

# PXA X-Series Signal Analyzer, Multi-touch N9030B

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



# Configure Your Keysight Technologies PXA Signal Analyzer

This step-by-step process will help you configure your new PXA X-Series signal analyzer. Tailor the performance to meet your requirements.

## Included in base product

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

- Spectrum analyzer measurement application
- Quad-core, high-performance processor, 16 GB RAM, removable solid-state drive
- Mechanical attenuator
- 25 MHz analysis bandwidth
- Digital processor with 2 GB capture memory
- Fast sweep capability
- LO/IM nulling
- Low frequency extension
- Noise floor extension
- Precision frequency reference
- Microsoft Windows 10 operating system
- Real-time link for real-time IQ data streaming up to 40 MHz
- Multi-language user interface
- User guides
- Power cord

## Get More Information

For a summary of specifications, refer to the N9030B data sheet (literature number 5992-1317EN).

A full set of specifications is available in the N9030B PXA Signal Analyzer Specification Guide at [www.keysight.com/find/pxa\\_specifications](http://www.keysight.com/find/pxa_specifications).

**Step 1. Select maximum frequency range (required option)**

| Description                       | Option number | Additional information |
|-----------------------------------|---------------|------------------------|
| Frequency range, 2 Hz to 3.6 GHz  | N9030B-503    |                        |
| Frequency range, 2 Hz to 8.4 GHz  | N9030B-508    |                        |
| Frequency range, 2 Hz to 13.6 GHz | N9030B-513    |                        |
| Frequency range, 2 Hz to 26.5 GHz | N9030B-526    |                        |
| Frequency range, 2 Hz to 44 GHz   | N9030B-544    |                        |
| Frequency range, 2 Hz to 50 GHz   | N9030B-550    |                        |

**Step 2. Add a preamplifier**

| Description                       | Option number | Additional information                                                                                              |
|-----------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------|
| Preamplifier, 100 kHz to 3.6 GHz  | N9030B-P03    | Compatible with frequency range options: N9030B-503, N9030B-508, N9030B-513, N9030B-526, N9030B-544, and N9030B-550 |
| Preamplifier, 100 kHz to 8.4 GHz  | N9030B-P08    | Compatible with frequency range options: N9030B-508, N9030B-513, N9030B-526, N9030B-544, and N9030B-550             |
| Preamplifier, 100 kHz to 13.6 GHz | N9030B-P13    | Compatible with frequency range options: N9030B-513, N9030B-526, N9030B-544, and N9030B-550                         |
| Preamplifier, 100 kHz to 26.5 GHz | N9030B-P26    | Compatible with frequency range options: N9030B-526, N9030B-544, and N9030B-550                                     |
| Preamplifier, 100 kHz to 44 GHz   | N9030B-P44    | Compatible with frequency range option: N9030B-544                                                                  |
| Preamplifier, 100 kHz to 50 GHz   | N9030B-P50    | Compatible with frequency range option: N9030B-550                                                                  |

**Step 3. Choose an attenuator**

| Description                         | Option number | Additional information                                               |
|-------------------------------------|---------------|----------------------------------------------------------------------|
| Mechanical attenuator               | Standard      | 2 dB steps, 0 to 70 dB; licensed as N9030B-FSA                       |
| Electronic attenuator up to 3.6 GHz | N9030B-EA3    | Add in addition to the mechanical attenuator; 1 dB steps, 0 to 24 dB |

**Step 4. Choose analysis bandwidth**

| Description                  | Option number | Additional information                                                                                                               |
|------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 25 MHz analysis bandwidth    | Standard      | Licensed as Option N9030B-B25                                                                                                        |
| 40 MHz analysis bandwidth    | N9030B-B40    | Extends the analysis bandwidth from 25 to 40 MHz (Option MPB required for measurements > 3.6 GHz)                                    |
| 85 MHz analysis bandwidth    | N9030B-B85    | Extends the analysis bandwidth from 25 to 85 MHz (Option MPB required for measurements > 3.6 GHz)                                    |
| 160 MHz analysis bandwidth   | N9030B-B1X    | Extends analysis bandwidth from 25 to 160 MHz (Option MPB required for measurements > 3.6 GHz)                                       |
| 255 MHz analysis bandwidth   | N9030B-B2X    | Extends analysis bandwidth from 25 to 255 MHz (Not compatible with frequency range Option N9030B-503) (Requires Options EPO and MPB) |
| 510 MHz analysis bandwidth   | N9030B-B5X    | Extends analysis bandwidth from 25 to 510 MHz (Not compatible with frequency range Option N9030B-503) (Requires Options EPO and MPB) |
| Microwave preselector bypass | N9030B-MPB    | Bypass the microwave preselector for wider bandwidth IF                                                                              |

