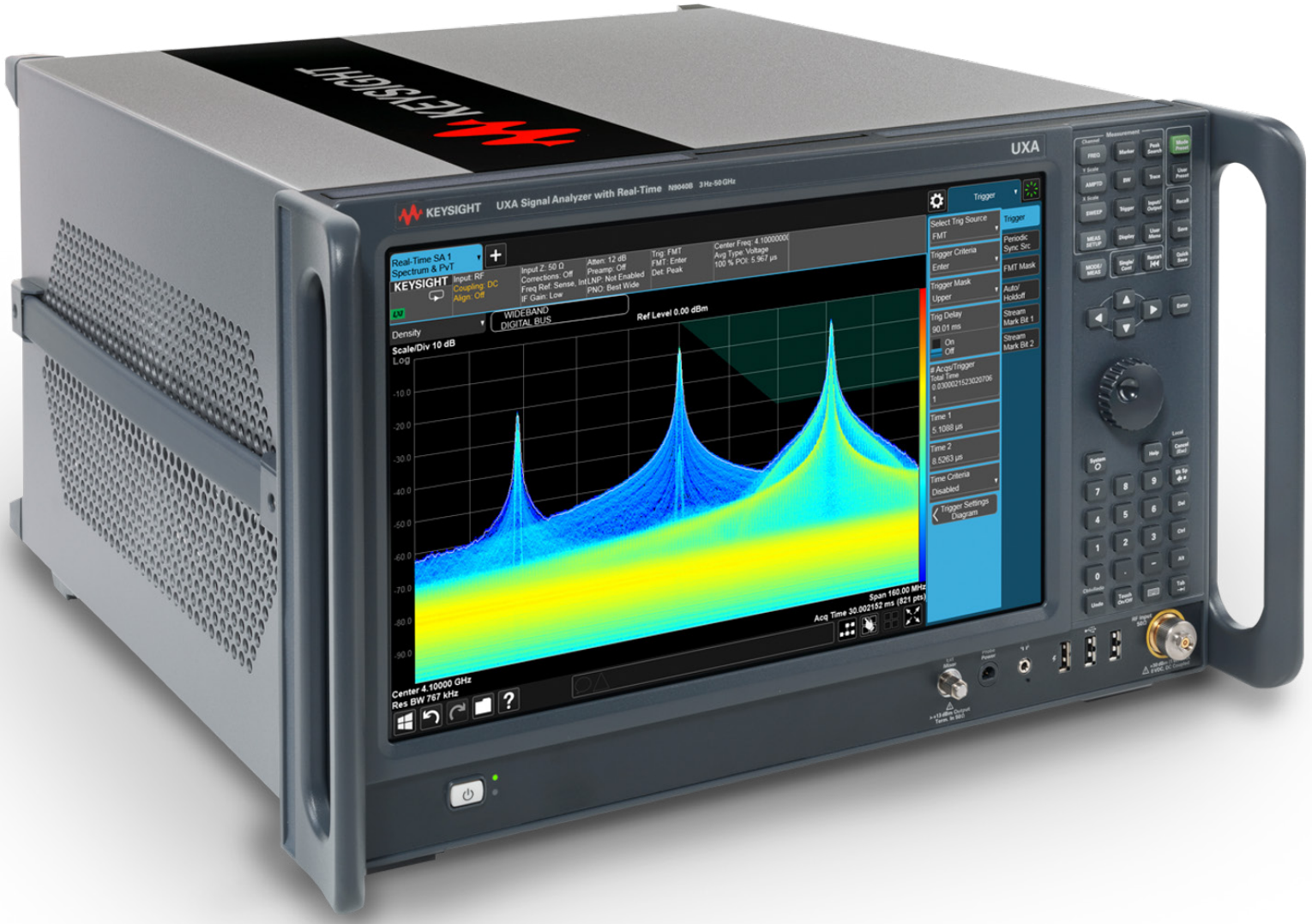
KEYSIGHT TECHNOLOGIES

5G Base Station Test Solutions Catalog



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Introduction

5G New Radio (NR) introduces wider bandwidths, millimeter-wave (mmWave) frequencies, massive multiple input / multiple output (mMIMO), beamforming, and other innovations that radically change the design, test, and optimization of base stations. Network equipment manufacturers (NEMs) need reliable and cost-effective base station test solutions that span the workflow — from the R&D lab to field test through volume manufacturing.

