

# Using multiple DC1000s with an LCR meter

Voltech

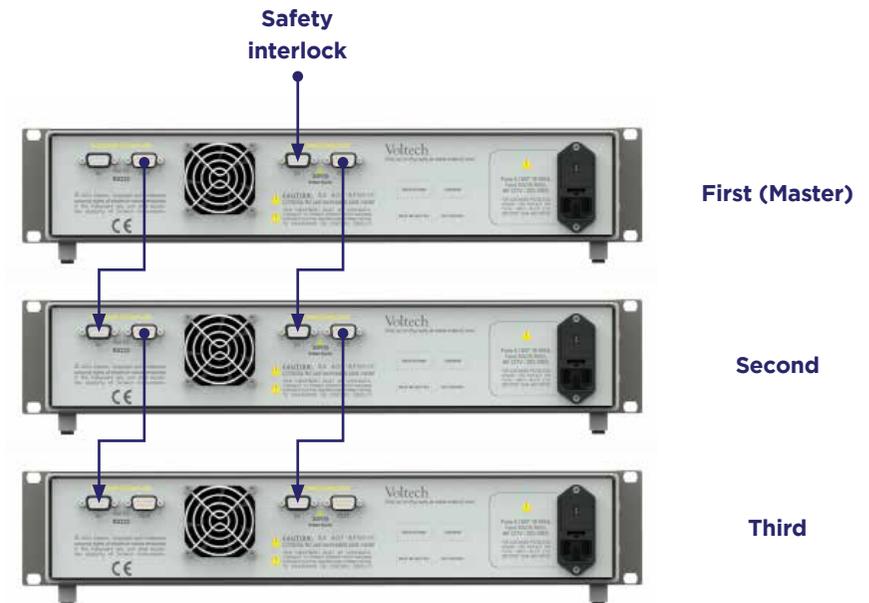
The DC1000A precision DC bias source features unique patented technology that permits its use with any LCR meter, decreases error currents by a factor of 10, and allows you to interconnect up to 20 units to achieve bias currents of up to 500A.

This document explains how to set up your environment to use multiple DC1000s with an LCR meter. As an example configuration, we will connect three DC1000As together to provide up to 75A, while measuring using an LCR meter.

## CONNECT RS232 AND INTERLOCKS

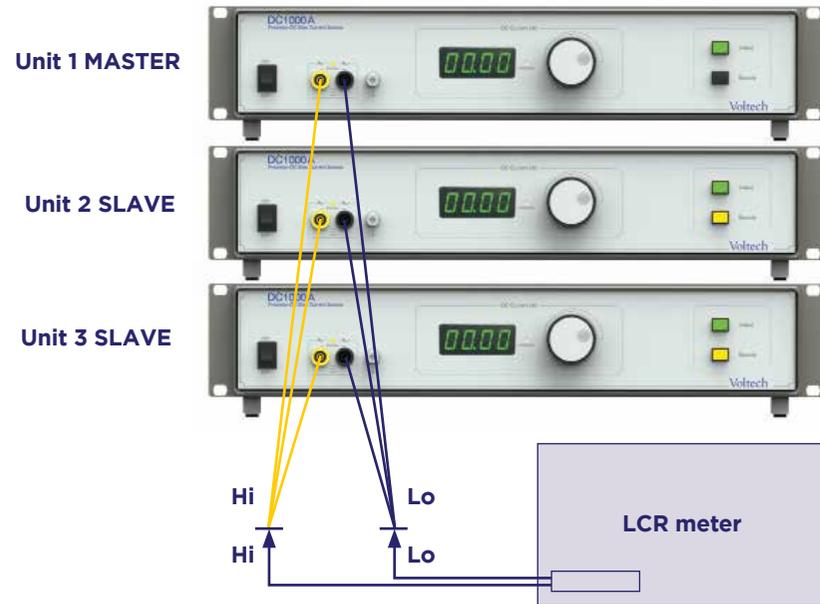
Using the **77-046** straight through 9w-9w M-F leads provided with the unit:

- 1 Connect **RS232 OUT** from the first DC1000 to the **RS232 IN** on the second DC1000
- 2 Connect **RS232 OUT** from the second unit to the **RS232 IN** on the third DC1000. The first unit will automatically become the **"MASTER"** unit and will control the other units in the chain
- 3 Insert your interlock system or interlock override plug into the **Interlock IN** on the first unit
- 4 Connect **Interlock OUT** on the first unit to **Interlock IN** on the second unit
- 5 Connect **Interlock OUT** on the second unit to **Interlock IN** on the third unit



