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. Tailor the performance to meet your requirements. For a full set of technical specifications, please refer to the N9000B CXA Signal Analyzer Specification Guide.

Included in base product

Standard options and accessories come with the CXA base model at no additional charge and do not need to be ordered. They include:

- Spectrum analyzer measurement application
- Dual-core, high-performance processor, 8 GB RAM, removable solid-state drive
- Frequency reference
- 10 MHz analysis bandwidth
- Enhanced phase noise
- Microsoft Windows 10 operating system
- Benchtop configuration
- Multi-language user interface
- User's guide (included in the CXA's embedded help system)
- Power cord

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Description	Option number	Additional information
Step 1. Select maximum frequency range (required option; frequency range not upgradeable)		
Frequency range, 9 kHz to 3.0 GHz	N9000B-503	
Frequency range, 9 kHz to 7.5 GHz	N9000B-507	
Frequency range, 9 kHz to 13.6 GHz	N9000B-513	
Frequency range, 9 kHz to 26.5 GHz	N9000B-526	
Step 2. Add a preamplifier		
		Preamplifiers improve the noise floor for low-level signal detection; +20 dB: 100 kHz to 26.5 GHz
Preamplifier, 100 kHz to 3.0 GHz	N9000B-P03	Compatible with N9000B-503, N9000B-507, N9000B-513, and N9000B-526
Preamplifier, 100 kHz to 7.5 GHz	N9000B-P07	Compatible with N9000B-507, N9000B-513, and N9000B-526
Preamplifier, 100 kHz to 13.6 GHz	N9000B-P13	Compatible with N9000B-513 and N9000B-526
Preamplifier, 100 kHz to 26.5 GHz	N9000B-P26	Compatible with N9000B-526
Step 3. Choose frequency reference		
Frequency reference	Standard	Aging rate: ± 1 x 10^{-6}/year
Precision frequency reference	N9000B-PFR	Reduces frequency drift for more accurate measurements; aging rate: ± 1 x 10^{-7}/year
Step 4. Choose an attenuator		
Mechanical attenuator	Standard	10 dB steps, 0 to 50 dB, for N9000B-503 and N9000B-507
		10 dB steps, 0 to 70 dB, for N9000B-513 and N9000B-526
Fine resolution step attenuator	N9000B-FSA	Allows 2 dB steps for the full range of the attenuator
Step 5. Choose analysis bandwidth		
10 MHz analysis bandwidth	Standard	Useful for most IoT devices and general-purpose radio devices measurement applications
25 MHz analysis bandwidth	N9000B-B25	Extends the analysis (demod) bandwidth from 10 to 25 MHz; useful for most cellular communications, wireless connectivity, and audio/video broadcasting measurement applications
Step 6. Add a tracking generator		
Tracking generator, 9 kHz to 3.0 GHz	N9000B-T03	Compatible with N9000B-503, N9000B-507 only
Tracking generator, 9 kHz to 6.0 GHz	N9000B-T06	Compatible with N9000B-507 only
Step 7. Choose performance		
Enhanced phase noise	Standard	Licensed as N9000B-EP4

Description	Model number	Additional information
Step 8. Add instrument features		
Enhanced display package	N90EMEDPB	Includes spectrogram, trace zoom, and zone span
Basic precompliance EMI	N90EMEMCB	Performs EMI precompliance measurements with CISPR 16-1-1 detectors and bandwidths. Other associated features available from the standard spectrum analyzer mode, such as CISPR band presets, and measure at marker, further enhance the EMI precompliance test flow. See also **the differences between N90EMEMCB and N6141EM0E EMI measurement application**
PowerSuite	N90EMPSMB	One-button power measurements, including CHP, OBW, APCR, SEM, TOI, CCDF, etc. (requires F/W A.31 or above)
External source control	N90EMESCB	External source control for selected Keysight EXG, MXG and PSG signal generators; Includes 3 BNC cables and 1 cross-over LAN cable. This feature is compatible with N9000B option 503 or 507 only
Step 9. Choose operating system		
Windows 10 operating system	Standard	Licensed as N9000B-W10
Step 10. Add security features		
Additional, removable solid-state drive	N9000B-SS1	Provides a fully-imaged, removable solid-state drive, in addition to the one installed in the instrument, with Windows 10 operating system
Exclude launch program	N9000B-SF1	Prevents the launching of Windows programs from the instrument application
Prohibit saving results	N9000B-SF2	Prevents the saving/recall of measurement results or user configurations to / from instrument's data storage
Step 11. Add rear panel output utilities		
Second IF output	N9000B-CR3	Wideband IF out; output on Aux IF connector at rear panel; compatible with N9000B-503 and N9000B-507 only

