R&S®RTB2000 Oscilloscope
Power of ten

- 70 MHz to 300 MHz
- 10-bit ADC
- 10 Msample standard memory
- 10.1" capacitive touchscreen

3 year warranty

ROHDE & SCHWARZ

R&S®RTB2000 Oscilloscope
At a glance

Power of ten (10-bit ADC, 10 Msample memory and 10.1" touchscreen) combined with smart operating concepts make the R&S®RTB2000 oscilloscope the perfect tool for troubleshooting embedded designs, for university laboratories as well as for production and service departments.

Rohde & Schwarz stands for quality, precision and innovation in all fields of wireless communications. As an independent, family-owned company, Rohde & Schwarz finances its growth from its own funds. The company plans for the long term to the benefit of its customers. Purchasing Rohde & Schwarz products is an investment for the future.

The largest display (10.1") with the highest resolution of its class (1280 × 800 pixel) works just like your smartphone. It contains a capacitive touchscreen to quickly navigate in pop-up menus and a touch function to easily adjust scaling, to zoom in or to move a waveform.

The 10-bit A/D converter yields up to a four-fold improvement compared to conventional 8-bit A/D converters. You get sharper waveforms with more signal details.

10 Msample memory depth is available on each channel as soon as all channels are active. When interleaved, 20 Msample are available. This is 10 times more than comparable oscilloscopes offer. It therefore captures longer signal sequences for more detailed analysis results.

The R&S®RTB2000 provides users with more than just an oscilloscope. It includes a logic analyzer, protocol analyzer, waveform and pattern generator and digital voltmeter. Dedicated operating modes for frequency analysis, mask tests and long data acquisitions are integrated. Debugging all kinds of electronic systems is easy and efficient – and satisfies the all-important rule of investment protection at a very attractive price.

Benefits

See small signal details in the presence of large signals
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Capture more time at full bandwidth
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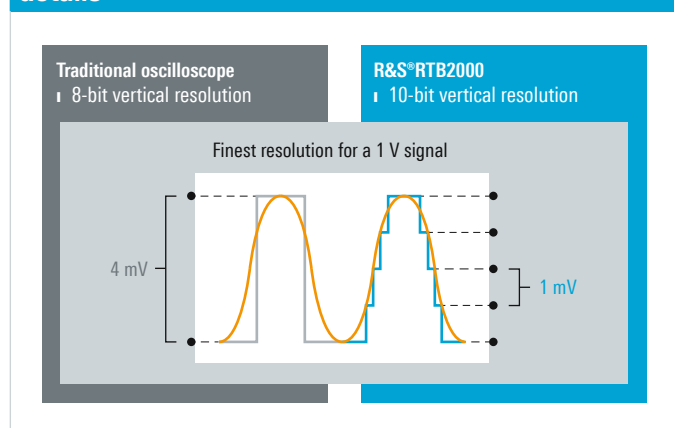## Choose your Rohde & Schwarz oscilloscope

	R&S®RTC1000	R&S®RTB2000	R&S®RTM3000	R&S®RTA4000
Number of oscilloscope channels	2	2/4	2/4	4
Bandwidth in MHz	50, 70, 100, 200, 300	70, 100, 200, 300	100, 200, 350, 500, 1000	200, 350, 500, 1000
Max. sampling rate in Gsample/s	1/channel, 2 interleaved	1.25/channel, 2.5 interleaved	2.5/channel, 5 interleaved	2.5/channel, 5 interleaved
Max. memory depth in Msample	1/channel, 2 interleaved	10/channel, 20 interleaved; 160 Msample (optional) segmented memory	40/channel, 80 interleaved; 400 Msample (optional) segmented memory	100/channel, 200 interleaved; 1 Gsample (standard) segmented memory
Timebase accuracy in ppm	50	2.5	2.5	0.5
Vertical bits (ADC)	8	10	10	10
Min. input sensitivity	1 mV/div	1 mV/div	500 µV/div	500 µV/div
Display	6.5", 640 × 480 pixel	10" capacitive touch, 1280 × 800 pixel	10" capacitive touch, 1280 × 800 pixel	10" capacitive touch, 1280 × 800 pixel
Update rate	10 000 waveforms/s	300 000 waveforms/s in fast segmentated memory mode	2 000 000 waveforms/s in fast segmentated memory mode	2 000 000 waveforms/s in fast segmentated memory mode
MSO	8 channels, 1 Gsample/s	16 channels, 2.5 Gsample/s	16 channels, 5 Gsample/s	16 channels, 5 Gsample/s
Protocol (optional)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, audio (I²S/LJ/RJ/TDM), ARINC, MIL	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, audio (I²S), ARINC, MIL
Generator(s)	1 generator, 4-bit pattern generator	1 ARB, 4-bit pattern generator	1 ARB, 4-bit pattern generator	1 ARB, 4-bit pattern generator
Math	+, −, *, /, FFT (128k points)	+, −, *, /, FFT (128k points)	+, −, *, /, FFT (128k points), 21 advanced functions	+, −, *, /, FFT (128k points), 21 advanced functions
Rohde & Schwarz probe interface	–	–	standard	standard
RF capability	FFT	FFT	spectrum analysis [1]	spectrum analysis [1]

[1] The R&S®RTM-K18 and R&S®RTA-K18 options are not distributed in North America.

See small signal details in the presence of large signals

▪ 10-bit A/D converter resolution
▪ 1 mV/div true vertical resolution

10-bit A/D converter: uncovers even small signal details

Traditional oscilloscope	R&S®RTB2000
▪ 8-bit vertical resolution	▪ 10-bit vertical resolution

Finest resolution for a 1 V signal

4 mV

1 mV

10-bit vertical resolution

The R&S®RTB2000 features a customized Rohde & Schwarz designed 10-bit A/D converter that delivers a four-fold improvement compared to conventional 8-bit A/D converters.

The increased resolution results in sharper waveforms with more signal details that would otherwise be missed. One example is the characterization of switched-mode power supplies. The voltages across the switching device must be determined during the on/off times within the same acquisition. For precise measurements of small voltage components, a high resolution of more than 8 bit is essential.

1 mV/div: full measurement bandwidth and low noise

The R&S®RTB2000 oscilloscope offers an outstanding sensitivity down to 1 mV/div. Traditional oscilloscopes reach this level of input sensitivity only by employing software-based magnification or by limiting the bandwidth. The R&S®RTB2000 oscilloscope shows the signal's real sampling points over the full measurement bandwidth – even at 1 mV/div. This ensures high measurement accuracy.

