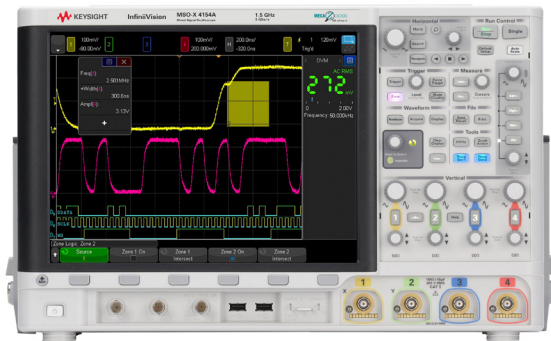


Keysight Technologies

Detailed Demonstration Guide: Sourcing Clean Voltage Using B2961A/62A

Keysight B2961A/62A 6.5 Digit Low Noise Power Source

Demonstration Guide



Introduction

The Keysight Technologies, Inc. B2961A/62A 6.5 Digit Low Noise Power Source is a bench-top power supply with revolutionary capabilities and functions not previously available. It can source either voltage or current with 6.5 digit of resolution while also monitoring them, which is essential for a variety of measurement applications.

Using optional external filters extremely reduces the noise level of the Keysight B2961A/62A output down to 10 μVrms (10 Hz to 20 MHz) at maximum, which satisfies requirements for testing oscillators and oscillating devices such as VCOs, PLLs. It also enables the testing and evaluation of ADC devices that require precise low-noise voltage supplies/sources for proper characterization.

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

Required Instruments and Accessories

Accessories required for the demo described in this demonstration guide, such as filters, a adapter, and BNC cable are provided as a demo kit with a demo unit of the Keysight B2961A/62A. Only an oscilloscope should be prepared separately.



Keysight B2961A/62A 6.5 Digit Low Noise Power Source



Keysight Oscilloscopes (MSO-X 4000 Series is shown)



N1294A-021 Ultra Low Noise Filter



N1294A-022 Low Noise Filter



Banana-to-BNC Adapter

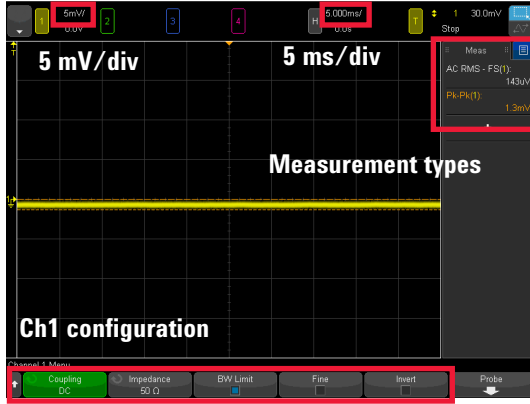


BNC Cable

Setup

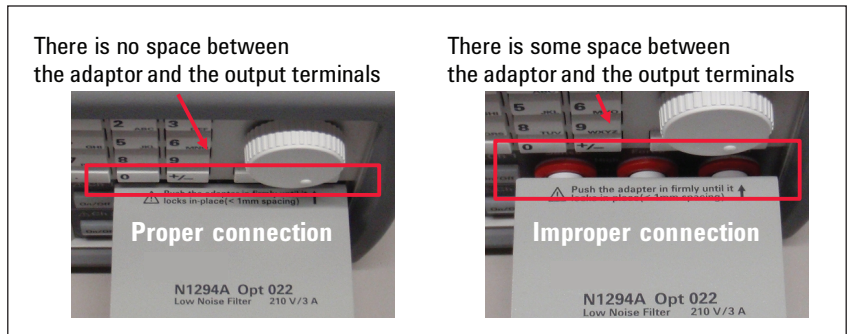
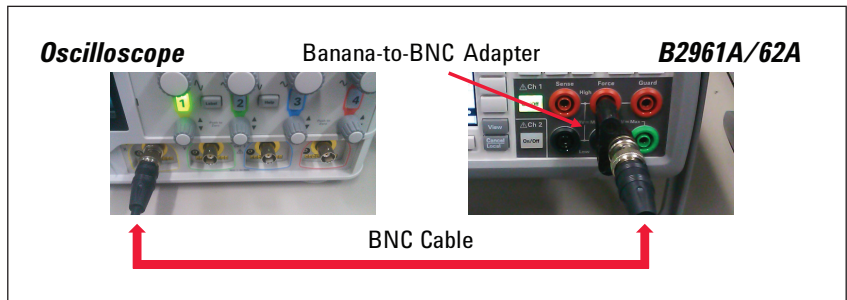
Oscilloscope setup

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 setup

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.



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

LAB: Show Output Noise via Oscilloscope

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.

Procedure overview

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

Demonstration

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 to select **Low terminal state** and press to edit it. Then select **FLOAT** to set **Low terminal state** to **Floating**.

