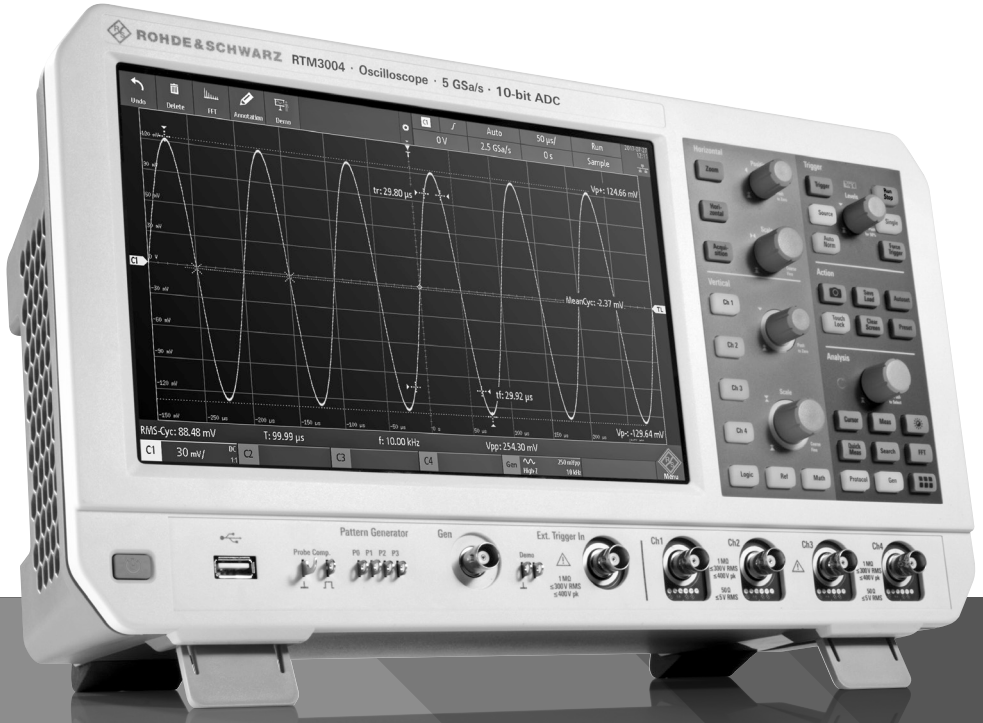
R&S®RTM3000 OSCILLOSCOPE

Specifications



Specifications
Version 13.00

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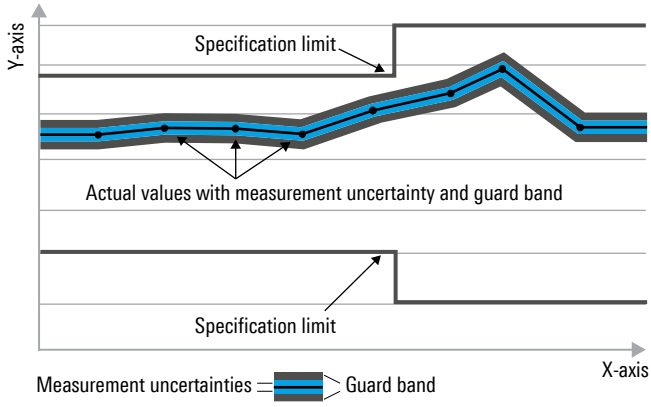
Definitions

General
Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ± or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value, e.g. dimensions or resolution of a setting parameter. Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter, e.g. nominal impedance. In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

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Base unit

Vertical system

Input channels	R&S®RTM3002	2 channels
	R&S®RTM3004	4 channels
Input impedance		50 Ω ± 1.5 % (meas.) 1 MΩ ± 1 % || 14 pF ± 1 pF (meas.)
Analog bandwidth (–3 dB)	at 50 Ω input impedance	
	R&S®RTM3002 and R&S®RTM3004	> 100 MHz
	R&S®RTM3002 with -B222 option and R&S®RTM3004 with -B242 option	> 200 MHz
	R&S®RTM3002 with -B223 option and R&S®RTM3004 with -B243 option	> 350 MHz
	R&S®RTM3002 with -B225 option and R&S®RTM3004 with -B245 option	> 500 MHz
	R&S®RTM3002 with -B2210 option and R&S®RTM3004 with -B2410 option	> 1 GHz
	at 1 MΩ input impedance	
	R&S®RTM3002 and R&S®RTM3004	> 100 MHz (meas.)
	R&S®RTM3002 with -B222 option and R&S®RTM3004 with -B242 option	> 200 MHz (meas.)
	R&S®RTM3002 with -B223 option and R&S®RTM3004 with -B243 option	> 350 MHz (meas.)
	R&S®RTM3002 with -B225 option and R&S®RTM3004 with -B245 option	> 500 MHz (meas.)
	R&S®RTM3002 with -B2210 option and R&S®RTM3004 with -B2410 option	> 500 MHz (meas.)
Lower frequency limit (–3 dB)	at AC coupling	< 5 Hz (meas.)
Analog bandwidth limits	at 50 Ω input impedance	
	R&S®RTM3002 and R&S®RTM3004	20 MHz
	R&S®RTM3002 with -B222 option and R&S®RTM3004 with -B242 option	20 MHz, 100 MHz
	R&S®RTM3002 with -B223 option and R&S®RTM3004 with -B243 option	20 MHz, 100 MHz, 200 MHz
	R&S®RTM3002 with -B225 option and R&S®RTM3004 with -B245 option	20 MHz, 100 MHz, 200 MHz, 350 MHz
	R&S®RTM3002 with -B2210 option and R&S®RTM3004 with -B2410 option	20 MHz, 100 MHz, 200 MHz, 350 MHz, 500 MHz
	at 1 MΩ input impedance	
	R&S®RTM3002 and R&S®RTM3004	20 MHz
	R&S®RTM3002 with -B222 option and R&S®RTM3004 with -B242 option	20 MHz, 100 MHz
	R&S®RTM3002 with -B223 option and R&S®RTM3004 with -B243 option	20 MHz, 100 MHz, 200 MHz
	R&S®RTM3002 with -B225 option, R&S®RTM3004 with -B245 option, R&S®RTM3002 with -B2210 option and R&S®RTM3004 with -B2410 option	20 MHz, 100 MHz, 200 MHz, 350 MHz
Rise time (calculated)	R&S®RTM3002 and R&S®RTM3004	< 3.5 ns
	R&S®RTM3002 with -B222 option and R&S®RTM3004 with -B242 option	< 1.75 ns
	R&S®RTM3002 with -B223 option and R&S®RTM3004 with -B243 option	< 1 ns
	R&S®RTM3002 with -B225 option and R&S®RTM3004 with -B245 option	< 700 ps
	R&S®RTM3002 with -B2210 option and R&S®RTM3004 with -B2410 option	< 350 ps

