

## VNA/FRA Delivers Higher Performance, New Features

[OMICRON Lab's](#) Bode 500 vector network analyzer offers an ultra-wide frequency range that will enable precise measurements from 10 millihertz up to 450 MHz. (The low end of the range is currently 1 Hz, with the extension to 10 millihertz (mHz) coming in future software versions.)

This instrument features high linearity and a high dynamic range of >120 dB to enable accurate vector network analysis, frequency response analysis and impedance measurements. The switchable inputs provide 50- $\Omega$  termination and a high-impedance setting with an ac-coupled 1 M $\Omega$  for measurements on active systems and use with external probes (see the figure).

With 66 dB of dynamic range on the output and a maximum power level of 16 dBm, the analyzer offers enough signal injection power for loop gain and output impedance measurements on switching converters and power distribution networks (PDNs). Several of these specifications including measurement frequency range, dynamic range, and signal source power range represent higher performance than the company's Bode 100 VNA (see the table). According to the vendor, these new capabilities make the Bode 500 the instrument of choice for power integrity verifications and loop stability measurements.

Weighing just under 5 lbs, the Bode 500 is a silent, fanless, portable instrument that can be powered by Ethernet (PoE), USB (USB-PD), or a standard power supply. The analyzer has a USB-C and an Ethernet interface for connection to the network or the control computer.

When used with the powerful Bode Analyzer Suite, the Bode 500 offers the same user experience and ease of use as the Bode 100. Additionally version 3.50 of the Bode Analyzer Suite will include a curve fitting feature that generates measurement-based electrical models in SPICE. However, this feature will be available in both the Bode 500 and the Bode 100. Besides the Bode Analyzer Suite, the Bode 500 can be controlled directly via SCPI commands, enabling standalone, platform-independent automated measurements.

As the table documents, the Bode 500 contains numerous performance improvements versus the Bode 100. These are reflected in the cost of the new analyzer versus the existing one. List price for the Bode 500 is \$14,900 versus \$6,390 for the Bode 100. In addition, there are various hardware accessories such as probes, adapters and signal injectors, which can be ordered separately or bundled with the analyzer.

The Bode 500 is available now for quotes and orders. For more information, see the [website](#) or contact the [company](#).



*Figure. OMICRON Lab's Bode 500 vector network analyzer/frequency response analyzer extends the upper limit of the measurement range from the 50 MHz of the Bode 100 to 450 MHz in this new instrument. It also provides higher dynamic range, a wider range of signal source power levels, and an Ethernet interface (see the table).*

Table. Comparing specs and features of the Bode 500 vs. the Bode 100.

| Characteristic                     | Bode 100               | Bode 500  |
|------------------------------------|------------------------|---|
| Frequency range                    | 1 Hz to 50 MHz         | 10 mHz* to 450 MHz<br><br>(*currently 1 Hz but will be extended to 10 mHz in a future software release) |
| Dynamic range                      | >100 dB                | >120 dB (typ.)  |
| Signal source power range          | -30 dBm to 13 dBm      | -50 dBm to 16 dBm   |
| Connector type                     | BNC                    | N   |
| Source impedance                   | 50 Ω                   | 50 Ω  |
| Channel termination                | 50 Ω/1 MΩ ac coupled   | 50 Ω/1 MΩ ac coupled  |
| Input ac measurement range         | Up to 10 Vrms          | Up to 10 Vrms   |
| S-parameter measurements (VNA)     | ✓                      | ✓   |
| Frequency response analysis        | ✓                      | ✓   |
| Impedance analysis                 | ✓                      | ✓   |
| Bode Analyzer Suite user interface | ✓                      | ✓   |
| Standalone SCPI interface          | X                      | ✓   |
| USB connector                      | Type B                 | Type C  |
| Ethernet connection                | X                      | ✓   |
| Network capability                 | X                      | ✓   |
| Web interface                      | X                      | ✓   |
| Powered via USB-PD                 | X                      | ✓   |
| Powered via Ethernet (PoE+)        | X                      | ✓   |
| Signal source indicator            | X                      | ✓   |
| Channel termination indicator      | X                      | ✓   |
| External reference frequency input | X                      | ✓(*)  |
| External trigger input             | X                      | ✓(*)  |
| External trigger output            | X                      | ✓(*)  |
| USB-A host interface               | X                      | ✓(*)  |
| Passive cooling (fan-less)         | ✓                      | ✓   |
| List price                         | EUR 5,790/U.S. \$6,390 | EUR 13,900/U.S. \$14,900  |

\*Function available in future software release.