

# Rohde & Schwarz Test & Measurement Distribution Portfolio

**EMIN**  
Testing & Measuring Everything



# RF Handheld Analyzers



## R&S®Spectrum Rider FPH

### Small form factor to handle big tasks

- Frequency ranges from 5 kHz to 2/6/13.6/26.5 GHz (base models); upgrade via keycode
- Solid RF performance
- Ideal for field use: >6 hours battery life, 2.5 kg (5.5 lb) weight, backlit keypad, fast boot time, nonreflective display, small footprint, ruggedized housing
- Large color display with touch and gesture operation



## R&S®FSH

### Where mobility counts

- Frequency range from 9 kHz to 3.6/8/13.6/20 GHz
- Excellent sensitivity (with preamplifier) of < -161 dBm (1 Hz)
- All-in-one analyzer: spectrum analyzer, network analyzer and CAT
- Internal tracking generator, VSWR bridge, bias tee
- Rugged, splash-proof housing for use in the field

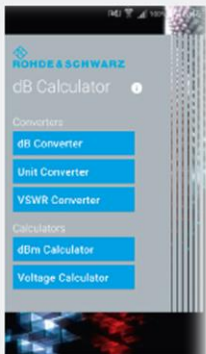


## R&S®Cable Rider ZPH

### Expect fast, expect efficient

- Frequency range from 2 MHz to 3 GHz/4 GHz, upgrade via keycode
- DTF, return loss, VSWR and one-port cable loss measurements
- Ideal for field use: 9-hour battery life, 2.5 kg (5.5 lb), backlit keypad, fast boot time, non-reflective display, small form factor, ruggedized housing (IP51)

## Learn more



### dB or not dB?

True or false:  $30 \text{ dBm} + 30 \text{ dBm} = 60 \text{ dBm}$ ?

Why does 1 % work out to be -40 dB one time, but 0.1 dB or 0.05 dB the next time? Sometimes even experienced engineers have trouble answering these questions. Decibels are found everywhere – in power levels, voltages, reflection coefficients, noise figures, field strengths and more. What is a decibel and how should we use it in our calculations? This application note provides a refresher on the subject of decibels.

► [www.rohde-schwarz.com/appnote/1MA98](http://www.rohde-schwarz.com/appnote/1MA98)

Get the highly rated calculator app for your everyday dB calculations now. Available on all platforms.



dB Calculator for Android



dB Calculator for iOS



dB Calculator for Windows Phone



dB Calculator

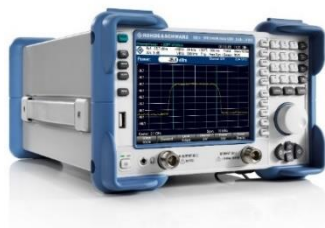
# Spectrum Analyzers



## R&S®FPC

### Unexpected performance in entry class

- RF performance engineered in Germany
- 10.1" WXGA (1366 × 768 pixel) display – largest and highest resolution in class
- Tracking generator and independent CW signal generator
- Built-in VSWR bridge
- One port vector network analyzer with Smith chart display



## R&S®FSC

### Professional spectrum analysis – compact and cost-efficient

- Frequency range 9 kHz to 3 GHz or 6 GHz
- Resolution bandwidths 10 Hz to 3 MHz
- High sensitivity (< -141 dBm (1 Hz), with optional preamplifier < -161 dBm (1 Hz))
- High third order intercept (> 10 dBm, typ. 15 dBm)
- Low measurement uncertainty (< 1 dB)



## R&S®FPL1000

### Experience high performance wherever you take it

- Frequency range 5 kHz to 3 GHz
- SSB phase noise: -108 dBc (1 Hz) at 10 kHz offset (1 GHz carrier)
- DANL with preamplifier: -167 dBm from 10 MHz to 2 GHz
- Lightweight with small footprint

# R&S RF Teaching Solution

## Teaching kit

R&S®FPC1500 – an affordable spectrum analyzer with the Value of Three: spectrum analysis, one port vector network analysis and signal generation R&S®FPC-Z10 – an universal board that is designed with a transceiver, DC-DC converter circuitry for EMI troubleshooting use cases, and an onboard calibration kit for network analysis.

## Lab sheets

Exercises with guided steps to be used with the educational kit to equip students with practical skills of operating test & measurement instrumentation

## R&S®InstrumentView

R&S®InstrumentView includes a teaching-specific feature called Lab that can help professors to conveniently manage, assist and monitor student measurements from a central or remote location



Request for the demo to receive a complimentary...

