

# Fast, Precise and Easy Digital Oscilloscopes



Oscilloscopes are used in almost every field of electronics today – from digital circuitry to power electronics and RF engineering. From a user perspective, the crucial qualities for an oscilloscope are the speed with which it detects errors and the accuracy with which it displays waveforms. This is why Rohde & Schwarz has designed and engineered its new R&S RTO family of oscilloscopes for speed and signal fidelity. Capable of analyzing one million waveforms per second, these scopes make even the rarest errors visible in an instant. They also feature the first digital trigger system to be implemented in an oscilloscope, which minimizes trigger jitter. Their completely rethought user interface provides the perfect overview, even in the case of complex measurements. The new oscilloscopes will initially be available in two- and four-channel models with bandwidths of 1 GHz and 2 GHz and a maximum sampling rate of 10 Gsample per second.

Conventional oscilloscopes capture signals at only 0.5 percent of the acquisition cycle. They spend most of their time storing, processing and displaying data while any errors occurring in the meantime go undetected. To address this issue, Rohde & Schwarz has increased the acquisition time by a factor of 20, raising it to 10 percent. A special ASIC achieves realtime processing of the digital measurement values at an unprecedented rate. As a result, the new scopes can analyze one million waveforms per second. Even with this high acquisition rate, all of the setting options and analysis functions remain available without reducing the measurement speed.

Rohde & Schwarz has also taken a new approach with the trigger system. Conventional analog trigger systems struggle with the time and amplitude offset between the analog trigger path and the digital signal acquisition path. This limits the instrument's accuracy. With the purely digital trigger architecture implemented

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for the first time in the new scopes, the trigger and the captured data share a common signal path and a common time base. The result is exceptionally low trigger jitter and exact assignment of the trigger to the signal. In addition, the digital trigger rearms immediately after a trigger event. The rearming delay that is typical of analog triggers is eliminated so that signal faults do not go undetected.

The single-core A/D converter in the R&S RTO scopes also helps to ensure high accuracy. It operates at a rate of 10 Gsample per second. The traditional approach to achieving such high conversion speeds is to use several slower A/D converters operating in parallel with time offset. Because behavior is not always absolutely consistent from one A/D converter to the next, mismatch can occur. By contrast, the Rohde & Schwarz 8-bit converter with more than seven effective bits achieves very high dynamic range. The result is minimal signal distortion and low inherent noise.

The Rohde & Schwarz oscilloscopes feature touch-screen operation that redefines ease of use. With semitransparent dialog boxes, movable measurement windows, configurable toolbar, and preview icons with live waveforms, users can accomplish even complex measurement tasks quickly and efficiently. With its 10.4-inch touch screen, the instrument strikes the right balance between usability and portability.

Rounding out its oscilloscope portfolio, Rohde & Schwarz also offers a range of active and passive probes. The active probes not only have outstanding measurement properties, they also incorporate two new features: the micro button, which can be assigned a number of different functions to control the scope directly; and the Probes, a built-in voltmeter that enables precise DC measurements for quick checks on supply voltages or operating points, regardless of the scope's current channel settings.

The two- and four-channel models of the R&S RTO with bandwidths of 1 GHz and 2 GHz plus a matching range of active and passive probes are now available from Rohde & Schwarz. More information on the new oscilloscopes can be found at [www.scope-of-the-art.com](http://www.scope-of-the-art.com).

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