NX Series

PRODUCT DATASHEET

NETWORKED REAL-TIME SPECTRUM ANALYZER

NXN-400 SERIES
40 GHz

V1.4 25/08/08

AROGIC

NXN-400
SERIES OVERVIEW

Key facts

Frequency range: 9 kHz - 40 GHz

1 GHz DANL: -159 dBm/Hz

1 GHz phase noise: -107 dBc/Hz@10 kHz

Analysis bandwidth: up to 100 MHz

1000M/100M Ethernet interface

Highly compatible API interface

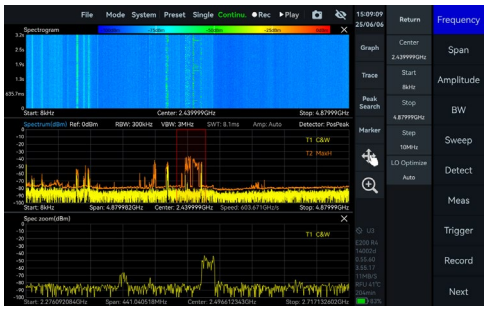
Windows 11/10/8/7 (x86, x64, AArch64) are supported

Debian 12/11/10 (x64, AArch64) are supported

Ubuntu 24.04/22.04/20.04/18.04 (x64, AArch64) are supported

Applications

Standard spectrum sweep



IQ streaming and analysis

Power vs time measurement

Real-time analysis

Specifications*

FREQUENCY

Frequency range	**NXN-400**	-
	9 kHz - 40 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-400		-	
Carrier frequency	1 GHz	40 GHz	-	-
1 kHz	-99.0	-78.4	-	-
10 kHz	-107.5	-85.7	-	-
100 kHz	-107.7	-85.1	-	-
1 MHz	-122.7	-100.8	-	-

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

	NXN-400		-	
Reference level (R.L.)	0 dBm	-50 dBm	-	-
9 kHz - 10 GHz	-72	-103	-	-
10 GHz - 20 GHz	-91	-115	-	-
20 GHz - 40 GHz	-85	-105	-	-

Image rejection **Spur reject = standard**	**NXN-400**	-
90 MHz - 33 GHz	> 90 dBc (typ.)	-

33 GHz - 40 GHz	> 58 dBc (typ.)	-

IF rejection	> 90 dBc; 8.2 GHz - 21.75 GHz: > 68 dBc
Local oscillator related spurious	<-65 dBc Center frequency ± (N/M) * 100 MHz, N, M = 1, 2, 3, 4, 5…

IIP3 / IIP2 (dBm)

	NXN-400		-	
Carrier frequency	1 GHz	40 GHz	-	-
R.L. = 20 dBm	40.3/75.5	31.7/88.6	-	-
R.L. = 0 dBm	27.4/45.3	10.3/86.1	-	-
R.L. = -20 dBm	8.7/25.2	4.8/66.6	-	-

AMPLITUDE

Max. input power (CW)	23 dBm	50 MHz - 40 GHz and the preamplifier is off
	10 dBm	9 kHz - 50 MHz or preamplifier is on
Max. DC voltage		±10 VDC
Display range		DANL-20 dBm (typ.)
Amplitude accuracy	9 kHz - 9.5 GHz	±2.0 dB
	9.5 GHz – 40 GHz	±3.0 dB
IF in-band flatness		±2.0 dB
Reference level (R.L.)		-50 dBm - 20 dBm (typ.)
RF preamplifiers		Automatically turn on or forcibly turn off
VSWR		
90 MHz -16 GHz		<2.0:1
16 GHz - 40 GHz		<3.0:1

Display average noise level (DANL) (dBm/Hz)
RBW=1 kHz

	NXN-400		-	
Reference level	-20 dBm	-50 dBm	-	-
9 kHz – 1 MHz	-136.0	-145.8	-	-
1 MHz - 88 MHz	-153.7	-158.0	-	-
88 MHz - 9.0 GHz	-154.1	-159.9	-	-
9.0 GHz - 19 GHz	-156.8	-161.5	-	-

19 GHz - 40 GHz	-145.2	-149.3	-	-

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, spectrogram, and historical trace
Measurements	Channel power, OBW, X dB bandwidth, Adjacent channel power ratio, IM3

Sweep speed	**NXN-400**	-
RBW ≥ 1 MHz FPGA **Spur Reject = Standard**	about 317.8 GHz/s	-
RBW = 250 kHz FPGA **Spur Reject = Standard**	about 326.7 GHz/s	-
RBW = 50 kHz FPGA **Spur Reject = Standard**	about 22.8 GHz/s	-
RBW = 1 kHz CPU **Spur Reject = Standard**	about 1.6 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	Maximum: 125 MSPS decimate factor: 1, 2, 4, 8, 32, 64, 128, 256, 512, 1024, 2048, 4096
External trigger response	Maximum response frequency 500 times/s

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/s	16.384 us
	N = 32, D = 1	3,906,250 times/s	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	Type-C, power supply dedicated port, please provide 12V2A peak power supply capacity Allowable voltage range 9 - 12 V, ripple less than 200mVp
Dat	RJ45 1000 Mbps * 1, 100 Mbps * 1
RF input	2.92 mm (F), Input impedance 50 Ω
External reference clock input	MMCX (F), amplitude ≥ 1.5 Vpp, input impedance is about 330 Ω
Reference clock output	Integrated in MUXIO, 3.3 V CMOS, programmable on/off
External trigger input	MMCX (F), 3.3V CMOS, input: high impedance
Trigger output	MMCX (F), 3.3 V CMOS
Analog IF output	MMCX (F), maximum output power -25dBm, output impedance 50 Ω Supporting, 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	NXN-400	-
	167 * 117 * 30 mm and about 665 g	-
GNSS synchronization	Internal GNSS	±100 ns
	Internal GNSS (opt05)	±75 ns
	Internal GNSS (opt06)	±50 ns
System requirements	Windows 11/10/8/7	x86, x64, AArch64
	Debian 12/11/10	x64, AArch64
	Ubuntu 24.04/22.04/20.04/18.04	x64, AArch64
Operating temperature (ambient)	T0 class (std.)	0 - 50 °C
	T1 class (opt40)	-20 - 65 °C
Storage temperature (ambient)	T0 class (std.)	-20 - 70 °C
	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;

(4) Necessary heat dissipation is provided to ensure the ambient and core temperature within the rated range at the same time.

(5) Sweep speed and display average noise level test conditions: MCU:0.55.57,FPGA:0.55.22,API:0.55.61

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 demodulation	software
72	Pulse detection	software

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