R&S Technical Book 'Fundamentals of Spectrum Analysis' worth €30 (while stocks last).

scan the QR code or visit us at <https://bit.ly/2U28QyH> to find out more



# Vector Network Analyzers



## R&S®ZNLE

### Measurements as easy as ABC

- Frequency range from 1 MHz to 3 GHz or 1 MHz to 6 GHz
- Two-port vector network analyzer with a full S-parameter test set for bidirectional measurements on passive components
- Wide dynamic range of up to 120 dB (typ.)
- Measurement bandwidths from 1 Hz to 500 kHz



## R&S®ZNL Vector Network Analyzer

### The 3-in-1 all rounder

- Frequency range from 5 kHz to 3 GHz (R&S®ZNL3) or 5 kHz to 6 GHz (R&S®ZNL6)
- Two-port vector network analyzer for bidirectional measurements
- Universal instrument concept:
  - Vector network analyzer
  - Fully integrated spectrum analyzer option

# Meters and Counters



## R&S®HM8118

### Universal, flexible and easy to use

- Measurement range: 20 Hz to 200 kHz (69 steps)
- Basic accuracy: 0.05 %
- Measurement rate: up to 12 values/s
- Automatic or manual selection of circuit type (serial, parallel)



## R&S®HMC8015

### All in one: the new compact class that has it all

- Power measurement range: 50  $\mu$ W to 12 kW
- Analog bandwidth: DC to 100 kHz
- Sampling rate: 500 ksample/s
- 16-bit resolution for current and voltage
- Basic accuracy: 0.05 %
- 26 different measurement and mathematical functions

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Subject to change

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81671 Munich, Germany

[www.rohde-schwarz.com](http://www.rohde-schwarz.com) | [customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com)

# Oscilloscopes



## R&S®Scope Rider RTH Handheld Oscilloscope

Lab performance in a rugged, portable design

- Bandwidth: 60 MHz to 500 MHz
- Sample rate: up to 5 Gsample/s
- Memory depth: up to 500 ksample, 50 Msample segmented memory
- ADC resolution: 10-bit
- Isolated channels (CAT IV 600 V (RMS) / CAT III 1000 V (RMS))
- Integrated multimeter or multimeter mode



## R&S®RTC1000 Oscilloscope

Great value

- Bandwidth: 50 MHz to 300 MHz
- Max. sample rate: 2 Gsample/s
- Max. memory depth: 2 Msample
- MSO: 8 digital channels, optional, retrofittable
- Pattern generator: 4-bit patterns up to 50 Mbit/s



## R&S®RTB2000 Oscilloscope

More signal details with the power of 10

- Bandwidth: 70 MHz to 300 MHz
- Sample rate: up to 2.5 Gsample/s
- Memory depth: up to 20 Msample
- ADC resolution: 10 bit
- Display: 10.1" capacitive touchscreen



## Five techniques for fast, accurate power integrity measurements

Industry dynamics are driving both a decrease in rail voltage values as well as tighter tolerances across a wide range of power rails. Making an accurate ripple measurement on a 1 V rail with 2% tolerance, for example, is difficult on all oscilloscopes. This guide describes how to set up your oscilloscope for accurate power integrity measurements.

- Tip 1: Adjust viewing characteristics
- Tip 2: Lower noise
- Tip 3: Achieve sufficient offset
- Tip 4: Evaluate switching and EMI
- Tip 5: Accelerate measurement time

▷ [www.rohde-schwarz.com/pi-ebook](http://www.rohde-schwarz.com/pi-ebook)





# Oscilloscopes



## R&S®RTM3000 Oscilloscope

See more of your signal with the power of 10

- Bandwidth: 100 MHz to 1GHz
- Sample rate: up to 5 Gsample/s
- Memory depth: up to 80 Msample
- ADC resolution: 10-bit
- Display: 10.1" capacitive touchscreen



## R&S®RTA4000 Oscilloscope

See more of your signal with the power of 10

- Bandwidth: 200 MHz to 1 GHz
- Sample rate: up to 5 Gsample/s
- Memory depth: up to 1 Gsample
- ADC resolution: 10-bit
- Display: 10.1" capacitive touchscreen



## R&S®RTE1000 Oscilloscope

Truly uncompromized in performance

- Bandwidth: 200 MHz to 2 GHz
- Sample rate: 5 Gsample/s
- Max. memory depth: 200 Msample
- Vertical resolution: up to 16-bit
- MSO: 16 digital channels, optional, retrofittable

## Buy a scope – get a probe!

Get a free probe when you buy a  
R&S®RTM3000 or R&S®RTA4000  
with PK1 application bundle

\*Choose one of these probes R&S®RT-ZS10, R&S®RT-ZD02, R&S®RT-ZD10, R&S®RT-ZPR20,  
R&S®RT-ZC15B, RT-ZHD07



Scan to find out more about the R&S®RTM3000  
and R&S®RTA4000 oscilloscopes offer.

