N9020B MXA X-Series Signal Analyzer, Multi-touch

Introduction

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

KEYSIGHT

Table of Contents

Included in Base Product 3

Configure your MXA Signal Analyzer 4

- Step 1. Select maximum frequency range (required option) 4
- Step 2. Add a preamplifier 4
- Step 3. Choose frequency reference 5
- Step 4. Choose an attenuator 5
- Step 5. Choose analysis bandwidth 5
- Step 6. Choose performance options 6
- Step 7. Add real-time spectrum analysis 6
- Step 8. Add optional features 7
- Step 9. Add security features 7
- Step 10. Add rear panel output utilities 7
- Step 11. Choose measurement application or software and license type 8
- Step 12. Choose 89600 VSA software 10
- Step 13. Choose physical instrument configuration 12
- Step 14. Choose accessories 12
- Step 15. Add calibration, technical training, support, and upgrade services 14

Instrument Upgrades 15

Related Literature 22

Included in Base Product

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

- Spectrum analyzer measurement application
- Hex-core, high-performance processor, 32 GB RAM, with flash calibration file memory
- Removable M.2 NVMe solid-state drive
- Frequency reference
- Mechanical attenuator
- 25 MHz analysis bandwidth
- Microsoft Windows 11 operating system
- Benchtop configuration
- Multi-Language user interface
- User guide
- Receiver calibrator (RCal) control License
- Power cord

Get More Information

For a summary of specifications, refer to the N9020B MXA data sheet (literature number 5992-1255EN).

A full set of specifications are available in the N9020B MXA Signal Analyzer Specification Guide at www.keysight.com/find/mxa_specifications.

Configure your MXA Signal Analyzer

This step-by-step process will help you configure your new Keysight Technologies, Inc. MXA X-Series signal analyzer. Tailor the performance to meet your requirements.

Step 1. Select maximum frequency range (required option)

Description	Option number	Additional information
Frequency range, 10 Hz to 3.6 GHz	N9020B-503	
Frequency range, 10 Hz to 8.4 GHz	N9020B-508	
Frequency range, 10 Hz to 13.6 GHz	N9020B-513	
Frequency range, 10 Hz to 26.5 GHz	N9020B-526	
Frequency range, 10 Hz to 32 GHz	N9020B-532	
Frequency range, 10 Hz to 44 GHz	N9020B-544	
Frequency range, 10 Hz to 50 GHz	N9020B-550	

Step 2. Add a preamplifier

Preamplifiers improve the noise floor for low-level signal detection

Description	Option number	Additional information
Preamplifier, 100 kHz to 3.6 GHz	N9020B-P03	Compatible with frequency range options: N9020B-503, N9020B-508, N9020B-513, N9020B-526, N9020B-532, N9020B-544 and N9020B-550
Preamplifier, 100 kHz to 8.4 GHz	N9020B-P08	Compatible with frequency range options: N9020B-508, N9020B-513, N9020B-526, N9020B-532, N9020B-544 and N9020B-550
Preamplifier, 100 kHz to 13.6 GHz	N9020B-P13	Compatible with frequency range options: N9020B-513, N9020B-526, N9020B-532, N9020B-544 and N9020B-550
Preamplifier, 100 kHz to 26.5 GHz	N9020B-P26	Compatible with frequency range options: N9020B-526, N9020B-532, N9020B-544 and N9020B-550
Preamplifier, 100 kHz to 32 GHz	N9020B-P32	Compatible with frequency range options: N9020B-532
Preamplifier, 100 kHz to 44 GHz	N9020B-P44	Compatible with frequency range options: N9020B-544
Preamplifier, 100 kHz to 50 GHz	N9020B-P50	Compatible with frequency range option: N9020B-550

Step 3. Choose frequency reference

Description	Option number	Additional information
Frequency reference	Standard	Aging rate: ± 1 x 10^{-6}/year
Precision frequency reference	N9020B-PFR	Reduces frequency drift for more accurate measurements
		Aging rate: ± 1 x 10^{-7}/year