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Vertical resolution		10 bit, up to 16 bit with high resolution decimation
Invert signal		yes
DC gain accuracy	offset and position = 0 maximum operating temperature change of ±5 °C after self-alignment	
	input sensitivity > 5 mV/div	±1.5 %
	input sensitivity ≤ 5 mV/div to ≥ 1 mV/div	±2 %
	input sensitivity < 1 mV/div	±3 %
Input coupling		DC, AC (> 7 Hz)
Input sensitivity	at 50 Ω	0.5 mV/div to 1 V/div
	at 1 MΩ	0.5 mV/div to 10 V/div
Maximum input voltage	at 50 Ω	5 V (RMS), max. 30 V (V_p)
	at 1 MΩ	300 V (RMS), 400 V (V_p), derates at 20 dB/decade to 5 V (RMS) above 250 kHz
Position range		±5 div
Offset range at 50 Ω	input sensitivity	
	≥ 112 mV/div to 1 V/div	±(30 V – 5 div × input sensitivity)
	≥ 33.8 mV/div to 111 mV/div	±(10 V – 5 div × input sensitivity)
	0.5 mV/div to 33.6 mV/div	±(2 V – 5 div × input sensitivity)
Offset range at 1 MΩ	input sensitivity	
	≥ 515 mV/div to 10 V/div	±(250 V – 5 div × input sensitivity)
	≥ 50.5 mV/div to 510 mV/div	±(25 V – 5 div × input sensitivity)
	0.5 mV/div to 50 mV/div	±(2 V – 5 div × input sensitivity)
Offset accuracy		±(0.5 % × |offset| + 0.1 div × input sensitivity + 0.5 mV)
DC measurement accuracy	after adequate suppression of measurement noise by using either high-resolution sampling mode or waveform averaging, or a combination of both	±(DC gain accuracy × |reading – net offset| + offset accuracy)
Channel-to-channel isolation (each channel at same input sensitivity)	input frequency < analog bandwidth	> 50 dB

Horizontal system

Timebase range		selectable between 0.5 ns/div and 500 s/div
Channel deskew		±500 ns
Trigger offset range	minimum	$\frac{memory\ depth}{actual\ sampling\ rate}$
	maximum	$\frac{2^{33}}{actual\ sampling\ rate}$
Modes		normal, roll
Channel-to-channel skew		< 200 ps (meas.)
Timebase accuracy	after delivery/calibration, at +23 °C	±2.5 ppm
	during calibration interval	±3.5 ppm
Delta time accuracy	corresponds to time error between to edges on same acquisition and channel; waveform sample rate Fs can be obtained via SCPI command "`ACQ:SRAT?`"; signal amplitude greater than 5 divisions, measurement threshold set to 50 %, vertical gain 10 mV/div or greater; rise time lower than 4/Fs; waveform acquired in sample mode	±(1.34/Fs + timebase accuracy × |reading|) (peak) (meas.)

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Acquisition system

Maximum realtime sampling rate	normal mode	2.5 Gsample/s
	interleaved mode, if following channels are not used simultaneously: • channel 1 and channel 2 • channel 3 and channel 4 • D15 to D8 and D7 to D0 (logic channels)	5 Gsample/s
Memory depth per channel	normal mode	40 Msample per channel
	interleaved mode, if following channels are not used simultaneously: • channel 1 and channel 2 • channel 3 and channel 4 • D15 to D8 and D7 to D0 (logic channels)	80 Msample per channel
Acquisition modes	sample	first sample in decimation interval
	peak detect	largest and smallest sample in decimation interval (400 ps detection)
	high resolution	average value of all samples in decimation interval
	envelope	envelope of acquired waveforms
	average	average over a series of acquired waveforms
	envelope + peak detect	envelope of acquired waveforms with active peak detect
	envelope + high resolution	envelope of acquired waveforms with active high resolution
	average + high resolution	average over a series of acquired high resolution waveforms
Number of averaged waveforms		2 to 100 000
Waveform acquisition rate	dot display, single channel, auto record length	up to 64 000 waveforms/s

Trigger system

Trigger level	range	±5 div from center of screen
Trigger modes		auto, normal, single, n single with R&S®RTM-K15 option
Hold-off range	time	inactive or 51.2 ns to 13.7 s
Trigger types		edge, width, video, pattern, runt, rise time, fall time, serial bus, line, timeout
	actions on trigger	pulse, sound, screenshot, save waveform, save reference waveform
Edge trigger A	trigger events	rising edge, falling edge, both edges
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option), external trigger input
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option), external trigger input
	trigger coupling	DC, AC (attenuates < 10 Hz (meas.)), LF reject (attenuates < 10 kHz (meas.))
	trigger filter	HF reject (attenuates > 100 kHz (meas.)), noise reject (attenuates > 100 MHz (meas.))
	selectable trigger hysteresis	automatic, small, medium, large

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Trigger A sensitivity hysteresis mode automatic	with DC, AC, LF reject, noise reject	
	1 GHz, 500 MHz, 350 MHz	$> \frac{2.2\,mV_{pp}}{input\ sensitivity} + 1\,div\ (nom.)$ (input sensitivity: [mV/div])
	200 MHz, 100 MHz	$> \frac{1.5\,mV_{pp}}{input\ sensitivity} + 0.8\,div\ (nom.)$ (input sensitivity: [mV/div])
	20 MHz	$> \frac{0.6\,mV_{pp}}{input\ sensitivity} + 0.4\,div\ (nom.)$ (input sensitivity: [mV/div])
	with HF reject	
	all input sensitivities	1 div (meas.)
Edge trigger A and B	trigger events	rising edge, falling edge, both edges
	sources for A trigger	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	trigger coupling of A trigger	DC
	sources for B trigger	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	trigger coupling of B trigger	DC
	selectable trigger hysteresis for A and B trigger	small, medium, large
	trigger B mode	after time or after events
	trigger B minimum time	3.2 ns
	trigger B maximum time	100 s
	trigger B events	1 to 65535
Width trigger	trigger events	pulse width is smaller, greater, equal, unequal, inside interval, outside interval
	minimum pulse width	3.2 ns
	maximum pulse width	6.8 s
	polarity	positive, negative
	sources	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	selectable trigger hysteresis	small, medium, large
Timeout trigger	trigger events	greater than timeout
	minimum timeout	3.2 ns
	maximum timeout	6.8 s
	polarity	stays high, stays low
	sources	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	selectable trigger hysteresis	small, medium, large
Video trigger	trigger events	selectable line, all lines, even frame, odd frame, all frames
	supported standards	PAL, NTSC, SECAM, PAL-M, SDTV 576i, HDTV 720p, HDTV 1080i, HDTV 1080p
	sources	
	R&S®RTM3002	channel 1, channel 2, ext. trigger input
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, ext. trigger input
	sync pulse polarity	positive, negative

