Bode 100

Vector Network Analyzer – VNA

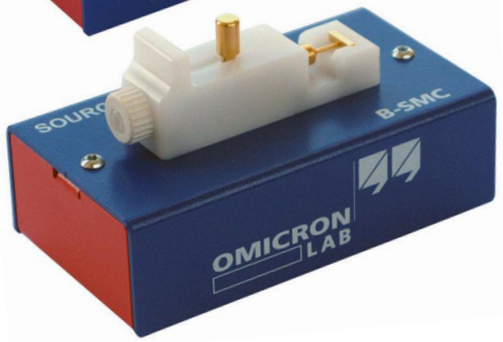
Original Manufacturer: Omicron Lab, Austria

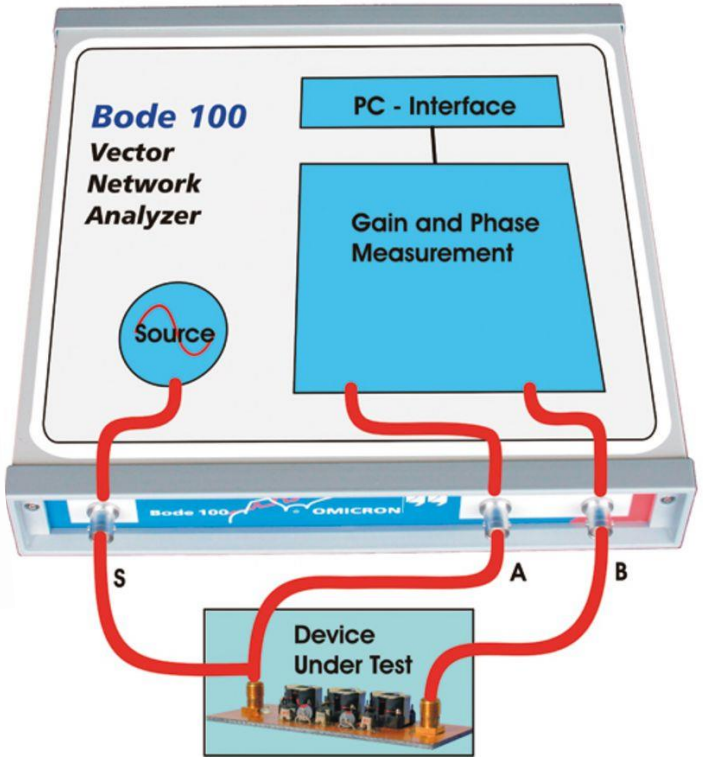
Authorized supplier for Czechia and Slovakia:

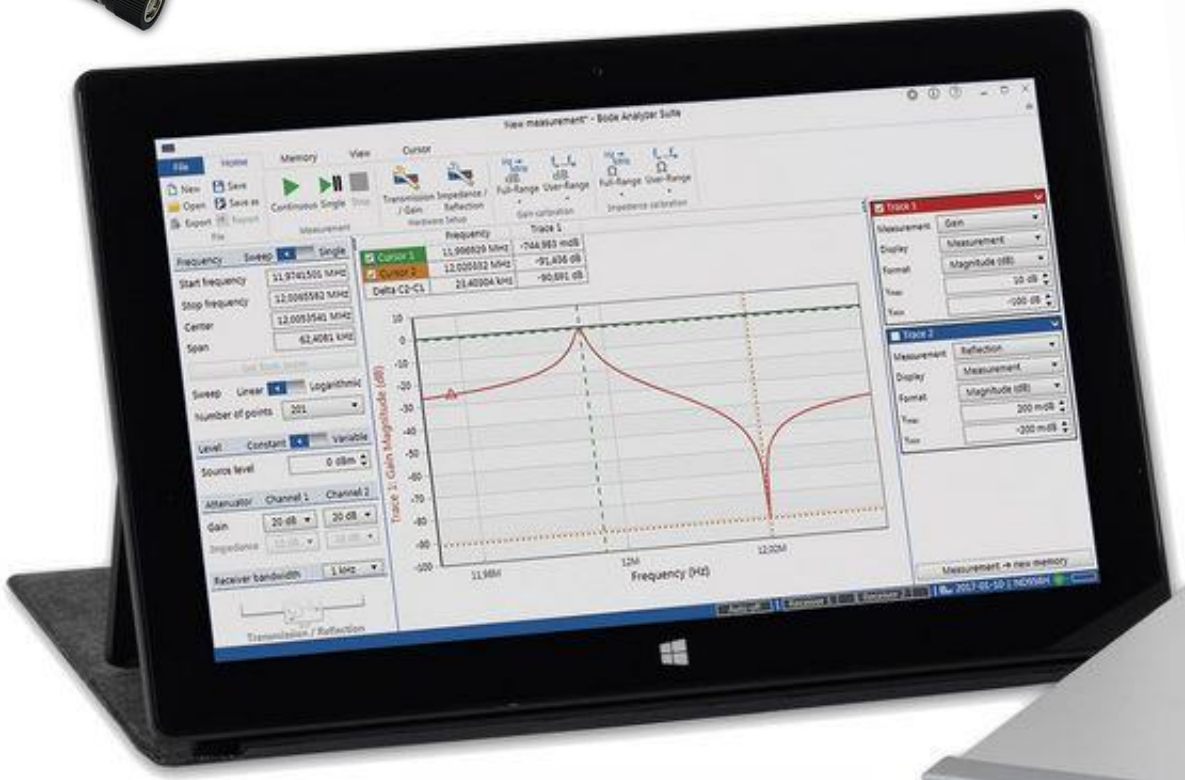
Amtest-TM, s.r.o., Svatováclavská 408, Uherské Hradiště

Czech Republic

OMICRON LAB







PICOTEST

Application Fields and Benefits

Use Bode 100 to measure:

- Complex gain of active and passive circuits
- Complex impedance and admittance of active and passive devices
- Swept S-parameters of electronic circuits and filters
- Group delay characteristics

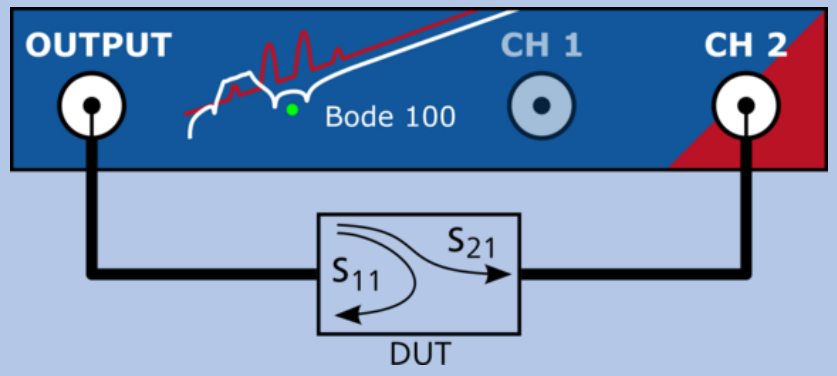
Advantages of Bode 100:

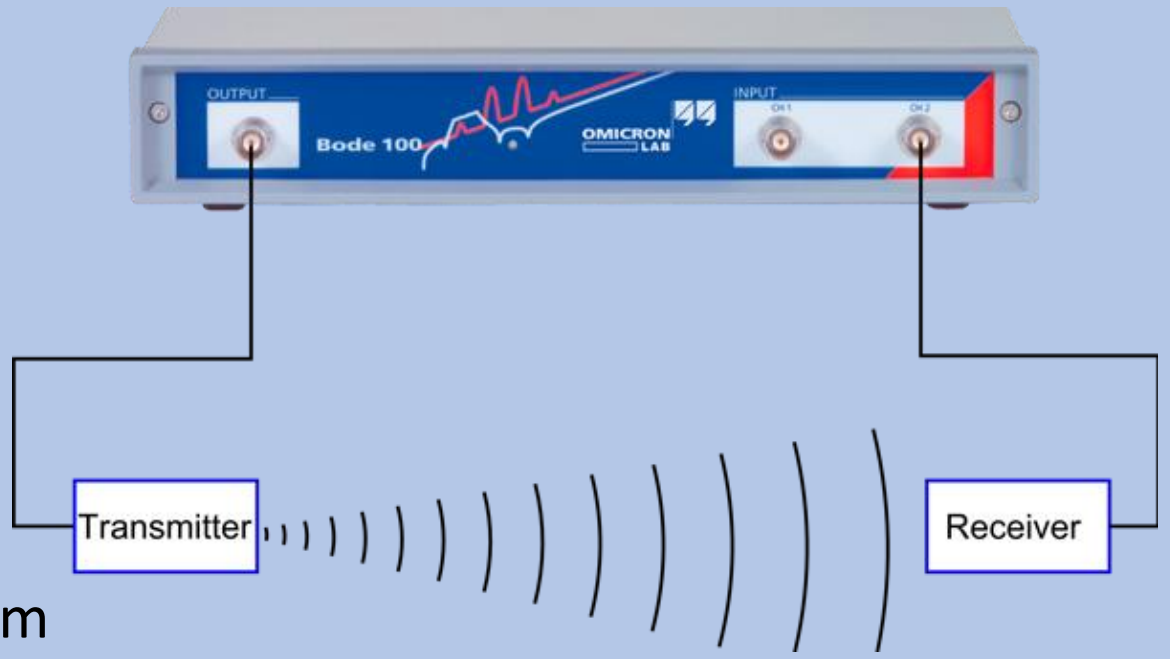
- VNA & FRA in one device
- Easy-to-use and intuitive software (Bode Analyzer Suite)
- Easy data processing and data sharing
- Highly accurate measurements
- Calibration & repair service from manufacturer
- Lightweight and portable hardware design without active cooling (silent lab)
- Automation Interface (API) for automated measurements
- Unbeatable price-performance ratio

Easily analyze:

