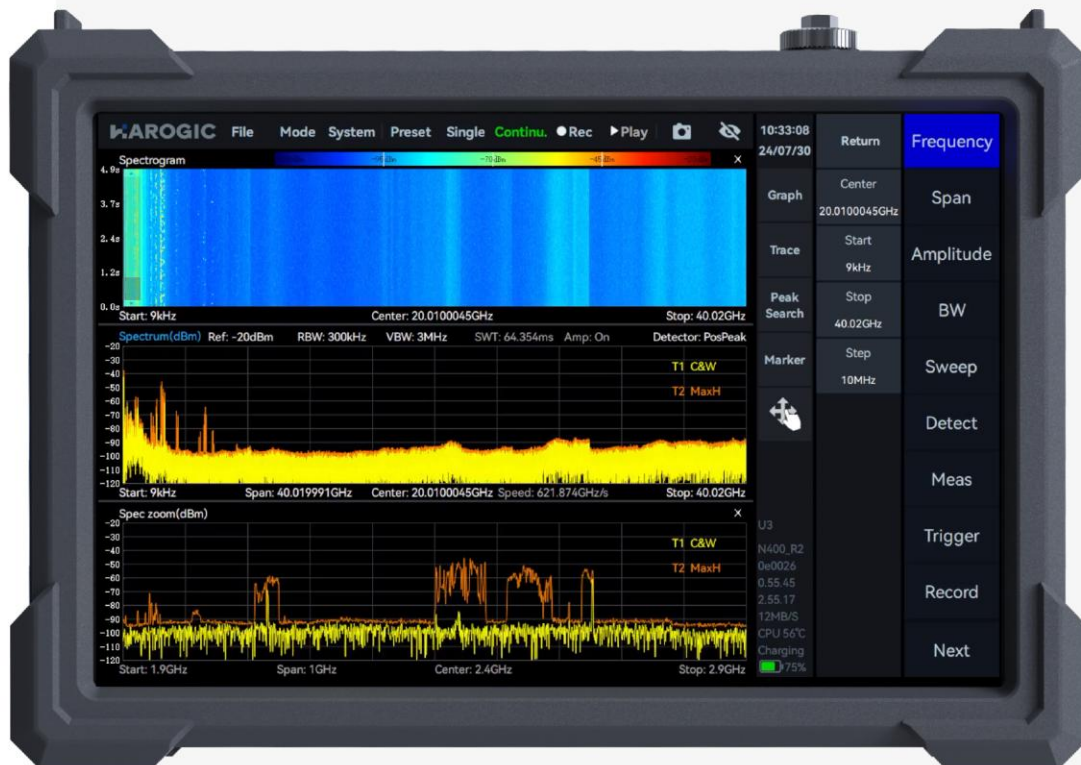




HANDHELD/BENCHTOP REAL-TIME SPECTRUM ANALYZER

PXN-400 SERIES
40 GHz



PXN-400

SERIES OVERVIEW

Key facts

Measure wide, measure smart

1.5 kg lightweight, 10.1-inch multi touchscreen

Frequency range: 9 kHz to 40 GHz

1 GHz DANL: -159 dBm/Hz

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

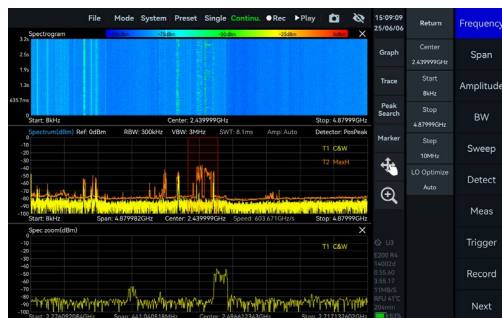
Analysis Bandwidth: up to 100 MHz

Channel power, phase noise and more

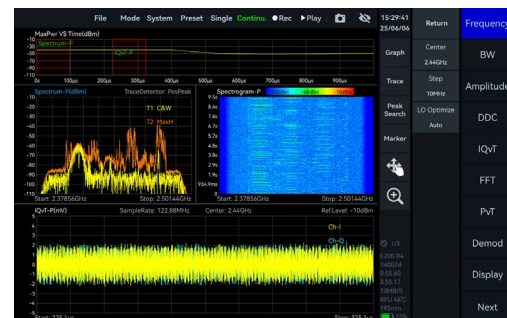
3 hours operation time, external power bank supported

