



R&S® ZNL VECTOR NETWORK ANALYZER

The 3-in-1 allrounder



Product Brochure
Version 05.00



AT A GLANCE

Measuring equipment for RF applications must satisfy high quality standards. Instruments should be easy to use and offer high versatility. Fast measurements and reliable performance are crucial. The R&S®ZNL meets these challenges and offers even more: it combines the functionality of a vector network analyzer, a spectrum analyzer and a power meter in a single, compact box.

With frequency ranges from 5 kHz to 3 GHz, 4.5 GHz or 6 GHz, the R&S®ZNL is well suited for RF component tests in industrial electronics and wireless communications.

Responding to constantly changing measurement needs in diverse environments, e.g. on test benches or production lines, can be challenging. The R&S®ZNL helps to reduce investment costs as it offers a unique option concept. The base unit can be extended with a fully integrated spectrum analyzer¹⁾. Moreover, the R&S®ZNL can be used as an RF power meter²⁾.

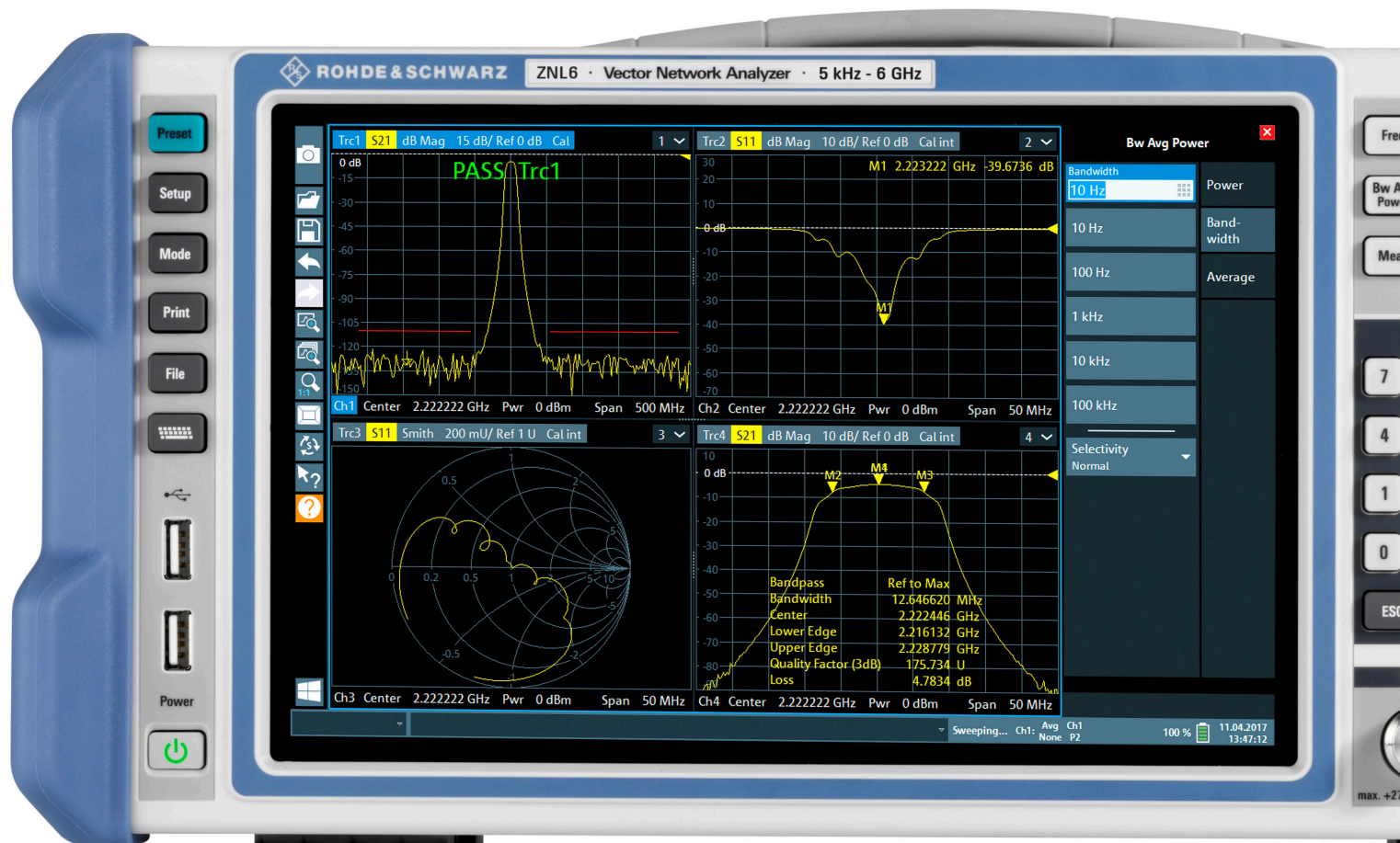
¹⁾ R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 option.

²⁾ R&S®FPL1-K9 option; requires R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 option and an R&S®NRP external power sensor.

Instead of investing in multiple instruments, research labs, service centers, universities and production facilities can benefit from a single, compact instrument that offers even higher measurement speed and better RF performance than dedicated instruments in comparable classes.

The instrument simultaneously displays vector network analysis and spectrum analysis measurements on its 10.1" multitouch screen. Clear menu structures and numerous wizards make measurements convenient to configure.

Although the R&S®ZNL hosts a variety of different functionalities, it is a very compact instrument with an attractive form factor. With a weight of only 6 kg to 8 kg, a carrying handle and an optional battery pack, the R&S®ZNL is fully portable and can be operated wherever needed.



