R&S®RTC1000 OSCILLOSCOPE

Specifications
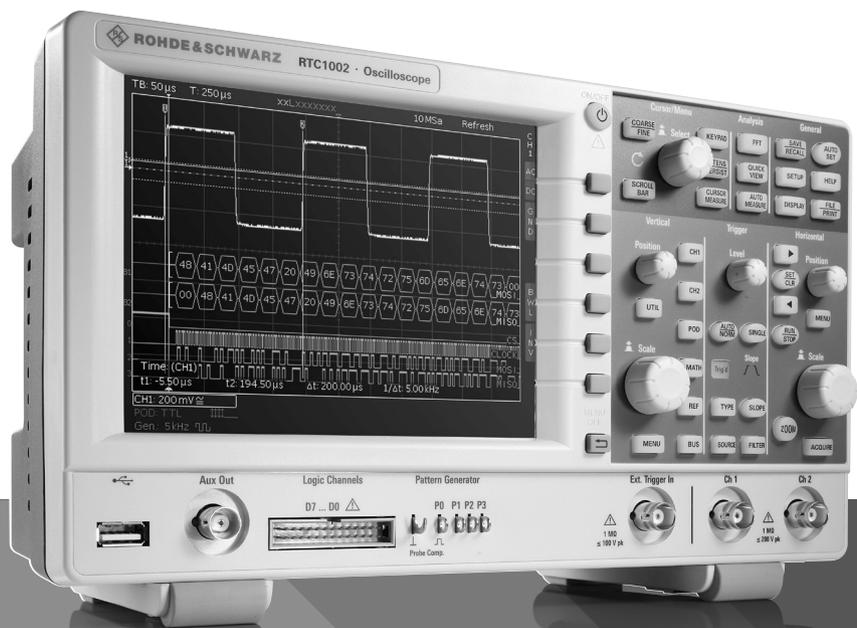
ROHDE & SCHWARZ

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CONTENTS

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.
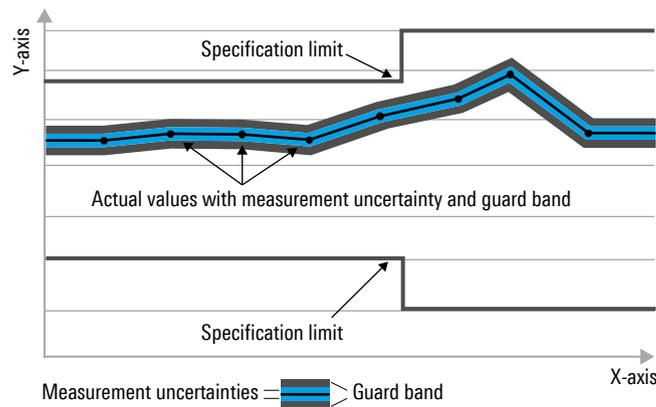
Non-traceable specifications with limits (n. trc.)

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.

Base unit

Vertical system

Input channels	R&S®RTC1002	2 channels
Input impedance	R&S®RTC1002	1 MΩ ± 2 % with 14 pF ± 2 pF (meas.)
Analog bandwidth (–3 dB)	R&S®RTC1002	> 50 MHz
	R&S®RTC1002 with -B220 option	> 70 MHz
	R&S®RTC1002 with -B221 option	> 100 MHz
	R&S®RTC1002 with -B222 option	> 200 MHz (≥ 5 mV/div)
	R&S®RTC1002 with -B223 option	> 300 MHz (≥ 5 mV/div)
Lower frequency limit (–3 dB)	at AC coupling	< 2 Hz (meas.)
Analog bandwidth limits (max. –1.8 dB, min. –3.5 dB)		20 MHz (meas.)
Rise time (10 % to 90 %, calculated)	R&S®RTC1002	< 7 ns
	R&S®RTC1002 with -B220 option	< 5 ns
	R&S®RTC1002 with -B221 option	< 3.5 ns
	R&S®RTC1002 with -B222 option	< 1.75 ns
	R&S®RTC1002 with -B223 option	< 1.15 ns
Vertical resolution		8 bit, up to 16 bit with high-resolution decimation mode
Invert signal		yes
DC gain accuracy	maximum operating temperature change of ±5 °C after self-alignment	
	all input sensitivities	±3 % of full scale
DC measurement accuracy	after adequate suppression of measurement noise by using high-resolution sampling mode or waveform averaging	±(DC gain accuracy × |reading + sensitivity × position setting| + 0.1 div + 1 mV)
Input coupling		DC, AC (> 7 Hz)
Input sensitivity		1 mV/div to 10 V/div
Maximum input voltage		max. 200 V (V_p), derates at 20 dB/decade to 5 V (RMS) above 100 kHz
Position range		±15 div
Channel-to-channel isolation (each channel at same input sensitivity)	input frequency < analog bandwidth	> 35 dB (meas.)