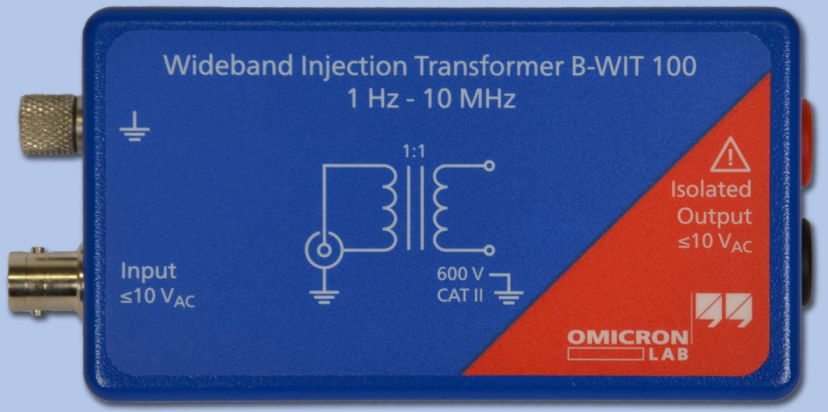
Stability of control circuits such as DC/DC converters in power supplies
Parasitic of passive components and circuit boards
Power-plane impedance for optimum decoupling
Reflection coefficient and return loss of filters, antennas or amplifiers
Ultrasonic and piezo electric devices
Resonance behavior of high Q-circuits like oscillating crystals
Resonance frequency and Q-factor of RFID and NFC tags and antennas

Features of Bode 100





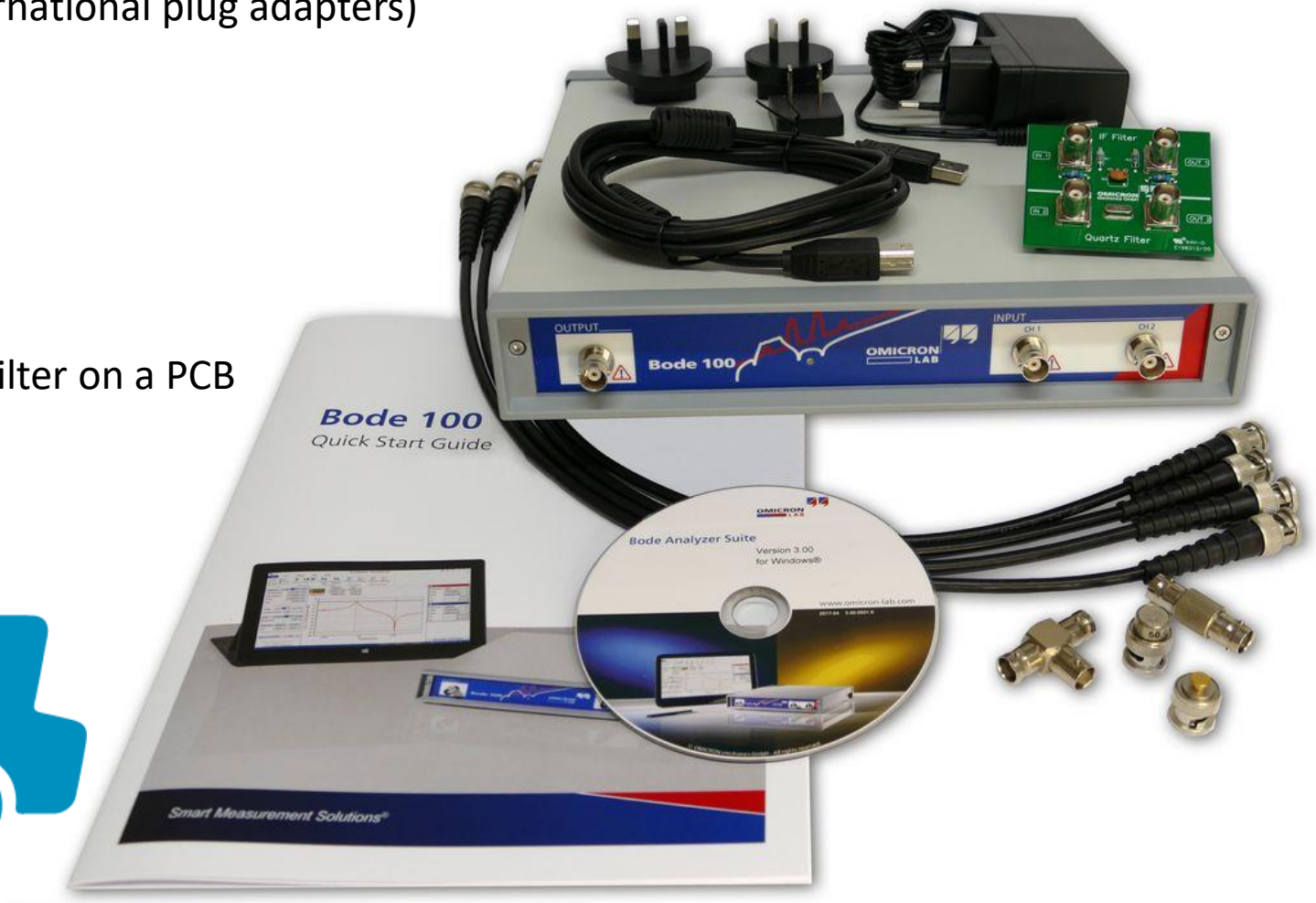
- Wide frequency range from 1 Hz to 50 MHz
- Adjustable output level from -30 dBm to 13 dBm
- Adjustable shaped level (variable signal level) over frequency
- Switchable channel input impedance (50 Ω / 1 MΩ)
- Highly sensitive inputs (superheterodyne receiver with 24 bit ADCs)
- Narrow-band receivers for highest noise rejection
- Flexible hardware design offering several measurement modes
- Fan-less and therefore absolutely silent on your bench



Scope of Delivery

The Bode 100 system (OL000100) includes:

- Bode 100 Vector Network Analyzer
- Bode Analyzer Suite software
- Printed Quick Start Guide (English)
- Wide range power supply (with international plug adapters)
- USB cable
- 4 x BNC cable 50 Ω (m-m)
- 1 x BNC T adapter (f-f-f)
- 1 x BNC straight adapter (f-f)
- 1 x BNC 50 Ω load (m)
- 1 x BNC short circuit (m)
- Test object with quartz filter and IF filter on a PCB

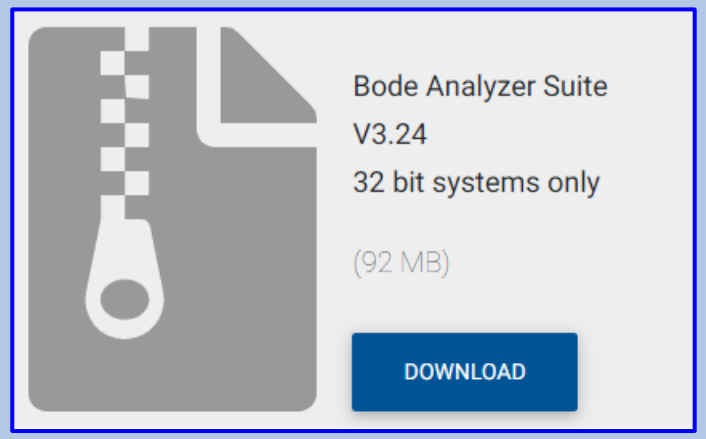


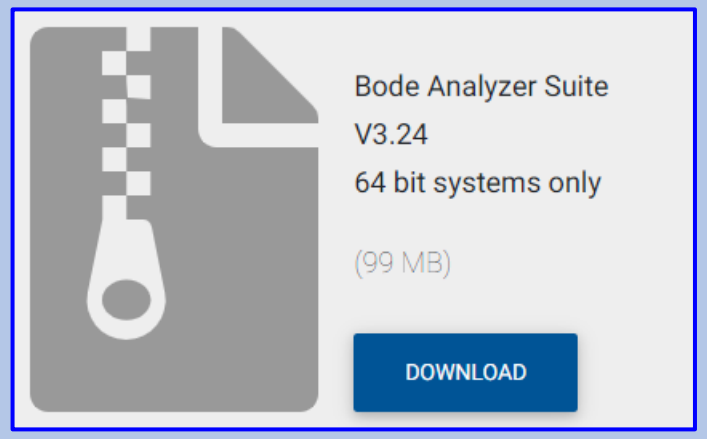
Bode Analyzer Suite

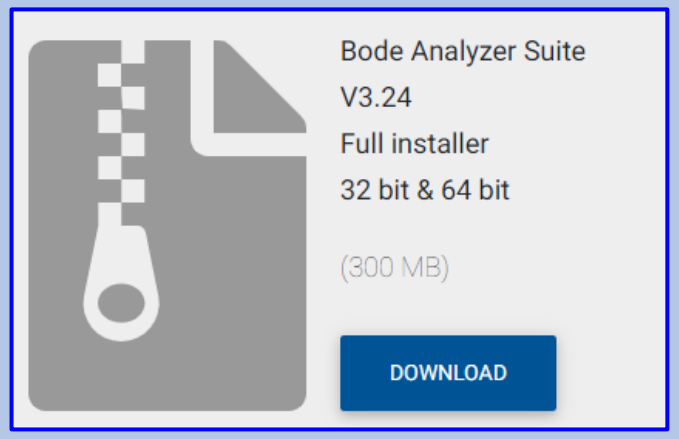
The Bode 100 is controlled via the Bode Analyzer Suite software, a powerful GUI for Windows PCs.

With the Bode Analyzer Suite (BAS) you have full control over the Bode 100 vector network analyzer.

BAS is an easy-to-use and intuitive user interface running on your Windows PC. BAS helps you to quickly measure and analyze your device under test. It offers great functions to save, document and share your measurement results.







Bode Analyzer Suite is free of charge, so feel free to download it!

