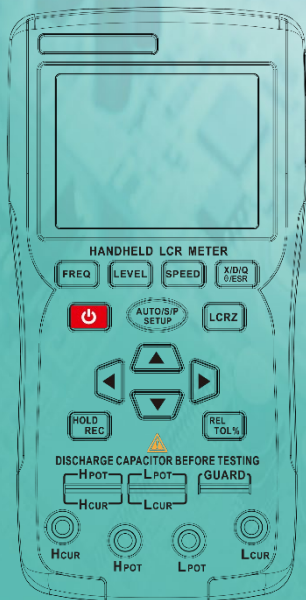


User manual



Limited warranty and scope of liability

This product comes with a one-year warranty from the date of purchase.

The warranty does not cover accessory damage or damage caused by accidents, negligence, improper use, modifications, exposure to contaminants, or operation in extreme conditions.

Note: If you encounter lag or freezing during use, please restart the device.

Table of Contents

Title	Page
Overview	1
Safety Instructions	1
Instrument Panel Overview	3
Display Description	4
Panel Key Functions	6
LCR Measurement Function Operation	7
Input Port Description	7
Measurement Method	8
Measurement Resistance	9
Measurement Capacitance	9
Measurement Inductance.....	9
Setting Method	10
System Settings	12
Maintenance and Care	15
Technical Parameters	16
General Technical Parameters	16
Mechanical Parameters	16
Environmental Parameters	16
Functional Parameters	17
Precision Reference Table	18
Bridge Symbols Description	19

Overview

Overview This product is a handheld, high-precision LCR digital bridge measuring instrument, designed for professional measurement of resistance, capacitance, inductance, and their characteristic parameters. It features an elegant design, compact size, and flexible operation. Equipped with a 2.8-inch TFT screen for clear display and a 4-wire measurement input, it effectively improves measurement accuracy and reliability. With superior performance and powerful functions, it meets various LCR measurement needs.

Safety notes

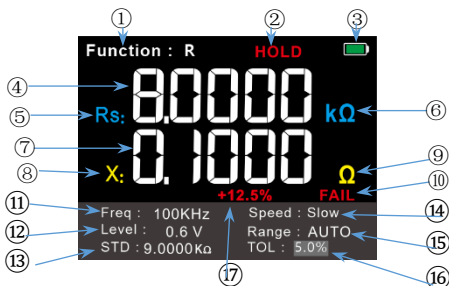
To avoid potential electric shock, fire, and personal injury, please read the safety precautions carefully before use. Only use the product for its intended purpose, as improper use may compromise its protective functions.

- Before using the product, inspect the casing for cracks or plastic damage. Pay special attention to the insulation near the input ports.
- Follow the instructions in this manual to select the correct input ports and settings, ensuring measurements are within the specified range. Do not use this product in explosive gas or vapor environments or humid conditions.
- Do not use the product with the front or back cover open.
- If the battery voltage is low, it may affect the accuracy of test results — please recharge the device promptly.
- Before LCR measurement, ensure the circuit is not live and discharge capacitors before starting the measurement.

Meter panel instructions

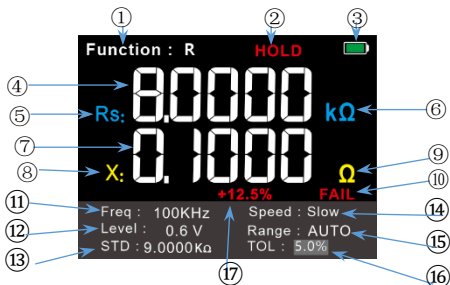


Display interface instructions



1	Measuring function	Display measuring functions: Auto, resistance, capacitance, inductance, impedance, electrolytic capacitance, battery internal resistance
2	HOLD	Indicates that it is currently in data save mode
3	Battery symbol	Displays the current battery level status
4	Master display value	Display the main parameter measurements
5	Functional symbols	Displays the symbols for the current measurement function, where s represents series equivalent and p represents parallel equivalent.
6	Unit symbol	Displays the unit symbol of the current main parameter measurement
7	Secondary display values	Display sub-parameter measurements
8	Sub-parameters	Displays the secondary parameter function symbol for the current measurement