Through early partnerships with key players across the 5G landscape, Keysight has developed the technology and expertise to help test engineers overcome new challenges. Keysight's innovative 5G NR base station test solutions use common software and precise measurement science, providing maximum reliability and cost effectiveness.

CHANNEL EMULATION SOLUTIONS

PROPSIM FS16 AND F64 RF CHANNEL EMULATORS

Keysight's PROPSIM 5G channel emulation solutions enable network equipment manufacturers to conduct full-stack, end-to-end protocol signaling and RF performance testing of base stations across sub-6 GHz and millimeter wave (mmWave) frequencies.

PROPSIM F16 and F64 RF channel emulators support the following:

- standalone (SA) and non-standalone (NSA) modes
- 5G NR coexistence scenarios
- Wi-Fi offloading scenarios

PROPSIM FS16

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PROPSIM F64

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WAVEFORM GENERATION AND ANALYSIS SOLUTIONS

5G R&D TESTBED

Keysight's 5G R&D Testbed leverages Keysight's VXG microwave signal generator and UXA Series signal analyzer to validate the performance of 5G NR base stations (gNodeBs or gNBs) according to the latest 3GPP standards.

When used in conjunction with Keysight software products, the Testbed provides analysis and insights into the over-the-air performance of 5G NR gNBs, MIMO phased array antennas, and beamforming mmWave antenna arrays.

5G R&D Testbed

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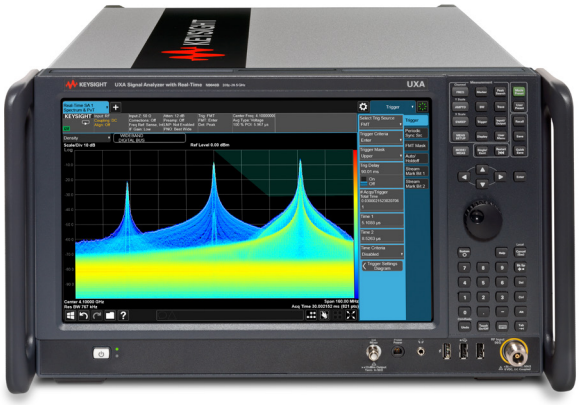
89600 VSA

REQUEST FREE TRIAL



N9040B UXA Signal Analyzer

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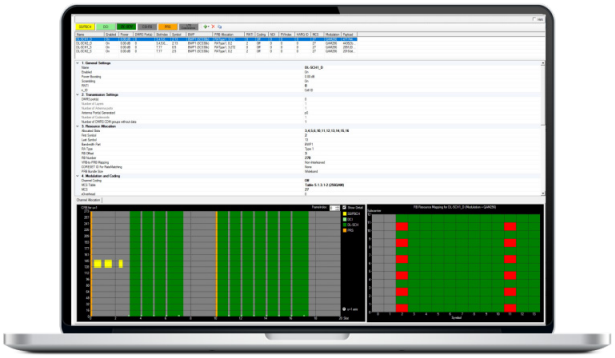

PathWave Signal Generation

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M9383B VXG Microwave Signal Generator

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RAN VALIDATION SOLUTIONS

UeSIM

UeSIM validates 5G radio access network (RAN) functionality and performance in the lab and the field. The solution provides these capabilities:

- full protocol stack assessment from Layer 1 to Layer 7
- functional testing — layer by layer — for potentially thousands of UEs
- load testing of 5G RAN — SA and NSA modes

OPEN RAN STUDIO

Open RAN Studio includes O-RAN-focused tools to construct, play, capture, and measure O-RAN traffic over 10 Gbps to 25 Gbps (fronthaul) Ethernet interfaces. The software provides beamforming support and enables analysis of frequency range 1 (FR1) and FR2 radio downlink and uplink paths.