Welcome to the Bode 100 download area

https://www.omicron-lab.com/downloads/vector-network-analysis/bode-100

Bode 100 Application Software

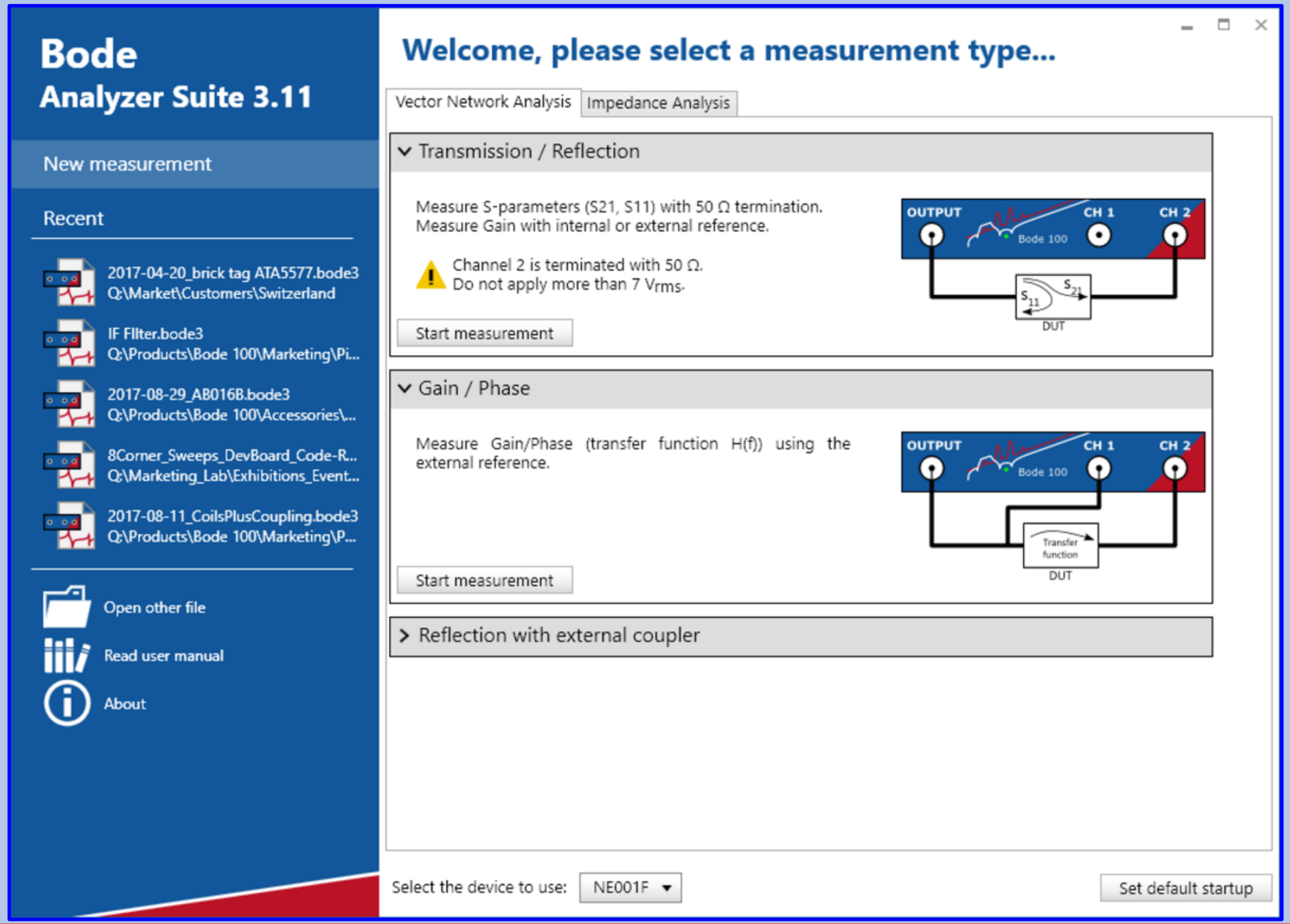
PC Requirements

Bode Analyzer Suite can be installed on a PC that fulfills the following requirements:

Characteristic	Minimum Configuration
Processor	Intel Core-I Dual-Core (or similar)
Memory (RAM)	2 GB, 4 GB recommended
Graphics resolution	Super VGA (1024x768) higher resolution recommended
Graphics card	DirectX 11 with Direct2D support
USB interface	USB 2.0 or higher
Operating system	Windows 10 required for BAS 3.24 or newer
Software	Bode Analyzer Suite 3.00 or newer

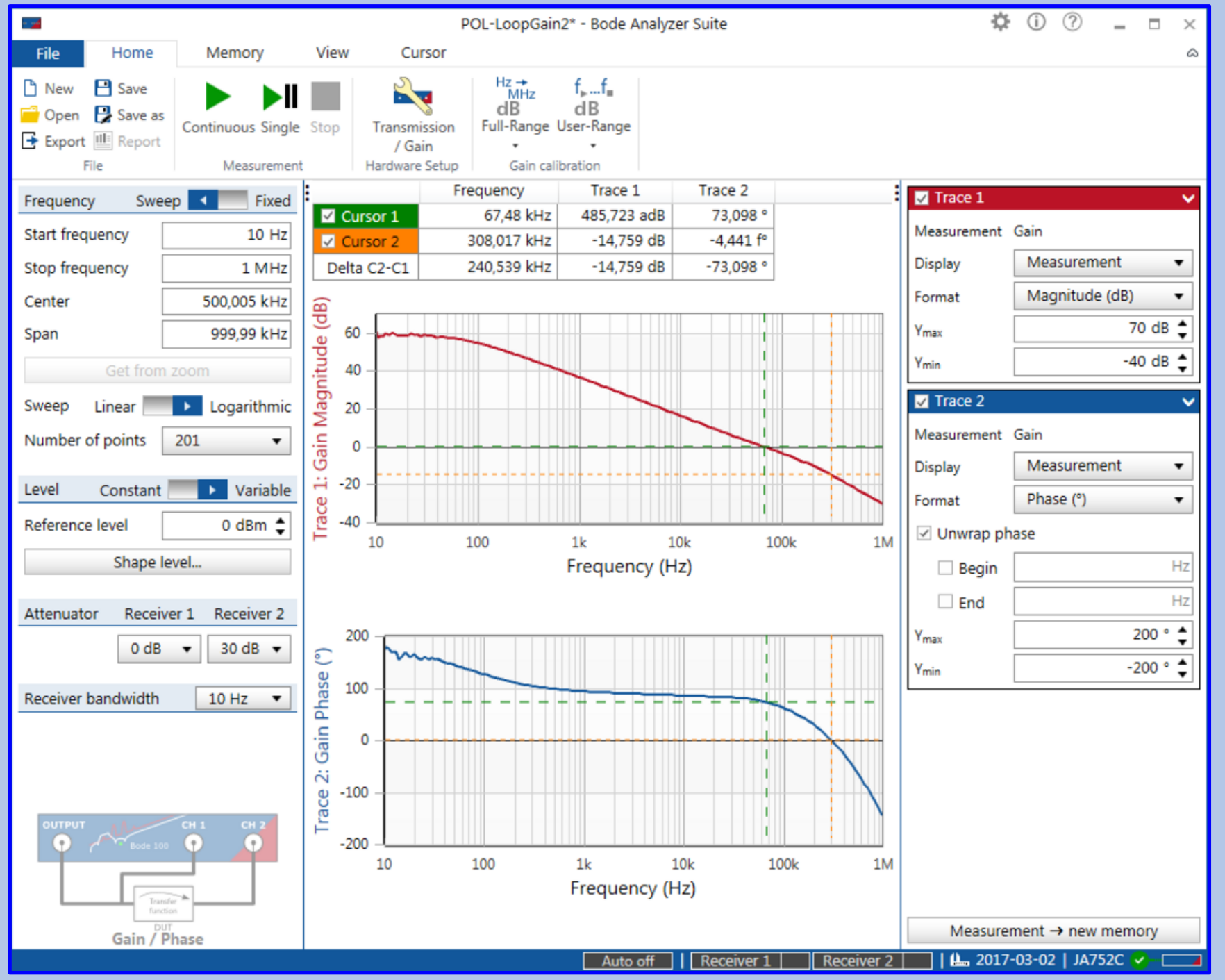
Start-up Screen

Use the startup screen to quickly set-up the Bode 100 according to your needs. All supported measurements are listed in the startup screen. To learn more about the measurements that can be performed with Bode 100, check out the next tab on this page...



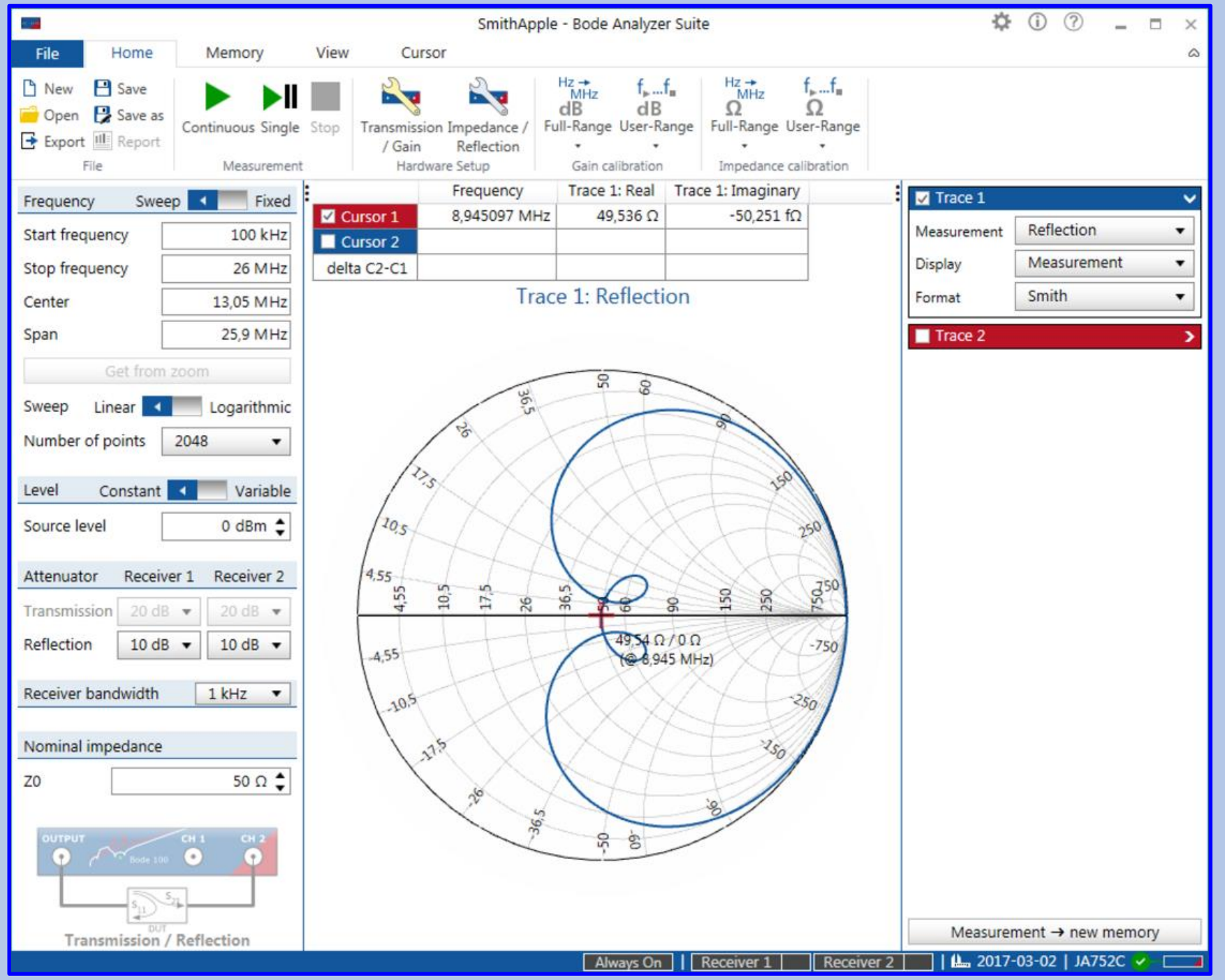
Frequency Sweep Measurements

Bode Analyzer Suite makes frequency sweep measurements an easy task. Impedance, Reflection, Admittance, Group Delay, Gain and Phase can be measured from 1Hz to 50MHz.
Define start frequency, stop frequency and number of points to generate linear or logarithmic frequency sweeps.
Cursors help you to find resonance frequencies or zero crossings in the measured curves.