Show interface instructions



9	Unit symbol	The unit symbol that displays the value of the subparameter of the current measurement
10	Results	Display measurement results in tolerance mode judgement, PASS or FAIL
11	Frequency	Display the set measurement frequency
12	Levels	Display the set measurement level
13	Nominal value	Show the nominal value set in tolerance mode
14	Speed	Display the set measurement speed
15	Measuring Range	Displays the set resistance test range
16	Tolerance	Shows the allowable error range set in tolerance mode
17	Tolerance values	Displays the percentage of the margin of error between the measured physical value and the nominal value

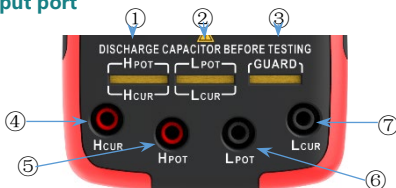
Panel key function description



-  **Power Button:** Press this button to turn the instrument on or off.
-  **Frequency Button:** Press this button to select different measurement frequencies.
-  **Level Button:** Press this button to select different measurement levels.
-  **Measurement Speed button:** Press this key to select different measurement speeds.
-  **Secondary parameter selection Button:** Press this button to switch the display of different secondary parameter values.
-  **Setting Button:** Short press this button to switch the measurement equivalent mode, and long press this button to enter the system setting interface.
-  **Main parameter selection Button :** Press this button to switch between different functional measurements.
-  **Arrow Button:** Press the up and down button to move the selection function menu, press the left and right button to modify the setting parameters.
-  **HOLD/REC Button:** Press this button briefly to hold the measurement data, and press and hold it to enter measurement recording mode and toggle the connection with the host computer.
-  **REL/TOL Button:** Press this button briefly to enter tolerance measurement mode, and press and hold it to reset the main parameter value to zero.

LCR functional measurement introduction

Measure input port



1	High-end input	Built-in gold-plated clip to insert the test piece pin, or a positive pin if the test piece has polarity
2	Low-end input	Built-in gold-plated clip to insert the part under test pin, or negative pin if the part under test has polarity
3	Ground end	Measure the grounding end of the connection wire
4	Hcur	Current sampling high end, connect the Kelvin clip red line
5	Hpot	Voltage sampling high end, Kelvin clamp wire
6	Lpot	Voltage sampling low end, connect Kelvin clip black wire
7	Lcur	Current sampling low end, connect Kelvin clip black wire

Note:

- The pin of the part under test can be inserted directly into the 1 and 2 ports for measurement.
- 4, 5, 6, and 7 are the 4-wire input ports, and the 4-wire terminals inserted into the random distribution clamp the pins of the parts under test for measurement.
- Voltage and live devices are not measured at this port.

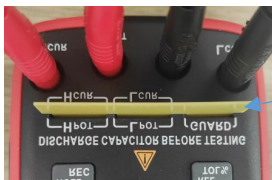
LCR measurement function introduction

Measurement Methods

1. Power on the device. When the measurement interface displays normally, the internal circuit will stabilize within a few seconds, and the measurement can begin.
2. Insert the 4-wire Kelvin clips . Clip the test leads to both ends of the test object. Alternatively, insert the test object's pins directly into the clip input terminal.
3. Read the measurement value on the screen.

Note:

- a. Do not apply voltage to the LCR port. Before measuring, make sure the circuit is de-energized and discharge any capacitors.
- b. When using 4-wire measurement, it is recommended to insert the included insulation spacer between the clips to improve measurement accuracy.