[https://www.rohde-schwarz.com/\\_250348](https://www.rohde-schwarz.com/_250348)

Limited time offer

Valid till  
June 30, 2019.



# Power Supplies



## R&S®NGE100B

### Reduced to the max

- R&S®NGE102B with two or R&S®NGE103B with three channels
- Max. output power of 66 W with R&S®NGE102B, 100 W with R&S®NGE103B (33.6 W per channel)
- Max. output voltage of 32 V per channel (up to 64 V/96 V in serial operation)
- Max. output current of 3 A per channel (up to 6 A/9 A in parallel operation)



## R&S®HMC804x

### 100 W and 1, 2 or 3 channels

- Clear display of all measured parameters
- Galvanically isolated, floating and short-circuit proof outputs
- Protective functions adjustable for each channel
- Ideal power supply for hardware developers and labs
- Remote control



## R&S®HMP

### Up to four channels in a single instrument

- R&S®HMP2020/R&S®HMP2030 with 2/3 channels and 188 W total output power
- R&S®HMP4030/R&S®HMP4040 with 3/4 channels and 384 W total output power
- Maximum output voltage of 32 V per channel; higher voltages possible in serial operation



## R&S®NGL200

### High precision source and sink

- Max. output power: 120 W
- Voltage per channel: 0 V to 20 V
- Max. current per channel: 6 A
- Load recovery time: < 30  $\mu$ s
- Ripple and noise: < 500  $\mu$ V<sub>RMS</sub> / < 1 mA<sub>RMS</sub>

## R&S®HMP4040 is rated very highly in online user-reviews

“HMP4040 was beyond impressive with voltage and current programming (accuracy)”

“Lots of power in a compact format, very good construction, reasonably clean output and very accurate.”

“The power supply showed consistently great behavior in all electric tests.”

### Scoring

Product Performed to Expectations:	9
Specifications were sufficient to design with:	10
Demo Software was of good quality:	10
Product was easy to use:	10
Support materials were available:	10
The price to performance ratio was good:	10
<b>Total Score:</b>	<b>59 / 60</b>



# Signal generators and power sensors



## HM8150 Arbitrary Function Generator

### 12.5 MHz

- Frequency range: 10 mHz to 12.5 MHz
- Output voltage: 10 mV (Vpp) to 10 V (Vpp) (into 50  $\Omega$ )
- Waveforms: sine wave, square wave, triangle, pulse, sawtooth, arbitrary
- Rise and fall time: < 10 ns
- Pulse width adjustment: 100 ns to 80 s
- Arbitrary waveform generator: 40 MSa/s



## HMF2525/HMF2550 Arbitrary Function Generator

### Accurate, versatile and affordable

- Frequency range: 10  $\mu$ Hz to 25/50 MHz
- Triangle waveforms up to 10 MHz
- Output voltage: 5 mV to 10 V (Vpp) (into 50  $\Omega$ )
- Total harmonic distortion of 0.04 % ( $f < 100$  kHz)
- Modulation modes: AM, FM, pulse, PWM, FSK (internal and external)



## R&S®SMB100B RF Signal Generator

### Perfect combination of performance and usability in a compact size

- Frequency range from 8 kHz to 1 GHz, 3 GHz or 6 GHz
- Outstanding single sideband (SSB) phase noise of < -134 dBc (meas.) at 1 GHz and an offset of 20 kHz
- Very low wideband noise of < -153 dBc (typ.) at 15 MHz <  $f \leq 6$  GHz and an offset of 30 MHz
- Ultra high output power of 34 dBm (meas.) at 1 GHz



## R&S®NRX Power Meter

### The new power meter generation with modern and intuitive user interface

- Intuitive operation with touch screen based GUI
- Supports up to four R&S®NRP and R&S®NRQ6 power sensors
- Supports all sensor-dependent measurement functions
- Optional high-precision CW and pulse mode reference source module
- Optional power reflection measurements with NRT-Zxx sensors



## R&S®NRP series Power Sensors

### Taking power measurements to the next level

- Maximum dynamic range: 93 dB
- Frequency range: DC to 110 GHz
- R&S®NRPxxS(N) for widest dynamic range
- R&S®NRPxxT(N) for highest accuracy
- R&S®NRPxxA(N) for EMC applications