

# LCR-Reader

## Consumer's Choice LCR-Meter

- Auto LCR/ESR measurements
- Li-Ion Rechargeable Battery
- Basic accuracy of 1.0%
- High Quality
- Low Price
- Weighs 1oz



# Safety Notices

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## **CAUTION**

Caution must be observed to avoid minor injury to yourself or damage to the product or other property.

## **Warning**

Warnings must be followed carefully to avoid personal injury, death or damage to the product or other property.

## **Safety Considerations**

Read the information below before using this metre. This metre is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. The following general safety precautions must be observed during all phases of operation, service, and repair of this metre. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards for design, manufacture, and intended use of the metre. LCR Research assumes no liability for the customer's failure to comply with these requirements

## **Caution**

- Disconnect power and discharge all high-voltage capacitors before testing
- De-energize circuits before connecting them to probes when measuring in-circuit components
- Battery must be charged by a power source with output voltage of DC 5V +/- 5%
- Indoor use only at altitudes up to 2000 meters

## **Warning**

- Use this meter only as specified in this manual; any unauthorized use will render the warranty null and void
- Inspect the meter before use; looking for any faults. Do not use if broken
- Do not touch exposed metal during measurement; keep fingers on insulated sleeves
- Do not use if meter is operating abnormally
- Do not operate in wet environments, around vapour or explosive gases.
- Do not get meter wet. Dry by authorized personnel only.
- Use only authorized replacement parts when repairing or maintaining device
- If replacing the battery, dispose of in battery recycling. Never dispose of batteries in household waste or in an incinerator
- Do not use damaged cables or chargers. Do not charge in damp environments. Damage to the device, property or self may occur.

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# Overview

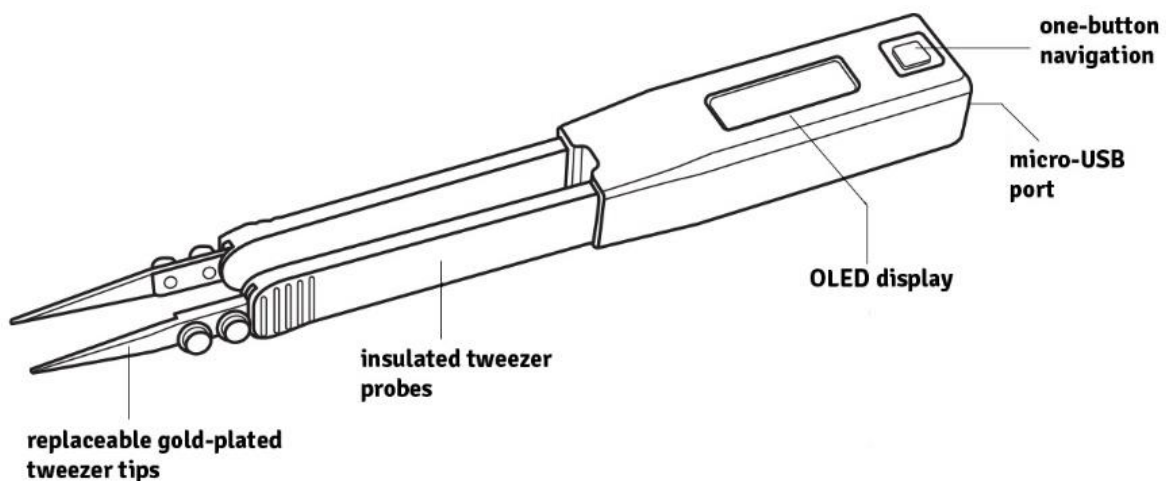
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## Product Overview

The LCR-Reader is a 1 oz. weight LCR-meter that is ultimately portable while still offering a high basic accuracy of 1%. It is an indispensable tool for testing and troubleshooting Surface Mount Technology in all aspects from manufacturing, lab-work, repair and maintenance, etc.

The unique design combines a set of gold-plated tweezers and an LCR-meter with test frequencies of 100Hz, 1kHz, and 10kHz. The tweezers are able to gain a full contact hold on all components to a 0201 size, either loose or mounted. It significantly reduces time wasted with fully automatic diagnosis of components and instantaneous measurement results.

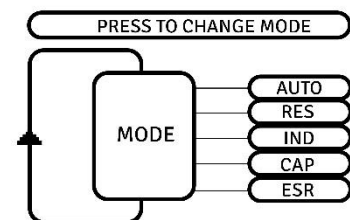
## Features and Functions



## Navigation

LCR-Reader is controlled with one button. To wake the device up, simply press the button.