## Step 5. Choose performance options

| Description                                | Option number | Additional information                                                                                                                                                                                                       |
|--------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital processor with 2 GB capture memory | Standard      | Licensed as N9030B-DP2                                                                                                                                                                                                       |
| Digital processor with 4 GB capture memory | Standard      | Standard in instruments with serial number prefixes $\geq$ MY/SG/US5608 when Option B85, B1X, B2X or B5X is installed. licensed as N9030B-DP4                                                                                |
| Fast sweep capability                      | Standard      | Improves sweep speed at swept-tune mode; licensed as N9030B-FS1 and N9030B-FS2                                                                                                                                               |
| LO/IM nulling                              | Standard      | Minimizes the LO feed-thru and intermodulation distortion; licensed as N9030B-NUL                                                                                                                                            |
| Noise floor extension                      | Standard      | Improves displayed average noise level (DANL), second-generation algorithm (instrument alignment process); licensed as N9030B-NF2                                                                                            |
| Precision frequency reference              | Standard      | Aging rate: $\pm 1 \times 10^{-7}$ /year; licensed as N9030B-PFR                                                                                                                                                             |
| Enhanced phase noise, DDS LO               | N9030B-EPO    | Improves phase noise; not compatible with Option B85 or B1X or frequency range Option 503; requires Option MPB or LNP                                                                                                        |
| Low noise path                             | N9030B-LNP    | Improves sensitivity (DANL) in frequency bands above 3.6 GHz                                                                                                                                                                 |
| External mixing                            | N9030B-EXM    | Provides external mixing with Keysight and third party mixers; single port <sup>1</sup> for LO out and IF in (SMA female)                                                                                                    |
| APC 3.5 mm connector                       | N9030B-C35    | 3.5 mm connector on 26.5 GHz PXA (compatible with Option 526 only)                                                                                                                                                           |
| I/Q baseband inputs, analog                | N9030B-BBA    | Single-ended/differential, 50 $\Omega$ /1 M $\Omega$ impedance (compatible with frequency range Options 503, 508, 513, and 526; not compatible with bandwidth Option B5X or Audio input Option 107)                          |
| Audio input and digitizer                  | N9030B-107    | Specifically for the measuring receiver and/or avionics measurements, requires measuring receiver app N9091EMOE and/or avionics app N9092EMOE; 100 k $\Omega$ input impedance; not compatible with Options B5X, BBA, or RTS. |

## Step 6. Add real-time spectrum analysis

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.

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

| Description                                                      | Model number | Additional information                                                                                                                                                                                                                                           |
|------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Real-time analysis up to maximum available BW, basic detection   | N9030RT1B    | Includes frequency mask trigger (FMT) and time qualified trigger (TQT); minimum 17.3 $\mu$ s signal duration for 100% probability of intercept (POI); requires Option B85, B1X, B2X, or B5X which determines maximum real-time bandwidth                         |
| Real-time analysis up to maximum available BW, optimum detection | N9030RT2B    | Includes frequency mask trigger; minimum 3.57 $\mu$ s signal duration for 100% probability of intercept (POI); requires bandwidth Option B85, B1X, B2X, or B5X which determines the maximum real-time BW                                                         |
| Frequency mask trigger, basic detection                          | N90EMFT1B    | Enables frequency mask triggering with N9067C pulse application and 89600 VSA software to detect signals as short as 15 $\mu$ s duration; included in N9030RT1B requires bandwidth options B85, B1X, B2X, or B5X                                                 |
| Frequency mask trigger, optimum detection                        | N90EMFT2B    | Enables frequency mask triggering with N9067EMOE pulse application and 89600 VSA software to detect signals as short as 3.6 $\mu$ s duration; included in N9030RT2B requires bandwidth options B85, B1X, B2X, or B5X                                             |
| Duplex IF RTSA                                                   | N90EMDUAB    | Enables control of 2 $\times$ 255 MHz DIF for optimized frequency and time domain analysis in RTSA mode; Requires option B5X and RT1(N9030RT1B) or RT2(N9030RT2B)                                                                                                |
| Real-time spectrum recorder and analyzer application             | N9030B-RTR   | Enables recording, analyzing and playback of spectrum density data over time for detecting and analyzing signal anomalies; requires RT1(N9030RT1B) or RT2 (N9030RT2B)                                                                                            |
| Real-time I/Q data streaming                                     | N9030B-RTS   | Stream gap-free 16 bit I/Q data up to 255 MHz bandwidth for offline analysis. High speed LVDS connector allows connection to third-party X-COM Systems data recorder IQC5255B. Requires Option RT1(N9030RT1B) or RT2 (N9030RT2B); Not compatible with Option 107 |