P8800S UeSIM

MORE INFO

U5040BSCA Open RAN Studio

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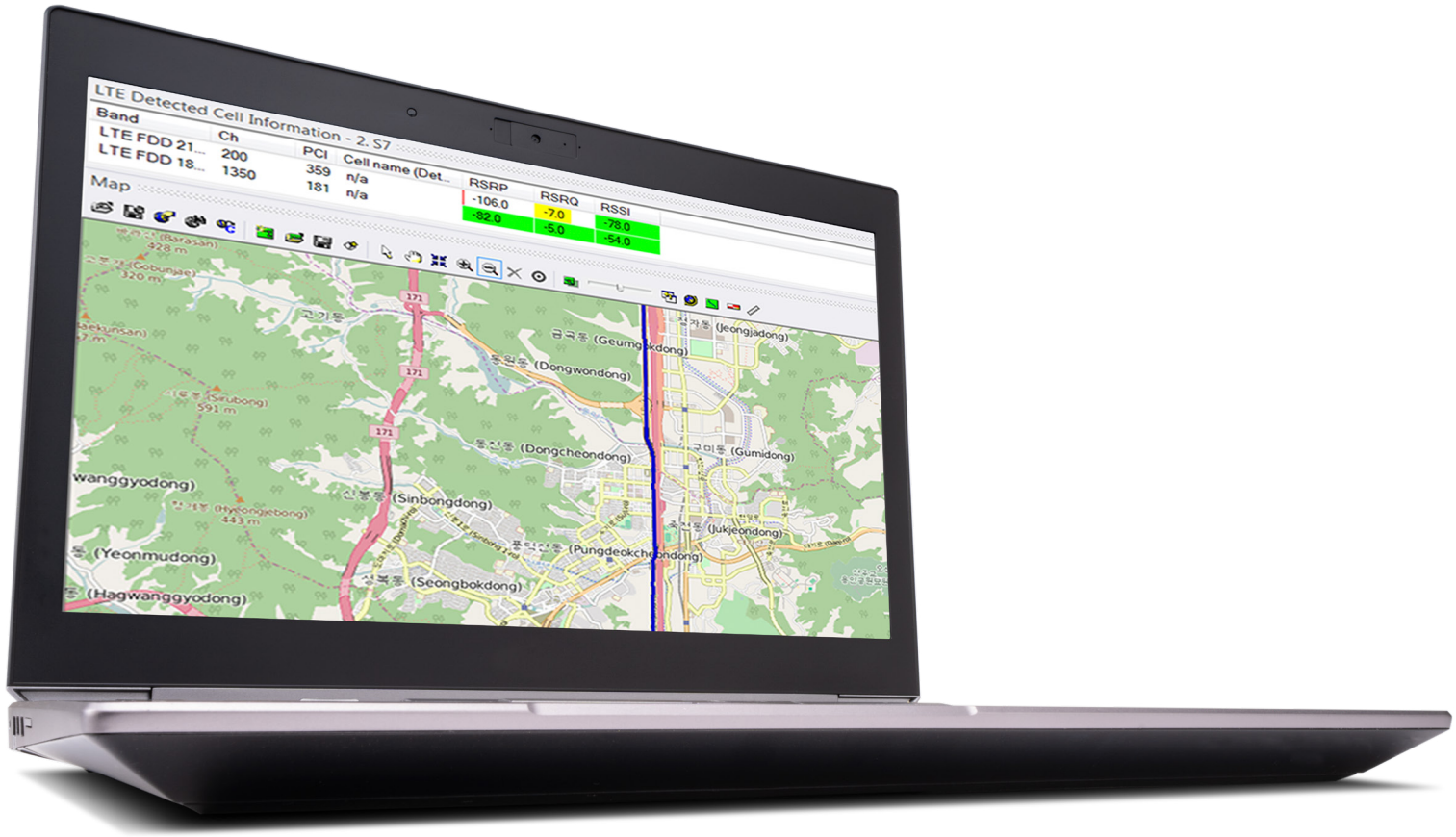
VIRTUAL DRIVE TESTING

Keysight's Virtual Drive Testing Toolset is a lab-based performance and interoperability test solution. It spans the R&D workflow to enable evaluation, characterization, and performance optimization for 5G NR base stations.



