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.

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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.

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 guide
- Power cord

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: $\pm 1 \times 10^{-6}$/year
Precision frequency reference	N9000B-PFR	Reduces frequency drift for more accurate measurements; aging rate: $\pm 1 \times 10^{-7}$/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 2G and 3G 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 [1]	Includes spectrogram, trace zoom, and zone span
Basic precompliance EMI	N90EMEMCB [1]	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**
External source control	N90EMESCB [1]	External source control for 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		

1. Note: Keysight offers 4 license types for the measurement applications and instrument features, in 2 license terms: Perpetual or Time-based.
    License types:
    – **Node-locked:** Allows you to use the license on one instrument/computer at a time
    – **Transportable:** Allows you to use the license on one instrument/computer at a time. This license may be transferred to another instrument/computer using Keysight's online tool
    – **Floating:** Allows you to access the license on the networked instruments/computers from a server, one at a time. For concurrent access, multiple licenses may be purchased
    – **USB Portable:** Allows you to access the license from one instrument/computer to another by end-user only with certified USB dongle, purchased separately
    License terms:
    – **Perpetual:** License can be used in perpetuity. For perpetual license holders, a separate support contract is required to access Keysight technical support and software updates
    – **Time-based:** License is time limited to a defined period, such as 12-months. A valid support contract is included in the pricing for time-based licenses.

Spectrum analyzer	Standard	Traditional spectrum analysis plus many new and enhanced functions; power measurements based on industry specifications; licensed as N9060EM1E
Analog demodulation	N9063EM0E	Adds 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
Phase noise	N9068EM0E	Adds one-button measurements for analyzing phase noise in frequency domain (log plot) and time domain (spot frequency), supports external mixing
Noise figure	N9069EM0E (requires preamplifier)	Adds one-button measurements for noise figure, gain, and related metrics; requires preamplifier to meet specifications; 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
Vector modulation analysis Digital Demodulation	N9054EM0E	Performs one-button flexible modulation analysis measurements with FSK, PSK, QAM, MSK, ASK, APSK, VSB etc. and poprular format preset
Vector modulation analysis Custom OFDM	N9054EM1E	Performs one-button custom OFDM modulation analysis measurement with user-defined settings or recalling 89600 VSA or Signal Studio output files
Pulse analysis	N9067EM0E	Characterize pulsed RF signals in the time domain, with phase, frequency and statistical analysis of large pulse sets

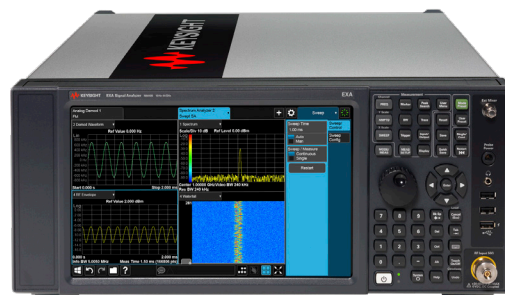| Description	Model number	Additional information
Step 12. Choose measurement application or software and license type (Continued)		
EMI	N6141EM0E	Performs pre-compliance conducted and radiated emission measurements
SCPI command language compatibility	N9062EM0E	Adds capability to emulate the R&S FSP/FSU/FSE/FSL/FSV spectrum analyzers or ESU EMI receiver
MATLAB software	N6171A	
89600 vector signal analysis (VSA) software	89601B (transportable license is standard)	Industry-leading measurement software for evaluating and troubleshooting signals in R&D; PC-based software supporting more than 30 measurement platforms, plus more than 75 signal standards and modulation types including MIMO analysis; **www.keysight.com/find/89600_VSA**
Cellular communications		
GSM/EDGE/Evo	N9071EM0E	Standard-based, one-button GSM/EDGE/EDGE Evolution measurements
W-CDMA/HSPA+	N9073EM0E	Standard-based, one-button W-CDMA, HSPA and HSPA+ measurements
LTE/LTE-Advanced FDD	N9080EM0E	Standard-based, one-button LTE/LTE-Advanced FDD measurements
NB-IoT & eMTC FDD	N9080EM3E	Standard-based, one-button NB-IoT/eMTC measurements
LTE/LTE-Advanced TDD	N9082EM0E	Standard-based, one-button LTE/LTE-Advanced TDD measurements
Wireless connectivity		
WLAN 802.11a/b/g/j/p/n/af/ah	N9077EM0E	Standard-based, one-button 802.11a/b/g/j/p/n/af/ah measurement
Bluetooth®	N9081EM0E	Standard-based, one-button Bluetooth (BR/EDR, Low Energy 4.0/4.2 and Bluetooth 5) measurements
Short Range Comm	N9084EM0E	Standard-based, one-button 802.15.4 for ZigBee measurement and G.9959 for Z-Wave measurement
Step 13. 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 14. Choose accessories		
Mouse, USB interface	Standard	Every CXA is shipped with a USB mouse which enhances the usability of the Windows operating system
User guide	Standard	US – English localization
		All user documentation is included in the CXA's embedded help system and on a CD that is shipped with the instrument
		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
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	
US 65-key USB keyboard	1KBD001A	Smaller keyboard
Front panel protection cover	Standard	
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

Configure Your Keysight CXA Signal Analyzer (Continued)

Description	Option number	Additional information
Step 15. 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 + guardbanding (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	
Calibration Assurance Plan, Return-to-Keysight, 5 years	R-50C-011-5	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, 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
For more information on training and application support services go to: www.keysight.com/find/training

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]

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

You can upgrade!

