R&S®ESSENTIALS

R&S®CABLE RIDER ZPH
CABLE AND ANTENNA ANALYZER

Expect fast, expect efficient

3 year warranty

Product Brochure
Version 04.01

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

TheR&S®Cable Rider ZPHhas all the essential basic measurement capabilities required for installing and maintaining antenna systems in the field. Its unique features ensure fast and efficient cable and antenna measurements and spectrum analysis. The easy-to-use analyzer features a touchscreen and large keypad designed for field use.

With its short boot andwarm-up times and fast measurement speed, the R&S®Cable Rider ZPH gets down to analyzing extremely fast. Measurement setups can be predrawn and settings preconfigured. Thanks to the wizard function, fast and accurate measurements are performed in a single step. Generating measurement reports is easy with the R&S®InstrumentView software.

There is no need to calibrate the analyzer before use. It is reliably and accurately calibrated before leaving the factory. Should calibration be needed to eliminate the effects of additional cables or adapters used to connect the analyzer to the device under test (DUT), the R&S®ZN-Z103 automatic calibration unit performs the calibration in just one step.

The battery lasts up to an entirework dayon just one charge. The keypad is illuminated to facilitate working in dim environments. The leading-edge capacitive touchscreen of the R&S®Cable Rider ZPH is changing the way users interact with an analyzer – simply touch the screen to add markers and change settings. These features and the ergonomic design make the R&S®Cable Rider ZPH ideal for fast and efficient on-site measurements.

Two different R&S®ZPH models are available to suit different needs, a pure one-port cable and antenna analyzer and a two-port model with additional spectrum analysis and tracking generator features.

Key facts

- ► Frequency range in cable and antenna analyzer mode from 2 MHz to 3 GHz or 4 GHz, upgrade via keycode
- ► Frequency range in spectrum analyzer mode from 5 kHz to 3 GHz or 4 GHz, upgrade via keycode
- ► One-port model features: DTF, return loss, VSWR and cable loss measurements
- ► Two-port model additionally features
  - – Two-port transmission measurement
  - – Spectrum analysis
  - – Interference analysis
  - – Signal strength mapping
  - – Modulation analysis
  - – Advanced gated trigger measurements
  - – EMF measurement application
- ► Ideal for field use: up to 9-hour battery life, 2.5 kg (5.5 lb), backlit keypad, fast boot time, non-reflective display, small form factor, ruggedized housing (IP51)
- ► Large color touchscreen
- ► Measurement wizard to speed up measurements and eliminate human errors
- ► Easy and cost-efficient upgrades of all options via software keycode

Backlit keypad for operation in dim environments

BENEFITS AND KEY FEATURES

Fast
- Change settings quicklyandeasily
- Fastest measurement speed
- Fastest boot and warm-up times
- Fast measurements – no calibration required
- Fast deployment with the wizard function
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Efficient
- Single charge lasts the entire work day
- Buy what you need when you need it
- One-step calibration
- Simplify measurements with the wizard function
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Standard measurement modes
- Distance-to-fault measurement
- Distance-to-fault measurement and return loss: combined measurement
- Voltage standing wave ratio (VSWR) measurement
- One-port cable loss measurement
- Phase display
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Optional measurement modes
- Power measurements with power sensors
- Channelpower meter
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Model-specific measurement modes (two-port combi model)
- Spectrum analysisperformanceincludingtracking generator
- Modulation analysis
- Interference analysis and signal strength mapping
- Advanced gated trigger measurements
- EMF measurement application
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Model selection guide

Feature	One-port model .02	Two-port model .12
Frequency upgrade to 4 GHz	•	•
Measurement wizard	•	•
R&S®InstrumentView support	•	•
R&S®MobileView support	•	•
DTF	•	•
Return loss and VSWR	•	•
Cable loss	•	•
Transmission (S_{21})	–	•
Spectrum analysis, 5 kHz to 3 GHz or 4 GHz	–	•
Tracking generator capability	–	•
Signal generator capability	–	•
Internal bias tee	–	•
Ideal for cable and antenna measurement and troubleshooting	•	•
Ideal for verifying signal transmission	–	•
Ideal for interference hunting	–	•

FAST

Changesettingsquickly and easily

Thanks to its hybrid design, the analyzer can be operated as usual via the keys and rotary knob or alternatively via the touchscreen. The keys are large and widely spaced. This makes the analyzer ideal for operation with gloves and also minimizes the big finger problem.

The R&S®Cable Rider ZPH offers a new kind of user experience with its built-in sensitive capacitive touchscreen:

- ► Directly interact with the elements on the screen
- ► Access menus faster
- ► Change frequency and span
- ► Add/move/delete markers
- ► Change other settings, etc.

Fastest measurement speed

The R&S®Cable Rider ZPHhas extremely fast synthesizers that yield the shortest measurement time per data point (0.3 ms/point) for reflection measurements. The measurement speed is so fast that the measurement time is not compromised even when you set more data points to see details. With 2001 data points set, for example, the measurement time is only 0.6 s whereas other analyzers can take anywhere from 1.4 s to 30 s.

Fastest boot and warm-up times

Waiting a long time for ananalyzer to boot and warm up can be frustrating. The R&S®Cable Rider ZPH boots up in less than 15 s and only needs 1 minute to warm up. This helps alleviate the frustration of waiting for the analyzer in order to start the first measurement.