Step 4. Choose an attenuator

Description	Option number	Additional information
Mechanical attenuator	Standard	2 dB steps, 0 to 70 dB
Electronic attenuator up to 3.6 GHz	N9020B-EA3	In addition to the mechanical attenuator; 1dB steps, 0 to 24dB

Step 5. Choose analysis bandwidth

Description	Option number	Additional information
25 MHz analysis bandwidth	Standard	Useful for most cellular communications, wireless connectivity, and audio/video broadcasting measurement applications; licensed as N9020B-B25
40 MHz analysis bandwidth	N9020B-B40	Extends the analysis bandwidth to 40 MHz (Option MPB required for measurements at frequency > 3.6 GHz); included in B85, B1A, or B1X; also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2; if Option BBA is installed, provides 40 MHz per channel baseband bandwidth
85 MHz analysis bandwidth	N9020B-B85	Extends the analysis bandwidth to 85 MHz (Option MPB required for measurements > 3.6 GHz); also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2; not compatible with Option BBA
125 MHz analysis bandwidth	N9020B-B1A	Extends the analysis bandwidth to 125 MHz (Option MPB required for measurements > 3.6 GHz); also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2; not compatible with Option BBA
160 MHz analysis bandwidth	N9020B-B1X	Extends the analysis bandwidth to 160 MHz (Option MPB required for measurements > 3.6 GHz); also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2; not compatible with Option BBA
Microwave preselector bypass	N9020B-MPB	Required for wide analysis bandwidth measurements with Option B40, B85, B1A, or B1X at frequency > 3.6 GHz; also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2

Step 6. Choose performance options

Description	Option number	Additional information
Digital processor with 2 GB capture memory	N9020B-DP2	Comes standard with Option B40, B85, B1A, or B1X; also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2
Digital processor with 4 GB capture memory	N9020B-DP4	Comes standard with Option B85, B1A, or B1X in instrument models with serial number prefix > MY/SG/US5608; also enables fast sweep capability licensed as N9020B-FS1 and N9020B-FS2
I/Q baseband inputs, analog	N9020B-BBA	Single-ended/differential, 50 Q/1 MQ impedance; not compatible with Option B85, B1A, B1X, 532, 544, or 550
External mixing	N9020B-EXM	Connects with Keysight and third-party mixers[1] to extend frequency coverage up to 1.1 THz: single port for LO out and IF in (SMA female)
Noise floor extension	N9020B-NF2	Improves analyzer's DANL performance (instrument alignment-based processes)

1. When used with the Keysight 11970 Series external mixers, an external diplexer is required. Recommended diplexer can be purchased from Keysight as N9029AE13, or from OML Inc. as DPL313B.

Step 7. Add real-time spectrum analysis

Description	Option number	Additional information
Real-time analysis up to maximum available BW, Basic Detection	N9020RT1B	Includes frequency mask trigger (FMT) and time qualified trigger (TQT); minimum 17.3 |is signal duration for 100% probability of intercept (POI); requires Option B85, B1A, or B1X, which determines maximum real-time bandwidth
Real-time analysis up to maximum available BW, Optimum Detection	N9020RT2B	Includes frequency mask trigger (FMT) and time qualified trigger (TQT); minimum 3.6 |is signal duration for 100% probability of intercept (POI); requires Option B85, B1A, or B1X, which determines maximum real-time bandwidth; node-locked license only
Frequency mask trigger, basic detection	N90EMFT1B	Enables frequency mask triggering with N9067EM0E pulse application and 89600 VSA software to detect signals as short as 17.3 |is duration; included in N9020RT1B (Option RT1); requires bandwidth options B85, B1A, or B1X
Frequency mask trigger, optimum detection	N90EMFT2B	Enables frequency mask triggering with N9067EM0E pulse application and 89600 VSA software to detect signals as short as 3.6 |is duration; included in N9020RT2B (Option RT2); requires bandwidth options B85, B1A, or B1X; node-locked license only

