



# NETWORKED REAL-TIME SPECTRUM ANALYZER

NXN SERIES  
4.5/6.3 GHz

## Key facts

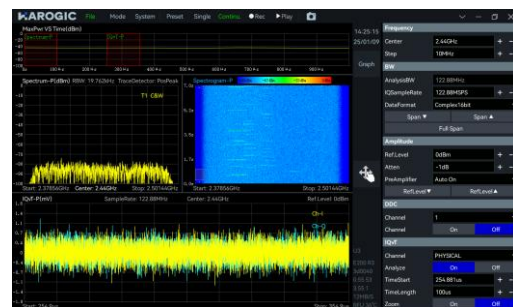
- Create your own RF system with limited budget
- Frequency range: 9 kHz to 4.5/6.3 GHz
- 1 GHz DANL: -162 dBm/Hz
- 1 GHz phase noise: -110 dBc/Hz@10 kHz
- Analysis bandwidth: up to 25 MHz
- 1000M/100M Ethernet interface
- Highly compatible API interface
- ARM and X86 processor are supported
- Linux and Windows operating systems are supported

## Applications

Standard spectrum sweep



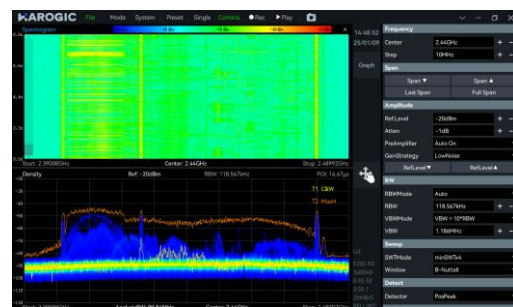
IQ streaming and analysis



Power vs time analysis



Real-time analysis



# Specifications\*

## FREQUENCY

Frequency range	NXN-45	NXN-60
	9 kHz-4.5 GHz	9 kHz-6.3 GHz
Reference clock	Internal or external	
Frequency accuracy	TCXO (std.)	<1 ppm, manual correction is available
	OCXO (opt01)	<1 ppm, manual correction is available
	Int. GNSS disciplined OCXO (opt06)	<0.05 ppm, when locked to GNSS
Aging and temperature stability	TCXO (std.)	<1 ppm/year, <1 ppm
	OCXO (opt01)	<1 ppm/year, <0.15 ppm
	Int. GNSS disciplined OCXO (opt06)	<1 ppm/year, <0.05 ppm

## SPECTRUM PURITY

SSB phase noise (dBc/Hz)	NXN-45		NXN-60	
Carrier frequency	1 GHz	4.5 GHz	1 GHz	6.3 GHz
1 kHz	-103.4	-93.5	-105.2	-91.2
10 kHz	-111.3	-100.3	-110.4	-99.3
100 kHz	-109.3	-98.5	-110.5	-97.4
1 MHz	-129.5	-121.9	-130.1	-119.9

Residual response (dBm) spur reject = enhanced RBW =1 kHz PosPeak detector	NXN-45		NXN-60	
Reference level (R.L.)	0 dBm	-50 dBm	0 dBm	-50 dBm
100 kHz-100 MHz	-85	-110	-90	-110
100 MHz-4.5 GHz	-85	-110	-90	-110
4.5 GHz-6.3 GHz	-	-	-90	-110

Image rejection	> 90 dBc(typ.) for spur reject = enhanced > 35 dBc (typ.) for spur reject = bypass
IF rejection	Low IF architecture

**Local oscillator related spurious**

<-65 dBc  
Center frequency  $\pm (N/M)*125$  MHz, N,M = 1,2,3,4,5...

