Scope of the art
R&S®Scope Rider
Handheld digital oscilloscope

Lab performance in a rugged and portable design

Invest 2 minutes and you’ll never look back.

ROHDE & SCHWARZ
R&S®Scope Rider
Experience our handheld scope for 2 minutes and you’ll never look back

Lab performance in a rugged and portable design – the perfect multipurpose tool for the lab or in the field.

Superior performance
- 60 MHz to 500 MHz with 5 Gsample/s sampling rate
- 10-bit ADC
- 2 mV/div to 100 V/div
- Up to 300 V offset range
- 33 automatic measurement functions
- 5 instruments in one handheld package
  - Lab performance oscilloscope
  - Logic analyzer
  - Protocol analyzer
  - Data logger
  - Digital multimeter*

5 instruments in one handheld package
- Lab performance oscilloscope
- Logic analyzer
- Protocol analyzer
- Data logger
- Digital multimeter*

CAT IV 600 V / CAT III 1000 V:
galvanic-insulated floating channels

Rugged, dust and water resistant housing

Capacitive touch and keypad operation
- Full operation via touch panel or keypad
- See more with a 7” color display
- Easy parameter adjustment with multifunction wheel
- Large buttons for use with gloves

Outstanding protection
- Maximum safety in all environments: CAT IV 600 V / CAT III 1000 V
- IP51 housing that meets military environmental requirements
- Nonslip and impact resistant rubberized surface

Excellent connectivity and much more
- Wireless LAN and Ethernet for web-based remote control and quick data access
- Finish faster with one-touch documentation
- MicroSD card and USB device/host support
- More than 4 hours of battery power

* Additional multimeter channel in two-channel model.
Safe measurements on power electronics
Analyzing modern electric drive systems requires measuring motor voltages and currents while analyzing digital control signals. Safety is a key consideration for such measurements.

The R&S®Scope Rider offers up to four isolated input channels with CAT IV 600 V rating that allow measurements on high-voltage electronics without compromising safety. Digital control signals can be analyzed with the 8-bit logic interface that is isolated from the analog input channels. The protocol trigger and decode capability of the R&S®Scope Rider is unprecedented in handheld oscilloscopes and provides direct display of decoded messages.

High-speed acquisition system with deep history:
never miss rare faults again
Capturing and analyzing rare anomalies in electric signals is a typical use case when debugging electronic systems. With an acquisition rate of up to 50,000 waveforms per second – more than 1,000 times faster than conventional handheld oscilloscopes – the R&S®Scope Rider sees signals other scopes miss. Rare faults in signals can be reliably captured and analyzed.

In history mode, the instrument automatically stores up to 5,000 waveforms in a separate history buffer. At any point in time, acquisition can be stopped and any waveform in the history buffer can be analyzed using the full oscilloscope functionality. One-time anomalies that would have been missed by a conventional handheld oscilloscope can now be analyzed in detail.

The high-speed acquisition system of the R&S®Scope Rider uncovers rare and unexpected signal anomalies.
Motor drive measurements often require up to four analog measurement channels with no channel free for monitoring digital control interfaces. The digital logic probe (MSO) of the R&S®Scope Rider features eight additional digital inputs for analyzing control signals, time-correlated to the analog channel signals. With 250 MHz bandwidth, 1.25 Gsample/s sampling rate and configurable thresholds, it adapts to almost any digital interface.

Protocols such as I2C or SPI are frequently used for transferring control messages between integrated circuits. The R&S®Scope Rider is the first isolated handheld digital oscilloscope with trigger and decode capability for in-depth troubleshooting. Triggering on protocol events or data enables selective acquisition of relevant events, data and signals.

Sporadic sensor signal faults or rare glitches in a power supply can cause complex system failures without any obvious indication of the root cause. The long-term data logger of the R&S®Scope Rider makes it possible to monitor up to four key measurements at a speed of 1, 2 or 5 measurements per second to uncover such rare failures. The large memory of 2 Msample per channel allows more than 23 days of log duration. The statistics display provides information about minimum and maximum values with exact time.

