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): ± 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

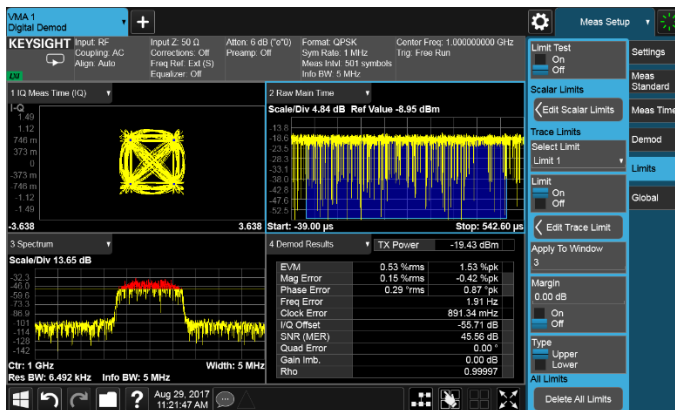## Scalable applications help you gain deeper insight into your designs

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)
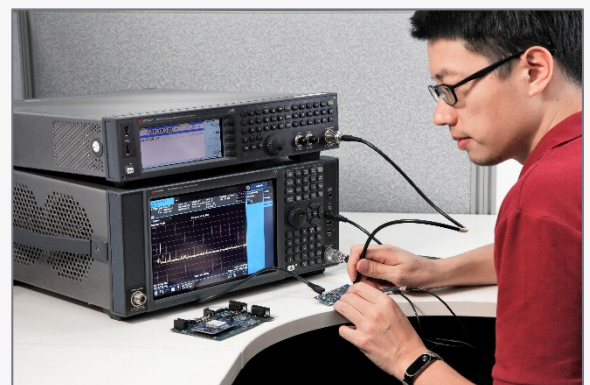
Take a Closer Look

We incorporated all the proven architecture, measurement science, expertise and software into this industry-leading low-cost platform - N9000B CXA.
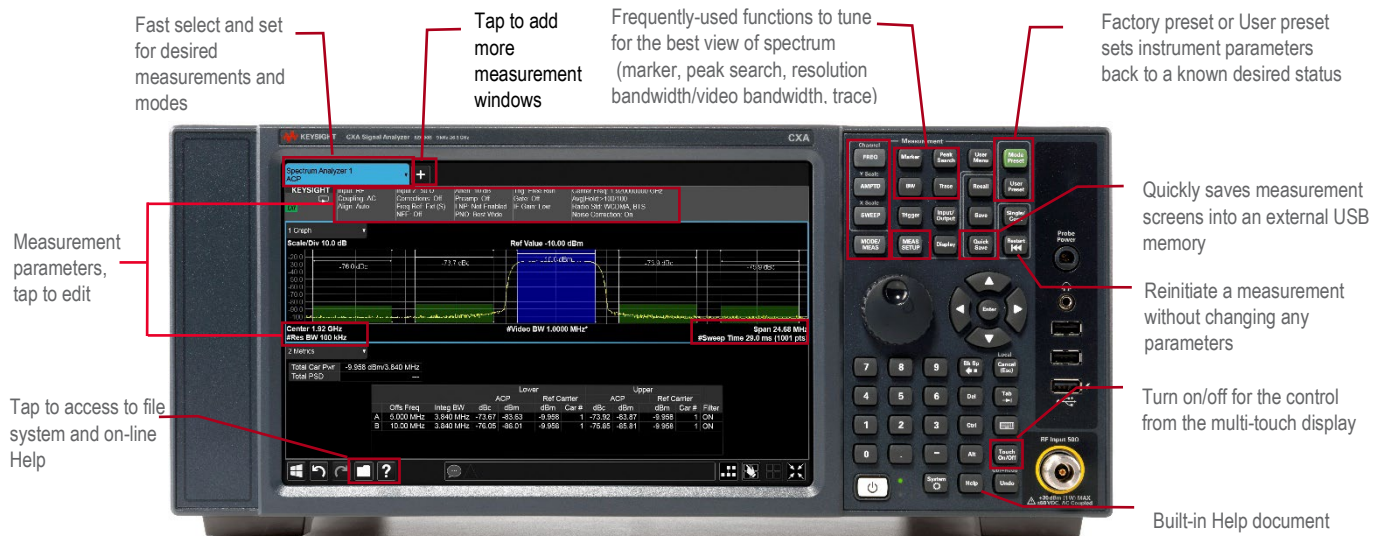
Fast select and set for desired measurements and modes

Tap to add more measurement windows

Frequently-used functions to tune for the best view of spectrum (marker, peak search, resolution bandwidth/video bandwidth, trace)

Factory preset or User preset sets instrument parameters back to a known desired status

