

Using Sage Instruments 960B for End-to-End Wireless Phone Testing [Samsung Galaxy S21,5G]

Assumptions: The 960B UI app software has been successfully installed on controller PC/Laptop.

Recommended Tests:

- SMOS Director & Responder
- SMOS One-way (MOS Tx & MOS Rx)
- One-Way Delay (One-Way Delay Rx & Tx)

General Test Configuration Setup:

Cellphones

- Using two cellphones, establish a 2-way audio call (reference here is for Samsung S21 phones).
Note1: Set the volume level on both phones to 50% or lower.
- Connect each cellphone to a USB-C audio adapter module (Sage PN 7905-0000-01).
Note1: The audio adapter module switch should be set to the cellphone icon (not 'MIC').
- Connect each audio adapter module to one of the 960B front panel analog 4W ports with a 3.5mm-to-RJ-22 interconnect cable (Sage PN 9400-0072-01), in the following manner:
 - Connect the 3.5mm ends of the cables marked '960B Receive' to the audio adapter module jacks marked with the headphone icon.
 - Connect the 3.5mm ends of the cables marked '960B Transmit' to the audio adapter module jacks marked with the microphone icon.
 - Connect each RJ-22 end of the cables to one of the 960B front panel analog 4W (RJ-22) ports.

960B Interface Setup

- From the Home screen, highlight the initial port line item (i.e. New Analog) and then click the 'Configure Span' button.

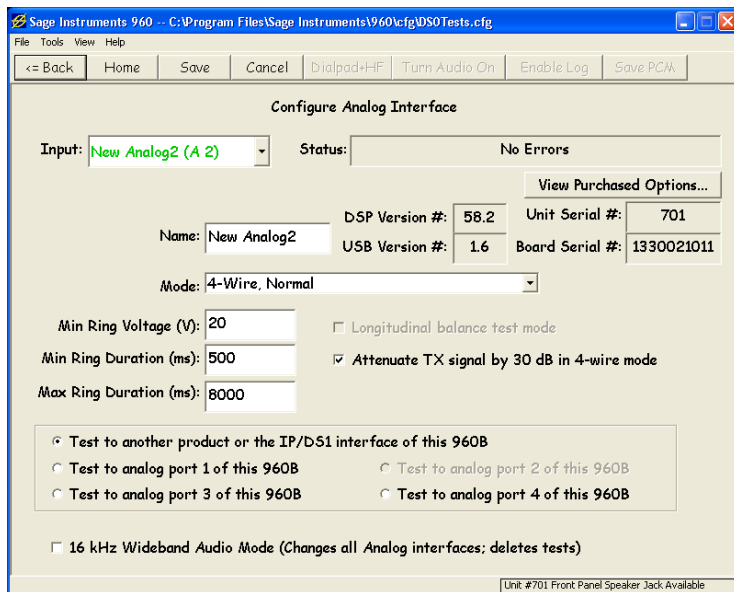


Fig. 1 – Analog Interface Configuration Display

- Recommended: Rename the port to something better suited for your application (or 'Port 1').

Using Sage Instruments 960B for End-to-End Wireless Phone Testing [Samsung Galaxy S21,5G]

- 3) In the 'Mode' drop-down list, select '4-Wire Normal'.
- 4) Click the check box next to 'Attenuate TX signal by 30 dB in 4-wire mode' to turn on the attenuation.
- 5) Recommended: Click the radio button next to 'Test to analog port 4 of this 960B' to direct the tests to that port.
- 6) Click the 'Save' button.
- 7) In the 'Input' drop-down list, select the second port and repeat steps 1 thru 6, with an exception in Step 5 (select "Test to analog port 2 of this 960B" to direct the tests to that port) – Don't forget to click the 'Save' button when finished.

960B Test Channel/Port Setup (using SMOS Director and Responder as example)

- 1) From the 'Home' screen, double-click port 1 to get Span View and then double-click channel 1 to get Channel View – This is where you can setup your test.