The accuracy of a signal displayed on the screen depends on the oscilloscope's inherent noise. The R&S®RTB2000 oscilloscope precisely measures even at the smallest vertical resolution by using low-noise frontends and state-of-the-art A/D converters.
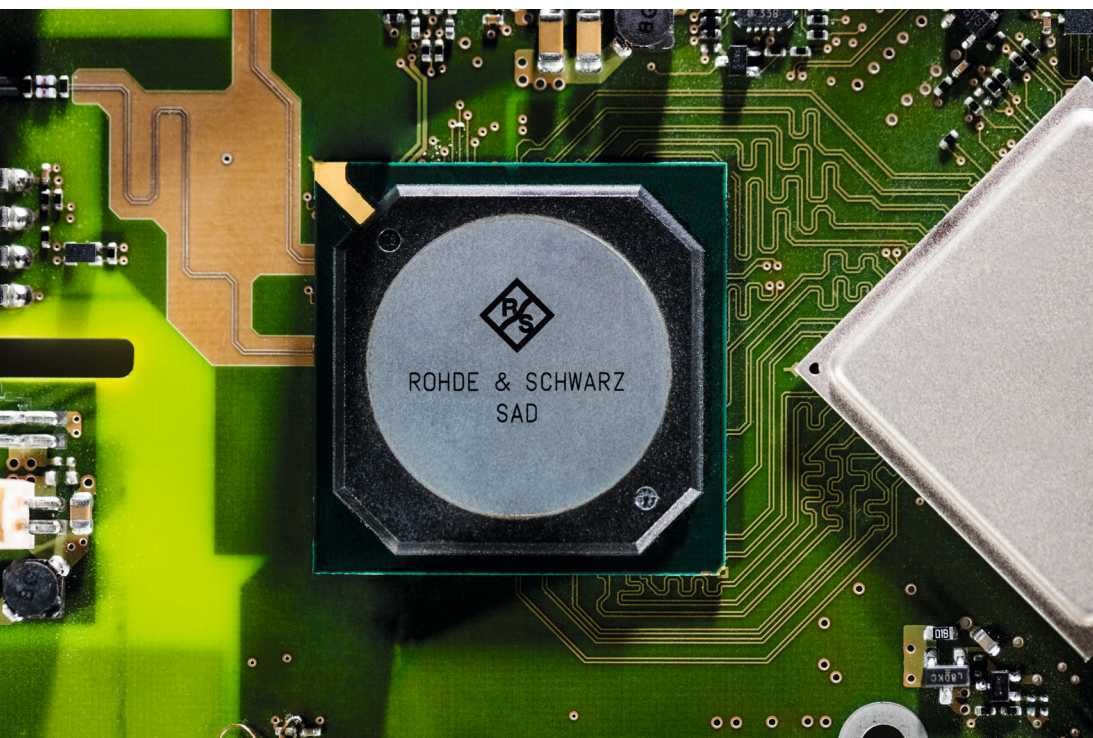
The Rohde & Schwarz designed 10-bit A/D converter ensures highest signal fidelity at highest resolution

Capture more time at full bandwidth

ı 10 Msample standard, 20 Msample interleaved
ı 160 Msample segmented memory with more than 13 000 recordings
ı History mode: analysis of past acquisitions
ı 1.25 Gsample/s, 2.5 Gsample/s interleaved

10 Msample standard and 20 Msample interleaved

The R&S®RTB2000 offers a class-leading memory depth: 10 Msample per channel are available, even 20 Msample in interleaved mode. This is 10 times more than similar oscilloscopes in the same instrument class. The user captures longer acquisition sequences even at high sampling rates for more detailed analysis results, e.g. when analyzing transients of switched-mode power supplies.

Segmented memory: 160 Msample with history function

The R&S®RTB-K15 option with deep, segmented memory analyzes signal sequences over a long observation period. For example, protocol-based signals with communications gaps such as I^2C and SPI can be captured over several seconds or minutes. Thanks to the variable segment size from 10 ksample to 10 Msample, the 160 Msample memory is optimally utilized; more than 13 000 cohesive individual recordings are possible.

In history mode, previous acquisitions to the maximum segmented memory depth of 160 Msample are available for further analysis. Mask tests, QuickMeas function and FFT, for example, can be used for further analysis.

Maintain fast sampling rates at all times

Signal faults and important events are detected better with an oscilloscope that offers a high sampling rate. Many applications require long acquisition cycles, for instance when analyzing serial protocols. With a sampling rate of up to 2.5 Gsample/s and a memory depth of up to 20 Msample, the R&S®RTB2000 oscilloscopes really excel here. They display signals, right down to the details, accurately and for long sequences.

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10 to 160 times more memory depth than traditional oscilloscopes in the same instrument class

Capture the longest time periods with class-leading 160 Msample memory

R&S®RTB2000

Comparable oscilloscopes

1   10   160
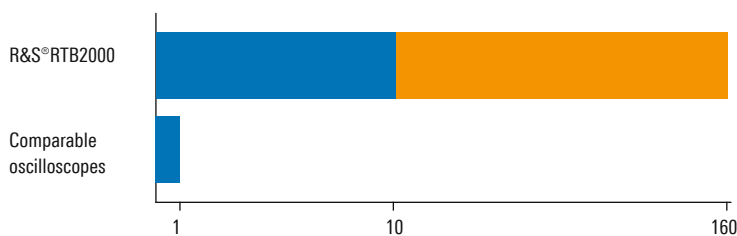
■ Standard memory   ■ Optional segmented memory

10.1" high-resolution capacitive touchscreen w

Quick access to important tools
▪ Drag & drop use of analysis tools
▪ Toolbar for access to functions
▪ Sidebar for intuitive configuration of functions

Easily customizable waveform display with R&S®SmartGrid technology
▪ Configurable display
▪ Resizable waveform areas
▪ Scales labeled on all axes

