Using the **DC1000** with an E4980AL LCR meter

Voltech

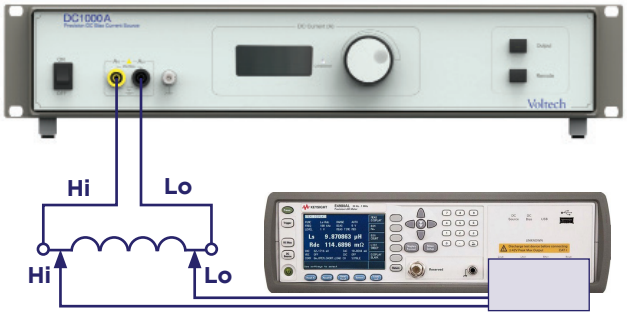
The high output impedance and intelligent compensation capabilities of the DC1000 allow it to be used with almost any manufacturer's LCR meter.

Using the test leads that were supplied with your DC1000 and with your LCR meter, it is fast and easy to setup your environment for testing any inductor under real DC bias loading.

SET-UP AND WARM-UP

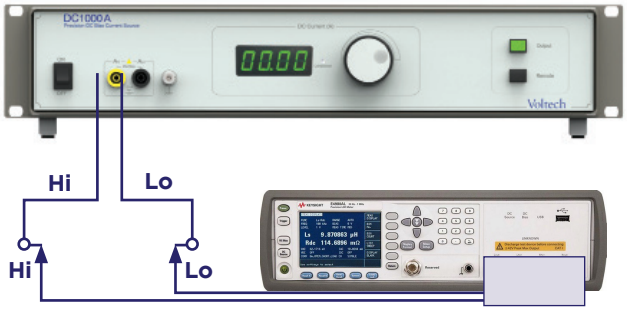
As with any measuring equipment, allow both the DC1000 and your LCR to warm up for 30 minutes to ensure stable readings.

Enable the DC1000 by fitting your **interlock system** to the **Interlock IN** port on the rear of the unit, or use **the Interlock Override plug** provided with the unit.



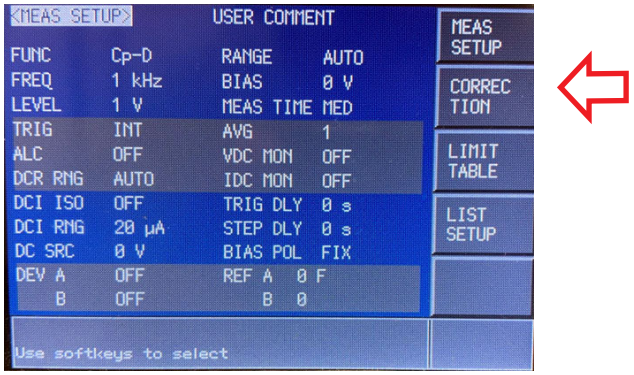
OPEN CIRCUIT COMPENSATION: SET-UP

1 Remove any **UUT** (unit under test)
2 Try to keep all test leads in the same position as when the UUT is present
3 Turn the DC1000 **ON**
4 Set the DC1000A to **0.00A**, using the rotary knob if needed
5 Set DC1000 output to **ON** (press "output" button)
6 Leave the wiring set up like this and proceed to the next step

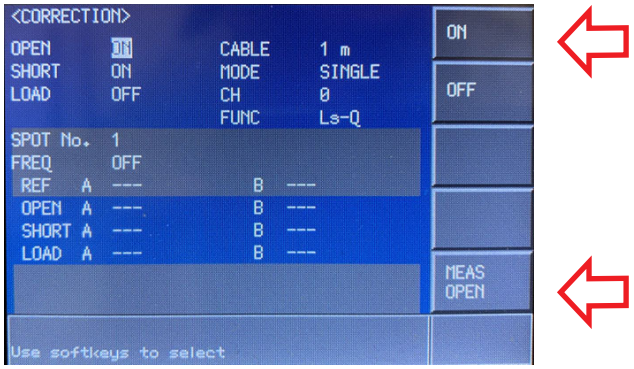


OPEN CIRCUIT COMPENSATION ON THE E4980AL

1 On the E4980AL, press the **MEAS SETUP** button
2 Use the soft keys to the right of the display to select **CORRECTION** (see below)

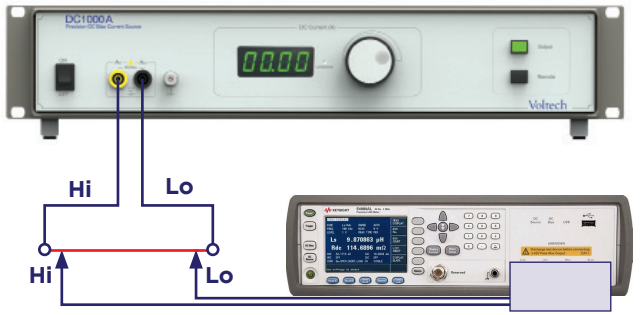


3 Using the Arrow keys, move the cursor down to **OPEN**
4 Press the soft key next to **ON** to enable the open circuit correction
5 Press the soft key next to **MEAS OPEN** and **wait**
6 The compensation process can take 60-120 seconds, during which the HP will compensate over all frequencies.
7 At the end of this process the HP will display "**OPEN measurement completed**" at the bottom of the screen



