**Irfora LAKUSE20198EU**

# Bench Digital LCR Meter

## User Manual

## 1. Introduction

This user manual provides detailed instructions for the operation, maintenance, and troubleshooting of the Irfora Bench Digital LCR Meter. This high-precision instrument is designed for accurate measurement of inductance (L), capacitance (C), and resistance (R) across a wide frequency range.
Featuring a 3.5-inch LCD screen and a user-friendly interface, the meter supports multiple test frequencies and levels, offering a basic accuracy of 0.1%. It includes USB and RS232 communication interfaces for remote operation and a handler interface for automated component sorting.

## 2. Safety Information

**WARNING: To prevent electric shock or damage to the instrument, please read and follow all safety instructions carefully before operation.**

- Ensure the correct power voltage (AC 200-240V, 50/60Hz) is used as specified on the device.
- Do not operate the meter in wet or damp conditions.
- Do not open the instrument casing; there are no user-serviceable parts inside. Refer all servicing to qualified personnel.
- Always disconnect the power cord before cleaning or moving the instrument.
- Use only the provided accessories (Kelvin Alligator Clip, power cord, fuses).
- Avoid exposing the instrument to extreme temperatures or direct sunlight.

## 3. Product Overview

The Irfora Bench Digital LCR Meter is designed for precision and ease of use. Below are the key components and features of the device.

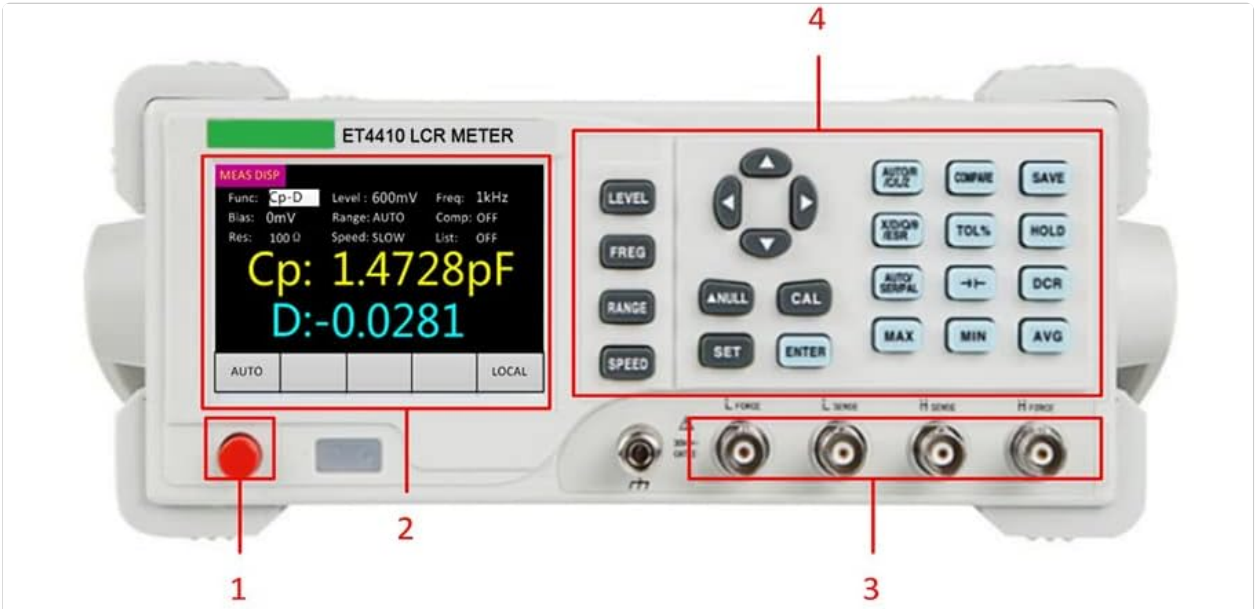

Figure 3.1: Front view of the Irfora Bench Digital LCR Meter, showing the display and control panel.