Horizontal system

Timebase range		selectable between 1 ns/div and 100 s/div
Channel deskew		±120 ns
Trigger offset range	minimum	memory depth/actual sampling rate
	maximum	2^{33}/actual sampling rate
Modes		normal, roll ≥ 50 ms/div
Timebase accuracy	after delivery/calibration, at +23 °C	±50 ppm
	during calibration interval	±60 ppm

Acquisition system

Maximum realtime sampling rate		2 × 1 Gsample/s or 1 × 2 Gsample/s
Memory depth per channel		2 × 1 Msample or 1 × 2 Msample
Acquisition modes	refresh	first sample in decimation interval
	peak detect	largest and smallest sample in decimation interval (1 ns detection)
	high resolution	average value of all samples in decimation interval (up to 16 bit)
	envelope	envelope of acquired waveforms
	average	average over a series of acquired waveforms
	filter	low-pass, adjustable
	smooth	
Number of averaged waveforms		2 to 1024
Waveform acquisition rate	dot display, single channel, max. waveform rate	up to 10 000 waveforms/s

Trigger system

Trigger level	range (min)	±15 div from center of screen
Trigger modes		auto, normal, single
Hold-off range	time	auto or 50 ns to 10 s
Trigger types		edge, pulse, video, logic, serial bus
Edge trigger	trigger events	rising edge, falling edge, both edges
	sources	channel 1, channel 2, logic channels from D7 to D0 (with R&S®RTC-B1 option), external trigger input, line
	coupling (analog channels, external trigger input)	DC, AC, auto level, low pass (attenuates > 5 kHz (meas.)), HF (attenuates < 30 kHz (meas.)), noise reject (enlarges trigger hysteresis)
Pulse trigger	trigger events	pulse width is smaller, greater, equal, unequal, inside interval, outside interval
	min. pulse width	8 ns
	max. pulse width	17.1 s
	polarity	positive, negative
	sources	channel 1, channel 2, logic channels from D7 to D0 (with R&S®RTC-B1 option)
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	channel 1, channel 2
	sync pulse polarity	positive, negative
Logic trigger	trigger events	logic condition between active channels
	sources	channel 1, channel 2, logic channels from D7 to D0 (with R&S®RTC-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
	min. duration time	8 ns
	max. duration time	17.1 s
Serial bus trigger	supported standards	
	R&S®RTC-K1 option	I^{2}C/SPI (two- and three-wire)
	R&S®RTC-K2 option	UART/RS-232/RS-422/RS-485
	R&S®RTC-K3 option	CAN/LIN
Trigger sensitivity	with DC, AC, LF reject	
	input sensitivity ≥ 5 mV/div	< 0.8 div (meas.)
	input sensitivity < 5 mV/div	< 1.5 div (meas.)
	with HF reject	
	all input sensitivities	< 1 div (meas.)
	with noise rejection	
	input sensitivity > 5 mV/div	< 1.5 div (meas.)
External trigger input	input impedance	1 MΩ ± 1 % with 14 pF ± 2 pF (meas.)
	maximum input voltage at 1 MΩ	max. 100 V (V_p), derates at 20 dB/decade to 5 V (RMS) above 100 kHz
	trigger level	±5 V
	sensitivity	300 mV (V_{pp})
	input coupling	DC, AC
Trigger output (AUX OUT connector)	functionality	A pulse is generated for every acquisition trigger event.
	output voltage	
	at high impedance	0 V to 3.0 V
	pulse polarity	high active
	output delay	depends on trigger settings
	pulse width	> 150 ns (trigger event)
		> 0.5 µs (mask violation)

