CONFIGURATION GUIDE

N9021B MXA Signal Analyzer

10 Hz – 50 GHz

KEYSIGHT TECHNOLOGIES

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Configure your N9021B MXA signal analyzer

This step-by-step process will help you to configure the N9021B MXA signal analyzer. Tailor the performance and features to meet your requirements.

N9021B MXA is a wideband millimeter-wave signal analyzer in the X-Series signal analyzers portfolio. For detailed specifications, you may refer to the N9021B data sheet (3119-1123EN)

Step 1. Choose maximum frequency range

Description	Option number	Additional information
Frequency range, 10 Hz – 32 GHz	N9021B-532	
Frequency range, 10 Hz – 44 GHz	N9021B-544	
Frequency range, 10 Hz – 50 GHz	N9021B-550	

Step 2. Add a Preamplifier

Description	Option number	Additional information
Preamplifier, 100 kHz – 32 GHz	N9021B-P32	Compatible with option 532 only
Preamplifier, 100 kHz – 44 GHz	N9021B-P44	Compatible with option 544 only
Preamplifier, 100 kHz – 50 GHz	N9021B-P50	Compatible with option 550 only

Step 3. Choose frequency reference

Description	Option number	Additional information
Frequency reference	Standard	Aging rate: $\pm 1 \times 10^{-6}$/year
Precision frequency reference	N9021B-PFR	Reduces frequency drift for more accurate measurement. Aging rate: $\pm 1 \times 10^{-7}$/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	N9021B-EA3	In addition to the mechanical attenuator, 1 dB steps, 0 to 24 dB

Step 5. Choose analysis bandwidth

Description	Option number	Additional information
255 MHz analysis bandwidth	N9021B-B2X	Option MPB required for measurement > 3.6 GHz; also enables fast sweep capability licensed as N9021B-FS1 and N9021B-FS2
510 MHz analysis bandwidth	N9021B-B5X	Option MPB required for measurement > 3.6 GHz; also enables fast sweep capability licensed as N9021B-FS1 and N9021B-FS2
Microwave pre-selector bypass	N9021B-MPB	Required for wideband analysis with option B2X, B5X at frequency > 3.6 GHz; also enables fast sweep capability licensed as N9021B-FS1 and N9021B-FS2

Step 6. Choose performance options

Description	Option number	Additional information
Digital processor with 2 GB capture memory	Standard	Standard when B2X or B5X is installed. Licensed as N9021B-DP2
Digital processor with 4 GB capture memory	Standard	Standard when B2X or B5X is installed. Licensed as N9021B-DP4
Fast sweep capability	Standard	Improves sweep speed at swept mode; licensed as 9021B-FS1 and FS2
Enhanced phase noise	Standard	Licensed as N9021B-EP1
Noise floor extension	N9021B-NF2	Improves analyzer's DANL performance
External mixing	N9021B-EXM	Connects with Keysight and 3rd party mixers to extend frequency coverage up to 1.1 THz
Fast power, up to maximum available analysis bandwidth	N9021B-FP2	Accelerate power measurements such as ACPR; requires option B2X or B5X

Step 7. Add real-time spectrum analysis

Description	Option number	Additional information
Real-time analysis to maximum available BW, basic detection	N9021B-RT1	Includes frequency mask trigger (FMT) and time qualified trigger; min.17.3 µs signal duration for 100% POI; requires B2X or B5X which determines max. real-time BW
Real-time analysis to maximum available BW, optimum detection	N9021B-RT2	Includes frequency mask trigger (FMT) and time qualified trigger; mini. 3.57 µs signal duration for 100% POI; requires B2X or B5X which determines max. real-time BW
Frequency mask trigger, basic detection	N9021B-FT1	Enables frequency mask triggering with 89600 VSA software to detect signals as short as 15 µs duration; included in N9021B-RT1; requires bandwidth option B2X or B5X
Frequency mask trigger, optimum detection	N9021B-FT2	Enables frequency mask triggering with 89600 VSA software to detect signals as short as 3.6 µs duration; included in N9021B-RT1; requires bandwidth option B2X or B5X
Duplex IF RTSA	N9021B-DUA	Enables control of 2 × 255 MHz DIF for optimized frequency and time domain analysis in RTSA mode; requires option B5X and RT1 or RT2