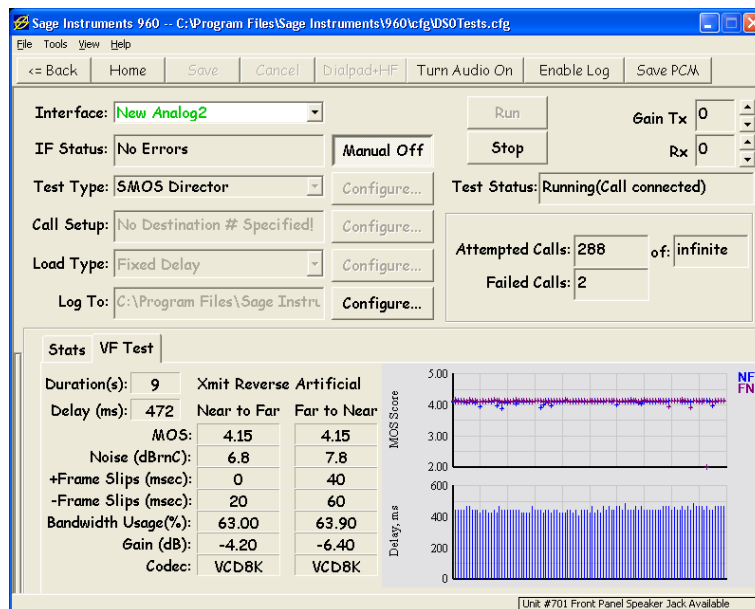


Fig. 2 – SMOS Director Test

Set up the SMOS Director (near-end side):

- 2) Click on the 'Test Type' drop-down list and select 'SMOS Director' and then click the 'Save' button.

Note1: Default test is 9 seconds of artificial speech in both directions.

Note2: The 'Tx' and 'Rx' gain settings in the upper right corner are set to unity (0 dB). These settings are useful when the 30 dB attenuator is not switched in – They will work to some degree in boosting or attenuating audio, but are not calibrated. The setup has been optimized for the test configuration using Galaxy S21 phones.

Set up the SMOS Responder (far-end side):

- 3) Click on the 'Interface' drop-down list and select the second interface.
- 4) Click on the 'Test Type' drop-down list and select 'SMOS Responder' and then click the 'Save' button.

Using Sage Instruments 960B for End-to-End Wireless Phone Testing [Samsung Galaxy S21,5G]

Run the test:

- 5) Click the 'Run' button to start the test.
- 6) Switch back to port one on the 'Director' side via the 'Interface' drop-down list and then click the 'Run' button.

Note1: If the test call setup field was set to run '0' times, the test will continue to run until the user stops the test.

Note2: By clicking on the 'Turn Audio On' button while in Channel View, users can listen to the test. But beware, depending on PC speed and power, the audio may be buffered. For real-time audio monitoring, plug an amplified speaker into the 'SPKR' port on the 960B front panel.

Misc Screen shots of different tests

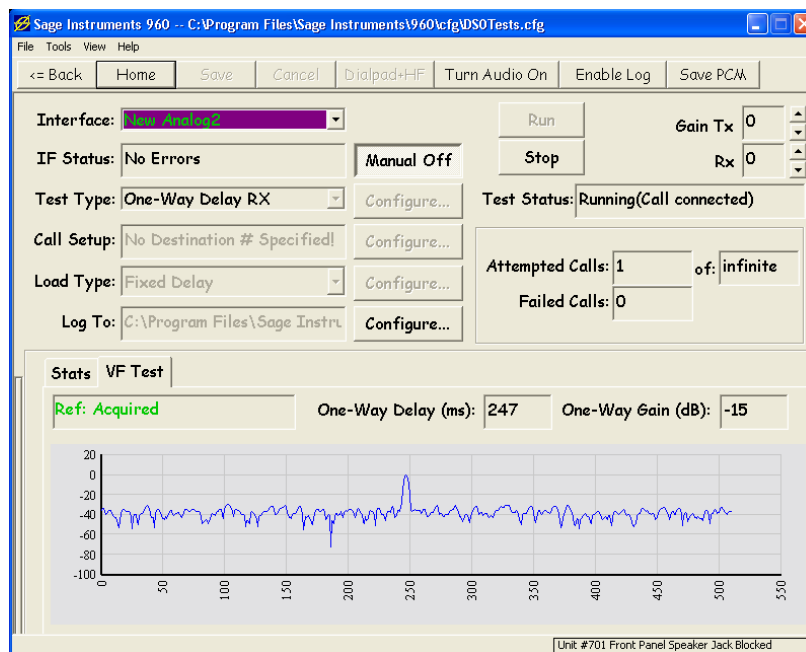


Fig. 3 – One Way Delay

Using Sage Instruments 960B for End-to-End Wireless Phone Testing [Samsung Galaxy S21,5G]

