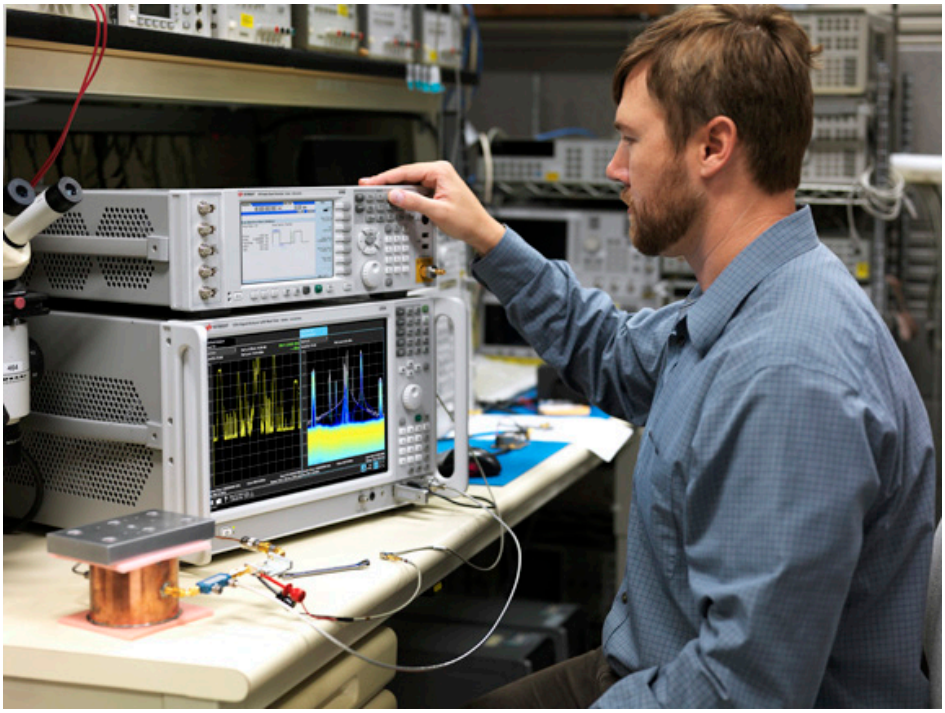
BROCHURE

UXG Agile Signal Generator N5193A

- 10 MHz to 40 GHz frequency range
- 180 ns frequency, amplitude, and phase update rate
- 10 ns minimum pulse width
- 90 dB pulse on/off ratio
- Linear chirp width 10 to 25% of carrier frequency

KEYSIGHT TECHNOLOGIES



Summary of Key Specifications

Frequency range	10 MHz to 20 GHz or 40 GHz
Phase noise	–126 dBc at 10 GHz, 10 kHz offset
Non-harmonic spurious	–70 dBc at 18 GHz
Output power	Standard: +10 dBm Optional: –130 dBm to 10 dBm
Fast CW mode frequency switching speed	370 ns
Normal/list update rate	< 180 ns in list mode (frequency, amplitude, phase)
Minimum pulse width	10 ns
Pulse rise/fall time	3 ns
Pulse on/off ratio	90 dB
Linear chirp width	10 to 25 percent of carrier frequency
Compatibility mode	Aeroflex
Height	3 rack units (3U)

Discover agile signal generation

Industry-leading performance
The UXG agile signal generator delivers unmatched performance in areas such as switching speed and phase control. To support realistic multi-threat scenarios, the UXG can switch frequency in as little as 370 ns. This is made possible by direct digital synthesis (DDS) technology and a Keysight-proprietary digital-to-analog converter (DAC).

Lower cost-of-ownership
The UXG has passed rigorous environmental testing including temperature, humidity, and shock.

Get Closer to Reality

Better testing done sooner equals deeper confidence in EW system performance. The Keysight UXG agile signal generator lets you create complex scenarios when you need them.

Off the shelf, the UXG is a powerful building block, whether you want a dependable LO or a scalable threat simulator. By blurring the lines between analog and vector technologies, the UXG accelerates the integration of new intelligence into up-to-date signal scenarios. With the UXG, you can generate increasingly complex simulations and get closer to reality.

Maximize testing in minimum time

Whether you need to test antennas, components, or subsystems, the UXG will help you test more in less time. Quickly characterize antennas over a wide frequency range with fast frequency tuning: 100-µs switching is standard and, for more demanding needs, speeds of 1 µs and 370 ns are available as options. The agile attenuator, also optional, enables fast, thorough characterization of components and subsystems over a wide range of signal amplitudes.