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Pattern trigger	trigger events	logic condition between active channels
	sources	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	state of channels	high, low, don't care
	logic between channels	and/or
	condition	true, false
	duration condition	smaller, greater, equal, unequal, inside interval, outside interval, timeout
	minimum duration time	3.2 ns
	maximum duration time	6.8 s
Runt trigger		triggers on pulse of positive, negative or either polarity that crosses one threshold but fails to cross a second threshold before crossing the first one again
Rise time, fall time	trigger events	time between the crossing of two selectable levels is lower, greater, equal, not equal
	minimum rise time	3.2 ns
	maximum rise time	6.8 s
	polarity	rising edge, falling edge, both edges
	sources	
	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
Serial bus trigger	supported standards	
	R&S®RTM-K1 option	I^2C, SSPI (two-wire, MOSI/MISO), SPI (three-wire, MOSI/MISO)
	R&S®RTM-K2 option	UART/RS-232/RS-422/RS-485 (RX/TX)
	R&S®RTM-K3 option	CAN/LIN
	R&S®RTM-K5 option	audio (I^2S, LJ, RJ, TDM)
	R&S®RTM-K6 option	MIL-STD-1553
	R&S®RTM-K7 option	ARINC 429
External trigger input	input impedance	1 MΩ ± 1 % with 14 pF ± 2 pF (meas.)
	maximum input voltage at 1 MΩ	300 V (RMS), 400 V (V_p), derates at 20 dB/decade to 5 V (RMS) above 250 kHz
	trigger level	±5 V
	sensitivity	> 300 mV (V_{pp})
	coupling	DC, AC, LF reject
Trigger output	functionality	A pulse is generated for every acquisition trigger event.
	output voltage	
	at high impedance	0 V to 4.8 V
	at 50 Ω	0 V to 2.4 V
	pulse polarity	high active

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Waveform measurements

Automatic measurements	measurements on channels, math waveforms, reference waveforms	burst width, count positive pulses, count negative pulses, count falling edges, count rising edges, mean value, RMS cycle, RMS, mean cycle, peak peak, peak+, peak–, frequency, period, amplitude, top level, base level, positive overshoot, negative overshoot, pulse width+, pulse width-, duty cycle+, duty cycle–, rise time, fall time, delay, phase, crest factor, slew rate+, slew rate–, σ.std. deviation, σ.std. deviation cycle, delay to trigger
	reference levels	lower, middle and upper level in percentage
	statistics	maximum, minimum, mean, standard deviation and measurement count for each automatic measurement
	number of active measurements	8
Cursor measurements	type	vertical, horizontal, vertical and horizontal, V-marker
	functions	x and y tracking, coupling of cursors, set to trace, two sources selectable
Quick measurements	function	fast overview of measurements from one channel, some measurements displayed with result lines in diagram
	sources	
	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
	measurements displayed in diagram	mean, max. peak, min. peak, rise time, fall time
	numerically displayed measurements	RMS cycle, peak-to-peak voltage, period, frequency

Digital voltmeter

Accuracy		related to channel settings of voltmeter source
Measurements		DC, AC+DC RMS, AC RMS
Sources	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
Number of measurements		up to 4
Resolution		up to 3 digits
Bandwidth		1 MHz

Counter

Measurements		frequency, period
Sources	R&S®RTM3002	channel 1, channel 2, trigger signal source
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, trigger signal source
Number of measurements		2
Resolution		6 digits
Frequency range		0. 05 Hz to bandwidth of oscilloscope (limited by bandwidth of trigger filter)

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Mask testing

Sources	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
Mask definition		acquired waveform with user-defined tolerance, can be stored and restored
Result statistics		completed acquisitions, passed and failed acquisitions (absolute and in percent), test duration
Actions on mask violation		sound, acquisition stop, screenshot, save waveform, pulse out (AUX OUT connector)
Captured segments	with R&S®RTM-K15 option	all segments, failed segments

Waveform maths

Number of math equations		up to 5
Functions		addition, subtraction, multiplication, division, square, square root, absolute value, reciprocal, inverse, log10, ln, derivation, integration, low pass, high pass, track period, track frequency, track pulse width, track duty cycle
Sources	R&S®RTM3002	channel 1, channel 2, math waveforms 1 to 4
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, math waveforms 1 to 4

Fast Fourier transform (FFT)

Sources	R&S®RTM3002	channel 1, channel 2, math waveforms, references
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, math waveforms, references
Setup parameters		start frequency, stop frequency, center frequency, frequency span, vertical scale, vertical position, resolution bandwidth, gate (time range and position)
Windows		Hanning, Hamming, Blackman, rectangular, flat top
Waveform arithmetic		none, min. hold, max. hold, average (selectable from 2 to 1024)
Scaling		dBm, dBV, dBµV, V (RMS)

Search function

Functions	search types	edge, width, peak, rise/fall time, runt, data2clock, pattern, window, protocol (available with R&S®RTM-K3, R&S®RTM-K6 and R&S®RTM-K7 options)
	configuration	manual level setting on screen, level with selectable hysteresis
	display of search events	up to 10 000 events in diagram and in result table
	markers on search events	up to 32 markers
	navigation in search events (stop mode)	knob (if result table is active)
Sources	R&S®RTM3002	channel 1, channel 2, math waveforms from 1 to 5, D15 to D0 (with R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, math waveforms from 1 to 5, D15 to D0 (with R&S®RTM-B1 option)

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Display characteristics

Diagram types	manually changeable vertical window size	Yt, XY, zoom, FFT, spectrogram (with R&S®RTM-K37 option)
XY mode		parallel display of XY diagram and Yt diagrams of input signals for X, Y
Zoom		horizontal and vertical zoom, split screen with overview signal and zoomed signal
Interpolation		sin(x)/x, linear, sample & hold
FFT mode		split screen with Yt diagrams and dedicated frequency diagram, spectrogram (with R&S®RTM-K37 option)
Waveform display		lines, dots only
Persistence		50 ms to 12.8 s; infinite
Special display mode		inverse brightness, waveform color modes for analog channels (temperature, fire, rainbow)
Diagram grid		lines, reticle, none, with annotation, track grid
Reference signals		up to 4 reference signals

Protocol and logic

Bus decode	number of bus signals	4 [1]
	bus types	parallel, parallel clocked • SSPI, SPI, I²C (R&S®RTM-K1 option) • UART/RS-232/RS-422/RS-485 (R&S®RTM-K2 option) • CAN, LIN (R&S®RTM-K3 option) • I²S, LJ, RJ, TDM (R&S®RTM-K5 option) • MIL-STD-1553 (R&S®RTM-K6 option) • ARINC 429 (R&S®RTM-K7 option)
	display types	decoded bus, logical signal, frame table (depends on decoded bus)
	position and size	size and position on screen selectable
	data format of decoded bus	hex, decimal, binary, octal, ASCII

Miscellaneous

Save/recall	device settings	save and recall on internal file system or USB memory stick or on a PC via web interface or USB-MTP
	reference waveforms	save and recall on internal file system or USB memory stick or on a PC via web interface or USB-MTP
	waveforms	save on USB memory stick or download and save on a PC via web interface or USB-MTP, available file formats: BIN, CSV, TXT float (MSB/LSB first)
	screenshots	save on USB memory stick or download and save on a PC via web interface or USB-MTP, available file formats: BMP, PNG
	device settings	save and recall on internal file system or USB memory stick or on a PC via web interface or USB-MTP

[1] If a bidirectional bus is used (e.g. UART RX/TX or SPI MOSI/MISO), two bus decoders are occupied.

