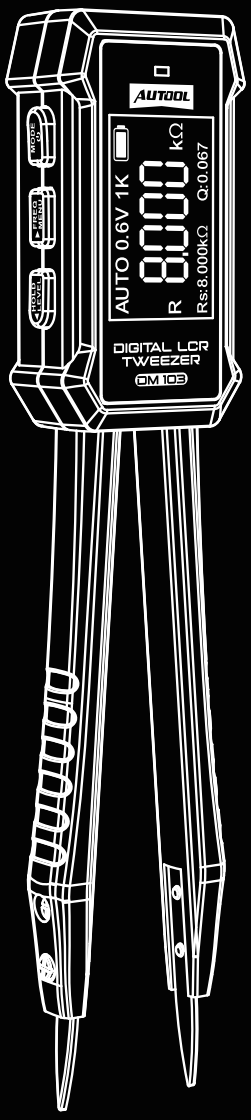
AUTOOL DM103

Digital LCR Tweezer

User Manual



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SAFETY RULES

General safety rules 

- Always keep this user manual with the machine.
- Before using this product, read all the operational instructions in this manual. Failure to follow them may result in electric shock and irritation to skin and eyes.
- Each user is responsible for installing and using the equipment according to this user manual. The supplier is not responsible for damage caused by improper use and operation.
- This equipment must only be operated by trained and qualified personnel. Do not operate it under the influence of drugs, alcohol, or medication.
- This machine is developed for specific applications.
- The supplier points out that any modification and/or use for any unintended purposes is strictly prohibited.
- The supplier assumes no express or implied warranties or liabilities for personal injury or property damage caused by improper use, misuse, or failure to follow safety instructions.
- This equipment is intended for use by professionals only. Improper use by non-professionals may result in injury or damage to the tools or workpieces.
- Keep out of reach of children.
- When operating, ensure nearby personnel or animals maintain a safe distance. Avoid working in rain, water, or damp environments. Keep the work area well-ventilated, dry, clean, and bright.

Handling 

- Used/damaged equipment must not be disposed of in household waste but must be disposed of in an environmentally friendly manner. Use designated electrical equipment collection points.
- Used recycling oil should be treated as hazardous waste, such as at a waste disposal facility.
- Do not attempt to repair the equipment yourself.
- It is essential to protect the equipment from rainwater, moisture, mechanical damage, overload, and rough handling.

Application ⚠

- Before use, check whether the equipment connectors and test probes are damaged. Do not operate the equipment if any damage is found.
- Use the equipment only in compliance with all safety instructions, technical documents, and vehicle manufacturer specifications.
- Use replacement batteries with similar capacity, design, chemical composition, service life, and from the same manufacturer. Mismatched batteries may cause gas formation and subsequent battery rupture.

PRECAUTIONS

Warning

- Do not input voltage during measurement. Do not measure “live circuits.” Before performing any live measurement, disconnect the power and ensure all capacitors in the circuit are fully discharged.
- Discharge capacitors before measuring them.
- Do not use or store this product for extended periods in high-temperature, dusty environments or under direct sunlight.
- Do not use this product near explosive gases or vapors, or in humid environments.

PRODUCT OVERVIEW

Product Features

- This product is a mini digital LCR tweezer.
- Powered by a lithium polymer battery, it offers ultra-long operating and standby time, and features a clear OLED display.
- It features an ultra-wide measurement range and high precision, and can intelligently identify resistors, capacitors, and inductors, accurately measuring their values.
- The compact and elegant body is easy to carry. The tweezer’s flexible measuring arms, paired with detachable gold-plated tips, make operation highly flexible and reliable.

- Suitable for measuring various SMD components or other LCR parameters.
- This product offers a user calibration mode, allowing users to calibrate based on standard resistances. To restore the factory calibration data, simply reset to the factory settings.