Relative phases between two signals can be easily measured with the dedicated XY mode that also shows the individual time signals.

The two-channel variant R&S®RTH1002 features a dedicated, isolated digital multimeter with 10,000 count resolution. Measurement functions include V DC, V AC, V AC + V DC, resistance, continuity and capacitance as well as current or temperature if suitable shunts are used.

The four-channel variant R&S®RTH1004 features a digital voltmeter on each input channel. Statistics information shows minimum, average and maximum values with corresponding time stamps.

The mask test mode shows pass and fail statistics and makes it easy to set up masks based on test signals.

Select the instrument you need at the push of a button.
Capacitive touch and keypad operation: intuitive to use

- Full instrument control via touch panel or keypad
- Excellent readability and crystal clear signals: 7", 800 x 480 pixel capacitive touch display
- Multifunction wheel for easy parameter adjustment
- Large keys for use with safety gloves

Wireless LAN or Ethernet: easy remote control within a web browser

An integrated wireless LAN module or the Ethernet port allow the R&S®Scope Rider to be remotely controlled directly from the web browser. The touch interface of the R&S®Scope Rider is accessible in the web browser. All settings can be adjusted on the PC. Image compression ensures that the screen image is rapidly updated.

User interface designed to customer needs

Making use of the latest display technology, the R&S®Scope Rider provides a crystal clear signal display with a high-resolution capacitive touch color display. Oscilloscope settings can easily be adjusted on the screen while dedicated keys provide quick access to important oscilloscope functions. A central multifunction wheel allows quick adjustment of settings such as the trigger level or the vertical position of each channel. Fully controllable via the keypad, the oscilloscope can also be used with gloves if safety or weather require them. Easy-to-understand diagrams explain important settings such as the trigger mode, the automatic measurement functions or the channel settings.

Easy documentation of measurement results

Simplify your measurement documentation with documentation project directories on the microSD card or USB flash drive. Screenshots, measurement results and settings files are saved with a single button press in the selected project directory. Data can be easily accessed and downloaded using the web browser interface.

Up to 32 Gbyte of data storage capability

The R&S®Scope Rider supports microSD cards with up to 32 Gbyte storage capability, making it possible to save virtually an unlimited amount of data, screenshots or settings files on the instrument.

Wireless LAN or Ethernet: easy remote control for safety critical measurements

An integrated wireless LAN module and web server allows easy remote control of the R&S®Scope Rider. The waveform display and user interface of the R&S®Scope Rider are directly available in the web browser; all settings can be changed on the screen. With no software installation required, the R&S®Scope Rider can be controlled from almost every portable device such as a laptop, a tablet or even a mobile phone.
Built for your work environment: outstanding protection and ruggedness

- Isolation of all analog input channels
- Rated for measurements in CAT III 1000 V / CAT IV 600 V environments
- IP51 housing for harsh environments
- Nonslip and impact resistant rubberized surface

Maximum safety in all environments
Troubleshooting in industrial environments presents many challenges. Debugging electronic systems at a modern production site can require analyzing low-voltage digital signals, as well as verifying the power quality of a 380 V supply, or testing the power efficiency of electrical drives. The R&S®Scope Rider CAT IV 600 V rating provides this level of flexibility in a single device.

Highest sensitivity and safe high-voltage measurements at the same time
Double isolation of all input channels, the multimeter channel¹ and the digital interfaces, including the logic channel (MSO), makes it possible to measure in mixed circuits with different ground levels. This reduces the risk of accidental short circuits and enables safe measurements in high-voltage electric installations. Sensitive analog or digital control circuits can be measured without compromising safety.

IP51 housing – tested in line with military environmental standards
Thanks to the passive cooling concept, the handheld oscilloscope feature a sealed IP51, dust and drip-proof housing. Tested in line with military environmental standards, the R&S®Scope Rider provides the ruggedness that is needed for harsh environments. A rubberized surface with large keys makes it easy to use in difficult environments.

