

# USB RF Vector Signal Analyzer (Spectrum Analyzer)

## BA100



### Overview

BA100, a vector signal analyzer with a compact design. It has excellent testing performance and measurement sensitivity, satisfying the requirements of most RF signal test parameters and general spectrum tests. On top of it all, it supports signal demodulation e.g. FM and Digital Signals. The PCB version module is available for system integration, including an API library for second development if needed.

- 1Gbit signal storage depth to capture and analyze signals
- 10MHz reference in/out, controlled by a USB interface
- Small size (180\*50\*290mm) and light weight (1.8kg)
- API library provided for secondary development

Frequency range  
**9kHz to 6GHz**

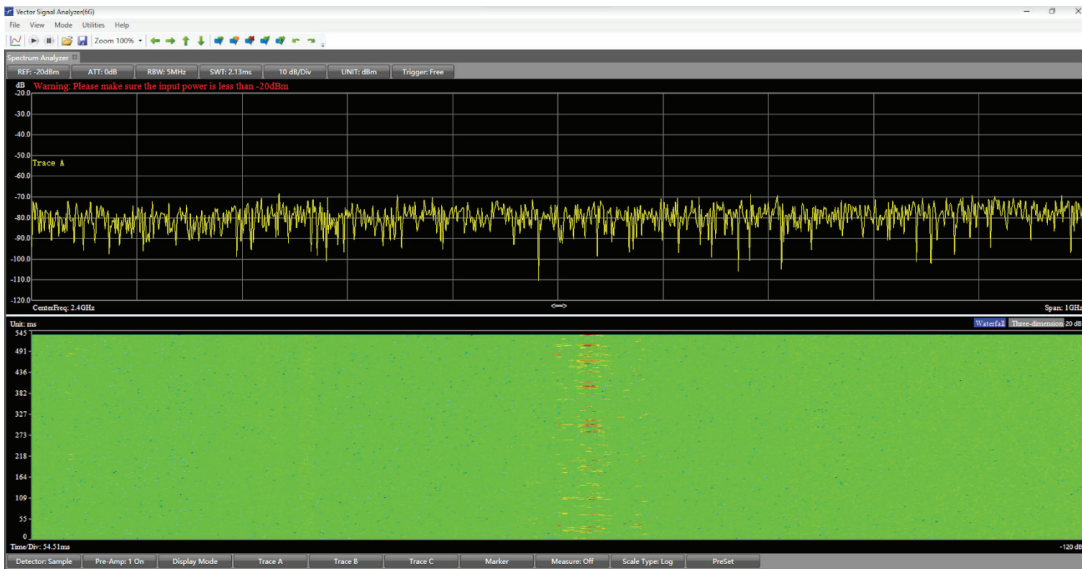
Signal demodulation  
**Digital signal**