Technical Specifications

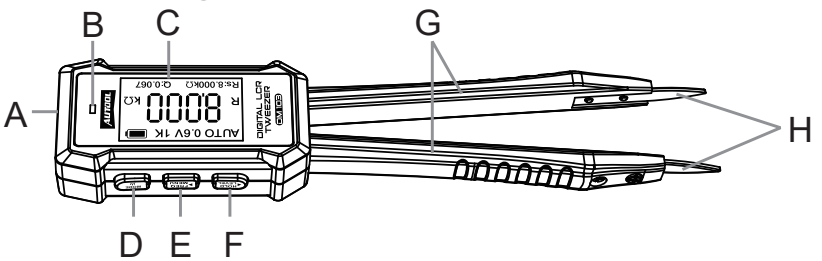
Functions	Measurement Range	100Hz Accuracy	1KHz Accuracy	10KHz Accuracy
Resistance	**1MΩ~10MΩ**	**5% ±5**	**5% ±5**	**----**
	1KΩ~1MΩ	**1% ±5**	**0.5% ±5**	**1% ±5**
	1Ω~1KΩ	**1% ±5**	**0.5% ±5**	**0.5% ±5**
	10mΩ~1Ω	**3% ±5**	**3% ±5**	**3% ±5**
	Measurement Range	**Auto Mode: 10mΩ~10MΩ Resistance Mode: 10mΩ~10MΩ**		
Capacitance	**1mf~20mF**	**5% ±5**	**5% ±5**	**----**
	1uF~1mF	**2% ±5**	**6% ±5**	**2% ±5**
	1nF~1uF	**2% ±5**	**0.5% ±5**	**0.5% ±5**
	1pF~1nF	**----**	**5% ±5**	**5% ±5**
	Measurement Range	**Auto Mode: 50pF~5mF Capacitance Mode: 1pF~20mF**		
Inductance	**1H~60H**	**5% ±5**	**5% ±5**	**2% ±5**
	1mh~1H	**2% ±5**	**2% ±5**	**0.5% ±5**
	10uH~1mH	**2% ±5**	**0.5% ±5**	**5% ±5**
	1uH~10uH	**----**	**5% ±5**	**----**
	Measurement Range	**Auto Mode: 5uH~60H Inductance Mode: 1uH~60H**		

Parameters	**L, C, R, D, Q, Rs**
Mode	**Auto Mode, Resistance Mode, Capacitance Mode, Inductance Mode, Diode Mode, Continuity Mode**
Frequency	**100Hz, 1KHz, 10KHz**
Voltage	**0.3V, 0.6V**
Display	**OLED**
Measurement Range	**Auto**
Test Speed	**1 time/second**
Data Holding	√
Language Selection	**Chinese / English**
Screen Orientation	**Left / Right**
Volume Setting	**0%~100%**

Backlight Brightness	**10%~ 100%**	
Auto Power Off	**Off / 5min~120min**	
Calibration Settings	**0Ω~10MΩ, OPEN**	
Factory Reset	√	
Firmware Upgrade	√	
Battery Type	**Lithium Polymer Rechargeable Battery, 3.7V, 400mAh**	
Material	**ABS**	
Operating Environment	Temperature	**40°C**
	Humidity	**<75%**
Storage Environment	Temperature	**-20°C~60°C**
	Humidity	**<80%**

PRODUCT STRUCTURE

Structure Diagram



[A] TYPE-C interface;

[B] Charging indicator light: The light is red while charging, and turns blue when the battery is fully charged;

[C] OLED display;

[D] [MODE] Power button: Press the button to power on, and press and hold for 2 seconds to power off; in the measurement interface, press the button to switch between AUTO, L, C, R, diode, and continuity measurement modes; in the settings interface, press the button to confirm or exit the function;

[E] [FREQ MENU] Right arrow button: In the measurement interface, press the button to switch between different frequencies; press and hold to enter or exit the settings interface; in the settings interface, press the button to move down the menu and adjust settings;

[F] [HOLD LEVEL] Left arrow button: In the measurement interface, press the button to hold the current value; press and hold to toggle the button sound; in the settings interface, press the button to move up the menu and adjust settings;

[G] Observation arms;
[H] Tweezer tips;

OPERATING STEPS

Setting Operation Instructions

- Press and hold the right arrow button to enter the settings interface. Press the left or right arrow button to select the menu to be adjusted. After selecting, press the power button to confirm. The selected menu will turn yellow. Then, press the left or right arrow button to adjust its parameters. After making the adjustments, press the power button to confirm and exit.
- To exit the settings interface, press and hold the right arrow button to exit or turn off the device.