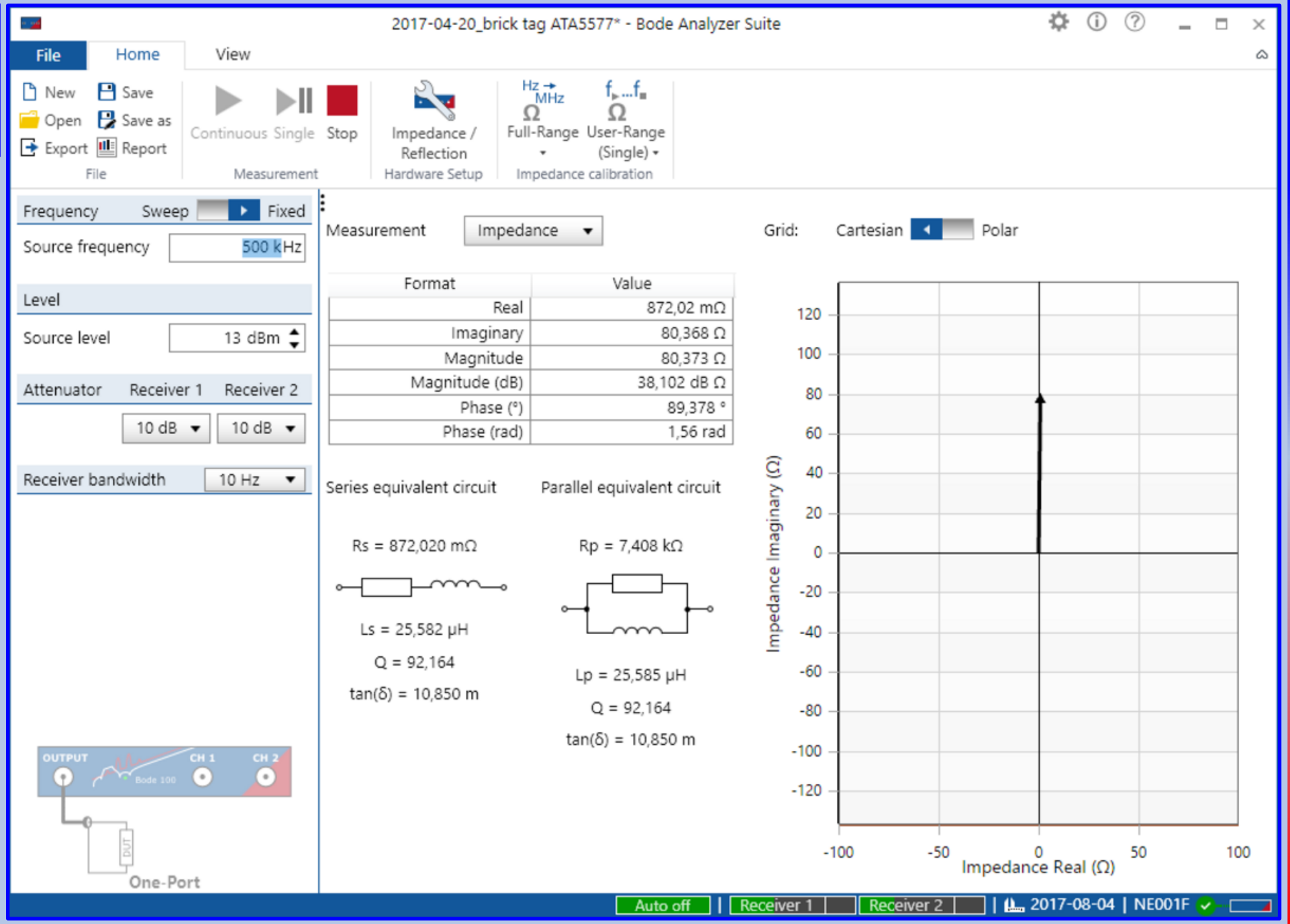
Smith, Polar and Nyquist Charts

Results can be displayed in various formats such as Magnitude, Magnitude (dB), Phase (rad), Phase (°), Real, Imaginary, etc... Besides normal x-y diagrams, Bode Analyzer Suite also offers Polar, Nyquist and Smith diagrams. All diagrams support full cursor and zooming functionality.



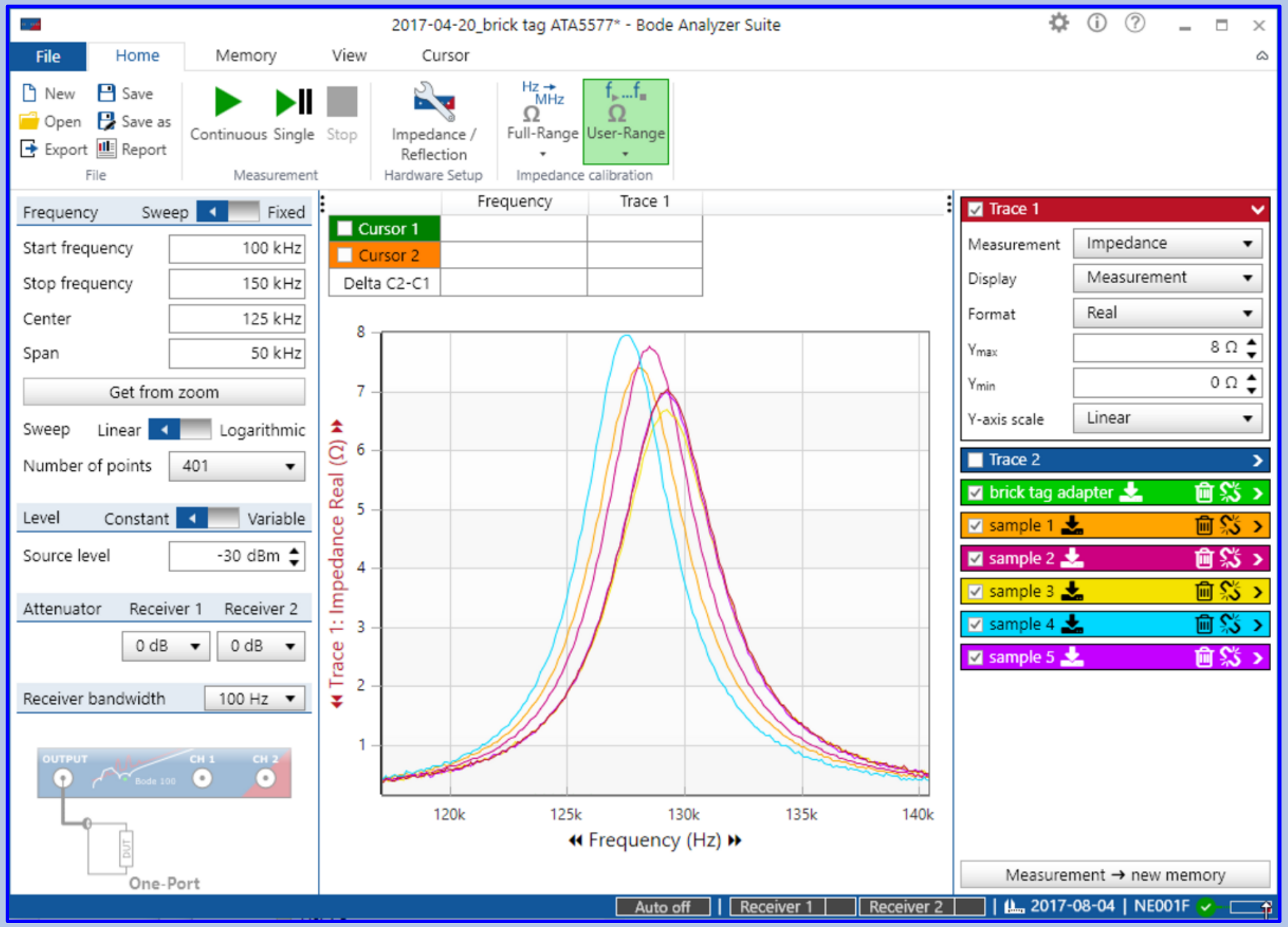
Fixed Frequency Measurements

Besides frequency sweep measurements Bode Analyzer Suite also offers fixed-frequency measurements.
The result can be displayed in either cartesian or polar form. Series and parallel equivalent circuit parameters are calculated during measurement and updated immediately.



Memory Curves

Use the one-click memory curves to display the change of your DUT in one single graph! Memory curves can be renamed and re-styled according to your needs. Cursors can be attached to a memory curve to read the values of the memory traces.



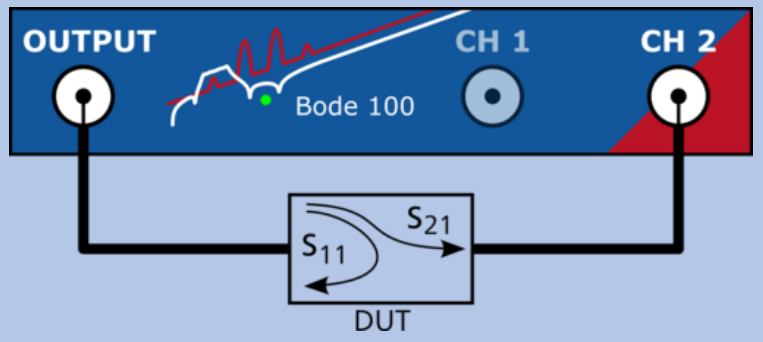
Measurement Modes

Pre-defined measurement modes make measurements simpler and ensure correct device setup and connection setup. The Bode Analyzer Suite offers a high variety of measurement modes to perform Transmission/Reflection, Gain and Impedance measurements using the Bode 100.

