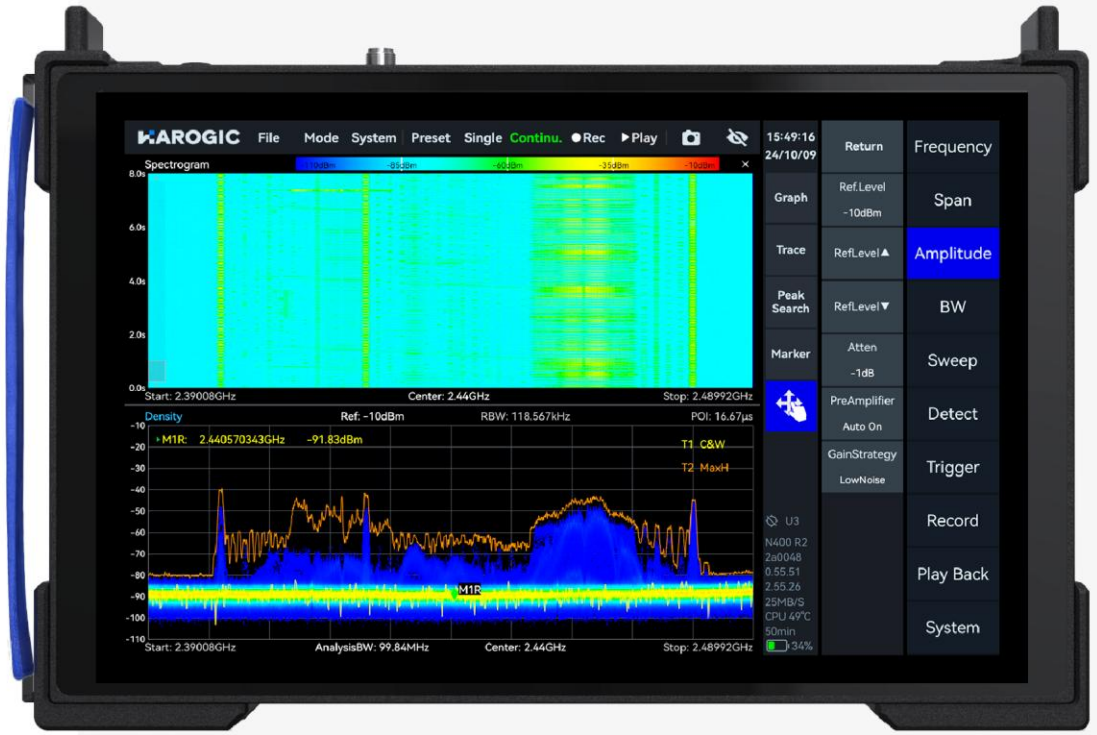
PX Series

PRODUCT DATASHEET



Handheld/Benchtop REAL-TIME SPECTRUM ANALYZER

PXN-400 Z
40 GHz

V1.4 25/08/08

KAROGIC

PXN-400 Z
OVERVIEW

Key facts

Windows11 operating system

1.19 kg lightweight, 8.8-inch multi touchscreen

Frequency range: 9 kHz - 40 GHz

1 GHz DANL: -159 dBm/Hz

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

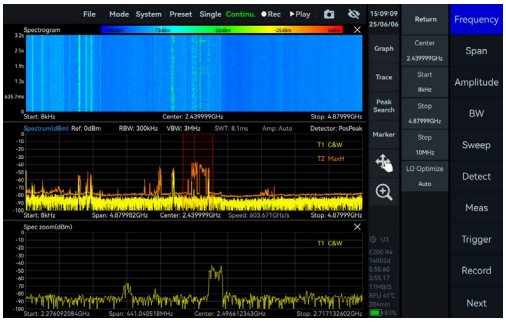
Analysis bandwidth: up to 100 MHz

CPU: high performance AMD Z1 Extreme

16 GB RAM and 512 GB SSD

Applications

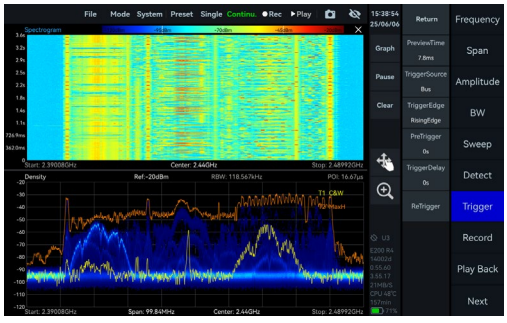
Standard spectrum sweep



IQ streaming and analysis

Power vs time measurement

Real-time analysis



PX Series

Applications

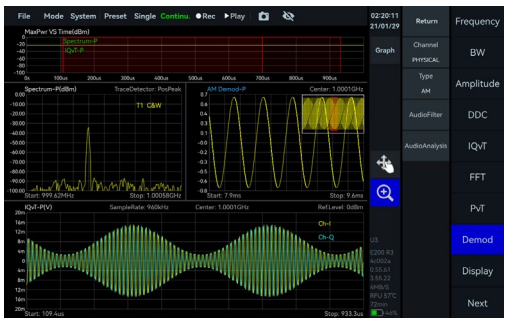
Channel power/ACPR

Phase noise

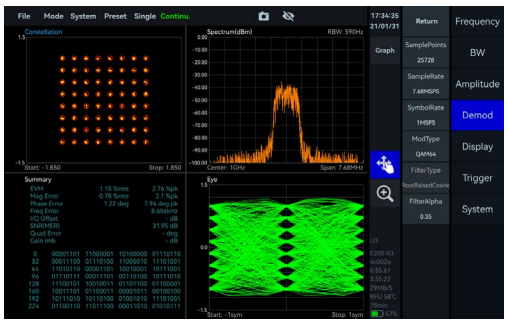
Frequency tracking

Pulse signal measure

AM/FM demodulation



Basic digital demodulation



Specifications*(Preview)

FREQUENCY

Frequency range	**PXN-400 Z**	-
	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
Aging and temperature stability	TCXO (std.)	<1 ppm/year, <1 ppm
	OCXO (opt01)	<1 ppm/year, <0.15 ppm

SPECTRUM PURITY

SSB phase noise (dBc/Hz)

	PXN-400 Z		-	
Carrier frequency	1 GHz	40 GHz	-	-
1 kHz	-99	-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

	PXN-400 Z		-	
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**	**PXN-400 Z**	-
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)

	PXN-400 Z		-	
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)	20 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

	PXN-400 Z		-	
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	1 Hz - 10 MHz