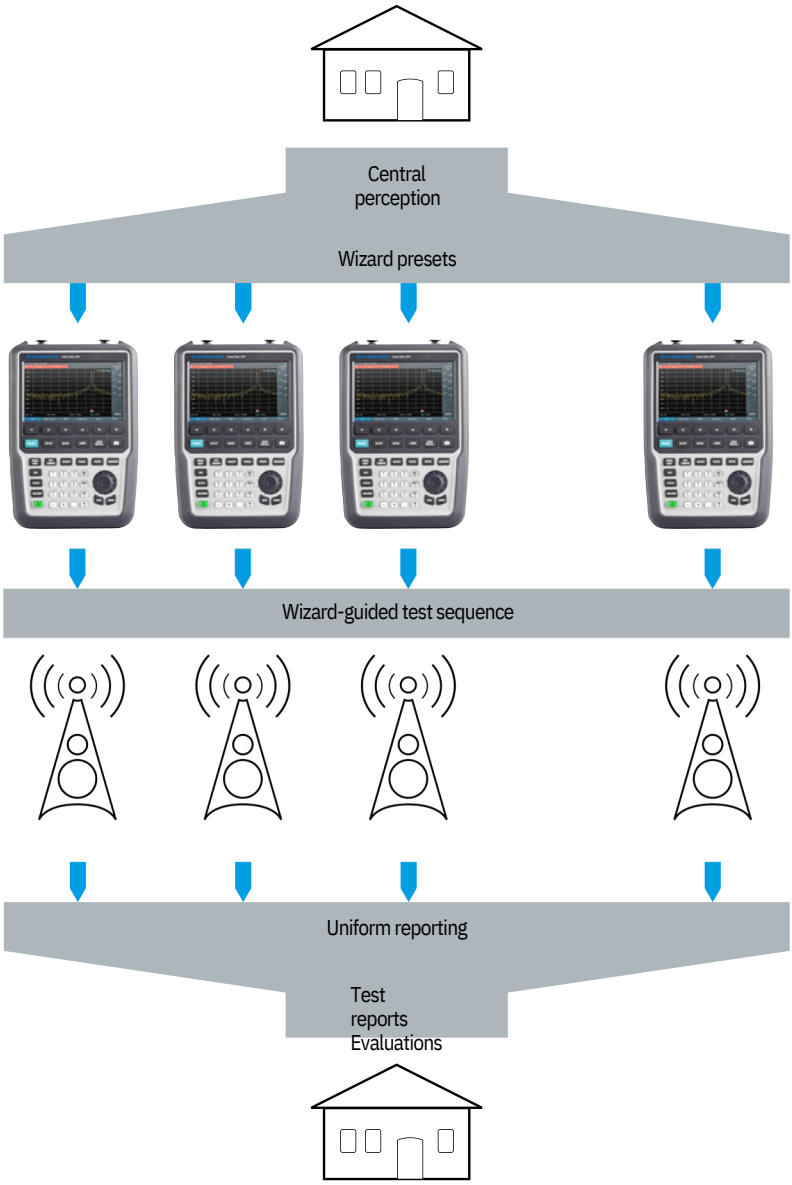
Fast measurements – no calibration required

Understanding the need to perform measurements quickly, the R&S®Cable Rider ZPH is factory-precalibrated over the supported frequency and temperature ranges. The factory calibration removes the drift error, which can be a hassle when you have to keep calibrating because the measured frequency and operating temperature change. No calibration reminder will pop up on the screen and interrupt measurements. The Rohde & Schwarz calibration lab performs stringent calibration during production to minimize measurement errors and provide reliable measurement results. A calibration certificate is included with the analyzer. When the calibration interval has lapsed, the analyzer can be sent back to Rohde & Schwarz for recalibration.

Fast deployment with the wizard function

For fast deployment, all settings and measurement steps can be preconfigured using the wizard function. The field technician only needs to execute the test sequences as shown on the display. The measurement instructions can be in pictorial form with short descriptions to provide clear step-by-step guidance for the field technician. The settings for each test sequence are preconfigured, eliminating the need to provide special dedicated operational training for the field technician. Since there is no need to change settings for different measurements, test time is reduced during installation and maintenance. For the same measurement at multiple sites, simply load the measurement set to all analyzers – fast deployment thanks to the wizard function.

Typical deployment setup with measurement preparation and postprocessing



EFFICIENT

Single charge lasts the entire work day

With a single full charge, the R&S®Cable Rider ZPH will keep going an entire work day. Simply charge it for approximately 4 hours and the lithium-ion battery pack lasts up to 9 hours. The advantages of having a long-lasting battery are obvious – no need to bring an extra battery with additional weight when climbing up a mast or tower, no frustration due to the battery power ending in the middle of the measurement.

Buy what you need when you need it

The base unit supportsfrequencies from 2 MHz to 3 GHz in cable and antenna analyzer mode and 5 kHz to 3 GHz in spectrum analyzer mode. When you need frequencies up to 4 GHz, simply purchase the R&S®ZPH-B4 frequency upgrade option and enter the keycode into the analyzer. The supported frequency range is instantly extended to 4 GHz. It is not necessary to send the analyzer to the service lab for an upgrade or recalibration. No downtime and no need to buy a new analyzer just for frequency upgrading.

One-step calibration

Typically, calibration is not required if the DUT is connected directly to the analyzer. However, if there are additional cables or adapters connected between the analyzer and the device under test (DUT), calibration is recommended to eliminate any influences. During calibration, the analyzer calibrates with the open, short and load standard. For convenient, one-step calibration, the R&S®ZN-Z103 calibration unit automatically switches internally between open, short and load. This saves time and eliminates the hassle of physically changing the different calibration standards in the field.

Simplify measurements with the wizard function

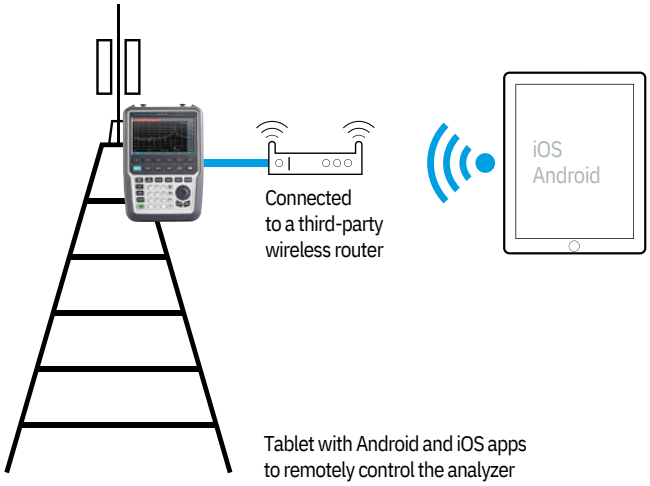
Themeasurementwizard simplifiesmeasurements by automating, standardizing and optimizing test sequences. A sequence of standardized and recurring measurements can be performed quickly and easily without mistakes.
The proven wizard function helps eliminate human errors and helps the user make correct measurements from the beginning.

Remote control with Android or iOS apps

Not all qualified engineers are qualified climbers. An engineer on the ground might have to give the climber on the mast or tower instructions for every measurement step. Remote control of the R&S®Cable Rider ZPH solves this problem. Simply connect a commercially available wireless router [1] to the analyzer and use the apps on the phone or tablet to remote control the analyzer and fully control the measurements.

[1] The wireless router is not provided by Rohde & Schwarz.