IP51 electrical insulation
- DC input
- USB, Ethernet

Interface
- CH 1
- CH 2
- CH 3
- CH 4

System
- DC input
- DC and/or AC voltage
- Channel reference

¹ Separate multimeter channel only in two-channel models.

Overview of measurement categories CAT I to CAT IV

<table>
<thead>
<tr>
<th>CAT I</th>
<th>CAT II</th>
<th>CAT III</th>
<th>CAT IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>Socket</td>
<td>Main fuse</td>
<td>Transformer</td>
</tr>
</tbody>
</table>

Wide range of probes and accessories

The R&S®Scope Rider comes with all essential accessories as standard:
- 500 MHz, 10:1, 600 V CAT IV voltage probe for each input channel
- Power supply with plugs for EU, GB and US
- Battery pack
- Soft handle

In addition, a wide range of accessories is available:
- 500 MHz, 100:1, voltage probes
- Replacement accessory set for voltage probes
- Extended accessory set for voltage probes
- Current probes
- 12 V / 24 V car adapter
- Soft carrying bag
- Hard shell protective carrying bag
- Battery charger
Specifications in brief

**Vertical system**
- **Input channels**: 2-channel models
- **Input channels**: 4-channel models
- **Maximum input voltage**
  - BNC inputs: CAT IV 300 V (RMS), 424 V (Vp)
  - with probe R&S®RT-ZI10 or R&S®RT-ZI11: CAT IV 600 V, CAT III 1000 V
- **Input sensitivity**: 2 mV/div to 100 V/div
- **Vertical resolution of overall system**: 9 bit
- **Offset range**: Input sensitivity > 750 mV/div
- **Input sensitivity ≤ 500 mV/div**: +/1 V

**Acquisition and Horizontal System**
- **Maximum real-time sampling rate**: 1/2 / 4 channels active
  - 5 / 2.5 / 1.25 GSample/s
- **Acquisition memory**: 1/2 / 4 channels active
  - 500 / 250 / 125 kSample/channel
- **Real-time waveform acquisition rate**: max.
  - 60 000 waveforms/sec
- **Timetable range**: 1 ns/div to 600 s/div

**Logic Analyzer (MSO) functionality** (optional: R&S®RTH-B1)
- **Input channels / memory depth**: 8 logic channels / 125 kSample
- **Bandwidth / sampling rate**: 250 MHz / 1.25 GSample/sec

**Protocol Trigger & Decode**
- **Supported Protocols** (Optional: R&S®RTH-K1, R&S®RTH-K2)
  - I2C, SPI, UART/RS-232/RS-422/RS-485

**Data logger**
- **Number of simult. logging channels**: 4
- **Measurement speed**: 1/2/5 measurements/s
- **Memory depth**: 2 MemProc by logging channel

**Digital voltmeter / Digital Multimeter**
- **Resolution**: 2-channel version (Digital Multimeter)
  - 10 000 counts
- **Voltage and current**: Current with optional current probe or shunt
  - AC, DC, AC+DC
- **Temperature**: With PT100 temperature sensor
- **Resistance, continuity, diode test, capacity, frequency**: Only 2-channel version

**General data**
- **Dimensions**
  - W x H x D: 201 mm x 293 mm x 74 mm
  - (7.91 in x 11.54 in x 2.91 in)
- **Weight**: with battery: 2.4 kg (5.3 lb) nom.
- **IP rating**: IP51, in line with IEC 60529
- **Screen**: 7.0” LC TFT 800 x 480 color display
- **Interaces**: USB host, USB device, LAN, Wireless LAN (optional)

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**Ordering information**

**Designation**

**Type**

**Order No.**

**Choose your R&S®Scope Rider Base Models**
- Handheld Oscilloscope, 60 MHz, 2 channels, CAT IV, DMM
  - R&S®RTH1002
  - 1317.5000k02
- Handheld Oscilloscope, 60 MHz, 4 channels, CAT IV
  - R&S®RTH1004
  - 1317.5000k04