Count on increased dependability

The UXG is designed for high reliability and fast, easy calibration, service, and repair. To help maximize instrument uptime, the instrument leverages design concepts used in our PSG, MXG, and EXG signal generators, which are among the most reliable signal sources ever offered by Keysight.

Accurately Simulate Complex Scenarios

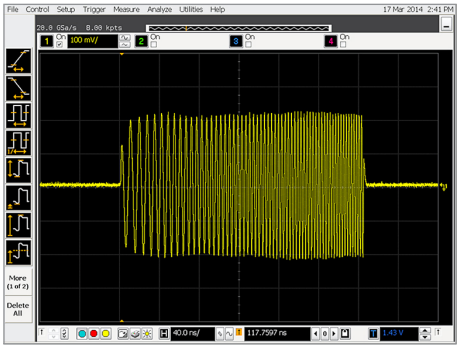
With the UXG, you can cover a wide range of EW, radar, and antenna-test requirements up to 40 GHz. Capabilities such as fast switching, phase repeatability, and pulse modulation let you accurately simulate complex signal scenarios:

- Update frequency, amplitude, and phase in as little as 180 ns
- Generate wide chirps that are 10 to 25 percent of carrier frequency
- Create pulses as narrow as 10 ns with 3 ns rise/fall times and 90 dB on/off ratio

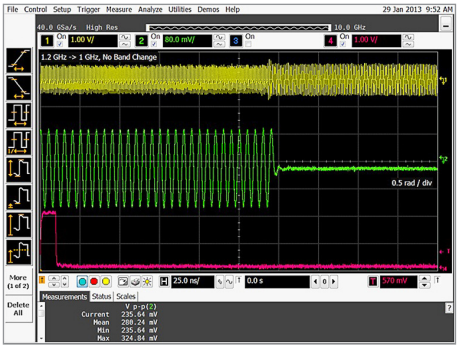
To help you quickly respond to new threats, the UXG understands pulse descriptor words (PDWs). Transfer them directly to the UXG and generate long pulse trains with individual control of pulse characteristics: width, frequency, amplitude, phase, dwell, and chirp.

You can also create pre-defined scenarios by storing PDWs in UXG memory and playing them using list mode, which has an update rate of less than 180 ns for frequency, amplitude, and phase. For on-the-fly changes, external events can trigger the UXG output by sending PDWs through the fast digital interface.

To simulate antenna scan patterns, you can configure the UXG with an optional attenuator that provides 80 dB of agile amplitude changes and 120 dB of overall attenuation range.



Generate wide chirps that are 10 to 25 percent of carrier frequency



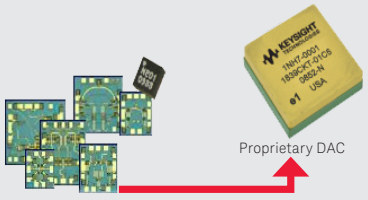
Switch frequency in as little as 370 ns

Enhancing signal purity

The performance of the UXG is based on innovative—and proprietary—technologies:

- DDS provides an unmatched combination of purity and switching speed
- Solid-state switches can quickly change output levels over large amplitude ranges and with accurate time alignment
- Signal-generation software enables creation of complex and precise outputs using PDWs

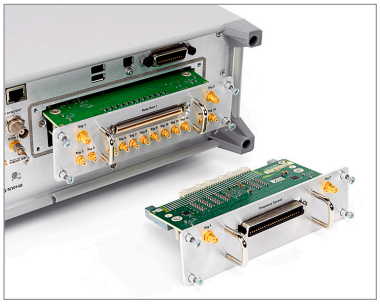
The core of the UXG's DDS architecture is a Keysight-proprietary DAC that provides industry-leading spurious-free dynamic range (SFDR). The DAC uses an ASIC design that minimizes signal crosstalk and reduces the injection of digital noise into analog circuitry. Innovations in the DAC's power-supply design and its resampling algorithm enhance signal quality by reducing noise and ensuring linear transitions.



Refresh Your System

Improve your system uptime with the commercial, off-the-shelf (COTS) UXG. It's just 3U high and is a slide-in replacement for legacy fast-switching sources.