DANL  
**-168 dBm @1GHz**

## Functions

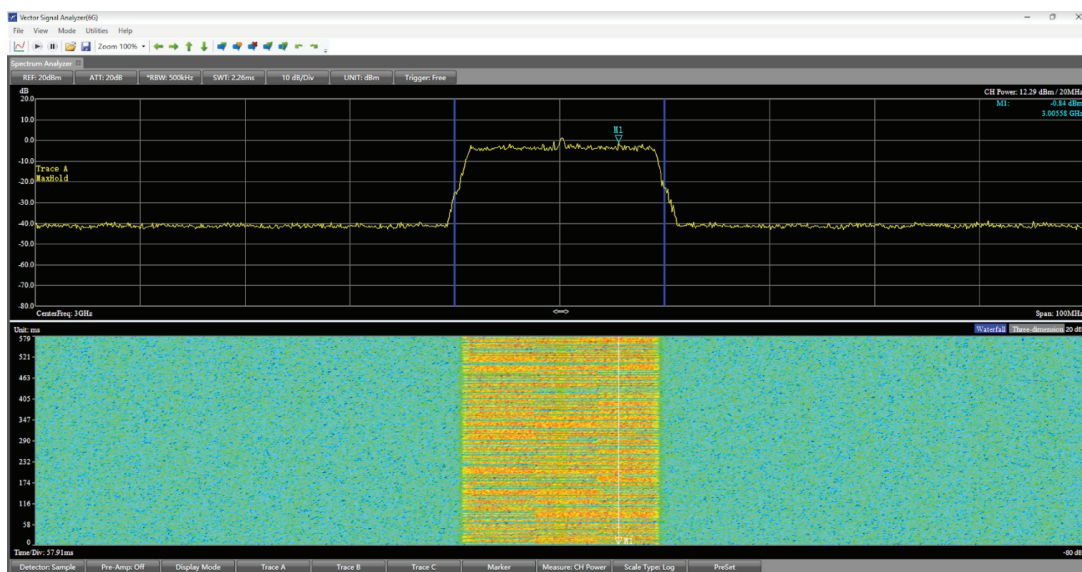
### General Spectrum Analysis

The BA100 provides spectrum testing including frequency and power measurements for conventional stable or periodic signals.



### Waterfall Display

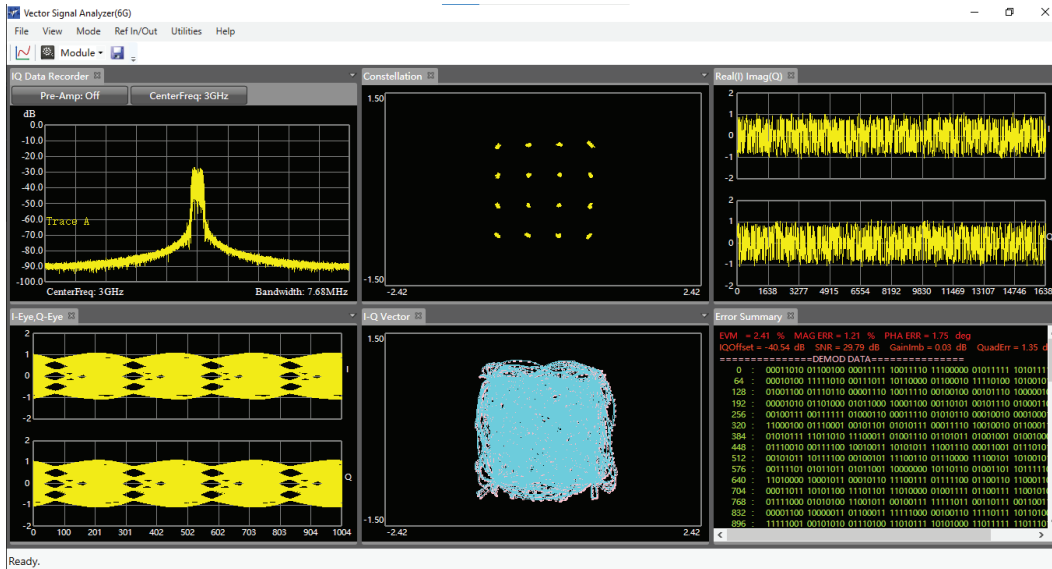
With this function, the BA100 is able to display the frequency and amplitude changes within a spectrum as a function of time (Spectrogram), displaying the spectrum changes that's easily identifiable.



## Functions

### Digital Signal Demodulation

Supports ASK/PSK/FSK/QAM digital signal demodulation, providing various information eg. spectrum, constellation, EVM, etc.



### FM Demodulation

This function allows the demodulated audio data to be stored in a PC.

### IQ Data Recorder

Stores IQ data and saves it in a PC (.txt format) for future data playback and analysis.

### Spectrum Playback

Allows IQ and Spectrum data (recorded by the BA100) to be played back in its own software.