10-second boot-up time

Integrated waveform and pattern generator up to 50 Mbit/s
▪ Output of sine, square/pulse, ramp and noise waveforms
▪ Output of arbitrary waveform files and 4-bit signal patterns
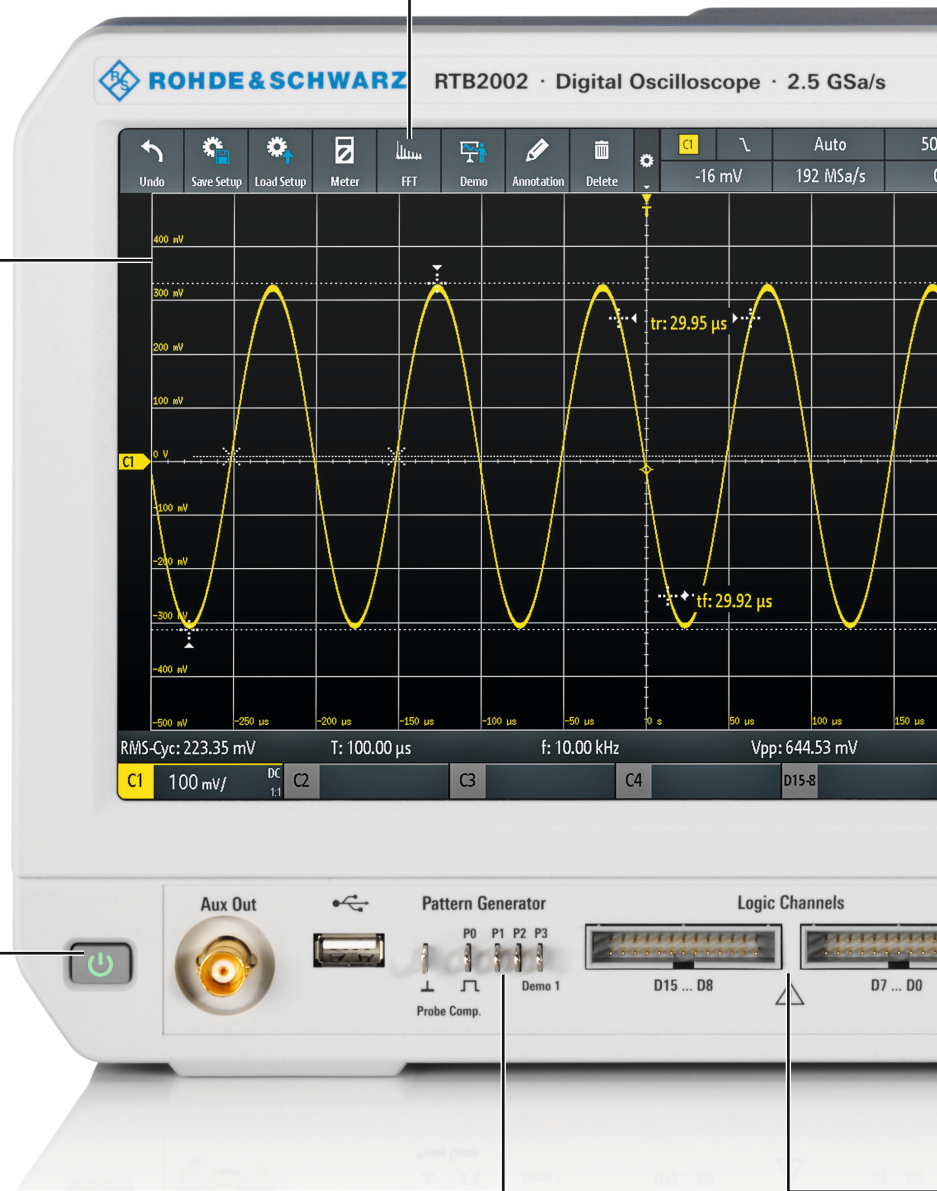
with gesture support

**10.1" high-resolution capacitive touchscreen
with gesture support**
▮ Gesture support for scaling and zooming
▮ More than twice the display area compared to similiar
oscilloscopes
▮ Nine times the pixels of comparable oscilloscopes:
1280 × 800 pixel resolution
▮ 12 horizontal grid lines for more signal details

**Documentation of results
at the push of a button**
▮ Documentation as a screenshot or of
instrument settings

Autoset function
▮ Automatic selection of vertical, horizontal
and trigger settings for optimal viewing of
active signals
▮ Setting of FFT parameters

**Color-coded controls indicate the
selected channel**

QuickMeas: results at the push of a button
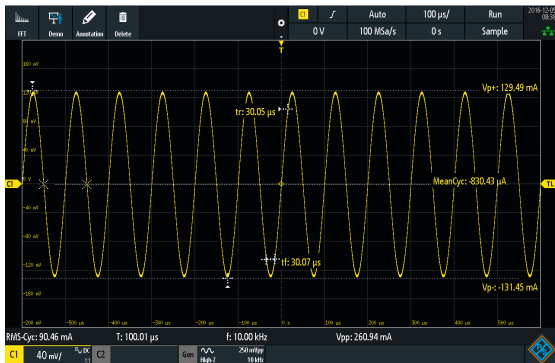▮ Graphical display of key measurement
results for the active signal

Integrated logic analyzer (MSO)
▮ 16 additional digital channels
▮ Synchronous and time-correlated analysis
of analog and digital components of
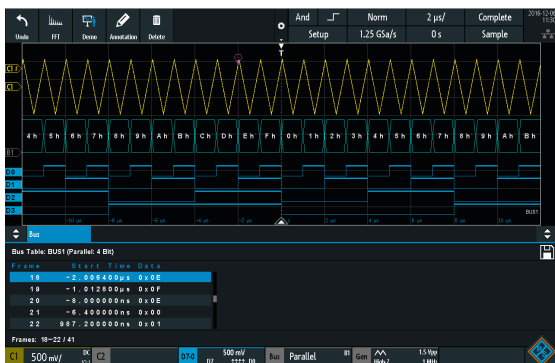embedded designs
▮ Fully retrofittable

X-in-1 oscilloscope

Oscilloscope

With a sampling rate of up to 2.5 Gsample/s and a memory depth of up to 20 Msample, the R&S®RTB2000 oscilloscope excels in its class. A waveform update rate of more than 50 000 waveforms/s ensures a responsive instrument that reliably catches signal faults. Included standard tools provide quick results, e.g. QuickMeas, mask tests, FFT, math, cursors and automatic measurements, including statistics.


