

# N9000B CXA Signal Analyzer

9 kHz to 26.5 GHz

## Master the Essentials of Signal Characterization for Industrial Communications and IoT

As the low cost, entry-level member of Keysight X-series signal analyzers, N9000B CXA signal analyzer is crafted for essential signal characterization for industrial communications and IoT. Harness the power of the X-series, and the proven measurement science, N9000B CXA is a reliable spectrum and signal analysis platform to address your versatile needs: from RF design verification, engineering, manufacturing, and repair service.

### A flexible, scalable test platform for you

When you need deeper insight into your design beyond spectrum analysis – CXA protects your investment with scalable capabilities, such as analog/digital demodulation, noise figure, EMI emission, LoRa, NB-IoT signal analysis, etc. All these extended capabilities can be easily enabled by X-series applications.



## Three great reasons of having a CXA signal analyzer on your bench

Superior performance adds confidence in each measurement you make

- Frequency range: 9 kHz to 3/7.5/13.6/26.5 GHz
- Internal fully calibrated preamplifier up to 26.5 GHz
- Resolution bandwidth: 1 Hz to 8 MHz
- Displayed average noise level (at 1 GHz): -163 dBm/Hz
- Third order interception (at 1 GHz): +17 dBm
- Total absolute amplitude accuracy (at 1 GHz):  $\pm 0.5$  dB
- Phase noise (1 GHz, 10 kHz offset): -110 dBc/Hz
- Maximum analysis bandwidth: 25 MHz



Figure 1. Detecting low-level and close-in signals made easy

Scalable applications help you gain deeper insight into your designs

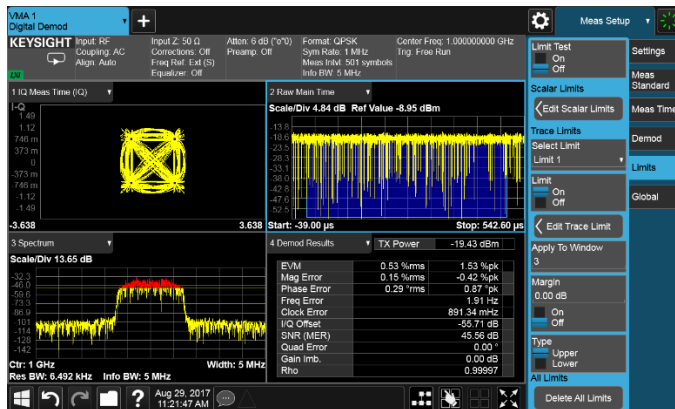


Figure 2. Signal demodulation analysis via the VMA application

Equip CXA with application software to cover your evolving testing needs:

- EMI precompliance test features: CISPR16-1-1 bandwidth, quasi-peak detector, limit lines, and amplitude correction factor, as well as easy-to-use instrument presets
- Popular applications such as noise figure, phase noise, EMI emissions, vector signal demodulation (VMA) and analog demodulation
- A wealth of wireless connectivity signal analysis applications such as LoRa CSS, 802.15.4 Zigbee, Bluetooth 4.0/4.2 and Bluetooth 5, WLAN 802.11a/b/g/j/p/n/af/ah; as well as legacy cellular communications formats from 2G to 4G

Easy to use in either manual or remote operation environment

- Multi-touch graphic user interface, 10.6-inch display
- Powersuite (requires N90EMPSMB software) covers frequently-used power measurements such as Channel power, PSD, OBW, ACP, CCDF, SEM, Harmonics, Spurious emission, Burst power, and TOI
- LXI-C certified with LAN Triggering and Time Synchronization
- I/O interface choices: USB, 100 Base-T LAN, GPIB
- Programming code compatible with Agilent ESA and X-series, IVI-COM supported
- Support BenchVue software (BV90001B)



## Take a Closer Look

We incorporated all the proven architecture, measurement science, expertise and software into this industry-leading low-cost platform - N9000B CXA.