Key features

- ▶ Frequency range from 5 kHz to 3 GHz (R&S®ZNL3), 4.5 GHz (R&S®ZNL4) or 6 GHz (R&S®ZNL6)
- ▶ Two-port vector network analyzer for bidirectional measurements
- ▶ Universal instrument
 - Vector network analyzer
 - Fully integrated spectrum analyzer (optional, for R&S®ZNL3, R&S®ZNL4 and R&S®ZNL6)
 - Support for external power sensor
- ▶ Wide dynamic range of typ. 130 dB
- ▶ Output power range from -40 dBm to typ. + 3 dBm
- ▶ Measurement bandwidths from 1 Hz to 500 kHz
- ▶ Fast measurements, e.g. 16.7 ms for 401 points (100 kHz IFBW, 200 MHz span, 2-port TOSM (SOLT))
- ▶ Compact size, low weight (6 kg to 8 kg)
- ▶ Optional battery pack
- ▶ Windows 10 operating system



BENEFITS

The 3-in-1 analyzer: compact vector network analyzer

- ▶ Solid RF performance
- ▶ Versatile features for lab and production
- ▶ Time domain analysis and distance-to-fault (DTF) measurements
- ▶ Compact 3-in-1 instrument
- ▶ Remote control via LAN and optional GPIB interface
- ▶ [page 4](#)

The 3-in-1 analyzer: fully integrated spectrum analyzer

- ▶ Integrated hardware for solid RF performance
- ▶ Spectrum analyzer function
- ▶ Analog demodulation
- ▶ Digital demodulation
- ▶ [page 6](#)

The 3-in-1 analyzer: RF power meter

- ▶ Precise power measurements
- ▶ [page 7](#)

User interface with multitouch screen

- ▶ Clear menu structures for efficient operation
- ▶ Large 10.1" multitouch screen for convenient operation
- ▶ Integrated PC
- ▶ Simultaneous display of multiple measurement modes with MultiView function
- ▶ [page 10](#)

Fully portable – ideal for field use

- ▶ Battery and DC power supply for field use
- ▶ Accessories for transport and field use
- ▶ [page 11](#)

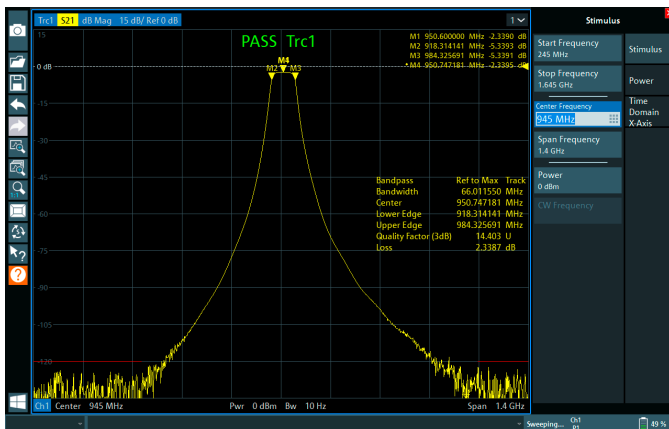
THE 3-IN-1 ANALYZER: COMPACT VECTOR NETWORK ANALYZER

The R&S®ZNL combines the functionality of a vector network analyzer, a spectrum analyzer and a power meter in a single, compact box. The all-in-one instrument is ideal for environments that involve constantly changing test requirements in development, production and service.

Solid RF performance

Vector network analyzers such as the R&S®ZNL can characterize electronic networks in the frequency domain, e.g. by measuring the magnitude and phase of S-parameters. Components can also be analyzed in the time domain with the R&S®ZNL-K2 option.

Measurement on a high-rejection bandpass filter using the bandpass filter function.



High dynamic range

The R&S®ZNL features a wide dynamic range of up to 130 dB (typ. at 10 Hz IFBW) and an output power of typ. 3 dBm. These values facilitate measurements on high-rejection filters that call for a wide dynamic range.

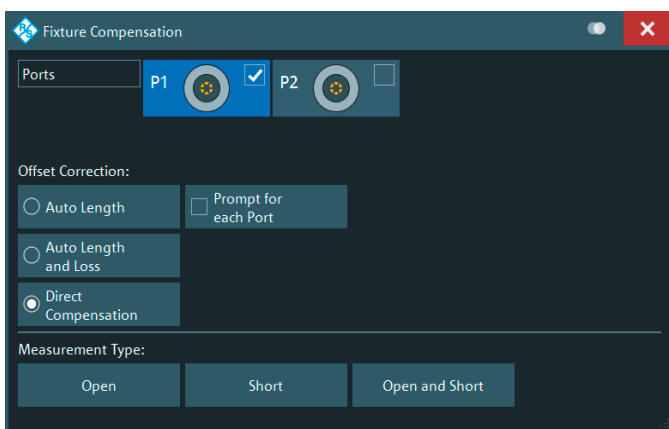
Low trace noise for high accuracy

The R&S®ZNL offers low trace noise of less than 0.0005 dB (typ. at 10 kHz IFBW). This delivers stable, reproducible and precise measurements even at higher IF bandwidths. Using higher IF bandwidths, the R&S®ZNL can perform faster measurements while maintaining the stability normally only achieved with narrower IF bandwidths.

Fast measurements for high throughput

With measurement times of e.g. 16.7 ms for 401 points (full two-port calibration, 200 MHz span, 100 kHz IFBW), high-speed data processing and fast LAN or IEC/IEEE/ GPIB data transfer, the R&S®ZNL meets the speed requirements encountered in production. Throughput can be maximized by using the segmented sweep function. Here, the frequency axis is divided into segments, and sweep parameters such as output power, IF bandwidth and number of points can be defined separately for each segment to optimally match the DUT characteristics. This increases measurement speed without any loss in accuracy.