## 3.1 Front Panel Layout


Figure 3.2: Detailed view of the front panel with numbered components for identification.

| Number | Description |
|---|---|
| 1 | The power switch |
| 2 | 3.5-inch LCD display |
| 3 | Grounding and test terminals (H Force, H Sense, L Sense, L Force) |
| 4 | Basic function keys (LEVEL, FREQ, RANGE, SPEED, ANULL, CAL, SET, ENTER, AUTO/ICLZ, COMPARE, SAVE, TOL%, HOLD, DCR, MAX, MIN, AVG) |

## 3.2 Rear Panel Layout




| number | instructions |
|---|---|
| 1 | The power switch |
| 2 | 3.5-inch LCD. |
| 3 | Grounding and test terminals. |
| 4 | Basic function keys. |

Figure 3.3: Detailed view of the rear panel with numbered components for identification.

| Number | Description |
|---|---|
| 1 | Power supply plug base and fuse case |
| 2 | Voltage selector |
| 3 | RS232 interface |
| 4 | USB Device interface |
| 5 | Handler interface |

## 3.3 Display Features


Figure 3.4: The 3.5-inch LCD screen provides clear, 5-digit measurement readings and parameter settings.

The 3.5-inch LCD screen displays measurement results, selected parameters (e.g., L, C, R, Z, X, D, Q, θ, ESR), test frequency, test level, bias voltage, and other operational settings. The 5-digit display ensures high resolution for precise readings.

## 3.4 Adjustable Handle


Figure 3.5: The integrated handle can be adjusted to various positions, allowing for flexible viewing angles and improved usability on a workbench.

## 4. Setup

Follow these steps to set up your Irfora Bench Digital LCR Meter for first use.

1. **Unpacking:** Carefully remove the LCR meter and all accessories from the packaging. Verify that all items listed in the package list are present: Bench Digital LCR Meter, Kelvin Alligator Clip, 2 Fuses, Power Cord, User Manual (English).
2. **Power Connection:**
   - Ensure the voltage selector (2 on Figure 3.3) on the rear panel is set to the correct voltage for your region (AC 200-240V).
   - Connect the provided power cord to the power supply plug base (1 on Figure 3.3) on the rear panel of the meter.

- Plug the other end of the power cord into a grounded electrical outlet.

3. **Initial Power On:** Press the power switch (1 on Figure 3.2) located on the front panel to turn on the device. The LCD screen (2 on Figure 3.2) will illuminate and display the startup sequence.
4. **Connecting Test Leads:** Connect the Kelvin Alligator Clip to the grounding and test terminals (3 on Figure 3.2) on the front panel. Ensure a secure connection for accurate measurements.

## 5. Operating Instructions

This section details the basic operation and advanced functions of the LCR meter.

### 5.1 Basic Measurement

1. **Power On:** Turn on the LCR meter using the power switch.
2. **Connect Component:** Connect the component to be measured to the Kelvin Alligator Clip.
3. **Select Measurement Function:** Use the function keys (4 on Figure 3.2) to select the desired measurement parameter (L/C/R/Z). The primary and secondary parameters (X/D/Q/θ/ESR) will be displayed automatically.
4. **Adjust Frequency:** Press the **FREQ** button to cycle through available test frequencies (100Hz, 120Hz, 200Hz, 400Hz, 800Hz, 1KHz, 2KHz, 4KHz, 8KHz, 10KHz, 15KHz, 20KHz, 40KHz, 50KHz, 80KHz, 100KHz).
5. **Adjust Test Level:** Press the **LEVEL** button to select the desired test signal level (100mV, 300mV, 600mV, 1000mV, 1500mV, 2000mV).
6. **Read Measurement:** The measurement results will be displayed on the 3.5-inch LCD screen.

### 5.2 Correction Functions

The meter supports Open Circuit Correction and Short Circuit Correction to improve measurement accuracy, especially for low-value components or long test leads.

- **Open Circuit Correction:** With no component connected to the test terminals, press the**CAL** button and follow the on-screen prompts for open circuit correction.
- **Short Circuit Correction:** Short the test terminals together (e.g., using a shorting bar or by touching the alligator clips together), then press the **CAL** button and follow the on-screen prompts for short circuit correction.

### 5.3 Screening and Comparator Functions

The screening function allows setting tolerance levels for component sorting, while the comparator function enables automatic sorting into qualified and failed bins.

- **Tolerance Setting:** Use the **TOL%** button to set tolerance levels from -100% to 100%, with fixed points at 10%, 25%, and 50%.
- **Comparator Sorting:** The comparator function offers 5 gear sorting, including 3 qualified gears, 1 failed gear, and 1 ancillary gear. This is particularly useful when using the Handler interface for automated testing.

### 5.4 Communication Interfaces

The meter is equipped with USB, RS232, and Handler interfaces for remote control and data acquisition.

