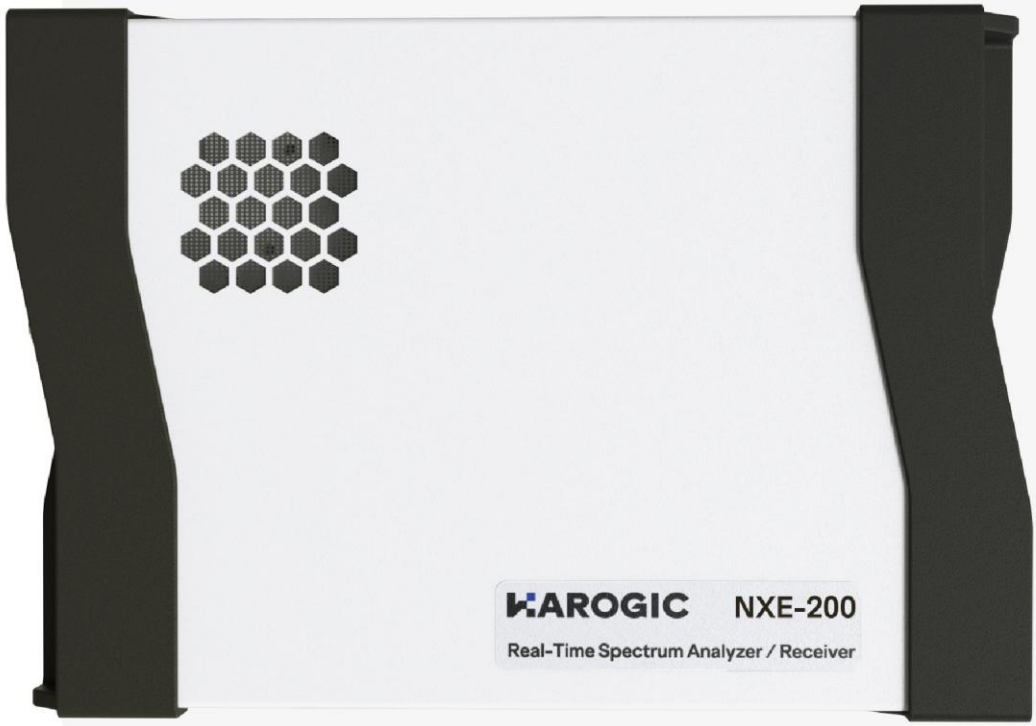
NX Series

PRODUCT DATASHEET



NETWORKED REAL-TIME SPECTRUM ANALYZER

NXE SERIES
9.5/20 GHz

V1.1 24/10/28

HAROGIC

NXE SERIES OVERVIEW

Key facts

Create your own RF system with limited budget

Frequency range: 9 kHz to 9.5/20 GHz

1 GHz DANL: -168 dBm/Hz

1 GHz phase noise: -100 dBc/Hz@10 kHz

Analysis bandwidth: up to 100 MHz

1000M/100M Ethernet interface

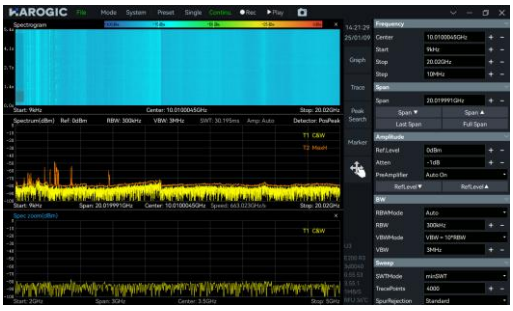
Highly compatible API interface

ARM and X86 processor are supported

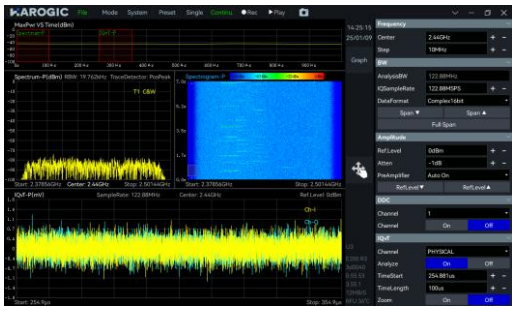
Linux and Windows operating systems are supported