(1) Rotate and press to select **Low Terminal State**

(2) Press **FLOAT**

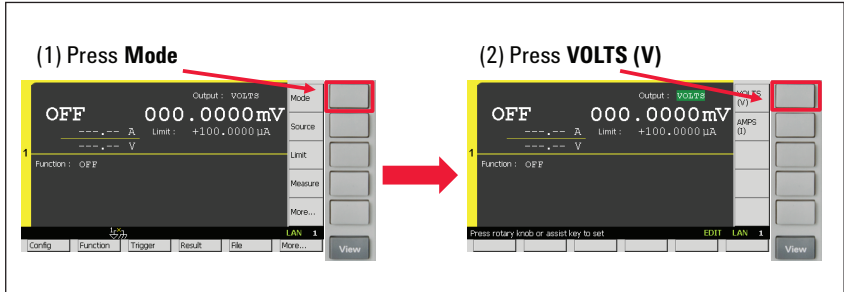
d. Press **OK** to make the modification effective.

(1) Press **OK** to make the modification effective

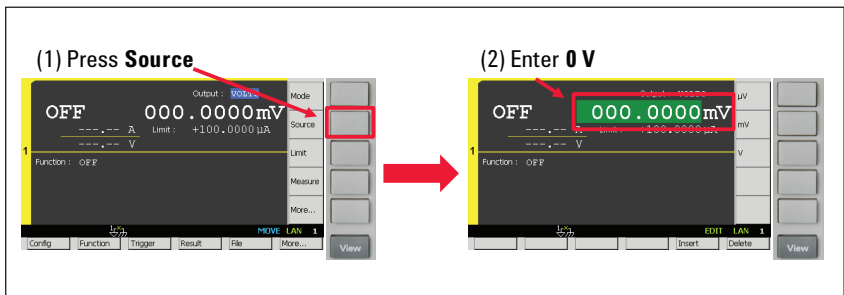
Low Terminal Status Indicator

LAB: Show Output Noise via Oscilloscope (continued)

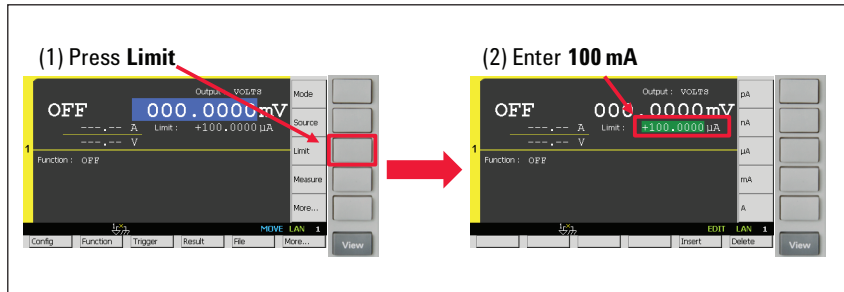
e. Press **Mode** to edit **Source function**, and then select **VOLTS (V)** to set **Source function to Voltage source**.



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**.




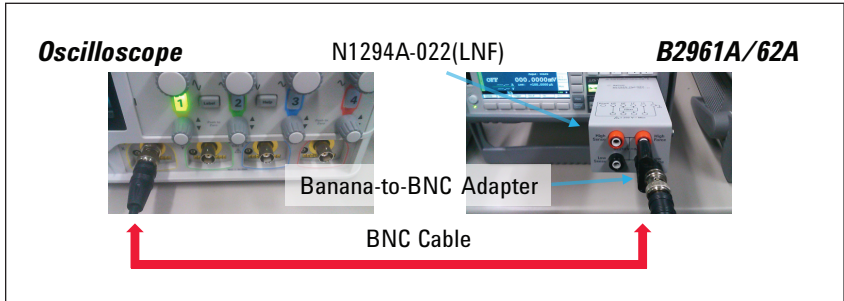
h. Press **On/Off** to source the voltage and monitor output via the scope.






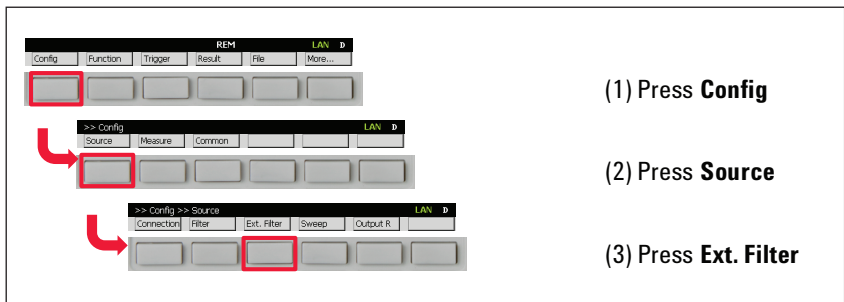
LAB: Show Output Noise via Oscilloscope (continued)




