NK430

50 MHz to 21 GHz PXIe RF Synthesizers

FEATURES

- RF Signal Sources
- Two-Slot PXIe Instruments – Plug Into Any Standard PXIe Chassis
- Lowest Phase Noise in the Industry
- Exceed the Performance of Expensive Benchtop Instruments at a Fraction of the Cost
- Compact – Up to 8 Channels in a Single Chassis
- 50 MHz to 21 GHz Frequency Range
- 50 µs Switching Time (Full Range)
- Ultra-Low Phase Noise
  - -124 dBc/Hz @ 10 kHz Offset, 10 GHz Carrier
  - Noise Floor -149 dBc/Hz
- 0.001 Hz Step Size
- Software for Windows and Linux Included
- Output Power +15 dBm

Astonishingly Low Phase Noise

The NK430 VCO-based synthesizers are high quality signal sources for use as local oscillators in receiver systems, for frequency extension, or as test signal sources. They provide great value by eliminating the need for an expensive instrument while still providing the ease of use of a full instrument. You can easily integrate the NK430 into your PXIe based test system using only two PXIe slots. The phase noise performance of the NK430 rivals that of the best of the RF generators in the market.

Extend the Frequency Range of Your RF Instruments for 5G Applications

The NK430 can be used to extend the frequency range of your existing RF instruments by downconverting and upconverting the input and outputs signals. For example, the NK430-0520DS has a frequency range of 50 MHz to 21 GHz and can be used to extend the frequency range of 6 GHz instruments to 27 GHz.

The ultra-low phase noise helps to maintain the measurement quality of your instruments. In 5G applications the low phase noise is required for valid measurements.

APPLICATIONS

- System Clock Source in Test Systems
- Downconversion and Upconversion for Frequency Extension
- Local Oscillator for Receivers