Step 8. Add optional features

Description	Option number	Additional information
Enhanced display package	N90EMEDPB	Includes spectrogram, trace zoom, and zone span
Basic EMI pre-compliance	N90EMEMCB	Perform basic EMI pre-compliance measurements with CISPR 16-1-1 detectors and bandwidths; tune and listen, and measure at marker are also available
Time domain scan	N90EMTDSB	Improves scan speed for EMC pre-compliance tests; requires N6141EM0E EMC pre-compliance measurement application and Option DP2, or B40 (or wider bandwidth option)
External source control	N90EMESCB	External source control for selected Keysight EXG, MXG, and PSG signal generators; supports external mixing
Fast power up to available maximum analysis bandwidth	N90EMFP2B	Accelerates power measurements such as ACPR; requires Option B40, B85, B1A, or B1X
Resolution bandwidth extended	N90EMRBEB	Extends the maximum RBW in Zero Span; requires option B85, B1A, or B1X

Step 9. Add security features

Description	Option number	Additional information
Additional removable M.2 NVMe solid-state drive (SSD), for PCA processor	N9020B-SS7	Provides a fully imaged, removable SSD in addition to the one installed in instruments, with Windows 11 operating system
Security features, exclude launch programs	N9020B-SF1	Prevents the launching of Windows programs from the instrument application
Security features, prohibit saving results	N9020B-SF2	Prevents instrument application from saving/recall of measurement results or user configurations to/from instrument's data storage
Security feature, secure RAM disk boot	N9020B-SF3	Allows the instrument to boot the Windows OS into volatile memory, which ensures that, after a power cycle, all information from the previous boot is lost

Step 10. Add rear panel output utilities

Description	Option number	Additional information
Second IF output	N9020B-CR3	Wideband IF out; center frequency depends on IF path; output on Aux IF connector at rear panel
Arbitrary IF output	N9020B-CRP	IF out 10 to 75 MHz (in 500 kHz steps); output on Aux IF connector at rear panel
Y-axis screen video output	N9020B-YAS	Screen video (0-1 volt open circuit) on rear panel analog out

Description	Option number	Additional information
Real-time link	Standard when B40 or DP2 is ordered	The LVDS connector allows MXA to connect to X-COM data recorder for data streaming (up to 40 MHz BW), and to the N5106A PXB baseband generator and channel emulator; requires Option B40 or DP2; licensed as N9020B-RTL

Step 11. Choose measurement application or software and license type

Note: Keysight offers 4 license types for the measurement applications and instrument features, in 2 license terms: Perpetual or Subscription.

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
- **Subscription:** License is time limited to a defined period, such as 12-months. A valid support contract is included in the pricing for Subscription licenses.

For detailed information, we strongly recommend you visit the X-Series measurement application collection page: www.keysight.com/find/xseriesapps

Description	Option number	Additional information
General purpose		
Spectrum analyzer and IQ analyzer	Standard	Traditional spectrum analysis plus many new and enhanced functions
Power suite	N90EMPSMB	Power measurements based on industry specifications
Analog demodulation	E9063EM0E	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	E9068EM0E	Adds one-button measurements for analyzing phase noise in frequency domain (log plot) and time domain (spot frequency), supports external mixing

Description	Option number	Additional information
Noise figure	E9069EM0E (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	E9054EM0E	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	E9054EM1E	Performs one-button custom OFDM modulation analysis measurement with user-defined settings or recalling 89600 VSA or Signal Studio output files
Channel Quality	E9056EM0E	Makes repeatable channel response measurements as group delay and other characteristics with multi-tone signals for wideband component testing
Pulse analysis	E9067EM0E	Characterize pulsed RF signals in the time domain, with phase, frequency and statistical analysis of large pulse sets; enables fixed and variable length gated acquisition for capturing pulses of varying pulse width and PRI (requires 4 GB capture memory Option DP4)
EMI	E6141EM0E	Performs pre-compliance conducted and radiated emission measurements
Remote language compatibility	E9061EM0E	Adds capability to emulate HP/Agilent 8566/68 and 856xE/EC spectrum analyzers
SCPI command language compatibility	E9062EM0E	Adds capability to emulate the R&S FSP/FSU/FSL/FSV/FSW spectrum analyzers or ESU EMI receiver
MATLAB software	N6171A	
Cellular communications		
GSM/EDGE/Evo	E9071EM0E	Standard-based, one-button GSM/EDGE/EDGE Evolution measurements
	E9071EMXE	Adds single acquisition combined measurement, a SCPI-command based measurement optimized for high-volume, high-throughput manufacturing; requires N9071EM0E; not compatible with Options DP2, B40, B85, B1A, B1X, or MPB
W-CDMA/HSPA+	E9073EM0E	Standard-based, one-button W-CDMA, HSPA and HSPA+ measurements; supports analog baseband analysis with Option BBA (BBIQ inputs)
	E9073EMXE	Adds single acquisition combined measurement, a SCPI-command based measurement optimized for high-volume, high-throughput manufacturing; requires N9073EM0E; not compatible with Options DP2, B40, B85, B1A, B1X, or MPB

