Demo Guide

Making Resistance Measurement Using B2901A/02A/11A/12A

B2900A Series Precision Source/Measure Unit

Procedure Overview

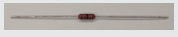
1. Make a resistance measurement
2. Make an accurate low resistance measurement

Objective

This demo shows how easily a resistance measurement can be made with the B2900A Series via easy-to-use Graphical User Interface.

Required instrument and accessory

Keysight B2901A/02A/11A/12A Precision Source/Measure Unit



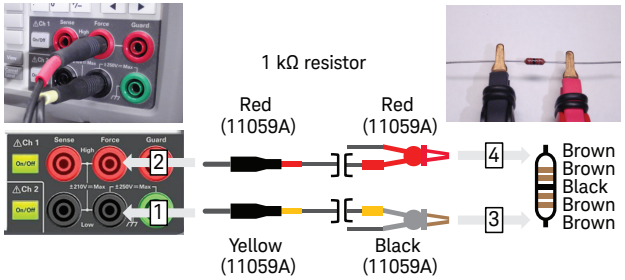
1.1 kΩ resistor

1 kΩ resistor

Keysight 11059A Kelvin Probe Set

Setup-1

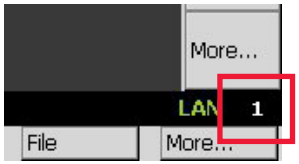
1. Connect the yellow banana plug to Ch 1 Low Force terminal.
2. Connect the red banana plug to Ch 1 High Force terminal.
3. Clip the one lead of 1 kΩ Resistor with the black gold-plated tweezers.
4. Clip the other lead of 1 kΩ Resistor with the red gold-plated tweezers.



1. Make a resistance measurement

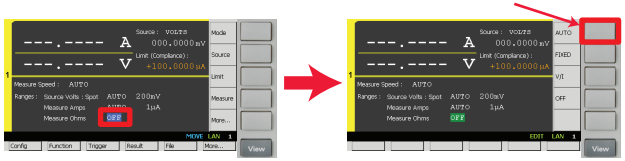
1-1. Change View mode to Single View

a. Press View repeatedly until Single View for Channel 1 is shown in the display.



1-2. Use AUTO measurement operation

a. Rotate to select Resistance measurement operation, and then press to edit it. Then select AUTO to set Resistance measurement operation to AUTO.

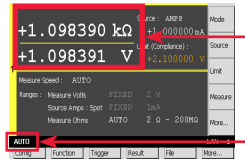


b. Press Ch1 On/Off to turn on Channel 1 Output relay.

c. Press Trigger to perform a single point measurement.

Measurement parameters are updated whenever Trigger Button is pressed

d. Press Auto to repeat single point measurements periodically.



Measurement parameters are updated periodically

"Auto" indicator is turned on

e. Press Auto to stop making measurements periodically.

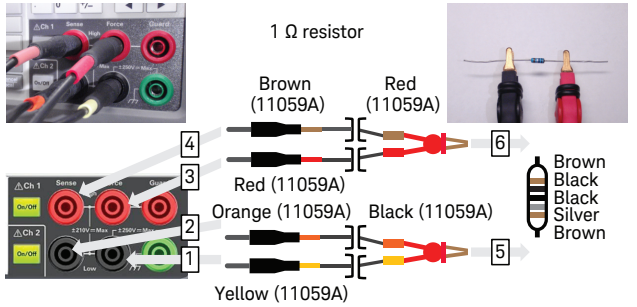
"Auto" indicator is turned off

1-3. Turn off the channel output

a. Press Ch1 On/Off to turn off Channel 1 Output relay.

Setup-2

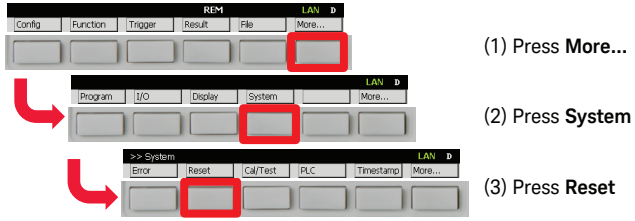
1. Connect the yellow banana plug to Ch 1 Low Force terminal.
2. Connect the orange banana plug to Ch 1 Low Sense terminal.
3. Connect the red banana plug to Ch 1 High Force terminal.
4. Connect the brown banana plug to Ch 1 High Sense terminal.
5. Clip the one lead of 1 Ω Resistor with red gold-plated flat tweezers.
6. Clip the other lead of 1 Ω Resistor with black gold-plated tweezers.



2. Make an accurate low resistance measurement

2-1. Reset the instrument

a. Press More..., System and then press Reset to display Confirmation dialogue.