Calibration Instructions

- When the user requires calibration, follow the instructions below. Calibration includes 10 ranges: 0Ω, 1Ω, 10Ω, 100Ω, 1KΩ, 10KΩ, 100KΩ, 1MΩ, 10MΩ, and OPEN. Single-range calibration is also available.
- Enter the settings interface, select the calibration settings menu, and press the power button to confirm. The calibration settings menu will turn yellow, and the screen will prompt "Waiting for calibration."
- Press the right arrow button to select the range to be calibrated. The corresponding range value will appear in the middle section of the right side of the screen.
- Fully connect the tweezer tips to both ends of the standard resistor, and press the left arrow button. The screen will display "Calibrating".
- Allow approximately 20 seconds for the calibration process to complete. Once complete, the buzzer will sound a single "beep," and the screen will display "Calibration successful." If an incorrect calibration value is entered, the buzzer will sound two "beeps," and the screen will display "Calibration failed."

⚠ Note

- The standard resistors used for calibration must be surface-mount carbon film resistors; wire-wound resistors should not be used.
- For 0Ω calibration, directly short the tweezer tips together, ensuring they completely touch for calibration.

- For OPEN calibration, do not connect any resistors; keep the tweezer tips in an open-circuit state for calibration.
- To restore factory calibration data, simply restore the factory settings.

Resistance Measurement

- Use the AUTO mode or manually adjust to the R mode.
- Place the tweezer tips on both ends of the resistor to be measured.
- Read the measured value displayed on the screen.

⚠ Note

- When measuring low resistors, ensure proper contact with the surface. Oxidation on the surface can affect measurement accuracy.
- If the measured value exceeds the range, the screen will display "OL".

Capacitance Measurement

- Use the AUTO mode or manually adjust to the C mode.
- Place the tweezer tips on both ends of the capacitor to be measured.
- Read the measured value displayed on the screen.

⚠ Note

- Before measuring capacitance, discharge the capacitor to avoid damage to the instrument from the stored charge.
- If the measured value exceeds the range, the screen will display "OL".

Inductance Measurement

- Use the AUTO mode or manually adjust to the L mode.
- Place the tweezer tips on both ends of the inductor to be measured.
- Read the measured value displayed on the screen.

Diode Measurement

- Manually switch to the diode mode. Place the tweezer tips on the positive and negative terminals of the diode. Read the measured value displayed on the screen.

⚠ Note

- Based on the diode symbol direction displayed on the screen, align the tweezer tips with the actual measurement object to determine the diode's polarity.
- The diode turn-on voltage measurement range of this product is for reference and comparison only, between 0.1V and 0.6V. If the measurement exceeds this range, "OL" will be displayed. For higher measurement requirements, a more professional diode tester should be used.

Continuity Measurement

- Manually switch to the continuity mode. Place the tweezer tips on both ends of the point to be measured. The buzzer will sound when the circuit is complete, and the measurement value will be displayed on the screen.

⚠ Note

- Due to the influence of parallel capacitance during live measurements, continuity results in live circuits should only be used for reference and comparison, not as the standard for determining whether the circuit is open or closed.

Low Battery Warning and Charging

- When the battery icon in the top-right corner of the screen shows one red bar after prolonged use, it indicates the need to charge. If use continues, when the battery voltage reaches the shutdown level, the buzzer will emit a "beep... beep... beep..." warning before automatically shutting down.
- Insert the TYPE-C data cable to connect the device to a DC5V output adapter or computer USB port to start charging.
- The charging indicator light will be red while charging, and turn blue once the battery is fully charged.

⚠ Note

- Do not exceed the DC5V charging range.

Firmware Upgrade

- In the power-off state, press and hold the left arrow button, then simultaneously press and hold the power button. The screen will display the "USB-Boot" prompt.
- Insert the TYPE-C data cable to connect to the computer, and the LCR meter disk will appear on the computer.
- Drag the prepared upgrade file into the LCR meter disk. The upgrade will proceed automatically. The screen will automatically switch to the measurement interface once the upgrade is successful.

Maintenance

- Do not attempt to open, repair, or alter the circuitry of this product.
- Clean with a damp cloth and mild detergent. Do not use corrosive agents or solvents.
- Dust or moisture in the testing ports may affect the accuracy of the readings.

