Meeting your needs
R&S®RTO2000
Digital Oscilloscope

HD 16 bit

Multi Domain

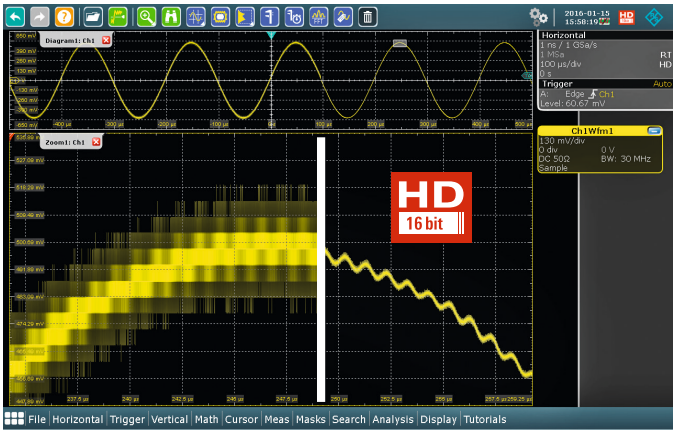
Turn your signals into success.

ROHDE&SCHWARZ

Best oscilloscope performance

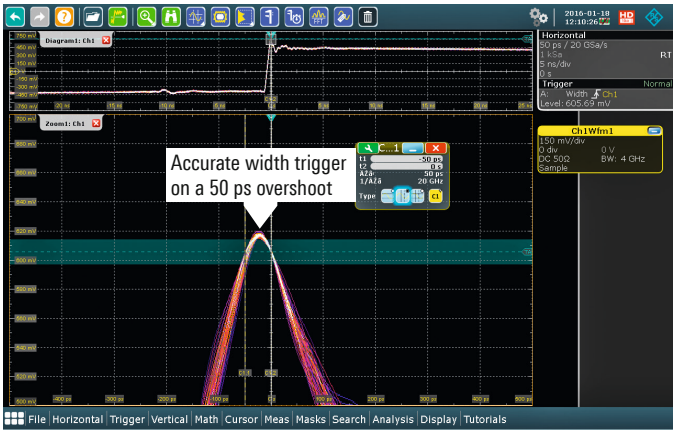
Up to 16-bit vertical resolution

The low-noise frontend and 10 GHz single-core A/D converter are the foundation for the extraordinarily high measurement accuracy and dynamic range of the R&S®RTO oscilloscopes. The high definition mode (HD mode) activates configurable lowpass filtering of the signal after the A/D converter, increasing the vertical resolution to up to 16 bit. Since filtering reduces quantizing noise, signal details become visible.



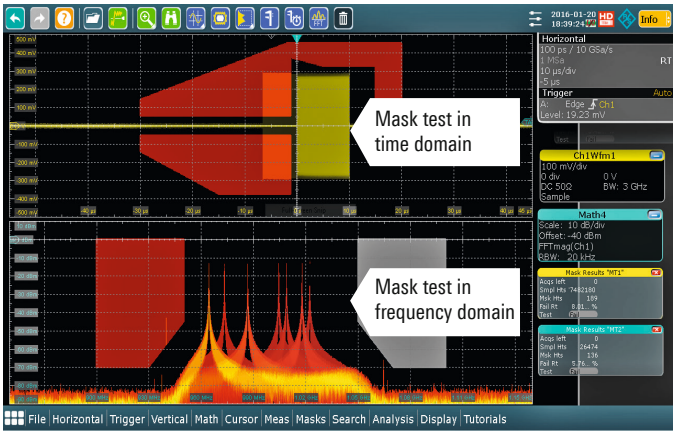
Trigger on any signal detail you can see

The unique digital trigger system from Rohde&Schwarz uses the sampling points of the A/D converter in the acquisition path so that the trigger system's input data is identical to the displayed signal. This results in minimal trigger jitter without postprocessing correction as well as high sensitivity that can be extended up to 16 bit in HD mode. Now you can reliably isolate even the smallest signals.