- **USB Interface:** Connect the meter to a computer via the USB port (4 on Figure 3.3) for data logging and remote control using compatible software.
- **RS232 Interface:** The RS232 port (3 on Figure 3.3) allows for serial communication with external systems.
- **Handler Interface:** The Handler interface (5 on Figure 3.3) is designed for integration into automated test systems, facilitating rapid component sorting based on set criteria.

## 6. Maintenance

Proper maintenance ensures the longevity and accuracy of your LCR meter.

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the instrument. For stubborn dirt, a slightly damp cloth with mild detergent can be used, but ensure no liquid enters the device. Do not use abrasive cleaners or solvents.
- **Storage:** When not in use, store the meter in a clean, dry environment away from direct sunlight, dust, and extreme temperatures.
- **Fuse Replacement:** If the meter does not power on, check the fuse located near the power input on the rear panel (1 on Figure 3.3). Replace with a fuse of the same type and rating (AC 250V 500mA). Always disconnect the power cord before replacing the fuse.
- **Calibration:** Regular calibration by qualified personnel is recommended to maintain the instrument's specified accuracy.

## 7. Troubleshooting

This section provides solutions to common issues you might encounter.

| Problem | Possible Cause | Solution |
|---|---|---|
| Meter does not power on | No power supply; Blown fuse; Power cord not connected properly | Check power outlet; Replace fuse (AC 250V 500mA); Ensure power cord is securely connected |
| Inaccurate readings | Test leads not properly connected; No Open/Short correction performed; Component damaged; Incorrect test frequency/level selected | Ensure secure connection of Kelvin clips; Perform Open/Short correction; Test with known good component; Adjust frequency/level as per component type |
| Display shows error message | Measurement range exceeded; Internal error | Adjust measurement range; Refer to specific error code in full manual (if applicable); Restart the device |

| Problem | Possible Cause | Solution |
|---|---|---|
| Communication issues (USB/RS232) | Incorrect cable; Driver not installed; Software settings incorrect | Use correct cable; Install necessary drivers; Verify software communication settings |

If the problem persists after attempting these solutions, please contact customer support.

## 8. Specifications

Detailed technical specifications for the Irfora Bench Digital LCR Meter.


Figure 8.1: Dimensions of the LCR meter: 305mm (12.01in) length, 265mm (10.43in) width, 105mm (4.13in) height.

| Parameter | Value |
|---|---|
| Model Number | LAKUSE20198EU |

| Parameter | Value |
| --- | --- |
| Screen | 3.5-inch LCD Screen |
| Digits | 5 Digits |
| Main Parameters | L, C, R, Z |
| Secondary Parameters | X, D, Q, θ, ESR |
| Inductance (L) Range | 0.001μH ~ 9999H |
| Capacitance (C) Range | 0.001pF ~ 9999μF |
| Resistance (R) Range | 0.0001Ω ~ 99.99MΩ |
| Basic Accuracy | 0.1% |
| Excitation Source Frequency | 16 Points (100, 120, 200, 400, 800, 1K, 2K, 4K, 8K, 10K, 15K, 20K, 40K, 50K, 80K, 100K Hz) |
| Measurement Display Speed | 2 times/s (slow), 5 times/s (medium), 10 times/s (fast) |
| Internal Bias | 0-1500mV Adjustable, 1mV Stepping |
| Test Level (Vrms) | 100mV, 300mV, 600mV, 1000mV, 1500mV, 2000mV |
| Correction Function | Open Circuit Correction, Short Circuit Correction |
| Screening Function | Tolerance -100%~100%, with fixed points of 10%, 25%, 50% |
| Comparator Selection | 5 Gear Sorting (3 Qualified, 1 Failed, 1 Ancillary) |
| Communication Interface | USB, RS232, Handler |
| Working Temperature | 0~40℃ |
| Working Humidity | 15-85% RH |
| Item Size | 305 x 265 x 105mm (12.01 x 10.43 x 4.13 inches) |
| Item Weight | 2111g (4.65lbs) |
| Voltage | AC 200-240V, 50/60Hz |

## 9. Warranty and Support

This product is subject to the standard return policy of 30 days for refund or replacement from the date of purchase. For extended coverage, protection plans are available:

- 3-Year Protection Plan

- 4-Year Protection Plan
- Complete Protect (monthly billing)

For technical support, warranty claims, or further assistance, please refer to the contact information provided by your retailer or the manufacturer, Irfora.