Logic analyzer

The R&S®RTB-B1 option turns every R&S®RTB2000 into an intuitive-to-use MSO with 16 additional digital channels. The oscilloscope captures and analyzes signals from analog and digital components of an embedded design – synchronously and time-correlated to each other. For example, the delay between input and output of an A/D converter can conveniently be determined using the cursor measurements.
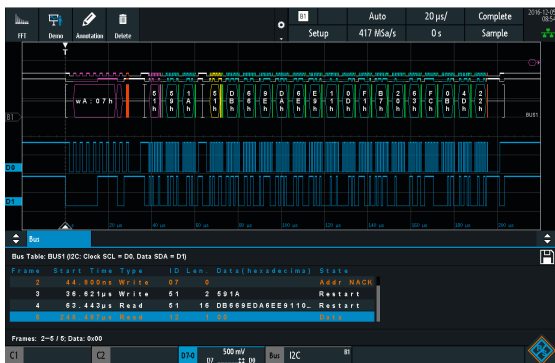

Protocol analyzer

Protocols such as I²C, SPI and CAN/LIN frequently transfer control messages between integrated circuits. The R&S®RTB2000 has versatile options for protocol-specific triggering and decoding of serial interfaces. Selective acquisition and analysis of relevant events and data is possible. With the hardware-based implementation, smooth operation and a high update rate is ensured even for long acquisitions. This is advantageous, for example, to capture multiple packetized serial bus signals.
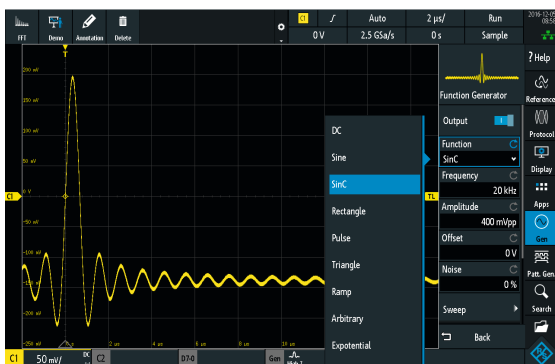
Waveform and pattern generator

The integrated R&S®RTB-B6 waveform and pattern generator (up to 50 Mbit/s) is useful for educational purposes and for implementing prototype hardware. Apart from the common sine, square/pulse, ramp and noise waveforms, it outputs arbitrary waveforms and 4-bit signal patterns. Waveforms and patterns can be imported as CSV files or copied from oscilloscope waveforms. Before playing signals back, the user can preview them to quickly check signal correctness. Predefined patterns for e.g. I²C, SPI, UART and CAN/LIN can be used.
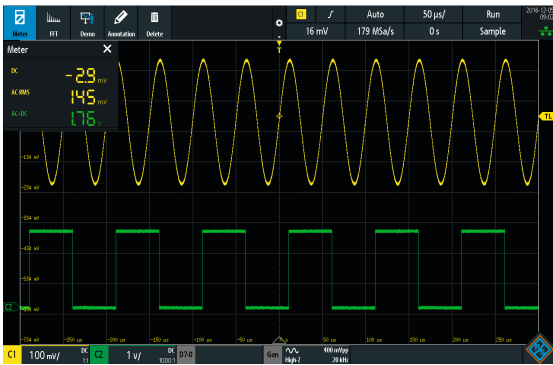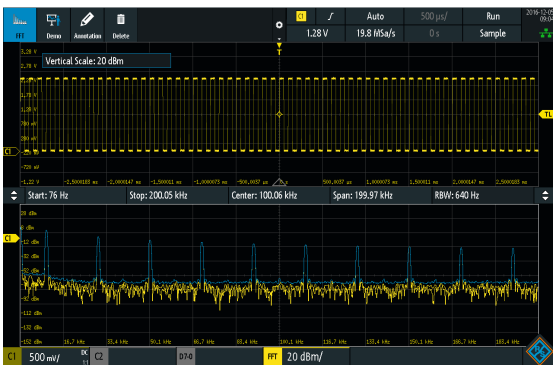
Digital voltmeter

The R&S®RTB2000 features a three-digit digital voltmeter (DVM) and six-digit frequency counter on each channel for simultaneous measurements. Measurement functions include DC, AC + DC (RMS) and AC (RMS). [1]

[1] Included in scope of delivery.

Frequency analysis mode

Difficult-to-find faults often result from the interaction between time and frequency signals. The FFT function of the R&S®RTB2000 is activated at the push on a button and by entering center frequency and span. Due to the high-performance FFT functionality of the R&S®RTB2000 oscilloscopes, signals can be analyzed with up to 128k points. Other tools include cursor measurements and autoset in the frequency domain.
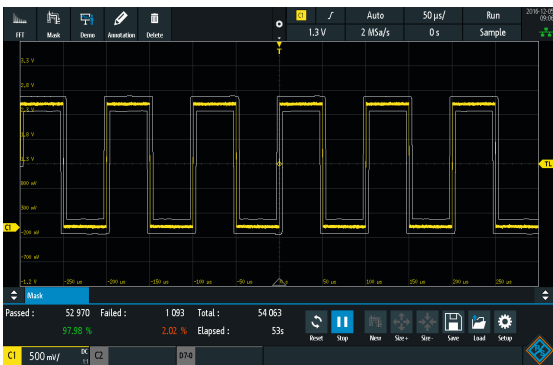
Mask test mode

Mask tests quickly reveal whether a specific signal lies within defined tolerance limits. By using statistical pass/fail evaluation, they assess the quality and stability of a DUT. Signal anomalies and unexpected results are quickly identified. When the mask is violated, the measurement stops. Each violation can generate a pulse output at the AUX-OUT connector on the R&S®RTB2000. This pulse output can be used to trigger actions in the measurement setup.
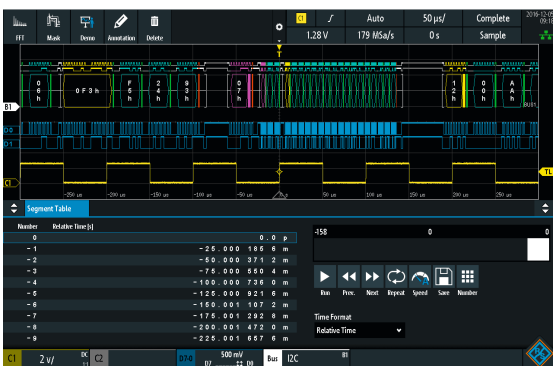
History and segmented memory mode

The R&S®RTB-K15 history function option increases the memory from 10 Msample to 160 Msample. Users scroll through past acquisitions and analyze the data using the oscilloscope tools, e.g. protocol decode and logic channels. Serial protocol and pulse sequences are recorded practically without interruptions.