Insulation
isolation sheet

- c. When measuring low load and high impedance load, it is recommended to use the clip input terminal, as it has lower stray parameters and provides more accurate results.
- d. Due to the varying AC characteristics of different components and circuits, selecting the appropriate measurement frequency, voltage level, and equivalent mode according to the test object's properties can improve measurement accuracy. You can refer to the following recommended settings.

LCR measurement function introduction

Measure resistance

1. Use the AUTO mode or manually adjust to the resistance mode, then clip the probes to both ends of the resistor.
2. When measuring low resistance, ensure the surface has sufficient contact. Oxidation on the surface can affect the measurement accuracy.
3. For high resistance and low resistance measurements, it is recommended to use the clip input terminal.

Measure capacitors

1. Use the AUTO mode or manually adjust to the capacitance mode, then clip the probes to both ends of the capacitor.
2. Before measuring the capacitance, ensure the capacitor is discharged to prevent any stored charge from damaging the instrument.
3. If the measurement value exceeds the range, the screen will display "OL".

For measuring capacitors above 1uF, selecting 1KHz or 100Hz frequency is more suitable; for measuring capacitors below 1uF, 1KHz or 10KHz frequency is recommended.

Measure inductance

1. Use the AUTO mode or manually adjust to the inductance mode, then clip the probes to both ends of the inductor.
2. For measuring inductors above 1H, selecting 1KHz or 100Hz frequency is more suitable; for measuring inductors below 1H, 1KHz or 10KHz frequency is recommended.
3. When using auto range and large inductance measurements result in significant errors, manually switch to the appropriate range for more accurate measurement. Refer to the following range setting method for guidance.

LCR measurement function introduction

Range setting

Press the left or right arrow key to select the range, then use the up or down arrow key to adjust the range setting.

1. The available ranges are Auto, 100 Ω , 1K Ω , 10K Ω , and 100K Ω . Typically, the Auto mode is selected.
2. If you need to observe the characteristics under different ranges or if certain special impedance devices are not measured accurately, you can manually select the range.
3. When the impedance of the device under test is unclear, start by selecting the 100 Ω range and gradually increase the range. The higher the range, the more accurate the result. If the measurement result fluctuates too much, lower the range setting.

Level setting

Press the left or right arrow key to select the level, then use the up or down arrow key or the LEVEL key to adjust the level setting.

The available level settings are 0.1V, 0.3V, and 0.6V. Typically, the 0.6V level is chosen for measurements. When performing online measurements, select 0.3V or 0.1V to avoid applying excessive excitation voltage that may trigger other devices.

Speed setting

Press the left or right arrow key to select the speed, then use the up or down arrow key or the SPEED key to adjust the measurement speed.

The available speed settings are slow, medium, and fast. Typically, slow speed is chosen to ensure more stable measurements. However, you can adjust the speed to medium or fast based on the actual measurement requirements.

LCR measurement function introduction

Frequency setting

Press the left or right arrow key to select the frequency, then use the up or down arrow keys or the FREQ key to adjust the frequency range.

1. The available frequencies are 100Hz, 120Hz, 1kHz, 10kHz, and 100kHz. Typically, 1kHz is used for measurement.
2. To view the device characteristics at different frequencies, press the FREQ key to switch between them.

Equivalent mode settings

Press the left or right arrow key to select the equivalent mode, then use the up or down arrow key to adjust it.

1. The equivalent modes are Auto, Series, and Parallel. Typically, the Auto mode is selected.
2. If you need to observe the device characteristics under different modes, press the left or right arrow key to switch between them.