Fixture compensation menu, showing the available compensation methods.



Features for production and lab

Versatile calibration features, support for calibration units

The R&S®ZNL calibration wizard guides users through the calibration process. Manual calibration kits and automatic calibration units are supported. Using a calibration unit minimizes the time needed to perform full system error correction. The calibration unit is ready for use right after it is connected to the R&S®ZNL. Calibrating a setup takes just a few steps. This is especially advantageous in production environments, helping to save time and maximize throughput. The calibration unit performs calibration with a single click on the “Start Auto Cal” button.

De/embedding and fixture compensation

Components are often specified together with the networks that match them to the impedance of the surrounding circuit. To characterize such components in a production environment, the R&S®ZNL can embed the DUT into a virtual matching network to provide realistic conditions by simulating the DUT installed in its operational environment. The R&S®ZNL offers a choice of predefined matching network topologies. It is also possible to read touchstone files into the R&S®ZNL and use them for deembedding/embedding. In addition, fixture compensation is available for correcting measurement results. This feature eliminates the unwanted effects of a test fixture or adapter located between the calibrated reference plane and the DUT.

Remote control via LAN and optional GPIB interface

The R&S®ZNL can be remotely controlled via its standard LAN interface. The optional GPIB interface can be used to connect a controller for remote control of the R&S®ZNL. Data is transmitted bidirectionally on the 8-bit parallel bus. The data measured during a sweep is transferred to the controller while the next sweep is in progress. As a result, data transfer time on the R&S®ZNL is virtually negligible.

Time domain analysis and distance-to-fault (DTF) measurements

The R&S®ZNL offers powerful time domain analysis (R&S®ZNL-K2 option) to measure components such as filters and high-speed digital data cables in the frequency and time domain.

With 100 001 points per trace, the R&S®ZNL can measure electrically long DUTs such as long cables without any limitations. The gating function of the R&S®ZNL makes it easy to locate cable faults and analyze them in detail.

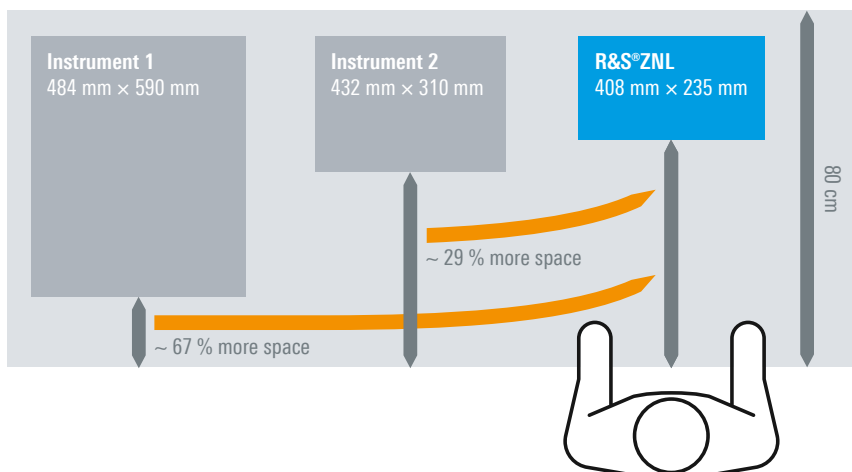
The distance-to-fault measurements option (R&S®ZNL-K3) allows the detection of cable discontinuities, which is important for base station antenna installation, for example. Users can select from a range of common cable types with predefined velocity factor and frequency-dependent attenuation, or create their own cable profiles. The R&S®ZNL-K2 and R&S®ZNL-K3 options use internal DC extrapolation. The low start frequency of 5 kHz is helpful as it provides improved accuracy.

Compact 3-in-1 instrument

With a depth of less than 24 cm and a weight of only 6 kg to 8 kg, the R&S®ZNL is the most compact instrument in its class. The small footprint leaves plenty of space on the workbench – more than with any other comparable benchtop analyzer.

With the R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 spectrum analyzer option installed, even more space is saved as the instrument offers the functionality of two analyzers in the same compact size. Adding support for R&S®NRP power sensors additionally provides power meter functionality, turning the R&S®ZNL into a 3-in-1 allrounder with a network analyzer, spectrum analyzer and power meter in a single box.

Comparison of footprint of different VNAs



THE 3-IN-1 ANALYZER: FULLY INTEGRATED SPECTRUM ANALYZER

Different modes of operation turn the R&S®ZNL vector network analyzer into a versatile multipurpose instrument. The R&S®ZNL3-B1/R&S®ZNL4-B1/R&S®ZNL6-B1 hardware option extends the base unit with a fully integrated spectrum analyzer on a dedicated hardware board. There is no need to reboot the instrument in order to switch between different modes.

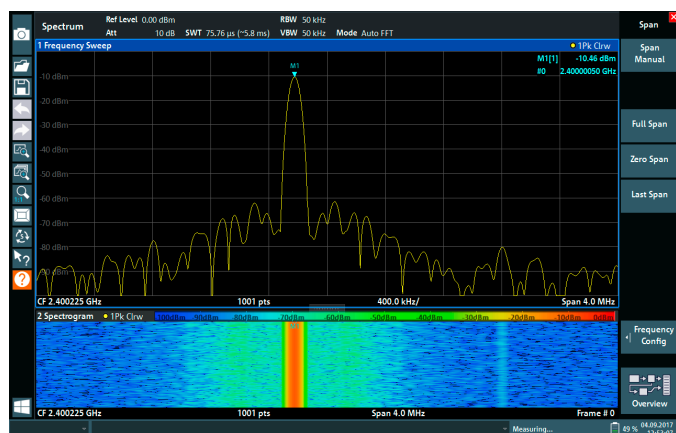
Integrated hardware for solid RF performance

The R&S®ZNL3-B1, R&S®ZNL4-B1 and R&S®ZNL6-B1 options are dedicated hardware boards, delivering performance comparable to that of pure spectrum analyzers in the economy and midrange classes. The R&S®ZNL equipped with the spectrum analyzer hardware features a phase noise of typ. -108 dBc (1 Hz) at 10 kHz offset, a third-order intercept point of typ. $+20$ dBm, and a displayed average noise level (DANL) of typ. -150 dBm.