**Choose your bandwidth upgrade**
- Upgrade of R&S®RTH1002 oscilloscopes to 100 MHz bandwidth
  - R&S®RTH-B221
  - 1325.9717.02
- Upgrade of R&S®RTH1002 oscilloscopes to 200 MHz bandwidth
  - R&S®RTH-B222
  - 1325.9723.02
- Upgrade of R&S®RTH1002 oscilloscopes to 350 MHz bandwidth
  - R&S®RTH-B223
  - 1325.9730.02
- Upgrade of R&S®RTH1004 oscilloscopes to 100 MHz bandwidth
  - R&S®RTH-B241
  - 1325.0588.02
- Upgrade of R&S®RTH1004 oscilloscopes to 200 MHz bandwidth
  - R&S®RTH-B242
  - 1326.0594.02
- Upgrade of R&S®RTH1004 oscilloscopes to 350 MHz bandwidth
  - R&S®RTH-B243
  - 1326.0607.02
- Upgrade of R&S®RTH1004 oscilloscopes to 500 MHz bandwidth
  - R&S®RTH-B244
  - 1326.0613.02

**Choose your options**

**Mixed Signal Upgrade for non-MSO models, 250 MHz**
- R&S®RTH-B1
  - 1325.9981.02

**I2C/SPI Serial Triggering and Decoding**
- R&S®RTH-K1
  - 1325.9969.02

**UART/RS-232/RS-422/RS-485 Serial Triggering and Decoding**
- R&S®RTH-K2
  - 1325.9975.02

**History and Segmented Memory**
- R&S®RTH-K15
  - 1326.1803.02

**Advanced Triggering**
- R&S®RTH-K19
  - 1326.0642.02

**Wireless LAN, all countries except US and Canada**
- R&S®RTH-K200
  - 1326.0602.02

**Web Interface Remote Control**
- R&S®RTH-K201
  - 1326.0636.02

**Choose your probes**

**Passive Probe, 500 MHz, isolated, 1:10, 10 MG, 12 µF; 800 V CAT IV, 1000 V CAT III**
- R&S®RZ-ZI10
  - 1326.1761.02

**Passive Probe, 500 MHz, isolated, 1:100, 100 MΩ, 4.6 µF, 600 V CAT IV, 1000 V CAT III, (3540 V CAT I)**
- R&S®RZ-ZI11
  - 1326.1810.02

**AC/DC Current Probe, battery-operated, 30 A, 100 kHz**
- R&S®HZO50
  - 3594.6476.02

**AC/DC Current Probe, battery-operated, 1000 A, 20 kHz**
- R&S®HZO51
  - 3594.6482.02

**Accessory Replacement Set for R&S®RT-ZI10 / R&S®RT-ZI11**
- R&S®RT-ZA20
  - 1326.1978.02

**Accessory Extension Set for R&S®RT-ZI10 / R&S®RT-ZI11**
- R&S®RT-ZA21
  - 1326.1984.02

**Safety Test Leads, red and black, silicone, 600 V CAT IV**
- R&S®RT-ZA22
  - 1326.0988.02

**PT 100 Temperature Probe**
- R&S®HZ812
  - 3594.4321.02

**Choose your accessories**

**Soft Carrying Bag**
- R&S®HA-Z220
  - 1309.6175.00

**Ethernet Cable, length: 2 m, crossover**
- R&S®HA-Z210
  - 1309.6152.00

**USB Cable, length: 1.8 m, standard/mini USB connector**
- R&S®HA-Z211
  - 1309.6169.00

**Spare Power Supply for R&S®RTH incl. power plugs for EU, GB, US**
- R&S®RT-ZA14
  - 1326.2874.02
Preconfigured 2-Channel R&S® Scope Rider Packages