**IIP3 / IIP2 (dBm)**

Carrier frequency	NXN-45		NXN-60	
	1 GHz	4.5 GHz	1 GHz	6.3 GHz
R.L. = 20 dBm	47.4 / 85.8	45.6 / 98.0	46.6 / 86.0	42.9 / 109.5
R.L. = 0 dBm	35.1 / 85.5	26.1 / 91.6	29.6 / 85.8	24.6 / 98.5
R.L. = -20 dBm	10.0 / 66.3	6.9 / 19.4	10.5 / 67.3	3.9 / 17.1

**AMPLITUDE**

**Max. input power (CW)**      23 dBm      30 MHz-4.5/6.3 GHz and the preamplifier is off  
    10 dBm      9 kHz-30 MHz or preamplifier is on

**Max. DC voltage**       $\pm 10$  VDC

**Display range**      DANL-23 dBm

**Amplitude accuracy**       $\pm 2.0$  dB

**IF in-band flatness**       $\pm 2.0$  dB

**Reference level (R.L.)**      -50 dBm-23 dBm

**RF preamplifiers**      automatically turn on or forcibly turn off

**VSWR**      R.L. = 10 dBm      <1.7:1

**30 MHz to Max.Freq.**      R.L. = 0 dBm      <2.0:1

R.L. = -40 dBm      <2.5:1

**Display average noise level**

**(DANL) (dBm/Hz)**

**RBW=10 kHz**

Reference level	NXN-45		NXN-60	
	-20 dBm	-50 dBm	-20 dBm	-50 dBm
<b>9 kHz</b>	-133.5	-149.5	-134.2	-134.3
<b>100 kHz - 30 MHz</b>	-139.2	-161.8	-138.6	-156.0
<b>30 MHz - 3.0 GHz</b>	-148.4	-163.4	-147.6	-163.4
<b>3.0 GHz - 4.5 GHz</b>	-148.1	-162.6	-150.2	-162.1
<b>4.5 GHz - 6.3 GHz</b>	-	-	-150.1	-160.1

## STANDARD SPECTRUM ANALYSIS

<b>Detector</b>	PosPeak, NegPeak, Sample, Average, RMS, MaxPower
<b>RBW</b>	0.1 Hz-2.5 MHz
<b>VBW</b>	0.1 Hz-10 MHz
<b>Data chart</b>	SASudio4 software provides spectrum, waterfall chart, and historical trace
<b>Measurements</b>	Channel power, OBW, X dB bandwidth, Adjacent channel power ratio, IM3

<b>Sweep speed</b>	<b>NXN-45</b>	<b>NXN-60</b>
<b>RBW = 250 kHz FPGA Spur Reject = Standard</b>	about 68.8 GHz/s	about 128.1 GHz/s
<b>RBW = 250 kHz FPGA Spur Reject = Enhanced</b>	about 32.7 GHz/s	about 63.0 GHz/s
<b>RBW = 30 kHz FPGA Spur Reject = Enhanced</b>	about 13.3 GHz/s	about 9.0 GHz/s
<b>RBW = 1 kHz CPU Spur Reject = Enhanced</b>	about 750 MHz/s	about 745 MHz/s

## IQ RECORDING

	<b>NXN-45</b>	<b>NXN-60</b>
<b>Burst Recording bandwidth</b>	Maximum: 6.25 MHz	Maximum: 25 MHz
	The built-in memory depth is 128 Mbytes	
<b>Continuous Recording bandwidth</b>	Maximum: 6.25 MHz	Maximum: 6.25 MHz
	Limited by the bandwidth of USB interface and hard disk. The storage depth is limited by the hard disk capacity	
<b>IQ sample rate</b>	7.8125MSPS, decimate factor: 1,2,4,8,16,32,64,128,256 supported (FPGA)	31.25MSPS, decimate factor: 1,2,4,8,16,32,64,128,256,512,1024 supported (FPGA)
<b>External trigger response</b>	Maximum response frequency 500 times/sec	

## DETECTION ANAYLSYS

	NXN-45	NXN-60
Lowest time resolution	128 ns	32 ns
Max. analysis bandwidth	6.25 MHz	25MHz
Detector	PosPeak, NegPeak, Sample, Average, RMS, MaxPower	