Spectrum analyzer function

In the spectrum analyzer mode, the instrument provides functions corresponding to those of a conventional spectrum analyzer. The analyzer measures the frequency spectrum of the RF input signal over the selected frequency range with the selected resolution and sweep time. Alternatively, it displays the waveform of the video signal for a fixed frequency. This application requires the R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 spectrum analyzer option.

Spectrum analyzer mode: the R&S®ZNL provides the full functionality of a standard spectrum analyzer.



The spectrum analyzer function includes an I/Q analyzer, which is the standard function for digital signal analysis. This application provides measurement and display functions for I/Q data. The captured I/Q data can be transferred to third-party software tools (e.g. MATLAB® or Python) for further analysis. The 40 MHz analysis bandwidth option (R&S®FPL1-B40) allows single-carrier signals with up to 40 MHz bandwidth to be analyzed and demodulated.

Analog demodulation

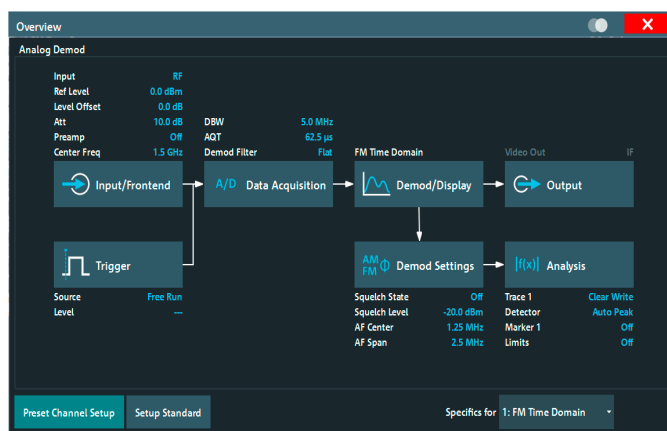
The R&S®FPL1-K7 option adds analog demodulation capabilities to the R&S®ZNL. It determines the characteristics of amplitude, frequency and phase modulated signals and also measures other components such as residual FM and synchronous modulation. Typical applications of the R&S®FPL1-K7 include:

- ▶ Transient and settling time measurements of oscillators like VCOs and PLLs
- ▶ Troubleshooting of AM/FM transmitters
- ▶ Simple chirp analysis of pulsed and continuous wave signals

Digital demodulation

The R&S®ZNL equipped with an R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 option can analyze and demodulate digitally modulated single-carrier signals with up to 40 MHz analysis bandwidth. The R&S®ZNL receives and digitizes the signal, which is then analyzed by the R&S®VSE vector signal explorer software with the R&S®VSE-K70 and/or R&S®VSE-K106 option. The software runs directly on the R&S®ZNL or an external PC.

Overview of analog demodulation menu: all setting functions are accessible here.



THE 3-IN-1 ANALYZER: RF POWER METER

Precise power measurements

The R&S®FPL1-K9 option adds support for R&S®NRP power sensors¹⁾, enabling precise power measurements. This application requires the R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 spectrum analyzer option to be installed.

Power sensors can be connected via USB or via the ruggedized power sensor connector included in the R&S®FPL1-B5 additional interfaces option.

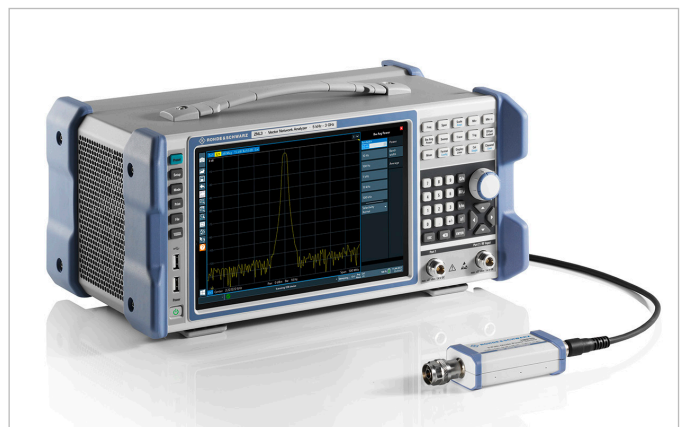
Up to four power sensors can be connected in parallel. Power sensors can also be used to trigger measurements at defined power levels.

¹⁾ The R&S®NRP power sensors supported by R&S®FPL1-K9 are listed in the R&S®ZNL data sheet PD 3607.17071.22.

Examples of R&S®NRP power sensors:
R&S®NRP8SN and R&S®NRP8S three-path diode power sensors



The R&S®ZNL with the R&S®FPL1-K9 option supports external R&S®NRP power sensors to deliver precise power measurements.



CLEARLY STRUCTURED USER INTERFACE

10.1" high-resolution multitouch screen

- ▶ 1280 × 800 pixel

Toolbar

- ▶ Fast access to standard functions such as print, save/open file, undo, redo, help

System keys

- ▶ For setups, presets, etc.