Recommended measurement conditions reference table			
Component names	Specifications	Measuring frequency	Equivalent pattern
Capacitance	$<1\ \mu\text{F}$	$\geq 1\text{KHz}$	Automatic, parallel
Capacitors	$\geq 1\ \mu\text{F}$ (non-electrolytic capacitance)	$\leq 1\text{KHz}$	Automatic, parallel
Capacitors	$\geq 1\ \mu\text{F}$ (electrolytic capacitor)	$\leq 1\text{KHz}$	Automatic, series
Inductance	$<1\text{H}$	$\geq 1\text{KHz}$	Automatic, series
Inductance	$\geq 1\text{H}$	$\leq 1\text{KHz}$	Automatic, series
Resistance	$< 10\text{K}\Omega$	1KHz	Automatic, tandem
Resistance	$\geq 10\text{K}\Omega$	1KHz	Automatic, parallel

LCR measurement function introduction

Tolerance pattern

The purpose of the tolerance mode is to set a nominal value and an allowable error range based on measurement requirements. The actual measured value is automatically compared with the nominal value, generating a measurement judgment result and tolerance percentage. This mode is suitable for batch component screening and comparative measurement.

Short press the REL/TOL% key to enter or exit the tolerance mode. The screen will display the nominal value and tolerance fields.

Press the up/down keys to enter the nominal value setting. Use the left/right keys to move the decimal point, then adjust the value with the up/down keys.

Once the settings are complete, press the AUTO/S/P key to confirm and exit.

Recording mode

1. Press and hold the HOLD/REC key to enter the automatic measurement recording mode, synchronizing with the PC software function.

2. The TYPE-C port supports remote control and data acquisition using the SCPI standard instrument protocol.

System settings

1. Long press the AUTO key to enter the system settings menu, where you can set the language, backlight brightness, auto power-off time, buzzer, calibration settings, and restore factory settings.
2. Use the up and down keys to select the item to be set, then use the left and right keys to adjust the setting.
3. Once settings are complete, long press the AUTO key or short press the LCRZ key to exit the settings menu.

Calibrate Settings

➤ Bridge Calibration

Enter the settings menu and select "Bridge Calibration." You can input the following 12 resistance values: 0Ω, 10mΩ, 100mΩ, 1Ω, 10Ω, 100Ω, 1KΩ, 10KΩ, 100KΩ, 1MΩ, 10MΩ, OPEN. Calibration can also be done for individual resistance values.

1. Use the left and right keys to select the resistance value to calibrate, connect the corresponding standard resistor, and press the AUTO key to start the calibration. At this point, the screen's section will turn yellow.
2. The calibration process will take 45 seconds, so please be patient.
3. Calibration results: Green indicates OK, Red indicates NG. Press the LCRZ key to exit.

Notes:

- a. Use non-inductive resistors for calibration. Do not use wound resistors.
- b. For 10mΩ and 100mΩ standard resistors, it is recommended to use 4-wire resistors.
- c. For OPEN calibration, do not connect any resistors.

Additional Notes:

1. Although this product provides an open user calibration learning mode, it has been 100% calibrated before leaving the factory, and no additional calibration is necessary for users. If calibration is required in special situations, the above method can be followed.
2. If calibration values are inaccurate or distorted, simply restore the factory settings to return to the factory calibration values.

Firmware Upgrade:

1. While the device is powered off, press and hold the X/D/Q key, then simultaneously press the power button until the screen displays “USB-Boot.”
2. Connect the device to a computer using a TYPE-C data cable. The computer will recognize it as an LCR disk.
3. Copy the prepared firmware upgrade file into the LCR disk. The device will automatically start the upgrade process. Do not perform any operations during the upgrade.
4. Once the upgrade is complete, the screen will automatically switch to the measurement interface, indicating a successful upgrade.

Maintenance and Care


Except for battery replacement, do not attempt to repair this product or modify its circuitry unless you have the appropriate qualifications and the corresponding calibration, performance testing, and repair instructions.

Clean the product

Please use a damp cloth and a mild cleaner to clean the exterior. Do not use corrosive agents or solvents. Dust or moisture on the testing ports may affect the accuracy of readings.

*Before cleaning the product, please remove all input signals.

