

ROHDE &amp; SCHWARZ

# RTO64 (1802.0001.04)

The Rohde & Schwarz RTO64 (order code 1802.0001.04) is a high-performance 4-channel digital oscilloscope featuring a 600 MHz base analog bandwidth, a 10-bit vertical resolution, and a brilliant 15.6-inch Full HD capacitive touchscreen. Designed for complex multi-domain debugging and high-speed signal analysis, it provides up to 10 GSa/s sample rate per channel and an exceptional acquisition rate of up to 1 million waveforms per second.

## SPECIFICATIONS

### General

|            |                                                                                                                             |
|------------|-----------------------------------------------------------------------------------------------------------------------------|
| Interfaces | 4x USB 3.1 Gen 1, 2x USB 2.0, 1x USB 3.1 Gen 1 Device, 1x LAN (10/100/1000BASE-T), 1x HDMI, 1x DisplayPort, GPIB (optional) |
| Display    | 15.6-inch TFT capacitive color touchscreen, 1920 × 1080 resolution (Full HD)                                                |

### Physical

|                       |                                                                  |
|-----------------------|------------------------------------------------------------------|
| Power Supply          | 100 V to 240 V AC (±10%) at 50 Hz to 60 Hz or 400 Hz, max. 450 W |
| Operating Temperature | 0 °C to +45 °C °C                                                |
| Dimensions (W×H×D)    | 450 mm × 311 mm × 211 mm mm                                      |
| Weight                | 13.0 kg kg                                                       |

### Vertical System

|                                   |                                                       |
|-----------------------------------|-------------------------------------------------------|
| Analog Bandwidth (-3 dB)          | 600 MHz (base model, software upgradable up to 6 GHz) |
| Number of Input Channels          | 4 analog channels                                     |
| Vertical Resolution               | 10-bit (up to 16-bit in HD mode)                      |
| Calculated Rise Time (10% to 90%) | < 583 ps                                              |
| Input Impedance                   | 50 Ω ± 1.5%, 1 MΩ ± 1%    12 pF (typ.)                |
| Input Coupling                    | 1 MΩ: AC, DC; 50 Ω: DC                                |
| Input Sensitivity Range (50 Ω)    | 500 μV/div to 1 V/div                                 |
| Input Sensitivity Range (1 MΩ)    | 500 μV/div to 10 V/div                                |
| Maximum Input Voltage (50 Ω)      | 5 V RMS, max. peak 30 V                               |
| Maximum Input Voltage (1 MΩ)      | 300 V RMS, CAT I                                      |
| DC Gain Accuracy                  | ±1% of full scale for ≥ 5 mV/div                      |
| A/D Converter Resolution          | 10-bit (up to 16-bit in HD mode)                      |

## Horizontal System

|                                 |                                                               |
|---------------------------------|---------------------------------------------------------------|
| Timebase Range                  | 25 ps/div to 10000 s/div                                      |
| Timebase Accuracy               | ±100 ppb (standard TCXO), ±20 ppb (with RTO6-B4 OCXO option)  |
| Channel-to-Channel Deskew Range | ±100 ns                                                       |
| Timebase Temperature Stability  | ±0.1 ppm (±0.02 ppm with RTO6-B4 OCXO option)                 |
| Timebase Aging                  | ±1 ppm per year (±0.02 ppm per year with RTO6-B4 OCXO option) |

## Acquisition System

|                                  |                                                                      |
|----------------------------------|----------------------------------------------------------------------|
| Maximum Real-Time Sample Rate    | 10 GSa/s per channel (4 channels), 20 GSa/s (2 channels interleaved) |
| Maximum Record Length (Standard) | 200 Mpoints per channel (4 channels), 400 Mpoints (interleaved)      |
| Maximum Record Length (Optional) | Up to 1 Gpoints per channel (2 Gpoints interleaved)                  |
| Waveform Capture Rate            | Up to 1,000,000 waveforms/s                                          |
| Acquisition Modes                | Sample, Peak Detect, Envelope, Average, High Resolution (HD)         |
| History Segment Memory           | Up to 1,000,000 segments (standard)                                  |

