

Bravo EX2

Quick Start Guide

Bravo EX2 Analyzer

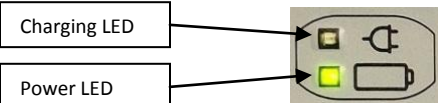
This model is a dual port VNA, supporting SWR, Return Loss, and Complex Impedance Measurements (S_{11} and S_{21}).

General

Frequency range 100kHz to 525MHz, user customizable color LCD, powered by 8AA NIMH rechargeable cells, has both Broadband and Frequency Specific Calibration Processes. 50 memory slots for saving test results or setups(calibrations), and works with our PC Vision™ software.

Power and Charging

The EX2 Analyzer comes with 8AA NIMH cells installed and pre-conditioned. Fully charged batteries will operate the instrument for 4 to 7 hours continuously between charges (depending on the frequencies in use). The instrument will also recharge while in use if plugged in using the AC Charger/Adapter.



Power LED is lit indicating the instrument is ON. Charging LED indicators are as follows:

OFF—No charging power in or charging aborted due to charging error; cells too hot or cold to take a charge.

SEE MANUAL

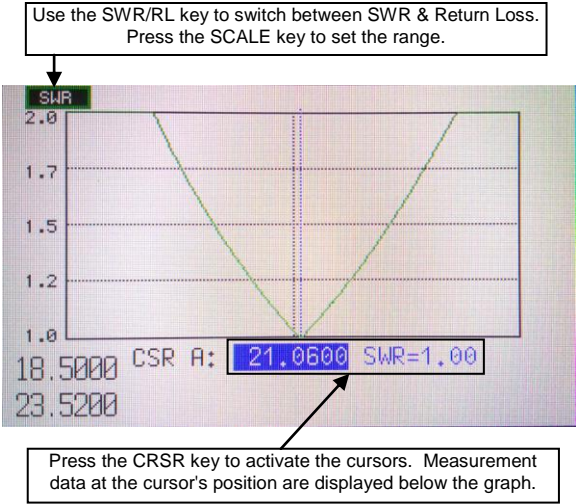
Slow, Short blink - Battery check mode. The charger is 'PINGing' the batteries to check chargeability status.

Slow, Long blink - Charger is in slow charge. If the unit is ON, this is the highest rate at which it will charge.

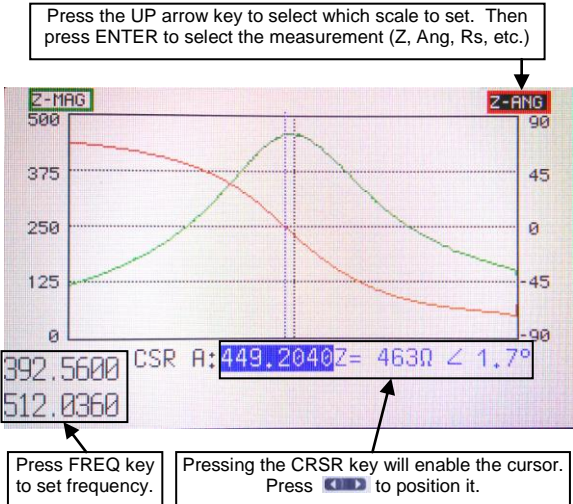
Double blink - Charger is in rapid charge mode. (around 700mA at 15v).

ON solid - Charger is in trickle charge. 2-hour run time available, min.

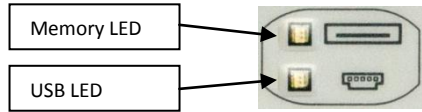
SWR or RL Screen



VNA Screen



Other Keypad Functions



Memory and USB Port LEDs:

Memory LED ON indicates writing to or recalling data from the Analyzer's memory. USBLED is on whenever the Analyzer is connected to your PC.

Memory— Press to Save or Recall test results or instrument settings.

Mode— For selecting: S_{11} or S_{21} VNA operation, Calibration Mode, and other settable options.

About Calibration Modes

There are two types of calibrations: "Broadband Calibration" and "Frequency-Specific Calibration."

Broadband Calibration

This method calibrates the instrument over its entire frequency range. The calibration data is stored and can be used for any range of frequencies. If this capability is needed, refer to the *Broadband Calibration Process* section in the Operating Manual.