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, peak-to-peak, peak+, peak-, frequency, period, amplitude, crest factor, top level, base level, pos overshoot, neg overshoot, pulse width+, pulse witdh-, duty cycle+, duty cycle-, rise time (80 %, 90 %), fall time (80 %, 90 %), delay, phase, standard deviation
	measurements on trigger signal	trigger period, trigger frequency implemented by means of six-digit hardware counter
	number of active measurements	6
Cursor measurements	measurements on channels, math waveforms, reference waveforms	voltage (V1, V2, ΔV), time (t1, t2, Δt, 1/Δt), ratio X, ratio Y, pulse and edge count (pos./neg.), peak values (V_{pp}, V_p+, V_{pp}-), V_{mean}, V_{RMS}, standard deviation, duty cycle (pos./neg.), rise/fall time (80 %, 90 %), crest factor, voltage at the cursor position
	functions	x and y tracking, coupling of cursors, set to screen, set to trace, automatic source
Quick measurements	function	fast overview of measurements from one channel, some measurements displayed with result lines in diagram
	sources	channel 1, channel 2
	measurements displayed in diagram	mean value, max. peak, min. peak, rise time, fall time
	numerically displayed measurements	RMS, peak-to-peak voltage, period, frequency, plus 6 automatic measurements selectable
Marker		up to 8 freely positionable markers for easy navigation

Digital voltmeter

Accuracy		related to channel settings of voltmeter source
Measurements		DC, AC + DC (RMS), AC (RMS)
Sources		channel 1, channel 2
Number of measurements		up to 4
Resolution		up to 3 digits
Bandwidth		> 1 MHz

Frequency counter

Measurements		frequency, period
Sources		trigger signal source (edge, video): line, channel 1, channel 2, external trigger in
Number of measurements		2
Resolution		5 digits
Frequency range		0. 03 Hz to bandwidth of oscilloscope (limited by bandwidth of trigger filter)

Component tester

Parameters		voltage (X), current (Y)
Selectable frequencies		50 Hz, 200 Hz
Component tester output (AUX OUT connector)	max. output voltage (open circuit)	10 V (V_p) ± 5 %
	max. output current (short circuit)	10 mA ± 10 %
	reference potential	ground

Mask testing

Sources		channel 1, channel 2
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)

Waveform maths

Quick math	number of math waveforms	1
	functions	addition, subtraction, multiplication, division
	sources	channel 1, channel 2
Mathematics	number of formula sets	5
	number of equations per set	5
	simultaneous display of math waveforms	4
	functions	addition, subtraction, multiplication, division, min./max., square, square root, absolute value, pos./neg. wave, reciprocal, inverse, log10/ln, derivation, integration, filter (lowpass/highpass)
	sources	channel 1, channel 2, math, user defined constants

Frequency analysis (FFT)

Setup parameters		center frequency, frequency span, vertical scale, vertical position
Length		2 ksample to 128 ksample
Window		Hanning, Hamming, Blackman, rectangular, flat top
Waveform arithmetic		none, envelope, average (selectable 2 to 512)
Scale		dBm, dBV, V_{eff}
Cursor		2 horizontal cursors, previous/next peak search
Sources		channel 1, channel 2

Reference signals

Simultaneous display of reference waveforms		4
Sources		analog and digital channels, math, reference