Application example of wireless remote operation via tablet



Three simple steps to work with the measurement wizard

1. Project manager/expert creates the test sequences
2. Operator uses the wizard to execute the test sequences
3. Operator shows the measurement result to the project manager/expert and documents it

OPERATIONG ELEMENTS

Ext. trigger input
Ext. reference input
(model .12 only)

Headphone jack (model .12 only)
Two USB ports

RF input

RF out

Capacitive touchscreen with smartphone-like gestures

Softkey labels (on display)

Softkeys

System keys

Screenshot key

DC connector (protected)

LAN and mini USB ports (protected)

Rotary knob with enter function

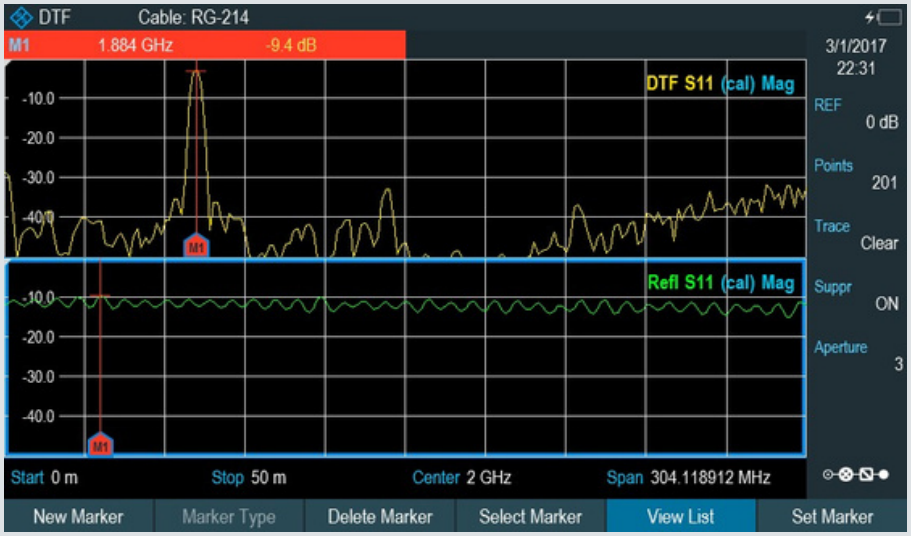
Built-in wizard

Power-on button (fastest boot time)

Illuminated keypad:
- ► Large keys
- ► Widely spaced

STANDARD MEASUREMENT MODES

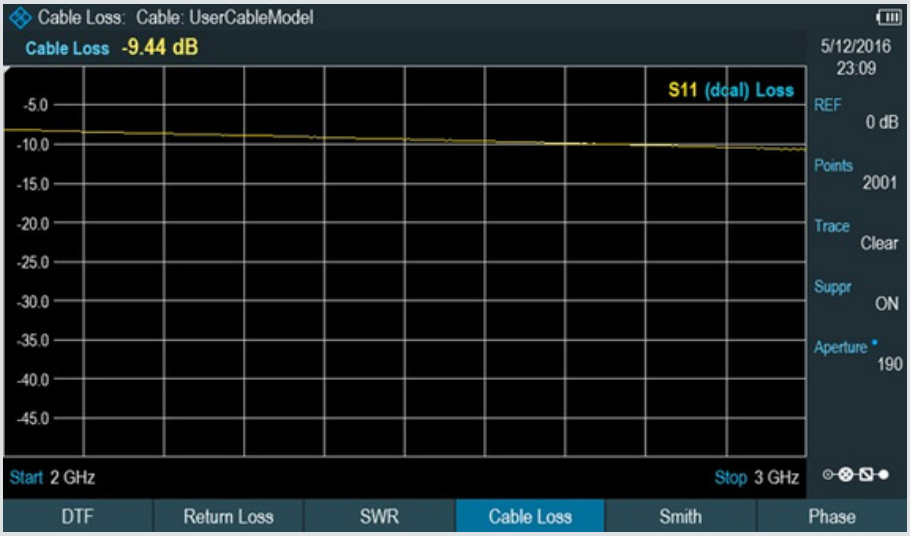
Distance-to-fault measurement



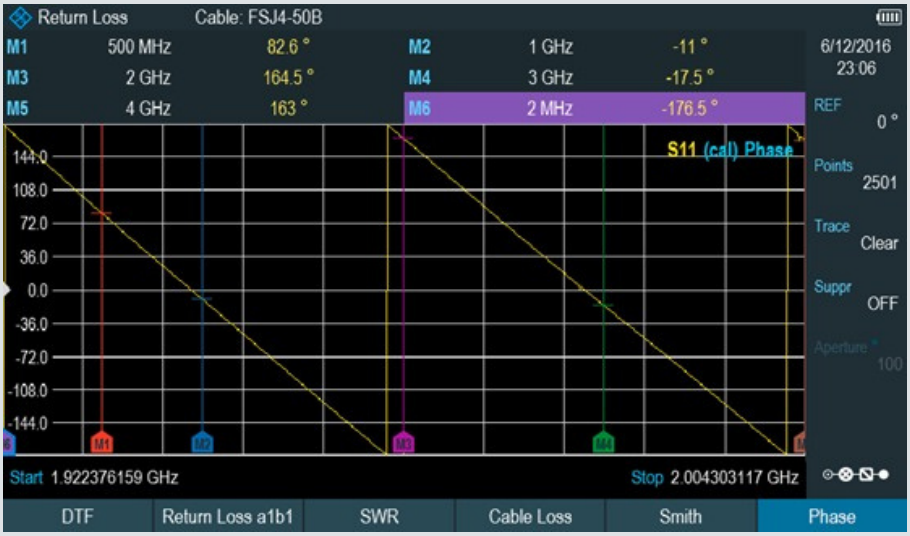
Distance-to-fault measurement and return loss: combined measurement

