

## Using Two Model 2400 SourceMeter® Instruments to Output up to Two Amps

Keithley offers a comprehensive line of products in our SourceMeter line summarized in the table below.

<b>Model :</b>	<b>2400</b>	<b>2410</b>	<b>2420</b>	<b>2425</b>	<b>2430</b>	<b>2440</b>	<b>6430</b>
<b>Power</b>	20 W	20 W	60 W	100 W	100 W	50 W	2 W
<b>Max Volts</b>	200 V	1000 V	60 V	100 V	100 V	40 V	200 V
<b>Max Current</b>	1 A	1 A	3 A	3 A	3 A, 10 A pulse	5 A	100 mA

To understand the data in the table, note that the first row indicates the Power for a given model number. This power specification governs how the maximum voltage and maximum current interact. For example, the model 2400 is a 20 Watt device with a maximum current of 1 Amp. If operating at 1 Amp, the maximum voltage could only be 20 volts, not 200 volts, to maintain the 20 Watt power limit. Similarly, when operating at 200 Volts, the maximum current is 100 mA.

Suppose your application requires more than 1 Amp and the expected voltage is 20 Volts or less. A model 2420 would satisfy this, or two model 2400 could be used in parallel.

Each Model 2400 SourceMeter can source up to one ampere of current and read the developed voltage. In applications that require more than one ampere the following method can be used to source up to two amperes. To accomplish this, the SOURCE OUTPUTS of two Model 2400 SourceMeter instruments are connected in parallel as shown in Figure 1.

### Method

1. Configure the circuit as shown in Figure 1.
2. Select the SOURCE I mode on each Model 2400 SourceMeter. Select one amp of current on unit #1 and vary the current output of unit #2 to the desired total current.
3. Set the compliance voltage on each SourceMeter to the maximum compliance expected in the circuit. In the case of Figure 1 this would be two volts. ( $1 \text{ ohm} \times 2\text{A} = 2\text{V max}$ )
4. Use CONFIG V and select 4-WIRE voltage sensing.
5. Make sure the leads and the terminal switch match. (e.g. Front for Front).
6. Press OPERATE on each unit.
7. Monitor the voltage levels. Notice that the voltage reads approximately 2 volts.
8. Press OPERATE on each unit to turn off current.

Note: The second set of SENSE lines are not actually necessary. One set is sufficient to monitor the compliance voltage level. The sense lines on unit #2 can be removed and 2-

WIRE sensing can be used. The voltage reading Unit #2 would include the test lead resistance voltage drop and therefore would be higher than the reading on Unit #1. The voltage level on Unit #1 would be the most accurate because of the 4-WIRE sensing.

Note: Don't use the resistance mode on either Model 2400. The calculation of resistance is accomplished by using the forced current and the read voltage. Each unit is forcing a different current. In this example the resistance would be calculated with 1 Amp, but the voltage drop would be 2V. Therefore the resistance would be calculated as 2 ohms.

Settings:

SOURCE	= I = 1.00A
MEASURE	= V = Measured value
COMPLIANCE	= 2.1V
SENSE MODE	= 4-WIRE
DEVICE	= 1 Ohm resistor

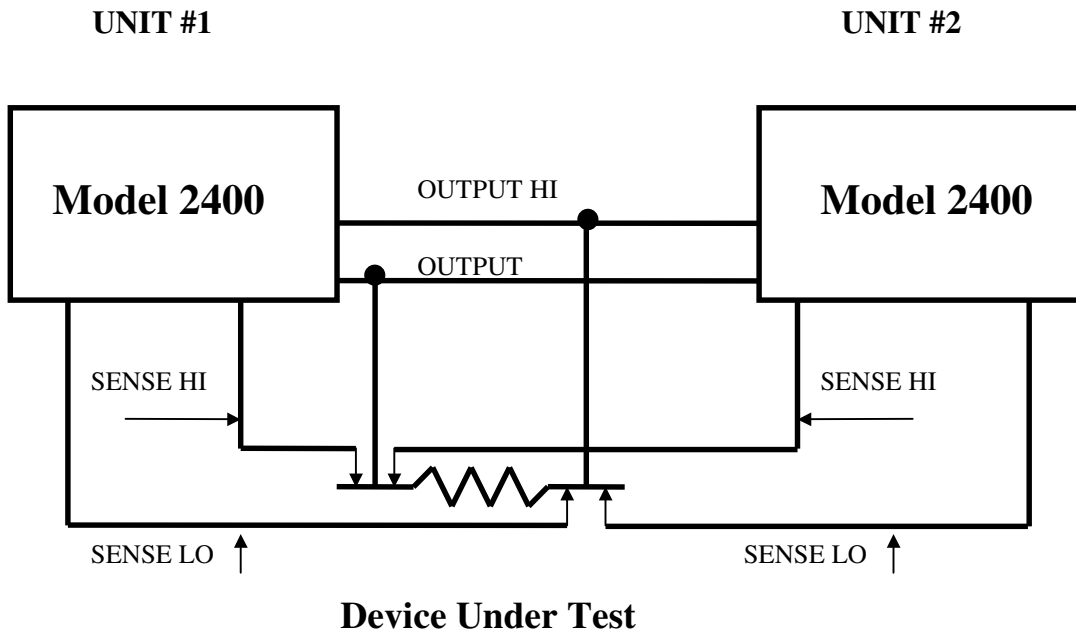


Figure 1. Connecting two Model 2400s in parallel