Description	Option number	Additional information
LTE/LTE-Advanced FDD	E9080EM0E	Standard-based, one-button LTE/LTE-Advanced FDD measurements
NB-IoT & eMTC FDD	E9080EM3E	Standard-based, one-button NB-IoT/eMTC measurements
LTE V2X	E9080EM4E	Standard-based, one-button LTE-V2X transmitter measurements
LTE/LTE-Advanced TDD	E9082EM0E	Standard-based, one-button LTE/LTE-Advanced TDD measurements
Multi-standard radio	E9083EM0E	Standard -based, one-button MSR measurements on any combination of LTE-FDD, LTE-TDD, W-CDMA/HSPA/HSPA+, GSM/EDGE/EDGE Evo, cdma2000, 1xEV-DO and TD-SCDMA signals
5G NR (New Radio)	E9085EM0E	Standard-based, one-button 5G NR (New Radio) downlink and uplink measurements; Firmware above A.20.25; Requires option B1A or B1X
Wireless connectivity		
WLAN 802.11 a/b/g/j/p/n/ af/ah	E9077EM0E	Standard-based, one-button 802.11 a/b/g/j/p/n/af/ah measurement
WLAN 802.11 ac/ax	E9077EM1E	Standard-based, one-button 802.11 ac/ax measurement
Bluetooth®	E9081EM0E	Standard-based, one-button Bluetooth (BR/EDR, Low Energy 4.0/4.2 and *Bluetooth* 5) measurements
Short range comm and IoT	E9084EM0E	Standard-based, one-button LoRa CSS measurement, 802.15.4 for ZigBee measurement and G.9959 for Z-Wave measurement

Step 12. Choose 89600 VSA software

Description	Option number	Additional information
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

Description	Option number	Additional information
		Channel response measurements such as phase/magnitude response and multi-tone group delay
Custom OFDM modulation analysis	89601BHFC	Proprietary and pre-standard OFDM formats
PowerSuite measurement	89601PSMC	PowerSuite measurement for ACP and EVM

Description	Option number	Additional information
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 802.11 a/b/g/j/p modulation analysis WiMax modulation analysis
High throughput WLAN modulation analysis	89601BHXC	WLAN 802.11 n/ac modulation analysis WLAN 802.11 ax 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 13. Choose physical instrument configuration

Description	Option number	Additional information
Bench top configuration	Standard	Provides two side carrying straps, four rear feet, and four bottom feet with a tilt stand
Portable configuration	N9020B-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

Description	Option number	Additional information
User guide	Standard	US - English localization
		All user documentation is included in the MXA's embedded, context-sensitive help system
		User documentation can be downloaded from: www.keysight.com/find/mxa_manuals
Power cord	Standard	Dependent upon the region of use
Adapter, 2.4 mm (F) to 2.9 mm (F)	Standard	Ship standard only for Option 532, 544 and 550
Adapter, 2.4 mm (F) to 2.4 mm (F)	Standard	Ship standard only for Option 544 and 550
Receiver calibration (RCal) module	U9361C/F/G/M	Enables magnitude and complex corrections; see U9361C/F/G/M configuration guide (3120-1408EN) for details
Front panel cover	CV1117A	Protective cover for front panel
Rack mount	1CM113A	Adds rack mount flanges to the MXA
Front handles	1CN103A	Adds front handles to the MXA
Rack mount with handles	1CP105A	Adds rack mount flanges and handles to the MXA
Rack slide	1CR013A	Adds a non-tilting rack slide to the MXA
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