Integrated spectrum analysis

Frequency analysis is easy. Simply set the center frequency, span and resolution bandwidth on the R&S®RTO oscilloscopes for up to four analog signals – just like on a spectrum analyzer. Thanks to many years of experience in RF development, the R&S®RTO oscilloscopes offer an outstanding dynamic range. The FFT-based spectrum analyzer is ultrafast, making it ideal for capturing sporadic disturbance signals. For debugging, R&S®RTO oscilloscopes simultaneously display the spectrum and the associated signal path and correlate events. The spectrogram mode, different detectors (such as max. hold) and mask tests offer further analysis capabilities.



Quickly find signal faults with 1 million waveforms/s

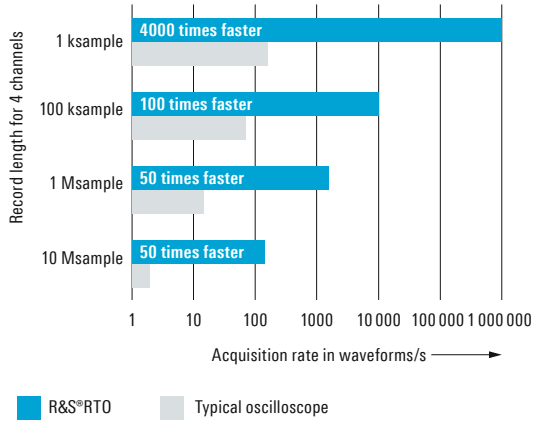
R&S®RTO oscilloscopes display up to 1 million waveforms/s. To make this possible, Rohde&Schwarz developed an ASIC with optimized signal processing. R&S®RTO oscilloscopes enable you to quickly and reliably detect sporadic signal faults. A high acquisition rate is even available when histograms, masks or cursor measurements are active.

Widest range of capabilities

Industry-leading 2 Gsample deep memory

In the basic configuration, R&S®RTO oscilloscopes offer 50 Msample acquisition memory per channel. Applications such as seamless acquisition of long pulse or protocol sequences often require even deeper memory. The R&S®RTO oscilloscopes' acquisition memory can be extended up to 2 Gsample. Signal processing in the ASIC ensures a smooth workflow even with deep memory.

R&S®RTO versus conventional oscilloscopes



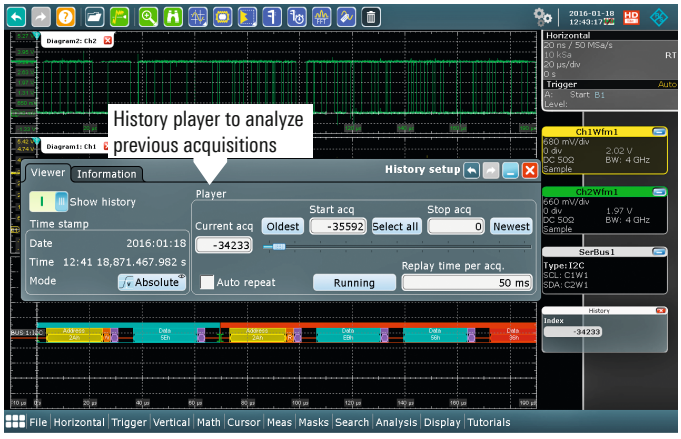
R&S®RTO oscilloscopes enable smooth work, even with deep memory.

First zone trigger in time and frequency domain

The R&S®RTO oscilloscopes' zone trigger lets you graphically separate events. Define up to eight zones of any shape and logically combine them over multiple channels or by using math functions. Depending on how the zones are defined, a trigger signal is activated when a signal either intersects or does not intersect the zone. This makes it possible to separate read/write sequences from the memory interfaces in the time domain.