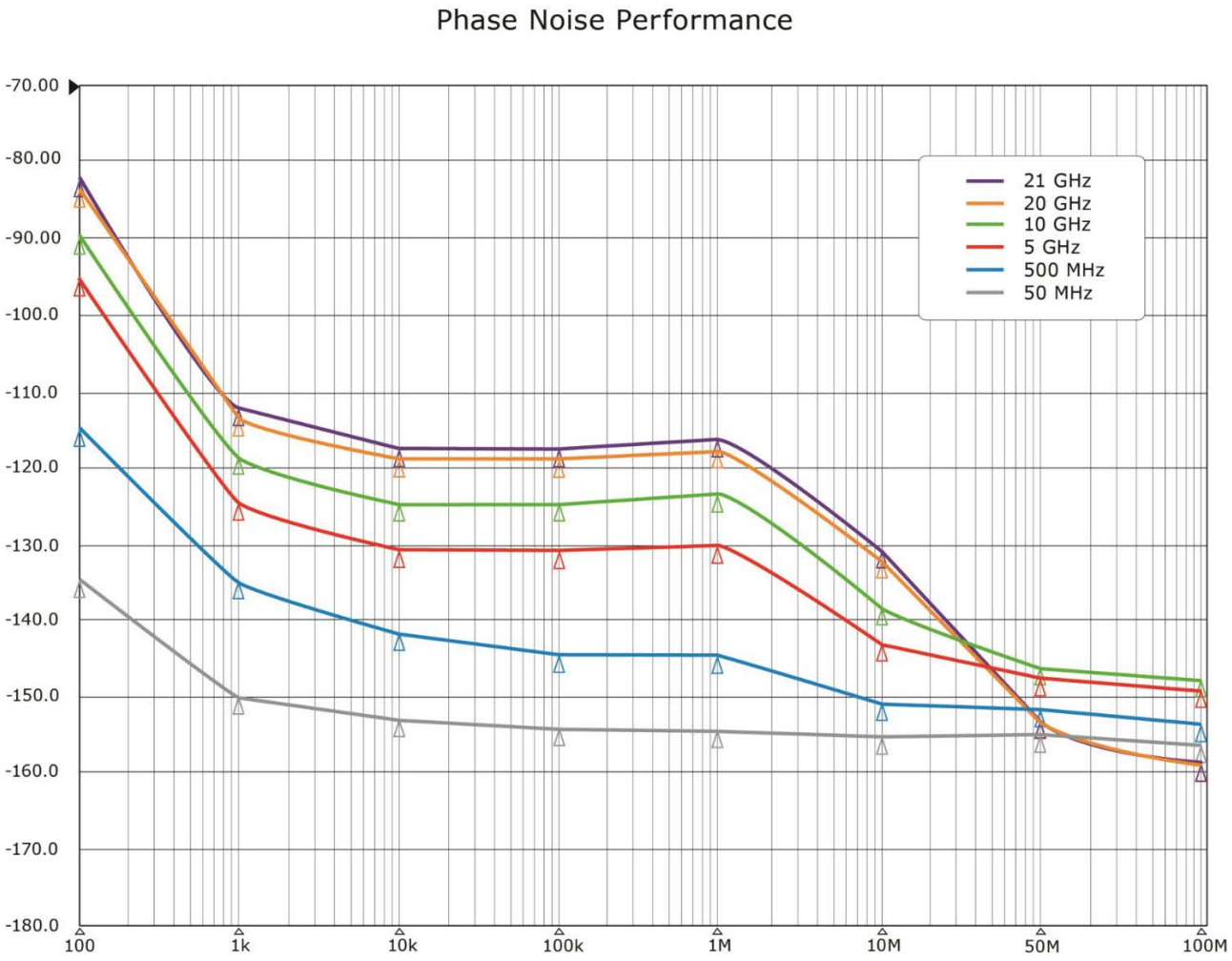
NK420 and NK430 With PXES-2590 Chassis

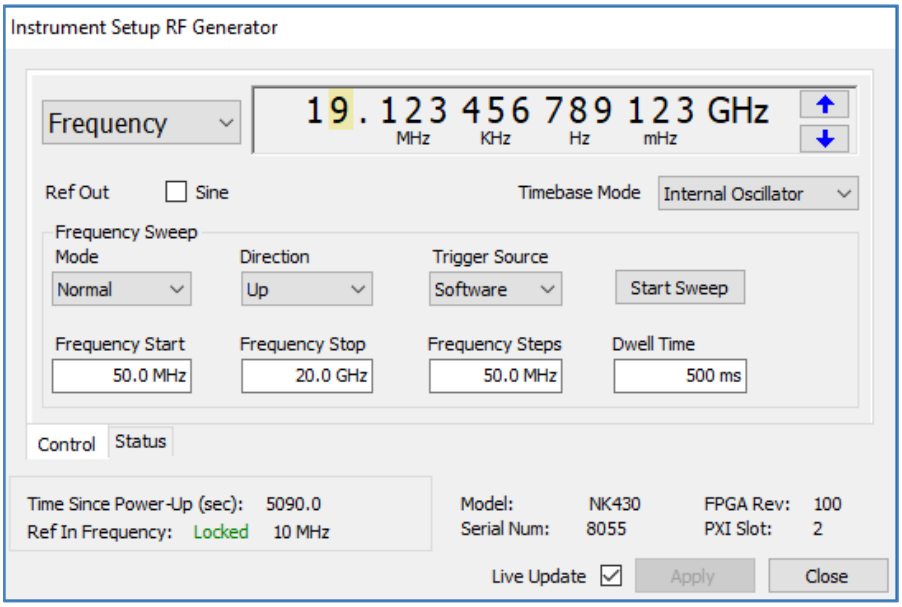
Easy to Use Software

Software for Windows and Linux is included with the NK430 and consists of a ready-to-run virtual front panel (GUI) and driver (dll) for users who want to write their own control software in LabVIEW, C++, C#, Basic or Python. Sample programs are provided to serve as starting points. The same driver also runs all other products from Carmel Instruments, including frequency counters, time interval analyzers, and clock generators.

Sweep (List) Mode

You can set the NK430 to sweep through a range of frequencies with a specific step size and dwell time at each frequency. There is also a List Mode in which you can load up to 32767 different frequencies and dwell times from a file.