Step 8. Add instrument features

Description	Option number	Additional information
Basic EMC features	N9021B-EMC	CISPR-compliant detectors, -6 dB RBW, and band-presets
Enhanced display package	N9021B-EDP	Includes spectrogram, trace zoom, and zone span
Resolution bandwidth extended	N9021B-RBE	Extends the maximum RBW in Zero Span; requires option B2X, or B5X
External source control	N9021B-ESC	Controls Keysight EXG, MXG and PSG signal generators' supports external mixing; includes 3 BNC cables and 1 cross-over LAN cable

Step 9. Add security features

Description	Option number	Additional information
Additional removable solid-state drive (SSD)	N9021B-SS1	Provides a fully-imaged, removable SSD in addition to the one installed in instruments, with Windows 10 operating system
Exclude launch program	N9021B-SF1	Prevents the launching of Windows programs from the instrument application
Prohibit saving results	N9021B-SF2	Prevents instrument application from saving/recalling of measurement results or user configurations to/from instrument's storage

Step 10. Add rear panel output utilities

Description	Option number	Additional information
Second IF output	N9021B-CR3	Wideband IF out; center frequency depends on IF path; output on Aux IF connector at rear panel
Arbitrary IF output	N9021B-CRP	IF out 10 to 75 MHz (in 500 kHz steps); output on Aux IF connector at rear panel
Y-axis video out	N9021B-YAS	Screen video (0-1 V open circuit) on rear panel analog out

Step 11. Choose measurement applications and license type

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

Description	Option number	Additional information
General purpose		
Spectrum analyzer	Standard	Traditional spectrum analysis plus many new and enhanced functions; power measurements based on industrial specifications; licensed as N9060EM1E
Phase noise	N9068EM0E	Add one-button measurements for analyzing phase noise in frequency domain (log plot) and time domain (spot frequency), supports external mixing
Vector modulation analysis - Digital demodulation	N9054EM0E	Performs on-button flexible modulation analysis with FSK, PSK, QAM, MSK, ASK, APSK, VSB etc. and popular format preset
Vector modulation analysis - Custom OFDM	N9054EM1E	Performs on-button custom OFDM modulation analysis measurement with user-defined settings or recalling 89600 VSA or Signal Studio output file
Pulse analysis	N9067EM0E	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)
Analog demodulation	N9063EM0E	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
EMI emissions	N6141EM0E	Performs pre-compliance conducted and radiated emission measurements
89600 vector signal analysis (Pathwave VSA software)	89601C	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
Remote language compatibility	N9061EM0E	Adds capability to emulate HP/Agilent 8566/68 and 856xE/EC spectrum analyzers
SCPI command language compatibility	N9062EM0E	Adds capability to emulate the R&S FSP/FSU/FSE/FSL/FSV spectrum analyzers or ESU EMI receiver
Cellular communications		
5G NR (New Radio)	N9085EM0E	Standard-based, one-button 5G NR downlink and uplink measurements
LTE/LTE-Advanced FDD	N9080EM0E	Standard-based, one-button LTE/LTE-Advanced FDD measurements
NB-IoT and eMTC FDD	N9080EM3E	Standard-based, one-button NB-IoT and eMTC measurements
LTE V2X	N9080EM4E	Standard-based, one-button LTE-V2X transmitter measurements
LTE/LTE-Advanced TDD	N9082EM0E	Standard-based, one-button LTE/LTE-Advanced TDD measurements

W-CDMA/HSPA+	N9073EM0E	Standard-based, one-button W-CDMA, HSPA, HSPA+ measurements
GSM/EDGE/Evo	N9071EM0E	Standard-based, one-button GSM/EDGE/Evo measurement application
Multi-standard radio	N9083EM0E	Standard-based, one-button MSR measurement application on any combination of LTE-FDD, LTE-TDD, W-CDMA/HSPA/HSPA+, GSM/EDGE/EDGE Evo, cdma2000, 1xEV-Do and TD-SCDMA signals
Wireless Connectivity		
WLAN 802.11a/b/g/j/p/n	N9077EM0E	Standard-based, one-button 802.11a/b/g/j/p/n/af/ah measurement
WLAN 802.11ac/ax	N9077EM1E	Standard-based, one-button 802.11ac/ax measurement
Bluetooth®	N9081EM0E	Standard-based, one-button Bluetooth (BR/EDR, Low energy 4.0/4/2 and Bluetooth 5/5.1) measurements
Short-range communications & IoT	N9084EM0E	Standard-based, one-button 802.15 for Zigbee measurement, G.9959 for Z-Wave measurement, and LoRa measurement