Step 12. Choose measurement application or software and license type

Keysight understands your need for the flexibility of using our industry-leading signal analysis applications, therefore, we provide you with the following three ways of ordering our applications:

- Ordering at individual application, with full set of choices of license terms and types
- Ordering at custom bundles, with node-locked, subscription license only
- Ordering at industry-specific bundles, with node-locked, subscription license only

Note: Keysight offers flexible license types and terms for the measurement applications, refer to page 11 of X-Series Measurement Applications - Brochure (5989-8019EN).

Ordering at individual application

Description	Model number	Additional information
General purpose		
Spectrum analyzer	Standard	Traditional spectrum analysis
Phase noise	W9068EM0E	Adds one-button measurements for analyzing phase noise in frequency domain (log plot) and time domain (spot frequency), supports external mixing
Noise figure	W9069EM0E (requires preamplifier)	Adds one-button measurements for noise figure, gain, and related metrics; requires preamplifier to meet 2specifications; works with Keysight U1831C USB noise source, N400xA Series smart noise sources and 346 Series noise sources; supports U7227 USB external preamplifiers Includes the advanced NF measurement features including external LO control over GPIB/LAN/USB, multi-stage converter tests with system LO, and manual mode to simulate the legacy NF meter
Analog demodulation	W9063EM0E	One-button measurement for AM/FM/PM demodulation with metrics, tune and listen, and AF spectrum; supports audio output (output voltage proportional to frequency deviation). FM Stereo and RDS are included
Vector modulation analysis – digital demodulation	W9054EM0E	Performs one-button flexible modulation analysis measurements with FSK, PSK, QAM, MSK, ASK, APSK, VSB, etc., and popular format preset

Description	Model number	Additional information
Vector modulation analysis – Custom OFDM	W9054EM1E	Performs one-button custom OFDM modulation analysis measurement with user-defined settings or recalling 89600 VSA or Signal Studio output files
EMI	W6141EM0E	Performs pre-compliance conducted and radiated emission measurements
Remote language compatibility	W9061EM0E	Adds capability to emulate HP/Agilent 8566/68 and 856xE/EC spectrum analyzers
SCPI command language compatibility	W9062EM0E	Adds capability to emulate the R&S FSP/FSU/FSE/FSL/FSV spectrum analyzers or ESU EMI receiver
MATLAB software	N6171A	
Cellular communications		
GSM/EDGE/Evo	W9071EM0E	Standard-based, one-button GSM/EDGE/EDGE Evolution measurements
W-CDMA/HSPA+	W9073EM0E	Standard-based, one-button W-CDMA, HSPA and HSPA+ measurements
LTE/LTE-Advanced FDD	W9080EM0E	Standard-based, one-button LTE/LTE-Advanced FDD measurements
NB-IoT & eMTC FDD	W9080EM3E	Standard-based, one-button NB-IoT/eMTC measurements
LTE V2X	W9080EM4E	Standard-based, one-button LTE-V2X transmitter measurements
LTE/LTE-Advanced TDD	W9082EM0E	Standard-based, one-button LTE/LTE-Advanced TDD measurements
Wireless connectivity		
WLAN 802.11a /b/g/j/p/n/af/ah	W9077EM0E	Standard-based, one-button 802.11a/b/g/j/p/n/af/ah measurement
Bluetooth®	W9081EM0E	Standard-based, one-button *Bluetooth* (BR/EDR, Low Energy 4.0/4.2 and *Bluetooth* 5) measurements
Short range comm and IoT	W9084EM0E	Standard-based, one-button LoRa CSS measurement, 802.15.4 for ZigBee measurement and G.9959 for Z-Wave measurement
Ordering at custom bundles, with node-locked, subscription license only		
It allows you to select any 3 or 5 signal analysis applications, in node-locked, subscription license only. This ordering method fits you well if you prefer to use these desired measurement applications for a period of time at a value price and also get the greatest flexibility of making purchase choices when you spend your budget next time		
Custom bundle		
Pick any 3 applications	N9089BAXE-030	Pick any 3 applications, with node-locked license type, at 12-month subscription or 36-month subscription
Pick any 5 applications	N9089BAXE-050	Pick any 5 applications, with node-locked license type, at 12-month subscription or 36-month subscription
Ordering at industry-specific bundles, with node-locked, subscription license only		
It allows you to select the following predefined industry-specific bundles, in node-locked subscription license only. This ordering method fits you well if you frequently use these applications		
Industry-specific bundle		
General purpose	N9089B03E	Node-locked license type, at 12-month or 36-month subscription only. Applications in this bundle include: • N9054EM0E VMA digital demodulation • N9054EM1E Custom OFDM • N9063EM0E Analog demodulation • N9068EM0E Phase noise • N9069EM0E Noise figure
2G and 3G Cellular communication	N9089B04E	Node-locked license type, at 12-month or 36-month subscription only. Applications in this bundle include: • N9071EM0E: GSM/EDGE • N9072EM0E: cdma2000 • N9073EM0E W-CDMA/HSPA • N9076EM0E 1xEV-DO • N9079EM0E TD-SCDMA