## REAL TIME SPECTRUM ANALYSIS

FFT analysis	FFT engine is implemented in FPGA. Frame compression and trace detection are supported. No missing samples between FFT frames	
	FFT frame update rate= $10^9$ ns/(N * D * highest Time Resolution) POI = N * D * highest Time Resolution N for FFT points (2048,1024,512,256,128,64,32) D for decimate factor (1, 2, 4, 8...)	
POI / FFT Refresh Rate	NXN-45	NXN-60
N = 2048, D = 1	262.144 us / 3,814 times/sec	65.536 us / 15,258 times/sec
N = 32, D = 1	4.096 us / 244,140 times/sec	1.024 us / 976,562 times/sec
Max. analysis bandwidth	6.25 MHz	25MHz
RBW	920 kHz-3.59 kHz (Flat-top) 488 kHz-1.90 kHz (B-Nuttall) 9 grades for each window type	3.68 MHz-3.59 kHz (Flat-top) 1.95 MHz-1.90 kHz (B-Nuttall) 11 grades for each window type
Window function	B-Nuttall, Flat-top, LowSideLobe	
Amplitude resolution	0.75 dB	

## GENERAL

Input and output	
Power supply	Type-C, dedicated power supply port. Acceptable voltage range: 9 to 12 V (ripple < 0.2 Vpp). Device will fetch up to 2 A current from this port
Data interface	RJ45 1000 Mbps x1, 100 Mbps x1
RF input	SMA (F), Input impedance 50 Ω
RF output	SMA (F), Input impedance 50 Ω
Reference input	MCX (F), amplitude ≥ 1.5 Vpp, input impedance is about 330 Ω
Reference output	Unavailable
External trigger input	MMCX (F), 3.3V CMOS, input: high impedance

External trigger output	MMCX (F), 3.3 V CMOS	
Analog IF output	Unavailable	
GNSS antenna	MMCX (F)	
General USB2.0	Type-C	
<b>Power consumption</b>	12-14 W	
<b>Size (D * W * H) and weight</b>	167 x117 x28 mm and about 650 g	
<b>GNSS synchronization</b>	Internal GNSS	+/- 100 ns
	Internal GNSS (opt05)	+/- 75 ns
	Internal GNSS (opt06)	+/- 50 ns
<b>System requirements</b>	Linux	aarch64, x64
	Windows	x64
<b>Operating temperature (ambient)</b>	T0 class (std.)	0-50 °C
	T1 class (opt40)	-20-65 °C
<b>Storage temperature (ambient)</b>	T0 class (std.)	-20-70 °C
	T1 class (opt40)	-40-85 °C
<b>Packaging and accessories</b>	Flash disk * 1, USB cable * 1, Power adapter * 1	

\*Specification applies under the following conditions:

- (1) Start up and warm up for 10 minutes
- (2) Ambient temperature 25 °C (core temperature 50 °C)
- (3) Stand spectrum analysis mode-spurious rejection enhance on.
- (4) Necessary heat dissipation is provided to ensure the ambient and core temperature within the rated range at the same time

## OPTIONS

Code		
01	Built-in OCXO reference clock	built-in hardware
02	Built-in signal generator	built-in hardware
05	Internal high precision GNSS	built-in hardware
06	Build-in GNSS disciplined OCXO reference clock	built-in hardware
34	External omnidirectional antenna, 400-8000MHz, Gain<2dBi	accessory
40	T1 temperature class	built-in hardware
71	Basic digital modulation analysis	software
72	Pulse signal measurement	software

## BUILT-IN SIGNAL GENERATOR (opt02)

Frequency range	100 kHz-6.3 GHz, step 10 Hz	
Power range	-50 dBm-0 dBm, 0.25 dB for each step	
VSWR	<2.0:1	30 MHz-6.3 GHz
Non-harmonic spurs	<-50 dBc	

### Harmonics

Frequency range	Second harmonic	Third harmonic and above
100 kHz-30 MHz	<-10 dBc	<-10 dBc
30 MHz-1.6 GHz	<-10 dBc	<-10 dBc
1.6 GHz-3 GHz	<-20 dBc	<-20 dBc
3 GHz-3.2 GHz	<-20 dBc	<-20 dBc
3.2 GHz-6.3 GHz	<-20 dBc	<-20 dBc

### Leakage to receiver

100 kHz-30 MHz	>90 dBc
30 MHz-3 GHz	>80 dBc
3 GHz-6.3 GHz	>70 dBc



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