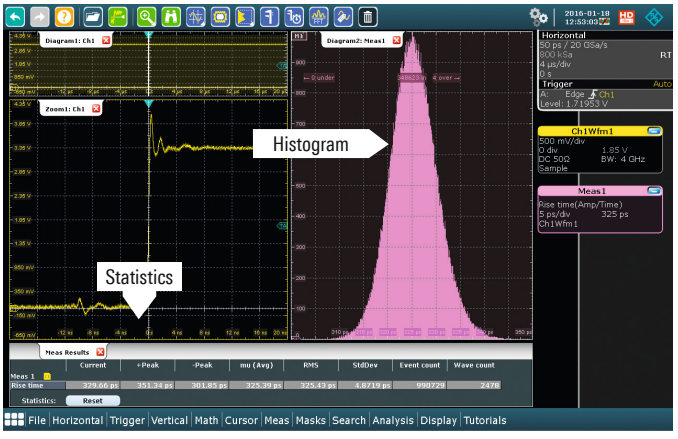
Analyze previous acquisitions – always available in history buffer

The R&S®RTO oscilloscopes' history function ensures that previous waveforms stored in memory can always be accessed. A trigger timestamp allows time correlation. You can view all saved signals and analyze them with tools such as zoom, measurement, math and spectrum analysis functions.



Deep toolset for signal analysis

R&S®RTO oscilloscopes offer over 90 measurement functions. The functions are organized by type into amplitude and time measurements, jitter, eye, histogram and spectral measurements. Statistics, histograms, and trend and track functions facilitate detailed analysis of the measurement results. The measurement results can also be used in math functions.



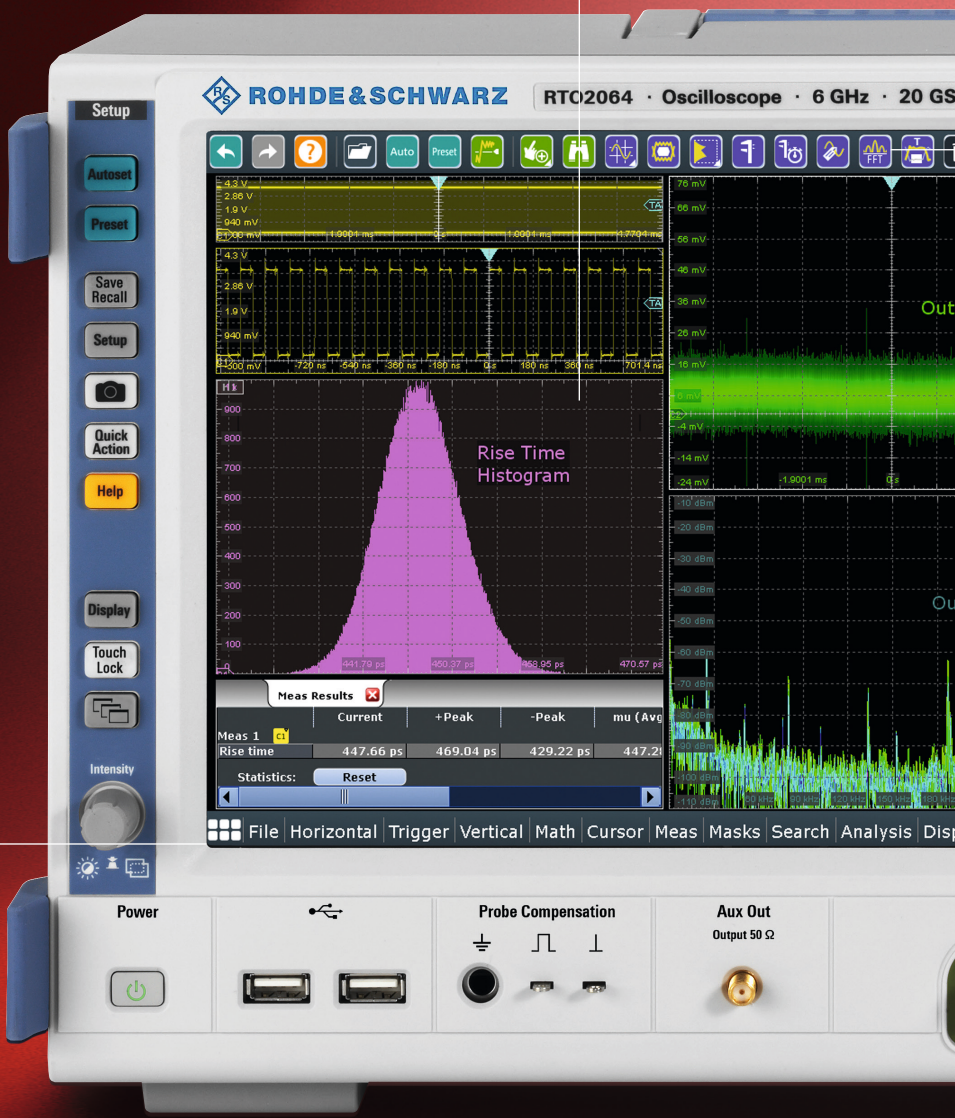
Advanced user interface

Easily customizable waveform display with R&S®SmartGrid technology

- Configure the display with R&S®SmartGrid
- Superposition windows in multiple tabs
- Scales labeled on all axes

