R&S®ESSENTIALS

R&S®ZNL
VECTOR NETWORK ANALYZER

The 3-in-1 allrounder



3 year warranty

Product Brochure
Version 08.00

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

RF measuring equipment has to meet high quality standards. It should be easy to use and highly versatile for fast measurements and reliable performance. The R&S®ZNL meets all of these challenges and all models can now combine a vector network analyzer, a spectrum analyzer and a power meter in a single, compact box.

The R&S®ZNL is ideal for RF component testing of industrial electronics, EMC and wireless communications with frequency ranges from 5 kHz up to 20 GHz.

Responding to constantly changing measurement needs in diverse environments (test benches or production lines) can be challenging. The R&S®ZNL reduces investment costs and offers a unique option concept. The base unit can be extended to a fully integrated spectrum analyzer and an RF power meter [1].

[1] R&S®FPL1-K9 option; requires R&S®ZNLx-B1 option and an R&S®NRP external power sensor.

The R&S®ZNL hosts a variety of different functions. Instead of investing in multiple instruments, research labs, service centers, universities and production facilities can benefit from a single, compact device with very fast measurement speeds and better RF performance than dedicated instruments in comparable classes. The R&S®ZNL can simultaneously display vector network analyzer and spectrum analyzer measurements on its 10.1" multitouch screen with the R&S®ZNLx-B1 option. Clear menu structures and numerous wizards make for convenient measurement configurations.

The R&S®ZNL offers a wide range of functions in a very compact size. Weighing just 6 kg to 7.3 kg, with a carrying handle and an optional battery pack, the R&S®ZNL is fully portable and can be operated wherever needed.



KEY FEATURES

- ▶ Frequency ranges
  - – 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
  - – R&S®ZNL14: 5 kHz to 14 GHz
  - – R&S®ZNL20: 5 kHz to 20 GHz
- ▶ Two-port vector network analyzer for bidirectional measurements
- ▶ Universal instrument
  - – Vector network analyzer
  - – Fully integrated spectrum analyzer
  - – Support for external power sensors
- ▶ 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 of 16.7 ms for 401 points (100 kHz IFBW, 200 MHz span, two-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
▶ page 4

The 3-in-1 analyzer: fully integrated spectrum analyzer
▶ page 6

The 3-in-1 analyzer: RF power meter
▶ page 7

Clearly structured user interface
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User interface with multitouch screen
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Fully portable – ideal for field use
▶ page 11

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

With the appropriate options, the R&S®ZNL can combine a vector network analyzer, a spectrum analyzer and a power meter in a single, compact box. The all-in-one instrument is ideal for development, production and service environments with their constantly changing test requirements.

Solid RF performance

The R&S®ZNL is a vector network analyzer that can characterize electronic networks in the frequency domain by measuring S-parameters, magnitude and phase. The R&S®ZNL-K2 option can analyze components in the time domain.

High dynamic range

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

Low trace noise for high accuracy

The R&S®ZNL has low trace noise of less than 0.0025 dB (typically at 10 kHz IFBW) for stable, reproducible and precise measurements even at higher IF bandwidths. The R&S®ZNL uses higher IF bandwidths for faster measurements while maintaining the stability normal for narrower IF bandwidths.

Fast measurements for high throughput

The R&S®ZNL satisfies production speed requirements with measurement times of 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 segmented sweep function can help maximize throughput. The frequency axis is divided into segments and sweep parameters such as output power, IF bandwidth and the number of points are defined separately for each segment to best match the DUT characteristics and increase measurement speed without sacrificing accuracy.

Production and lab features

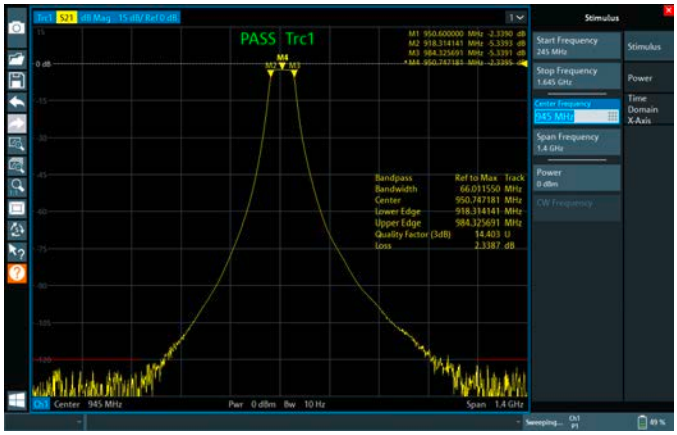
Versatile calibration features, calibration unit support