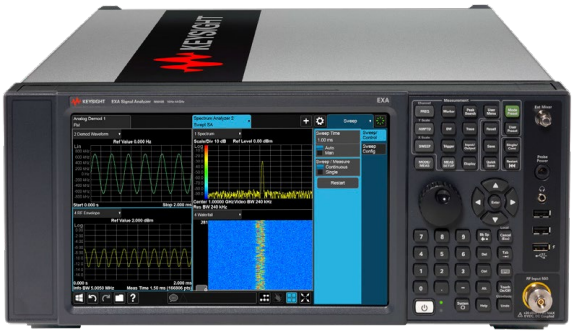
Description	Model number	Additional information
Step 13. Choose 89600 VSA software licenses		
Basic vector signal analysis and hardware connectivity	89601200C (required core option)	Provides the tools and user interface that make up the 89600 VSA software including time and frequency domain measurement, hardware connectivity, recordings, and playback Channel quality modulation analysis
General purpose		
Digital demodulation analysis	89601AYAC	• Analysis of > 40 modulation formats, including custom APSK and presets for communication formats like GSM/EDGE, ZigBee FSK, Bluetooth® BR, APCO25 and SOQPSK • Proprietary and pre-standard, customized IQ constellation signals • TEDS modulation analysis • Channel response measurements such as phase/magnitude response and multi-tone group delay
Custom OFDM modulation analysis	89601BHFC	• Proprietary and pre-standard OFDM formats
Cellular communication		
5G NR modulation analysis	89601BHNC	• 5G NR modulation analysis • Pre-5G modulation analysis
LTE/LTE-A FDD modulation analysis	89601BHGC	• LTE FDD modulation analysis • LTE-Advanced FDD modulation analysis
LTE/LTE-A TDD modulation analysis	89601BHHC	• LTE TDD modulation analysis • LTE-Advanced TDD modulation analysis
3G modulation analysis bundle	89601B7NC	• W-CDMA/HSPA+ modulation analysis • TD-SCDMA/HSPA modulation analysis • cdma2000 modulation analysis • 1xEV-DO and 1xEV-DV modulation analysis
Wireless connectivity		
Wireless connectivity modulation analysis	89601B7RC	• WLAN 802.11a/b/g/j/p modulation analysis • WiMax modulation analysis
High throughput WLAN modulation analysis	89601BHXC	• WLAN 802.11n/ac modulation analysis • WLAN 802.11ax modulation analysis
IoT modulation analysis	89601BHTC	• NB-IoT modulation analysis • RFID modulation analysis
Radar analysis		
Pulse analysis	89601BHQC	• Pulsed modulated radar signal analysis
FMCW radar analysis	89601BHPC	• For multi-chirp linear FM modulated signals or automotive radar
Other standard formats		
DOCSIS modulation analysis	89601BHMC	• DOCSIS3.1 downstream and upstream modulation analysis
Multi-vendor hardware connectivity	89601301C	• Connect multi-vendor hardware for modulation analysis
Step 14. Choose physical instrument configuration		
Bench top configuration	Standard	Provides two side carrying straps, four rear feet, and four bottom feet with a tilt stand
Portable configuration	N9000B-PRC	Provides a convenient, pivoting carrying handle as well as rubber protective corners and end guards; this configuration is intended for applications requiring more rugged packaging, such as in the field
Step 15. Choose accessories		
User guide	Standard	US – English localization
		All user documentation is included in the CXA's embedded help system
		User documentation can be downloaded from: www.keysight.com/find/cxa_manuals
Power cord	Standard	Dependent upon region of use
Rack mount	1CM113A	Adds rack mount flanges to the CXA