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 instrument features

| Description                   | Model number | Additional information                                                                                                                               |
|-------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enhanced display package      | N90EMEDPB    | Includes spectrogram, trace zoom, and zone span                                                                                                      |
| Basic EMI precompliance       | N90EMEMCB    | Perform basic EMI precompliance 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 EMI measurement application and Option DP2, or B40 (or wider bandwidth option)  |
| External source control       | N90EMESCB    | External source control for Keysight EXG, MXG, and PSG signal generators; supports external mixing; includes 3 BNC cables and 1 cross-over LAN cable |
| Fast power                    | N90EMFP2B    | Accelerates the power measurements such as ACPR; requires Option B40, B85, B1X, B2X, or B5X                                                          |
| Resolution bandwidth extended | N90EMRBEB    | Extends the maximum RBW in Zero Span; requires option B85, B1X, B2X, or B5X                                                                          |

### Step 8. Add security features

| Description                                  | Option number | Additional information                                                                                                             |
|----------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------|
| Additional removable solid-state drive (SSD) | N9030B-SS1    | Provides a fully-imaged, removable SSD in addition to the one installed in instruments, with Windows 10 operating system           |
| Exclude launch program                       | N9030B-SF1    | Prevents the launching of Windows programs from the instrument application                                                         |
| Prohibit saving results                      | N9030B-SF2    | Prevents instrument application from saving/recall of measurement results or user configurations to/from instrument's data storage |

### Step 9. Add rear panel output utilities

| Description       | Option number | Additional information                                                                                                                                                                  |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Second IF output  | N9030B-CR3    | Wideband IF out; center frequency depends on IF path; output on Aux IF connector at rear panel                                                                                          |
| Arbitrary IF out  | N9030B-CRP    | IF out 10 to 75 MHz (in 500 kHz steps); output on Aux IF connector at rear panel                                                                                                        |
| Y-axis video out  | N9030B-YAV    | Screen video (0-1 volt open circuit); log video and linear video                                                                                                                        |
| Aux log video out | N9030B-ALV    | Fast rise time video out; output on Aux IF connector                                                                                                                                    |
| Real-time link    | Standard      | The LVDS connector allows PXA to connect to the X-COM data recorder for data streaming (up to 40 MHz BW) and N5106A PXB baseband generator and channel emulator; licensed as N9030B-RTL |

### Step 10. 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 Time-based.

License types:

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- **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
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License terms:

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### General purpose

|                     |           |                                                                                                                                                                                                                  |
|---------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                 |

**Step 10. Choose measurement application or software and license type, continued**

| Description                                     | Model number                                   | Additional information                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise figure                                    | N9069EM0E<br>(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 popular 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; enables fixed and variable length gated acquisition for capturing pulses of varying pulse width and PRI (requires 4 GB capture memory Option DP4)                                                                                                                                                                                                  |
| EMI                                             | N6141EM0E                                      | Performs pre-compliance conducted and radiated emission measurements                                                                                                                                                                                                                                                                                                                                                                                                      |
| 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/FSL/FSV/FSW spectrum analyzers or ESU EMI receiver                                                                                                                                                                                                                                                                                                                                                                             |
| MATLAB software                                 | N6171A                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 89600 vector signal analysis (VSA) software     | 89601B<br>(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; <a href="http://www.keysight.com/find/89600_VSA">www.keysight.com/find/89600_VSA</a>                                                                                                                                           |
| <b>Cellular communications</b>                  |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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; supports analog baseband analysis with Option BBA (BBIQ inputs)                                                                                                                                                                                                                                                                                                                                           |
| 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                                                                                                                                                                                                                                                                                                                                                                                                              |
| Multi-standard radio                            | N9083EM0E                                      | 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)                               | N9085EM0E<br>(requires Option B1X, B2X or B5X) | Standard-based, one-button 5G NR (New Radio) downlink and uplink measurements                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Wireless connectivity</b>                    |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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                                                                                                                                                                                                                                                                                                                                                                                                            |
| 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) measurements                                                                                                                                                                                                                                                                                                                                                                            |
| Short Range Comm                                | N9084EM0E                                      | Standard-based, one-button 802.15.4 for ZigBee measurement and G.9959 for Z-Wave measurement                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Measuring receiver and avionics</b>          |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Measuring receiver                              | N9091EM0E                                      | Provides metrology-grade accuracy for calibrating the signal generators and step attenuators                                                                                                                                                                                                                                                                                                                                                                              |
| Avionics measurements                           | N9092EM0E                                      | Verifies RF/baseband signals used for aircraft navigations including VOR (VHF Omnidirectional Range) and ILS (Instrument Landing System)                                                                                                                                                                                                                                                                                                                                  |