VSWR measurement

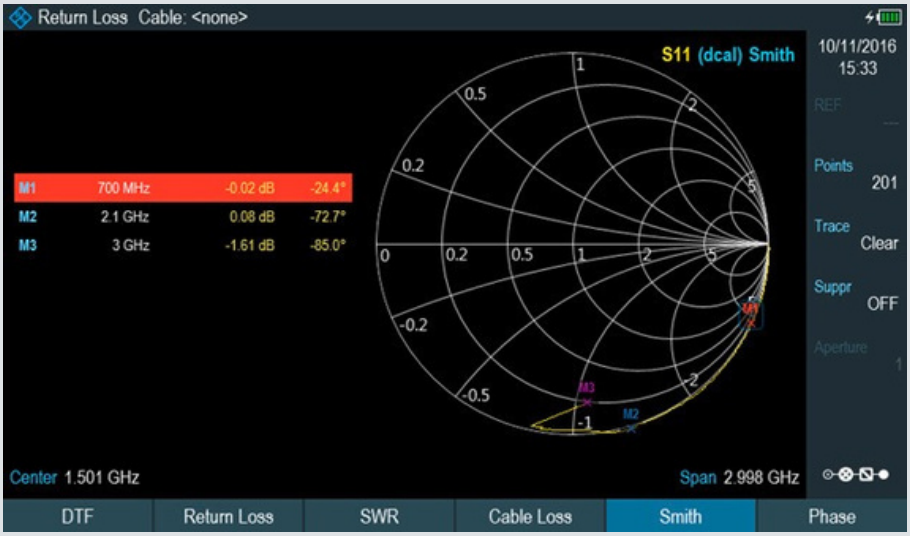
wavetel
a simac group company
sales@wavetel.fr
www.wavetel.fr
+33(0)2 99 14 69 65
simac



One-port cable loss measurement



Phase display



Smith chart display

OPTIONAL MEASUREMENT MODES

Power measurements withpowersensors

Some applications require very high accuracy to measure and align transmitting power. The R&S®ZPH-K9 option allows the R&S®Cable Rider ZPH to perform power measurements together with the R&S®NRP-Zxx power sensor series, with a measurement range of –67 dBm to +45 dBm and covering frequencies up to 110 GHz.

Channel power meter

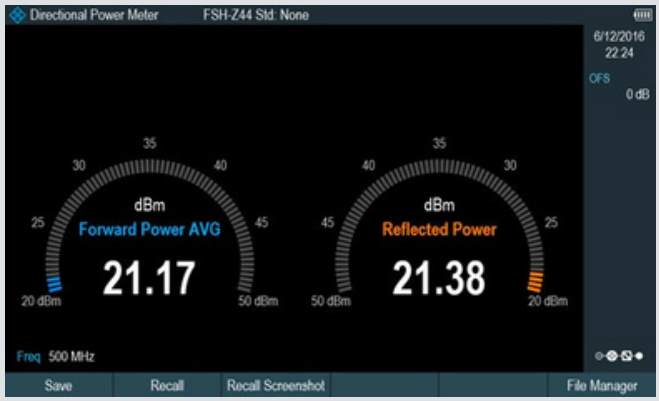
The R&S®ZPH-K19 channel power meter option converts the analyzer into a portable power meter with a level measurement accuracy of typically 0.5 dB. This option makes it possible to achieve power measurement results quickly and easily without needing a power sensor or the spectrum analyzer mode. This can help in applications such as checking power levels along the signal path of a field transmitter or verifying the power level of a design in the lab.

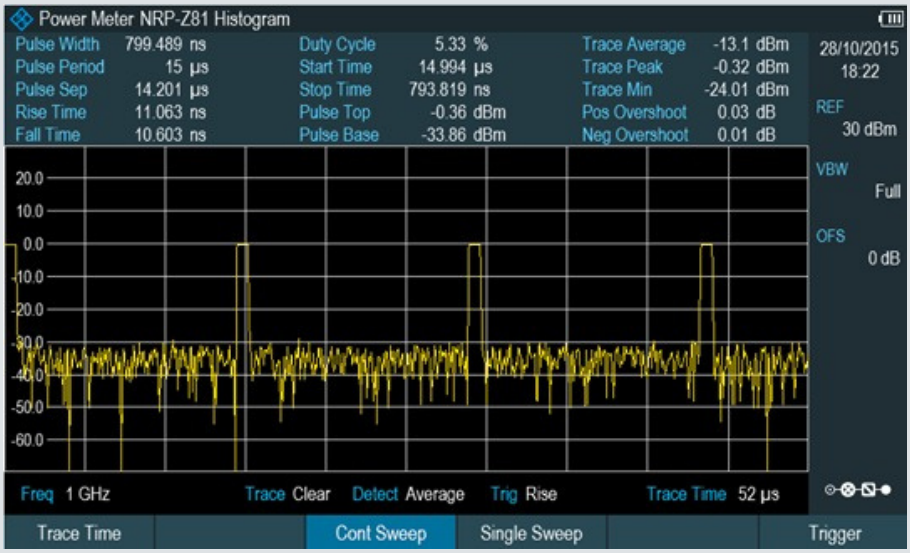
Pulsemeasurementswithpowersensors

The R&S®ZPH-K29 option enables precise pulse and peak power measurements using the R&S®Cable Rider ZPH together with a Rohde & Schwarz wideband power sensor. The wideband power sensors measure pulses with a resolution of up to 50 ns and support frequencies up to 44 GHz. This option is useful when the R&S®Cable Rider ZPH is used to install and maintain radar transmitter systems.

R&S®ZPH-K19 channel power meter

R&S®ZPH-K9 power sensor support





R&S®ZPH-K29 pulse measurement

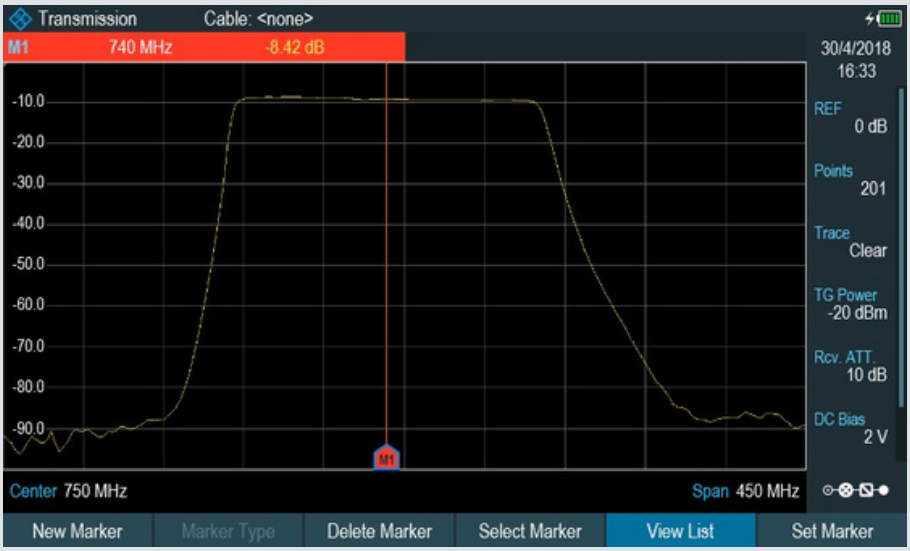
MODEL-SPECIFIC MEASUREMENT MODES (TWO-PORT COMBI MODEL)

In many cases, field engineers need multiple instruments to complete their tasks: a cable and antenna analyzer, a spectrum analyzer, a signal generator and a bias source. The two-port combi model R&S®Cable Rider ZPH now combines all of these instruments into one powerful box.

