Test (▶|)

1. Set the rotary switch to the **Ω** position, then press **SELECT** until the diode symbol (▶|) appears on the display.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the red test lead to the anode and the black test lead to the cathode of the diode.
4. Read the forward voltage drop. Reverse the leads; an open circuit (OL) indicates a good diode.

5.2.12. Continuity Test (Buzzer)

1. Set the rotary switch to the **Ω** position, then press **SELECT** until the continuity symbol (buzzer icon) appears on the display.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads across the circuit or component.
4. If the resistance is below approximately 50Ω, the buzzer will sound, indicating continuity.

5.2.13. Duty Ratio Measurement (%)

1. Set the rotary switch to the **Hz** position, then press **SELECT** until the duty ratio symbol (%) appears on the display.
2. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
3. Connect the test leads in parallel across the signal source.
4. Read the duty ratio percentage on the display.

5.2.14. Flashlight

- Press and hold the **MAX/MIN** button for approximately 2 seconds to turn the built-in flashlight ON or OFF.

6. MAINTENANCE

6.1. Cleaning

Wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Keep the input terminals free of dirt and moisture.

6.2. Battery Replacement

When the low battery indicator appears on the display, replace the batteries immediately to ensure accurate readings. Refer to Section 4.1 for battery installation instructions.

6.3. Storage

If the meter is not to be used for an extended period, remove the batteries to prevent leakage and damage to the device. Store the meter in a cool, dry place, away from direct sunlight and extreme temperatures.

7. TROUBLESHOOTING

If you encounter issues with your ET8104 multimeter, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No display or dim display	Dead or low batteries; incorrect battery polarity.	Replace batteries; check battery polarity.
"OL" (Overload) displayed	Measurement exceeds the selected range; open circuit (for resistance/continuity).	Switch to a higher range (if in manual range); check circuit connection.
Inaccurate readings	Low battery; incorrect function/range selected; poor test lead connection; external interference.	Replace batteries; verify function/range; ensure secure connections; move away from strong electromagnetic fields.
No continuity beep	Resistance too high; meter not in continuity mode.	Ensure resistance is below 50Ω; press SELECT to enter continuity mode.
Meter does not turn on	Rotary switch not moved from OFF; dead batteries.	Rotate switch to a function; replace batteries.

If the problem persists after trying these solutions, please contact LIBODD customer support for further assistance.

8. SPECIFICATIONS

The following table details the technical specifications of the LIBODD ET8104 Digital Multimeter.

Parameter	Range / Value	Accuracy
Display	LCD, 9999 counts	N/A
DC Voltage Range	100mV / 1V / 10V / 100V / 1000V	$\pm(0.5\%+3)$ for 100mV-100V, $\pm(0.8\%+10)$ for 1000V

Parameter	Range / Value	Accuracy
DC Voltage Resolution	0.01mV / 0.1mV / 0.001V / 0.01V / 0.1V	N/A
AC Voltage Range	100mV / 1V / 10V / 100V / 750V	$\pm(0.8\%+3)$ for 100mV-100V, $\pm(1.2\%+10)$ for 750V
AC Voltage Resolution	0.01mV / 0.1mV / 0.001V / 0.01V / 0.1V	N/A
DC Current Range	100mA / 1000mA (1A)	$\pm(1.2\%+10)$
DC Current Resolution	10 μ A / 100 μ A	N/A
AC Current Range	60mA / 600mA	$\pm(1.2\%+10)$
AC Current Resolution	10 μ A / 100 μ A	N/A
DC/AC 10A Current Range	10A	$\pm(2.0\%+30)$
DC/AC 10A Current Resolution	0.01A	N/A
Resistance Range	1000 Ω / 10K Ω / 100K Ω / 1000K Ω (1M Ω) / 10M Ω / 100M Ω	$\pm(0.8\%+5)$ for 1000 Ω ; $\pm(0.8\%+3)$ for 10K Ω -10M Ω ; $\pm(2.5\%+3)$ for 100M Ω (>60M Ω for reference only)
Resistance Resolution	0.1 Ω / 1 Ω / 10 Ω / 100 Ω / 1k Ω / 10k Ω	N/A
Capacitance Range	100nF / 1000nF / 10 μ F / 100 μ F / 1000 μ F / 10mF / 100mF	$\pm(3.5\%+20)$ for 100nF-1000 μ F; $\pm(5\%+3)$ for 10mF-100mF
Capacitance Resolution	10pF / 100pF / 1nF / 10nF / 100nF / 1 μ F / 10 μ F	N/A
Frequency Range	10Hz / 100Hz / 1KHz / 10KHz / 100KHz / 1MHz / 10MHz	$\pm(0.1\%+3)$
Frequency Resolution	0.01Hz / 0.1Hz / 1Hz / 10Hz / 100Hz / 1KHz / 10KHz	N/A
Temperature Range	-20°C to 1000°C / 0°F to 1832°F	$\pm(1.5\%+15)$ for <400°C/<750°F; $\pm(1.5\%+15)$ for >400°C/>750°F
Temperature Resolution	1°C / 1°F	N/A

Parameter	Range / Value	Accuracy
NCV	Yes	N/A
Neutral/FireWire Test	Yes	N/A
Full Unit Symbol Display	Yes	N/A
Low Voltage Display	Yes	N/A
Maximum Display	9999 (3 9/10) automatic polarity display	N/A
Measurement Method	Double integral A/D conversion	N/A
Sampling Rate	Approx. 3 times per second	N/A
Over-range Display	"OL"	N/A
Power Supply	1.5V AAA battery × 2 (not included)	N/A
Dimensions (approx.)	142mm x 70mm x 32mm (5.59 x 2.76 x 1.26 inches)	N/A
Weight (approx.)	10 grams (0.353 ounces)	N/A
Item Model Number	1005006132892403	N/A



Figure 8.1: ET8104 Multimeter Dimensions. This image provides a visual representation of the multimeter's physical dimensions, including length, width, and screen size.

9. PACKAGE CONTENTS

Upon opening your LIBODD ET8104 Digital Multimeter package, you should find the following items:

- 1 x LIBODD ET8104 Digital Multimeter
- 1 x K-type Thermocouple
- 1 x Pair of Test Leads (Red and Black)
- 1 x User Manual (this document)



Figure 9.1: Contents of the ET8104 Multimeter Package. This image shows the multimeter, test leads, K-type thermocouple, and user manual as typically included in the product packaging.

10. WARRANTY AND SUPPORT

LIBODD products are manufactured to high-quality standards. For specific warranty information, please refer to the warranty card included with your purchase or contact your retailer. If you have any questions, require technical assistance, or need to report an issue, please contact LIBODD customer support through your purchase platform or the official LIBODD website.

Please retain your proof of purchase for warranty claims.