

FEATURES

- RF Synthesizers 250 MHz to 32 GHz (In Bands)
- Single-Slot PXIe Instruments – Plug Into Any Standard PXIe Chassis
- Low Cost – Replace Expensive Benchtop Instruments with High Quality Signal Source
- Compact – Up to 16 Channels in a Single Chassis
- Six Models

Model	Fmin (GHz)	Fmax (GHz)
NK420-0260	0.25	6
NK420-2080	2	8
NK420-6013	6	13
NK420-1014	10	14
NK420-8020	8	20
NK420-2832	28	32

- Low Phase Noise
 - ♦ 10 GHz Output: -93 dBc/Hz @ 10 kHz
 - ♦ Noise Floor -156 dBc/Hz
- 1 kHz Step Size
- Software for Windows and Linux Included
- Output Power 8 to 13 dBm
- Two Options for Ultra-Low Phase Noise Reference Clock which can Drive the PXIe Backplane and Serve as System Clock
 - ♦ 135 dBc/Hz at 10 Hz Offset from 10 MHz
 - ♦ 140 dBc/Hz at 10 Hz Offset from 10 MHz
 - ♦ Output On Front Panel SMA

Great Value

The NK420 is a YIG-based synthesizer which provides a high quality signal source for use as local oscillator in receiver systems, for frequency extension, or a test signal source. It provides 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 NK420 into your PXIe based test system using only one PXIe slot.

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

The NK420 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 NK420-8020 has a frequency range of 8 to 20 GHz and can be used to extend the frequency range of 6 GHz instruments to up to 26 GHz.

APPLICATIONS

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



NK420 and NK430 With PXES-2590 Chassis

Easy to Use Software

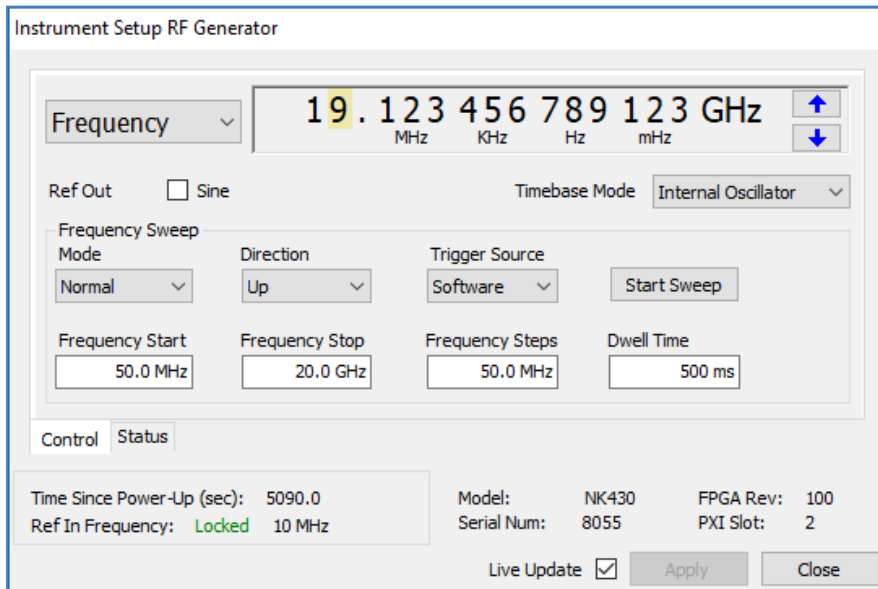
Software for Windows and Linux is included with the NK420 and consists of a ready-to-run virtual front panel (GUI) and driver (dll) for users who want to write their own control software in LabVIEW, C++, C#, Basic or Python. Sample programs are provided to serve as starting points. The same driver also runs all other products from Carmel Instruments, including frequency counters, time interval analyzers, and clock generators.

Optional Ultra-Low Phase Noise Reference

The NK420 accepts an external frequency reference from 10 to 200 MHz. There is also has an option for an ultra-high performance internal 10 MHz frequency reference with phase noise of -140 dBc/Hz at 10 Hz offset, temperature stability of 5 ppb (0.005 ppm) over 0°C to 65°C range, and Allen Deviation of 5×10^{-12} with 1 second tau (short term stability). This optional NIST-traceable internal reference greatly improves the close-in phase noise of the synthesizer and its absolute frequency accuracy. It is available on a front panel SMA and it can drive the reference clock on the PXI backplane so all instruments in the chassis can use the same reference without having to connect external cables.