Two USB 2.0 ports

- ▶ For storage media
- ▶ For accessories

Status bar



Softkey bar

- ▶ Quick access to key functions
- ▶ Hardware settings at a glance

Numerical keypad

- ▶ With unit keys for frequency and level

Function keys

Control knob

Port 1

Port 2/RF input



USER INTERFACE WITH MULTITOUCH SCREEN

Clear menu structures for efficient operation

The R&S®ZNL has a clearly structured user interface. Measurements can be configured in just a few steps.

Users can drag and drop traces, channels and diagrams to arrange and combine them in any desired way. Different instrument setups can be saved and reloaded, and switching between setups is possible with minimal effort.

The R&S®ZNL offers a variety of marker functions for efficient analysis of the measured trace:

- ▶ Up to ten markers per trace are available. Results are represented in different formats such as magnitude, phase, impedance, admittance and VSWR.
- ▶ The unit of the marker can be chosen independently of the displayed trace format.
- ▶ Markers and traces can be named to describe the specific application.
- ▶ Available marker functions include maximum, minimum, RMS and peak-to-peak detection, as well as bandwidth measurement, etc.

Moreover, the user can define limit lines to verify compliance of the DUT with specified values and required standards.

Large 10.1" multitouch screen for convenient operation

The large 10.1" multitouch screen allows users to arrange measurement tasks as required and move and combine traces, channels and diagrams by using the drag & drop function.

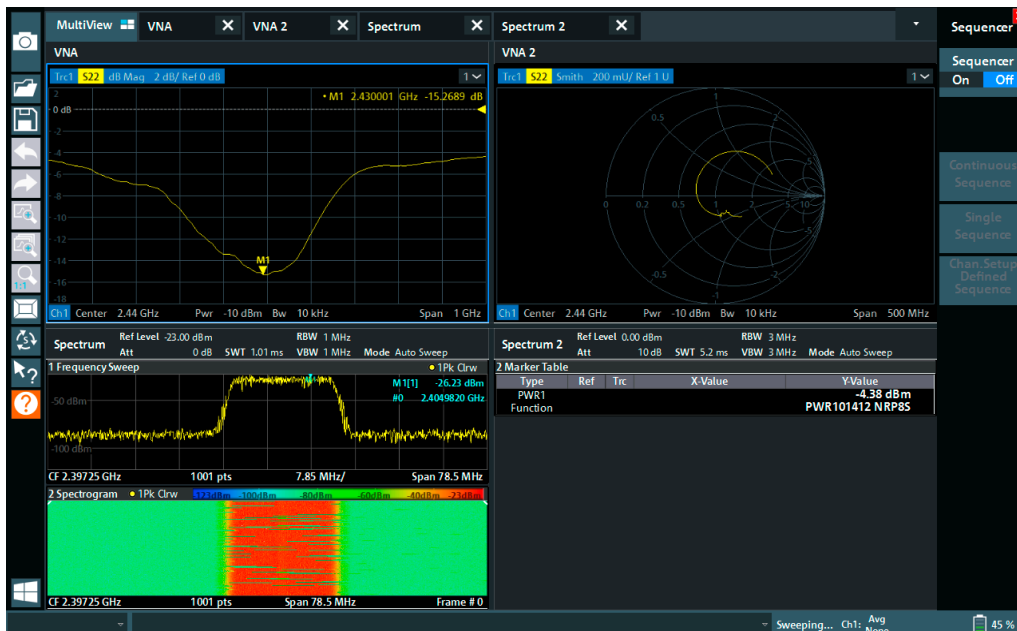
Integrated PC

With its fully integrated, powerful PC platform running the Windows 10 operating system, the R&S®ZNL is a stand-alone solution. There is no need for an external PC or controller. The analyzer's solid state hard disk ensures fast boot-up time and high reliability to satisfy the most demanding requirements.

Simultaneous display of multiple measurement modes with MultiView function

To support full DUT characterization, the MultiView function simultaneously displays all active vector network analyzer, spectrum analyzer and power meter measurements. Measurements are updated in real time and can be accessed directly by tapping on the desired window.

With the test sequencer activated in MultiView mode, vector network analyzer measurements and spectrum analyzer measurements can be performed alternately.



In MultiView mode, all active measurements are displayed at the same time. Here, a vector network analyzer measurement (two different representations) is displayed along with a spectrum analyzer measurement.

FULLY PORTABLE – IDEAL FOR FIELD USE

Due to its unique hardware concept, the R&S®ZNL combines multiple functionalities in a compact form factor. Its weight is correspondingly low. Depending on the options installed, the R&S®ZNL weighs between 6 kg and 8 kg.

Battery and DC power supply for field use

With a carrying handle and an optional battery pack (R&S®FPL1-B31), the R&S®ZNL is a fully portable instrument ideal for field use.

The optional 12 V/24 V DC power supply (R&S®FPL1-B30) is available for operation of the R&S®ZNL in vehicles.

Accessories for transport and field use

For transport and field deployment of the R&S®ZNL, the optional R&S®FPL1-Z2 transport bag protects the instrument against damage and the ingress of dirt. Side vents and a transparent top cover allow portable operation while the instrument is safely stored in the bag. A carrying vest holster (R&S®FPL1-Z3 option) is also available.

For outdoor use in challenging light conditions, the instrument display can be equipped with an anti-glare film (R&S®FPL1-Z5 option). This improves the contrast of the display and protects the screen against scratches.

The R&S®ZNL can be stowed and carried in a robust transport bag.



Rear view of the R&S®ZNL with battery compartment. The batteries can be easily accessed.