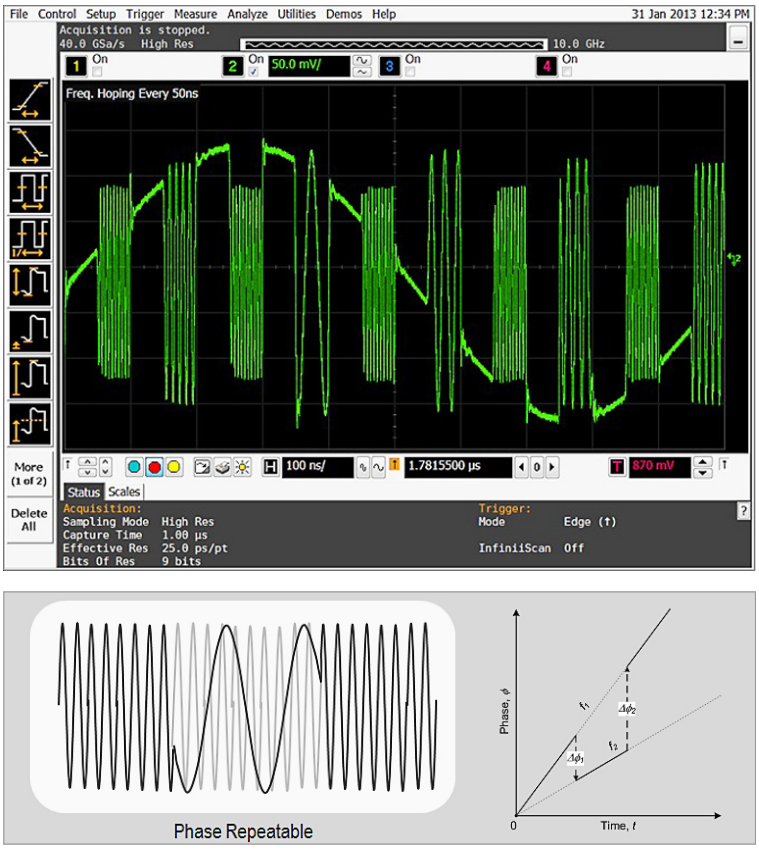
Physically, you can connect the UXG directly to existing wiring and cabling through a fast BCD I/O interface and compatible trigger and hardware connections. Programmatically, the UXG minimizes the need for software changes because the standard model is code-compatible with Aeroflex sources.



Ramp Up Rapidly, Scale Up Easily

To help you maximize productivity, every UXG includes one day of Start-Up Assistance. Training is performed at your site and is delivered by an experienced Keysight application engineer.

To ensure scalable performance, the UXG offers a range of options that let you configure it for use as an agile LO or a versatile threat simulator. Options can be included with your original purchase or easily added later as needs evolve.



Accurately simulate multi-threat scenarios with built-in phase coherency

Harnessing the advantages of DDS

Many signal-generator architectures rely on direct analog synthesis or use phase-locked loops (PLLs) for indirect analog synthesis. In comparison, DDS provides important advantages in LO replacement and signal simulation:

- Digital control over frequency and phase at nanohertz or nano-degree resolution within a single clock cycle
- Precise numerical control, also within one clock cycle, of modulation created in the digital domain
- Fast frequency hopping with phase continuity or phase repeatability

These advantages make it possible to produce complex scenarios such as the simulation of multiple pulse-Doppler radars at different frequencies while maintaining their original phase relationships.

