



Keysight LCR Meter SOP

Standard operating procedure for the Keysight brand of LCR meters.

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Step 1 — Layout



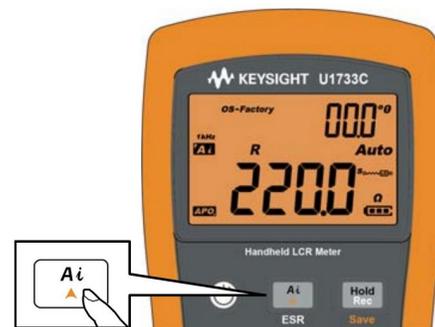
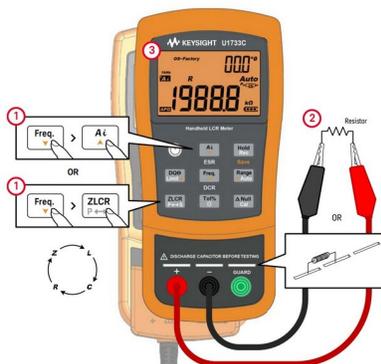
- Here is the layout for what you will be using. There are three components:
- Positive Test Lead (Red probe)
- Negative Test Lead (Black probe)
- Keysight U1733C LCR Meter

Step 2 — Setting Up



- The power button turns it on and off
 - You can connect a component in two different places
 - You can directly plug in the leads of a component into the component socket
 - Or you can connect a component with the between the two leads
 - If testing a polarized component, make sure you connect the appropriate leads to the positive and negative terminals on the LCR meter.
- ⚠ Make sure to discharge capacitors or any other charged components before testing to avoid potential damage to the meter or the equipment being tested**

Step 3 — Different Functions



- Press the **Freq.** key to select a suitable test frequency
- The **Ai** key will automatically identify the appropriate measurement required for the device-under-test (DUT).
- ① The **Ai** key is probably all you will need for most measurements
 - The **Ai** symbol will flash while the LCR meter identifies the DUT, and
 - Selects an appropriate measurement in the primary display (L, C, or R) and secondary display (D, Q, or θ),
 - Selects an appropriate range
 - Selects an appropriate measuring mode (series or parallel).
 - Alternatively, you can press the **ZLCR** key to switch to your desired measurement in the primary display (Impedance, Capacitance, Inductance, or Resistance).

Step 4 — Changing Measurements and Testing Modes (Advanced)



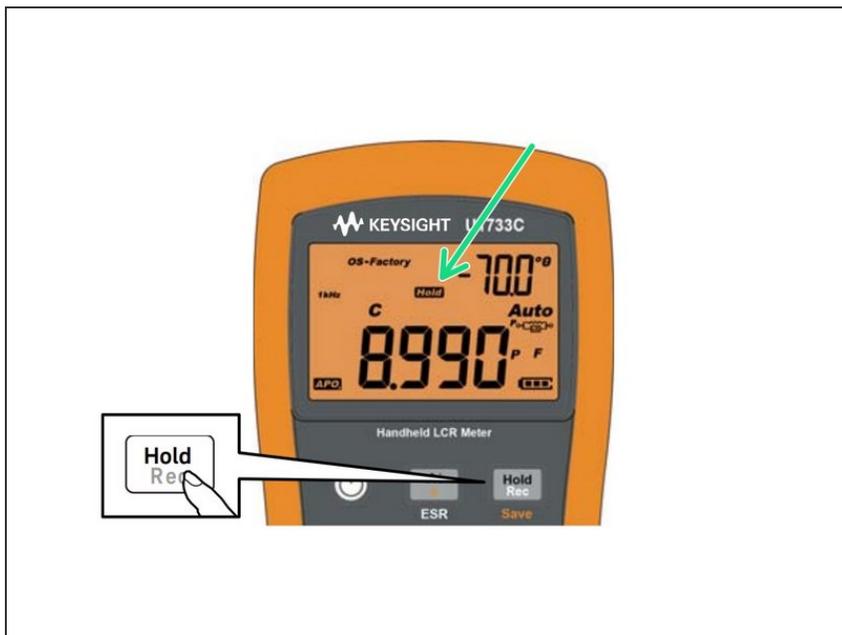
- If you are measuring Impedance, Capacitance, or Inductance, you can use the **DQ0** key to switch to your desired measurement.
- Your measurement will appear in the secondary display (Dissipation Factor, Quality Factor, or Phase Angle)
- The LCR meter can also test your component in series or parallel for all ranges
 - Press the **ZLCR** key for more than 1 second to toggle the parallel and series mode. Series mode is set as the default setting.
- To enable the tolerance mode, insert an appropriate component as a standard value into the component socket or connect the test clip to the component leads, then press the **Tol%** key to set this value as the standard reference tolerance
 - This function is designed for convenient component sorting. The beeper will beep three times whenever the component under test exceeds the setting tolerance. Conversely, when the beeper beeps once, this indicates that the component is within the setting tolerance.
- ⓘ The tolerance mode cannot be activated if it is shown on the display or when the tested capacitance value is below 50 counts.
- ⓘ Tolerance mode is only available in manual ranging; therefore, activation while in autoranging will automatically set the LCR meter to manual ranging.