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

UPGRADE

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	
Upgrade to the 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 the 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	N9000BU-EDP	None	Also orderable at N90EMEDPB (requires F/W revision A.21.04 onward)
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	N9000BU-SS1	None	Provides a fully-imaged, removable solid-state drive, with Windows 10 operating system
Upgrade operating system to Windows 10	N9000BU-SS1	PC7, W7X	Provides a removable solid-state drive with Windows 10 operating system

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.

Instrument Upgrades (Continued)

Description	Upgrade number	Requirements CXA must already include the following)	Additional information
Korean version of Getting Started Guide	N9000BU-AB1	None	
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	

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

Note: It is recommended to order measurement applications with the model numbers listed at Step 12. Alternatively, you can use the ordering numbers in this table to add the measurement applications. The last two letters of the ordering numbers indicate the license type—FP stands for fixed perpetual, TP for transportable perpetual; it is recommended that you configure each application with the same license type; visit www.keysight.com/find/X-series_transportable for more information about transportable licenses.

Description	Fixed license	Transportable license	Additional information
Cellular communications			
LTE/LTE-Advanced FDD	N9080C-1FP	N9080C-1TP	Standard-based, one-button LTE-FDD measurements
	N9080C-2FP	N9080C-2TP	Standard-based, one-button LTE-Advanced FDD measurements; requires N9080C-1FP/1TP
NB-IoT/eMTC	N9080C-3FP	N9080C-3TP	Standard-based, one-button NB-IoT/eMTC measurements
LTE/LTE-Advanced TDD	N9082C-1FP	N9082C-1TP	Standard-based, one-button LTE-TDD measurements
	N9082C-2FP	N9082C-2TP	Standard-based, one-button LTE-Advanced TDD measurements; requires N9082C-1FP/1TP
GSM/EDGE/EVO	N9071C-1FP	N9071C-1TP	Licensed as N9071C-2FP or -2TP and N9071C-3FP or -3TP. Standard-based, one-button GSM/ EDGE/EDGE Evolution measurements
W-CDMA/HSPA+	N9073C-1FP	N9073C-1TP	Standard-based, one-button W-CDMA measurements
	N9073C-2FP	N9073C-2TP	Adds HSPA measurements; requires 1FP/1TP
	N9073C-3FP	N9073C-3TP	Adds HSPA+ measurements; requires 1FP/1TP, 2FP/2TP
Wireless connectivity			
WLAN 802.11 a/b/g/n/ah/af	N9077C-1FP	N9077C-1TP	Licensed as N9077C-2FP or -2TP and N9077C-3FP or -3TP; standard-based, one-button 802.11a/b/g/j/p/n measurement
	N9077C-6FP	N9077C-6TP	Adds 802.11ah measurements
	N9077C-7FP	N9077C-7TP	Adds 802.11af measurements
Bluetooth®	N9081C-2FP	N9081C-2TP	Standard based, one-button Bluetooth version 2.1 + EDR and Low Energy (LE) measurements
	N9081C-3FP	N9081C-3TP	Standard-based, one-button *Bluetooth*® 5 measurement; requires N9081C-2FP/2TP
Short range communications	N9084C-1FP	N9084C-1FP	Short range communications 802.15.4 for ZigBee measurements
	N9084C-2FP	N9084C-2FP	Short range communications G.9959 for Z-Wave measurements
General purpose			
Analog demodulation	N9063C-1FP	N9063C-1TP	Licensed as N9063C-2FP or -2TP and N9063C-3FP or -3TP. Adds 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.
Phase noise	N9068C-2FP	N9068C-2TP	One-button phase noise measurements in frequency domain (log plot) and time domain (spot frequency)
Noise figure	N9069C-3FP (requires preamplifier)	N9069C-3TP (requires preamplifier)	Licensed as N9069C-1FP or -1TP and N9069C-2FP or -2TP. Adds one-button measurements for noise figure, gain, and related metrics; requires preamplifier to meet specifications; works with Keysight N400xA Series smart noise sources and 346 Series noise sources; supports U7227 Series 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.

Instrument Upgrades (Continued)

Description	Fixed license	Transportable license	Additional information
General purpose (Continued)			
Vector modulation analysis	N9054C-1FP	N9054C-1TP	One-button vector modulation analysis measurements
EMI	N6141C-2FP	N6141C-2TP	Pre-compliance conducted and radiated emission measurements
MATLAB software	N6171A-M01	Not available	Instrument Control Toolbox
	N6171A-M02	Not available	Instrument Control Toolbox
			Communications System Toolbox
			DSP System Toolbox
			Signal Processing Toolbox
	N6171A-M03	Not available	Instrument Control Toolbox
			Communications System Toolbox
			DSP System Toolbox
			Signal Processing Toolbox
			RF Toolbox
Pulse	N9067C-1FP	N9067C-1TP	Characterize pulsed RF signals in the time domain, with phase, frequency and statistical analysis of large pulse sets
89600 VSA software	Not available	89601B (transportable license is standard)	Industry-leading measurement software for evaluating and troubleshooting signals in R&D; PC-based software supporting more than 40 measurement platforms, plus more than 75 signal standards and modulation types including MIMO analysis; **www.keysight.com/find/89600vsa**

Related Literature

Keysight CXA signal analyzers

Publication title	Publication number
N9000B CXA X-Series Signal Analyzer, Multi-touch - Data Sheet	5992-1274EN
X-Series Signal Analyzers - Brochure	5992-1316EN
X-Series Measurement Applications - Brochure	5989-8019EN

Learn more at: www.keysight.com

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