To select a measurement mode, press the button. The device cycles through the modes with each press.



## Charging the Battery

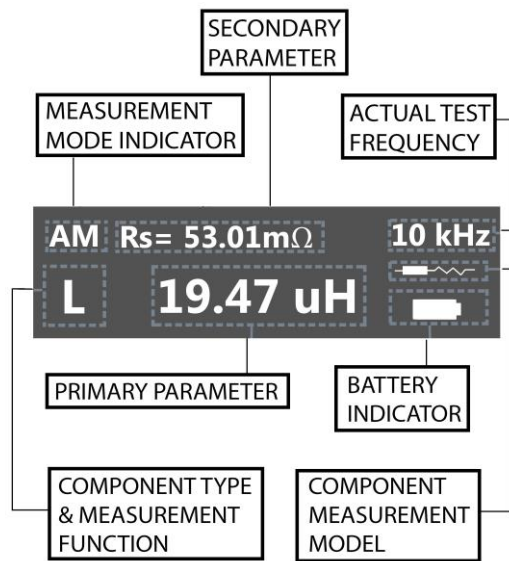
The battery icon on the bottom-right of the display gives an indication of the remaining charge. This icon will be filled in when the battery is full and will "empty" as the battery depletes.

The LCR-Reader is powered by a Li-Ion battery and is rechargeable via a micro-USB. To charge the battery, simply plug the device into a power source like a computer or USB-wall adapter. The adapter should have an output voltage of 5V+/- 5% with an output current of 100 mA or greater.

It takes about 2 hours for a full charge, and will last up to 80 hours of continuous use.

## General Display Overview

The LCR-Reader's OLED display is divided into sections.



*Primary Parameter:* The Primary Parameter is located in the middle of the screen and uses the largest font. In the example, the main impedance value is 144.3 pF

*Secondary Parameter:* The Secondary Parameter is located on the top of the screen. This is where the ESR values can be found and other minor impedance readings.

*Measurement Mode:* Shown in fig.1 as 'AM', this indicates that the device will automatically determine the type of component being evaluated. The device

will automatically select the proper measurement mode.

*Component Type and Measurement Function:* The LCR-Reader will display what test mode it is operating under. When measuring a Capacitance, the device will show C, R for Resistance, and L for Inductance

*Test Frequency:* The device is evaluating components with the frequency shown; 100Hz, 1kHz, 10kHz

*Battery Icon:* This shows the battery's remaining power.

## Display Indicators

### Measurement Units

In the following table, the different icons and indicators are explained

Display Indicators	
Indicator	Description
A	'Automatic' measurement mode
L	'Inductance' measurement mode

C	'Capacitance' measurement mode
R	'Resistance' measurement mode
100 Hz	100 Hz test frequency
1 kHz	1 kHz test frequency
10 kHz	10 kHz test frequency
AC	Automatic circuit mode selection
█	Battery level indicator

## Measurement Units

The following table outlines the primary display measurements

Measurement Units Display	
Legend	Description
M	Mega 1E+06 (1000000)
K	Kilo 1E+03 (1000)
m	Milli 1E-03 (0.001)
u	Micro 1E-06 (0.000001)
n	Nano 1E-09 (0.000000001)
p	Pico 1E-12 (0.000000000001)
uH, mH, H	Henry, units for inductance measurement
pF, nF, uF, mF	Farad, units for capacitance measurement
mΩ, Ω, kΩ, MΩ	Ohm, units for resistance and impedance measurement
Hz, kHz	Hertz, units for frequency measurement

## Care and Maintenance

**Warning:** To avoid electrical shock or damage to the device, keep the insides of the housing dry. Use damp clothes with little to no extra moisture. Be sure that all parts are dry before storage.

The LCR-Reader may need cleaning or maintenance after an extended period of time.

To clean the device, wipe down with a damp, gentle cloth. Be sure to not have extra moisture left on the device.

Clean the case out with a damp cloth and mild detergent.

To clean the tips, screws and arms wipe with rubbing alcohol.

The tips may wear out over time due to use; this may cause readings to be slightly inaccurate. To replace the tips, remove the screws and washers and remove the tips. Wipe the arms down with rubbing alcohol as to remove any debris. Replace the tips.

*Note: when replacing the tips, turn the device on and pay attention to the screen. If the device shows a reading, remove the tips again and wipe down with alcohol. Sometimes debris gets caught between the arms and tips causing the device to show values.*

# Making Measurements

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LCR-Reader is capable of fully automatic measurements, with the ability to select manual test modes for specific tasks. When a component is in contact, the device will automatically determine the type of component while in 'Automatic Mode'; all measurement values, including any secondary value, are automatically displayed.