Applications

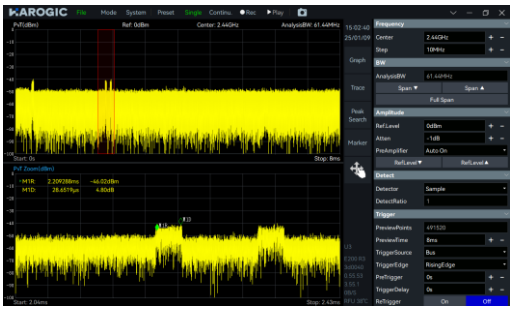
Standard spectrum sweep



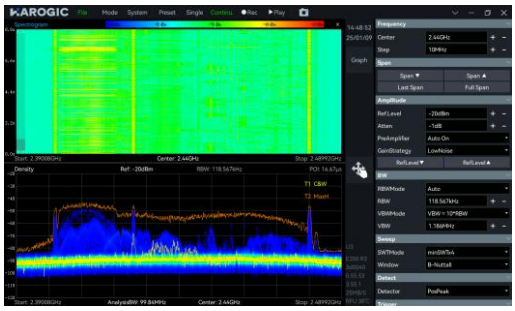
IQ streaming and analysis



Power vs time analysis



Real-time analysis



Specifications*

FREQUENCY

Frequency range	**NXE-90**	**NXE-200**
	9 kHz-9.5 GHz	9 kHz-20 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)

	NXE-90		NXE-200	
Carrier frequency	1 GHz	9.5 GHz	1 GHz	20 GHz
1 kHz	-95.2	-91.5	-91.2	-80.6
10 kHz	-101.6	-98.5	-99.7	-90.6
100 kHz	-100.6	-99.7	-101.1	-96.2
1 MHz	-120.9	-116.2	-121.6	-111.5

Residual response (dBm)
spur reject = bypass
RBW =1 kHz
PosPeak detector

	NXE-90		NXE-200	
Reference level (R.L.)	0 dBm	-50 dBm	0 dBm	-50 dBm
9 kHz-1 GHz	-83	-120	-90	-120
1 GHz-3 GHz	-83	-120	-80	-120
3 GHz-9.5/20 GHz	-90	-130	-90	-120

Image rejection	**NXE-90**	**NXE-200**
9 kHz-3 GHz	> 90 dBc (typ.)	> 90 dBc (typ.)

3 GHz-9.5 GHz	> 90 dBc(typ.) for spur reject = enhanced; > 60 dBc (typ.) for spur reject = bypass	> 90 dBc (typ.)
9.5 GHz-20 GHz	-	> 90 dBc(typ.) for spur reject = enhanced; > 60 dBc (typ.) for spur reject = bypass

IF rejection	> 90 dBc (typ.) for spur reject = enhanced; > 80 dBc (typ.) for spur reject = bypass
Local oscillator related spurious	<-65 dBc Center frequency ± (N/M)*100 MHz, N,M = 1,2,3,4,5…

IIP3 / IIP2 (dBm)

	NXE-90		**NXE-200**	
Carrier frequency	1 GHz	9.5 GHz	1 GHz	20 GHz
R.L. = 20 dBm	46.1 / 83.2	40.5 / 92.8	45.5 / 82.6	35.3 / 93.6
R.L. = 0 dBm	26.7 / 85.0	19.2 / 90.3	25.5 / 81.1	21.0 / 89.0
R.L. = -20 dBm	10.5 / 82.2	2.0 / 49.3	7.9 / 81.5	-4.5 / 55.3

AMPLITUDE

Max. input power (CW)	23 dBm	90 MHz-9.5/20 GHz and the preamplifier is off
	10 dBm	9 kHz-90 MHz or preamplifier is on
Max. DC voltage		±10 VDC
Display range		DANL-23 dBm
Amplitude accuracy	9 kHz-9.5 GHz	±2.0 dB
	9.5 GHz–20 GHz	±3.0 dB
IF in-band flatness		±2.0 dB
Reference level (R.L.)		-50 dBm-23 dBm
RF preamplifiers		automatically turn on or forcibly turn off
VSWR **90 MHz to Max.Freq.**		<2.0:1