Frequency response analysis (Bode plot)

ı **Analyze the frequency response of passive filters and amplifier circuits**
ı **Perform control loop response measurements**
ı **Perform power supply rejection ratio measurements**
ı **Simple and fast documentation**

Perform low-frequency response analysis with an oscilloscope

The R&S®RTB-K36 frequency response analysis (Bode plot) option lets you perform low-frequency response analysis on your oscilloscope easily and quickly. It characterizes the frequency response of a variety of electronic devices, including passive filters and amplifier circuits. For switch mode power supplies, it measures the control loop response and power supply rejection ratio. The frequency response analysis option uses the oscilloscope's built-in waveform generator to create stimulus signals ranging from 10 Hz to 25 MHz. Measuring the ratio of the stimulus signal and the output signal of the DUT at each test frequency, the oscilloscope plots gain and phase logarithmically.

The R&S®RTB-K36 frequency response analysis (Bode plot) option characterizes the frequency response of a variety of electronic devices, including passive filters and amplifier circuits

The amplitude output level of the generator signal can be varied during the measurement to suppress the noise behavior of the DUT

The measurement resolution can be varied by changing the points per decade

A table of measurement results provides detailed information about each measurement point, consisting of frequency, gain and phase shift

R&S®RT-ZP1X 38 MHz bandwidth 1:1 passive probe

Features and functionalities

Amplitude profile

The R&S®RTB-K36 frequency response analysis (Bode plot) option allows users to profile the amplitude output level of the generator. This helps to suppress the noise behavior of the DUT when performing a control loop response or power supply rejection ratio and to improve signal-to-noise ratio (SNR). It is possible to define up to 16 steps.

Improve resolution and markers support

You can choose the points per decade to set up and modify the resolution of your plot. The oscilloscope supports up to 500 points per decade. Markers can be dragged to the desired position, directly on the plotted trace. A legend displays the coordinates of the markers. To determine the crossover frequency, set one marker to 0 dB and the second marker to −180° phase shift. Now you can easily determine the phase and gain margin.

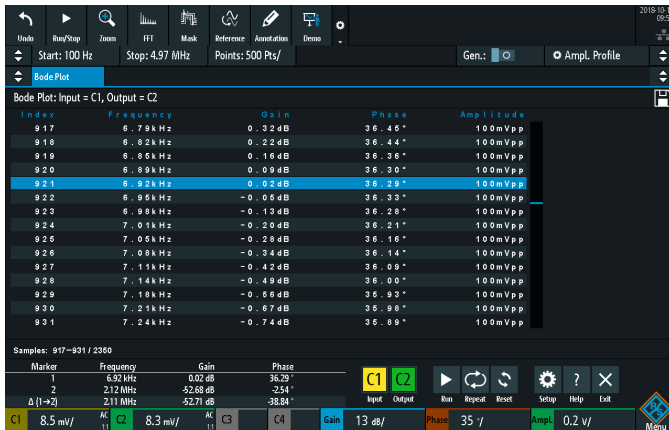### Measurement table

You can view the results in a table. This table details information about each measured point, consisting of frequency, gain and phase shift. In case you use cursors, for ease of use, the associated row of the result table is highlighted. For reporting, screenshots, table results or both can be quickly saved to a USB device.

Broad probe portfolio

Accurate control loop response or power supply rejection ratio characterization highly depends on choosing the right probes, since peak-to-peak amplitudes of V_{in} and V_{out} can be very low at some test frequencies. These values would be buried in the oscilloscope's noise floor and/or in the switching noise of the DUT itself. We recommend the low-noise R&S®RT-ZP1X 38 MHz bandwidth 1:1 passive probes. These reduce measurement noise and provide the best SNR.

The best choice for education

Professors especially like the password-protected education mode that disables automatic functions such as Autoset. This helps students understand the concepts. The built-in web server functionality enables professors to display their oscilloscope screen content to the classroom and over a network.

Updating and monitoring hundreds of units? The remote interfaces make these tasks as easy as switching on a light bulb.

ı **Education mode to disable automatic functions**
ı **X-in-1 integration**

Ready for the teaching lab

In the teaching lab, the R&S®RTB2000 oscilloscope is the perfect choice to teach students how to measure with an oscilloscope. This Rohde & Schwarz oscilloscope has an easy-to-use concept combined with state-of-the-art technology – at an affordable price. Students appreciate the intuitive and quick access to frequently used functions via dedicated buttons and capacitive touchscreen operation. And they solve their lab tutorial without worrying about oscilloscope functionality.

The large 10.1" high-resolution screen shows every signal detail, and one instrument can be shared among several students. Reports can be efficiently created with the handy and flexible screen annotation tool.

X-in-1 integration saves space and costs

With the R&S®RTB2000, students and professors in a university lab get an oscilloscope plus logic and protocol analyzer, waveform and pattern generator and digital voltmeter. Dedicated operation modes for frequency analysis, mask tests and long data acquisitions are also integrated. Debugging all kinds of electronic systems is easy and efficient – and satisfies the all-important rule of investment protection at a very attractive price. The compact design and small footprint save precious bench space in the lab.

Perfect instruments for everyday use at universities and colleges thanks to diverse functionality, rugged design and small footprint

And there is so much more ...

▪ **Efficient reporting capabilities**
▪ **Localized GUI and online help**
▪ **Fully upgradeable via software licenses**
▪ **Web server functionality for instrument access**
▪ **Extensive range of probes and accessories**

Grows with your needs

The R&S®RTB2000 oscilloscopes flexibly adapt to needed project updates by installing software licenses. This applies to e.g. triggering and decoding of serial protocols and the history and segmented memory mode. The waveform and pattern generator and the MSO capabilities [1] are built-in and just need to be activated. Via keycode, the bandwidth can be upgraded up to 300 MHz. All this makes retrofitting really easy.

Multilingual support: choose among thirteen languages

The R&S®RTB2000 oscilloscope's user interface and online help support thirteen languages (English, German, French, Spanish, Italian, Portuguese, Czech, Polish, Russian, simplified and traditional Chinese, Korean and Japanese). Users can change the language in just a few seconds while the instrument is running.

[1] The R&S®RTB-B1 MSO option additionally contains two logic probes with 16 digital channels.

Protection of data

The secure erase function protects sensitive data. This function removes all user data and settings, including device setups and reference waveforms.