App cockpit to quickly set up analysis functions

- Directly access all analysis functions
- Easily add user applications
- Decode protocols in seconds



Fast access to important tools

- Toolbar for quick access to functions
- Sidebar for easy configuration of a measurement

High-resolution capacitive touch-screen with gesture support

- Brilliant 12.1" screen
- Capacitive touchscreen
- Drag & drop signal placement
- Use gestures to scale and zoom

Clear orientation thanks to color coding

- Color-coded controls indicate the currently selected channel
- Color coding of trigger source

Engineered for multi-domain challenges

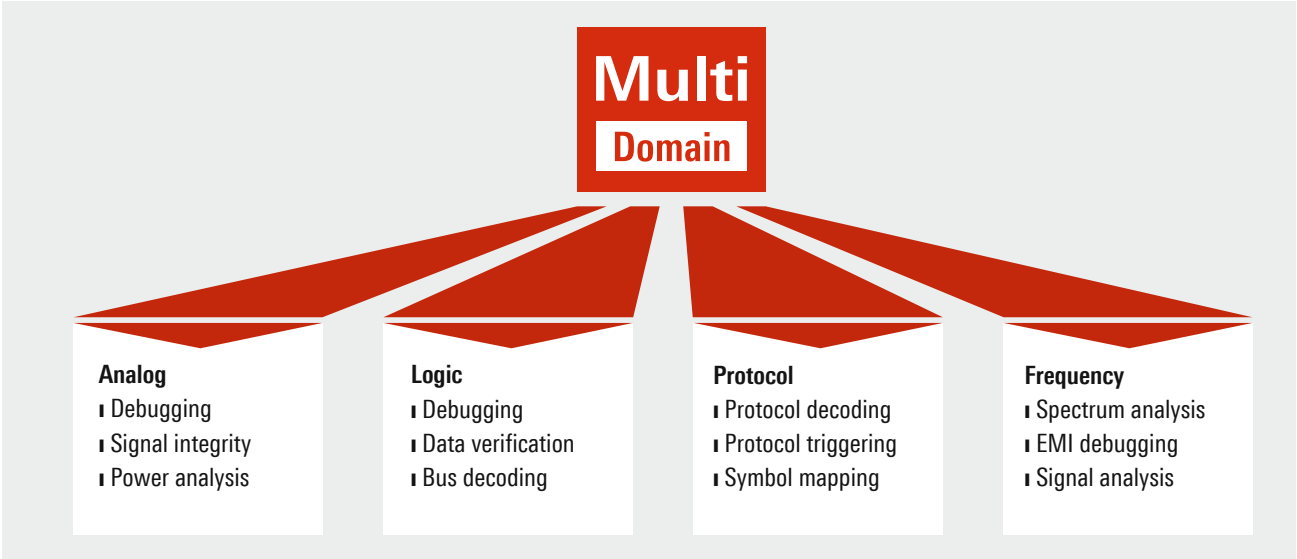
Your need

New challenges often arise when testing modern embedded designs. Various functional units such as the voltage supply, processor, sensor technology, digital I/Os and radio interfaces are connected with each other at the IC or board level, making them susceptible to mutual interference. For debugging, the different input and outputs signals such as current, voltage, data telegrams, reference clock, sensor and wireless data need to be synchronized. Until now, dedicated measuring instruments were used for measurements in the time domain, for spectrum, logic and protocol analysis and for clock and data generation.