### Zero Span Mode

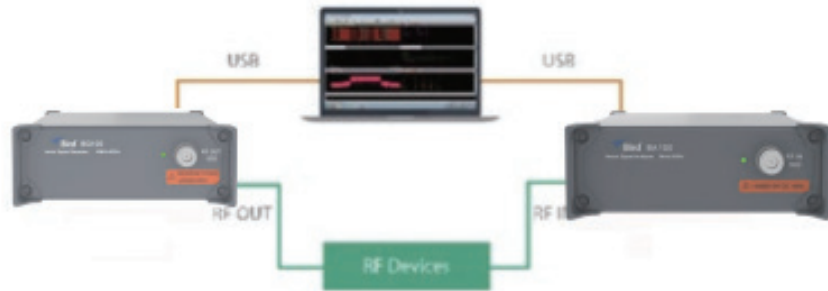
Users are able to set the instrument's span to 0 and enter this mode (similar to an oscilloscope) when analyzing the time domain characteristics of a signal. Video trigger may also be used in this mode.

## Application



### Laboratory RF Test

BA100 vector signal analyzer can perform RF testing in the laboratory. BA100 combines BG100 vector signal source can test intermodulation distortion of amplifiers, mixers, and receivers. This system can also test antennas, amplifiers, and attenuators' performance such as bandwidth, frequency response, and gain.



### Teaching Application Test

BA100 vector signal analyzer, combine with BG100 vector signal source, enables a demonstration of the testing of RF microwave devices. It reduces the complexity of RF microwave professional teaching and meets the teaching needs of telecom and electronic engineering related majors.



## Innovative Features

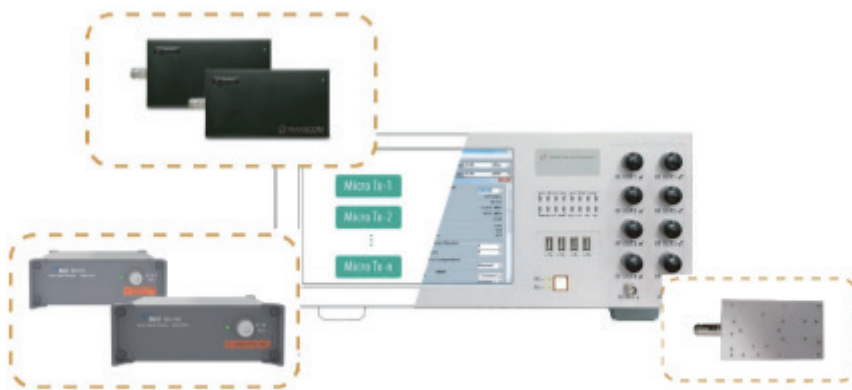
### Compact Size & Fast Deployment

Thanks to its compact form factor, users will be able to build and conduct field tests easily.



### System Integration & Secondary Development

Compact form factor, superior specifications, comprehensive telecommunication, general demodulation support and an open API Interface provides user with exactly what they need for a system integration. It also comes in three different product models, a full-sized USB module, a small-size USB module, and a PCB module.



## Control Element



## Specifications

Function	Description
Sensitivity	Low, Medium and High
Demodulator	Digital signals

Frequency	Description
Frequency Range	9kHz to 6GHz
Frequency Reference	Aging rate: ±1ppm
Frequency Readout Accuracy	± (readout frequency * Frequency Reference + RBW mid-value + 0.5*)
Frequency Span Accuracy	±1%
Sweep Time	1.1ms to 1600s   2.69ms to 1600s, zero span

Resolution bandwidth	Description
RBW Range	10Hz to 5MHz, (1-2-3-5-10 Sequence)
RBW Accuracy	RBW ≥ 1MHz, ±10%