Display characteristics

Diagram types		Yt, XY, zoom, FFT, component tester
XY mode		parallel display of XY diagram and Yt diagrams of input signals for X, Y
Zoom		horizontal zoom with fast navigation, split screen with overview signal and zoomed signal
FFT mode		split screen with overview signal and dedicated frequency display
Interpolation		sin(x)/x, linear, sample & hold
Waveform display		lines, dots only
Persistence		50 ms to 9.6 s, infinite
Special display mode		inverse brightness, false colors
Diagram grid		lines, reticle, none
Virtual screen		20 divisions

Protocol and logic

Bus decode	number of bus signals	2 [1]
	bus types	parallel, parallel clocked
	R&S®RTC-K1 option	SSPI, SPI, I²C
	R&S®RTC-K2 option	UART/RS-232/RS-422/RS-485
	R&S®RTC-K3 option	CAN, LIN
	display types	decoded bus, logical signal, frame table (depends on decoded bus)
	data format of decoded bus	hex, decimal, binary

Miscellaneous

Save/recall	device settings	save and recall on internal file system or USB flash drive or on a PC via web interface
	reference waveforms	save and recall on internal file system or USB flash drive or on a PC via web interface
	waveforms	save on USB flash drive or download and save on a PC via web interface available file formats: BIN, CSV, TXT float (MSB/LSB first)
	screenshots	save on USB flash drive or download and save on a PC via web interface, available file formats: BMP, PNG, GIF
Print button		configurable button, actions on press: • save device settings • save waveforms • save screenshot • save screenshot and setup
Menu languages		available menu languages: • English • German • French • Russian • Simplified Chinese • Traditional Chinese • Spanish
Help		online help, available languages: • English • German • French • Simplified Chinese • Spanish

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

Input and outputs

Front		
Channel inputs		BNC, for details see Vertical system
External trigger input	trigger in	BNC, for details see Trigger system
	additional digital channel	for level see Trigger system
AUX OUT	trigger out	for details see Trigger system
	mask violation	pulse
	waveform generator (with R&S®RTC-B6 option only)	BNC, for details see Waveform generator
Probe compensation output	signal shape rectangle	$V_{low} = 0$ V, $V_{high} = 2.4$ V (meas.)
	frequency	1 kHz and 1 MHz with probe adjust wizard
Pattern source (with R&S®RTC-B6 option only)	P3 to P0 (with R&S®RTC-B6 option only)	4 lugs, for details see 4-bit pattern generator
Digital channel inputs	D7 to D0	with R&S®RTC-B1 option only
Ground lug		connected to ground
USB host interface		1 port, type A plug, version 2.0, USB drives only, FAT32 formatting required
Rear		
USB device interface		1 port, type B plug, version 2.0
Ethernet interface		1 port, RJ-45 connector
Security slot		for standard Kensington style lock

General data

Display		
Type		6.5" VGA color display
Resolution		640 × 480 pixel (VGA)
Temperature		
Temperature loading	operating temperature range	+5 °C to +40 °C
	storage temperature range	−20 °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
Maximum of sound pressure level		30.4 dB (A) at 0.3 m distance (at +23.6 °C, 931 mbar (hPa), 39 % rel. humidity), in line with EN ISO 3744
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, $_\text{c}$CSA$_\text{US}$
Calibration interval		1 year
Power supply		
AC supply		100 V to 240 V at 50 Hz to 60 Hz, 100 V to 120 V at 400 Hz
Power consumption		max. 25 W
Safety		in line with IEC 61010-1, EN 61010-1, CAN/CSA-C22.2 No. 61010-1, UL 61010-1
Mechanical data		
Dimensions	W × H × D	285 × 175 × 140 mm (11.22 in × 6.89 in × 5.51 in)
Weight	without options (nom.)	1.7 kg (3.75 lb)

