

Keysight Technologies Sourcing Clean Voltage Using B2961A/62A With External Filters

B2961A/62A 6.5 Digit Low Noise Power Source

Procedure overview

1. Turn on Show output noise without external filter
2. Show output noise via Low Noise Filter
3. Show output noise via Ultra Low Noise Filter

Objective

This demo shows excellent low noise output capability of the B2961A/62A Power Source with external filters by monitoring the outputs through the oscilloscope.

Required instrument and accessory



Keysight B2961A/62A
6.5 Digit Low Noise
Power Source



Keysight Oscilloscope
(MSO-X 4000 Series
is shown)



N1294A-021 Ultra
Low Noise Filter
(ULNF)



N1294A-022 Low
Noise Filter (LNF)



Banana-to-BNC
Adapter



BNC Cable

Note: When the filters are attached to the output terminals later, push them in firmly until it locks in-place

There is no space between the adaptor and the output terminals



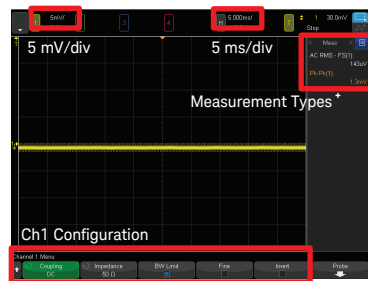
There is some space between the adaptor and the output terminals



Setup

Oscilloscope setup

1. Set vertical scale of Ch1, horizontal scale to 5 mV/div, 5 ms/div.
2. Set Ch1 Input Impedance to 50 Ohm and BW Limit enabled.
3. Select "AC RMS - FS", "Pk-Pk" as Measurement Type.
4. Confirm the noise floor of those Measurement Type on the scope.



B2961A/62A Power Source

1. Attach a banana-to-BNC adapter to the B2961A/62A's Ch1 High/Low Force Terminals
2. Connect the scope's Ch1 and BNC terminal of the banana-to-BNC adapter with a BNC cable.

Oscilloscope

Banana-to-BNC adapter

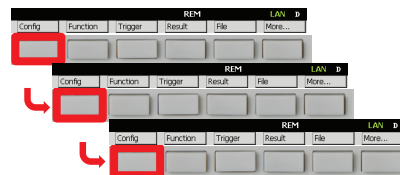
B2961A/62A



BNC cable

1. Show output noise without external filter

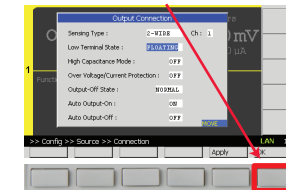
- a. Press **View** repeatedly until Single View for Channel 1 is shown in the display.
- b. Press **Config**, **Source**, and then press **Connection** to open Output Connection dialogue.



- (1) Press Config
- (2) Press Source
- (3) Press Connection

- c. Rotate **Low** to select Low terminal state and press **OK** to edit it. Then select **FLOAT** to set Low terminal state to Floating.
- d. Press **OK** to make the modification effective.

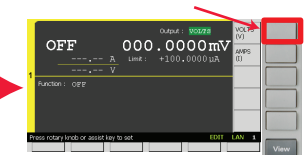
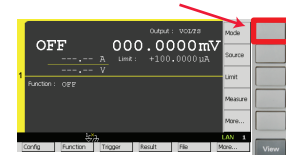
(1) Press OK to make the modification effective



Low terminal status indicator

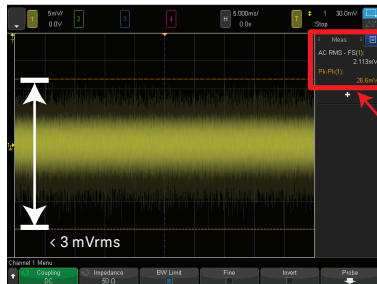


- e. Press **Mode** to edit Source function, and then select **VOLTS (V)** to set Source function to Voltage source.



- f. Press **Source** to edit Source value, and then enter 0 V to set Source value to 0 V.

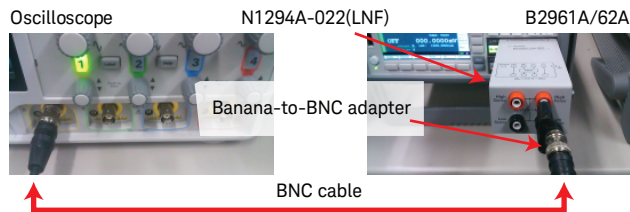
- g. Press **Limit** to edit Limit value, and then enter 100 mA to set Limit value to 100 mA
- h. Press **On/Off** to source the voltage and monitor output via the scope



RMS Voltage Noise should be less than 3 mVrms

2. Show output noise via low noise filter

- a. Press **On/Off** to turn off the output.
- b. Attach LNF and make a connection between its outputs and the scope.

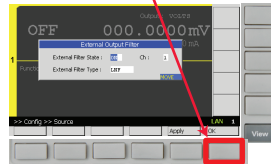


- c. Press **Config**, **Source**, and then press **Ext. Filter** to open External Output Filter dialogue.

- d. Rotate the knob to select External filter type and press the knob to edit it. Then press **LNF** to select Low Noise Filter.
- e. Rotate the knob to select External filter state and press the knob to edit it. Then press **ON** to set it on.

- f. Press **OK** to make the modification effective.

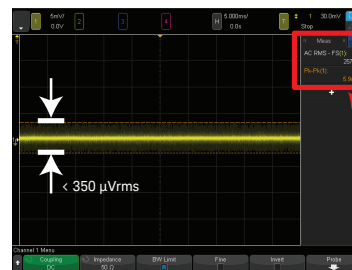
(1) Press OK to make the modification effective



External filter status indicator



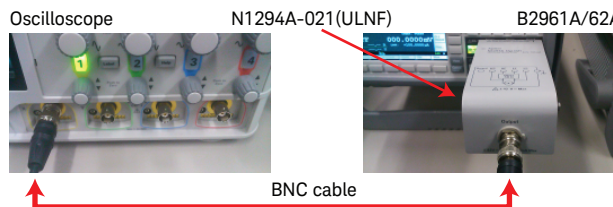
- g. Press **On/Off** to source the voltage and monitor it via the scope.



RMS Voltage Noise should be less than 350 μ Vrms

3. Showing output noise via ultra low noise filter

- a. Press **On/Off** to turn off the output.
- b. Attach ULNF and make a connection between its outputs and the scope.

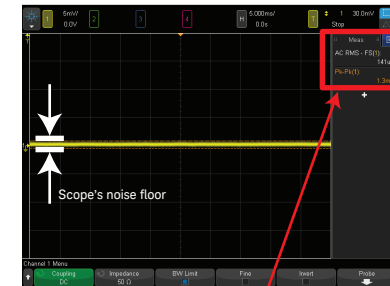


- c. Press **Config**, **Source**, and then press **Ext. Filter** to open External Output Filter dialogue.

- d. Rotate the knob to select External filter type and press the knob to edit it. Then press **ULNF** to select Ultra Low Noise Filter.

- e. Press **OK** to make the modification effective

- f. Press **On/Off** to source the voltage.



RMS Voltage Noise should be same as the noise floor of the scope. ULNF dramatically reduces the noise to the level too small for the scope to capture it.

For other unlisted countries:
www.keysight.com/find/contactus

www.keysight.com/find/precisionSOURCE