The R&S®ZNL calibration wizard guides users through the calibration process and supports both manual calibration kits and automatic calibration units. Automatic calibration units minimize the time needed to correct system errors. The calibration unit can be used upon connection to the R&S®ZNL. A setup can be calibrated in a few simple steps, a big benefit in production environments, where saving time and maximizing throughput are critical. A single click on the "Start Auto Cal" button starts the calibration process.

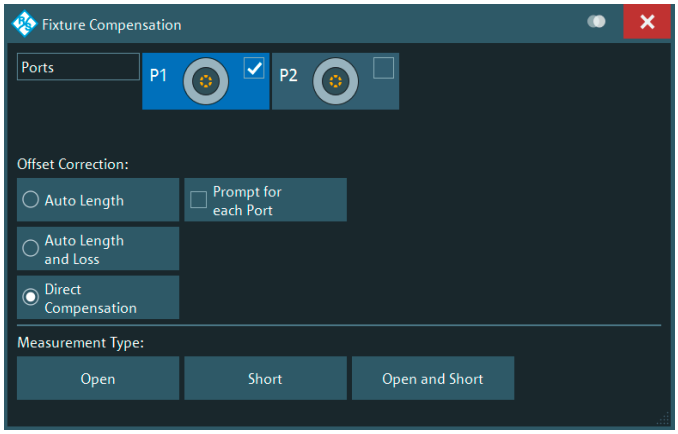
De/embedding and fixture compensation

Components are often specified together with the networks that match them to the impedance of the surrounding circuit. When characterizing such components in a production environment, the R&S®ZNL can embed the DUT into a virtual matching network for realistic conditions that simulate a DUT being installed in an operational environment. The R&S®ZNL offers predefined matching network topologies. Touchstone files can be fed into the

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



Fixture compensation menu, showing the available compensation methods.



R&S®ZNL and used for deembedding/embedding. Fixture compensation adjusts measurement results to eliminate the unwanted effects of test fixtures or adapters 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 with a standard LAN interface. A remote controller can be connected to the R&S®ZNL with an optional GPIB interface. Data is transmitted bidirectionally on the 8-bit parallel bus. The measured data from a sweep is transferred to the controller while the next sweep is in progress, making data transfer times for the R&S®ZNL all but negligible.

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

The R&S®ZNL offers a powerful time domain analysis option (R&S®ZNL-K2) 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 long electrical DUTs such as cables without any limitations. The R&S®ZNL gating function makes cable faults easy to locate and analyze in detail.

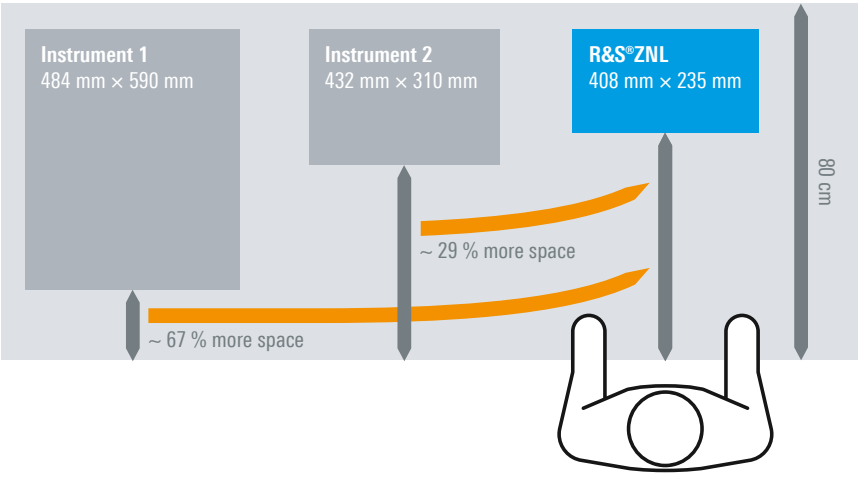
The distance-to-fault measurement option (R&S®ZNL-K3) can detect cable discontinuities when installing base station antennas. A range of common cable types with predefined velocity factors and frequency-dependent attenuation are available. Users can also create their own cable profiles. The R&S®ZNL-K2 and R&S®ZNL-K3 options use internal DC extrapolation. The low start frequency of 5 kHz improves accuracy.