Vector Network Analysis

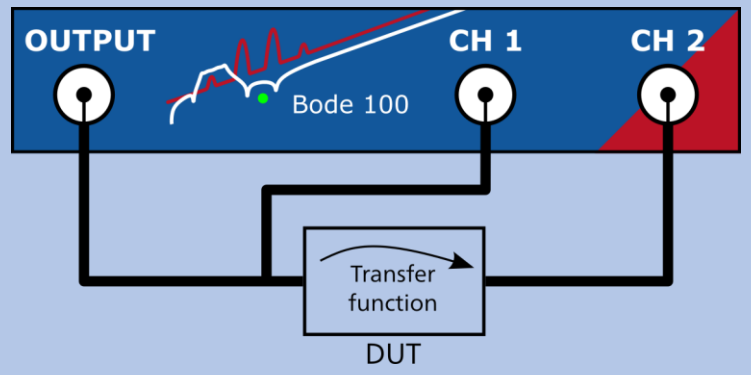
Transmission/Reflection Measurement

Measure S-Parameters S11 and S21
in the 50 Ω domain or Gain with 1 MΩ impedance.



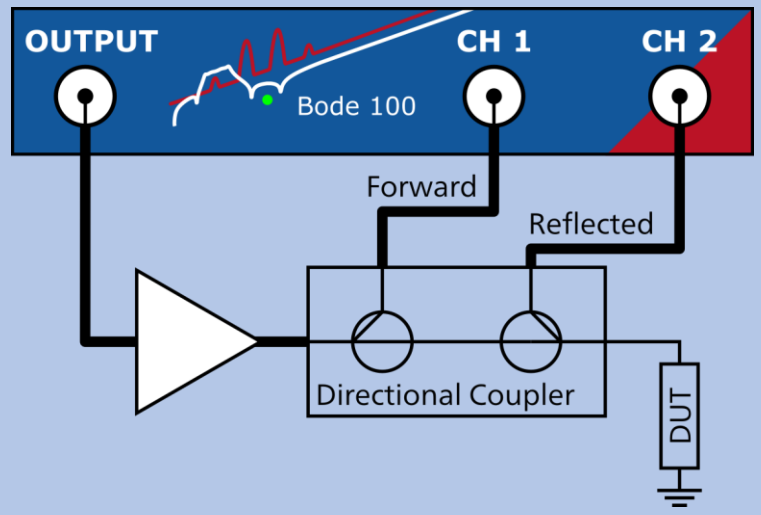
Gain/Phase Measurement

Measure Gain/Phase respectively voltage transfer function using two input ports. Input port impedance is software-selectable (1 MΩ or 50 Ω).



External Coupler Measurement

Measure reflection/impedance using an external amplifier in conjunction with an external coupler.



Measurement Modes

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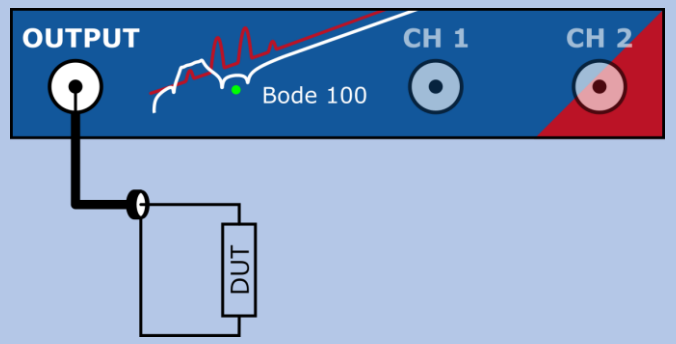
Impedance Analysis

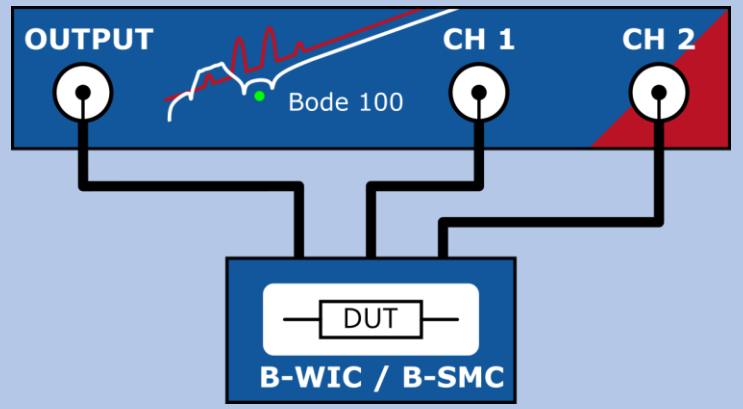
One-Port Impedance Measurement

Measure reflection/impedance of a one-port DUT connected to the output port of Bode 100.



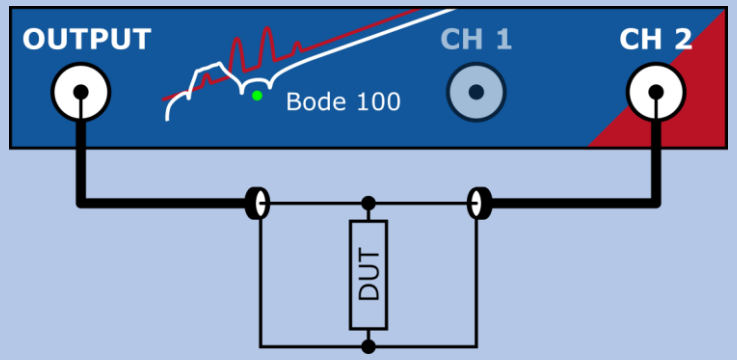
Impedance Adapter Measurement

Measure impedance of passive THT or SMD components using the impedance test fixtures B-WIC or B-SMC.



Shunt-Thru Measurement

A measurement configuration very sensitive for low impedance values and therefore suitable to analyze low-impedance devices such as ESR of ceramic capacitors.



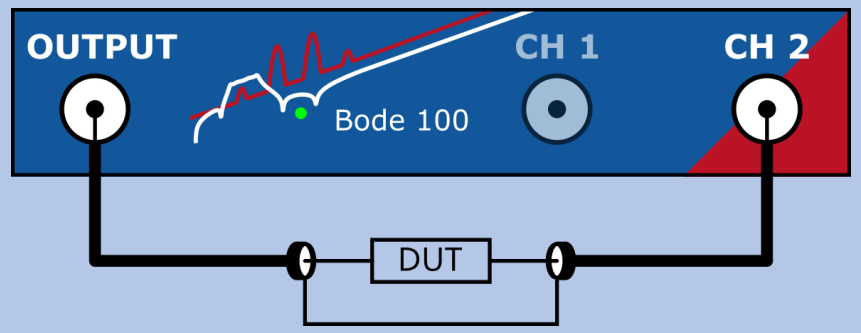
Measurement Modes

Pre-defined measurement modes make measurements simpler and ensure correct device setup and connection setup. The Bode Analyzer Suite offers a high variety of measurement modes to perform Transmission/Reflection, Gain and Impedance measurements using the Bode 100.

Impedance Analysis

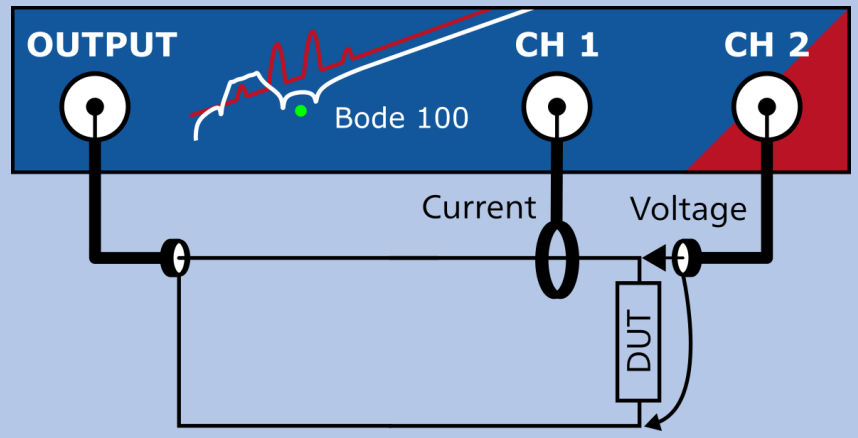
Series-Thru Measurement

A measurement configuration very sensitive to high-impedance. Suitable for high-impedance measurements such as piezo-element characterization.