Description	Model number	Additional information
Front handles	1CN103A	Adds front handles to the CXA
Rack mount with handles	1CP105A	Adds rack mount flanges and handles to the CXA
Rack slide	1CR013A	Adds a non-tilting rack slide to the CXA
USB DVD-ROM/CD-R/RW drive	1DVR001A	Enhances the usability of the Windows operating system
Mouse, USB interface	1MSE001A	
Minimum loss pad, 50 to 75 Ω (type-N to BNC)	MLP001A	50 Ω type-N male to 75 Ω BNC female adapter Frequency range: 9 MHz to 2 GHz Input/output return loss: 20 and 11 dB Insertion loss: 5.7 dB
USB external preamplifier, 10 MHz to 4 GHz	U7227A	Brings reliable gain and low noise figure to measurement systems, and improves the overall system performance
USB external preamplifier, 0.1 to 26.5 GHz	U7227C	Brings reliable gain and low noise figure to measurement systems, and improves the overall system performance
Near field probes	N9311X-100	Includes 4 pieces of H-field probes, for detecting EMI emissions
Front cover	CV1117A	Protective cover for front panel
Step 16. Add calibration, technical training, support, and upgrade services		
Commercial calibration certificate with test data	N9000B-UK6	Calibration certificate only available at time of instrument purchase; only provides measurement results
Keysight Cal + uncertainties + guard banding (accredited cal)	N9000B-AMG	Provides ISO 17025A accredited calibration from factory
ANSI Z540-1-1994 calibration	N9000B-A6J	Provides ANSI Z540 compliant calibration from factory
Calibration Assurance Plan, Return-to-Keysight, 3 years	R-50C-011-3	Keysight tests your instrument against its original specifications and automatically makes adjustments if outside of specified parameters; pre- and post-adjustment measurement data reports also provided
Calibration Assurance Plan, Return-to-Keysight, 5 years	R-50C-011-5	
Calibration Assurance Plan, Return-to-Keysight, 7 years	R-50C-011-7	
Calibration Assurance Plan, Return-to-Keysight, 10 years	R-50C-011-10	
Service: remote scheduled productivity assistance	PS-S10-100	Hourly phone-in technical support service designed to help you understand and operate your equipment through convenient phone and Web access
Service: 1-day start-up assistance	PS-S20-01	Training on how to operate your instrument effectively (recommended)
Service: Productivity assistance	PS-S20-100	Daily instrument and application consulting using your equipment and device under test
Service: Custom engineering service	PS-X10-100	Application-specific technical assistance

Other calibration options may be available; for more information on calibration go to:
www.keysight.com/find/calibration

N9311X-100 (Near field probes)

CXA bench top configuration



Instrument Upgrades

Fast license-key upgrades for performance options that do not require additional hardware:

1. Place an order for the upgrade with Keysight and request to receive the option upgrade entitlement certificate and a one-time software upgrade license through email
2. Redeem the certificate through the Web by following the instructions on the certificate
3. Install the license file and latest software in the CXA
4. Begin using the new capability [1, 2]

You can upgrade!