Display average noise level (DANL) (dBm/Hz)
RBW=10 kHz

	NXE-90		**NXE-200**	
Reference level	-20 dBm	-50 dBm	-20 dBm	-50 dBm

9 kHz	-136.9	-142.4	-141.2	-152.3
100 kHz - 90 MHz	-146.3	-150.9	-152.2	-160.2
90 MHz - 3.0 GHz	-145.7	-165.1	-147.2	-165.3
3.0 GHz - 9.5 GHz	-148.9	-157.4	-139.1	-157.1
9.5 GHz - 20 GHz	-	-	-138.2	-159.5

STANDARD SPECTRUM ANALYSIS

Detector	PosPeak, NegPeak, Sample, Average, RMS, MaxPower
RBW	0.1 Hz-10 MHz
VBW	0.1 Hz-10 MHz
Data chart	SAStudio4 software provides spectrum, waterfall chart, and historical trace
Measurements	Channel power, OBW, X dB bandwidth, Adjacent channel power ratio, IM3

Sweep speed	**NXE-90**	**NXE-200**
RBW ⩾ 1 MHz FPGA **Spur Reject = Bypass**	about 630 GHz/s	about 640 GHz/s
RBW = 250 kHz FPGA **Spur Reject = Standard**	about 320 GHz/s	about 323 GHz/s
RBW = 30 kHz FPGA **Spur Reject = Bypass**	about 152 GHz/s	about 151 GHz/s
RBW = 1 kHz CPU **Spur Reject = Bypass**	about 3.4 GHz/s	about 4.7 GHz/s

IQ RECORDING

Burst recording bandwidth	Maximum: 100 MHz The built-in memory depth is 128 Mbytes
Continuous recording bandwidth	Maximum: 6.25 MHz Limited by the bandwidth of USB interface and hard disk. The storage depth is limited by the hard disk capacity
IQ sample rate	125MSPS, decimate factor: 1,2,4,8,32,64,128,256,512,1024,2048,4096 supported (FPGA)
External trigger response	Maximum response frequency 500 times/sec

DETECTION ANAYLSYS

Lowest time resolution	8 ns
Max. analysis bandwidth	100 MHz
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 * 8 ns); POI = N * D * 8 ns
N for FFT points (2048,1024,512,256,128,64,32)
D for decimate factor (1, 2, 4, 8...)

Typical settings	FFT refresh rate	POI
N = 2048, D = 1	61,035 times/sec	16.384 us
N = 32, D = 1	3,906,250 times/sec	0.256 us

Max. analysis bandwidth	100 MHz
Window function	B-Nuttall, Flat-top, LowSideLobe
RBW	14.73 MHz-3.59 kHz (Flat-top) 7.81 MHz-1.90 kHz (B-Nuttall) 13 grades for each window type
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	2.92 mm (F), Input impedance 50 Ω
Reference input	MMCX (F), amplitude ≥ 1.5 Vpp, input impedance is about 330 Ω
Reference output	Integrated in MUXIO, 3.3 V CMOS, programmable on/off
External trigger input	MMCX (F), 3.3V CMOS, input: high impedance
External trigger output	MMCX (F), 3.3 V CMOS
Analog IF output	MMCX (F), maximum output power: -25 dBm, output impedance 50 Ω supported, 307.2 MHz±50 MHz

GNSS antenna	MMCX (F)	
General USB2.0	Type-C	
Power consumption	13-16 W	
Size (D * W * H) and weight	**NXE-90**	**NXE-200**
	167 x117 x30 mm and about 660 g	167 x117 x30 mm and about 695 g
GNSS synchronization	Internal GNSS	+/- 100 ns
	Internal GNSS (opt05)	+/- 75 ns
	Internal GNSS (opt06)	+/- 50 ns
System requirements	Linux	aarch64, x64
	Windows	x64
Operating temperature	T0 class (std.)	0-50 °C
(ambient)	T1 class (opt40)	-20-65 °C
Storage temperature	T0 class (std.)	-20-70 °C
(ambient)	T1 class (opt40)	-40-85 °C
Packaging and accessories	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.

(3) 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
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

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