Amplitude	Description																
Measuring Range	Display average noise level to +20dBm																
Input Attenuator Range	0-30dB, 1dB Step																
Maximum Safe Input Level	Sensitivity: +30dBm (Low) Sensitivity: 0dBm (Medium) Sensitivity: -20dBm (High)																
Reference Level Range	-140dBm to +20dBm   -190dBm to +70dBm (Ref level offset: ON)																
Amplitude Accuracy	±1.5dB (ATT set to 0dB, input signal: -5 to -30dBm; detector set to Positive, Sensitivity set to Low; RBW auto-coupled, all other Settings auto-coupled, 23±5°C , half hour warm-up required)																
RBW Switching Uncertainty	±0.3dB																
Input Attenuator Uncertainty	±0.6dB																
Accuracy of Reference Level	Reference level: ≥ -60dBm, ±0.8dB																
Residual Response	-75dBm																
Input-Related Response	<table border="0"> <tr> <td>9kHz to 700MHz</td> <td>&lt;-70dBc</td> <td>2.2GHz to 2.7GHz</td> <td>&lt;-53dBc</td> </tr> <tr> <td>700MHz to 900MHz</td> <td>&lt;-46dBc</td> <td>2.7GHz to 2.9GHz</td> <td>&lt;-42dBc</td> </tr> <tr> <td>900MHz to 1.3GHz</td> <td>&lt;-42dBc</td> <td>2.9GHz to 3.3GHz</td> <td>&lt;-38dBc</td> </tr> <tr> <td>1.3GHz to 2.2GHz</td> <td>&lt;-46dBc</td> <td>3.3GHz to 6GHz</td> <td>&lt;-53dBc</td> </tr> </table>	9kHz to 700MHz	<-70dBc	2.2GHz to 2.7GHz	<-53dBc	700MHz to 900MHz	<-46dBc	2.7GHz to 2.9GHz	<-42dBc	900MHz to 1.3GHz	<-42dBc	2.9GHz to 3.3GHz	<-38dBc	1.3GHz to 2.2GHz	<-46dBc	3.3GHz to 6GHz	<-53dBc
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Second Harmonic Distortion	1.6GHz: 70dBc																
Third-Order Intercept (TOI)	+15dBm (-10dBm tones, 1MHz apart, Sensitivity set to low, Ref set to -10dBm)																
P1dB	+5dBm (nominal)																
Phase Noise @1GHz	-95dBc/Hz, @10kHz (typically -98dBc/Hz) -123dBc/Hz, @1MHz (typically -125dBc/Hz)																

## Specifications

Storage	Description
Maximum storage depth	1Gbit
Data format	I/Q two-way, 16bit

General	Description
OS for Software	Windows 10, Windows 7
Power Supply Current	2A MAX
Connect interface	RF output: N-type, 50 Ω PC connect: USB type-C Power connect: DC12V
Temperature	Operating: 0°C to 50°C Storage: -20°C to 70°C
Dimension and weight	180×50×290mm, 1.8kg
Warranty	3 years

## Technical Specifications

There are certain factors such as probability distribution, measurement uncertainty and environmental factors that may end up affecting an instrument's performance. Hence, these conditions must be met for optimal performance:-

- The device is turned ON for 30 mins as a warm up procedure.
- The instrument internal reference signal is applied.

Testing temperature of 23+/-5°C, unless other specific conditions applied.

## Typical value

Additional description does not cover all performance information of the product guarantee. Unless otherwise specified, the typical value refers to the indicator or technical specification with which more than 80% of products comply under 23+/-5°C. The measurement uncertainty is excluded. BA100 should be within the calibration period.

## Nominal value

The nominal value refers to the characteristic description or design range. It is not tested or covered by the product. BA100 should be within the calibration period.



## Ordering List

Model	Description
BA100	Vector Signal Analyzer (9kHz to 6GHz)

Accessories Model	Description
MRX-AS001	Power adapter
MRX-AS004	USB cable
MRX-S003	Spectrum playback software
MRX-S004	Spectrum analysis, waterfall display and FM demodulation

Options	Description
MRX-S006	Digital demodulation license
MRX-H002	100MHz Bandwidth (hardware upgrade)



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