Measurement parameters, tap to edit

Quickly saves measurement screens into an external USB memory

Reinitiate a measurement without changing any parameters

Tap to access to file system and on-line Help

Turn on/off for the control from the multi-touch display

Built-in Help document

Figure 3. N9000B CXA signal analyzer front view

4U Height (177 mm, 7.0 inch)

426 mm (16.8 inch)

368 mm (14.4 inch)

Proven Architecture Inside

- High performance dual core 64-bit CPU

- 8 GB RAM, 160 GB removable solid-state drive

- Windows 10 operating system
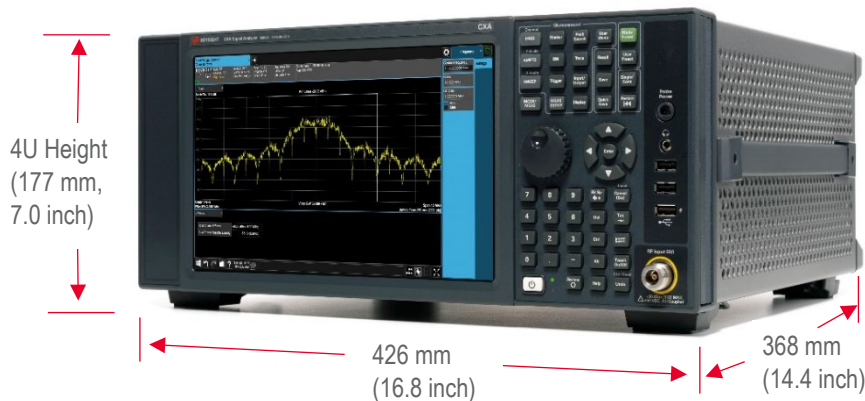
Figure 4. The dimension of N9000B CXA signal analyzer

Noise source connection port and power supply

Removable solid-state drive allows you to easily manage sensitive data and files

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)
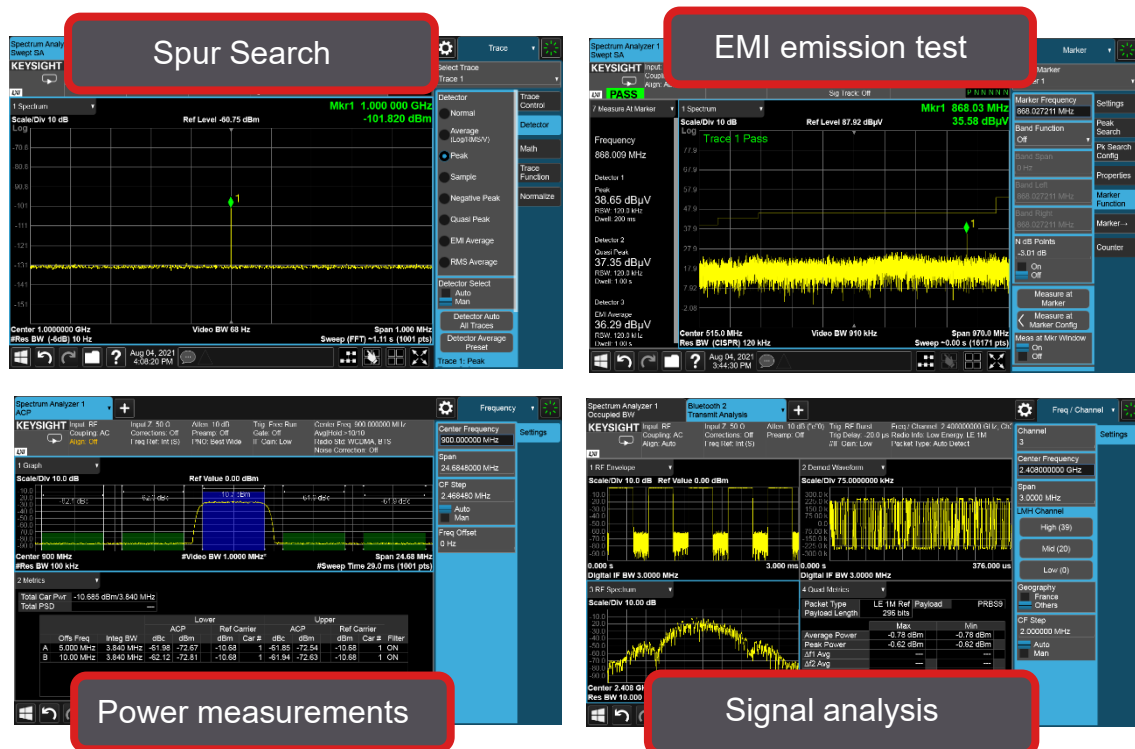