Frequency-Specific Calibration

This method is more accurate than broadband, but must be done each time the frequency is changed:

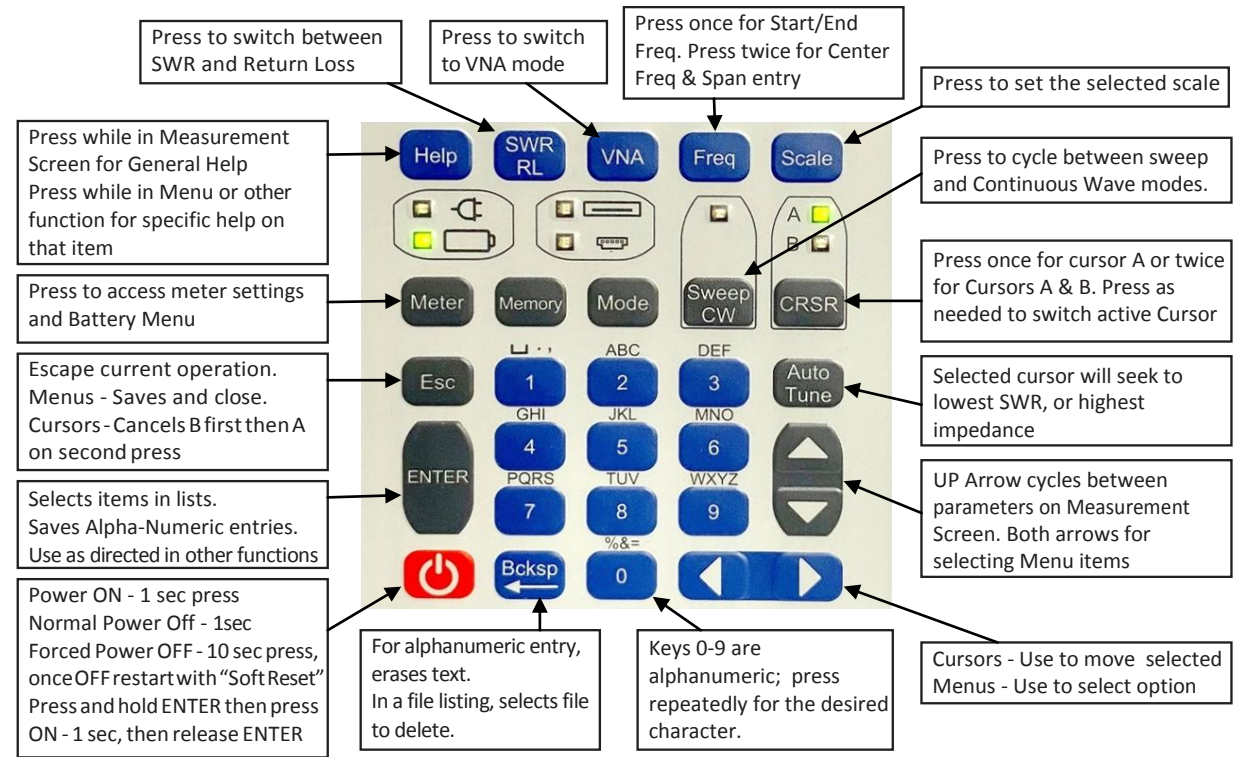
Step 1 Press Mode key and select CALIBRATIONS. Use left/right arrow keys to select FREQ SPECIFIC option. Press ESC key to save and exit

Step 2 From any measurement screen, press the FREQ Key. Press once for Start-End Frequency entry or twice for Center Frequency-Span entry.

Step 3 Enter the desired frequencies

Step 4 Press ENTER key, to begin the Frequency-Specific Calibration process.

When prompted for OPEN, attach test lead and/or adapter (if any) that will be used with all measurements, (Use of OPEN terminator is optional, but gives better results above 180MHz) and press ENTER.



Frequency Specific Calibration (Cont.)

Step 5 When prompted, attach the short, then 50 Ω terminators at the end of the test lead or at N connector. Press ENTER after each terminator is attached.

Step 6 At the end of the calibration process, the instrument is ready for use.

Step 7 (optional) This frequency-specific calibration can be saved to the instrument’s memory for future recall: Press MEMORY Key and select SAVE SETTINGS and press ENTER.

Step 8 (optional) Enter the name you wish to save and press ENTER to save the settings

Start Measurement Process

SWR or Return Loss Measuring

- 1. Connect the test lead and/or adapter, if they are to be removed from the measurements.
- 2. Press the SWR/RL key to select desired measurement.
- 3. Either select Broadband Calibration or perform the “Frequency Specific Calibration” (instructions on this guide’s Front Right panel).
- 4. When calibration is complete connect the antenna or other device to be tested (aka DUT).
- 5. Use the Scale key to adjust the scale for the best plot presentation.
- 6. Press the Cursor key to select Cursor A or A & B with Δ reading. Use the Autotune for the cursor to seek to the lowest SWR or RL reading. Or use Left/Right Arrow keys to adjust Cursor positions manually as desired.
- 7. If Broadband Calibration was used, the frequency band can be adjusted without recalibration.
- 8. If Frequency Specific Calibration is used you will need to disconnect the DUT from the test lead and/ or adapter, or N connector, press Freq key, select new frequency range and perform the Frequency Specific Calibration with the new frequency range.

