

Using the Model 2450 to Measure Resistance Using SCPI Commands

The Model 2450 has three methods for measuring resistance:

- 1. Source Voltage and Measure Current, Set Measure Units to Ohms
- 2. Source Current and Measure Voltage, Set Measure Units to Ohms
- 3. Measure Resistance Using Auto-Ohms (Ohmmeter) Mode

These three modes will be explained in more detail with SCPI examples for each. In each case, a $100k\Omega$ resistor is used as the DUT.

1. Source Voltage and Measure Current, Read Ohms:

Here is an example if the user wants to take resistance readings by sourcing voltage and measuring current. Specifically, this program takes five readings by sourcing 5V, measuring current with autorange enabled, and setting the measure units to ohms. Offset compensation is turned on. The source and measure values are retrieved.

```
*RST
SENS:FUNC 'CURR'
SENS:CURR:RANG:AUTO ON
SENS:CURR:UNIT OHM
SENS:CURR:OCOM ON
SOUR:FUNC VOLT
SOUR:FUNC VOLT
SOUR:VOLT 5
SOUR:VOLT:ILIM 0.01
COUNT 5
OUTP ON
TRAC:TRIG "defbuffer1"
TRAC:DATA? 1, 5, "defbuffer1", SOUR, READ
OUTP OFF
```

The result of executing the code is shown in the screen capture shown below. Notice that even though the measurement units are in ohms, the measurement range is 10μ A.



2. Source Current and Measure Voltage, Read Ohms:

Here is an example if the user wants to take resistance readings by sourcing current and measuring voltage. Specifically, this program takes five readings by sourcing 5e–6A, measuring voltage with autorange enabled, and setting the measure units to ohms. Offset compensation is enabled. The source and and measure values are retrieved.

*RST SENS:FUNC 'VOLT' SENS:VOLT:RANG:AUTO ON SENS:VOLT:UNIT OHM SENS:VOLT:OCOM ON SOUR:FUNC CURR SOUR:CURR 5e-6 SOUR:CURR:VLIM 10 COUNT 5 OUTP ON TRAC:TRIG "defbuffer1" TRAC:DATA? 1, 5, "defbuffer1", SOUR, READ OUTP OFF

The result of executing the code is shown in the screen capture shown below. Notice that even though the measurement units are in ohms, the measurement range is 2V. Using the Model 2450 to Measure Resistance Using SCPI Commands

USBTMC∜SRQ defbuffer1 ───── No Script •MEASURE CURRENT 2-WIRE	IDLE 🖛 🔺
+100.604 kΩ	AZERO
Range Auto	
°SOURCE CURRENT ○ ○ ● ○ ○	MEAS
+05.0000 µA	
Range 10µA Source +05.0000µA Limit	10.0000V

current. The unit automatically sets the magnitude of the

current source, voltage compliance, and the measure range.

This mode is the same as the Ohmmeter QuickSet function.

Here is a program that uses the resistance function to take

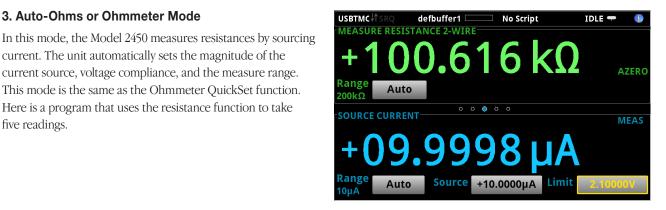
3. Auto-Ohms or Ohmmeter Mode

five readings.

*RST

SENS:FUNC 'RES' SENS:RES:RANG:AUTO ON SENS:RES:OCOM ON COUNT 5 OUTP ON TRAC:TRIG "defbuffer1" TRAC:DATA? 1, 5, "defbuffer1", SOUR, READ OUTP OFF

The result of executing the code is shown in the screen capture shown below. Notice that the measuring range is $200k\Omega$.



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