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Camera key		configurable camera key, actions on press: • save screenshot • one-touch
	save screenshot	one-touch off
	one-touch	one or more from the list: • setup • screenshots (PNG, color) • waveforms (BIN-MSB, CI, display data) • references • search event table • bus table • statistics
Instrument security		secure erasure of internal file system and all settings
Menu languages		available menu languages: • English • German • French • Spanish • Italian • Portuguese • Czech • Polish • Russian • Simplified Chinese • Traditional Chinese • Korean • Japanese
Help		online help, available languages: • English
Undo/redo		deep undo/redo function

Input and outputs

Front		
Channel inputs		BNC, for details see Vertical system
	probe interface	auto detection of passive probes, Rohde & Schwarz active probe interface
External trigger input		BNC, for details see Trigger system
	probe interface	auto detection of passive probes
Waveform generator (requires R&S®RTM-B6 option)		BNC, for details see R&S®RTM-B6, waveform generator, demo lug and GND lug
Probe compensation output	signal shape	rectangle
	frequency	1 kHz
	voltage	V_{low} = 0 V, V_{high} = 1.5 V to 3.3 V (meas.)
Pattern source (requires R&S®RTM-B6 option)	P3 to P0	4 lugs, for details see R&S®RTM-B6, 4-bit pattern generator
	frequency	1 mHz to 25 MHz
	voltage	V_{low} = 0 V, V_{high} = 1.5 V to 3.3 V (meas.)
Ground lug		connected to ground
USB host interface		1 port, type A plug, version 2.0, flash drives only, FAT32 formatting required
Rear		
Ethernet interface		1 port, 1 Gbit
AUX OUT (BNC)	trigger out,	for details see Trigger system
	reference frequency	10 MHz ±3.5 ppm (meas.)
	mask violation	pulse
USB device interface		1 port, type B plug, version 2.0
Fixation loop		for securing the instrument with a cable
Security slot		for standard Kensington style lock
Right side		
Digital channel inputs	D15 to D8, D7 to D0	requires R&S®RTM-B1 option

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General data

Display		
Type		10.1" WXGA display with capacitive touch
Resolution		1280 × 800 pixel (WXGA)
Temperature		
Temperature loading	operating temperature range	0 °C to +50 °C
	storage temperature range	–40 °C to +70 °C
Climatic loading		+25 °C/+40 °C at 85 % rel. humidity cyclic, in line with IEC 60068-2-30
Altitude		
Operating		up to 3000 m above sea level
Nonoperating		up to 4600 m above sea level
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 1.8 g at 55 Hz; 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6 MIL-PRF-28800F, 4.5.5.3.2 sinusoidal vibration, class 3 and 4
	random	8 Hz to 500 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64, MIL-PRF-28800F, 4.5.5.3.1 random vibration, class 3 and 4
Shock		40 g shock spectrum, in line with MIL-STD-810E, method no. 516.4, procedure I, MIL-PRF-28800F, 4.5.5.4.1 functional shock, 30 g, 11 ms, halfsine
EMC		
RF emission		in line with CISPR 11/EN 55011 group 1 class A (for a shielded test setup); the instrument complies with the emission requirements stipulated by EN 55011, EN 61326-1 and EN 61326-2-1 class A, making the instrument suitable for use in industrial environments
Immunity		in line with IEC/EN 61326-1 table 2, immunity test requirements for industrial environments [2]
Certifications		VDE, $_{C}$CSA$_{US}$, KC
Calibration interval		1 year
Power supply		
AC supply		100 V to 240 V at 50 Hz to 60 Hz 1.6 A to 0.7 A
Power consumption		max. 160 W
Safety		in line with • IEC 61010-1, IEC 61010-2-030 • EN 61010-1, EN 61010-2-030 • CAN/CSA-C22.2 No. 61010-1 • CAN/CSA-C22.2 No. 61010-2-030 • UL 61010-1, UL 61010-2-030
Mechanical data		
Dimensions	W × H × D	390 mm × 220 mm × 152 mm (15.35 in × 8.66 in × 5.98 in)
Weight	without options (nom.)	3.3 kg (7.275 lb)
Audible noise	maximum sound pressure level at a distance of 1.0 m	28.3 dB(A)

[2] Test criterion is displayed noise level within ±1 div for input sensitivity of 5 mV/div.

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Options

R&S®RTM-B1

Mixed signal option, additional 16 logic channels		
Vertical system		
Input channels		16 logic channels (from D15 to D0)
Arrangement of input channels		arranged in two logic probes with 8 channels each, assignment of the logic probes to the channels D15 to D8 and D7 to D0
Input impedance		100 kΩ ± 2 % || ~4 pF (meas.) at probe tips
Maximum input frequency	signal with minimum input voltage swing and hysteresis setting: normal	400 MHz (meas.)
Maximum input voltage		±40 V (V_p)
Minimum input voltage swing		500 mV (V_{pp}) (meas.)
Threshold groups		from D15 to D12, D11 to D8, D7 to D4 and D3 to D0
Threshold level	user range	±8 V in 25 mV steps
	predefined	CMOS 2.5 V, TTL 1.4 V, ECL -1.3 V
Threshold accuracy	threshold setting between ± 4 V	±(100 mV + 3 % of threshold setting)
Comparator hysteresis		small, medium, large
Horizontal system		
Channel deskew	range for each channel	±500 ns
Channel-to-channel skew		< 200 ps (meas.) for same vertical settings on the channels
Acquisition system		
Sampling rate	two logic probes (normal mode)	2.5 Gsample/s on each channel
	one logic probe (interleaved mode)	5 Gsample/s on each channel
Memory depth	two logic probes (normal mode)	40 Msample for every channel
	one logic probe (interleaved mode)	80 Msample for every channel
Trigger system		see chapter Trigger system of the base unit
Waveform measurements		
Measurement sources		all channels from D15 to D0
Automatic measurements		positive pulse width, negative pulse width, period, frequency, burst width, delay, phase, positive duty cycle, negative duty cycle, positive pulse count, negative pulse count, rising edge count, falling edge count
Additional cursor function		display of hex value at the cursor position
Display characteristics		
Channel activity display		independent of the oscilloscope acquisition, the state (stays low, stays high or toggles) of the channels from D15 to D0 is displayed