Measurement Process (cont.)

- 9. The user may switch between SWR/R and VNA (single port) operation without re-calibration. Use the Scale key to cycle the scale for the best plot presentation.
- 10. (Optional) To save the plot press the MEMORY key, select SAVE TRACE, and use alpha numeric keys to enter a name, then press ENTER to save.

VNA Functions

S11 (R_s, X_s, |Z|) Measurements

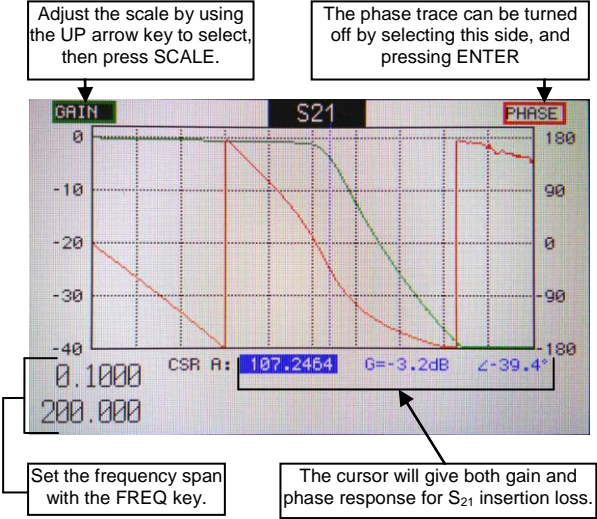
- 1. Press the VNA Key
- 2. Connect the test lead and/or adapter, if they are to be removed from the measurements.
- 3. Either select Broadband Calibration or perform the “Frequency Specific Calibration” (instructions on this guide’s Front Right panel).
- 4. When calibration is complete connect the antenna or other device to be tested (aka DUT).
- 5. Use the UP arrow to select the left or right scales.
- 6. With a scale selected, <ENTER> to select the desired measurement for that side: Z-Mag (|S₁₁| in Ω), Z-Ang (Impedance Angle), R_s, X_s.
- 7. Press Scale key to adjust the VNA scale for the best plot presentation.
- 8. Press CRSR to select Cursor A or A & B with Δ reading. Use Left/Right Arrow keys to adjust Cursor positions.

Points to Remember:

- a. If Broadband Calibration was used, the frequency band can be adjusted without recalibration.
- b. If Frequency Specific Calibration was used you will need to disconnect the DUT from the test lead and/or adapter, or N connector, press Freq key, select new frequency range and perform the Frequency Specific Calibration with the new frequency range.
- c. (Optional) To save the plot press the MEMORY

key and use alpha numeric keys to enter a name, then press ENTER to save.

S21 Plot:



Standard S21 Measurement Procedure:

From Mode Menu select S21

- 1. Connect the test lead and/or adapter, if they are to be removed from the measurements.
- 2. Either select Broadband Calibration or perform the “Frequency Specific Calibration” (instructions on this guide’s Front Right panel).
- 3. Once the Open-Short-Load part of the calibration is completed (assuming you’re using frequency-specific calibrations), attach all of the cabling that will be used between the S₁₁ & S₂₁ ports and press <ENTER> to calibrate the THROUGH. This will compensate for any losses in the test leads. The magnitude should now show a FLAT trace at 0dB, and a FLAT phase trace at close to 0°.
- 4. Attach the test leads to your DUT, and adjust the scales to best view the traces. Depending on what type of device you're measuring, you should get a result similar to the above photograph. If you don't need the PHASE trace, use the UP arrow to select the PHASE scale, and press <ENTER> to turn it off.

- 5. Press the Cursor key to select Cursor A or A & B with Δ reading. Use Left/Right Arrow keys to adjust Cursor positions.

In Case of Difficulty:

Need Help - If your EX2 Analyzer does not appear to be performing correctly or responding to key commands try a Soft Reset:

Step 1 Turn the Analyzer OFF. If a 1 second press of the ON/OFF key does not respond, press and hold the ON/ OFF key for 10 seconds then release to force a shutdown.

Step 2 Press and hold the ENTER key

Step 3 Press ON/OFF to power up the Analyzer

Step 4 A second later, release ENTER key

Step 5 At the prompt, press ENTER again to reset

NOTE: Default “Factory Settings” will be restored and firmware reset to correct any issues. Be advised that while any saved settings or traces will be preserved, any *unsaved* data will be lost.

If you are still having an issue, please contact our Technical Support at 800-258-7805 US & Canada or +1-760-931-8979 M-F 800am-4:30pm US Pacific Time, or Email: techsupport@aeatechnology.com



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