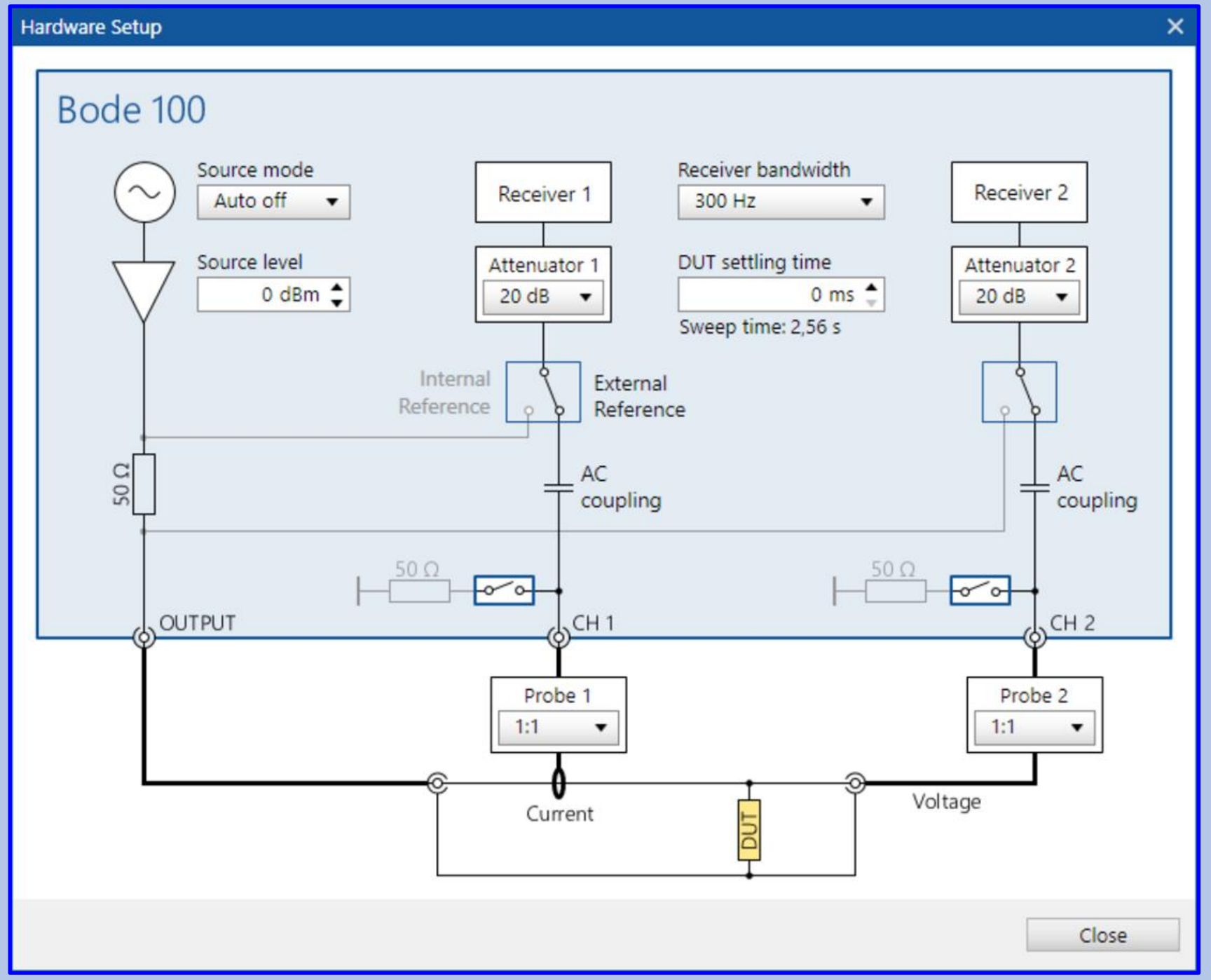
Voltage/Current Measurement

Voltage/Current equals Impedance. This setup is very flexible and especially suitable to measure input impedance and output impedance of active circuits such as DC/DC converters.



Hardware Setup

Configure Bode 100 according to your needs! The hardware setup helps you to configure the device hardware and connection setup correctly. You can switch the input impedance from 50 Ω to 1 MΩ and enter external probe factors or adjust the receiver attenuation/range.



Reporting and Documentation

With the Bode Analyzer Suite it is easy for you to create a one-click pdf report on your measurement, including all relevant device settings and measurement curves.
You can also copy and paste the diagrams directly into a word processor like Microsoft Office Word. Furthermore, all measurement values can be exported to a .csv file or .xslx file for further processing in any spreadsheet application or math program.
In addition, Bode Analyzer Suite 3.0 or newer support direct Touchstone file export.
Note: You can save every measurement to a .bode3 file. It contains all measurement data, calibration and device settings for archiving and/or sharing measurements. Bode-files can be analyzed with the Bode Analyzer Suite even if no Bode 100 hardware is connected.

Measurement: Transmission / Reflection

OMICRON LAB

	Cursor 1	Cursor 2	Delta C2-C1
Frequency	10,713 MHz	11,299 MHz	1,224 MHz
Trace 1	-38,841 dB	-88,491 dB	-49,65 dB
Trace 2	-34,816 dB	-26,05 dB	8,766 dB

Sweep	
Start frequency:	9,839 MHz
Stop frequency:	11,462 MHz
Center frequency:	10,651 MHz
Span:	1,622 MHz
Sweep mode:	Linear
Numer of points:	201

Calibration	Full-Range	User-Range
Gain	-	-
Impedance	-	-

Termination	Channel 1	Channel 2
Gain	1 MΩ	50 Ω
Impedance	1 MΩ	50 Ω

Hardware setup	
Device type:	Bode100R2
Serial number:	NE001F
Receiver bandwidth:	30 Hz
Output level:	13 dBm
DUT settling time:	0 µs
Nominal Impedance:	50 Ω

Attenuator setting	Channel 1	Channel 2
Transmission	20 dB	20 dB
Reflection	10 dB	10 dB

Receiver switch	Channel 1	Channel 2
Gain	Internal	External
Impedance	Internal	Internal

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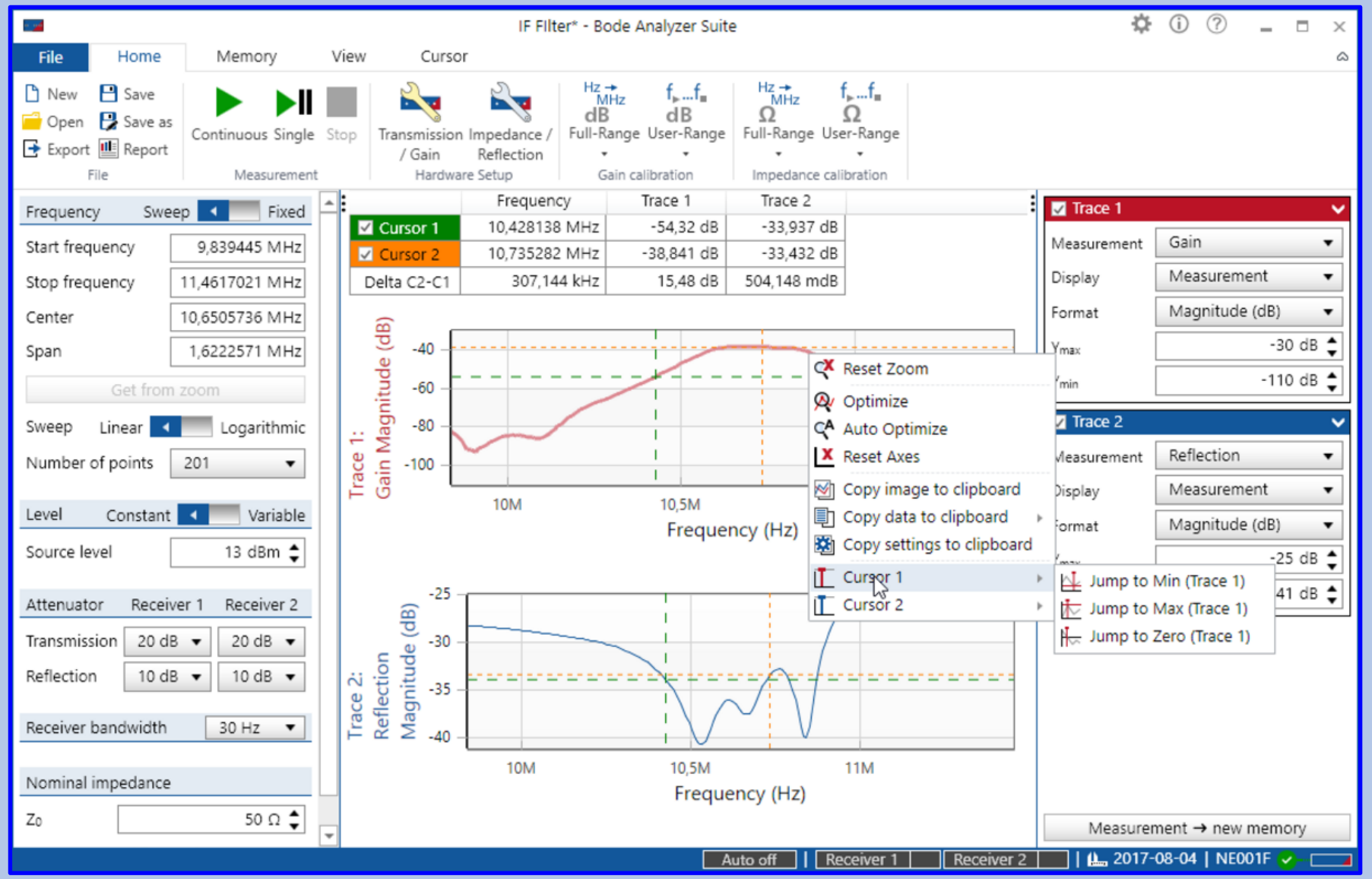
Interactive User Interface

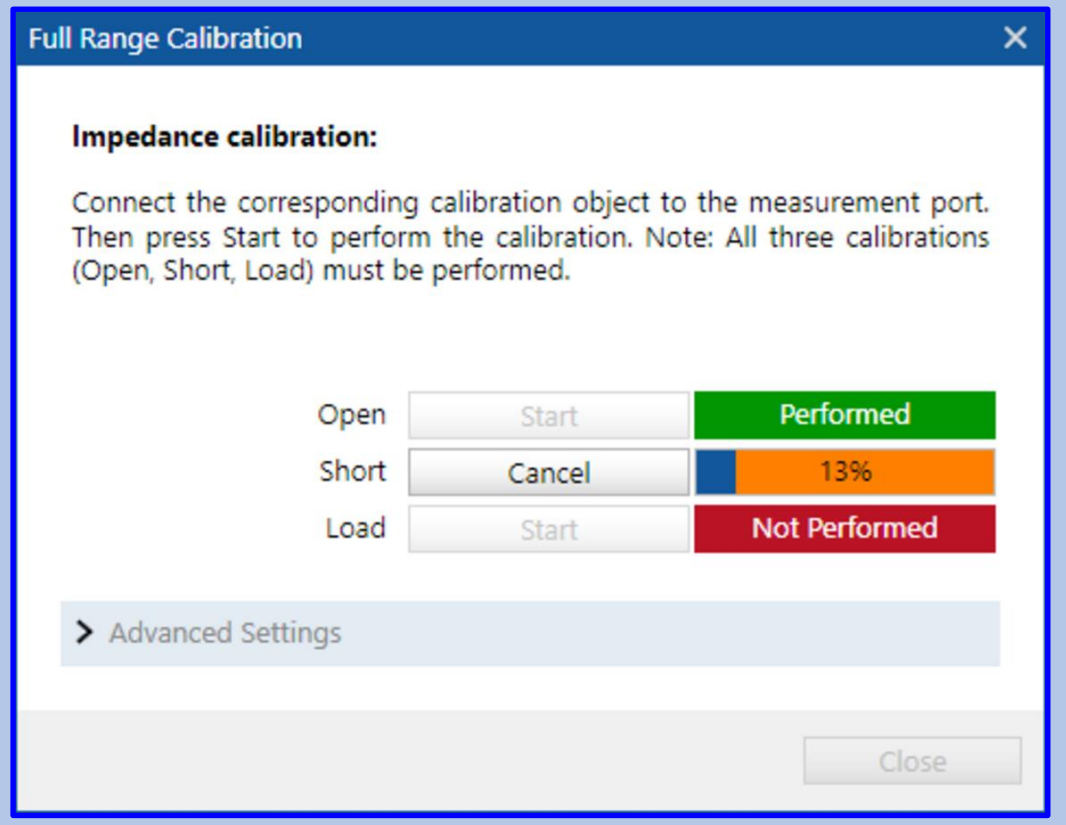
Bode Analyzer Suite features an interactive user interface with cursors and cursor grid that show cursor values and special calculation results. Use the cursors to find minima and maxima in the curves or any specific values. All diagrams can be zoomed and optimized to automatically adjust the axis scaling to the measurement results.

