

# YSA-P400 SERIES HANDHELD/BENCHTOP REAL-TIME SPECTRUM ANALYZER

## At a Glance

YSA-P400 Series is XGY's popular handheld/benchtop real-time spectrum analyzer that offers laboratory-grade RF performance in a portable form factor at an affordable price.

Ultra-wide frequency range from 9 kHz up to 40 GHz, remarkable dynamic range of -161 dBm/Hz and an analytical bandwidth of 100 MHz, the YSA-P400 guarantees precise and comprehensive signal detection.

It is perfect for various applications including wireless monitoring, interference hunting, radar testing, 5G network maintenance, EMC pre-compliance, scientific research, and education.



## Ultra-Portable Design

- 1.5 kg lightweight
- 3 hours battery life
- External power bank supported

## Easy to use

- 10.1-inch multi-touch screen
- Intuitive gesture control
- Compact handheld form factor

## High performance

- Frequency range: 9 kHz to 40 GHz
- 1 GHz DANL: -161 dBm/Hz
- 1 GHz PN: -107 dBc/Hz@10kHz
- Analysis Bandwidth: up to 100 MHz

## Advanced Analysis

- IQ streaming and analysis
- Real-time analysis
- Phase noise measurement
- Channel power/ACPR



# 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



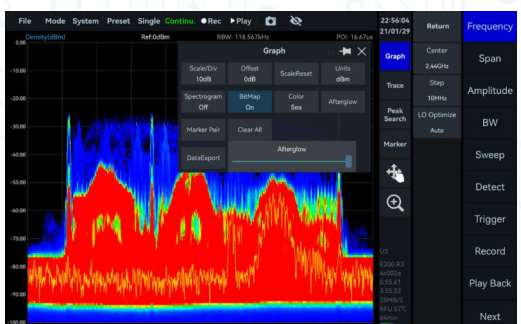
## IQ Streaming

- 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)



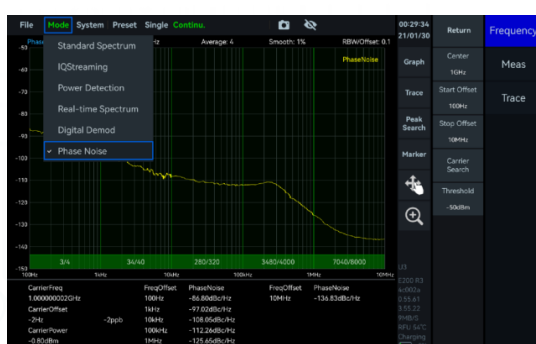
## Real-Time Analysis Mode

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



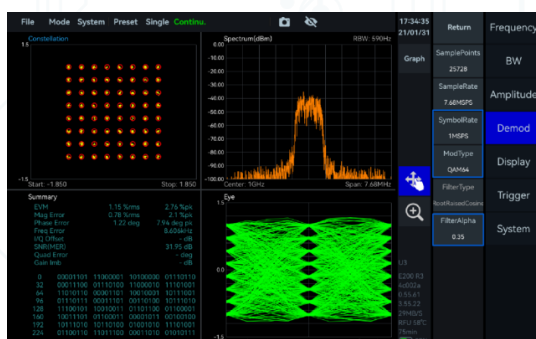
## Harmonics

- 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)

