

ROHDE & SCHWARZ

UPV

The Rohde & Schwarz UPV is a high-precision audio analyzer designed for testing analog and digital audio interfaces. It provides comprehensive generator and analyzer functions in a single instrument, featuring outstanding measurement accuracy, low residual distortion, and versatile analysis capabilities including high-resolution FFT and intermodulation measurements.

SPECIFICATIONS

General

Interfaces	USB 2.0 (6 ports), LAN (10/100/1000 Base-T Ethernet), GPIB (IEEE-488.2), RS-232, VGA, DVI-D, Reference In/Out, Trigger In/Out
Display	6.4-inch color TFT-LCD, VGA (640 x 480 pixels)

Physical

Power Supply	100 V to 240 V AC ($\pm 10\%$), 50 Hz to 60 Hz / 400 Hz, maximum 150 VA
Operating Temperature	+5 °C to +45 °C °C
Dimensions (W×H×D)	427 mm × 177 mm × 487 mm mm
Weight	15.3 kg (base unit without options) kg

Analog Generator

Number of Channels	2
Connector Types	XLR (balanced), BNC (unbalanced)
Frequency Range	0.1 Hz to 80 kHz
Frequency Accuracy	± 10 ppm
Frequency Resolution	0.1 mHz
Maximum Output Voltage	20 V RMS (balanced), 10 V RMS (unbalanced)
Output Impedance	10 Ω , 200 Ω , 600 Ω (balanced); 5 Ω , 50 Ω , 600 Ω (unbalanced)
Amplitude Accuracy	± 0.05 dB at 1 kHz
Frequency Flatness	± 0.02 dB (20 Hz to 20 kHz, relative to 1 kHz)
Total Harmonic Distortion + Noise (THD+N)	≤ -110 dB (typical -115 dB) at 1 kHz, 1.5 V to 10 V, 10 Hz to 22 kHz bandwidth
Spurious Signals	≤ -120 dB (up to 20 kHz)
Crosstalk	≤ -120 dB (up to 20 kHz)
Waveforms	Sine, Dual-Sine, Multi-Sine, Noise (White, Pink), Arbitrary (ARB), Square, Burst, Polarity

Analog Analyzer

Input Impedance	200 k Ω (balanced), 100 k Ω (unbalanced), switchable to 150 Ω or 600 Ω
Maximum Input Voltage	110 V RMS / 156 V peak
Input Coupling	AC, DC
Residual THD+N	≤ -110 dB (typical -115 dB) at 1 kHz, 1 V to 20 V, 10 Hz to 22 kHz bandwidth
Noise Floor	≤ -124 dBu (≤ 0.5 μ V), A-weighted, input shorted
Common Mode Rejection Ratio (CMRR)	≥ 100 dB (at 50/60 Hz), ≥ 86 dB (at 1 kHz)
Crosstalk (Channel-to-Channel)	≤ -120 dB (up to 20 kHz)

Digital Audio Interfaces

Digital Formats	AES/EBU, S/PDIF (coaxial & optical)
Sampling Frequency Range	30 kHz to 200 kHz
Sampling Frequency Accuracy	± 10 ppm
Input/Output Impedance	110 Ω (balanced XLR), 75 Ω (unbalanced BNC)

Measurement Functions & Processing

Measurement Modes	RMS (with/without selective filter), Peak, Quasi-Peak, Average, Crest Factor
FFT Analysis Size	Up to 256k points
FFT Windowing Functions	Rectangular, Hann, Hamming, Blackman-Harris, Flat-Top, Kaiser-Bessel, Rife-Vincent
Weighting Filters	A-weighting, C-weighting, CCIR-1k weighted, CCIR unweighted, CCITT, C-message, IEC-651
Intermodulation Distortion (IMD) Methods	MOD (DIN/IEC), DFD (IEC 60268-3), DIM (IEC 60268-3)
Wow and Flutter Standards	IEC, DIN, NAB, JIS

System, Software & Control

Internal Operating System	Windows
Control Interface	Front panel keypad, rotary knob, or external keyboard/mouse
Automation Programming Interfaces	SCPI command set, LabVIEW drivers
Data Export Formats	ASCII, CSV, XML, MAT (MATLAB)

Connectivity & Expansion

GPIB Interface	IEEE-488.2 compatible
LAN Port	RJ-45, 10/100/1000 Base-T Ethernet
USB Ports	6 $\times$ USB 2.0 (4 on rear panel, 2 on front panel)
External Monitor Output	VGA (D-Sub 15) and DVI-D
Reference Clock Input/Output	10 MHz (BNC, rear panel)
Trigger Input/Output	Trigger Input = BNC (rear panel)
Auxiliary Outputs	Analog monitor outputs = Headphone jack on front panel

Environmental & Compliance

Storage Temperature Range	-20 °C to +70 °C
Recommended Calibration Interval	1 year
Safety Standards	IEC 61010-1, EN 61010-1
EMC Compliance	EN 55011 Class A, EN 61326-1

Performance

Analog-to-Digital Converter Resolution	24-bit
Digital-to-Analog Converter Resolution	24-bit

Options

Analog Bandwidth Extension Option (R&S UPV-B2)	Extends frequency range of analog generator to 185 kHz and analyzer to 250 kHz
Digital Audio Interface Option (R&S UPV-B1)	Adds AES/EBU and S/PDIF (coaxial and optical) digital interfaces
I2S Interface Option (R&S UPV-B4)	Enables digital audio measurements on chip-level I2S interfaces
Audio Switcher Option (R&S UPV-B41)	Supports connection of R&S UPZ audio switchers for multi-channel measurements

Frequency

Analog Generator Frequency Range (Standard)	0.1 Hz to 80 kHz
Analog Generator Frequency Range (with R&S UPV-B2)	0.1 Hz to 185 kHz (with R&S UPV-B2 Analog Bandwidth Extension option)
Analog Analyzer Frequency Range (with R&S UPV-B2)	DC to 250 kHz (with R&S UPV-B2 Analog Bandwidth Extension option)

Software Options

PESQ Measurement Option (R&S UPV-K1)	Enables PESQ ITU-T P.862/P.862.1 speech quality measurements
PEAQ Measurement Option (R&S UPV-K2)	Enables PEAQ ITU-R BS.1387 audio quality measurements
POLQA Measurement Option (R&S UPV-K12)	Enables POLQA ITU-T P.863 speech quality measurements
Hearing Aid Measurement Option (R&S UPV-K21)	Enables hearing aid acoustic measurements in accordance with IEC 60118 and ANSI S3.22

TECHNOLOGY

Audio Test & Measurement

APPLICATIONS

Audio Device Characterization and Design Verification

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