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R&S®RTM-B6

Waveform generator and 4-bit pattern generator		
Waveform generator		
Resolution		14 bit
Sample rate		250 Msample/s
Amplitude	level	
	high Z	20 mV to 10 V (V_{pp})
	50 Ω	10 mV to 5 V (V_{pp})
	accuracy (frequency ≤100 kHz)	3 %
DC offset	level	
	high Z	± 5 V
	50 Ω	± 2.5 V
	accuracy	3 % or ± 5 mV whatever is greater
Sine	frequency	0.1 Hz to 25 MHz
	SFDR	> 40 dBc (meas.)
	THD	> 40 dBc (meas.)
Rectangle	frequency	0.1 Hz to 10 MHz
Pulse	frequency	0.1 Hz to 10 MHz
	edge time	adjustable
	duty cycle	1 % to 99 %
Ramp, triangle, sinc, exponential	frequency	0.1 Hz to 1 MHz
Arbitrary	frequency	0.1 Hz to 10 MHz
	memory depth	32k point
Noise	bandwidth	max. 25 MHz
	level	0 to 100 % of signal amplitude
Modulation	AM	
	function	sine, rectangle, triangle, ramp
	frequency	0.1 Hz to 1 MHz
	depth	0 to 100 %
	FM	
	function	sine, rectangle, triangle, ramp
	frequency	0.1 Hz to 1 MHz
	deviation	depends on modulation frequency
	ASK	
	function	sine, rectangle, triangle, ramp
	frequency	0.1 Hz to 1 MHz
	ASK depth	0 to 100 %
	FSK	
	function	sine, rectangle, triangle, ramp
	frequency	0.1 Hz to 1 MHz
	FSK rate	0.1 Hz to carrier frequency/2
Sweep	start frequency	1 Hz to 25 MHz
	stop frequency	1 Hz to 25 MHz
	sweep time	1 ms to 10 s
	sweep type	linear, logarithmic, triangle
Burst	number of cycle	1 to 1024
	idle time	28 ns to 17 s
	start phase	0° to 360°
	trigger	continuous, manually
4-bit pattern generator		
Functions		probe adjust/square wave, bus signal source 4-bit counter, programmable 4-bit pattern
Bus signal source		SPI, I^2C, UART, CAN, LIN, audio, PWM
	bandwidth	9600 bit/s to 1 Mbit/s
4-bit counter	frequency	25 mHz to 50 MHz
Programmable pattern	sample rate	20 ns to 1 s, up/down
	square wave frequency	1 mHz to 500 kHz
	memory depth	8096 bit per channel
	pattern idle time	50 ns to 1 s
	amplitude	V_{low} = 0 V, V_{high} = 1.5 V to 3.3 V (meas.)

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R&S®RTM-K1

I²C triggering and decoding		
Bus configuration	sources for SCL and SDA	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (requires R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	bit rate	up to 10 Mbps
	size of address	7 bit or 10 bit
	size of data	8 bit
	label list	associate frame identifier with symbolic ID
Trigger	trigger events	start, stop, restart, missing acknowledge, address (7 bit or 10 bit), data, address and data
	offset for trigger on data	0 data byte to 4095 data byte
	data pattern width	up to 3 sequential data byte
Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	address, data, start, stop, ACK, NACK, error
	displayed format of address	hex, symbolic ID (label list)
	displayed format of data	ASCII, binary, decimal or hex
SPI triggering and decoding		
Bus configuration	sources for CS, CLK, MOSI and MISO	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (requires R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	bit rate	up to 25 Mbps
	chip select (CS)	active low, active high or missing (SSPI)
	clock (CLK) slope	rise or fall
	data symbol size	1 bit to 32 bit
	idle time for SSPI	12.8 ns to 26.8 ms
Trigger	trigger events	start of frame, end of frame, bit number, data pattern
	selectable bit number	0 to 4095
	offset for trigger on data pattern	0 to 4095 bit
	data pattern size	1 bit to 32 bit
Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	data, start, stop, error
	displayed format of data	ASCII, binary, decimal or hex
	data decoding	MSB or LSB first

R&S®RTM-K2

UART/RS-232/RS-422/RS-485 triggering and decoding		
Bus configuration	source for RX and TX	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (requires R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	bit rate	300 bps to 1 Mbps or user-selectable up to 6 Mbps
	end of frame	timeout
	signal polarity	idle low, idle high
	data symbol size	5 bit to 9 bit
	parity	none, even or odd
	stop bits	1, 1.5 or 2
	Idle time	up to 26.8 ms
Trigger	trigger events	start bit, start of frame, symbol number, any symbol, pattern of symbols, parity error, stop bit error, break
	offset for trigger on data symbol	0 to 4095 symbols
	data symbol pattern width	1 to floor (32/symbol size) symbols

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Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	data, start, stop, error, parity
	displayed format of data	ASCII, binary, decimal or hex

R&S®RTM-K3

CAN triggering and decoding		
Bus configuration	signal type	CAN_H, CAN_L
	bit rate	10/20/33.3/50/83.3/100/125/250/500/ 1000 kbps or user-selectable in range from 100 bps to 2 Mbps
	sampling point	10 % to 90 % within bit period
	label list	associate frame identifier with symbolic ID
Trigger	trigger events	start of frame, frame type, identifier, identifier + data, error condition (any combination of CRC error, bit stuffing error, form error and ACK error)
	identifier setup	frame type (data, remote or both), identifier type (11 bit or 29 bit); condition =, ≠, >, <; identifier selectable from label list
	data setup	data pattern up to 8 byte (hex or binary); condition =, ≠, >, <
Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	start of frame, identifier, DLC, data payload, CRC, ACK, end of frame, error frame, overload frame, CRC error, bit stuffing error, ACK error
	displayed format of data	hex, decimal, binary, ASCII
	frame table	decode results displayed as tabulated list, errors highlighted in red; frame navigation; data export as CSV file
Search	search events	frame, error, identifier, identifier + data, identifier + error
	frame event setup	start of frame, end of frame, overload frame, error frame, data ID 11 bit, data ID 29 bit, remote ID 11 bit, remote ID 29 bit
	error event setup	any combination of CRC error, bit stuffing error, form error and ACK error
	identifier setup	frame type (data, remote or both), identifier type (11 bit or 29 bit); condition =, ≠, >, <; identifier selectable from label list
	data setup	data pattern up to 8 byte (hex or binary); condition =, ≠, >, <
	event table	search results displayed as tabulated list; event navigation
LIN triggering and decoding		
Bus configuration	version	1.3, 2.x or SAE J2602; mixed traffic is supported
	bit rate	1.2/2.4/4.8/9.6/10.417/19.2 kbps or user-selectable in range from 100 bps to 5 Mbps
	polarity	active high or active low
	label list	associate frame identifier with symbolic ID

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Trigger	source	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (requires R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	trigger events	start of frame (sync break), identifier, identifier + data, wakeup frame, error condition (any combination of checksum error, parity error and sync field error)
	identifier setup	range from 0d to 63d; condition =, ≠, >, <; identifier selectable from label list
	data setup	data pattern up to 8 byte (hex or binary); condition =, ≠, >, <
Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	frame, frame identifier, parity, data payload, checksum, error condition
	displayed format of data	hex, decimal, binary, ASCII
	frame table	decode results displayed as tabulated list, errors highlighted in red; frame navigation; data export as CSV file
Search	search events	frame, error, identifier, identifier + data, identifier + error
	frame event setup	start of frame, wake up
	error event setup	any combination of checksum error, parity error and sync field error
	identifier setup	range from 0d to 63d; condition =, ≠, >, <; identifier selectable from label list
	data setup	data pattern up to 8 byte (hex or binary); condition =, ≠, >, <
	event table	search results displayed as tabulated list; event navigation