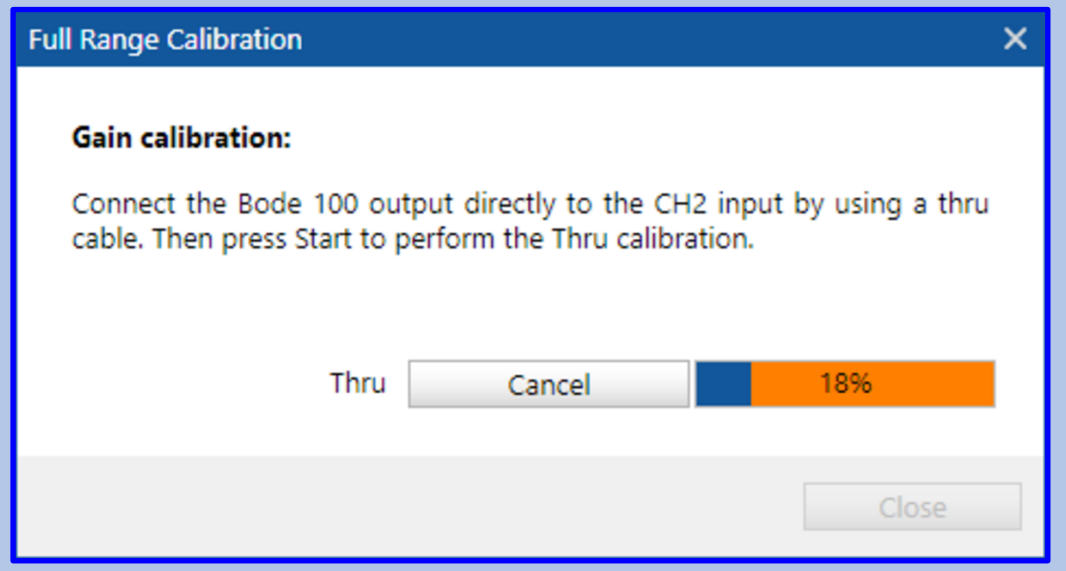


Gain and Impedance Calibration

Do you want to compensate the cables or the measurement setup?

The Bode Analyzer Suite offers THRU calibration for the Gain/Phase measurements and OPEN SHORT LOAD calibration for impedance/reflection measurements. You can apply all necessary settings in the calibration window, the calibration state is shown graphically.

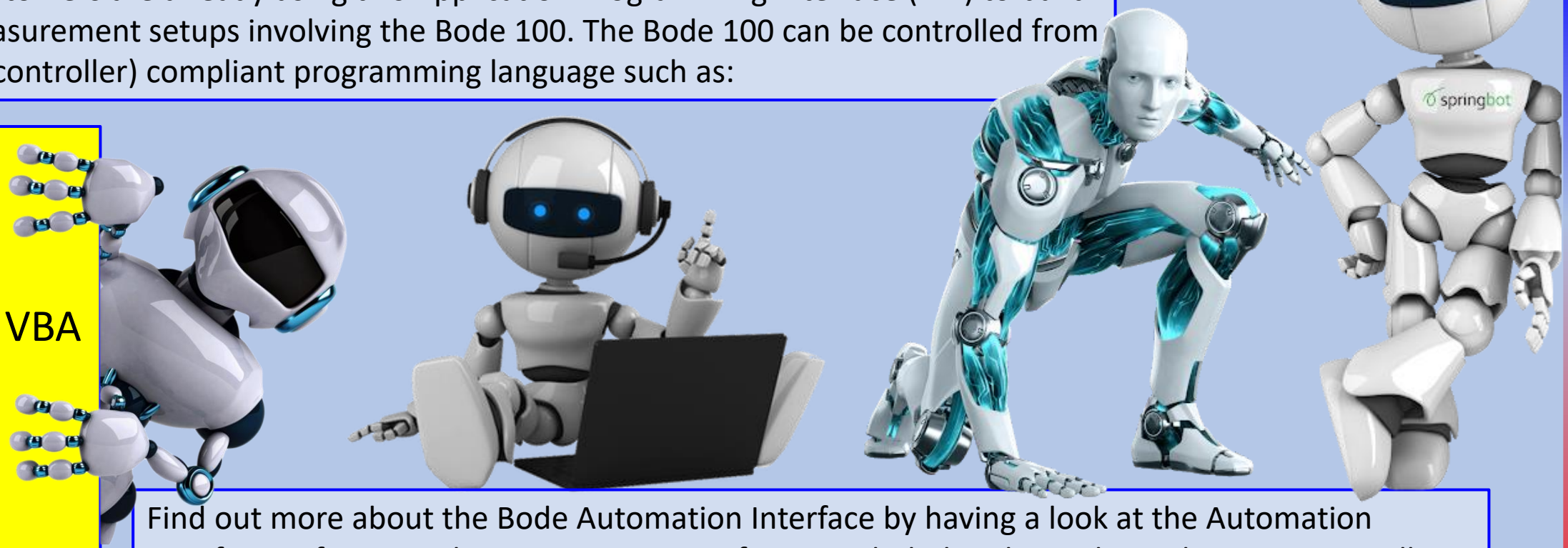




Some measurements have to be repeated over and over again ...

... Therefore, we added an Automation Interface to the Bode 100 right from the beginning. Today many customers are already using this Application Programming Interface (API) to build automated measurement setups involving the Bode 100. The Bode 100 can be controlled from any COM (OLE controller) compliant programming language such as:

MATLAB®
C#
VB.NET
Excel® with VBA
C++
TCL
Python®
Delphi®
etc...

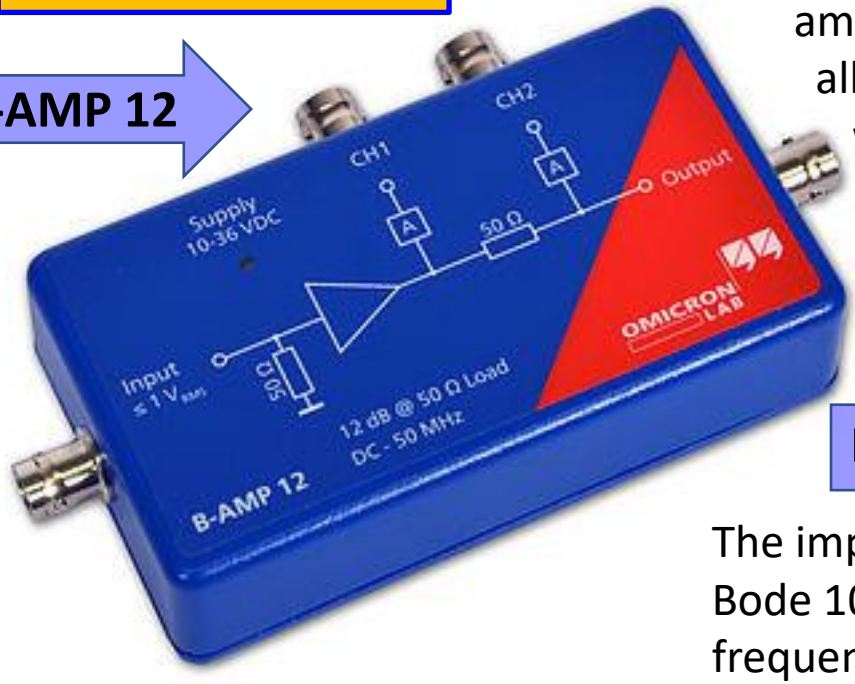


Find out more about the Bode Automation Interface by having a look at the Automation Interface Reference. The Automation Interface is included in the Bode Analyzer Suite installer. Check out the Bode 100 download area.

In addition, there is a LabVIEW® instrument driver available for download from www.ni.com.

Accessories

B-AMP 12



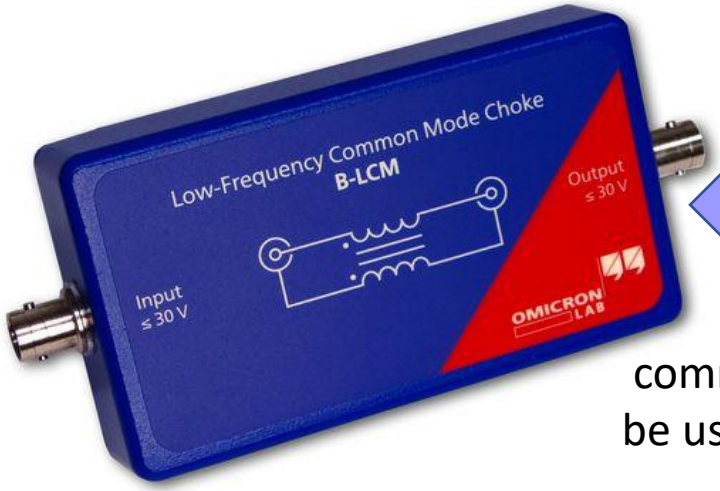
Sometimes more power is better...

B-AMP 12 is an external power amplifier for the Bode 100 that allows you to generate signals with a power up to 25 dBm!

Impedance Test Fixtures

The impedance adapters turn your Bode 100 into an easy-to-use high-frequency LCR-meter. The gold-plated contact electrodes with spring-based mechanism offer low contact resistance and reproducible results.