Description	Option number	Additional information
V-band waveguide harmonic mixer, 50 to 75 GHz	M1970V-001	Requires Option EXM; USB mixer with smart features
Extended V-band waveguide harmonic mixer, 50 to 80 GHz	M1970V-002	Requires Option EXM; USB mixer with smart features
E-band waveguide harmonic mixer, 60 to 90 GHz	M1970E	Requires Option EXM; USB mixer with smart features
W-band waveguide harmonic mixer, 75 to 110 GHz	M1970W	Requires Option EXM; USB mixer with smart features
E-band waveguide harmonic mixer, 60 to 90 GHz	M1971E-001	Requires Option EXM; USB mixer with smart features and 3 signal paths
E-band waveguide harmonic mixer, 55 to 90 GHz	M1971E-003	Requires Option EXM; USB mixer with smart features and 3 signal paths
V-band waveguide harmonic mixer, 50 to 75 GHz	M1971V	Requires Option EXM; USB mixer with smart features and 3 signal paths
W-band waveguide harmonic mixer, 75 to 110 GHz	M1971W	Requires Option EXM; USB mixer with smart features and 3 signal paths
26 to 40 GHz waveguide harmonic mixer	11970A	Requires Option EXM and N9029BE13 diplexer
33 to 50 GHz waveguide harmonic mixer	11970Q	Requires Option EXM and N9029BE13 diplexer
40 to 60 GHz waveguide harmonic mixer	11970U	Requires Option EXM and N9029BE13 diplexer
50 to 75 GHz waveguide harmonic mixer	11970V	Requires Option EXM and N9029BE13 diplexer
75 to 110 GHz waveguide harmonic mixer	11970W	Requires Option EXM and N9029BE13 diplexer
LO/IF diplexer	N9029BE13	Ordering convenience; required for 11970 Series external mixers
50 to 75 GHz frequency extension module	N9029BV-W15	VDI signal analyzer frequency extension module; requires Option EXM
60 to 90 GHz frequency extension module	N9029BV-W12	VDI signal analyzer frequency extension module; requires Option EXM
75 to 110 GHz frequency extension module	N9029BV-W10	VDI signal analyzer frequency extension module; requires Option EXM
90 to 140 GHz frequency extension module	N9029BV-W08	VDI signal analyzer frequency extension module; requires Option EXM
110 to 170 GHz frequency extension module	N9029BV-W06	VDI signal analyzer frequency extension module; requires Option EXM

Description	Option number	Additional information
140 to 220 GHz frequency extension module	N9029BV-W05	VDI signal analyzer frequency extension module; requires Option EXM
170-260 GHz frequency extension module	N9029BV-W04	VDI signal analyzer frequency extension module; requires Option EXM
220 to 330 GHz frequency extension module	N9029BV-W03	VDI signal analyzer frequency extension module; requires Option EXM
260 to 400 GHz frequency extension module	N9029BV-W2B	VDI signal analyzer frequency extension module; requires Option EXM
330 to 500 GHz frequency extension module	N9029BV-W02	VDI signal analyzer frequency extension module; requires Option EXM
550 to 750 GHz frequency extension module	N9029BV-W1B	VDI signal analyzer frequency extension module; requires Option EXM
750 to 1100 GHz frequency extension module	N9029BV-W01	VDI signal analyzer frequency extension module; requires Option EXM
USB external preamplifier, 10 MHz to 4 GHz	U7227A	
USB external preamplifier, 0.1 to 26.5 GHz	U7227C	
USB external preamplifier, 2 to 50 GHz	U7227F	

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

Step 15. Add calibration, technical training, support, and upgrade services

Description	Option number	Additional information
Commercial calibration certificate with test data	N9020B-UK6	Calibration certificate only available at time of instrument purchase; only provides measurement results
Keysight Calibration + Uncertainties + Guardbanding (accredited cal)	N9020B-AMG	Provides ISO 17025A accredited calibration from factory
ANSI Z540-1 -1994 Calibration	N9020B-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
Calibration Assurance Plan, Return-to-Keysight, 7 years	R-50C-011-7	automatically makes adjustments if outside of specified parameters; pre- and post-adjustment measurement data reports also provided

Description	Option number	Additional information
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

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 MXA
4. Begin using the new capability[1] [2]

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

Upgrades for analysis bandwidth depend on the vintage of the instrument and the options already installed. More than one option may be required to achieve desired wider analysis bandwidth. Use our web-based calculator to find the upgrade options you may need: www.keysight.com/find/BW-selector

You Can Upgrade!