## Step 11. Choose accessories

| Description                                            | Option number | Additional information                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User guides                                            | Standard      | US – English localization<br>All user documentation is included in the embedded help system inside the PXA and on a DVD that is shipped with the instrument<br>User documentation can be downloaded from:<br><a href="http://www.keysight.com/find/pxa_manuals">www.keysight.com/find/pxa_manuals</a> |
| Power cord                                             | Standard      | Depends on the region of use                                                                                                                                                                                                                                                                          |
| Adapter, 2.4 mm (f) to 2.4 mm (f)                      | Standard      | Only for PXA with Option 544 or 550                                                                                                                                                                                                                                                                   |
| Adapter, 2.4 mm (f) to 2.92 mm (f)                     | Standard      | Only for PXA with Option 544 or 550                                                                                                                                                                                                                                                                   |
| Rack mount                                             | 1CM113A       | Adds rack mount flanges to the PXA                                                                                                                                                                                                                                                                    |
| Front handles                                          | 1CN103A       | Adds front handles to the PXA                                                                                                                                                                                                                                                                         |
| Rack mount with handles                                | 1CP105A       | Adds rack mount flanges and handles to the PXA                                                                                                                                                                                                                                                        |
| Rack slide                                             | 1CR014A       | Adds a non-tilting rack slide to the PXA                                                                                                                                                                                                                                                              |
| USB DVD-ROM/CD-R/RW drive                              | 1DVR001A      | Enhances the usability of the Windows operating system                                                                                                                                                                                                                                                |
| Mouse, USB interface                                   | 1MSE001A      | Enhances 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 $\Omega$<br>(type-N to BNC) | MLP001A       | 50 $\Omega$ type-N male to 75 $\Omega$ BNC female adapter<br>Frequency range: 9 MHz to 2 GHz<br>Input/output return loss: 20 and 11 dB<br>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                                                                                                                                                                                                                                 |
| Extended 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, 55 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 N9029AE13 diplexer                                                                                                                                                                                                                                                            |
| 33 to 50 GHz waveguide harmonic mixer                  | 11970Q        | 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 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                 | U7227F        |                                                                                                                                                                                                                                                                                                       |

## Step 12. Add calibration, technical training, support, and upgrade services

| Description                                                          | Option number | Additional information                                                                                                                                                                                     |
|----------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Commercial calibration certificate with test data                    | N9030B-UK6    | Calibration certificate only available at time of instrument purchase; only provides measurement results                                                                                                   |
| Keysight Calibration + Uncertainties + Guardbanding (accredited cal) | N9030B-AMG    | Provides ISO 17025A accredited calibration from factory                                                                                                                                                    |
| ANSI Z540-1-1994 Calibration                                         | N9030B-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  |                                                                                                                                                                                                            |

For more information on accessories go to: [www.keysight.com/find/accessories](http://www.keysight.com/find/accessories)

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

For more information on training and application support services go to: [www.keysight.com/find/training](http://www.keysight.com/find/training)



## 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 PXA
4. Begin using the new capability<sup>1,2</sup>

Installation and testing information is available at:

[www.keysight.com/find/pxa\\_upgrades](http://www.keysight.com/find/pxa_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](http://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 license-key upgradeable.

| Description                                             | Upgrade number | Requirements (PXA must already include the following option(s)) | Additional information                                                        |
|---------------------------------------------------------|----------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------|
| Increase frequency from 3.6 to 8.4 GHz                  | N9030BU-F01    | 503                                                             |                                                                               |
| Increase frequency from 3.6 to 13.6 GHz                 | N9030BU-F02    | 503                                                             |                                                                               |
| Increase frequency from 3.6 to 26.5 GHz                 | N9030BU-F03    | 503                                                             |                                                                               |
| Increase frequency from 3.6 to 44 GHz                   | N9030BU-F04    | 503                                                             | Not compatible with Opt BBA                                                   |
| Increase frequency from 3.6 to 50 GHz                   | N9030BU-F05    | 503                                                             | Not compatible with Opt BBA                                                   |
| Increase frequency from 8.4 to 13.6 GHz                 | N9030BU-F06    | 508                                                             |                                                                               |
| Increase frequency from 8.4 to 26.5 GHz                 | N9030BU-F07    | 508                                                             |                                                                               |
| Increase frequency from 8.4 to 44 GHz                   | N9030BU-F08    | 508                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 8.4 to 50 GHz                   | N9030BU-F09    | 508                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 8.4 to 44 GHz                   | N9030BU-F16    | 508, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 8.4 to 50 GHz                   | N9030BU-F17    | 508, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 13.6 to 26.5 GHz                | N9030BU-F10    | 513                                                             |                                                                               |
| Increase frequency from 13.6 to 44 GHz                  | N9030BU-F11    | 513                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 13.6 to 50 GHz                  | N9030BU-F12    | 513                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 13.6 to 44 GHz                  | N9030BU-F18    | 513, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 13.6 to 50 GHz                  | N9030BU-F19    | 513, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 26.5 to 44 GHz                  | N9030BU-F13    | 526                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 26.5 to 50 GHz                  | N9030BU-F14    | 526                                                             | Not compatible with Opt BBA, or B2X or B5X                                    |
| Increase frequency from 26.5 to 44 GHz                  | N9030BU-F20    | 526, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 26.5 to 50 GHz                  | N9030BU-F21    | 526, B5X                                                        | Not compatible with Opt BBA, 107                                              |
| Increase frequency from 44 GHz to 50 GHz                | N9030BU-F15    | 544                                                             | Not compatible with Opt BBA; Includes 50 GHz preamplifier                     |
| Increase analysis bandwidth from 25 to 40 MHz           | N9030BU-B40    | MPB                                                             | Also enables 40 MHz per channel baseband bandwidth if Option BBA is installed |
| Increase analysis bandwidth from 25 or 40 MHz to 85 MHz | N9030BU-B85    | MPB                                                             | Includes additional hardware; not compatible with EPO                         |
| Increase analysis bandwidth from 25 to 160 MHz          | N9030BU-B1X    | MPB                                                             | Includes additional hardware; not compatible with EPO                         |
| Increase analysis bandwidth from 40 to 160 MHz          | N9030BU-BU3    | MPB, B40                                                        | Includes additional hardware; not compatible with EPO                         |