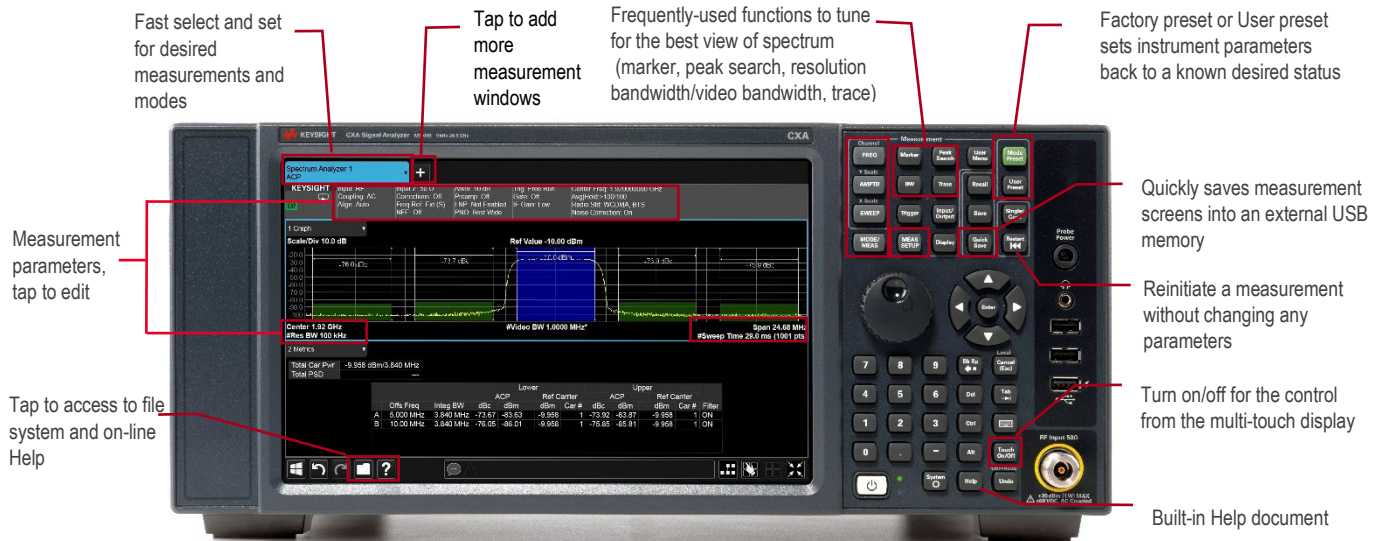


Figure 3. N9000B CXA signal analyzer front view

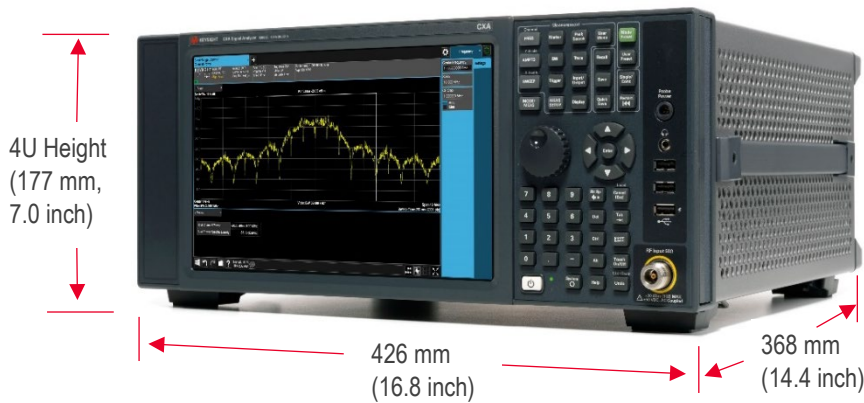


Figure 4. The dimension of N9000B CXA signal analyzer

### Proven Architecture Inside

- High performance dual core 64-bit CPU
- 8 GB RAM, 160 GB removable solid-state drive
- Windows 10 operating system



Figure 5. The rear panel of N9000B CXA signal analyzer

## Common Measurements Available From a CXA

RF design engineers' ultimate goal is to ensure their radio transmitters to transmit at the right frequency with enough power, but not excessive power that may bring bad interference to other electronic devices in the neighborhood. For example, in radio transmitter test case, you primarily care about the transmission power and frequency, and how accurate they are. You also care about those harmonics, spurious and distortions that might generate internal or external interference to the whole system. If you design wireless devices, IoT devices, or medical devices, you need test your products against certain wireless standard to make sure your device follow and meet all the required specifications

Keysight N9000B CXA is primarily a general purpose spectrum analyzer, which helps you to characterize the most fundamental parameters of an wireless transmitter, such as if its center frequency, drift; output power, or occupied bandwidth; or its in-band or out-band spurious.