Options can be added after your initial purchase. All of our X-Series application options are

[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 two years 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 two years, or if the analyzer is more than two years 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.

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Increase frequency from 3.6 to 8.4 GHz	N9020BU-F01	503	
Increase frequency from 3.6 to 13.6 GHz	N9020BU-F02	503	
Increase frequency from 3.6 to 26.5 GHz	N9020BU-F03	503	
Increase frequency from 3.6 to 32 GHz	N9020BU-F04	503	
Increase frequency from 3.6 to 44 GHz	N9020BU-F05	503	
Increase frequency from 8.4 to 13.6 GHz	N9020BU-F06	508	
Increase frequency from 8.4 to 26.5 GHz	N9020BU-F07	508	
Increase frequency from 8.4 to 32 GHz	N9020BU-F08	508	
Increase frequency from 8.4 to 44 GHz	N9020BU-F09	508	
Increase frequency from 13.6 to 26.5 GHz	N9020BU-F10	513	
Increase frequency from 13.6 to 32 GHz	N9020BU-F11	513	
Increase frequency from 13.6 to 44 GHz	N9020BU-F12	513	
Increase frequency from 26.5 to 32 GHz	N9020BU-F13	526	
Increase frequency from 26.5 to 44 GHz	N9020BU-F14	526	
Increase frequency from 32 to 44 GHz	N9020BU-F15	532	
Increase frequency from 3.6 to 50 GHz	N9020BU-F16	503	
Increase frequency from 8.4 to 50 GHz	N9020BU-F17	508	
Increase frequency from 13.6 to 50 GHz	N9020BU-F18	513	
Increase frequency from 26.5 to 50 GHz	N9020BU-F19	526	

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Increase frequency from 32 to 50 GHz	N9020BU-F20	532	
Increase frequency from 44 to 50 GHz	N9020BU-F21	544	
Increase analysis bandwidth from 25 MHz to 40 MHz (for RF and microwave MXA)	N9020BU-B40	503, 508, 513, or 526	Includes hardware and license key; adds microwave preselector bypass for instruments with Option 508, 513, or 526; also enables 40 MHz per channel baseband bandwidth if Option BBA is installed
Increase analysis bandwidth from 25 MHz to 40 MHz (for millimeter wave MXA)	N9020BU-BUN	532, 544, 550	Includes hardware and license key; also add microwave preselector bypass
Increase analysis bandwidth from 25 MHz to 85 MHz (for RF and microwave MXA)	N9020BU-B85	503, 508, 513, or 526	Includes hardware and license key; also add microwave preselector bypass for instruments with Option 508, 513, or 526 and license for Option DP4; not compatible with Option BBA
Increase analysis bandwidth from 25 MHz to 85 MHz (for millimeter wave MXA)	N9020BU-BUD	532, 544, 550	Includes hardware and license key; also add microwave preselector bypass and license for Option DP4
Increase analysis bandwidth from 40 MHz to 85 MHz	N9020BU-BU1	B40	Includes hardware and license key; add license for Option DP4; not compatible with Option BBA
Increase analysis bandwidth from25 to 125 MHz (for RF and microwave MXA)	N9020BU-B1A	503, 508, 513, or 526	Includes hardware and license key; also add microwave preselector bypass for instruments with Option 508, 513, or 526 and license for Option DP4, not compatible with Option BBA
Increase analysis bandwidth from 25 MHz to 125 MHz (for millimeter wave MXA)	N9020BU-BUE	532, 544, 550	Includes hardware and license key; also add microwave preselector bypass and license for Option DP4
Increase analysis bandwidth from 40 to 125 MHz	N9020BU-BU2	B40	Includes hardware and license key; add license for Option DP4; not compatible with Option BBA
Increase analysis bandwidth from 85 to 125 MHz	N9020BU-BU6	B85	License key only