Rohde&Schwarz solution

R&S®RTO oscilloscopes are the first to integrate a powerful waveform generator. They offer a fully integrated multi-domain test solution with frequency, protocol and logic analysis functions. You will appreciate the standardized user interface with consistent, simple operation of all functions and the fact that all analysis functions are synchronized. The following example clearly demonstrates the benefits. Sporadic failures of embedded design functions are often caused by interference from the internal voltage supply. R&S®RTO oscilloscopes analyze the quality of the voltage supply in the time and frequency domain based on processor and interface activity. The integrated waveform generator can be used to program the DUT or to provide signals for the test. This one-box solution makes it possible to quickly detect errors even in complex designs.

R&S®RTO oscilloscopes offer a complete multi-domain test solution



Specifications in brief

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Vertical system			
Number of channels	R&S®RTO2002/2012/2022/2032	2	
	R&S®RTO2004/2014/2024/2034/2044/2064	4	
Analog bandwidth (–3 dB) and rise time at 50 Ω	R&S®RTO2002 and R&S®RTO2004	600 MHz	583 ps
	R&S®RTO2012 and R&S®RTO2014	1 GHz	350 ps
	R&S®RTO2022 and R&S®RTO2024	2 GHz	175 ps
	R&S®RTO2032 and R&S®RTO2034	3 GHz	116 ps
	R&S®RTO2044	4 GHz	100 ps
	R&S®RTO2064	on 4 channels: 4 GHz, on 2 channels: 6 GHz	76 ps
All instruments can be extended to up to 6 GHz bandwidth.			
Impedance		50 Ω ± 1.5%, 1 MΩ ± 1% at 15 pF (meas.)	
Input sensitivity	max. bandwidth in all ranges	50 Ω: 1 mV/div to 1 V/div, 500 µV to 1 V (optional); 1 MΩ: 1 mV/div to 10 V/div, 500 µV to 10 V (optional)	
ENOB of A/D converter	full-scale sine wave, < –3 dB frequency bandwidth	> 7 bit (meas.)	
Acquisition system			
Realtime sampling rate	R&S®RTO200x/201x/202x/203x	max. 10 Gsample/s on each channel	
	R&S®RTO2044/2064	max. 10 Gsample/s on 4 channels, max. 20 Gsample/s on 2 channels	
Acquisition memory	standard configuration, per channel/1 channel active	R&S®RTO 2-channel model: 50/100 Msample, R&S®RTO 4-channel model: 50/200 Msample	
	max. upgrade (R&S®RTO-B110 option), per channel/1 channel active	R&S®RTO 2-channel model: 1/2 Gsample, R&S®RTO 4-channel model: 1/2 Gsample	
Max. acquisition rate	continuous acquisition and display, 10 Gsample/s, 1 ksample	1 000 000 waveforms/s	
	ultra-segmented mode	< 300 ns blind time	
Decimation mode	any combination of decimation mode and waveform arithmetics on up to 3 waveforms per channel	sample, peak detect, high resolution, root mean square	
Waveform arithmetics		off, envelope, average	
Interpolation modes		linear, sin(x)/x, sample&hold	
Horizontal system			
Timebase range		25 ps/div to 10 000 s/div	
Accuracy	after delivery/calibration	±5 ppm	
	R&S®RTO-B4 option	±0.02 ppm	
Trigger system			
Trigger types		edge, glitch, width, runt, window, timeout, interval, slew rate, data2clock, pattern, state, serial pattern, TV/video, serial bus trigger (optional), zone trigger (optional)	
Zone trigger (optional)		logical combination of max. 8 polygons, intersect or not intersect source: measurement channels, spectrum, math functions	
Sensitivity	definition of trigger hysteresis	automatic or manually adjustable from 0 div to 5 div	
General data			
Dimensions	W × H × D	427 mm × 249 mm × 204 mm (16.81 in × 9.8 in × 8.03 in)	
Weight		9.6 kg (21.2 lb)	
Screen		12.1" LC TFT capacitive color touchscreen, 1280 × 800 pixel (XGA)	
Interfaces		1 Gbps LAN, type A: 2 × USB 3.1, 2 × USB 2.0, type B: 1 × USB 3.1, GPIB (optional), DVI and display port for external monitor, external trigger, trigger output	

Service that adds value

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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