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.

| Description                                                                          | Upgrade number | Requirements (PXA must already include the following)                     | Additional information                                                                                                                                 |
|--------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Increase analysis bandwidth from 85 to 160 MHz                                       | N9030BU-BU7    | MPB, B85                                                                  |                                                                                                                                                        |
| Increase analysis bandwidth from 25 or 40 MHz to 255 MHz (for RF and microwave PXA)  | N9030BU-B2X    | MPB, 508, 513, or 526                                                     | Includes EPO and additional hardware; not compatible with Option 503, 544, or 550                                                                      |
| Increase analysis bandwidth from 25 or 40 MHz to 255 MHz (for RF and microwave PXA)  | N9030BU-BUQ    | MPB, EPO, 508, 513, or 526                                                | Includes additional hardware; not compatible with Option 503, 544, or 550                                                                              |
| Increase analysis bandwidth from 25 or 40 MHz to 255 MHz (for millimeter wave PXA)   | N9030BU-BUW    | MPB, 544 or 550                                                           | Includes EPO and additional hardware; not compatible with 503, 508, 513, 526, B1X, B85 or BBA                                                          |
| Increase analysis bandwidth from 85 or 160 MHz to 255 MHz (for RF and microwave PXA) | N9030BU-BU8    | MPB, B85 or B1X, and 508, 513, or 526                                     | Includes EPO and additional hardware which replaces B85 or B1X; not compatible with Option 503, 544, or 550                                            |
| Increase analysis bandwidth from 85 or 160 MHz to 255 MHz (for millimeter wave PXA)  | N9030BU-BUX    | MPB, 544, 550, B85 or B1X                                                 | Includes EPO and additional hardware; not compatible with 503, 508, 513, 526                                                                           |
| Increase analysis bandwidth from 25 or 40 MHz to 510 MHz (for RF and microwave PXA)  | N9030BU-B5X    | MPB, 508, 513, or 526                                                     | Includes EPO and additional hardware; not compatible with Option BBA or Option 503, 544, or 550                                                        |
| Increase analysis bandwidth from 25 or 40 MHz to 510 MHz (for RF and microwave PXA)  | N9030BU-BUR    | MPB, EPO, 508, 513, or 526                                                | Includes additional hardware; not compatible with Option BBA or Option 503, 544, or 550                                                                |
| Increase analysis bandwidth from 25 or 40 MHz to 510 MHz (for millimeter wave PXA)   | N9030BU-BUT    | MPB, EPO, 544 or 550                                                      | Includes additional hardware; not compatible with 503, 508, 513, 526, B1X, B85 or BBA                                                                  |
| Increase analysis bandwidth from 85 or 160 MHz to 510 MHz (for RF and microwave PXA) | N9030BU-BU9    | MPB, B85 or B1X, and 508, 513, or 526                                     | Includes EPO and additional hardware which replaces B85 or B1X; not compatible with Option BBA or Option 503, 544, or 550                              |
| Increase analysis bandwidth from 255 to 510 MHz (for RF and microwave PXA)           | N9030BU-BUF    | MPB, EPO, B2X, 508, 513, or 526                                           | Includes additional hardware; not compatible with Option BBA, or Option 503, 544, or 550                                                               |
| Increase analysis bandwidth from 25 or 40 MHz to 510 MHz (for millimeter-wave PXA)   | N9030BU-BUG    | MPB, B25 or B40 and 544 or 550                                            | Includes EPO and additional hardware; not compatible with Option 503, 508, 513, 526                                                                    |
| Increase analysis bandwidth from 85 or 160 MHz to 510 MHz (for millimeter-wave PXA)  | N9030BU-BUJ    | MPB, B85 or B1X, and 544 or 550                                           | Includes EPO and additional hardware which replaces B85 or B1X; not compatible with Option 503, 508, 513, 526                                          |
| Digital processor with 4 GB capture memory                                           | N9030BU-DP4    | B85, B1X, or B2X                                                          | Includes hardware and license key for instruments with serial number prefixes < MY/SG/US5608                                                           |
| Real-time analysis up to maximum available BW, basic detection                       | N9030BU-RT1    | B85, B1X, B2X or B5X (Analysis BW option determines maximum real-time BW) | Includes frequency mask trigger; minimum 17.3 $\mu$ s signal duration for 100% POI. Also orderable at N9030RT1B (requires F/W revision A.21.04 onward) |
| Real-time analysis up to maximum available BW, optimum detection                     | N9030BU-RT2    | B85, B1X, B2X or B5X (Analysis BW option determines maximum real-time BW) | Includes frequency mask trigger; minimum 3.57 $\mu$ s signal duration for 100% POI. Also orderable at N9030RT2B (requires F/W revision A.21.04 onward) |
| Duplex IF RTSA                                                                       | N9030BU-DUA    | B5X and RT1 or RT2                                                        | Also orderable at N903EMDUAB (requires F/W revision A.21.04 onward)                                                                                    |
| Frequency mask trigger, basic detection                                              | N9030BU-FT1    | B85, B1X, B2X, or B5X                                                     | Also orderable at N90EMFT1B (requires F/W revision A.21.04 onward)                                                                                     |
| Frequency mask trigger, optimum detection                                            | N9030BU-FT2    | B85, B1X, B2X, or B5X                                                     | Also orderable at N90EMFT2B (requires F/W revision A.21.04 onward)                                                                                     |