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

Options

R&S®RTC-B1

Mixed signal option, additional 8 logic channels		
Vertical system		
Input channels		8 logic channels (D7 to D0)
Arrangement of input channels		assignment of the logic probes to the channels 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	300 MHz (meas.)
Maximum input voltage		±40 V (V_p)
Minimum input voltage swing	hysteresis small	300 mV (V_{pp}) (meas.)
	hysteresis medium	800 mV (V_{pp}) (meas.)
	hysteresis large	1500 mV (V_{pp}) (meas.)
Threshold groups		D7 to D0
Threshold level	range	–2 V to 8 V in 10 mV steps
	predefined	CMOS, TTL, ECL
Threshold accuracy		±(100 mV + 3 % of threshold setting) (meas.)
Comparator hysteresis		small, medium, large
Horizontal system		
Channel-to-channel skew		max. 1 ns (meas.)
Acquisition system		
Sampling rate		1 Gsample/s for every channel
Memory depth		1 Msample for every channel
Trigger system		see Trigger system
Waveform measurements		
Measurement sources		all channels from D7 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, value at the cursor position
Additional cursor function		display of decoded parallel bus 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 D7 to D0 is displayed.

R&S®RTC-B6

Waveform generator		
Resolution		8 bit
Sample rate		978 ksample/s
Amplitude	level	
	high Z	60 mV to 6 V (V$_{pp}$) [3]
	accuracy	3 % at 1 kHz
DC offset	level	
	high Z	±3 V
	accuracy	3 % or ± 25 mV (meas.)
Sine/rectangle	frequency	0.1 Hz to 50 kHz
Pulse	frequency	0.1 Hz to 10 kHz
Ramp/triangle	frequency	0.1 Hz to 10 kHz
4-bit pattern generator		
Functions		bus signal source 4-bit counter, programmable 4-bit pattern
Amplitude		approx. 2.5 V (V$_{pp}$)
Bus signal source		SPI, I²C, UART, CAN, LIN
	bit rate	
	UART	9600 bit/s, 115.2 kbit/s, 1 Mbit/s
	SPI	100 kbit/s, 250 kbit/s, 1Mbit/s
	I²C	100 kbit/s, 400 kbit/s, 1000 kbit/s, 3400 kbit/s
	CAN	50 kbit/s, 100 kbit/s, 1 Mbit/s
	LIN	9.6 kbit/s, 10.417 kbit/s, 19 kbit/s
4-bit counter	frequency	100 mHz to 50 MHz
Squarewave	frequency	1 mHz to 500 kHz
	duty cycle	1 % to 99 %
Programmable pattern	sample time	20 ns to 42 s, up/down
	memory depth	2048 sample
	pattern idle time	20 ns to 42 s

R&S®RTC-Bxx bandwidth upgrades

Option	Model	Analog bandwidth upgrade from 50 MHz to
R&S®RTC-B220	R&S®RTC1002	70 MHz
R&S®RTC-B221	R&S®RTC1002	100 MHz
R&S®RTC-B222	R&S®RTC1002	200 MHz
R&S®RTC-B222	R&S®RTC1002	300 MHz

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[3] Maximum output voltage (DC offset + amplitude): 4 V.

R&S®RTC-K1

I²C triggering and decoding		
Bus configuration	sources for SCL and SDA	channel 1, channel 2, logic channels from D7 to D0
	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 and trigger event are displayed in different colors
	displayed format of address	hex
	displayed format of data	ASCII, binary, decimal or hex
SPI triggering and decoding		
Bus configuration	sources for CS, CLK, data	channel 1, channel 2, logic channels from D7 to D0, extern input (only CS)
	bit rate	up to 25 Mbps
	chip select (CS)	active low, active high or missing (two-wire SPI)
	clock (CLK) slope	rise or fall
	data symbol size	1 bit to 32 bit
	idle time for two-wire SPI	< 1 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 and trigger event are displayed in different colors
	displayed format of data	ASCII, binary, decimal or hex
	data decoding	MSB or LSB first