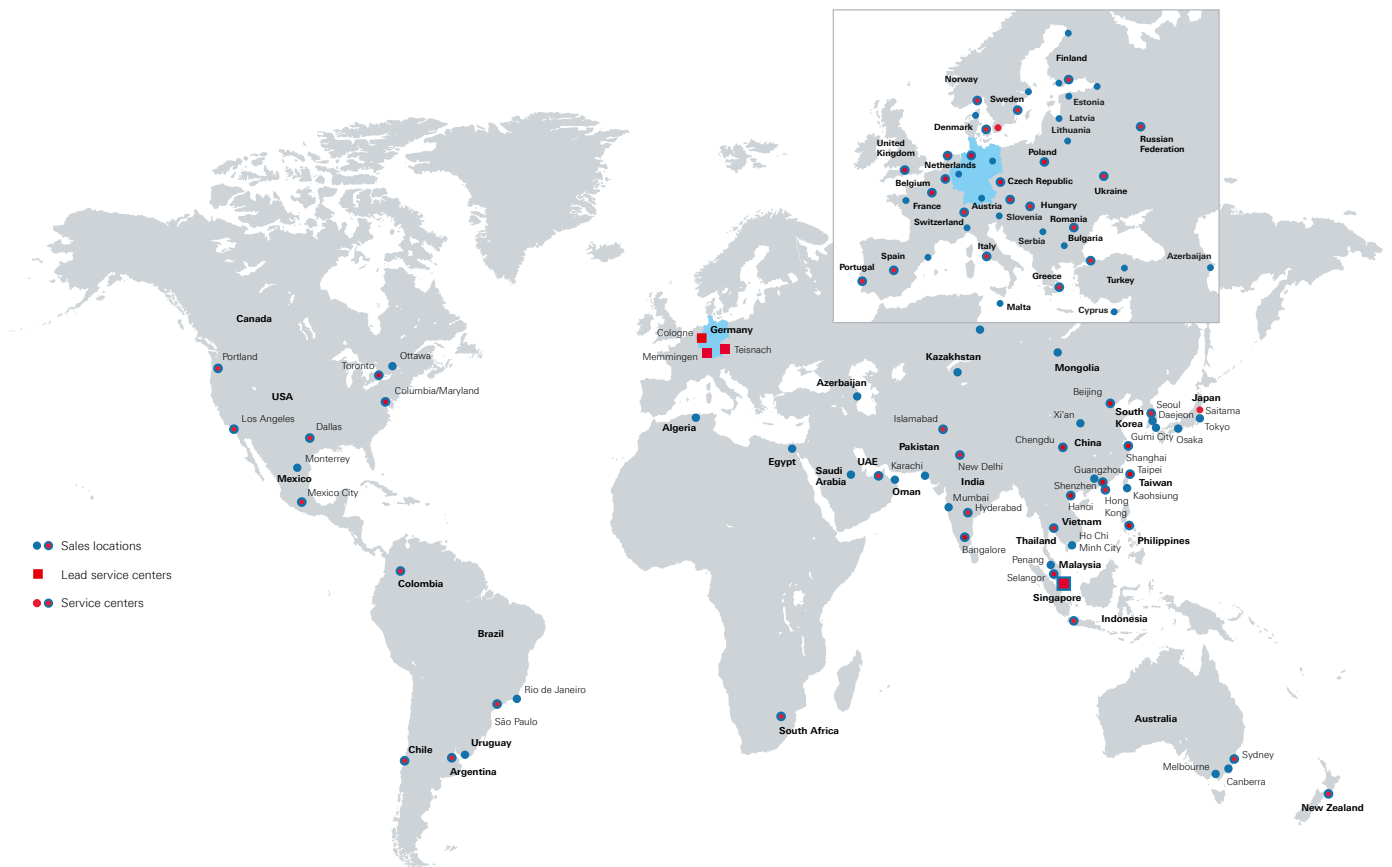


FROM PRE-SALE TO SERVICE. AT YOUR DOORSTEP.

The Rohde & Schwarz network in over 70 countries ensures optimum on-site support by highly qualified experts.

User risks are reduced to a minimum at all stages of the project:

- ▶ Solution finding/purchase
- ▶ Technical startup/application development/integration
- ▶ Training
- ▶ Operation/calibration/repair



SPECIFICATIONS IN BRIEF

Specifications in brief

Network analysis

| | | |
|------------------------|--|--|
| Frequency range | R&S®ZNL3 | 5 kHz to 3 GHz |
| | R&S®ZNL4 | 5 kHz to 4.5 GHz |
| | R&S®ZNL6 | 5 kHz to 6 GHz |
| Dynamic range | | > 120 dB (spec.); typ. > 130 dB |
| Output power | | 0 dBm (spec.); typ. + 3dBm |
| Trace noise | | < 0.0035 dB (spec.); typ. < 0.0005 dB |
| Measurement speed | | |
| Sweep time | 401 points, 2-port TOSM, 200 MHz span, 100 kHz IFBW | 16.7 ms |
| Data transfer | over IEC/IEEE/GPIB, 201 points | typ. 3 ms |
| | HiSLIP over 1 Gbit/s LAN | typ. 2.5 ms |
| Measurement parameters | | S-parameters (S_{xy}), wave quantities, wave ratios, impedance parameters (Z_{xy}), admittance parameters (Y), stability factors dB, magnitude, phase, Smith chart, polar diagram, SWR, unwrapped phase, linear magnitude, inverse Smith chart, real, imaginary, delay |
| Display formats | | reflection normalization (open or short), reflection (OSM (OSL)), enhanced reflection normalization (OM or SM), transmission normalization (response calibration), transmission normalization in both directions (response calibration), one-path two-port, TOSM (SOLT) |
| Calibration methods | | reflection normalization (open or short), reflection (OSM (OSL)), enhanced reflection normalization (OM or SM), transmission normalization (response calibration), transmission normalization in both directions (response calibration), one-path two-port, TOSM (SOLT) |
| | | |
| Number of points | vector network analyzer mode | 1 to 100001 |
| | spectrum analyzer mode | 101 to 100001 |
| IF bandwidth (IFBW) | | 1 Hz to 500 kHz, in steps of 1/1.5/2/3/5/7 |