Battery Charging

When the battery icon appears as " " in the upper-right corner of the screen, it indicates that the device needs to be charged. Follow these steps:

1. Insert the included TYPE-C data cable and connect it to a DC 5V output adapter to charge.
2. During normal charging, the charging indicator light will be red.
3. Once fully charged, the charging indicator light will turn green.

Technical indicators

<i>General Technical Indicators</i>	
Display (TFT)	2.8 inches, 320*240
Measuring range	Auto
Material	ABS+TPE
Sampling rate	Adjustable
Data hold	√
Screen backlighting	√
Low battery tips	√
Automatic shutdown	√

<i>Mechanical technical index</i>	
Dimensions	177*89*40mm
Weight	345g (without battery)
Battery type	2000mAh lithium battery * 1
Warranty period	One year

<i>Environmental technical indicators</i>		
Working environment	Temperature	0 ~ 40 °C
	Humidity	< 75%
Storage environment	Temperature	- 20 ~ 60 °C
	Humidity	< 80%

Technical indicators of hand-held bridge

Functional characteristics	Instructions
Measuring function	Automatic、resistance、capacitor、inductance、impedance、electrolytic capacitor
Main Parameters	L, C, R, Z
Subparameters	X, D, Q, θ , ESR
Equivalent mode	Series, parallel
Inductive range	0~100H
Capacitance range	0~100000uF
Resistance range	0 ~ 10 m Ω
Test frequency	100Hz, 120Hz, 1KHz, 10KHz, 100KHz
Test level	0.1V, 0.3V, 0.6V
Highest accuracy	0.3%
Measuring speed	1 second/time, 2 seconds/time, 4 seconds/time
Output impedance	100 Ω
Language	Chinese, English
Brightness	25%, 50%, 75%, 100% adjustable
Automatic shutdown	15 minutes, 30 minutes, 45 minutes, 60 minutes, turn off
Buzzer	Open and close
Bridge calibration	Short circuit, open circuit
Endurance time	13h

Refer to the precision comparison table

Types	Range	100/120Hz	1KHz	10KHz	100KHz
Capacitance	1mF~100mF	5% ± 5	5% ± 5	---	---
	1uF~1mF	1% ± 5	1% ± 5	---	---
	1nF~1uF	2%±5	0.5% ± 5	0.5% ± 5	1% ± 5
	1pF~1nF	---	1.5% ± 5	2% ± 5	2% ± 5
Inductance	1H-100H	3% ± 5	3% ± 5	---	---
	1mH~1H	0.5% ± 5	0.5% ± 5	---	---
	10uH~1mH	3% ± 5	0.5% ± 5	0.5% ± 5	1.5% ± 5
	1uH~10uH	---	3% ± 5	3% ± 5	4% ± 5
Resistance	100KΩ ~ 10MΩ	5% ± 5	3% ± 5	---	---
	1 kΩ ~1 00KΩ	0.4% ± 5	0.3% ± 5	0.3% ± 5	0.5% ± 5
	1Ω~1 KΩ	1.5% ± 5	0.3% ± 5	0.3% ± 5	0.5% ± 5
	0.01 Ω to 1Ω	4% ± 5	3% ± 5	3% ± 5	5% ± 5

Bridge symbol Description

Symbol	Description	Symbol	Description
R	Resistance	LEVEL	Voltage Level
C	Capacitance	SPEED	Measurement Speed
L	Inductance	AUTO	Auto mode
Z	Impedance	SETUP	Setup Mode
X	Reactive	HOLD	Hold Function
D	Wear and tear	BATT	Battery Internal Resistance
Q	Factor of quality	REC	Record Mode
Theta.	Phase Angle	TOL	Tolerance Mode
ESR	Equivalent resistance	REL	Relative Value
S	Tandem equivalent	Hpot	Voltage Sampling High End
P	Parallel equivalent	Hcur	Current Sampling High End
ECAP	Electrolytic capacitor	Lpot	Voltage Sampling Low End
FREQ	Frequency	Lcur	Current Sampling Low End