Connectivity

The R&S®RTB2000 can be directly connected to a PC via the built-in USB host and USB device ports. The USB host transfers screenshots or instrument settings to a USB stick. Media transfer protocol (MTP) implementation ensures seamless integration. The USB device port and the LAN interface also enable remote control. The built-in web server functionality allows users to control the oscilloscope and display their screen content to an audience. Data and programming interfaces are included, e.g. for seamless MATLAB® integration.

Probes to measure accurately

A comprehensive probe portfolio for accurate measurements rounds out the R&S®RTB2000 oscilloscope offering. Each R&S®RTB2000 is delivered with passive voltage probes. Single-ended high-voltage probes, differential probes and current probes are also available and can be ordered additionally.

▷ For more information, see the product brochure: Probes and accessories for Rohde & Schwarz oscilloscopes (PD 3606.8866.12).
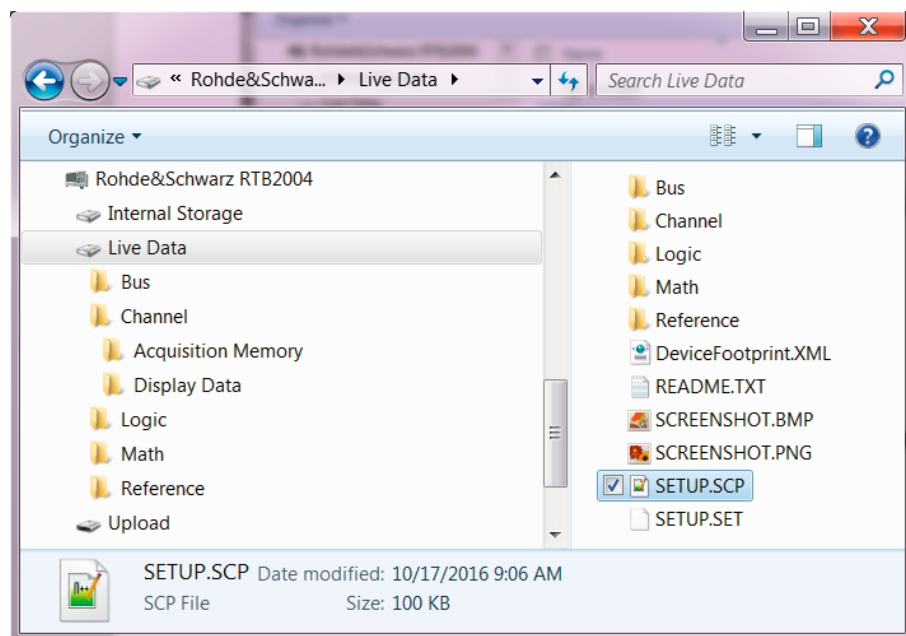
With the USB MTP implementation, easy access to live channel data and screenshots and integration into customers computing environment is possible
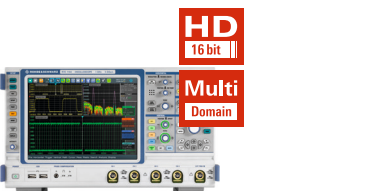
Oscilloscope portfolio

R&S®	RTH1000	RTC1000	RTB2000	RTM3000
Vertical				
Bandwidth	60/100/200/350/500 MHz [1]	50/70/100/200/300 MHz [1]	70/100/200/300 MHz [1]	100/200/350/500 MHz/1 GHz [1]
Number of channels	2 plus DMM/4	2	2/4	2/4
Resolution	10 bit	8 bit	10 bit	10 bit
V/div 1 MΩ	2 mV to 100 V	1 mV to 10 V	1 mV to 5 V	500 µV to 10 V
V/div 50 Ω	–			500 µV to 1 V
Horizontal				
Sampling rate per channel (in Gsample/s)	1.25 (4-channel model); 2.5 (2-channel model); 5 (all channels interleaved)	1; 2 (2 channels interleaved)	1.25; 2.5 (2 channels interleaved)	2.5; 5 (2 channels interleaved)
Max. memory (per channel/1 channel active)	125 ksample (4-channel model); 250 ksample (2-channel model); 500 ksample (50 Msample in segmented memory mode [2])	1 Msample; 2 Msample	10 Msample; 20 Msample (160 Msample in segmented memory mode [2])	40 Msample; 80 Msample (400 Msample in segmented memory mode [2])
Segmented memory	option	–	option	option
Acquisition rate (in waveforms/s)	50 000	10 000	50 000 (300 000 in fast segmented memory mode [2])	64 000 (2 000 000 in fast segmented memory mode [2])
Trigger				
Options	advanced, digital trigger (14 trigger types) [2]	elementary (5 trigger types)	basic (7 trigger types)	basic (10 trigger types)
Mixed signal option				
No. of digital channels [1]	8	8	16	16
Sampling rate of digital channels (in Gsample/s)	1.25	1	1.25	two logic probes: 2.5 on each channel; one logic probe: 5 on each channel
Memory of digital channels	125 ksample	1 Msample	10 Msample	two logic probes: 40 Msample per channel; one logic probe: 80 Msample per channel
Analysis				
Cursor meas. types	4	13	4	4
Stand. meas. functions	33	31	32	32
Mask test	elementary (tolerance mask around the signal)	elementary (tolerance mask around the signal)	elementary (tolerance mask around the signal)	elementary (tolerance mask around the signal)
Mathematics	elementary	elementary	basic (math on math)	basic (math on math)
Serial protocols triggering and decoding [1]	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, CAN-FD, SENT (7)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN (5)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN (5)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429 (8)
Display functions	data logger	–	–	–
Applications [1], [2]	high-resolution frequency counter, advanced spectrum analysis, harmonics analysis	digital voltmeter (DVM), component tester, fast Fourier transform (FFT)	digital voltmeter (DVM), fast Fourier transform (FFT), frequency response analysis [3]	power, digital voltmeter (DVM), spectrum analysis and spectrogram, frequency response analysis [3]
Compliance testing [1], [2]	–	–	–	–
Display and operation				
Size and resolution	7", color, 800 × 480 pixel	6.5", color, 640 × 480 pixel	10.1", color, 1280 × 800 pixel	10.1", color, 1280 × 800 pixel
Operation	optimized for touchscreen operation, parallel button operation	optimized for fast button operation	optimized for touchscreen operation, parallel button operation	
General data				
Dimensions in mm (W × H × D)	201 × 293 × 74	285 × 175 × 140	390 × 220 × 152	390 × 220 × 152
Weight in kg	2.4	1.7	2.5	3.3
Battery	lithium-ion, > 4 h	–	–	–

[1] Upgradeable.   [2] Requires an option.   [3] Available Q1 2019.