When you add the X-series applications onto the CXA, it becomes a flexible signal analyzer, capable to characterize today's narrow band wireless connectivity formats, such as LoRa, Bluetooth, Zigbee, NB-IoT signals, WLAN 802.11 a/b/g/j/p/n/af/ah, and more custom digital modulation signals. The N9000B CXA signal analyzer is with 10 MHz analysis bandwidth as standard, and up to 25 MHz analysis bandwidth optional (option B25)

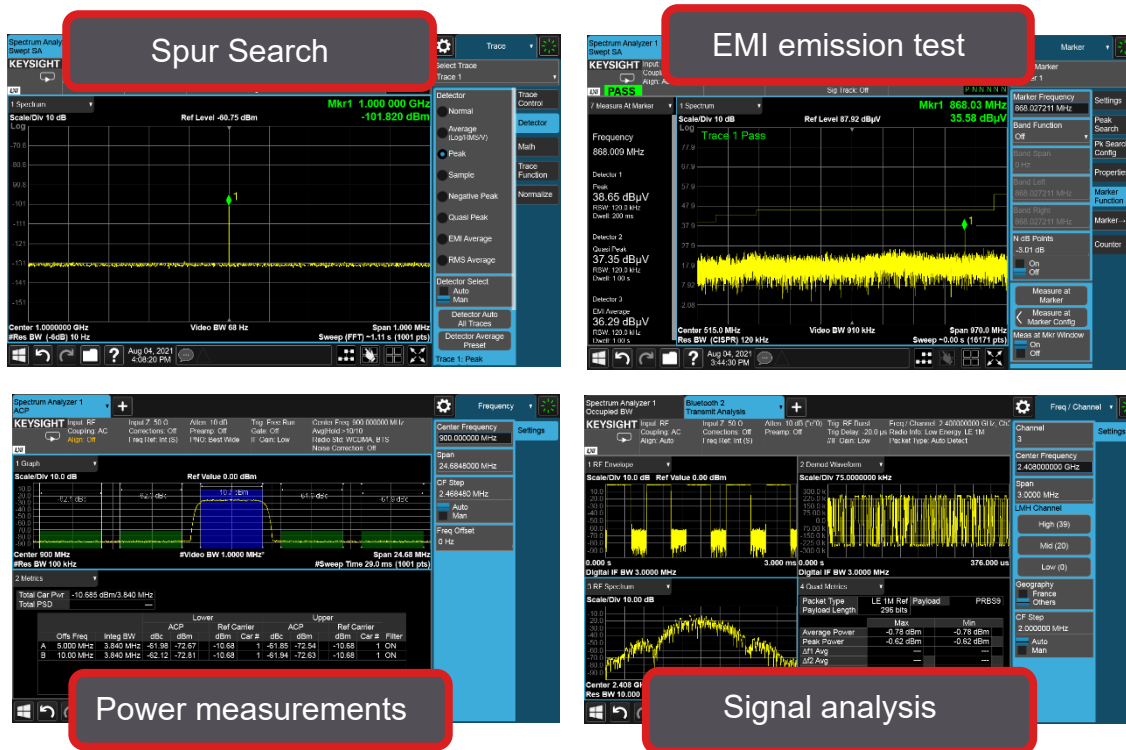


Figure 6. The 4 types of common measurements available from a CXA



## Power measurements

There are many transmitter related power measurements that you can rely on CXA to accomplish them easily. And we put them into one-button Powersuite (N90EMPSMB), covering:

- Channel power (CHP)
- Occupied bandwidth (OBW)
- Adjacent channel power (ACP)
- CCDF
- Burst power
- Spurious emission
- SEM
- TOI
- Harmonics