Virtual Drive Testing Toolset

MORE INFO

5G Field Test Solutions

AIR INTERFACE FIELD MEASUREMENT

FIELDFOX PHASED ARRAY ANTENNA CONTROL

Keysight's FieldFox handheld analyzer, combined with a phased array antenna, provides a portable solution for measuring and analyzing the 5G air interface in the field. The planar phased array antenna supports multiple beam widths that you can use for channel acquisition, RF probing, and signal-to-noise ratio enhancement. It provides the following benefits:

- measures signal power level across azimuth and elevation from base stations
- reduces measurement complexity by capturing energy radiated from gNB
- simulates 5G UE antenna performance with calibrated mmWave phased array antenna

FieldFox Phased Array Antenna Control

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NEMO WIRELESS NETWORK SOLUTIONS

Keysight's Nemo RF network solutions enable customers to better and more cost effectively optimize and automate processes and wireless networks. Nemo hardware and software tools provide end-to-end information flow in measurement analytics:

- Nemo Outdoor 5G NR drive test solution measures air interface parameters.
- Nemo Handy is an Android application that measures wireless diagnostics information of air interface and mobile application quality of service and quality of experience.
- Nemo Analyze facilitates network quality and end-user service improvement with analysis of wireless network parameters.

Nemo Outdoor

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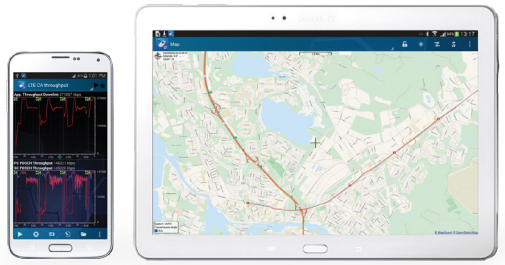

Nemo Handy

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Nemo Analyze

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5G Vector Transceivers

5G MULTIBAND VECTOR TRANSCEIVERS

5G multiband vector transceiver solutions are used for 5G base station (gNB) in-band FR1 and FR2 performance characterization in all phases of the product development cycle to validate critical performance parameters such as adjacent channel leakage ratio (ALCR), a crucial base station specification.

Keysight's S91XX family of 5G Multiband Vector Transceivers provide up to 1.2 GHz wide-band signal generation and analysis of 5G NR (3GPP Release 15 and higher) waveforms in both FR1 and FR2. The transceivers are compatible with Keysight's Test Automation Platform and PathWave Vector Signal Analysis Software. The S9130A-TR1 supports non-signaling high-volume test of 5G NR Performance gNBs, radio units, RF sub-systems and components, distributed units, active antenna arrays, amplifiers, and chipsets.

S9101A-TR2
5G Multiband Vector Transceiver

MORE INFO

S9130A-TR1
5G Performance Multiband Vector Transceiver

MORE INFO

PXI VECTOR TRANSCEIVERS

VXT PXI VECTOR TRANSCEIVERS

Keysight's PXI vector transceivers (M9410A and M9411A) offer the following:

- built-in 1.2 GHz signal generation and analysis bandwidth
- output power up to > +20 dBm
- amplitude accuracy < ±0.5 dB for both generator and analyzer
- SSB phase noise -130 dBc / Hz at 1 GHz (10 kHz offset)
- < 0.3 % EVM of 100 MHz bandwidth OFDM signal for 5G test
- frequency extension to cover mmWave (FR2) with M1740A mmWave transceiver
- support for multichannel timing synchronization

M9410A

GET A QUOTE

M9411A

MORE INFO

FOR MORE INFORMATION

Please visit Keysight 5G Solutions – Online https://www.keysight.com/us/en/solutions/5g.html