Applications

Standard spectrum sweep



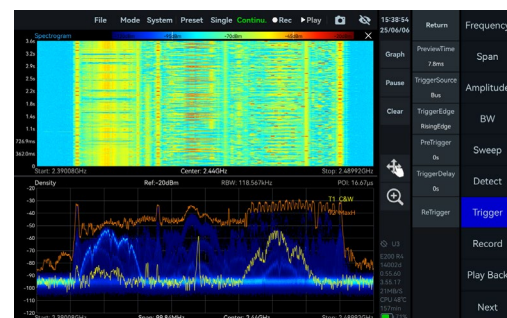
IQ streaming and analysis



Power vs time measurement



Real-time analysis



Applications

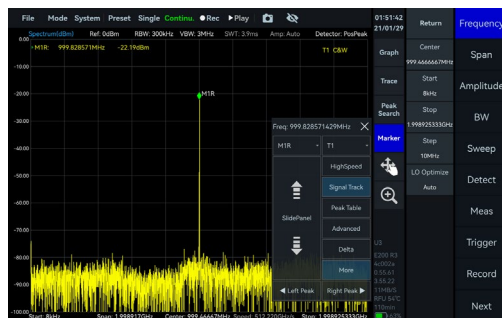
Channel power/ACPR



Phase noise



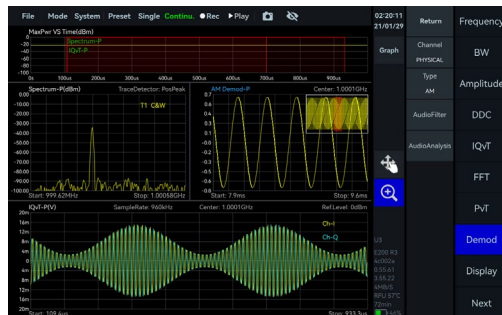
Frequency tracking



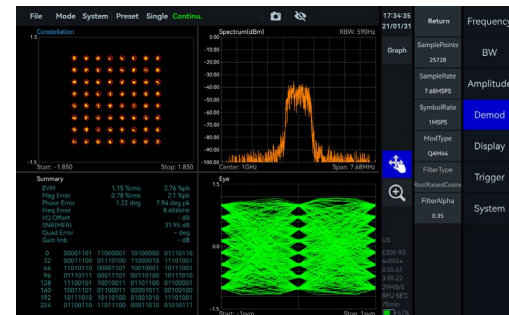
Pulse signal measure



AM/FM demodulation



Basic digital demodulation



Specifications*

FREQUENCY

Frequency range	PXN-400		-
	9 kHz - 40 GHz		-
Reference clock	Internal or external		
Frequency accuracy	OCXO (std.)	<1 ppm, manual correction is available	
	OCXO (opt01)	<1 ppm, manual correction is available	
Aging and temperature stability	OCXO (std.)	<1 ppm/year, <1 ppm	
	OCXO (opt01)	<1 ppm/year, <0.15 ppm	

SPECTRUM PURITY

SSB phase noise (dBc/Hz)				
Carrier frequency	PXN-400		-	
	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				
Reference level (R.L.)	PXN-400		-	
	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		-	
90 MHz - 33 GHz	> 90 dBc (typ.)		-	
33 GHz - 40 GHz	> 58 dBc (typ.)		-	

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

IIP3/IIP2 (dBm)				
PXN-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

PXN-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	1 Hz-10 MHz
VBW	1 Hz-10 MHz
Data chart	SASudio4 software provides spectrum, waterfall chart, and historical trace
Measurements	Channel power, OBW, XdB bandwidth, Adjacent channel power ratio, IM3

Sweep speed	PXN-400	-
RBW ≥ 1 MHz FPGA Spur reject = standard	about 569.6 GHz/s	-
RBW = 250 kHz FPGA Spur reject = standard	about 594.1 GHz/s	-
RBW = 50 kHz FPGA Spur reject = standard	about 22.9 GHz/s	-
RBW = 1 kHz CPU Spur reject = standard	about 1.5 GHz/s	-

IQ RECORDING

Burst recording bandwidth	Maximum: 100 MHz The built-in memory depth is 128 Mbytes
Continuous recording bandwidth	Maximum: 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 ANALYSIS

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 = $10^9 \text{ ns} / (N * D * 8 \text{ ns})$; POI = $N * D * 8 \text{ ns}$
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 (65 W)

USB port

USB3.0 Type-C * 1, USB2.0 Type-C * 1, USB2.0 Type-A * 1

Video and audio interfaces

Micro HDMI * 1 (support for extended display), 3.5mm headphone port * 1

RF input

2.4 mm (M), Input impedance 50 Ω

External reference clock input

MMCX (F), amplitude $\geq 1.5 \text{ Vpp}$, input impedance is about 330 Ω

Reference clock output

Integrated in MUXIO, 3.3 V CMOS, programmable on/off

External trigger input

MMXC (F), 3.3 V CMOS, input: high impedance

External trigger output

MMXC (F), 3.3 V CMOS

Analog IF output

MMCX (F), maximum output power – 25 dBm, output impedance 50 Ω
Supporting 307.2 MHz $\pm$ 50 MHz

Display	IPS LCD 1280 * 800, 10.1-inch multi-touch screen	
EMMC storage	16 GB	
Power consumption	25 W (typ.)	
Size (D * W * H) and weight	260 * 179 * 46 mm about 1.5 kg	
GNSS synchronization	Internal GNSS (external antenna support only)	± 100 ns
Operating temperature (ambient)	0 - 50 °C	
Storage temperature (ambient)	-20 - 70 °C	
Packaging and accessories	Spectrum analyzer with protective shell * 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 demodulation	software
72	Pulse detection	software

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