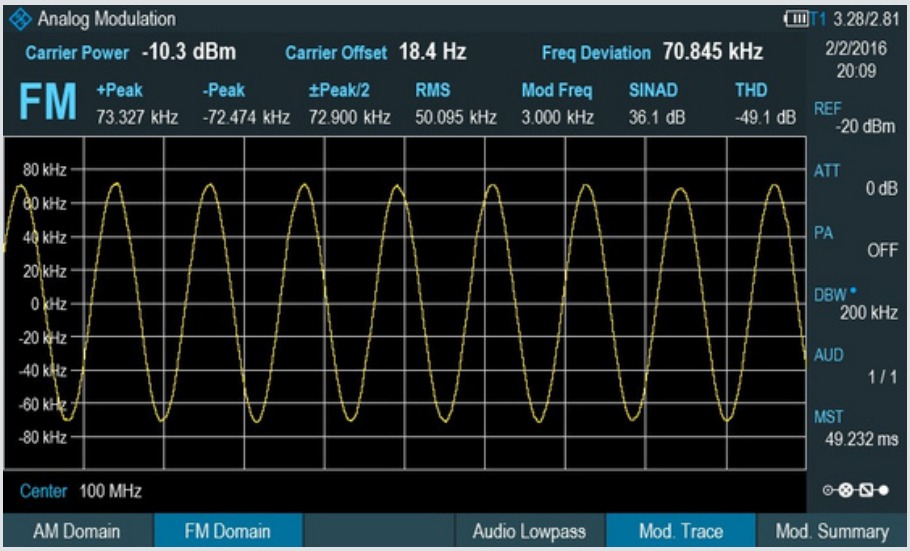
Spectrum analysis performance including tracking generator

Withitshigh sensitivity (DANL of typ. < –146dBm up to 3 GHz), the R&S®Cable Rider ZPH is a powerful and easy-to-use spectrum analyzer for RF diagnostics in the field, e.g. on antenna RF feed signals. The DANL can be further improved to typ. –163 dBm with the optional R&S®ZPH-B22 preamplifier. The R&S®ZPH features tracking generator functionality, which makes scalar transmission measurements possible, e.g. frequency response measurements on RF filters. Bias tees broaden the functionality even further, e.g. for measuring tower mounted amplifiers (TMA).

The R&S®Cable Rider ZPH can even utilize its unique independent signal source to operate as a continuous wave (CW) signal generator or as an independent tracking source for frequency conversion measurements.



Filter transmission measurement with the R&S®ZPH-K1 option



Analysis of a frequency-modulated signal with the R&S®ZPH-K7 modulation analysis option

Modulation analysis

The R&S®ZPH-K7 option converts the R&S®Cable Rider ZPH into a modulation analyzer to measure the quality of amplitude or frequency modulated signals. The analog modulation display shows the waveform as well as measurement parameters such as carrier power, carrier offset, modulation index (depth) for AM signals, frequency deviation for FM signals, SINAD and THD. The modulation summary display provides user-definable limits for each measurement. This feature is especially useful for installation and maintenance of AM/FM radio stations.

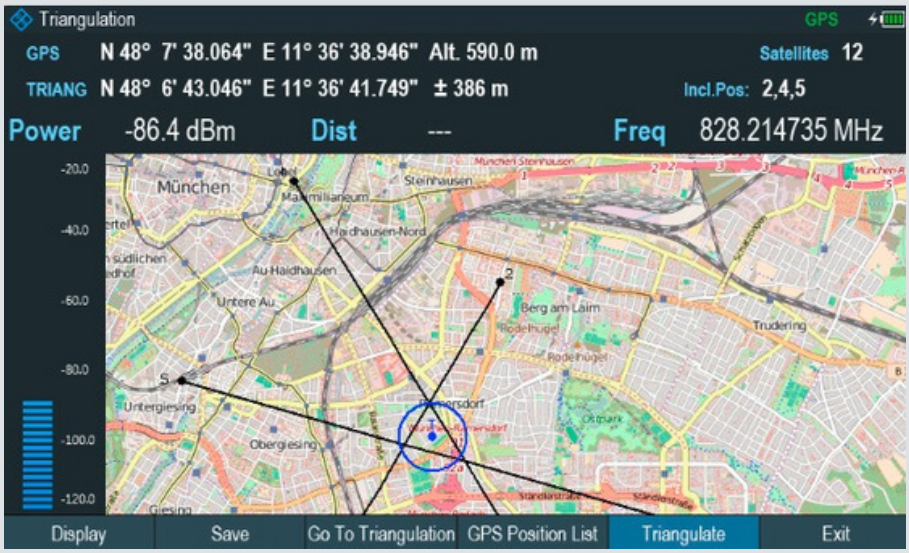
Basic digital modulation formats are used in many applications, e.g. near-field communications. The R&S®Cable Rider ZPH supports both ASK and FSK analysis. The digital modulation displays include trace, eye diagram, modulation error and symbol analysis. Specialized configuration presets for Bluetooth® Low Energy (Bluetooth® LE) and tire pressure monitoring systems (TPMS) are available, too. The R&S®ZPH-K7 option lets users easily verify the quality of the basic modulated signals.