SHORT CIRCUIT COMPENSATION: SET-UP

1 Fit a **short** between all leads. A **bus bar** or thick copper wire is ideal for this, as it will give good contact to all four clips. Try to keep all test leads in the **same position** as when the UUT is present
2 Turn the DC1000 **ON**
3 Set the DC1000A to **0.00A**, using the rotary knob if needed
4 Set the DC1000 output to **ON** (press the "output" button)
5 Leave the wiring set up like this and proceed to the next step



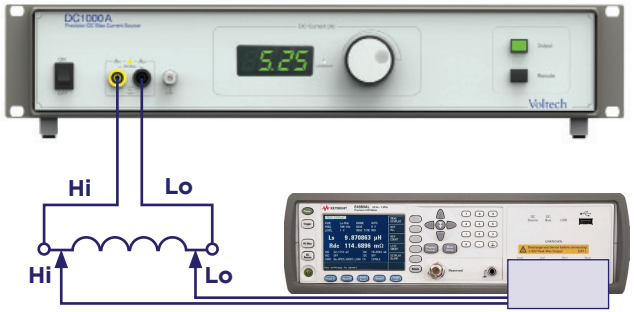
SHORT CIRCUIT COMPENSATION ON THE E4980AL

1 Move the cursor using the arrow keys down to **SHORT**
2 Press the soft key next to **ON** to enable the E4980AL short circuit correction
3 Press the soft key next to **MEAS SHORT** and **wait**
4 The compensation process can take 60-120 seconds, during which the HP will compensate over all frequencies
5 At the end of this process the HP will display "**SHORT measurement completed**" at the bottom of the screen

MEASURING UNDER LOAD: SET-UP

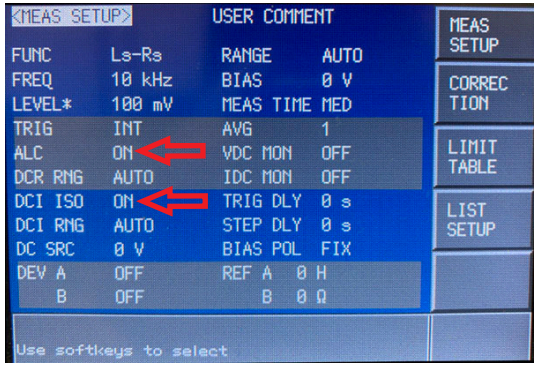
Once you have compensated the LCR for the leads and DC1000 you are ready to make measurements under load.

1 Turn the DC1000 output **OFF**
2 Add your **UUT** back into the circuit, attempting to keep the test leads in the **same position** as when compensating
3 Select the DC bias current you require using the rotary knob
4 Enable the DC bias current by pressing **OUTPUT**



PERFORMING MEASUREMENTS

1 Press **MEAS SETUP** on the E4980AL to return to the measure set up screen. Here, you should **ENABLE ALC** (auto level control) and also **ENBALE DCI ISO**



2 Press **DISPLAY FORMAT** on the E4980AL to return to the main screen. Using the cursors move down to **FUNC** and select the parameters you wish to measure using the soft keys. In this example we have selected **Ls** (Inductance) and **Rs** (Resistance)
3 Move the cursor down again to **FREQ** and then enter the frequency you require. If using the number pad to enter a frequency, remember to press **ENTER** to accept the frequency. Here we have selected **10kHz**
4 Move the cursor down again to **LEVEL** and enter the voltage required. In this example we have selected **0.1V**
5 Adjustments can be made to the DC bias level in real time with the DC1000 output enabled, and while the **E4980AL** is measuring, using the **rotary knob** on the **DC1000**

6 In our example (below), the inductance, see below, is **283.3uH @ 0A DC**

7 Once the DC bias level is increased above the saturation point of the core, the inductance of the transformer drops. see below, **102.2uH @ 3A DC**

By taking several readings over the range, you can easily plot a graph to show the characteristic saturation curve of the UUT.

BEST PRACTICE / WARNINGS

- **DO NOT** disconnect the UUT or E4980AL whilst the DC1000 is operating and ENABLED.
- Always remove the DC bias current by **disabling the OUTPUT** button before disconnecting either the UUT or the LCR
- Always try to keep all leads in the **same position** to improve the accuracy of the compensation, and hence the accuracy of your measurements
- For best performance connect the earth socket on the front of the DC1000 with the earth socket on the LCR meter
- Consult your E4980AL user documentation for more detailed instructions on compensation and general use