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Increase analysis bandwidth from 25 to 160 MHz (for RF and microwave MXA)	N9020BU-B1X	503, 508, 513, or 526	Includes hardware and license key; also add microwave preselector bypass for instruments with Option 508, 513, or 526 and license for Option DP4, not compatible with Option BBA
Increase analysis bandwidth from 25 MHz to 160 MHz (for millimeter wave MXA)	N9020BU-BUL	532, 544, 550	Includes hardware and license key; also add microwave preselector bypass and license for Option DP4
Increase analysis bandwidth from 40 to 160 MHz	N9020BU-BU3	B40	Includes hardware and license key; add license for Option DP4; not compatible with Option BBA
Increase analysis bandwidth from 85 to 160 MHz	N9020BU-BU7	B85	License key only
Increase analysis bandwidth from 125 to 160 MHz	N9020BU-BUA	B1A	License key only
Digital processor with 4 GB capture memory for instruments with serial number prefixes < MY/SG/US5608	N9020BU-DP4	B85, B1A, or B1X	Includes hardware and license key
Upgrade to the precision frequency reference	N9020BU-PFR	None	
Add an electronic attenuator, 3.6 GHz	N9020BU-EA3	None	
Add enhanced fast sweep speed	N9020BU-FS2	DP2, B40, or MPB	
Add preamplifier, 3.6 GHz	N9020BU-P03	None	
Add preamplifier, 8.4 GHz	N9020BU-P08	508, 513, 526, 532, 544, or 550	Not compatible with Option 503
Add preamplifier, 13.6 GHz	N9020BU-P13	513, 526, 532, 544, or 550	Not compatible with Options 503, 508
Add preamplifier, 26.5 GHz	N9020BU-P26	526, 532, 544, or 550	Not compatible with Options 503, 508, 513
Add preamplifier, 32 GHz	N9020BU-P32	532	Only compatible with Option 532

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Add preamplifier, 44 GHz	N9020BU-P44	544	Only compatible with Option 544
Add preamplifier, 50 GHz	N9020BU-P50	550	Only compatible with Option 550
Add analog baseband IQ inputs	N9020BU-BBA	None	Not compatible with Options B85, B1A, B1X, 532, 544, 550
Add external mixing	N9020BU-EXM	None	Includes hardware and license key
Add fast power up to available maximum analysis bandwidth	N9020BU-FP2	B40, or B85, B1A, B1X	For fast power measurements such as ACPR; Also orderable at N90EMFP2B (requires F/W revision A.21.04 onward)
Add noise floor extension	N9020BU-NF2	None	Instrument alignment based
Add security features, exclude launch program	N9020BU-SF1	None	Prevents the launching of Windows programs from the instrument application
Add security features, prohibit saving results	N9020BU-SF2	None	Prevents the saving/recall of measurement results or user configurations to/from instrument's data storage
Add security features, secure RAM disk boot	N9020BU-SF3	PC8, or PCA	License key only; allows the instrument to boot the Windows OS into volatile memory, which ensures that, after a power cycle, all information from the previous boot is lost
Add removable solid-state drive (SSD)	N9094BU-SS1 (under N9020BU)	PC6, or PC6S	Provides additional removable solid-state drive, with Windows 10 operating system
Add removable solid-state drive (SSD)	N9094BU-SS2 (under N9020BU)	PC8	Provides additional removable solid-state drive, with Windows 10 operating system
Add removable M.2 NVMe solid-state drive (SSD)	N9094BU-SS3 (under N9020BU)	PCA	Provides additional removable solid-state drive, with Windows 10 operating system
Add removable solid-state drive (SSD)	N9094BU-SS6 (under N9020BU)	PC8	Provides additional removable solid-state drive, with Windows 11 operating system
Add removable solid-state drive (SSD)	N9094BU-SS7 (under N9020BU)	PCA	Provides additional removable M.2 NVMe solid-state drive, with Windows 11 operating system