Spectrum analysis (R&S®ZNL3 with R&S®ZNL3-B1, R&S®ZNL4 with R&S®ZNL4-B1 or R&S®ZNL6 with R&S®ZNL6-B1 option)

| | | |
|--------------------------------------|--|--------------------------------------|
| Frequency range | R&S®ZNL3 | 5 kHz to 3 GHz (1 Hz resolution) |
| | R&S®ZNL4 | 5 kHz to 4.5 GHz (1 Hz resolution) |
| | R&S®ZNL6 | 5 kHz to 6 GHz (1 Hz resolution) |
| Displayed average noise level (DANL) | RF attenuation 0 dB | < -140 dBm (spec.); typ. < -150 dBm |
| Phase noise | 1 GHz, 10 kHz offset | < -103 dBc (1 Hz); < -108 dBc (1 Hz) |
| Max. signal analysis bandwidth | with R&S®FPL1-B40 option | 40 MHz |
| Intermodulation | | |
| Third-order intercept point (TOI) | $300 \text{ MHz} \leq f_{in} \leq 3 \text{ GHz}$ | > 16 dBm (spec.); typ. > 20 dBm |
| Second-harmonic intercept (SHI) | $900 \text{ MHz} \leq f_{in} \leq 1.5 \text{ GHz}$ | 70 dBm (nom.) |

General features

| | | |
|---|--|---|
| Limit lines | vector network analyzer mode | single, segmented, upper limit, lower limit |
| Number of channels | within one vector network analyzer setup | no limitation |
| Number of channel setups | | max. 14 |
| Number of traces (simultaneous display) | vector network analyzer mode | no limitation |
| | spectrum analyzer mode (R&S®ZNL3-B1/R&S®ZNL4-B1/ ZNL6-B1 option) | 6 |
| Number of markers | vector network analyzer mode | 10 + 1 reference marker (per trace) |
| | spectrum analyzer mode (R&S®ZNL3-B1/R&S®ZNL4-B1/ ZNL6-B1 option) | 16 |

General data

| | | |
|------------------------|----------------------------|---|
| Operating system | | Windows 10 |
| Display | | 10.1" (26.4 cm) WXGA color LCD, multitouch screen |
| Dimensions (W x H x D) | | 408 mm x 186 mm x 235 mm (16.06 in x 7.32 in x 9.25 in) |
| Weight | depending on configuration | 6 kg to 8 kg (13.23 lb to 17.64 lb) |