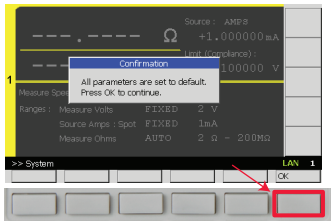
(1) Press **More...**

(2) Press **System**

(3) Press **Reset**

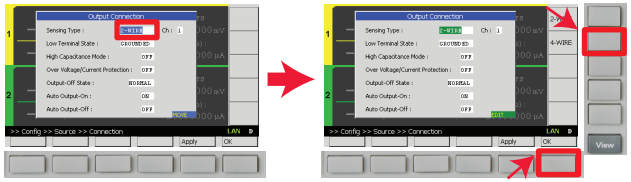
KEYSIGHT TECHNOLOGIES

b. Press OK to reset the instrument.

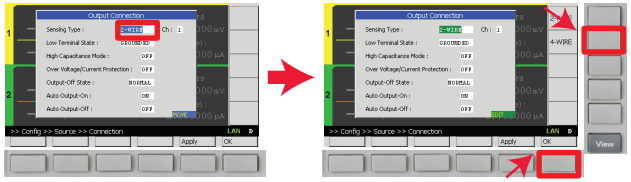


2-2. Perform the measurement via 4-wire connection

a. Press Config, Source, and then press Connection to display Output Connection dialogue.



b. Press and select 4-WIRE, and then press OK to configure to use 4-wire connection.



c. Press Mode, then press AMPS (I) to set Channel 1 V/I Source Function to I Source. (If Mode can't be found on the Assist keys, press Mode to change the keys.)

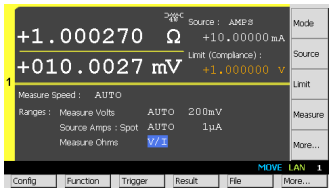
d. Press Source and set Channel 1 Source Value to 10 mA.

e. Press Limit and set Channel 1 Limit value to 1 V.

f. Rotate to select Resistance measurement operation and press to edit it. Then press V/I to set Resistance measurement operation to V/I.

g. Press Ch1 On/Off to turn on Channel 1 Output relay.

h. Press Trigger to perform a single point measurement.

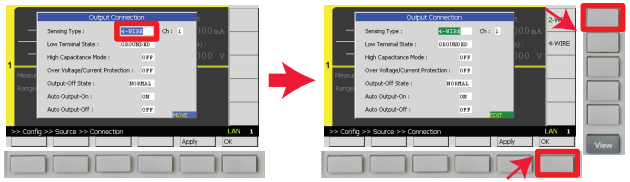


2-3. Perform the measurement via 2-wire connection

a. Press Ch1 On/Off to turn off Channel 1 Output relay.

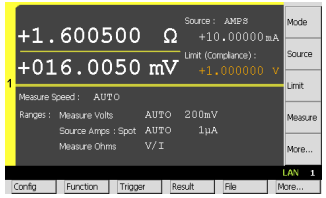
b. Press Config, Source, and then press Connection to display Output connection dialogue.

c. Press , 2-WIRE, and then press OK to configure to use 2-wire connection.



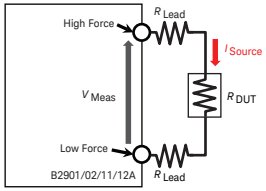
d. Press Ch1 On/Off to turn on Channel 1 Output relay.

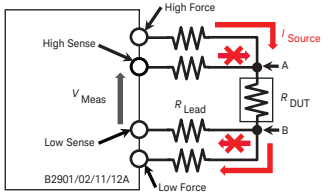
e. Press Trigger to perform a single point measurement.

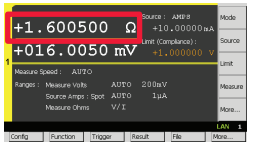


2-4. Compare two results

a. Compare two results to see the effect of 4-wire connection. The result with 4-wire connection is 1 Ohm, while the one with 2-wire connection is 1.6 Ohm. The difference, that is 0.6 Ohm, should be the residual lead resistance on the measurement cables.







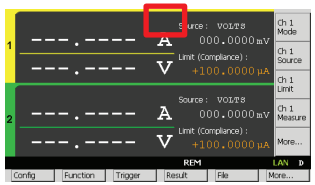
a) Result with 2-wire connection

b) Result with 4-wire connection

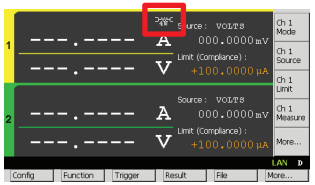
The result with 2-wire connection includes the residual lead resistance R_{Lead}

Configure 4-wire connection

If the channel is configured to use 4-wire connection, you can see the status indicator on GUI as below, although no indicator can be seen on being configured to use 2-wire connection.



2-wire connection



4-wire connection

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