VBW	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	**PXN-400 Z**	-
RBW ≥ 1 MHz FPGA spur reject = standard	about 572.3 GHz/s	-
RBW = 250 kHz FPGA spur reject = standard	about 596.2 GHz/s	-
RBW = 50 kHz FPGA spur reject = standard	about 22.2 GHz/s	-
RBW = 1 kHz CPU spur reject = standard	about 1.3 GHz/s	-

IQ RECORDING

Burst recording bandwidth	Maximum: 100 MHz The built-in memory depth is 128 Mbytes
Continuous recording bandwidth	Maximum: 50 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	USB PD
Data interface	USB3.0 Type-C * 1
RF input	2.92mm (F), Input impedance 50 Ω
External Reference clock input	MMCX (F), amplitude ≥ 1.5 Vpp, input impedance is about 300 Ω
Reference clock output	Integrated in MUXIO, 3.3 V CMOS, programmable on/off
External trigger input	Integrated in MUXIO, 3.3 V CMOS, input: high impedance
Trigger output	Integrated in MUXIO, 3.3 V CMOS
External antenna input	MMCX (F)

Display	IPS LCD 2560×1600, 8.8-inch multi-touch screen
EMMC storage	512 GB
Power consumption	25 - 45 W (typ.)

Size (D * W * H) and weight	222 mm * 147 mm * 42 mm and about 1.19 kg	
GNSS synchronization	GNSS (only support external antenna)	±100 ns
Operating temperature (ambient)	0 - 50 °C	
Storage temperature (ambient)	0 - 70 °C	
Packaging and accessories	spectrum analyzer * 1, power adapter * 1, power cable * 1, calibration certificate*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
34	External omnidirectional antenna, 400-8000MHz, Gain<2dBi	accessory
71	Basic digital modulation analysis	software
72	Pulse signal measurement	software

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