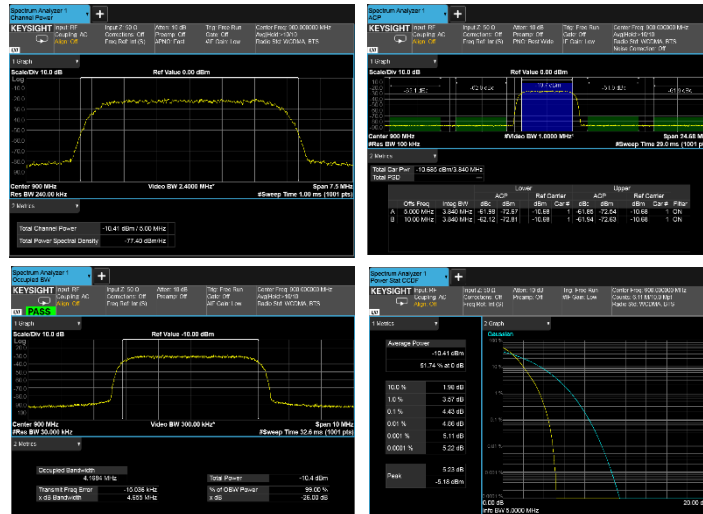


Figure 7. N90EMPSMB Powersuite measurements running on CXA

## EMI emission measurements

The concept of getting a product to market on time and within budget is nothing new. Companies know well that EMI compliance testing can be a bottleneck in the product development cycle. To ensure a successful final EMI compliance testing, precompliance test has been added into the product development cycle, and it is the earlier, the better.

Early stage of EMI precompliance test does not mean you always need to set up an expensive EMI compliance test lab of your own. Instead, you can highly rely on a signal analyzer or a spectrum analyzer to detect unwanted power emissions:

- Does my product generate excessive power or unexpected spurious?
- Does my product cause radiated emissions from a USB port, a LAN port, a faulty shielding case or a cable, even the power cord?



Figure 8. Detecting EMI emissions with a near-field probe (N9311X-100)

The close field testing is the only way to locate the exact source of the emission, however, it is a relative test, meaning a comparison of the measurement results from time to time is more meaningful for EMI improvement of your design.

Note that it is meaningless to compare the close field test result against the EMI standard test limit lines, because several factors can affect the test readout.

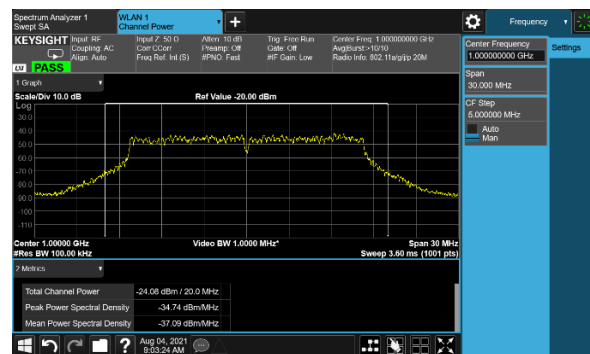
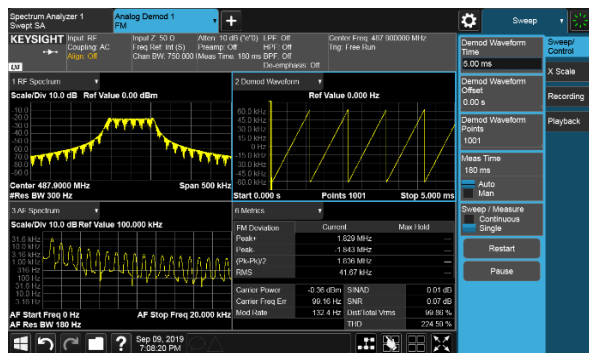
# Expect More

N9000B CXA signal analyzer supports more than 25 measurement applications, to address your evolving demands of technology:

General purpose	Wireless connectivity	Cellular communication	Others
Analog demodulation	WLAN (802.11a/b/g/j/p/n/af/ah)	LTE/LTE-Advanced FDD	Enhanced display package
Vector demodulation	Short-range and IoT (802.15.4)	LTE/LTE-Advanced TDD	Basic EMI precompliance
EMI precompliance	Zigbee, Z-wave; LoRa CSS)	LTE V2X	External source control
Noise figure	Bluetooth	NB-IoT and eMTC FDD	SCPI command compatibility
Phase noise	NB-IoT	W-CDMA/HSPA+	
Pulse		GSM/EDGE/Evo	

These applications offer 4 license types and 2 license terms, flexibly addressing different budget spending needs. It also helps you to manage the licenses for multiple projects and multiple users in multiple locations.