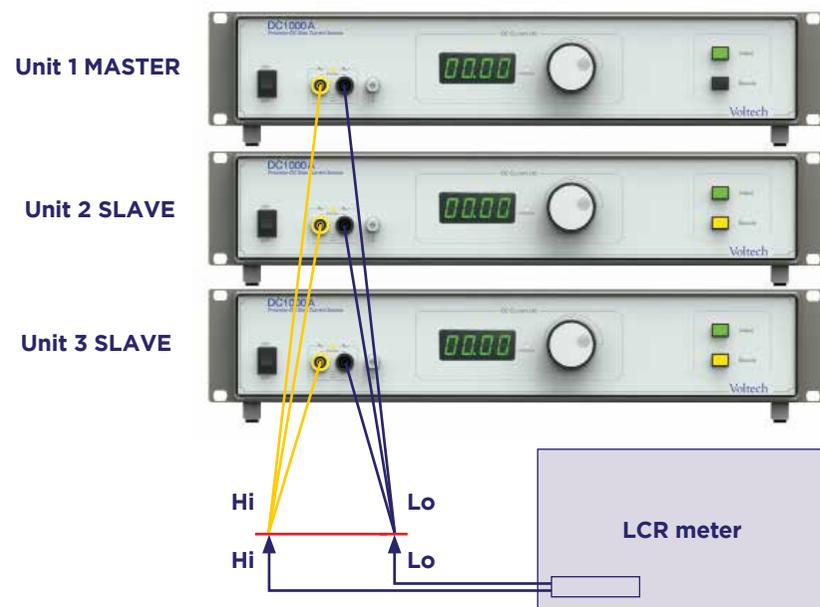
## OPEN CIRCUIT COMPENSATION

- 1 Remove any **UUT** (unit under test)
- 2 Connect the DC1000 outputs in **parallel** using the test leads provided.  
Ensure the leads common together at the point of contact with the UUT. Try to keep all test leads in the same position as when the UUT is present
- 3 Turn the DC1000s and LCR meter **ON** and allow to warm up for 30 minutes
- 4 Set bias current to **0.00A**, using rotary knob on the **MASTER DC1000**, if needed
- 5 On the **MASTER** unit, set DC1000 output to **ON** by pressing “output” button. The green **OUTPUT LEDs** on all three units will light. The two slave units’ orange **REMOTE LEDs** will also light, showing that they are being controlled by the Master unit
- 6 Perform **open circuit compensation** on your LCR meter (sometimes called “Open Correction”)
- 7 Remember to compensate at **all frequencies** at which you want to measure
- 8 When complete, press the Master **OUTPUT** button to turn all the DC1000s **OFF**



## SHORT CIRCUIT COMPENSATION

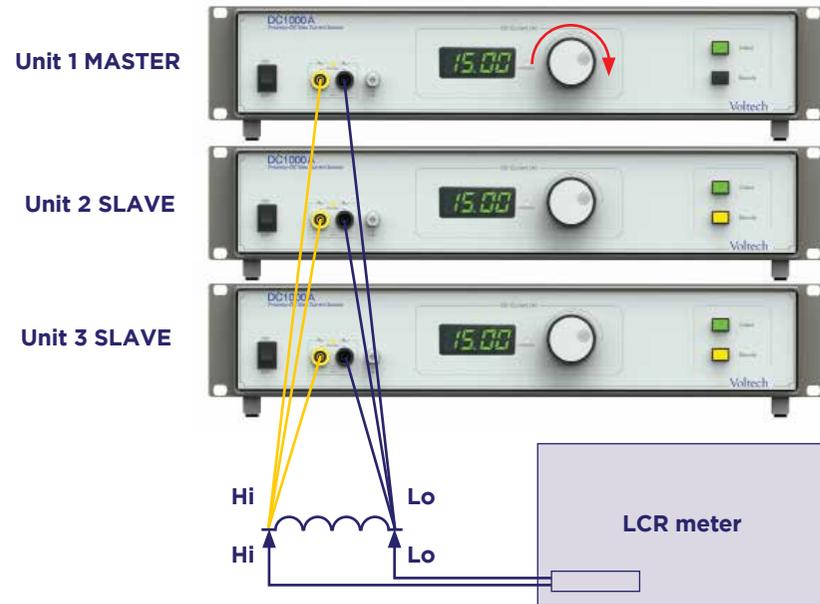
- 1 Fit a **short** between all leads. A **bus bar** or thick copper wire is ideal for this, as it will give good contact to all four clips. Try to keep all test leads in the **same position** as when the UUT is present
- 2 Set the DC1000A to **0.00A**, using the rotary knob if needed
- 3 On the **MASTER** unit, set the DC1000 output to **ON**, by pressing the “output” button. All three green **OUTPUT LEDs** will light. The two slave units’ orange **REMOTE LEDs** will also light, showing they are being controlled by the Master unit
- 4 Perform **short circuit compensation** on your LCR meter (sometimes called “Short Correction”)
- 5 Remember to compensate at **all frequencies** at which you want to measure
- 6 When complete, press the Master **OUTPUT** button to turn all the DC1000s **OFF**



## MAKING MEASUREMENTS

Once you have compensated the LCR for the leads and DC1000s you can 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 on the **MASTER** unit
- 4 The Slave units will adjust automatically. In the example shown each unit is providing **15A** to give a total DC bias current of **45A**
- 5 Enable the DC bias current by pressing **OUTPUT** on the **MASTER** unit
- 6 Perform measurements using the **LCR**
- 7 Adjustments can be made to the DC bias level while the output is enabled (and the LCR is measuring) using the **rotary knob**



## BEST PRACTICE / WARNINGS

- **DO NOT** disconnect the UUT or LCR while the DC1000 is operating
- Always remove the DC bias current by **disabling the OUTPUT** button before disconnecting either the UUT or the LCR meter
- Always try to keep all leads in the **same position** to improve the accuracy of the compensation, and hence the accuracy of your measurements
- **NEVER daisy-chain the leads from unit to unit. Each cable can carry only 25 AMPS. Hence the leads must be joined at the UUT using a bus-bar or similar that can carry the maximum current you wish to apply.**