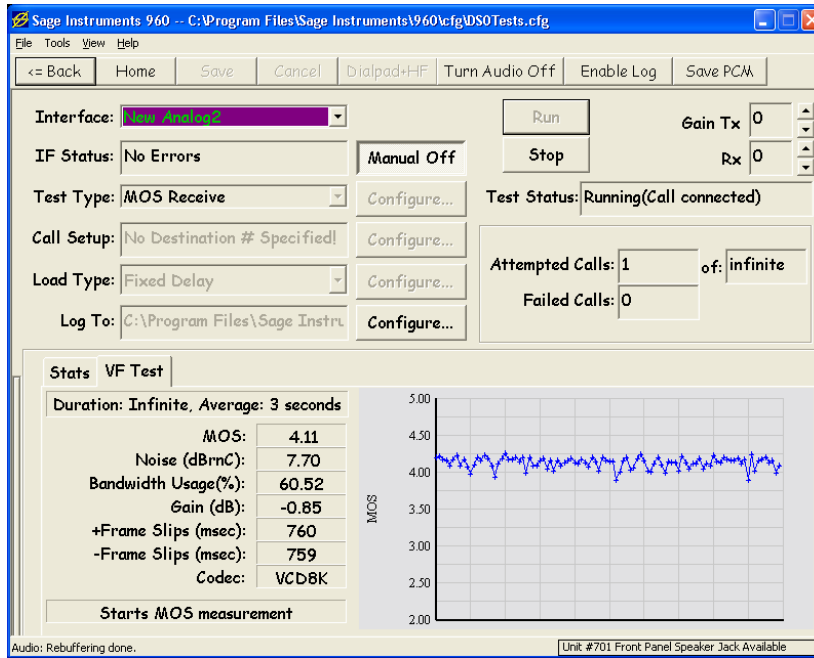


Fig. 4 – One-way MOS

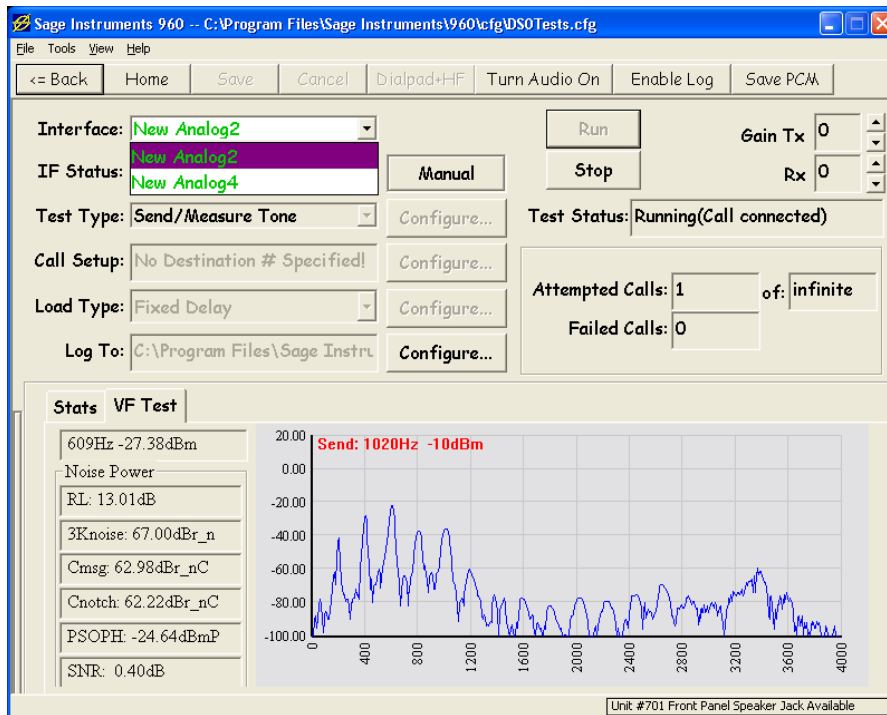


Fig. 5 – Send & Measure Tone