| Description                                                  | Upgrade number | Requirements (PXA must already include the following) | Additional information                                                                                                                                                                                                                     |
|--------------------------------------------------------------|----------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Real-time I/Q data streaming                                 | N9030BU-RTS    | RT1 or RT2                                            | Includes additional hardware                                                                                                                                                                                                               |
| Enhanced phase noise, DDS LO (for RF and microwave PXA)      | N9030BU-EPO    | MPB or LNP, 508, 513, or 526                          | Includes additional hardware; not compatible with frequency range Options 503, 544, or 550 or bandwidth Options B85 or B1X                                                                                                                 |
| Add time domain scan capability                              | N9030BU-TDS    | N6141C                                                | For EMC pre-compliance tests only. Also orderable at N90EMTDSB (requires F/W revision A.21.04 onward)                                                                                                                                      |
| Add resolution bandwidth extended                            | N9030BU-RBE    | B85, B1X, B2X or B5X                                  | Also orderable at N90EMRBEB (requires F/W revision A.21.04 onward)                                                                                                                                                                         |
| Add an electronic attenuator, 3.6 GHz                        | N9030BU-EA3    | None                                                  |                                                                                                                                                                                                                                            |
| Add preamplifier, 3.6 GHz                                    | N9030BU-P03    | 550, 544, 526, 513, 508, or 503                       |                                                                                                                                                                                                                                            |
| Add preamplifier, 8.4 GHz                                    | N9030BU-P08    | 550, 544, 526, 513, or 508                            |                                                                                                                                                                                                                                            |
| Add preamplifier, 13.6 GHz                                   | N9030BU-P13    | 550, 544, 526, or 513                                 |                                                                                                                                                                                                                                            |
| Add preamplifier, 26.5 GHz                                   | N9030BU-P26    | 550, 544, or 526                                      |                                                                                                                                                                                                                                            |
| Add preamplifier, 44 GHz                                     | N9030BU-P44    | 544                                                   | Not compatible with Option 550                                                                                                                                                                                                             |
| Add preamplifier, 50 GHz                                     | N9030BU-P50    | 550                                                   |                                                                                                                                                                                                                                            |
| Add APC 3.5 mm connector                                     | N9030BU-C35    | 526                                                   | Includes additional hardware; not compatible with Option 503, 508, 513, 544 or 550                                                                                                                                                         |
| Add I/Q baseband inputs, analog                              | N9030BU-BBA    | 526, 513, 508, or 503                                 | Includes additional hardware; not compatible with Option 544, 550 or B5X                                                                                                                                                                   |
| Add removable solid-state drive (SSD)                        | N9030BU-SS1    | None                                                  | Provides additional removable solid-state drive, with Windows 10 operating system                                                                                                                                                          |
| Add external mixing                                          | N9030BU-EXM    | None                                                  | Includes additional hardware                                                                                                                                                                                                               |
| Add second IF output                                         | N9030BU-CR3    | None                                                  | Provides wideband IF out, output center frequency depends on IF path                                                                                                                                                                       |
| Add microwave preselector bypass                             | N9030BU-MPB    | LNP                                                   |                                                                                                                                                                                                                                            |
| Add low noise path                                           | N9030BU-LNP    | MPB                                                   |                                                                                                                                                                                                                                            |
| Add preselector bypass and low noise path on uW instruments  | N9030BU-HL1    | 526, 513, or 508                                      | Includes additional hardware; installs both Options MPB and LNP when neither are previously installed; for instruments with frequency range $\leq$ 26.5 GHz                                                                                |
| Add preselector bypass and low noise path on mmW instruments | N9030BU-HL2    | 544 or 550                                            | Includes additional hardware; installs both Options MPB and LNP when neither are previously installed; for instruments with frequency range $\geq$ 44 GHz                                                                                  |
| Add Y-axis video output                                      | N9030BU-YAV    | None                                                  |                                                                                                                                                                                                                                            |
| Arbitrary IF output                                          | N9030BU-CRP    | None                                                  | Provides user-programmable IF out (10 to 75 MHz, at 500 kHz step)                                                                                                                                                                          |
| Add auxiliary log video out                                  | N9030BU-ALV    | None                                                  |                                                                                                                                                                                                                                            |
| Add fast power                                               | N9030BU-FP2    | B40, B85, B1X, B2X, or B5X                            | Accelerates power measurements such as ACPR. Also orderable at N90EMFP2B (requires F/W revision A.21.04 onward)                                                                                                                            |
| Add precompliance EMI features                               | N9030BU-EMC    | None                                                  | Compliant with CISPR 16-1-1 2007 detectors and BWs. Also orderable at N90EMEMCB (requires F/W revision A.21.04 onward)                                                                                                                     |
| Add enhanced display package                                 | N9030BU-EDP    | None                                                  | Also orderable at N90EMEDPB (requires F/W revision A.21.04 onward)                                                                                                                                                                         |
| Add external source control                                  | N9030BU-ESC    | None                                                  | Adds feature to control the Keysight EXG, MXG, and PSG signal generators for scalar stimulus/response measurements. Ships with 3 BNC cables and 1 cross-over LAN cable. Also orderable at N90EMESCB (requires F/W revision A.21.04 onward) |
| Add security features, exclude launch program                | N9030BU-SF1    | None                                                  | Prevents the launching of Windows programs from the instrument application                                                                                                                                                                 |
| Add security features, prohibit saving results               | N9030BU-SF2    | None                                                  | Prevents instrument application from saving /recall of measurement results or user configurations to/from instrument's data storage                                                                                                        |