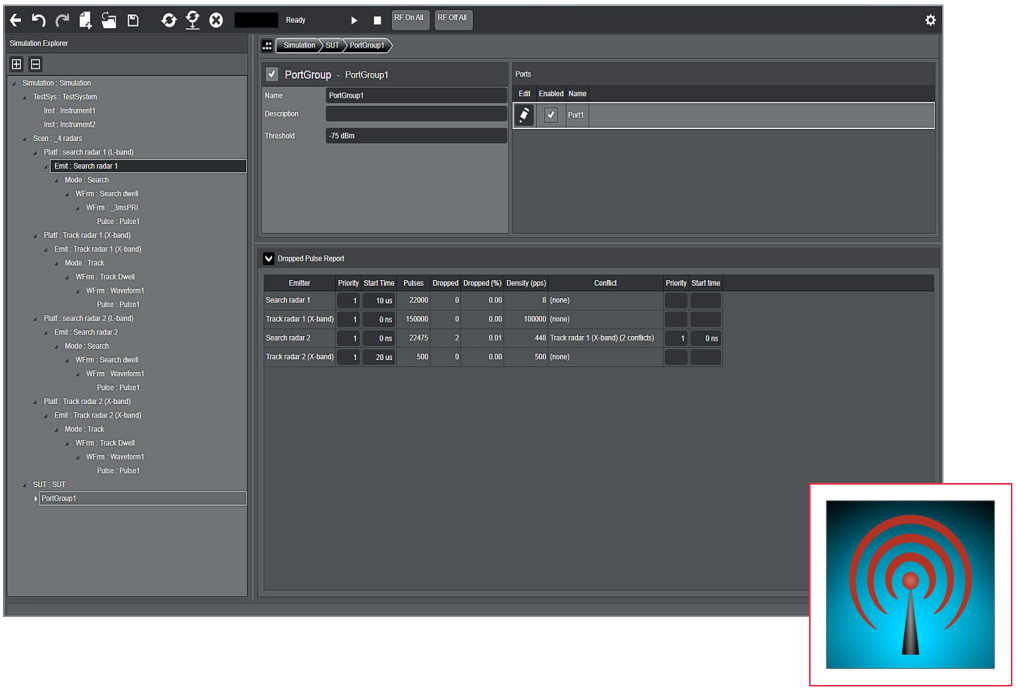
Simplify Signal Creation

Creating realistic multi-emitter EW scenarios is a complex challenge that involves correctly interleaving multiple pulse trains as well as identifying, counting, and prioritizing pulse collisions. For increased realism, antenna radiation and scan patterns, as well as PRI patterns must be added into the pulse train. Managing all these parameters manually can be a daunting task.

Signal Studio for multi-emitter scenario generation (MESG) provides Keysight-validated, performance-optimized multi-emitter signals for the N5193A UXG agile signal generator, saving you time and resources. The software simplifies threat interleaving and enables you to more quickly and easily create scenarios for EW system test applications including:

- Threat de-interleaving, sorting, and identification
- Subsystem interface management and threat correlation
- Electronic countermeasures

Signal Studio for MESG increases productivity, speeds EW testing, and supports multi-emitter simulations at multiple stages in the development cycle, for more optimized designs and better EW systems. Once signals are created in Signal Studio, they can be downloaded directly into the UXG as a PDW list.



UXG Front and Rear Panels

Sum composite analog modulation of AM or FM/ΦM, or digitally sum using EXT 1 and 2 inputs (Option UNT).

Define and apply AM, FM, ΦM, pulse, and chirp to any carrier frequency with the internal modulation generator (Option UNT). For even more modulation capability, add ultra-wide chirps (Option WC1).

Easily save and recall instrument setups from the front panel.

Transfer instrument files and licenses into the UXG via two USB 2.0 connectors.

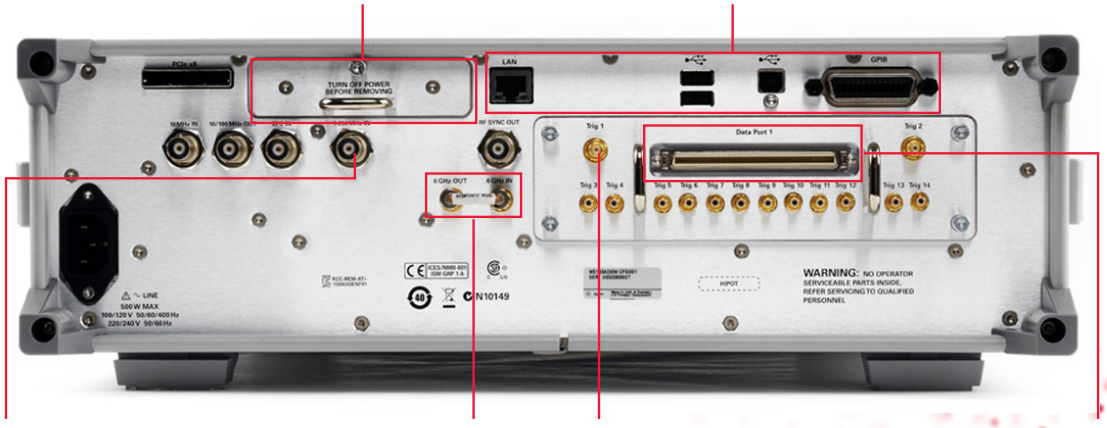
Accept input signals for external pulse modulation with Gate/ Pulse/Trigger input (Option PM1).

Get answers quickly with the context-sensitive embedded help system.

Make convenient coaxial connections with the RF output, 3.5 mm or 2.4 mm (Option 520 or 540), or optional Type-N (Option 1ED).

Securely store all user files in the removable solid-state drive.

Connect to automated systems with standard LAN, GPIB, and USB interfaces.



Synchronize to other equipment in your system with the flexible 1 to 250 MHz synchronization input.

Share the 6 GHz DDS clock among multiple UXGs for phase-coherent applications.

Easily send trigger or marker signals in or out of the UXG with bidirectional ports.

Send PDWs directly into the UXG at full speed with the fast digital interface.

Learn more at: www.keysight.com

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

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