Step 12. Choose accessories

Description	Option number	Additional information
Power cord	Standard	Dependent upon the region of use
Adapter	11901B	2.4mm female to APC-3.5 female adapter
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	1CR014A	Adds a non-tilting rack slide to the MXA
USB DVD-ROM/CD-R/RW drive	1DVR001A	Enhances the usability of the Windows OS
Mouse, USB interface	1MSE001A	Enhances the usability of the 89600 VSA software
US 65-key USB keyboard	1KB001A	Smaller keyboard; enhances usability of the 89600 VSA software
Minimum loss pad, 50 to 75 Ω	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
Front panel cover	N9020B-CVR	Protective cover for front panel
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
E-band waveguide harmonic mixer, 55 to 75 GHz	M1971V	Requires Option EXM; USB mixer with smart features and 3 signal paths

E-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 33 to 50 GHz waveguide harmonic mixer	11970A 11970Q	Requires Option EXM and N9029AE13 diplexer Requires Option EXM and N9029AE13 diplexer
40 to 60 GHz waveguide harmonic mixer	11970U	Requires Option EXM and N9029AE13 diplexer
50 to 75 GHz waveguide harmonic mixer	11970V	Requires Option EXM and N9029AE13 diplexer
75 to 110 GHz waveguide harmonic mixer	11970W	Requires Option EXM and N9029AE13 diplexer
LO/IF diplexer	N9029AE13	Ordering convenience; required for 11970 Series external mixers
90 to 140 GHz OML harmonic mixer	N9029AE08	Ordering convenience; requires Option EXM
110 to 170 GHz OML harmonic mixer	N9029AE06	Ordering convenience; requires Option EXM
140 to 220 GHz OML harmonic mixer	N9029AE05	Ordering convenience; requires Option EXM
220 to 325 GHz OML harmonic mixer	N9029AE03	Ordering convenience; requires Option EXM
50 to 75 GHz frequency extension module	N9029AV15	VDI signal analyzer frequency extension module; requires Option EXM
60 to 90 GHz frequency extension module	N9029AV12	VDI signal analyzer frequency extension module; requires Option EXM
75 to 110 GHz frequency extension module	N9029AV10	VDI signal analyzer frequency extension module; requires Option EXM
90 to 140 GHz frequency extension module	N9029AV08	VDI signal analyzer frequency extension module; requires Option EXM
110 to 170 GHz frequency extension module	N9029AV06	VDI signal analyzer frequency extension module; requires Option EXM
140 to 220 GHz frequency extension module	N9029AV05	VDI signal analyzer frequency extension module; requires Option EXM
220 to 330 GHz frequency extension module	N9029AV03	VDI signal analyzer frequency extension module; requires Option EXM
325 to 500 GHz frequency extension module	N9029AV02	VDI signal analyzer frequency extension module; requires Option EXM
550 to 750 GHz frequency extension module	N9029AV1B	VDI signal analyzer frequency extension module; requires Option EXM
750 to 1100 GHz frequency extension module	N9029AV01	VDI signal analyzer frequency extension module; requires Option EXM
Power supply module for VDI module	N5262VDI-175	Required for the N9029AVxx VDI module
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	U7227A	

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

Last step. Add calibration, technical training and support

Description	Option number	Additional information
Commercial calibration certificate with test data	N9021B-UK6	Calibration certificate only available at time of instrument purchase; only provides measurement results
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

For more information on training and application support services go to:
www.keysight.com/find/training

Related resources

N9021B MXA signal analyzer Data Sheet, 3119-1123EN

Learn more at: www.keysight.com

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

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