2. Show output noise via Low Noise Filter

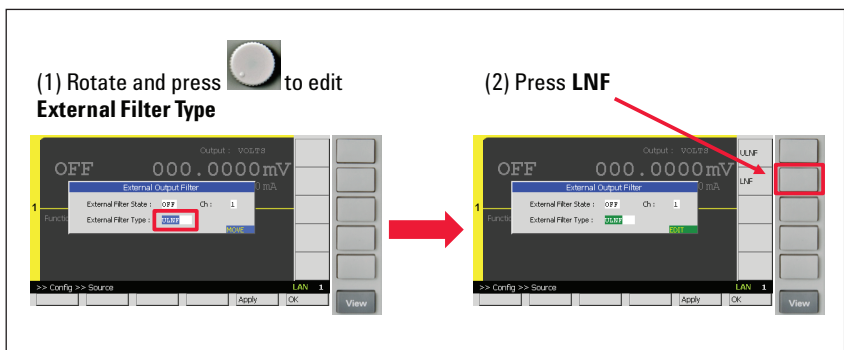
- a. Press  to turn off the output.
- b. Attach LNF and make a connection between its outputs and the scope.






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

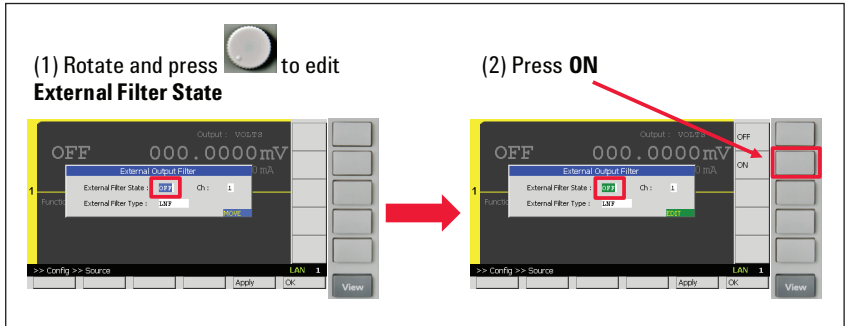



- d. Rotate  to select **External filter type** and press  to edit it. Then press  to select **Low Noise Filter**.

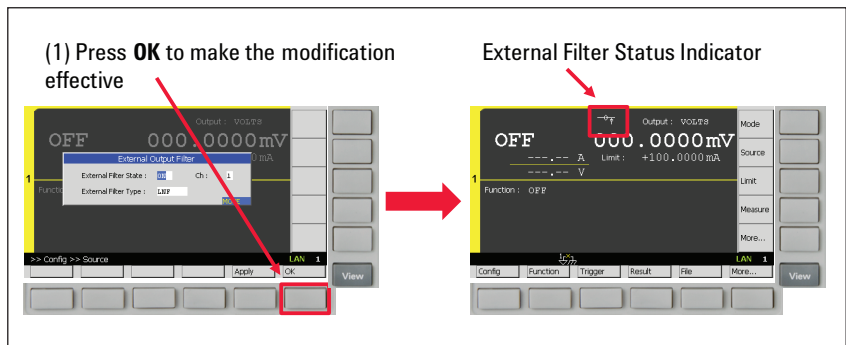


LAB: Show Output Noise via Oscilloscope (continued)

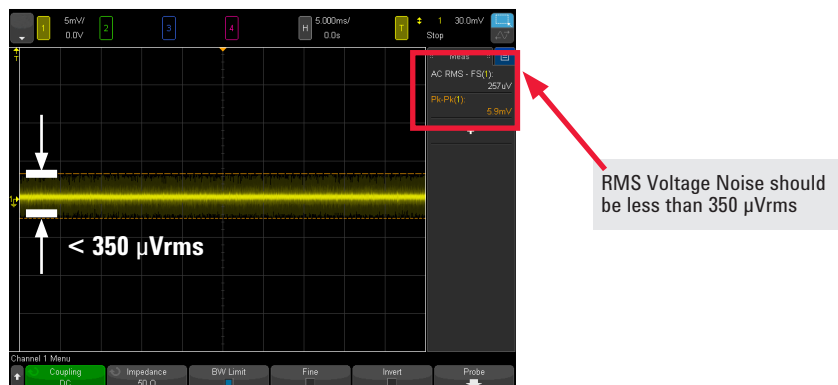
e. Rotate  to select **External filter state** and press  to edit it. Then press  to set it on.



f. Press  to make the modification effective.




