

ROHDE & SCHWARZ

RTO2024

The Rohde & Schwarz RTO2024 is a high-performance 4-channel digital oscilloscope featuring a 2 GHz analog bandwidth, a maximum real-time sample rate of 20 Gsample/s (interleaved), and a 12.1-inch WXGA capacitive touchscreen with SmartGrid interface. Combining excellent signal fidelity with up to 16-bit vertical resolution in High Definition (HD) mode and an acquisition rate of up to 1 million waveforms per second, the RTO2024 is designed for multi-domain applications, including high-speed serial bus analysis, electronic design verification, and EMI troubleshooting.

SPECIFICATIONS

General

Interfaces	4 × USB 3.0, 2 × USB 2.0, USB 2.0 device, Gigabit LAN (LXI), DVI-D, DisplayPort
Display	12.1-inch WXGA capacitive color touchscreen, 1280 × 800 resolution

Physical

Operating Temperature	0 °C to +45 °C °C
Dimensions (W×H×D)	427 mm × 249 mm × 204 mm mm
Weight	9.6 kg

Vertical System

Analog Bandwidth (-3 dB)	2 GHz
Calculated Rise Time (10% to 90%)	175 ps
Number of Input Channels	4
Input Coupling	50 Ω : DC; 1 M Ω : AC, DC, GND
Input Impedance	50 $\Omega \pm 1.5$ %; 1 M $\Omega \pm 1$ % 12 pF
Input Sensitivity Range (50 Ω)	1 mV/div to 1 V/div
Input Sensitivity Range (1 M Ω)	1 mV/div to 10 V/div
Vertical Resolution	8-bit (up to 16-bit in High Definition mode)
Maximum Input Voltage (50 Ω)	5 V RMS
Maximum Input Voltage (1 M Ω)	150 V RMS
DC Gain Accuracy	± 1.5 % of full scale
Offset Range (50 Ω)	± 2 V (1 mV/div to 100 mV/div), ± 5 V (101 mV/div to 1 V/div)
Hardware Bandwidth Limits	Selectable: 20 MHz, 100 MHz, 200 MHz, 500 MHz, 1 GHz, 1.5 GHz
ADC Hardware Resolution	8-bit (up to 16-bit with High Definition mode)
Channel-to-Channel Isolation	> 60 dB (up to 2 GHz)
Probe Interface	Rohde & Schwarz active probe interface
High Definition Mode (HD Mode)	up to 16-bit resolution (selectable digital filtering)

Horizontal System

Timebase Range	25 ps/div to 10000 s/div
Timebase Accuracy	± 0.2 ppm (standard), ± 0.02 ppm (with R&S RTO-B4 OCXO option)
Timebase Delay Range	-1000 s to 10000 s

Acquisition System

Maximum Real-Time Sample Rate	10 Gsample/s per channel (20 Gsample/s interleaved)
Maximum Record Length (Memory Depth)	50 Msample per channel, 200 Msample interleaved (standard); up to 1 Gsample / 2 Gsample (optional)
Segmented Memory	Up to 1,048,576 segments (memory-dependent)
Waveform Capture Rate	1,000,000 waveforms/s
Acquisition Modes	Sample, Peak Detect, Average, High Resolution, Envelope
Mixed Signal Option (MSO)	16 digital channels (optional, with R&S RTO-B1)
Arbitrary Waveform Generator Option	2 channels, 100 MHz, 14-bit (optional, with R&S RTO-B6)

Trigger System

Trigger Sources	Any analog channel, external trigger, AC line
Trigger Modes	Auto, Normal, Single
Trigger Coupling	DC, AC, LF Reject, HF Reject
Standard Trigger Types	Edge, Glitch, Width, Runt, Window, Timeout, Interval, Slew Rate, Setup & Hold, State, Pattern
Advanced Trigger Types	Serial Pattern, Zone Trigger, Protocol Trigger (optional)
Trigger Jitter	< 1 ps RMS (typical)
Trigger Level Range (Internal)	±5 divisions from screen center

Waveform Measurements and Analysis

Automatic Measurements	More than 90 automatic measurement functions
Waveform Math Operators	Basic arithmetic, algebraic, trigonometric, integration, differentiation, FFT, logical, filters
FFT Window Types	Hanning, Hamming, Blackman, Flat Top, Rectangular
FFT Maximum Points	Up to 128 Mpoints (dependent on memory)
Limit / Mask Testing	Standard, user-defined, or templates

Display and User Interface

Display Type	Capacitive color TFT touchscreen with R&S SmartGrid
Display Size	12.1 in
Display Resolution	1280 × 800 pixels (WXGA)
Waveform Display Formats	Y-t, X-Y, X-Y-Z

Connectivity and Interfaces

USB Host Ports	2 × USB 3.0 (rear), 4 × USB 2.0 (2 front, 2 rear)
USB Device Port	1 × USB 2.0 type B (rear)
LAN Interface	RJ-45 connector, 10/100/1000Base-T, LXI Class C compliant
External Trigger Input	BNC, 50 Ω or 1 MΩ
Reference Clock Input	BNC, 10 MHz
Reference Clock Output	BNC, 10 MHz
Video Output Port	DVI-D and DisplayPort

Power Specifications

Power Supply Voltage Range	100 V to 240 V AC (±10%)
Power Consumption	Max. 450 W

Environmental and Compliance

Operating Temperature Range	0 °C to +45 °C
Storage Temperature Range	-40 °C to +70 °C
Operating Altitude	Up to 3000 m
Storage Altitude	Up to 4600 m

Physical Characteristics

Dimensions (W x H x D)	427 mm × 249 mm × 204 mm
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Acquisition & Memory

Standard Memory Depth	50 Msample per channel (4 channels), 100 Msample (2 channels), 200 Msample (1 channel)
Memory Depth Expansion Options	Up to 1 Gsample per channel (option dependent)
Maximum Real-Time Sample Rate (Interleaved)	20 GSa/s (2 channels interleaved)
Timebase Aging	±1 ppm per year (±0.02 ppm per year with R&S RTO-B4 OCXO option)
Timebase Temperature Stability	±1 ppm (±0.02 ppm with R&S RTO-B4 OCXO option)

Signal Generation & Digital Options

MSO Channels Detail	16 digital channels, 400 MHz, 5 GSa/s (with R&S RTO-B1 option)
Arbitrary Waveform Generator Specification	2 analog channels, 100 MHz, 14-bit, 500 MSa/s (with R&S RTO-B6 option)

System & Interfaces

Operating System	Windows Embedded Standard 7 (64-bit)
Storage	Removable SSD
GPIO Interface Option	Supported via R&S RTO-B10 option
LXI Compliance	LXI version 1.4 Class C

Display

Touchscreen Technology	Projected capacitive (PCAP) multi-touch
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Measurements

Digital Voltmeter (DVM)	3-digit measurement on up to 4 channels (DC, AC+DC RMS, AC RMS)
Frequency Counter	7-digit resolution on up to 4 channels

TECHNOLOGY

Digital Phosphor Oscilloscope (DPO)

APPLICATIONS

High-speed digital design, power electronics testing, RF debugging, EMI troubleshooting, serial protocol analysis

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