Virtual Front Panel Software

SPECIFICATIONS

Phase Noise – 20 and 21 GHz Models (dBc/Hz)

	50 MHz		500 MHz		5 GHz		10 GHz		20 GHz		21 GHz	
Offset	**Typ**	**Max**	**Typ**	**Max**	**Typ**	**Max**	**Typ**	**Max**	**Typ**	**Max**	**Typ**	**Max**
100 Hz	-126	-123	-114	-111	-100	-97	-92	-89	-89	-86	-89	-86
1 kHz	-143	-140	-128	-125	-121	-118	-113	-110	-111	-108	-107	-104
10 kHz	-151	-148	-140	-137	-130	-127	-124	-121	-118	-115	-116	-113
100 kHz	-156	-153	-147	-144	-132	-129	-126	-123	-120	-117	-119	-116
1 MHz	-156	-153	-147	-144	-130	-127	-124	-121	-118	-115	-117	-114
10 MHz	-156	-153	-151	-148	-143	-140	-138	-135	-130	-127	-134	-131
50 MHz	-156	-153	-152	-149	-149	-146	-148	-145	-153	-150	-152	-149
100 MHz	-156	-153	-152	-149	-149	-146	-149	-146	-156	-153	-155	-152

Phase Noise (Typ) – 10.5 GHz Models (dBc/Hz)

Offset	50 MHz	500 MHz	5 GHz	10 GHz
100 Hz	-135	-116	-96	-90
1 kHz	-150	-136	-125	-119
10 kHz	-154	-142	-131	-125
100 kHz	-155	-146	-131	-125
1 MHz	-155	-146	-130	-124
10 MHz	-156	-151	-144	-138
100 MHz	-156	-154	-149	-148

General

- Warranty: 1 year

RF Output

- Frequency Range: See table under “Ordering Information”
- Step Size: 0.001 Hz
- Output Power: +15 dBm min
- Switching Speed (full band): 150 µs max (50 µs optional)
- Harmonics: -12 dBc typ. (-10 dBc below 250 MHz)
- Sub-Harmonics: -50 dBc typ.
- Spurs: -60 dBc typ.
- Output Impedance: 50 Ohm

Inputs and Outputs

- RF Output: SMA
- Reference Oscillator Input: SMA
- Reference Oscillator Output: SMA

Internal Reference Oscillator

- Frequency: 10 MHz
- Stability: ±1 ppm
- Aging: ±0.5 ppm/year
- Tuning Range: ±2 ppm
- Output Impedance: 50 Ohm
- Warm Up Time: 2 minutes
- Output Connector: SMA
- Output Power: +5 dBm ±1 dB

External Reference Input

- Input Frequency: 10 MHz
- Lock Range: ±5 ppm
- Input Level: 0 dBm ±6 dB
- Input Impedance: 50 Ohm

Software

- The driver and Virtual Front Panel control all Carmel Instruments products
- Windows® and Linux driver
  - Windows® NT/95/98/2000/XP, 32 bit
  - Windows® Vista/7/8/10, 32/64-bit
  - Linux with 2.4/2.6 kernels (e.g. Redhat 3, Redhat 5), 32/64-bit
  - VBA (for use from excel®, used on some Teradyne testers)
  - Written in plain C++ for easy porting to other environments
- Virtual Front Panel (Windows® based)
  - Can run multiple instruments of any model simultaneously
  - Compatible with Windows® XP/Vista/7/8/10 32/64-bit
  - Requires Microsoft™ .NET Framework 3.5 (included)

Computer Requirements

- Two PXIe slot x1 Lane
- Size: 3U PXIe

Calibration

- Traceable calibration
  - Calibration period: 1 year

Power, Cooling and Physical

- Power supply requirements from PXI bus (typical):
  - 3.3V @ 0.5A
  - 12V @ 1.2A
- Total power consumption: 17W typical
- Operating ambient temperature range: 0°C to 45°C
- Weight: 25 oz (720 g)

Ordering Information

PN	Fmin	Fmax	Switching Speed
NK430-0510A	500 MHz	10.5 GHz	50 µs
NK430-0510B	50 MHz	10.5 GHz	50 µs
NK430-0520AR	500 MHz	20 GHz	150 µs
NK430-0520BR	500 MHz	21 GHz	150 µs
NK430-0520CR	50 MHz	20 GHz	150 µs
NK430-0520DR	50 MHz	21 GHz	150 µs
NK430-0520AS	500 MHz	20 GHz	50 µs
NK430-0520BS	500 MHz	21 GHz	50 µs
NK430-0520CS	50 MHz	20 GHz	50 µs
NK430-0520DS	50 MHz	21 GHz	50 µs