R&S®RTC-K2

UART/RS-232/RS-422/RS-485 triggering and decoding		
Bus configuration	source for data	channel 1, channel 2, logic channels from D7 to D0
	bit rate	300/600/1200/2400/4800/9600/14400/ 19200/28800/38400/56000/57600/ 115200 bps 128 kbps/256 kbps/1 Mbps or user-selectable up to 3 Mbps
	end of frame	timeout, none
	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
Trigger	trigger events	start bit, start of frame, symbol number, any symbol, pattern of symbols, parity error, frame error, break
	offset for trigger on data symbol	0 to 4095 symbols
	data symbol pattern width	1 to floor (32/symbol size) symbols
Decode	displayed signals	bus signal, logic signal or both
	color coding of bus signal	data, start, stop; error and trigger event are displayed in different colors
	displayed format of data	ASCII, binary, decimal or hex

R&S®RTC-K3

CAN triggering and decoding		
Bus configuration	signal type	CAN_H, CAN_L
	sources	channel 1, channel 2, logic channels from D7 to D0
	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; three table positions (top, bottom, full screen); 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 J602; 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 1 kbps to 5 Mbps
	polarity	active high or active low
	label list	associate frame identifier with symbolic ID
Trigger	source	any input channel
	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; three table positions (top, bottom, full screen); 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

Ordering information

Designation	Type	Order No.
R&S®RTC1000 base model		
Oscilloscope, 50 MHz, 2 channels	R&S®RTC1002	1335.7500.P02
Base unit (including standard accessories: 300 MHz passive probe per channel, R&S®RTC-B6 waveform generator, power cord, getting started manual and safety instructions)		
Choose your bandwidth upgrade		
Upgrade of R&S®RTC1002 to 70 MHz bandwidth	R&S®RTC-B220	1335.7300.03
Upgrade of R&S®RTC1002 to 100 MHz bandwidth	R&S®RTC-B221	1335.7317.03
Upgrade of R&S®RTC1002 to 200 MHz bandwidth	R&S®RTC-B222	1335.7275.03
Upgrade of R&S®RTC1002 to 300 MHz bandwidth	R&S®RTC-B223	1335.7323.03
Choose your options		
Mixed signal upgrade for non-MSO models, 300 MHz	R&S®RTC-B1	1335.7281.03
Waveform generator	R&S®RTC-B6	1335.7298.03
I²C/SPI serial triggering and decoding	R&S®RTC-K1	1335.7230.03
UART/RS-232/RS-422/RS-485 serial triggering and decoding	R&S®RTC-K2	1335.7246.03
CAN/LIN serial triggering and decoding	R&S®RTC-K3	1335.7252.03
Application bundle, consists of the following options: R&S®RTC-K1, R&S®RTC-K2, R&S®RTC-K3, R&S®RTC-B6	R&S®RTC-PK1	1335.7330.03
Choose your additional probes		
Single-ended passive probes		
300 MHz, 10 MΩ, 10:1, 400 V (RMS), 12 pF	R&S®RT-ZP03S	1803.1001.02
500 MHz, 10 MΩ, 10:1, 300 V (RMS), 10 pF	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
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
Logic probe		
400 MHz logic probe, 8 channels	R&S®RT-ZL03	1333.0715.02
Probe accessories		
Feedthrough termination 50 Ω	R&S®HZ22	3594.4015.02
Adapter BNC/banana	R&S®RT-ZA11	1333.0796.02
Probe pouch	R&S®RT-ZA19	1335.7875.02
Choose your accessories		
Soft case, for R&S®RTC1002 oscilloscope and accessories	R&S®RTC-Z3	1333.0867.02
Rackmount kit	R&S®ZZA-RTC1K	1333.0967.02

Warranty and service

Warranty		
Base unit		3 years
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [4]	pay per calibration
Accredited calibration	up to five years [4]	pay per accredited calibration
Warranty and repair	up to five years [4]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

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

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The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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