	RTA4000	RTE1000	RTO2000	RTP
	200/350/500 MHz/1 GHz [1]	200/350/500 MHz/1/1.5/2 GHz [1]	600 MHz/1/2/3/4/6 GHz [1]	4/6/8/13/16 GHz [1]
	4	2/4	2/4 (only 4 channels in 4 GHz and 6 GHz models)	4
	10 bit	8 bit (up to 16 bit with HD mode)	8 bit (up to 16 bit with HD mode) [2]	8 bit (up to 16 bit with HD mode) [2]
	500 µV to 10 V	500 µV to 10 V	1 mV to 10 V (500 µV to 10 V) [2]	1 mV to 10 V
	500 µV to 1 V	500 µV to 1 V	1 mV to 1 V (500 µV to 1 V) [2]	1 mV to 1 V
	2.5; 5 (2 channels interleaved)	5	10; 20 (2 channels interleaved in 4 GHz and 6 GHz model)	20
	100 Msample; 200 Msample (1 Gsample in segmented memory mode)	50 Msample/200 Msample	standard: 50 Msample/200 Msample; max. upgrade: 1 Gsample/2 Gsample	standard: 50 Msample/200 Msample; max. upgrade: 1 Gsample/2 Gsample
	standard	standard	standard	standard
	64 000 (2 000 000 in fast segmented memory mode)	1 000 000 (1 600 000 in ultra-segmented memory mode)	1 000 000 (2 500 000 in ultra-segmented memory mode)	950 000 (3 200 000 in ultra-segmented memory mode)
	basic (10 trigger types)	advanced, digital trigger (13 trigger types)	advanced (includes zone trigger), digital trigger (14 trigger types) [2]	advanced, digital trigger (14 trigger types) with realtime deembedding [2], zone trigger [2]
	16	16	16	16
	two logic probes: 2.5 on each channel; one logic probe: 5 on each channel	5	5	5
	two logic probes: 100 Msample per channel; one logic probe: 200 Msample per channel	100 Msample	200 Msample	200 Msample
	4	3	3	3
	32	47	47	47
	elementary (tolerance mask around the signal)	advanced (user-configurable, hardware based)	advanced (user-configurable, hardware based)	advanced (user-configurable, hardware based)
	basic (math on math)	advanced (formula editor)	advanced (formula editor)	advanced (formula editor)
	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429 (8)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429, FlexRay™, CAN-FD, USB 2.0/HSIC, Ethernet, Manchester, NRZ, SENT, SpaceWire, CXPI, USB Power Delivery, automotive Ethernet 100BASE-T1 (19)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, I²S, MIL-STD-1553, ARINC 429, FlexRay™, CAN-FD, MIPI RFFE, USB 2.0/HSIC, MDIO, 8b10b, Ethernet, Manchester, NRZ, SENT, MIPI D-PHY, SpaceWire, MIPI M-PHY/UniPro, CXPI, USB 3.1 Gen1, USB-SSIC, PCIe 1.1/2.0, USB Power Delivery, automotive Ethernet 100BASE-T1 (27)	I²C, SPI, UART/RS-232/RS-422/RS-485, CAN, LIN, CAN-FD, MIPI RFFE, USB 2.0/ HSIC, MDIO, 8b10b, Ethernet, Manchester, NRZ, MIPI D-PHY, MIPI M-PHY/UniPro, USB 3.1 Gen1, USB-SSIC, PCIe 1.1/2.0, USB Power Delivery, automotive Ethernet 100BASE-T1 (20)
	–	histogram, trend, track [2]	histogram, trend, track [2]	histogram, trend, track
	power, digital voltmeter (DVM), spectrum analysis and spectrogram, frequency response analysis [3]	power, 16-bit high definition mode (standard), advanced spectrum analysis and spectrogram	power, 16-bit high definition mode, advanced spectrum analysis and spectrogram, jitter, clock data recovery, I/Q data, RF analysis	16-bit high definition mode, advanced spectrum analysis and spectrogram, jitter, RF analysis, realtime deembedding
	–	–	various options available (see PD 3607.2684.22)	various options available (see PD 5215.4152.22)
	10.1", color, 1280 × 800 pixel	10.4", color, 1024 × 768 pixel	12.1", color, 1280 × 800 pixel	12.1", color, 1280 × 800 pixel
	optimized for touchscreen operation, parallel button operation			
	390 × 220 × 152	427 × 249 × 204	427 × 249 × 204	441 × 285 × 316
	3.3	8.6	9.6	18
	–	–	–	–

Specifications in brief

Specifications in brief		
Vertical system		
Number of channels	R&S®RTB2002; R&S®RTB2004	2; 4
Bandwidth (–3 dB)	R&S®RTB2002/2004 (with R&S®RTB-B2x1, R&S®RTB-B2x2 and R&S®RTB-B2x3 options)	70 MHz, 100 MHz, 200 MHz, 300 MHz
Rise time (calculated)	R&S®RTB2002/2004 (with R&S®RTB-B2x1, R&S®RTB-B2x2 and R&S®RTB-B2x3 options)	5 ns, 3.5 ns, 1.75 ns, 1.15 ns
Input impedance		1 MΩ ± 2% with 9 pF ± 2 pF (meas.)
Input sensitivity	max. bandwidth in all ranges	1 mV/div to 5 V/div
DC gain accuracy	offset and position = 0, maximum operating temperature change of ±5°C after self-alignment	
	input sensitivity > 5 mV/div	± 1.5% of full scale
	input sensitivity ≤ 5 mV/div	± 2% of full scale
ADC resolution		10 bit, up to 16 bit with high resolution decimation
Acquisition system		
Maximum realtime sampling rate		1.25 Gsample/s; 2.5 Gsample/s, interleaved
Acquisition memory	standard; with R&S®RTB-K15 option	10 Msample; 20 Msample, interleaved; 160 Msample segmented memory
Horizontal system		
Timebase range		selectable between 1 ns/div and 500 s/div
Trigger system		
Trigger types	standard	edge, width, video (PAL, NTSC, SECAM, PAL-M, SDTV 576i, HDTV 720p, HDTV 1080i, HDTV 1080p), pattern, line, serial bus
	option	I^{2}C, SPI, UART/RS-232/RS-422/RS-485, CAN/LIN
Analysis and measurement functions		
QuickMeas	at the push of a button, measurement values are continuously written onto the waveform	peak-to-peak voltage, pos. peak, neg. peak, rise time, fall time, mean value, RMS value, time, period, frequency
Waveform mathematics		addition, subtraction, multiplication, division, FFT
MSO option		
Digital channels		16 (2 logic probes)
Sampling rate		1.25 Gsample/s
Acquisition memory		10 Msample
Waveform generator		
Resolution, sample rate		14 bit, 250 Msample/s
Amplitude	high Z; 50 Ω	20 mV to 5 V (V_{pp}); 10 mV to 2.5 V (V_{pp})
DC offset	high Z; 50 Ω	±2.5 V; ±1.25 V
Signal forms frequency ranges	sine	0.1 Hz to 25 MHz
	pulse/rectangle	0.1 Hz to 10 MHz
	ramp/triangle	0.1 Hz to 1 MHz
	noise	max. 25 MHz
Arbitrary	sampling rate; memory depth	max. 10 Msample/s; 16k points
General data		
Screen		10.1" WXGA TFT color display (1280 × 800 pixel)
Interfaces		USB host with MTP, USB device, LAN, powerful web server for remote display and operation
Audible noise	maximum sound pressure level at a distance of 1.0 m	28.3 dB(A)
Dimensions	W × H × D	390 mm × 220 mm × 152 mm (15.4 in × 8.66 in × 5.98 in)
Weight		2.5 kg (5.5 lb)