Interference analysis and signal strength mapping

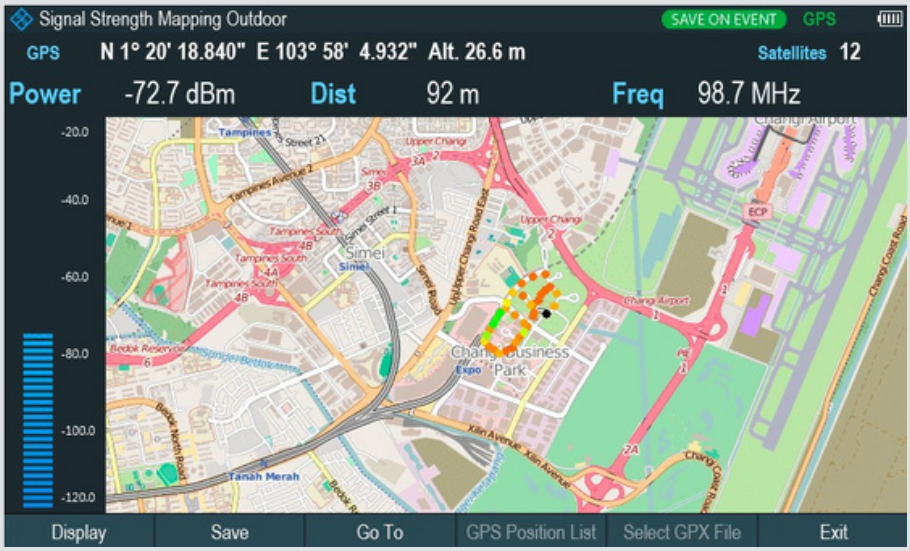
The R&S®ZPH-K15interference analysis andR&S®ZPH-K16 signal strength mapping options are great tools for analyzing and locating ambiguous signals or interferers.

Long-term spectrogram recording allows up to 999 hours of on-air activity to be captured; the recording duration depends on the recording interval setting. The recorded data can be analyzed on the R&S®ZPH or with the R&S®InstrumentView software.

Signal strength mapping displays a pictorial view of the signal power level on an indoor or outdoor map. The color indicator provides a good estimation of the signal coverage in a particular area or where the interferer or intended signal is most likely located.



Locating a signal with the R&S®ZPH-K15 interference analysis option and the R&S®HE400 directional antenna



Display of the interferer signal strength on the map with the R&S®ZPH-K16 signal strength mapping option

Advanced gated trigger measurements

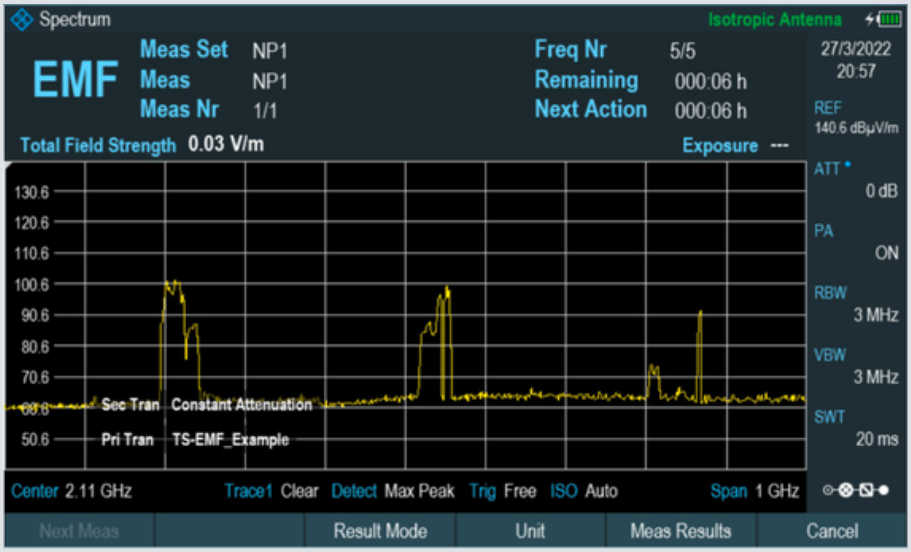
Inspectrum analyzer mode (including channel power and spectrogram mode), the R&S®Cable Rider ZPH supports a gated trigger function. The gated trigger is useful for displaying weak uplink signals that are normally buried by strong downlink signals in TDD networks.

The R&S®ZPH-K57 advanced gated trigger measurements option can extend functions to include occupied bandwidth (OBW), adjacent channel leakage ratio (ACLR) and spectrum emission mask (SEM) measurement modes.
The standard gated trigger and new advanced gated trigger measurement options help assess network quality and easily identify interferers.

EMF measurement application

TheR&S®ZPH-K105 option supports automated test sequences for frequency selective measurements. R&S®InstrumentView software conveniently configures these measurements. The configuration setup covers one or several sub-measurements on various frequencies or channels and can include setting EMF emission limits in line with national and international standards during configuration or after measurement. This provides a quick overview of whether the transmitter system complies with the applicable safety exposure limits. Pre-configuration is done in the lab, saving time and effort in the field. With
just a few clicks, all test sequences are executed automatically. The result can be previewed on the analyzer or with R&S®InstrumentView software to analyze and document the results.

Gated trigger in ACLR mode with advanced the R&S®ZPH-K57 advanced gated trigger measurements option



Frequency selective measurement with the R&S®ZPH-K105 EMF measurement application option

SPECIFICATIONS IN BRIEF

Specifications in brief		
Frequency range	R&S®CableRiderZPH (one-portmodel.02)	2 MHz to 3 GHz
	withR&S®ZPH-B4 option	2 MHz to 4 GHz
	R&S®CableRiderZPH (two-portcombimodel.12)	
	with R&S®ZPH-K1 option	5 kHz to 3 GHz
	with R&S®ZPH-B4 and R&S®ZPH-K1 options	5 kHz to 4 GHz
Frequency resolution		1 Hz
Spectrum measurement with combi model .12 only, with R&S®ZPH-K1 option		
Spectral purity, SSB phase noise	f = 500 MHz, carrier offset 30 kHz	< –88 dBc (1 Hz), typ. –95 dBc (1 Hz)
	f = 500 MHz, carrier offset 100 kHz	< –98 dBc (1 Hz), typ. –105 dBc (1 Hz)
	f = 500 MHz, carrier offset 1 MHz	< –118 dBc (1 Hz), typ. –125 dBc (1 Hz)
Displayed average noise level (DANL)	0 dB RF attenuation, termination 50 Ω, RBW = 1 kHz, VBW = 10 Hz, sample detector, log scaling, normalized to 1 Hz	
	frequency preamplifier = off	
	1 MHz to 10 MHz	< –130 dBm, typ. –135 dBm
	10 MHz to 1 GHz	< –142 dBm, typ. –146 dBm
	1 GHz to 4 GHz	< –140 dBm, typ. –144 dBm
	frequency preamplifier = on	
	1 MHz to 10 MHz	< –150 dBm, typ. –160 dBm
	10 MHz to 3 GHz	< –158 dBm, typ. –163 dBm
	3 GHz to 4 GHz	< –156 dBm, typ. –161 dBm
Individual measurements		reflection (S_{11}), one-port cable loss, distance-to-fault
Port output power	controlled via tracking generator attenuation	–10 dBm (nom.)
Maximum permissible spurious signal	measurement = reflection (S_{11})/one-port cable loss/distance-to-fault analysis	+17 dBm (nom.)
Data points	selectable	101 to 2501
Reflection measurement S_{11}		
CorrecteddirectivitywithR&S®ZN-Z103 option	2 MHz ≤ f ≤ 4 GHz (with R&S®ZPH-B4 option)	> 42 dB (nom.)
Measurement speed		0.3 ms/point
Result formats		magnitude, VSWR, magnitude and distance-to-fault, VSWR and distance-to-fault
One-port cable loss measurement		
Result format		magnitude
Range	selectable	1/2/5/10/20/50/100/120/150 dB
Distance-to-fault analysis		
Result formats		return loss (dB), VSWR
Fault resolution		1.5 m × 108 m × velocity factor/span
Maximum cable length	depending on cable loss	1500 m (nom.)
Maximum rated input levels		
DC voltage		50 V
CW RF power	model .02: port 1 (power meter input)	30 dBm
	model .12: port 1 (RF input)	20 dBm
	port 2 (reflectometer input)	23 dBm
General data		
Display resolution	WVGA	800 × 480 pixel
Battery (R&S®HA-Z306 option)	capacity	72 Wh
	voltage	11.25 V (nom.)
Operating time with new, fully charged battery	one-port model .02	9 h
	two-port combi model .12, spectrum analyzer mode	9 h
	two-port combi model .12, cable and antenna analyzer mode	6.5 h
Dimensions	W × H × D	202 mm × 294 mm × 76 mm (8.0 in × 11.6 in × 3 in)
Weight		2.5 kg (5.5 lb)