## Trigger System

|                        |                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| Trigger Sources        | Analog channels 1 to 4, External Trigger, Line (Mains)                                        |
| Trigger Modes          | Auto, Normal, Single                                                                          |
| Trigger Coupling       | DC, AC, HF Reject, LF Reject, Noise Reject                                                    |
| Standard Trigger Types | Edge, Glitch, Width, Runt, Window, Timeout, Interval, Slew Rate, Setup & Hold, Pattern, State |
| Advanced Trigger Types | Zone Trigger, Serial Bus Trigger (with options)                                               |
| Trigger Jitter         | typ. < 1 ps RMS                                                                               |
| Trigger Level Range    | ±5 div from screen center                                                                     |
| Trigger Hysteresis     | Automatic or adjustable (0 div to 5 div)                                                      |

## Waveform Measurements and Analysis

|                         |                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------|
| Automatic Measurements  | Up to 31 measurements simultaneously                                                            |
| Measurement Statistics  | Mean, Min, Max, Standard Deviation, Count                                                       |
| Waveform Math Operators | +, -, *, /, Integration, Differentiation, FFT, Log, Absolute, Square, Square Root, Sine, Cosine |
| FFT Window Types        | Hanning, Hamming, Blackman, Rectangular, Flat Top                                               |
| FFT Maximum Points      | Up to 8 Mpoints (standard), up to 64 Mpoints (optional)                                         |

## Display and User Interface

|                          |             |
|--------------------------|-------------|
| Waveform Display Formats | YT, XY, XYZ |
|--------------------------|-------------|

## Connectivity and Interfaces

|                        |                                  |
|------------------------|----------------------------------|
| External Trigger Input | BNC, 50 $\Omega$ or 1 M $\Omega$ |
| Reference Clock Input  | BNC, 10 MHz                      |
| Reference Clock Output | BNC, 10 MHz                      |
| Auxiliary Output       | BNC, Trigger out                 |

## Environmental and Compliance

|                                     |                                                                |
|-------------------------------------|----------------------------------------------------------------|
| Storage Temperature Range           | -40 °C to +70 °C                                               |
| Operating Humidity                  | Up to 95% relative humidity (non-condensing)                   |
| Operating Altitude                  | Up to 3000 m                                                   |
| Safety Certifications               | IEC 61010-1, EN 61010-1, CAN/CSA-C22.2 No. 61010-1, UL 61010-1 |
| Electromagnetic Compatibility (EMC) | IEC/EN 61326-1 Class A                                         |

## Physical Characteristics

|                         |                                                          |
|-------------------------|----------------------------------------------------------|
| Form Factor             | Benchtop                                                 |
| Cooling Fan Noise Level | Forced air cooling, low-noise temperature-controlled fan |

## Computer System

|                     |                                  |
|---------------------|----------------------------------|
| Operating System    | Windows 10 IoT Enterprise 64-bit |
| Processor           | Intel Core i7                    |
| System Memory (RAM) | 16 GB                            |
| Storage             | ≥ 256 GB removable SSD           |

## Digital Channels

|                     |                                           |
|---------------------|-------------------------------------------|
| MSO Channels        | 16 digital channels (with RTO6-B1 option) |
| MSO Sample Rate     | 5 GSa/s                                   |
| MSO Memory Depth    | 200 Mpoints per channel                   |
| MSO Input Impedance | 100 k $\Omega$    4 pF                    |

## Arbitrary Waveform Generator

|                         |                                                              |
|-------------------------|--------------------------------------------------------------|
| AWG Channels            | 2 analog, 8 pattern generator channels (with RTO6-B6 option) |
| AWG Vertical Resolution | 14-bit                                                       |
| AWG Maximum Sample Rate | 500 MS/s                                                     |
| AWG Bandwidth           | 100 MHz                                                      |

## Digital Voltmeter (DVM)

|                  |                            |
|------------------|----------------------------|
| DVM Channels     | 4 (one per analog channel) |
| DVM Resolution   | Up to 3 digits             |
| DVM Measurements | DC, AC+DC RMS, AC RMS      |

Frequency Counter

|                    |          |
|--------------------|----------|
| Counter Channels   | 2        |
| Counter Resolution | 8 digits |

Power Specifications

|                   |                            |
|-------------------|----------------------------|
| Power Consumption | Max. 450 W (typical 160 W) |
|-------------------|----------------------------|

Inputs & Outputs

|                           |                                        |
|---------------------------|----------------------------------------|
| Probe Interface           | Rohde & Schwarz active probe interface |
| Calibration Signal Output | Square wave, 1 kHz, 1 V (Vpp)          |

TECHNOLOGY

Digital Oscilloscope

APPLICATIONS

High-speed digital design, power electronics, RF debug, and serial protocol analysis

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