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Upgrade operating system to Windows 10	N9094BU-SS1/W10 (under N9020BU)	PC6, W7X	Provides a removable solid-state drive with Windows 10 operating system
Upgrade operating system to Windows 11	N9094BU-SS6/W11 (under N9020BU)	PC8, W10	Provides additional removable solid-state drive, with Windows 11 operating system
Upgrade operating system to Windows 11	N9094BU-SS7/W11 (under N9020BU)	PCA, W10	Provides additional removable M.2 NVMe solid-state drive, with Windows 11 operating system
Upgrade operating system to Windows 11	N9094BU-PC8/W11 (under N9020BU)	PC6, W7X or W10	Upgrade to PC8, hex-core, high performance processor, 32 GB RAM, with flash calibration file memory and removable solid-state drive
Upgrade operating system to Windows 11	N9094BU-PCA/W11 (under N9020BU)	PC6, W7X or W10	Upgrade to PCA, hex-core, high performance processor, 32 GB RAM, with flash calibration file memory and removable M.2 NVMe solid-state drive
Upgrade to PC6S, quad-core, high-performance processor, 16 GB RAM, with flash calibration file memory	N9094BU-PCS (under N9020BU)	PC6	Upgrade to quad-core, high-performance processor, 16 GB RAM, with flash calibration file memory and removable solid-state drive
Upgrade to PC8, hex-core, high-performance processor, 32 GB RAM, with flash calibration file memory	N9094BU-PC8 (under N9020BU)	PC6, or PC6S	Upgrade to PC8, hex-core, high-performance processor, 32 GB RAM, with flash calibration file memory and removable solid-state drive
Upgrade to PCA, hex-core, high-performance processor, 32 GB RAM, with flash calibration file memory	N9094BU-PCA (under N9020BU)	PC6, PC6S, or PC8	Upgrade to PCA, hex-core, high performance processor, 32 GB RAM, with flash calibration file memory and removable M.2 NVMe solid-state drive
Add APC 3.5 mm connector	N9020BU-C35	526	Includes additional hardware; not compatible with Option 503, 508, 513, 532, 544 or 550; eliminates amplitude response errors due to modes otherwise seen with Type-N connector above 18 GHz; refer to N9020B specifications guide for details
Add second IF output	N9020BU-CR3	B40, B85, B1A, B1X, DP2, MPB, CRP, 532, 544 or 550	

Description	Upgrade number	Requirements (MXA must already include the following)	Additional information
Add arbitrary IF output	N9020BU-CRP	Front end controller with hardware ID 41 or 75	Press System, Show, Hardware to determine hardware ID
Add second IF output and arbitrary IF output	N9020BU-HL3	Front end controller without hardware ID 41 or 75	Includes hardware and license key
Add Y-axis screen video output	N9020BU-YAS	None	
Rack mount and handle kit	1CP105A	None	Not compatible with Option PRC, 1CN103A, 1CM113A
Front handle kit	1CN103A	None	Not compatible with Option PRC, 1CP105A, 1CM113A
Rack mount kit	1CM113A	None	Not compatible with Option PRC, 1CP105A, 1CM113A
Rack slide kit	1CR013A	None	Not compatible with Option PRC
Portable configuration	N9020BU-PRC	None	Not compatible with Options 1CM, 1CP, 1CN, 1CR
Minimum loss pad, 50 to 75 Ω (type-N to BNC)	MLP001A	None	1CP105A, 1CM113A, 1CN103A, 1CR013A
Korean version of Getting Started Guide	N9020BU-AB1	None	
Chinese version of Getting Started Guide	N9020BU-AB2	None	
Spanish version of Getting Started Guide	N9020BU-ABE	None	
French version of Getting Started Guide	N9020BU-ABF	None	
Japanese version of Getting Started Guide	N9020BU-ABJ	None	
Russian version of Getting Started Guide	N9020BU-AKT	None	

Related Literature

Keysight MXA signal analyzers

Publication title	Publication number
X-Series Signal Analyzers - Brochure	5992-1316EN
N9020B MXA X-Series Signal Analyzer, Multi-touch - Data Sheet	5992-1255EN
X-Series Measurement Applications - Brochure	5989-8019EN

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

Figure 1. MXA bench top configuration