Figure 6. The 4 types of common measurements available from a CXA

Power measurements

There are many transmitter related power measurements that you can reply 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
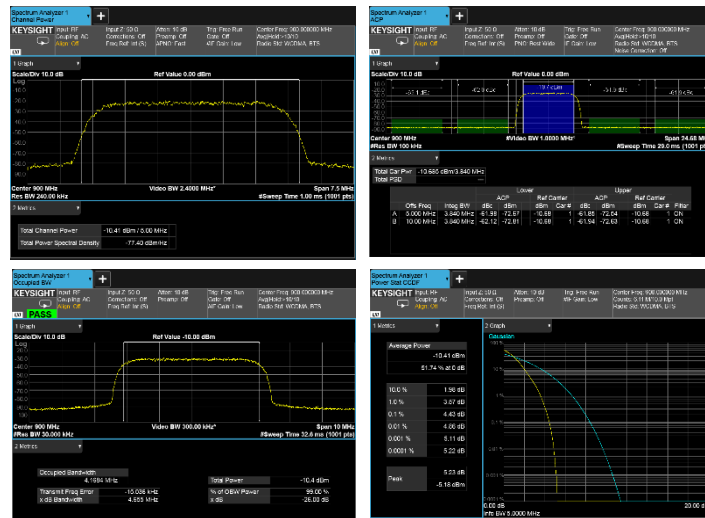- Spurious emission
- SEM
- TOI
- Harmonics

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?

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.

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

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

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.
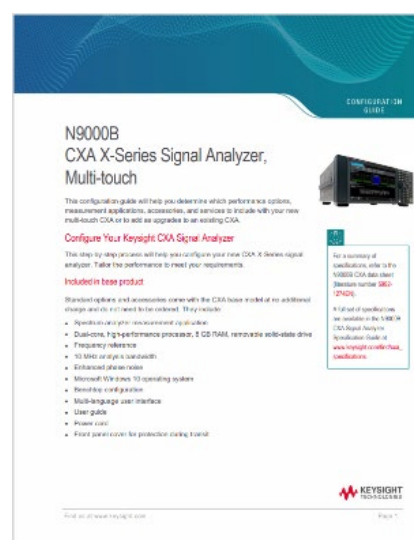
Type	Perpetual	Time-based
Node-locked	■	■
Transportable	■	■
USB portable	■	■
Network floating	■	■
Business expense	Capex $$'s	Opex $$'s
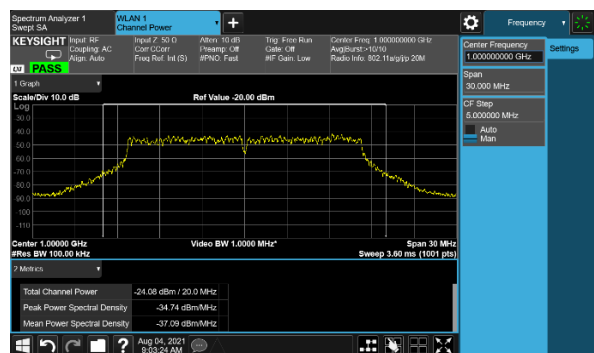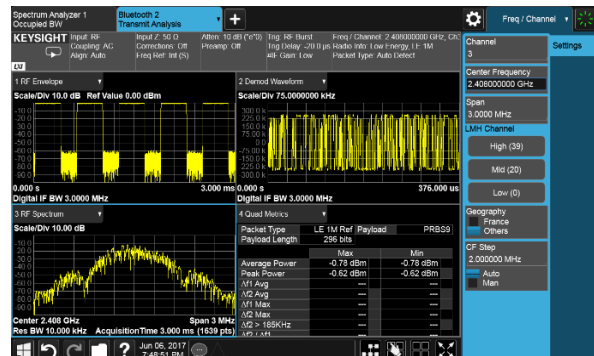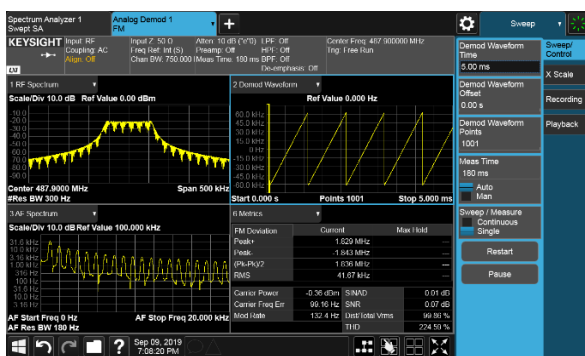
Ordering Information

Ordering number	Description
Base Instrument	
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
Performance option	
N9000B-PFR	Precision frequency reference (enables ±0.1ppm 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
Additional capability	
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

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Mess- und Prüftechnik. Die Experten.

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