Type	Perpetual	Time-based
Node-locked	■	■
Transportable	■	■
USB portable	■	■
Network floating	■	■
Business expense	Capex \$\$\$	Opex \$\$\$



## Ordering Information

Ordering number	Description
<b>Base Instrument</b>	
N9000B-503	N9000B CXA signal analyzer, 9 kHz to 3 GHz
N9000B-507	N9000B CXA signal analyzer, 9 kHz to 7.5 GHz
N9000B-513	N9000B CXA signal analyzer, 9 kHz to 13.6 GHz
N9000B-526	N9000B CXA signal analyzer, 9 kHz to 26.5 GHz
<b>Performance option</b>	
N9000B-PFR	Precision frequency reference (enables $\pm 0.1$ ppm annual aging rate)
N9000B-FSA	Fine resolution attenuator (enables 2-dB steps of the input attenuator)
N9000B-B25	25 MHz analysis bandwidth
N9000B-P03	Preamplifier, 3 GHz
N9000B-P07	Preamplifier, 7.5 GHz
N9000B-P13	Preamplifier, 13.6 GHz
N9000B-P26	Preamplifier, 26.5 GHz
<b>Additional capability</b>	
N9000B-TG3	Tracking generator, 9 kHz to 3 GHz
N9000B-TG6	Tracking generator, 9 kHz to 6 GHz

Download [N9000B configuration guide \(5992-1275EN\)](#) for a complete view of options and software for N9000B CXA signal analyzer

Visit N9000B website [www.keysight.com/find/CXA](http://www.keysight.com/find/CXA) for more information

Visit our website [www.keysight.com/find/xseriesapps](http://www.keysight.com/find/xseriesapps) for more information about X-series applications

**N9000B CXA X-Series Signal Analyzer, Multi-touch**

This configuration guide will help you determine which performance options, measurement applications, accessories, and services to include with your new multi-touch CXA or to add as upgrades to an existing CXA.

**Configure Your Keysight CXA Signal Analyzer**

This step-by-step process will help you configure your new CXA X-Series signal analyzer. Table the performance to meet your requirements.

**Included in base product**

- Standard options and accessories come with the CXA base model at no additional charge and are not listed below.
- Optional and/or recommended capabilities:
  - Dual-core, high-performance processor, 5 GHz RAM, removable solid-state drive
  - Precision reference
  - 10 MHz or higher bandwidth
  - Enhanced phase noise
  - Microsoft Windows 10 operating system
  - Remote configuration
  - Multi-language user interface
  - User guide
  - In-use case
  - Front panel cover for protection during travel

For a summary of specifications, refer to the N9000B CXA data sheet (5992-1275EN).

A list of specifications for models in the N9000B CXA data sheet is available at [www.keysight.com/find/CXA\\_specifications](http://www.keysight.com/find/CXA_specifications).

KEYSIGHT  
INTELLIGENT INSTRUMENTS

© 2017 Keysight Technologies, Inc. All rights reserved. 5992-1275EN-01

## Related documents

Literature	What's included	Pub number
N9000B Data Sheet	Summary of instrument specifications	5992-1274EN
N9000B Specification Guide	Instrument specifications in details	N9000-90035
N9000B Configuration Guide	Instrument options, software, upgrade kits	5992-1275EN
User's and Programmer's Guide	About the GUI, measurement modes, functions, key reference, and SCPI commands	N9060-90041
EMI troubleshooting: The need for close field probes	Locating, evaluating, and troubleshooting potential emission sources with close field probes	5991-0144EN
Making conducted and radiated emission measurements	An overview of conducted and radiated EMI emission measurements and a methodology for EMI precompliance testing	5990-6152EN
Technical overview of N6141EM0E EMI measurement application	A summary of the N6141EM0E measurement application for EMI emission test: features, and license types and terms	5992-2842EN
Spectrum analysis Basics (AN150)	The classic AN150 introduces the fundamentals of classic swept-tuned spectrum analyzers and the latest advances in modern signal analyzers	5952-0292EN
IoT design and development solutions	Learn about the rising challenges for IoT devices, test considerations, and solutions	5992-1478EN
Noise figure measurement guide	About how to carry out noise figure measurements with X-series signal analyzers and relevant application N9069EM0E	N9060-90001
10 hints for noise figure measurements	About how to minimize the uncertainties in your noise figure measurements	5980-0288EN
N9054EMxE Technical Overview VMA vector modulation analysis	A summary of the N9054EMxE VMA application for a wide range of comprehensive signal analysis: time domain I/Q waveform, monitoring spectrum and digital demodulation analysis	5992-2852EN

Learn more at: [www.keysight.com](http://www.keysight.com)

For more information on Keysight Technologies' products, applications, or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