Options can be added after your initial purchase. Most X-Series options are license-key upgradeable.

Installation and testing information is available at: www.keysight.com/find/cxa_upgrades

Description	Upgrade number	Requirements - CXA must already include the following	Additional information
Increase analysis bandwidth from 10 to 25 MHz	N9000BU-B25	None	
Add preamplifier, 3 GHz	N9000BU-P03	None	
Add preamplifier, 7.5 GHz	N9000BU-P07	507, 513 or 526	Not compatible with Option 503
Add preamplifier, 13.6 GHz	N9000BU-P13	513 or 526	Not compatible with Option 503 or 507
Add preamplifier, 26.5 GHz	N9000BU-P26	526	Not compatible with Option 503, 507, or 513
Add fine resolution step attenuator	N9000BU-FSA	None	
Add precision frequency reference	N9000BU-PFR	None	
Add tracking generator, 3 GHz	N9000BU-T03	None	Requires hardware and license key; not compatible with Options 513 or 526
Add tracking generator, 6 GHz	N9000BU-T06	None	Requires hardware and license key; not compatible with Options 503, 513, or 526
Add basic EMI precompliance features	N9000BU-EMC	None	Also orderable at N90EMEMCB (Requires F/W revision A.21.04 onward)
Add external source control	N9000BU-ESC	None	Adds feature to control selected Keysight EXG, MXG, and PSG signal generators; includes 3 BNC cables and 1 cross-over LAN cable; not compatible with Options 513 or 526. Also orderable at N90EMESCB (requires F/W revision A.21.04 onward)
Add second IF output	N9000BU-CR3	None	Requires hardware and license key; not compatible with Options 513 or 526
Add enhanced display package	N9000B-EDP	None	Adds spectrogram, trace zoom, and zone span. Also orderable at N90EMEDPB (requires F/W revision A.21.04 onward)
Add PowerSuite	N90EMPSMB	None	Adds power measurements such as channel power, OBW, ACPR, TOI, CCDF, etc. (requires F/W revision A.31 or above)
Add security features, exclude launch program	N9000BU-SF1	None	Prevents the launching of Windows programs from the instrument application
Add security features, prohibit saving results	N9000BU-SF2	None	Prevents the saving/recall of measurement results or user configurations to / from instrument's data storage
Add removable solid-state drive for CXA base instrument with PC7	N9000BU-SS1	PC7	Provides additional fully-imaged, removable solid-state drive, with Windows 10 operating system, for PC7
Upgrade operating system to Windows 10, for CXA base instrument with PC7	N9000BU-SS1	PC7, W7X	Provides a removable solid-state drive with Windows 10 operating system
Add removable solid-state drive for CXA base instrument with PC9	N9000BU-SS2	PC9	Provides additional fully-imaged, removable solid-state drive, with Windows 10 operating system, for PC9
Chinese version of Getting Started Guide	N9000BU-AB2	None	
Spanish version of Getting Started Guide	N9000BU-ABE	None	
French version of Getting Started Guide	N9000BU-ABF	None	
Japanese version of Getting Started Guide	N9000BU-ABJ	None	
Russian version of Getting Started Guide	N9000BU-AKT	None	

1. At the time of manufacture, the hardware related to many of these options was fully adjusted and the option performance was verified to be within its warranted specifications. Within one year of the initial calibration date of the analyzer, this option is fully calibrated with no further adjustment or verification testing.
2. If this analyzer has been adjusted as part of a repair or calibration during its first year, or if the analyzer is more than one year old, additional adjustment and performance verification tests are required to ensure that some newly installed options are functioning properly. However, the completion of these tests does not guarantee that the analyzer meets all warranted specifications.

For more information on accessories go to: www.keysight.com/find/accessories

Related Literature

Keysight CXA signal analyzers

Publication title	Publication number
N9000B CXA X-Series Signal Analyzer, Multi-touch - Data Sheet	5992-1274EN
N9000B CXA Signal Analyzer, Technical Overview	3121-1302EN
X-Series Measurement Applications - Brochure	5989-8019EN

For more information on Keysight Technologies' products, applications, or services, please visit: www.keysight.com