When the tweezer tips show signs of wear, oxidation, or damage, they can be replaced. The replacement method is as follows:

- Remove the 4 screws from the tweezer tips. The screw model is 3.5PM2*3. Be sure to use the matching tool.
- Install the new tweezer tips.
- Tighten the screws securely.

MAINTENANCE SERVICE

- Our products are made of long-lasting and durable materials, and we insist on perfect production process. Each product leaves the factory after 35 procedures and 12 times of testing and inspection work, which ensures that each product has excellent quality and performance.

Maintenance

To maintain the performance and appearance of the product, it is recommended that the following product care guidelines be read carefully:

- Be careful not to rub the product against rough surfaces or wear the product, especially the sheet metal housing.
- Please regularly check the product parts that need to be tightened and connected. If found loose, please tighten it in time to ensure the safe operation of the equipment. The external and internal parts of the equipment in contact with various chemical media should be frequently treated with anti-corrosion treatment such as rust removal and painting to improve the corrosion resistance of the equipment and extend its service life.
- Comply with the safe operating procedures and do not overload the equipment. The safety guards of the products are complete and reliable.
- Unsafe factors are to be eliminated in time. The circuit part should be checked thoroughly and the aging wires should be replaced in time.
- When not in use, please store the product in a dry place. Do not store the product in hot, humid, or non-ventilated places.

WARRANTY

- From the date of receipt, we provide a three-year warranty for the main unit and all the accessories included are covered by a one-year warranty.

Warranty access

- The repair or replacement of products is determined by the actual breakdown situation of product.
- It is guaranteed that AUTOOL will use brand new component, accessory or device in terms of repair or replacement.
- If the product fails within 90 days after the customer receives it, the buyer should provide both video and picture, and we will bear the shipping cost and provide the accessories for the customer to replace it free of charge. While the product is received for more than 90 days, the customer will bear the appropriate cost and we will provide the parts to the customer for replacement free of charge.

These conditions below shall not be in warranty range

- The product is not purchased through official or authorized channels.
- The product breakdown because the user does not follow product instructions to use or maintain the product.

We AUTOOL pride ourselves on superb design and excellent service. It would be our pleasure to provide you with any further support or services.

Disclaimer

- All information, illustrations, and specifications contained in this manual, AUTOOL resumes the right of modify this manual and the machine itself with no prior notice. The physical appearance and color may differ from what is shown in the manual, please refer to the actual product. Every effort has been made to make all descriptions in the book accurate, but inevitably there are still inaccuracies, if in doubt, please contact your dealer or AUTOOL after-service centre, we are not responsible for any consequences arising from misunderstandings.

RETURN & EXCHANGE SERVICE

Return & Exchange

- If you are an AUTOOL user and are not satisfied with the AUTOOL products purchased from the online authorized shopping platform and offline authorized dealers, you can return the products within seven days from the date of receipt; or you may exchange it for another product of the same value within 30 days from the date of delivery.
- Returned and exchanged products must be in fully saleable condition with documentation of the relevant bill of sale, all relevant accessories and original packaging.
- AUTOOL will inspect the returned items to ensure that they are in good condition and eligible. Any item that does not pass inspection will be returned to you and you will not receive a refund for the item.
- You can exchange the product through the customer service center or AUTOOL authorized distributors; the policy of return and exchange is to return the product from where it was purchased. If there are difficulties or problems with your return or exchange, please contact AUTOOL Customer Service.

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EU DECLARATION OF CONFORMITY

We as the manufacturer declare that the designated product:

Description: Automotive Relay Tester (Model DM103) complies with the requirements of the:

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU + 2015/863 + 2017/2102

Applied Standards:

EN IEC 55014-1:2021, EN IEC 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A2:2021, EN IEC 55014-2:2021 IEC 62321-3-1:2013, IEC 62321-5:2013, IEC 62321-4:2013+A1:2017, IEC 62321-7-1:2015, IEC 62321-7-2:2017, IEC 62321-6:2015, IEC 62321-8:2017

Certificate No.: HS202408077210E, HS202408077213E

Test Report No.: HS202408077210-1ER, HS202408077213-1ER

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