R&S®RTM-K5

Audio (I^2S, LJ, RJ, TDM) triggering and decoding		
Bus configuration	source (data, clock, word/sync)	
	R&S®RTM3002	channel 1, channel 2, logic channels from D15 to D0 (requires R&S®RTM-B1 option)
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4, logic channels from D15 to D0 (with R&S®RTM-B1 option)
	thresholds	per-channel threshold (analog channels), per-group threshold (logic channels), assisted threshold configuration (find level)
	bit rate	up to 30 Mbps
	signal type	I^2S standard, left justified, right justified, TDM
	polarity	data: active high, active low
		clock: rising edge, falling edge
		word/sync: normal, inverted
	word length	2 to 32 bit
	bit order	most significant bit first (MSBF)
		least significant bit first (LSBF)
	I^2S specific setup	
	first channel	left, right
	LJ/RJ specific setup	
	first channel	left, right
	channel offset	0 to 31 bit
	TDM specific setup	
	number of channels	1 to 8
	channel length	2 bit to 32 bit
	channel offset	0 to (channel length – word length) bits
	channel delay	0 to 31 bit

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Trigger	trigger events	data, window, word/sync, error condition
	data setup	define individual value and condition for each audio channel; condition =, ≠, >, <, inside range, outside range, don't care; trigger when "all" or "any" audio channel conditions are met in single audio frame
	window setup	audio channel setup same as data setup; user-defined window length up to 4 000 000 000 frames
	word/sync setup	rising edge, falling edge
Decode	displayed signals	bus signal, stacked bus signal, logic signal
	color coding of bus signal	color-coded audio channels
	displayed format of data	hex, signed decimal, binary, ASCII
	frame table	decode results displayed as tabulated list with timestamp; frame navigation; data export as CSV file
	track of audio waveform	displays audio channel content as a waveform that is time-correlated to the source signals; user can activate, scale and position each audio channel individually

R&S®RTM-K6

MIL-STD-1553 triggering and decoding		
Protocol configuration	source	
	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
	bit rate	standard bit rate (1 Mbit/s)
	polarity	normal, inverted
	label list	associate frame identifier with symbolic ID
	auto threshold setup	assisted threshold configuration
	timing	max response (4 µs to 200 µs)
Trigger	trigger event setup	sync, word, command word, status word, command and data word, error condition
	sync setup	all words, command/status word, data word
	word setup	all words, command word, status word, data word
	command word setup (type: address/word)	RT address (condition =, ≠, ≥, ≤, in range, out of range); direction (T/R); subaddress (condition =, ≠, ≥, ≤, in range, out of range); data word count (condition =, ≠, ≥, ≤, in range, out of range)
	command word setup (type: mode code)	RT address (condition =, ≠, ≥, ≤, in range, out of range); subaddress (0, 31 or either); mode code from labeled dropdown list
	status word setup	RT address; status flags (message error, instrumentation, service request, broadcast command, busy, subsystem flag, dynamic bus control, terminal flag) individually configurable (1, 0, don't care)
	command and data word setup	transmission type (BC-RT, RT-BC, BC-BC, mode code); RT address (condition =, ≠, ≥, ≤, in range, out of range); subaddress (condition =, ≠, ≥, ≤, in range, out of range); data word count (condition =, ≠, ≥, ≤, in range, out of range); data pattern up to 4 words long (condition =, ≠, ≥, ≤, in range, out of range); payload data index (condition =)
	error condition setup	any combination of sync error, Manchester error, parity error, timing error (see protocol configuration)

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Decode	display signals	bus signal; symbolic ID in bus signal when label list in use
	color coding	sync, RT address, subaddress, mode code, status bit field, data, error condition
	displayed format of data	hex, decimal, binary, ASCII
	frame table	decode results displayed as tabulated list, errors highlighted in red; frame navigation; data export as CSV file; column with symbolic ID when label list in use
Search	search events	word, command word, mode code, status word, command and data word, error
	word setup	command, status, data
	command word setup	see trigger settings for “command word setup (type: address/word)”
	mode code setup	see trigger settings for “command word setup (type: mode code)”
	status word setup	see trigger settings for “status word setup”
	command and data word setup	see trigger settings for “command and data word setup”
	error condition setup	all, sync, parity, Manchester, timing

R&S®RTM-K7

ARINC 429 triggering and decoding		
Protocol configuration	source	
	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
	bit rate	high (100 kbit/s), low (12.5 kbit/s), or user-defined in range 10 kbit/s to 1 Mbit/s
	polarity	A leg, B leg, normal, inverted
	label list	associate numeric label with symbolic ID; optional definition of ARINC word format in terms of availability of label-specific SDI and SSM fields
	auto threshold setup	assisted threshold configuration
Trigger	trigger event setup	word, label, label and data, error condition, transmission interval
	word setup	word start, word stop
	label setup	label (condition =, ≠, ≥, ≤, in range, out of range)
	data setup	data pattern up to 23 bit long (condition =, ≠, ≥, ≤, in range, out of range); data bit offset; SDI (00,01,10,11); SSM (00,01,10,11); label list can be used to determine availability of trigger properties SSM and SDI for given label value
	error condition setup	any combination of coding error, parity error, gap error
	transmission interval setup	label (condition =); SDI (optional); time interval (condition >, <, in range, out of range)
Decode	display signals	bus signal, logic signal or both; symbolic ID in bus signal when label list in use
	color coding	word begin, word end, label, SDI, data, SSM, parity, error
	displayed format of data	hex, decimal, binary, ASCII
	frame table	decode results displayed as tabulated list, errors highlighted in red; frame navigation; data export as CSV file; column with symbolic ID when label list in use
Search	search events	word, label, label and data, error condition
	word setup	word start, word stop
	label setup	see trigger settings for “label setup”
	data setup	see trigger settings for “data setup”
	error condition setup	coding error, parity error, gap error, any

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R&S®RTM-K15

History and segmented memory				
Acquisition memory		automatic, predefined, manual		
	automatic	automatic segment size and numbers		
	predefined	defined size and automatic numbers		
	manual	user-defined size and numbers		
Memory segmentation	function	memory segments for the acquisition		
	number of segments [3]	record length	segments (up to)	total memory (per channel)
		5 ksample	34 952	174.8 Msample
		10 ksample	34 952	349.5 Msample
		20 ksample	17 476	349.5 Msample
		50 ksample	6 990	349.5 Msample
		100 ksample	3 883	388.3 Msample
		200 ksample	2 056	411.2 Msample
		500 ksample	852	426 Msample
		1 Msample	426	426 Msample
		2 Msample	214	428 Msample
		5 Msample	85	425 Msample
		10 Msample	42	420 Msample
		20 Msample	21	420 Msample
		40 Msample	10	400 Msample
		80 Msample	5	400 Msample
	segmentation is active on all analog and logic channels, protocol decoding and spectrum analysis			
Fast-segmented mode	continuous recording of waveforms in acquisition memory without interruption due to visualization; blind time between consecutive acquisitions less than 200 ns (up to 2 000 000 waveforms/s)			
History mode	function	The history mode always provides access to past acquisitions in the segmented memory.		
	timestamp resolution	3.2 ns		
	history player	replays the recorded waveforms; repetition possible; adjustable speed; manual next / previous segment; numerical segment number input		
	analyze options	overlay all segments, average all segments, envelope all segments		

[3] At interleaved mode.