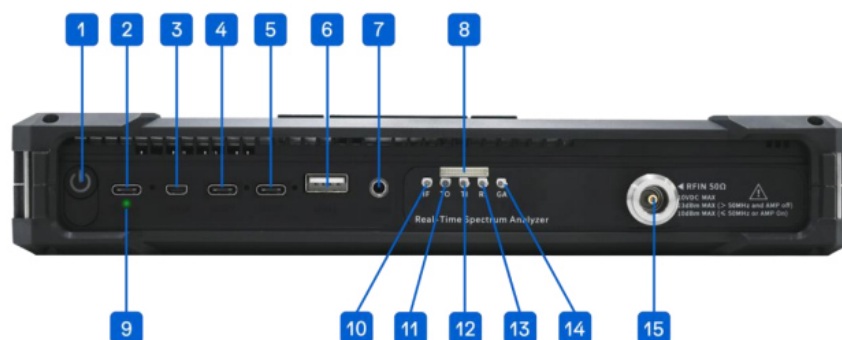
- Signal quality assessment
- ASK/FSK/PSK/GMSK/QAM
- Constellation & Eye diagrams
- Bit table & data extraction
- Modulation performance analysis



## GNSS module

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

## Front panel interface description



### Detailed information of external interface

| No. | Interface                | Description                                                                                                            |
|-----|--------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1   | Power                    | On/Off instrument                                                                                                      |
| 2   | Charging                 | Instrument charging port, USBPD 20V 3.25A. Please connect the power supply according to the datasheet.                 |
| 3   | Micro HDMI               | For extended display.                                                                                                  |
| 4   | USB3                     | USB Interface Details:USB3 is a USB 3.0 interface. USB1 and USB2 are USB 2.0 interfaces.                               |
| 5   | USB2                     | Used to connect external storage devices, USB keyboards, or mice.                                                      |
| 6   | USB1                     | Can connect a driver -free Hub with an Ethernet port for remote PC control via network cable.                          |
| 7   | Audio Output             | 3.5mm headphone jack. Volume can be adjusted via the menu: "System" -> "Device" -> "Volume".                           |
| 8   | MUXIO                    | 14 Pin misc interface                                                                                                  |
| 9   | Charging Indicator Light | Green flash: Charging Green solid light: Fully charged                                                                 |
| 10  | Analog IF Output         | MMCX(F), maximum output power -25 dBm, output impedance 50 $\Omega$ .                                                  |
| 11  | Trigger Output           | 3.3V CMOS.                                                                                                             |
| 12  | Trigger Input            | 3.3V CMOS, high impedance input.                                                                                       |
| 13  | Reference Clock Input    | MMCX(F), amplitude 1.5Vpp, input impedance 330 $\Omega$ . Sine wave, square wave, and clipped sine wave are supported. |
| 14  | GNSS Antenna             | MMCX(F), amplitude 1.5Vpp, input impedance 330 $\Omega$ .                                                              |
| 15  | RF Input                 | N(F) or 2.4 mm (M), input impedance 50 $\Omega$ .                                                                      |