| Description                                  | Upgrade number | Requirements (PXA must already include the following) | Additional information                                                                                                                                                     |
|----------------------------------------------|----------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add audio input and digitizer                | N9030BU-107    | None                                                  | Specifically for measuring receiver and/or avionics measurements; not compatible with Option B5X, RTS, or BBA                                                              |
| USB DVD-ROM/CD-R/RW drive                    | 1DVR001A       | None                                                  | Includes additional hardware                                                                                                                                               |
| 65-key USB keyboard                          | 1KBD001A       | None                                                  | Small keyboard; includes additional hardware                                                                                                                               |
| Rack mount and handle kit                    | 1CP105A        | None                                                  | Includes additional hardware                                                                                                                                               |
| Rack slide kit                               | 1CR014A        | None                                                  | Includes additional hardware                                                                                                                                               |
| Front handle kit                             | 1CN103A        | None                                                  | Includes additional hardware                                                                                                                                               |
| Rack mount kit                               | 1CM113A        | None                                                  | Rack mount flanges; not compatible with Options 1CP, 1CN; includes additional hardware                                                                                     |
| Minimum loss pad, 50 to 75 Ω (type-N to BNC) | MLP001A        | None                                                  | 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; includes additional hardware |
| Upgrade operating system to Windows 10       | N9030BU-SS1    | PC6, W7X                                              | Provides a removable solid-state drive with Windows 10 operating system                                                                                                    |
| Korean version of Getting Started Guide      | N9030BU-AB1    | None                                                  |                                                                                                                                                                            |
| Chinese version of Getting Started Guide     | N9030BU-AB2    | None                                                  |                                                                                                                                                                            |
| Spanish version of Getting Started Guide     | N9030BU-ABE    | None                                                  |                                                                                                                                                                            |
| French version of Getting Started Guide      | N9030BU-ABF    | None                                                  |                                                                                                                                                                            |
| Japanese version of Getting Started Guide    | N9030BU-ABJ    | None                                                  |                                                                                                                                                                            |
| Russian version of Getting Started Guide     | N9030BU-AKT    | None                                                  |                                                                                                                                                                            |