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R&S®RTM-K31

Power analysis		
General description	The R&S®RTM-K31 power analysis option extends the R&S®RTM firmware with measurement functionality focused on switched mode power supplies (SMPS) and DC/DC converters.	
Input	quality	evaluation of power quality at an AC input; measures real power, apparent power, reactive power, power factor and phase angle of power, frequency, crest factor, RMS of voltage and current
	harmonics	measures up to the 334th harmonic of the incoming line frequency; precompliance checking for IEC 61000-3-2 (A, B, C, D), RTCA DO-160, MIL-STD-1399, max. limit checks
	inrush current	measures peak inrush current and electrical charge within up to 3 configurable measurement zones to analyze the inrush and post-inrush behavior
	consumption	long term measurement of consumed power and energy to analyze nonperiodical signals of e.g. standby devices
Switching/control loop	slew rate	The minimum and maximum slew rate of current or voltage is measured at start and end of the switching cycle.
	modulation	measures modulation of switching frequency, duty cycle (±) and pulse width
	dynamic on-resistance	measures resistance of the switching transistor(s) in active state
Power path	efficiency	measures input and output power to calculate the efficiency of a power device
	switching loss	measures switching loss and conduction loss of a power device
	safe operating area (SOA)	checks violation of voltage and current limits in which a power device can operate without damage; current versus voltage view (linear or log); violation mask is user-defined and editable in linear and log-log views; save/load of masks; export of mask violation data
	turn on/off time	measures relationship between AC and DC current, when turning SMPS off and on
Output	ripple	measures AC components of output voltage or current, AC RMS, mean, period, frequency, duty cycles, min./max./peak-to-peak amplitude
	spectrum	FFT analysis of output, measurement of frequency peaks
	transient response	This measurement captures the device behavior between the event of load changes and stabilization; includes peak (voltage, time), settling time, rise time, overshoot and delay
Deskew	automated	By using the R&S®RT-ZF20 probe deskew and calibration test fixture and Rohde & Schwarz voltage and current probes, the skew between the signals is compensated automatically.
Zero offset	automated	automatic compensation of input offset
Reporting	Report data can be saved for every measurement. Report generation using user-selected test results from historical and current tests. Put repeated and/or different measurements in one report. R&S®Oscilloscope Report Creator can be downloaded from Rohde & Schwarz website free-of-charge.	

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R&S®RTM-K36

Frequency response analysis – Bode plot (does not require R&S®RTM-B6 option)		
Stimulus	frequency mode	single sweep or repeated sweep
	frequency range	10 Hz to 25 MHz
	amplitude mode	fixed or amplitude profile
	amplitude level	20 mV to 10 V into high Z
		10 mV to 5 V into 50 Ω
Input and output sources	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
Number of test points		10 points to 500 points per decade
Dynamic range		typ. > 70 dB based on 0 dBm (630 mV (V_{pp})) into 50 Ω, gain noise < 1 dB, phase noise < 5°
Measurement		dual pair of tracking gain and phase cursors
Diagram types	manually changeable vertical window size	parallel display of result window and input and output signal view
Result table		navigation and export functions
Scaling	during and after test	auto-scale and manual scaling and positioning

R&S®RTM-K37

Spectrum analysis and spectrogram		
General	additional displays	spectrum traces and/or spectrogram
Spectrum	sources	
	R&S®RTM3002	channel 1, channel 2
	R&S®RTM3004	channel 1, channel 2, channel 3, channel 4
	setup parameters	center frequency, frequency span, automatic RBW, resolution bandwidth, gate position, gate width, vertical scale, vertical position
	scaling	dBm, dBµV, dBV, V (RMS)
	span	0.2 Hz to 1.2 GHz
	resolution bandwidth	span/10 ≥ RBW ≥ span/1000
	windows	flat top, Hanning, Hamming, Blackman, rectangular
	trace types	normal, max. hold, min. hold, average (selectable from 2 to 1024)
Spectrogram	color	rainbow, temp. color, monochrome
Marker	peak marker search	standard search parameter: min. level
		advanced search parameter: min. level, excursion, maximum width, distance to next peak
	reference marker	selection via index or frequency range
	markers on peak	up to 100 markers
	sources	any spectrum trace
	table	frequency and magnitude, absolute or relative to reference marker
	marker result display	indicated at wave form: level, frequency
Cursor	measurements on spectrum traces	level, frequency, level and frequency, V marker
	additional actions for cursor	coupling of cursors, set to trace, set to screen, track scaling, set next and previous peak
Spectrogram measurements	two time cursor	t1, t2, delta t, total time, relative time between segments