ORDERING INFORMATION

Designation	Type	Order No.
Base unit (includes accessories such as power cable, manual)		
Handheld cable and antenna analyzer, 2 MHz to 3 GHz	R&S®Cable Rider ZPH	1321.1211.02
Handheld cable and antenna analyzer, combi model, 5 kHz to 3 GHz	R&S®Cable Rider ZPH	1321.1211.12
Options (for model .02 and model .12)		
Frequency upgrade, 3 GHz to 4 GHz	R&S®ZPH-B4	1321.0380.02
Power sensor support	R&S®ZPH-K9	1321.0415.02
Channel power meter	R&S®ZPH-K19	1321.0409.02
Pulse measurements with power sensor	R&S®ZPH-B10	1321.0396.02
Option (for model .02 only)		
GPS support	R&S®ZPH-B29	1321.0421.02
Options (for model .12 only)		
Spectrum analyzer preamplifier (requires R&S®ZPH-K1)	R&S®ZPH-B22	1334.5627.02
Spectrum analysis measurement application	R&S®ZPH-K1	1334.5604.02
Modulation analysis AM/FM/ASK/FSK (requires R&S®ZPH-K1)	R&S®ZPH-K7	1334.5633.02
Interference analysis (requires R&S®ZPH-K1)	R&S®ZPH-K15	1334.5640.02
Signal strength mapping measurement application (requires R&S®ZPH-K1)	R&S®ZPH-K16	1334.5656.02
Advanced gated trigger measurements (requires R&S®ZPH-K1)	R&S®ZPH-K57	1334.5685.02
EMF measurement application	R&S®ZPH-K105	1300.7510.02
Accessories		
Calibration unit	R&S®ZN-Z103	1334.7207.02
Combined open/short/50 Ω load calibration standard, for calibrating the VSWR and DTF measurements, DC to 3.6 GHz	R&S®FSH-Z29	1321.1328.02
Battery charger for R&S®HA-Z306	R&S®HA-Z303	1300.7510.02
Lithium-ion battery pack, 6.4 Ah	R&S®HA-Z306	1334.7207.02
Spare power supply, incl. mains plug for EU, GB, US, AUS, CH	R&S®HA-Z301	1321.1328.02
Car adapter	R&S®HA-Z302	
Headphones	R&S®FSH-Z36	1321.1334.02
Spare USB cable	R&S®HA-Z211	1321.1386.02
Spare Ethernet cable	R&S®HA-Z210	
Soft carrying bag	R&S®HA-Z220	
Hard case	R&S®HA-Z321	1321.1340.02
Hard shell protective carrying case	R&S®RTH-Z4	1145.5838.02
Carrying holster	R&S®HA-Z322	
Rainproof carrying holster	R&S®HA-Z322	
Antennas and accessories		
RF cable (length: 1 m), DC to 8 GHz, armored, N male/N female connectors		1309.6169.02
RF cable (length: 3 m), DC to 8 GHz, armored, N male/N female connectors	R&S®FSH-Z320	1309.6600.00
Matching pad, 50/75 Ω, L section	R&S®FSH-Z321	1309.6152.02
Matching pad, 50/75 Ω, series resistor 25 Ω	R&S®RAM	1309.6617.00
Matching pad, 50/75 Ω, L section, N to BNC	R&S®RAZ	1309.6175.02
Adapter N (m) – BNC (f)	R&S®FSH-Z38	0358.5414.00
Adapter N (m) – N (m)		1321.1357.02
Adapter N (m) – SMA (f)		0358.5714.00
Adapter N (f) – SMA (f)		1326.2774.02
Adapter N (m) – 7/16 (f)		1300.7740.02
Adapter N (m) – 7/16 (m)		1321.1370.02
Adapter N (m) – FME (f)		0118.2812.00
Adapter BNC (m) – banana (f)		1321.1370.03
Attenuator, 50 W, 20 dB, 50 Ω, DC to 6 GHz, N (f) – N (m)		3092.6581.00
Attenuator, 100 W, 20 dB, 50 Ω, DC to 2 GHz, N (f) – N (m)	R&S®RDL50	0
Attenuator, 100 W, 30 dB, 50 Ω, DC to 2 GHz, N (f) – N (m)	R&S®RBU100	4012.5837.00
Handheld directional antenna (with antenna handle)	R&S®RBU100	0
	R&S®HE400BC	3692.7660.00
		3530.6646.00
		3530.6630.00

