YSA-U090 SERIES
USB REAL-TIME SPECTRUM ANALYZER

At a Glance

YSA-U090 Series is XGY's benchmark-grade USB real-time spectrum analyzer that offers laboratory-grade RF performance in a compact, portable form factor at an affordable price.

With a frequency range from 9 kHz to 9 GHz, a remarkable dynamic range of -168 dBm/Hz, and an analytical bandwidth of up to 100 MHz, the YSA-U090 guarantees precise and comprehensive signal detection.

It is perfect for various applications including wireless monitoring, interference hunting, automated test systems, scientific research, and education.

Ultra-Portable Design

- Compact size (163 x 66 x 37 mm)
- Lightweight (<= 420 g)
- USB 3.0 Type-C interface
- Ideal for field & drone applications

Easy to Use

- Cross-platform (Windows & Linux)
- Rich API SDK (C/C++, Python, etc.)
- Built-in GNSS positioning
- Plug-and-play USB connectivity

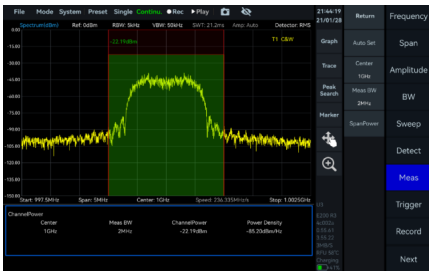
High Performance

- 9 kHz to 9 GHz Frequency Range
- Superheterodyne Architecture
- 14-Stage Pre-selection Filters
- DANL -168 dBm/Hz (Typ.)

Advanced Analysis

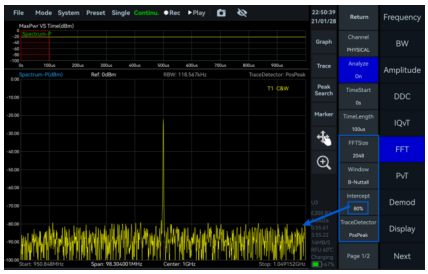
- 100 MHz Real-Time Bandwidth
- Scan Speed >= 1 THz/s
- 100% POI for Transient Signals
- FPGA-based FFT Engine

Application Software Operation Overview



Standard Spectrum Analysis

- Panoramic sweep and zoom
- Trace-based signal analysis
- Spectrogram (Waterfall) display
- Channel Power, OBW, ACPR
- IP3/IM3 measurement
- Signal recording capability



IQ Streaming

- Fixed LO IQ capture
- Time-domain signal recording
- IQ waveform & Spectrogram
- Power-time display
- AM/FM & Audio analysis
- Multi-channel DDC

Power Detection Mode

- Fixed LO configuration
- Time-power analysis
- Power-time waveform & zoom
- Data recording & playback
- Pulse detection (optional)

Real-Time Analysis Mode

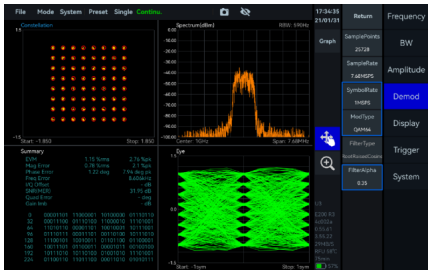
- Fixed LO IQ capture
- Transient & burst analysis
- Spectrum probability density
- Real-time spectrogram
- Real-time record & playback

Harmonics

- Fundamental frequency analysis
- Harmonic distortion evaluation
- Non-linear characterization
- Harmonic spectrum diagram
- Detailed measurement table

Phase Noise Measurement Mode

- Automated measurement
- High-precision SSB spectrum
- Detailed data tables
- Phase stability evaluation
- Noise density analysis



Digital Demodulation Mode (Opt)

- Signal quality assessment
- ASK/FSK/PSK/GMSK/QAM
- Constellation & Eye diagrams
- Bit table & data extraction
- Modulation performance analysis

GNSS Module

- External GNSS module support
- USB-to-serial connection
- Virtual serial interface
- Configurable COM & Baud rate
- Real-time positioning display

Technical Specifications

Frequency	
Frequency Range	9 kHz – 9 GHz
Reference Clock	Internal or External (10 MHz)
Frequency Accuracy	< 0.5 ppm (Standard, Manual correction supported) < 0.2 ppm (Option 01 OCXO) < 0.05 ppm (GNSS Locked)
Aging Rate	< 1 ppm/year (Standard TCXO) < 0.15 ppm/year (Option 01 OCXO)

Spectral Purity (SSB Phase Noise @ 1 GHz)	
Offset 100 Hz	-88 dBc/Hz (Typ.)
Offset 1 kHz	-99 dBc/Hz (Typ.)
Offset 10 kHz	-112 dBc/Hz (Typ.)
Offset 100 kHz	-115 dBc/Hz (Typ.)
Offset 1 MHz	-132 dBc/Hz (Typ.)
Spurious Responses	Image Rejection: > 95 dBc (Typ.) IF Rejection: > 95 dBc (Typ.)

Amplitude & Dynamic Range	
Max Input Power	+23 dBm (CW, Preamp Off) +10 dBm (Preamp On)
Max DC Voltage	± 10 VDC
Amplitude Accuracy	± 1.0 dB (20°C to 30°C) ± 1.5 dB (Full Temp Range)
IF Flatness	± 1.5 dB (50 MHz Bandwidth)
VSWR	< 2.0:1 (Nominal, 90 MHz to Max Freq)
DANL @ 1 GHz	-154 dBm/Hz (Preamp Off) -168 dBm/Hz (Preamp On, Typ.)
IIP3 @ 1 GHz	+23 dBm (0 dBm Ref Level) +42 dBm (+20 dBm Ref Level)

Real-Time Spectrum Analysis (RTSA)	
Analysis Bandwidth	50 MHz (Standard) 100 MHz (Option 50)
FFT Rate	> 15,000 FFTs/s (Standard) Up to 3.9 Million FFTs/s (N=32, D=1)
POI (100% Intercept)	Minimum signal duration for 100% POI: approx. 131 us (Standard), down to 0.5 us (High speed mode)
Window Functions	Kaiser, Blackman-Harris, Flat-Top, Hanning, Rectangular
Detectors	Positive Peak, Negative Peak, Sample, Average, RMS

Sweep Speed	
Scan Rate	>= 1 THz/s (RBW = 250 kHz, FPGA Mode)
Fine Scan	>= 300 GHz/s (RBW = 25 kHz, FPGA Mode) >= 4 GHz/s (RBW = 1 kHz, CPU Mode)

General Specifications	
Data Interface	USB 3.0 Type-C (Supports USB 2.0 with reduced bandwidth)
Power Supply	USB Type-C (5V 3A), Power Consumption <= 20 W
RF Connector	N-Type Female (50 Ω)
Auxiliary Ports	GNSS Antenna (SMA), Trigger In/Out (MMCX), Ref Clock (MMCX)
Dimensions	163 x 66 x 37 mm (Full Enclosure)
Weight	<= 420 g
Operating Temp	0°C to +50°C (Ambient)
OS Support	Windows 7/8/10/11 (x86/x64) Linux (Debian 10/11/12, Ubuntu 18.04-24.04)

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Specifications subject to change without notice. Per AS/NZS standards.