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Ordering information

Designation	Type	Order No.
Choose your R&S®RTM3000 base model		
Oscilloscope, 100 MHz, 2 channels	R&S®RTM3002	1335.8794.02
Oscilloscope, 100 MHz, 4 channels	R&S®RTM3004	1335.8794.04
Base unit (including standard accessories: 500 MHz passive probe per channel, power cord)		
Choose your bandwidth upgrade		
Upgrade of R&S®RTM3002 oscilloscopes to 200 MHz bandwidth	R&S®RTM-B222	1335.9003.02
Upgrade of R&S®RTM3002 oscilloscopes to 350 MHz bandwidth	R&S®RTM-B223	1335.9010.02
Upgrade of R&S®RTM3002 oscilloscopes to 500 MHz bandwidth	R&S®RTM-B225	1335.9026.02
Upgrade of R&S®RTM3002 oscilloscopes to 1 GHz bandwidth	R&S®RTM-B2210	1335.9032.02
Upgrade of R&S®RTM3004 oscilloscopes to 200 MHz bandwidth	R&S®RTM-B242	1335.9049.02
Upgrade of R&S®RTM3004 oscilloscopes to 350 MHz bandwidth	R&S®RTM-B243	1335.9055.02
Upgrade of R&S®RTM3004 oscilloscopes to 500 MHz bandwidth	R&S®RTM-B245	1335.9061.02
Upgrade of R&S®RTM3004 oscilloscopes to 1 GHz bandwidth	R&S®RTM-B2410	1335.9078.02
Choose your options		
Mixed signal upgrade for non-MSO models, 400 MHz	R&S®RTM-B1	1335.8988.02
Arbitrary waveform and 4-bit pattern generator	R&S®RTM-B6	1335.8994.02
I^2C/SPI serial triggering and decoding	R&S®RTM-K1	1335.8807.02
UART/RS-232/RS-422/RS-485 serial triggering and decoding	R&S®RTM-K2	1335.8813.02
CAN/LIN serial triggering and decoding	R&S®RTM-K3	1335.8820.02
Audio (I^2S, LJ, RJ, TDM) triggering and decoding	R&S®RTM-K5	1335.8842.02
MIL-STD-1553 serial triggering and decoding	R&S®RTM-K6	1335.8859.02
ARINC 429 serial triggering and decoding	R&S®RTM-K7	1335.8865.02
History and segmented memory	R&S®RTM-K15	1335.8907.02
Power analysis	R&S®RTM-K31	1335.8920.02
Frequency response analysis (Bode plot)	R&S®RTM-K36	1335.9178.02
Spectrum analysis and spectrogram	R&S®RTM-K37	1335.9184.02
Application bundle [4], consists of the following options: R&S®RTM-K1, R&S®RTM-K2, R&S®RTM-K3, R&S®RTM-K5, R&S®RTM-K6, R&S®RTM-K7, R&S®RTM-K15, R&S®RTM-K31, R&S®RTM-K36, R&S®RTM-K37, R&S®RTM-B6	R&S®RTM-PK1	1335.8942.02
Application bundle [5], consists of the following options: R&S®RTM-K1, R&S®RTM-K2, R&S®RTM-K3, R&S®RTM-K5, R&S®RTM-K6, R&S®RTM-K7, R&S®RTM-K15, R&S®RTM-K31, R&S®RTM-K36, R&S®RTM-K37, R&S®RTM-B6	R&S®RTM-PK1US	1335.9190.02
Choose your additional probes		
Single-ended passive probes		
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, 2.5 mm	R&S®RT-ZP10	1409.7550.00
38 MHz, 1 MΩ, 1:1, 55 V, 39 pF, 2.5 mm	R&S®RT-ZP1X	1333.1370.02
Active broadband probes: single-ended		
1.0 GHz, 10:1, 1 MΩ, BNC interface	R&S®RT-ZS10L	1333.0815.02
1.0 GHz, active, 1 MΩ, Rohde & Schwarz probe interface	R&S®RT-ZS10E	1418.7007.02
1.0 GHz, active, 1 MΩ, R&S®ProbeMeter, micro button, Rohde & Schwarz probe interface	R&S®RT-ZS10	1410.4080.02
1.5 GHz, active, 1 MΩ, R&S®ProbeMeter, micro button, Rohde & Schwarz probe interface	R&S®RT-ZS20	1410.3502.02
Active broadband probes: differential		
1.0 GHz, active, differential, 1 MΩ, R&S®ProbeMeter, micro button, incl. 10:1 external attenuator, 1 MΩ, 60 V DC, 42.4 V AC (peak), Rohde & Schwarz probe interface	R&S®RT-ZD10	1410.4715.02
1.5 GHz, active, differential, 1 MΩ, R&S®ProbeMeter, micro button, Rohde & Schwarz probe interface	R&S®RT-ZD20	1410.4409.02
Power rail probe		
2.0 GHz, 1:1, 50 kΩ, ±0.85 V, ±60 V offset, Rohde & Schwarz probe interface	R&S®RT-ZPR20	1800.5006.02
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
400 MHz, 1000:1, 50 MΩ, 1000 V, 7.5 pF	R&S®RT-ZH11	1409.7737.02

[4] The R&S®RTM-PK1 option is not distributed in North America.

[5] The R&S®RTM-PK1US option is only distributed in North America.

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Designation	Type	Order No.
High voltage probes: differential		
200 MHz, 250:1/25:1, 5 MΩ, 750 V (peak), 300 V CAT III, Rohde & Schwarz probe interface	R&S®RT-ZHD07	1800.2307.02
100 MHz, 500:1/50:1, 10 MΩ, 1500 V (peak), 1000 V CAT III, Rohde & Schwarz probe interface	R&S®RT-ZHD15	1800.2107.02
200 MHz, 500:1/50:1, 10 MΩ, 1500 V (peak), 1000 V CAT III, Rohde & Schwarz probe interface	R&S®RT-ZHD16	1800.2207.02
100 MHz, 1000:1/100:1, 40 MΩ, 6000 V (peak), 1000 V CAT III, Rohde & Schwarz probe interface	R&S®RT-ZHD60	1800.2007.02
Current probes		
20 kHz, AC/DC, 0.01 V/A and 0.001 V/A, ±200 A and ±2000 A, BNC interface	R&S®RT-ZC02	1333.0850.02
100 kHz, AC/DC, 0.1 V/A, 30 A, BNC interface	R&S®RT-ZC03	1333.0844.02
2 MHz, AC/DC, 0.01 V/A, 500 A (RMS), Rohde & Schwarz probe interface	R&S®RT-ZC05B	1409.8204.02
10 MHz, AC/DC, 0.01 V/A, 150 A (RMS), BNC interface	R&S®RT-ZC10	1409.7750K02
10 MHz, AC/DC, 0.01 V/A, 150 A (RMS), Rohde & Schwarz probe interface	R&S®RT-ZC10B	1409.8210.02
50 MHz, AC/DC, 0.1 V/A, 30 A (RMS), Rohde & Schwarz probe interface	R&S®RT-ZC15B	1409.8227.02
100 MHz, AC/DC, 0.1 V/A, 30 A (RMS), BNC interface	R&S®RT-ZC20	1409.7766K02
100 MHz, AC/DC, 0.1 V/A, 30 A (RMS), Rohde & Schwarz probe interface	R&S®RT-ZC20B	1409.8233.02
120 MHz, AC/DC, 1 V/A, 5 A (RMS), BNC interface	R&S®RT-ZC30	1409.7772K02
EMC near-field probes		
Probe set for E and H near-field measurements, 30 MHz to 3 GHz	R&S®HZ-15	1147.2736.02
Logic probes		
400 MHz logic probe, 8 channels	R&S®RT-ZL04	1333.0721.02
Probe accessories		
Probe power supply for R&S®RT-ZC10/20/30	R&S®RT-ZA13	1409.7789.02
External attenuator 10:1, 2.0 GHz, 1.3 pF, 60 V DC, 42.4 V AC (peak) for R&S®RT-ZD20/30 probes	R&S®RT-ZA15	1410.4744.02
Probe pouch	R&S®RT-ZA19	
Power deskew and calibration test fixture	R&S®RT-ZF20	1800.0004.02
3D positioner with central tensioning knob for easy clamping and positioning of probes (span width: 200 mm, clamping range: 15 mm)	R&S®RT-ZAP	1326.3641.02
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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Warranty and service

Warranty		
Base unit		3 years
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [6]	pay per calibration
Warranty and repair	up to five years [6]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

[6] For extended periods, contact your Rohde & Schwarz sales office.

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