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<tr>
<th>Name</th>
<th>Scope Rider Package Type</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>RTH-B1</td>
<td>Mixed Signal (Logic analyzer) option</td>
<td>1325.9981.02</td>
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<tr>
<td>RTH-B224</td>
<td>500 MHz bandwidth upgrade for RTH1002</td>
<td>1326.0571.02</td>
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<tr>
<td>RTH-B223</td>
<td>350 MHz bandwidth upgrade for RTH1002</td>
<td>1325.9730.02</td>
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<td>RTH-B222</td>
<td>200 MHz bandwidth upgrade for RTH1002</td>
<td>1325.9723.02</td>
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<tr>
<td>RTH-B221</td>
<td>100 MHz bandwidth upgrade for RTH1002</td>
<td>1325.9717.02</td>
</tr>
</tbody>
</table>

From 50 MHz to 4 GHz Powerful portfolio

**R&S®RT1000**: Analyzes faster. See more. Highest dynamic range of up to 4 GHz at 1 million waveforms per second.

**R&S®RTE**: Easy. Powerful. More confidence in your measurements, more task and test results.

**R&S®RTO**: Switch on. Measure. Done. Start measuring while others are still booting up.

**R&S®HMO3000**: Your everyday oscilloscope. Take advantage of segmented memory.


**R&S®RTO**: Analyze faster. See more. More confidence in your measurements, more task and test results.

Generator and voltmeter included.

R&S®Scope Rider: 2 minutes to be sure.

**R&S®HMO**: More confidence in your measurements, more tools and fast results.
Preconfigured 4-Channel R&S® Scope Rider Packages

<table>
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<tr>
<th>Package Name</th>
<th>Preconfigured 2-channel Scope Rider Package</th>
<th>Order No.</th>
<th>Package consists of</th>
<th>Order No.</th>
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</thead>
<tbody>
<tr>
<td>RTH1004</td>
<td>60 MHz, 4 channels, CAT IV</td>
<td>1317.5000P04</td>
<td>60 MHz, 4 channels base model</td>
<td>1317.5000k04</td>
</tr>
<tr>
<td>RTH1004</td>
<td>100 MHz, 4 channels, CAT IV</td>
<td>1317.5000P14</td>
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<td>1317.5000k14</td>
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<tr>
<td>RTH1024</td>
<td>200 MHz, 4 channels, CAT IV</td>
<td>1317.5000P24</td>
<td>200 MHz, 4 channels base model</td>
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<tr>
<td>RTH1034</td>
<td>350 MHz, 4 channels, CAT IV</td>
<td>1317.5000P34</td>
<td>350 MHz, 4 channels base model</td>
<td>1317.5000k34</td>
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<tr>
<td>RTH1054</td>
<td>500 MHz, 4 channels, CAT IV</td>
<td>1317.5000P54</td>
<td>500 MHz, 4 channels base model</td>
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<tr>
<td>RTH104MSO</td>
<td>60 MHz, 4 channels, MSO</td>
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<td>60 MHz, 4 channels base model</td>
<td>1317.5000k05</td>
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<tr>
<td>RTH1014MSO</td>
<td>100 MHz, 4 channels, MSO</td>
<td>1317.5000P15</td>
<td>100 MHz, 4 channels base model</td>
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<td>RTH1024MSO</td>
<td>200 MHz, 4 channels, MSO</td>
<td>1317.5000P25</td>
<td>200 MHz, 4 channels base model</td>
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<tr>
<td>RTH1034MSO</td>
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<td>1317.5000P35</td>
<td>350 MHz, 4 channels base model</td>
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<tr>
<td>RTH1054MSO</td>
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<td>1317.5000P55</td>
<td>500 MHz, 4 channels base model</td>
<td>1317.5000k55</td>
</tr>
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About Rohde & Schwarz
The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radio monitoring and radiolocation. Founded more than 80 years ago, this independent company has an extensive sales and service network and is present in more than 70 countries. The electronics group is among the world market leaders in its established business fields. The company is headquartered in Munich, Germany. It also has regional headquarters in Singapore and Columbia, Maryland, USA, to manage its operations in these regions.

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

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