ORDERING INFORMATION

| Designation | Type | Order No. |
|--|--------------|-----------------|
| Base unit | | |
| Vector network analyzer, 5 kHz to 3 GHz, two ports, N (f) | R&S®ZNL3 | 1323.0012.03 |
| Vector network analyzer, 5 kHz to 4.5 GHz, two ports, N (f) | R&S®ZNL4 | 1323.0012.04 |
| Vector network analyzer, 5 kHz to 6 GHz, two ports, N (f) | R&S®ZNL6 | 1323.0012.06 |
| Hardware options | | |
| Spectrum analyzer function for R&S®ZNL3 | R&S®ZNL3-B1 | 1323.1802.02 |
| Spectrum analyzer function for R&S®ZNL4 | R&S®ZNL4-B1 | 1303.8099.02 |
| Spectrum analyzer function for R&S®ZNL6 | R&S®ZNL6-B1 | 1323.2067.02 |
| Extended power range for R&S®ZNL3 | R&S®ZNL3-B22 | 1323.1860.02 |
| Extended power range for R&S®ZNL4 | R&S®ZNL4-B22 | 1303.8118.02 |
| Extended power range for R&S®ZNL6 | R&S®ZNL6-B22 | 1323.2021.02 |
| Receiver step attenuator for R&S®ZNL3 port 1 | R&S®ZNL3-B31 | 1323.1848.02 |
| Receiver step attenuator for R&S®ZNL3 port 2 | R&S®ZNL3-B32 | 1323.1854.02 |
| Receiver step attenuator for R&S®ZNL4 port 1 | R&S®ZNL4-B31 | 1303.8124.02 |
| Receiver step attenuator for R&S®ZNL4 port 2 | R&S®ZNL4-B32 | 1303.8130.02 |
| Receiver step attenuator for R&S®ZNL6 port 1 | R&S®ZNL6-B31 | 1323.2038.02 |
| Receiver step attenuator for R&S®ZNL6 port 2 | R&S®ZNL6-B32 | 1323.2044.02 |
| Additional removable PC board with SSD | R&S®ZNL-B19 | 1323.2938.02 |
| OCXO accurate reference frequency | R&S®FPL1-B4 | 1323.1902.02 |
| Additional interfaces | R&S®FPL1-B5 | 1323.1883.02 |
| GPIB interface | R&S®FPL1-B10 | 1323.1890.02 |
| DC power supply (12 V/24 V) | R&S®FPL1-B30 | 1323.1877.02 |
| Lithium-ion battery pack | R&S®FPL1-B31 | 1323.1725.02 |
| 40 MHz analysis bandwidth ¹⁾ | R&S®FPL1-B40 | 1323.1931.02 |
| Software options | | |
| Time domain analysis | R&S®ZNL-K2 | 1323.1819.02 |
| Distance-to-fault measurements | R&S®ZNL-K3 | 1323.1825.02 |
| AM/FM/φM analog modulation analysis ¹⁾ | R&S®FPL1-K7 | 1323.1731.02 |
| Measurements with R&S®NRP power sensors ¹⁾ | R&S®FPL1-K9 | 1323.1754.02 |
| Noise figure measurements ^{1), 3)} | R&S®FPL1-K30 | 1323.1760.02 |
| License dongle ²⁾ | R&S®FSPC | 1310.0002.03 |
| Vector signal explorer base software ²⁾ | R&S®VSE | 1345.1011.06 |
| Vector signal analysis ²⁾ | R&S®VSE-K70 | 1320.7522.06 |
| EUTRA/LTE NB-IoT/narrowband IoT analysis ²⁾ | R&S®VSE-K106 | 1320.7900.06 |
| Recommended extras | | |
| Calibration kits | | |
| Calibration kit, N (m), 50 Ω, 0 Hz to 18 GHz | R&S®ZN-Z170 | 1328.8163.02 |
| Calibration kit, N (f), 50 Ω, 0 Hz to 18 GHz | R&S®ZN-Z170 | 1328.8163.03 |
| Calibration kit, 3.5 mm (m), 50 Ω, 0 Hz to 26.5 GHz | R&S®ZN-Z135 | 1328.8157.02 |
| Calibration kit, 3.5 mm (f), 50 Ω, 0 Hz to 26.5 GHz | R&S®ZN-Z135 | 1328.8157.03 |
| Calibration units | | |
| Calibration unit, 2 ports, N (f), 5 kHz to 6 GHz | R&S®ZN-Z150 | 1335.6710.72 |
| Calibration unit, 2 ports, SMA (f), 100 kHz to 8.5 GHz | R&S®ZN-Z151 | 1317.9134.32 |
| Calibration unit, 1 port, N (f), 2 MHz to 4 GHz | R&S®ZN-Z103 | 1321.1828.02 |
| Calibration unit, 1 port, N (f), 1 MHz to 6 GHz | R&S®ZN-Z103 | 1321.1828.12 |
| Cables | | |
| N (m)/N (m), 50 Ω, length: 0.6 m/0.9 m, 0 Hz to 18 GHz | R&S®ZV-Z191 | 1306.4507.24/36 |
| N (m)/3.5 mm (m), 50 Ω, length: 0.6 m/0.9 m, 0 Hz to 18 GHz | R&S®ZV-Z192 | 1306.4513.24/36 |
| 3.5 mm (f)/3.5 mm (m), 50 Ω, length: 0.6 m/0.9 m, 0 Hz to 26.5 GHz | R&S®ZV-Z193 | 1306.4520.24/36 |

| Designation | Type | Order No. |
|--|--------------|--------------|
| Active probes | | |
| USB-powered adapter N(m) to probe plug | R&S®RT-ZA9 | 1417.0909.02 |
| Active probe, single-ended, 0 Hz to 3 GHz ^{1),4)} | R&S®RT-ZS30 | 1410.4309.02 |
| Active probe, single-ended, 0 Hz to 6 GHz ^{1),4)} | R&S®RT-ZS60 | 1418.7307.02 |
| Active probe, differential, 0 Hz to 3 GHz ^{1),4)} | R&S®RT-ZD30 | 1410.4609.02 |
| Active probe, differential, 0 Hz to 4 GHz ^{1),4)} | R&S®RT-ZD40 | 1410.5205.02 |
| Power rail active probe, 0 Hz to 4 GHz ^{1),4)} | R&S®RT-ZPR40 | 1800.5406.02 |
| Accessories | | |
| Broadband limiter, N(m to f), 50 Ω, 50 MHz to 6 GHz | R&S®ZN-B13 | 1303.7840.02 |
| Smart noise source, 10 MHz to 26.5 GHz ^{1),3),5)} | R&S®FS-SNS26 | 1338.8008.26 |
| Protective hard cover | R&S®FPL1-Z1 | 1323.1960.02 |
| Transport bag, with transparent cover | R&S®FPL1-Z2 | 1323.1977.02 |
| Carrying vest holster | R&S®FPL1-Z3 | 1323.1683.02 |
| Spare battery pack | R&S®FPL1-Z4 | 1323.1677.02 |
| Anti-glare film | R&S®FPL1-Z5 | 1323.1690.02 |
| Rackmount kit | R&S®FPL1-Z6 | 1323.1954.02 |
| For a list of the R&S®NRP power sensors supported by R&S®FPL1-K9, refer to the R&S®ZNL data sheet PD 3607.1071.22. | | |

¹⁾ Requires R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 hardware option.

²⁾ Use of R&S®VSE with R&S®ZNL requires R&S®ZNL3-B1, R&S®ZNL4-B1 or R&S®ZNL6-B1 hardware option.

³⁾ Requires R&S®FPL1-B5 hardware option for noise source control.

⁴⁾ Requires R&S®RT-ZA9 accessory.

⁵⁾ Requires R&S®FPL1-K30 software option.

| Warranty | | |
|---|---------|---|
| Base unit | | 3 years |
| All other items ¹⁾ | | 1 year |
| Options | | |
| Extended warranty, one year | R&S®WE1 | |
| Extended warranty, two years | R&S®WE2 | |
| Extended warranty with calibration coverage, one year | R&S®CW1 | Please contact your local Rohde & Schwarz sales office. |
| 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.