Sweep (List) Mode

You can set the NK420 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

General

- Warranty: 1 year

RF Output

- Frequency Range: See table under “Ordering Information”
 - ♦ Custom frequency range also available
- Output Power:
 - ♦ -0260: 11 dBm
 - ♦ -2080: 13 dBm
 - ♦ -6013: 10 dBm
 - ♦ -1014: 8 dBm
 - ♦ -8020: 8 dBm
 - ♦ -2832: 10 dBm
- Output Power Variation Over Freq/Temp: 6 dB
- Step Size: 1 kHz
- Switching Speed:
 - ♦ 100 MHz Step (Freq > 500 MHz): 1 ms
 - ♦ 1000 MHz Step: 2 ms
 - ♦ Full Band Step: 3 ms
- Warm Up Time:
 - ♦ To PLL Lock: 250 ms
 - ♦ With Option 10 and 11 Oven Reference Oscillator: 5 Min
- Output Impedance: 50 Ohm
- Load VSWR: 2.0:1
- Harmonics and Subharmonics:
 - ♦ -0260: -8 dBc
 - ♦ -2080: -12 dBc
 - ♦ -6013: -15 dBc

- ♦ -1014: -20 dBc
- ♦ -8020: -20 dBc
- ♦ -2832: -20 dBc
- Non-Harmonic Spurious (100Hz-500kHz, > 500 kHz):
 - ♦ -0260: -60 dBc, -60 dBc
 - ♦ -2080: -60 dBc, -80 dBc
 - ♦ -6013: -60 dBc, -80 dBc
 - ♦ -1014: -60 dBc, -60 dBc
 - ♦ -8020: -54 dBc, -74 dBc
 - ♦ -2832: -54 dBc, -74 dBc

Phase Noise

Offset	-0260	-2080	-6013	-1014	-8020	-2832
100 Hz	74	72	70	70	68	63
1 kHz	94	93	88	88	84	83
10 kHz	96	95	90	90	88	83
100 kHz	119	117	116	116	115	113
1 MHz	142	142	142	142	138	137
10 MHz	150	156	156	156	156	145
100 MHz	170	170	168	168	166	155

Inputs and Outputs

- RF Output: SMA
- Reference Oscillator Input: SMA
- Reference Oscillator Output (Option 10 and 11 only): SMA

Reference Oscillator

- User Supplied Reference: 10 MHz to 200 MHz
 - ♦ Input Power: 0 ±3 dBm
- Optional NIST traceable Internal Ultra-Low Phase Noise Oscillator:
 - ♦ Option 10:
 - Over full temperature range: ±0.005 ppm (±5 ppb)
 - Aging: ±0.05 ppm/year (±50 ppb)
 - Warm-up time: 5 minutes
 - Phase noise -135 dBc @ 10 Hz offset from 10 MHz
 - ♦ Option 11:
 - Over full temperature range: ±0.005 ppm (±5 ppb)
 - Aging: ±0.05 ppm/year (±50 ppb)
 - Warm-up time: 5 minutes
 - Phase noise -140 dBc @ 10 Hz offset from 10 MHz
 - ♦ Output on Front Panel SMA
 - ♦ Can also drive PXIe backplane to serve as system clock

Lock Indicator

- Front panel LED indicates when the internal timebase is locked to the reference oscillator

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

- One 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 @ 1.0A (1.2A with oven oscillator, 1.5A warm-up)
- Total power consumption: 17W typical (20W with oven)
- Operating ambient temperature range: 0°C to 45°C
- Weight: 9 oz (250 g)

Ordering Information

PN	Description
NK420-0260	PXIe Frequency Synthesizer 0.25 – 6 GHz
NK420-2080	PXIe Frequency Synthesizer 2 – 8 GHz
NK420-6013	PXIe Frequency Synthesizer 6 – 13 GHz
NK420-1014	PXIe Frequency Synthesizer 10 – 14 GHz
NK420-8020	PXIe Frequency Synthesizer 8 – 20 GHz
NK420-2832	PXIe Frequency Synthesizer 28 – 32 GHz
Opt-10	NIST traceable, ultra-low phase noise, ovenized oscillator, 135 dBc/Hz @ 10 Hz
Opt-11	NIST traceable, ultra-low phase noise, ovenized oscillator, 140 dBc/Hz @ 10 Hz