**Note: It is recommended to order measurement applications with the model numbers listed at Step 10.** 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](http://www.keysight.com/find/X-Series_transportable) for more information about transportable licenses

| Description                         | Fixed license                      | Transportable license              | Additional information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General purpose</b>              |                                    |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 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                         | Adds one-button measurements for analyzing phase noise in frequency domain (log plot) and time domain (spot frequency), supports external mixing                                                                                                                                                                                                                                                                                                                                                        |
| 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 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          | N9054C-1FP                         | N9054C-1TP                         | One-button vector modulation analysis measurements                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Pulse                               | N9067C-1FP                         | N9067C-1TP                         | Characterize pulsed RF signals in the time domain, with phase, frequency and statistical analysis of large pulse sets.                                                                                                                                                                                                                                                                                                                                                                                  |
|                                     | N9067C-2FP                         | N9067C-2TP                         | Enables fixed and variable length gated acquisition for capturing pulses of varying pulse width and PRI; requires 4 GB capture memory Option DP4                                                                                                                                                                                                                                                                                                                                                        |
| EMI                                 | N6141C-2FP                         | N6141C-2TP                         | Pre-compliance conducted and radiated emission measurements                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Remote language analyzers           | N9061C-1FP                         | Not available                      | Add capability to emulate HP/Agilent 8566/68 and 856xE/EC spectrum analyzers; licensed as N9061C-1FP and N9061C-2FP                                                                                                                                                                                                                                                                                                                                                                                     |
| SCPI command language compatibility | N9062C-2FP                         | Not available                      | Adds capability to emulate the R&S FSP/FSU/FSE spectrum analyzers or ESU EMI receiver.                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Description                                 | Fixed license | Transportable license                      | Additional information                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------|---------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cellular communications</b>              |               |                                            |                                                                                                                                                                                                                                                                                                                                    |
| 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                                                                                                                                                                                                             |
| 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; supports analog baseband analysis with Option BBA (BBIQ inputs)                                                                                                                                                                                                                    |
|                                             | N9073C-2FP    | N9073C-2TP                                 | Adds HSPA measurements; requires 1FP/1TP                                                                                                                                                                                                                                                                                           |
|                                             | N9073C-3FP    | N9073C-3TP                                 | Adds HSPA+ measurements; requires 1FP/1TP, 2FP/2TP                                                                                                                                                                                                                                                                                 |
| <b>Wireless connectivity</b>                |               |                                            |                                                                                                                                                                                                                                                                                                                                    |
| WLAN 802.11a/b/g/j/p/n/ac/af/ah/ax          | 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-4FP    | N9077C-4TP                                 | Adds 802.11ac; requires N9077C-1FP/1TP (licensed as N9077C-2FP/2TP and 3FP/3TP)                                                                                                                                                                                                                                                    |
|                                             | N9077C-6FP    | N9077C-6TP                                 | Standard-based, one-button 802.11ah measurement                                                                                                                                                                                                                                                                                    |
|                                             | N9077C-7FP    | N9077C-7TP                                 | Standard-based, one-button 802.11af measurement                                                                                                                                                                                                                                                                                    |
|                                             | N9077C-8FP    | N9077C-8TP                                 | Standard-based, one-button 802.11ax single user PPDU measurement                                                                                                                                                                                                                                                                   |
|                                             | N9077C-MFP    | N9077C-MTP                                 | Standard-based, one-button 802.11ax multi-user PPDU measurement                                                                                                                                                                                                                                                                    |
| Bluetooth®                                  | N9081C-2FP    | N9081C-2TP                                 | Standard-based, one-button Bluetooth® version 2.1+ EDR and Low Energy (BR/EDR/LE 4.0/4.2) measurements                                                                                                                                                                                                                             |
|                                             | N9081C-3FP    | N9081C-3TP                                 | Standard-based, one-button Bluetooth 5 measurement; requires N9081C-2FP/2TP                                                                                                                                                                                                                                                        |
| Short range communications                  | N9084C-1FP    | N9084C-1TP                                 | Standard-based, one-button 802.15.4 for ZigBee measurement                                                                                                                                                                                                                                                                         |
|                                             | N9084C-2FP    | N9084C-2TP                                 | Standard-based, one-button G.9959 for Z-Wave measurement                                                                                                                                                                                                                                                                           |
| <b>Other</b>                                |               |                                            |                                                                                                                                                                                                                                                                                                                                    |
| MATLAB software                             | N6171A-M01    | Not available                              | Instrument Control Toolbox                                                                                                                                                                                                                                                                                                         |
|                                             | N6171A-M02    | Not available                              | Instrument Control Toolbox<br>Communications System Toolbox<br>DSP System Toolbox<br>Signal Processing Toolbox                                                                                                                                                                                                                     |
|                                             | N6171A-M03    | Not available                              | Instrument Control Toolbox<br>Communications System Toolbox<br>DSP System Toolbox<br>Signal Processing Toolbox<br>RF Toolbox                                                                                                                                                                                                       |
| 89600 vector signal analysis (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 30 measurement platforms, plus more than 75 signal standards and modulation types including MIMO analysis;<br><a href="http://www.keysight.com/find/89600_VSA">www.keysight.com/find/89600_VSA</a> |

## Related Literature

### Keysight PXA signal analyzers

| Publication title                          | Publication number |
|--------------------------------------------|--------------------|
| Brochure                                   | 5992-1316EN        |
| Data Sheet                                 | 5992-1317EN        |
| X-Series Measurement Applications Brochure | 5990-8019EN        |

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