To manually select the measurement mode, press the button. For more information, see the *Navigation* section of this manual

**Warning:** To avoid electrical hazards and possible damage to the meter or to the equipment under test, always discharge the capacitor to be tested before measuring. For in circuit measurements, always disconnect the circuit power and discharge all high-voltage capacitors before testing.

# Specifications

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## Technical Specifications

Test Frequency:	1 kHz, 10 kHz, 100Hz
Test Signal Level:	0.45 +/- 5% Vrms Sine wave
Source Impedance:	62.5Ω/1K Ω/15kΩ +/- 1%

## Measurement Ranges

Resistance R:	0.1 Ω to 10 Ω
Capacitance C:	2 pF to 5mF
Inductance L:	0.5 uH to 999 mH

## Physical Specifications

Size:	14.8 x 2.0 x 1.5 cm (5.8 x 0.76 x 0.57 in)
Weight:	29 grams (0.063 lb)
Display:	0.91-inch, 128x32 OLED display
Battery Type:	3.7V LiPO Rechargeable 220 mAh
Battery Life:	40 hours (2 hour charging cycle)
Charging Source:	USB port USB power adapter (output voltage DC 5V +/- 5%)
Storage Compliance:	-20° to 60°C, 0% to 80% RH
Operating Temperature:	0°C to 50°C
Safety and EMC Compliance:	IEC61000-4-2 ESD (4 kV Contact, 8 kV Air) EN 61000-4-3 Radiated Immunity IEC61000-4-8 Magnetic Field Immunity FCC15/EN 55011/ICES-003 – Class A, Radiated Emissions FCC15 Class A Conducted Emissions
Calibration Cycle:	1 year

*Note: Battery life may vary by use, configuration and other factors.*



# Warranty

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**Notice:** To the best of our knowledge this document is believed to be accurate. The manufacturer reserves the right to change the information and does not assume any responsibility for omissions and/or errors found in this document.

**Warranty:** Manufacturer warrants his product to be free from defects in materials and workmanship for a period of one (1) year from the shipment date. Manufacturer warrants the following items for ninety (90) days from the date of shipment: rechargeable batteries, disks and documentation. During the warranty period, the manufacturer will, at its discretion, either repair or replace any product that proves to be defective. To exercise this warranty, write or call your local distributor. You will be given prompt assistance and return instructions. Please send the product with shipping prepaid to the indicated service facility. Repairs will be made and the product will be returned to you. Repaired or replaced products are warranted for the balance of the original warranty period, or ninety (90) days from the date of the repair.

This warranty does not cover the repair of any product whose serial number has been altered, defaced or removed. This warranty does not cover finishes (scratches on surface or screen), normal wear and tear, nor does it cover damage resulting from misuse, dirt, liquids, proximity or exposure of heat, accident, abuse, neglect, misapplication, operation outside of the environmental specifications, tampering, unreasonable use, service performed or attempted by an unauthorized service centres, failure to provide reasonable and necessary maintenance.

This warranty does not apply to defects resulting from product modification without manufacturer's express written consent, or misuse of any product or part. This warranty also does not apply to software, non-rechargeable batteries, damage from battery leakage, and improper polarity of the batteries or problems arising from normal wear or failure to follow instructions. This warranty does not cover LCD damage, physical damage to the jog dial button, slide switch and reset switch; electrical damage of the product due to high voltage or improper battery type.

The design and implementation of any circuit based on this product is the sole responsibility of the customer. Manufacturer does not warrant any damage that occurs as result of the user's circuit or any defects that result from user-supplied products. This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of factory including, but not limited to. Operation contrary to furnished instructions, shipping accidents, modification or repair by the user, neglect, accidents or others acts of God.

The foregoing is in lieu of all other expressed warranties and the manufacturer does not assume or authorize any party to assume for it any obligation or liability. The duration of any warranties that may be implied by law (including the warranties of merchantability and fitness) is limited to the term of this warranty. In no event shall the manufacturer be liable for special, incidental or consequential damages arising from ownership or use of this product, or for any delay in the performance of its obligations under this warranty due to causes beyond its control. This warranty is limited in duration to one (1) year from the date of the original purchase.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. The remedies provided herein are buyer's sole and exclusive remedies. Neither manufacturer, nor any of its employees, shall be liable for any direct, indirect, special, incidental or consequential damages arising out of the use of its devices and software even if manufacturer has been advised in advance of the possibility of such damages. Such excluded damages shall include, but are not limited to: costs of removal and installation, losses sustained as the result of injury to any person, or damage to property.