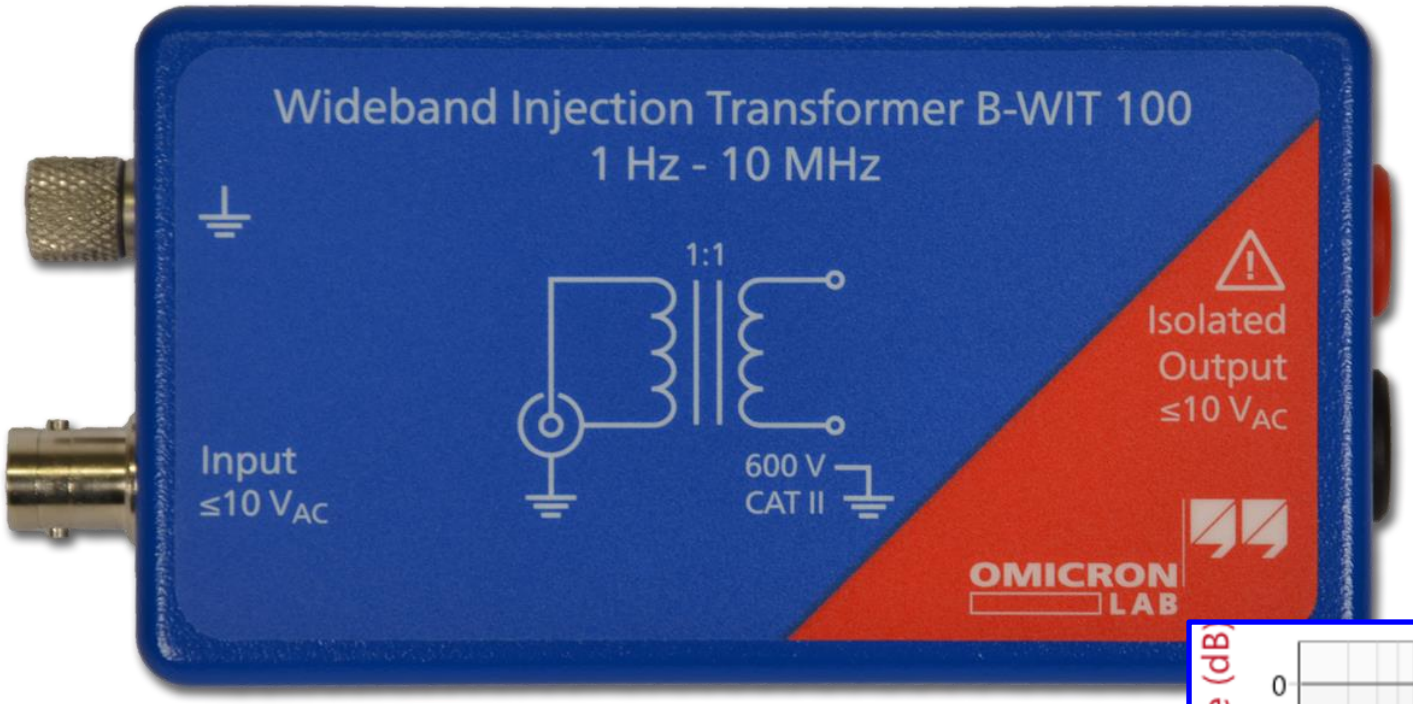
Common Mode Choke



B-LCM is a low frequency common mode choke that can be used to reduce ground-loop currents in a test setup.

Accessories

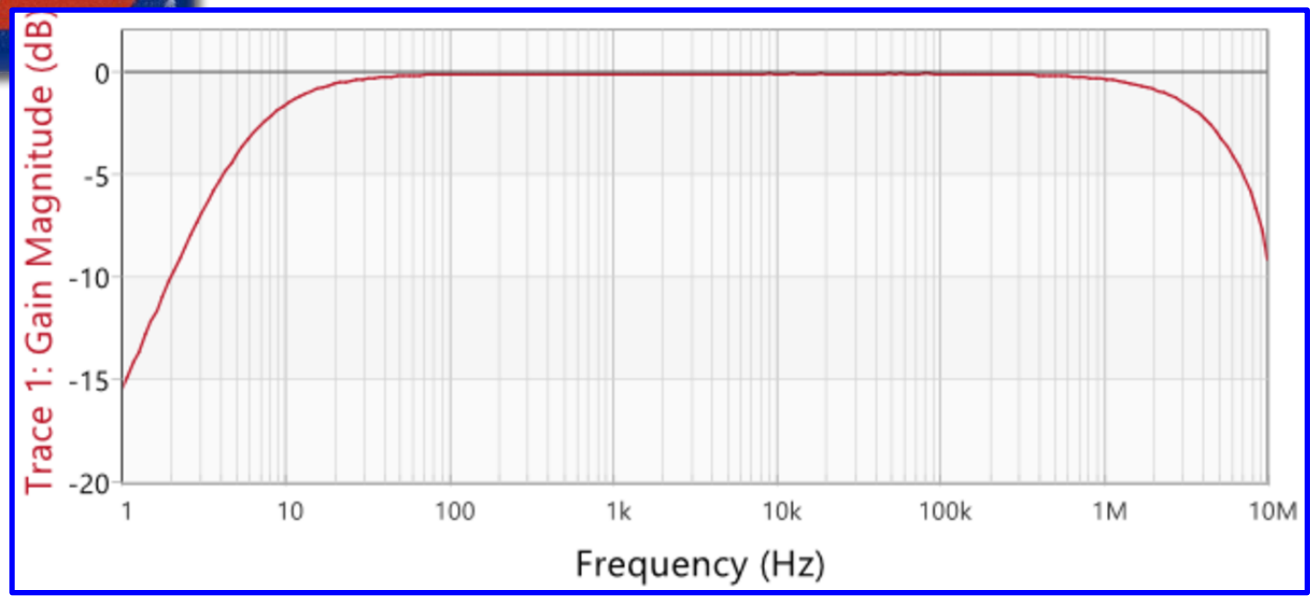
The PML111O is a passive 10:1 probe especially designed for the Bode 100. It features a 1 MΩ tip resistance with low capacitance for low-noise measurements and best device-protection.



Passive 10:1 Probe

Wideband Injection Transformer

Our injection transformers are especially designed to assess the stability of control loops. Due to the safe isolation (600V CAT II), they can even be used on DC/DC converters that deal with high output voltages.



Accessories

Active Differential Probe

The TT-SI 9001 active differential probe can handle up to 700Vpeak differential mode and common mode signals. The bandwidth of the probe is DC to 25 MHz.

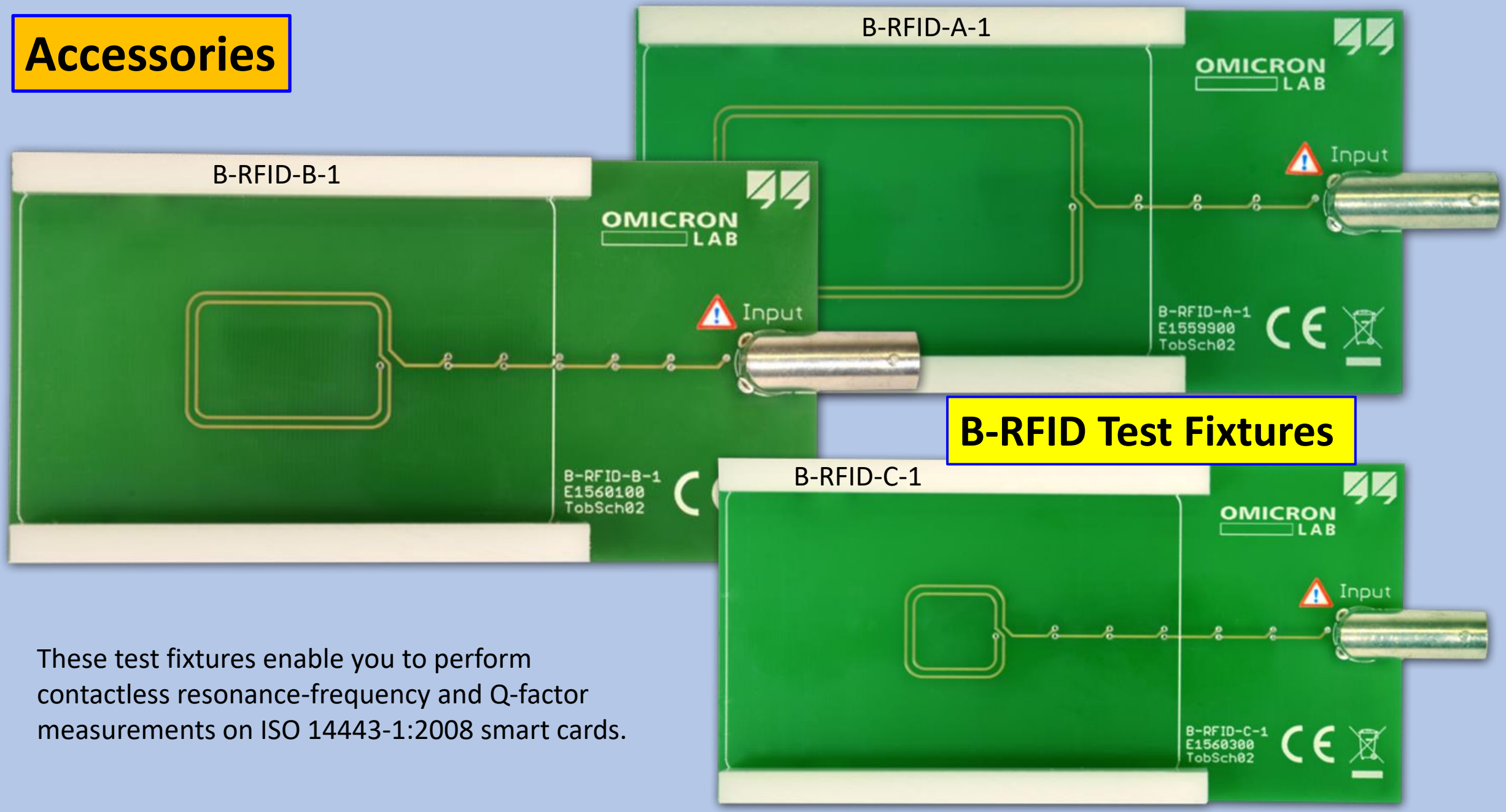
Bode 100 Carrying Case

Carrying case for the Bode 100 with custom cut-out foam interior. Designed to hold the Bode 100 including cables, power supply, B-WIT 100, B-SMC and B-WIC.

Accessories

B-RFID Test Fixtures

Accessories



B-RFID Test Fixtures

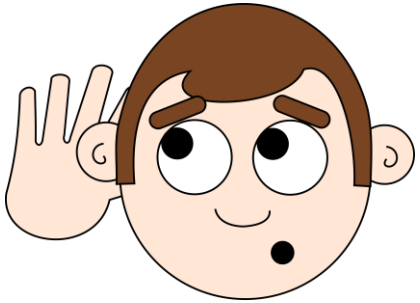
These test fixtures enable you to perform contactless resonance-frequency and Q-factor measurements on ISO 14443-1:2008 smart cards.

Accessories

Maximize the capabilities of your Bode 100 using Picotest Signal Injectors to measure power supplies, regulators and other linear circuitry or components.

Picotest Signal Injectors

In case of interest, need for more information, and/or price offer, please, don´t hesitate to contact us:



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