# Specifications

| Category           | Parameter / Condition                   | Specification                                                                                |
|--------------------|-----------------------------------------|----------------------------------------------------------------------------------------------|
| Frequency          | Frequency Range                         | 9 kHz - 40 GHz                                                                               |
|                    | Reference Clock                         | Internal or External                                                                         |
|                    | Frequency Accuracy                      | OCXO (std.), <1 ppm                                                                          |
|                    | Aging & Temp. Stability                 | OCXO (std.), <1 ppm/year                                                                     |
| Spectrum Purity    | SSBPhase Noise<br>(Carrier: 1 GHz)      | 1 kHz: -99 dBc/Hz<br>10 kHz: -107.5 dBc/Hz<br>100 kHz: -107.7 dBc/Hz<br>1 MHz: -122.7 dBc/Hz |
|                    |                                         | 1 kHz: -78.4 dBc/Hz<br>10 kHz: -85.7 dBc/Hz<br>100 kHz: -85.1 dBc/Hz<br>1 MHz: -100.8 dBc/Hz |
|                    | Image Rejection                         | 9 kHz - 3 GHz: > 90 dBc (typ.)<br>3 GHz - 9.5 GHz: > 58 dBc (typ.)                           |
|                    | LO Related Spurious                     | < -65 dBc                                                                                    |
|                    |                                         |                                                                                              |
| Amplitude          | Max. Input Power (CW)                   | +20 dBm (90 MHz-40 GHz, preamp off)<br>+8 dBm (9 kHz-90 MHz or preamp on)                    |
|                    | Max. DC Voltage                         | ± 10 VDC                                                                                     |
|                    | Display Range                           | DANL to 20 dBm (typ.)                                                                        |
|                    | Amplitude Accuracy                      | ± 2.0 dB (9 kHz - 9.5 GHz)<br>± 3.0 dB (9.5 GHz - 40 GHz)                                    |
|                    | IF In-band Flatness                     | ± 2.0 dB                                                                                     |
|                    | Reference Level (R.L.)                  | -50 dBm to 20 dBm (typ.)                                                                     |
|                    | RF Preamplifiers                        | Automatic / Forcibly turn off                                                                |
|                    | VSWR                                    | <2.0:1 (90 MHz - 16 GHz)<br><3.0:1 (16 GHz - 40 GHz)                                         |
| Sensitivity (DANL) | Display Average Noise Level (RBW=10kHz) | Ref level: -20 / -50 dBm                                                                     |
|                    | 9 kHz                                   | -134 / -145 dBm/Hz                                                                           |
|                    | 100 kHz - 88 MHz                        | -151 / -157 dBm/Hz                                                                           |
|                    | 88 MHz - 9.0 GHz                        | -148 / -154 dBm/Hz                                                                           |
|                    | 9.0 GHz - 19 GHz                        | -153 / -158 dBm/Hz                                                                           |
|                    | 19 GHz - 40 GHz                         | -146 / -147 dBm/Hz                                                                           |
| Non - Linearity    | IIP3 / IIP2 (Carrier: 1 GHz)            | Ref 20dBm: 40.3 / 75.5 dBm<br>Ref 0dBm: 27.4 / 45.3 dBm<br>Ref -20dBm: 8.7 / 25.2 dBm        |
|                    |                                         | Ref 20dBm: 31.7 / 88.6 dBm<br>Ref 0dBm: 10.3 / 86.1 dBm<br>Ref -20dBm: 4.8 / 66.6 dBm        |
|                    |                                         |                                                                                              |
|                    | IIP3 / IIP2 (Carrier: 40 GHz)           |                                                                                              |
| Inputs / Outputs   | Power Supply                            | USB PD (20 V)                                                                                |
|                    | Data Interfaces                         | USB3.0 Type-C × 1, USB2.0 Type-C × 1, USB2.0 Type-A × 1                                      |
|                    | Video/Audio Interfaces                  | Micro HDMI × 1 (extended display), 3.5mm headphone port × 1                                  |
|                    | RF Input                                | 2.4 mm (Male), 50 Ω                                                                          |
|                    | Reference Input                         | MMCX (F), ≥ 1.5 Vpp, ~300 Ω                                                                  |
|                    | Reference Output                        | Integrated in MUXIO, 3.3 V CMOS, programmable on/off                                         |
|                    | Ext. Trigger Input/Output               | Integrated in MUXIO, 3.3 V CMOS (Input: high Z)                                              |
|                    | Analog IF Output                        | MMCX (F), Max -25 dBm, 50 Ω, 307.2 MHz ± 50 MHz                                              |
| General            | Display                                 | IPS LCD 1280×800, 10.1-inch multi-touch screen                                               |
|                    | Storage                                 | 16 GB EMMC                                                                                   |
|                    | Power Consumption                       | Typical 25 W                                                                                 |
|                    | Size & Weight                           | 260 x 179 x 46 mm, approx. 1.5 kg                                                            |
|                    | GNSS Synchronization                    | Internal GNSS (+/- 100 ns)                                                                   |
|                    | Operating Temperature                   | 0 - 50 °C (ambient)                                                                          |
|                    | Storage Temperature                     | -20 - 70 °C (ambient)                                                                        |
|                    | Included Accessories                    | Protective shell, power adapter, power cable, calibration certificate                        |