Ordering information

Designation	Type	Order No.
Choose your R&S®RTB2000 base model		
Oscilloscope, 70 MHz, 2 channels	R&S®RTB2002	1333.1005.02
Oscilloscope, 70 MHz, 4 channels	R&S®RTB2004	1333.1005.04
Base unit (including standard accessories: R&S®RT-ZP03 passive probe per channel, power cord)		
Choose your bandwidth upgrade		
Upgrade of R&S®RTB2002 oscilloscopes to 100 MHz bandwidth	R&S®RTB-B221	1333.1163.02
Upgrade of R&S®RTB2002 oscilloscopes to 200 MHz bandwidth	R&S®RTB-B222	1333.1170.02
Upgrade of R&S®RTB2002 oscilloscopes to 300 MHz bandwidth	R&S®RTB-B223	1333.1186.02
Upgrade of R&S®RTB2004 oscilloscopes to 100 MHz bandwidth	R&S®RTB-B241	1333.1257.02
Upgrade of R&S®RTB2004 oscilloscopes to 200 MHz bandwidth	R&S®RTB-B242	1333.1263.02
Upgrade of R&S®RTB2004 oscilloscopes to 300 MHz bandwidth	R&S®RTB-B243	1333.1270.02
Choose your options		
Mixed signal upgrade for non-MSO models, 300 MHz, incl. 2 × R&S®RT-ZL03	R&S®RTB-B1	1333.1105.02
Arbitrary waveform generator	R&S®RTB-B6	1333.1111.02
I²C/SPI serial triggering and decoding	R&S®RTB-K1	1333.1011.02
UART/RS-232/RS-422/RS-485 serial triggering and decoding	R&S®RTB-K2	1333.1028.02
CAN/LIN serial triggering and decoding	R&S®RTB-K3	1333.1034.02
History and segmented memory	R&S®RTB-K15	1333.1040.02
Frequency response analysis (Bode plot)	R&S®RTB-K36	1335.8007.02
Application bundle, consists of the following options: R&S®RTB-K1, R&S®RTB-K2, R&S®RTB-K3, R&S®RTB-K15, R&S®RTB-K36, R&S®RTB-B6	R&S®RTB-PK1	1333.1092.02
Choose your additional probes		
Single-ended passive probes		
300 MHz, 10 MHz, 10:1/1:1, 10 MΩ/1 MΩ, 400 V, 12 pF/82 pF	R&S®RT-ZP03	3622.2817.02
500 MHz, 10 MΩ, 10:1, 300 V, 10 pF, 5 mm	R&S®RT-ZP05S	1333.2401.02
500 MHz, 10 MΩ, 10:1, 400 V, 9.5 pF	R&S®RTM-ZP10	1409.7708.02
38 MHz, 1 MΩ, 1:1, 55 V, 39 pF	R&S®RT-ZP1X	1333.1370.02
High voltage single-ended passive probes		
250 MHz, 100:1, 100 MΩ, 850 V, 6.5 pF	R&S®RT-ZH03	1333.0873.02
400 MHz, 100:1, 50 MΩ, 1000 V, 7.5 pF	R&S®RT-ZH10	1409.7720.02
High voltage probes: passive		
25 MHz, 8 MΩ, 2.75 pF, 10:1/100:1, ±700 V, 1000 V (RMS) CAT III	R&S®RT-ZD002	1337.9700.02
25 MHz, 8 MΩ, 2.75 pF, 20:1/200:1, ±1400 V, 1000 V (RMS) CAT III	R&S®RT-ZD003	1337.9800.02
400 MHz, 1000:1, 50 MΩ, 1000 V, 7.5 pF	R&S®RT-ZH11	1409.7737.02
Current probes		
20 kHz, AC/DC, 10 A/1000 A	R&S®RT-ZC02	1333.0850.02
100 kHz, AC/DC, 30 A	R&S®RT-ZC03	1333.0844.02
10 MHz, AC/DC, 150 A	R&S®RT-ZC10	1409.7750.02
100 MHz, AC/DC, 30 A	R&S®RT-ZC20	1409.7766.02
120 MHz, AC/DC, 5 A	R&S®RT-ZC30	1409.7772.02
Power supply for current probes	R&S®RT-ZA13	1409.7789.02
Active differential probes		
100 MHz, 1000:1/100:1, 8 MΩ, 1000 V (RMS), 3.5 pF	R&S®RT-ZD01	1422.0703.02
200 MHz, 10:1, 1 MΩ, 20 V diff., 3.5 pF	R&S®RT-ZD02	1333.0821.02
Logic probes		
Active 8-channel logic probe	R&S®RT-ZL03	1333.0715.02
Probe accessories		
50 Ω feedthrough termination	R&S®HZ22	3594.4015.02
Probe pouch	R&S®RT-ZA19	1335.7875.02
Choose your accessories		
Front cover	R&S®RTB-Z1	1333.1728.02
Soft bag	R&S®RTB-Z3	1333.1734.02
Transit case	R&S®RTB-Z4	1335.9290.02
Rackmount kit	R&S®ZZA-RTB2K	1333.1711.02

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