Step 5 — ESR and DCR Measurement (Advanced)



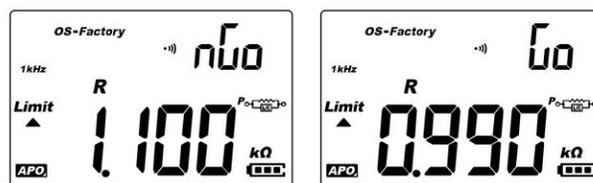
- Press **AI** for more than 1 second to select the ESR measurement. Use the ESR measurement to measure the equivalent series resistance of the capacitor, independent of its capacitance
- Press **Freq.** for more than 1 second to select the DCR measurement. The DCR measurement measures the resistance of an unknown component by 1 VDC.

Step 6 — Freezing Display and Static Recording (Advanced)



- **Freezing the Display (Hold)**
 - To freeze the display for any function, press the **Hold** key. The **Hold** annunciator is shown on the display while the Hold function is active.
 - Press **Hold** again to update the reading automatically once it is stable. The **Hold** annunciator flashes while waiting for the reading to be stable.
 - Press **Hold** for more than 1 second to release the Hold function.
- **Enabling the static recording mode (Rec)**
 - Press the **Hold** key for more than 1 second to enter the static recording mode.
 - Press **Hold** again to cycle through the Max, Min, Avg, or MaxMinAvg (present) input values.
 - To exit this mode, press and hold the **Hold** key for more than 1 second.

Step 7 — Setting Limit Comparison (Advanced)



● Setting the high/low limit comparison (Limit)

- The high and low limit comparison function helps you to sort components easily. There are 32 limit sets available (16 fixed factory sets, and 16 variable user sets).
- Press the **DQ0** key for more than 1 second to activate the high/low limit mode. The last-known set number (H## or L##) will be indicated in the secondary display.
- While the **Limit** annunciator is flashing, use the **Ai** or **Freq.** key to select an appropriate limit set.
- You may press **DQ0** or **Range** again to toggle between the high (H) or low (L) values shown on the primary display.
- Press **Hold** while the **Limit** annunciator is flashing to start the comparison. (If no activity is detected after 3 seconds, the comparison will also begin.) The LCR meter beeps three times and displays **nGo** in the secondary display if the reading is greater than the high limit or lesser than the low limit.
- If the reading is within the high and low limits, the meter beeps once and displays **Go** in the secondary display.

Step 8 — Relative Measurements (Advanced)

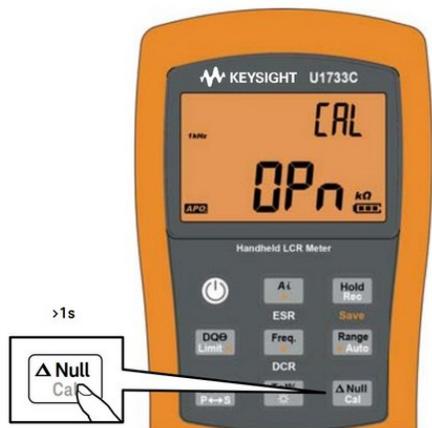


Figure 2-18 Using the Null function

- **Making relative measurements (Null)**
 - When making relative measurements, also called null, each reading is the difference between a stored (selected or measured) relative value and the input signal.
 - One possible application is to increase the accuracy of a resistance measurement by nulling the test lead resistance (test leads shorted). Nulling the leads is also particularly important prior to making capacitance measurements (test leads open).
 - Press the **ΔNull** key to enter the relative mode and store the display reading as a reference value. The LCR meter will then display all subsequent readings relative to the reference value.
 - The **Δ** annunciator is shown on the display while the relative mode is active. Press **ΔNull** again to exit the relative mode.
 - ⓘ The relative mode cannot be activated if the display value is **OL**.

- ① Relative mode is only available in manual ranging; therefore, activation while in autoranging will automatically set the LCR meter to manual ranging.

Step 9 — CAL Function (Advanced)



- **Performing the open/short CAL**
- The CAL function offsets (corrects) the LCR meter's internal parameters as well as external connector residues for further measuring. Performing this action will help you to correct the influence for temporary uses.
- ① It is highly recommended that open/short CAL be performed before making precision measurements.
- Press and hold the **ΔNull** key for more than 1 second to enter the open/short CAL mode for the selected frequency and range.
- Open/Short CAL prompts will be shown on the display. Follow the prompts for open connector (OPn) or short connector (SHor) connection and press the **ΔNull** key.
- After the open/short CAL is completed, the LCR meter will be restored to the normal display and ready for normal usage.