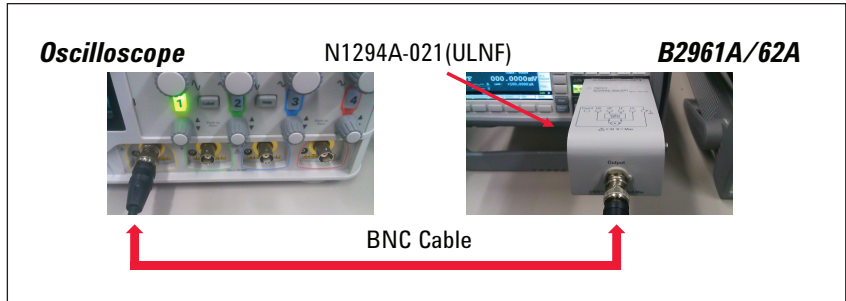
g. Press  to source the voltage and monitor it via the scope.






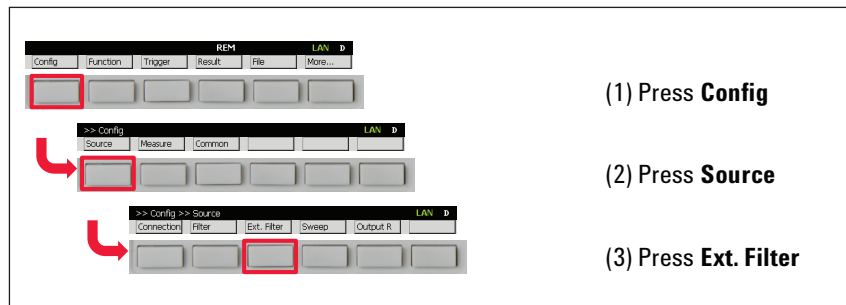
LAB: Show Output Noise via Oscilloscope (continued)




3. Show output noise via Ultra Low Noise Filter

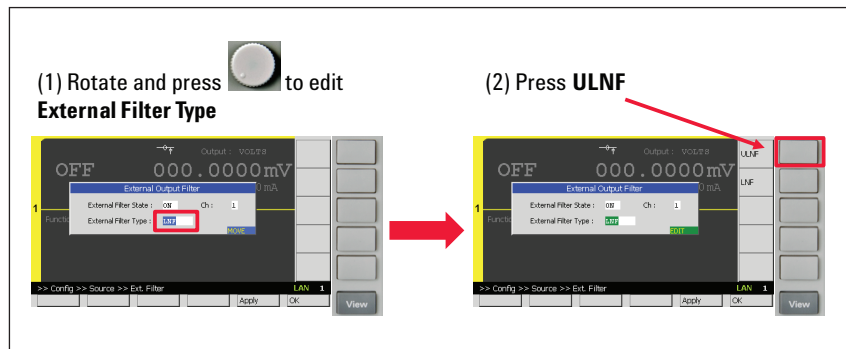
- a. Press  to turn off the output.
- b. Attach ULNF and make a connection between its outputs and the scope.



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

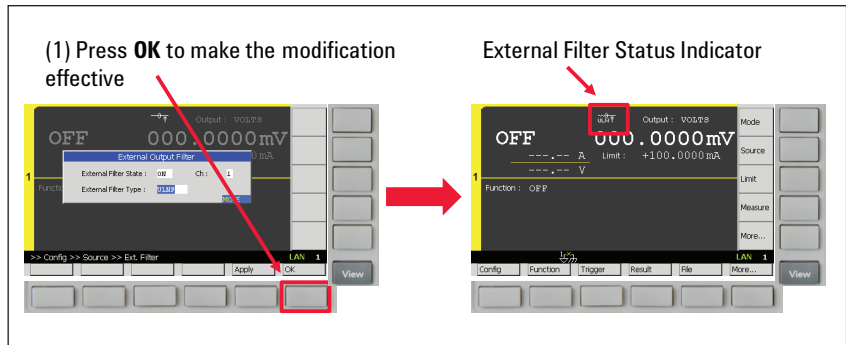


- d. Rotate  to select **External filter type** and press  to edit it. Then press  to select **Ultra Low Noise Filter**.

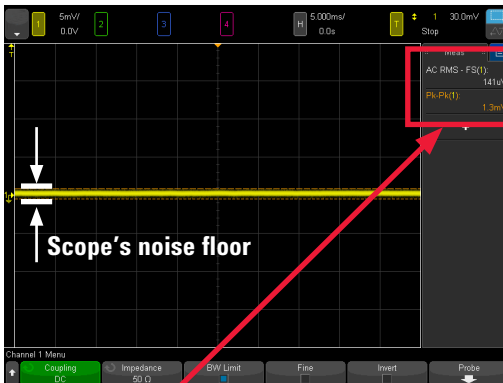


LAB: Show Output Noise via Oscilloscope (continued)

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.

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