Designation	Type	Order No.
Cable set for R&S®HE400BC (R&S®HE300USB required)	R&S®HE400-KB	4104.7770.0
Handheld directional antenna (with antenna handle)	R&S®HE400	4
Cable set for R&S®HE400 (R&S®HE300USB required)	R&S®HE400-K	4104.6000.0
HF antenna module, 8.3 kHz to 30 MHz	R&S®HE400HF	2
VHF antenna module, 20 MHz to 200 MHz	R&S®HE400VHF	4104.7770.0
UWB antenna module, 30 MHz to 6 GHz	R&S®HE400UWB	2
Log-periodic antenna module, 450 MHz to 8 GHz	R&S®HE400LP	4104.8002.0
Cellular antenna module, 700 MHz to 2500 MHz	R&S®HE400CEL	2
USB adapter, for R&S®HE300/R&S®HL300	R&S®HE300USB	4104.8202.0
Log-periodic OEM antenna, 700 MHz to 4 GHz	R&S®HA-Z350	2
Yagi antenna, 1710 MHz to 1990 MHz	R&S®HA-Z1900	4104.6900.0
Yagi antenna, 824 MHz to 960 MHz	R&S®HA-Z900	2
Telescopic antenna	R&S®CS-ZANT	4104.8402.0
RF cable (length: 1 m), DC to 6 GHz, N male/N male connectors	R&S®HA-Z901	2
Carrying bag, for R&S®HA-Z900 or R&S®HA-Z1900 Yagi antenna	R&S®HA-Z902	4104.7306.0
Compact probe set for E and H near-field measurements, 30 MHz to 3 GHz	R&S®HZ-15	2
Near-field probe set H field	R&S®HZ-17	4080.9440.0
Preamplifier (3 GHz, 20 dB), power adapter (100 V to 230 V), for R&S®HZ-15	R&S®HZ-16	2
Portable EMF measurement system, hardcase	R&S®TS-EMF	1321.1405.0
Isotropic antenna, 30 MHz to 3 GHz	R&S®TSEMF-B1	2
Isotropic antenna, 700 MHz to 6 GHz	R&S®TSEMF-B2	1328.6825.0
Isotropic antenna, 9 kHz to 200 MHz	R&S®TSEMF-B3	2
Converter cable	R&S®TSEMF-CV	1328.6283.0
Power sensors supported by the R&S®Cable Rider ZPH		2
Directional power sensor, 25 MHz to 1 GHz	R&S®FSH-Z14	4500.7470.0 1444.0029.0 0
Directional power sensor, 200 MHz to 4 GHz	R&S®FSH-Z44	2
Universal power sensor, 10 MHz to 8 GHz, 100 mW, two-path	R&S®NRP-Z211	3626.3757.0 1444.0035.0 2
Universal power sensor, 10 MHz to 18 GHz, 100 mW, two-path	R&S®NRP-Z221	2
Wideband power sensor, 50 MHz to 18 GHz, 100 mW	R&S®NRP-Z81	1328.6883.0 1417.0409.0 2
Wideband power sensor, 50 MHz to 40 GHz, 100 mW (2.92 mm)	R&S®NRP-Z85	2
Wideband power sensor, 50 MHz to 40 GHz, 100 mW (2.40 mm)	R&S®NRP-Z86	1147.3736.0 1417.0309.0 2
Wideband power sensor, 50 MHz to 44 GHz, 100 mW (2.40 mm)	R&S®NRP-Z86	2
Three-path diode power sensor, 100 pW to 200 mW, 10 MHz to 8 GHz	R&S®NRP8S	1339.4141.0 1137.9009.0 2
Three-path diode power sensor, 100 pW to 200 mW, 10 MHz to 18 GHz	R&S®NRP18S	2
Three-path diode power sensor, 100 pW to 200 mW, 10 MHz to 33 GHz	R&S®NRP33S	1147.3720.0 1411.7501.0 2
Three-path diode power sensor, 100 pW to 200 mW, 50 MHz to 40 GHz	R&S®NRP40S	2
Three-path diode power sensor, 100 pW to 200 mW, 50 MHz to 50 GHz	R&S®NRP50S	1158.9295.0 1417.0109.4 6
Thermal power sensor, 300 nW to 100 mW, DC to 18 GHz	R&S®NRP18T	0
Thermal power sensor, 300 nW to 100 mW, DC to 33 GHz	R&S®NRP33T	1074.5719.0 1417.0109.4 2
Thermal power sensor, 300 nW to 100 mW, DC to 40 GHz	R&S®NRP40T	4
Thermal power sensor, 300 nW to 100 mW, DC to 50 GHz	R&S®NRP50T	1074.5702.0 1419.0006.0 2
Thermal power sensor, 300 nW to 100 mW, DC to 67 GHz	R&S®NRP67T	2
Thermal power sensor, 300 nW to 100 mW, DC to 110 GHz	R&S®NRP110T	1074.5690.0 1419.0029.0 2
Average power sensor, 100 pW to 200 mW, 8 kHz to 6 GHz	R&S®NRP6A	2
Average power sensor, 100 pW to 200 mW, 8 kHz to 18 GHz	R&S®NRP18A	1158.9250.0 1419.0064.0 2
Optical power sensors and accessories		2
OEM USB optical power meter (germanium)	R&S®HA-Z360	1334.5062.0
OEM USB optical power meter (filtered InGaAs)	R&S®HA-Z361	0
SC adaptor for optical power meter	R&S®HA-Z362	1334.5079.0
LC adaptor for optical power meter	R&S®HA-Z363	0
2.5 mm universal adaptor for optical power meter	R&S®HA-Z364	1334.5185.0
1.25 mm universal adaptor for optical power meter	R&S®HA-Z365	0
Patch cord SC-LC SM, SX, length: 1 m	R&S®HA-Z366	1334.5198.0
Patch cord SC-SC SM, SX, length: 1 m	R&S®HA-Z367	0
		1334.5250.0
		0
		1334.5279.0
		0
		1334.5285.0

Designation	Type	Order No.
Thepowersensors require the following adapter cable for operation with the R&S®Cable Rider ZPH		
USB adapter cable for R&S®FSH-Z14/R&S®FSH-Z44	R&S®FSH-Z144	1145.5909.0
USB adapter cable (passive), length: 2 m, to connect R&S®NRP-Zxx S/SN power sensors to the R&S®Cable Rider ZPH	R&S®NRP-Z4	2
R&S®NRP power sensors require the following adapter cable for operation with the R&S®Cable Rider ZPH		1146.8001.0
USB interface cable, length: 1.5 m, to connect R&S®NRP-Zxx sensors to the R&S®Cable Rider ZPH	R&S®NRP-ZKU	1419.0658.03 2

Warranty		
Base unit		3 years
All other items [1]		1 year
Options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

[1] For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

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