Compact 3-in-1 instrument up to 6 GHz

The R&S®ZNL is the most compact instrument in its class with a depth of less than 24 cm and weighing just 6 to 8 kg. The small footprint frees up more space on your workbench than any other comparable benchtop analyzer.

The R&S®ZNLx-B1 spectrum analyzer option saves even more space by combining the capacity of two analyzers in the same compact size. R&S®NRP power sensor support adds a power meter function that transforms the R&S®ZNL into a 3-in-1 allrounder by combining a network analyzer, spectrum analyzer and power meter in a single box.

Footprints for different VNAs



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

Different operating modes transform the R&S®ZNL vector network analyzer into a versatile multipurpose instrument. The R&S®ZNLx-B1 hardware option expands the base unit to include a fully integrated spectrum analyzer on a dedicated hardware board. Switching between modes no longer requires a reboot.

Integrated hardware for solid RF performance

The R&S®ZNLx-B1 options use dedicated hardware boards for performance comparable to dedicated economy and midrange spectrum analyzers. The R&S®ZNL with spectrum analyzer hardware typically has phase noise of –108 dBc (1 Hz) at 10 kHz offset, a typical third-order intercept point of up to +22 dBm and a typical displayed average noise level (DANL) of up to –150 dBm.

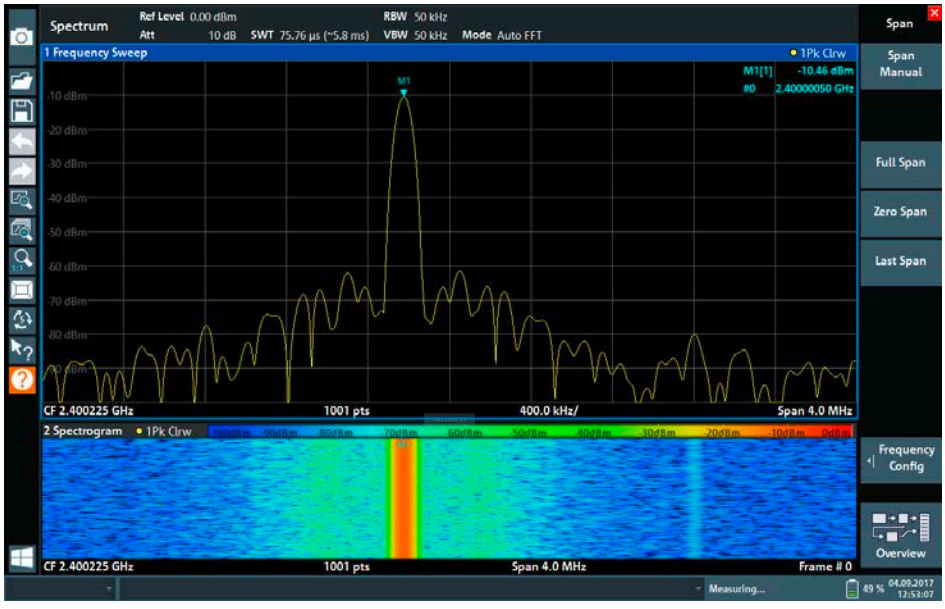
Spectrum analyzer function

In spectrum analyzer mode, the R&S®ZNL can function as a conventional spectrum analyzer for up to 26.5 GHz. The analyzer measures the RF input signal frequency spectrum over the selected range with the selected resolution and sweep times. The video signal waveform for a fixed frequency can also be displayed. The application is available for all R&S®ZNL models with the R&S®ZNLx-B1 spectrum analyzer option.

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

Preselector bypass

The spectrum analyzer hardware for R&S®ZNL14 and R&S®ZNL20 vector analyzers uses a YIG filter to reject images for frequencies higher than 6 GHz. The YIG preselector might need to be disabled for broadband analysis. The R&S®FPL1-B11 option can bypass the YIG filter and should be included with the R&S®FPL1-B40 option. This is especially useful for I/Q analysis at frequencies higher than 6 GHz.



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

Analog demodulation

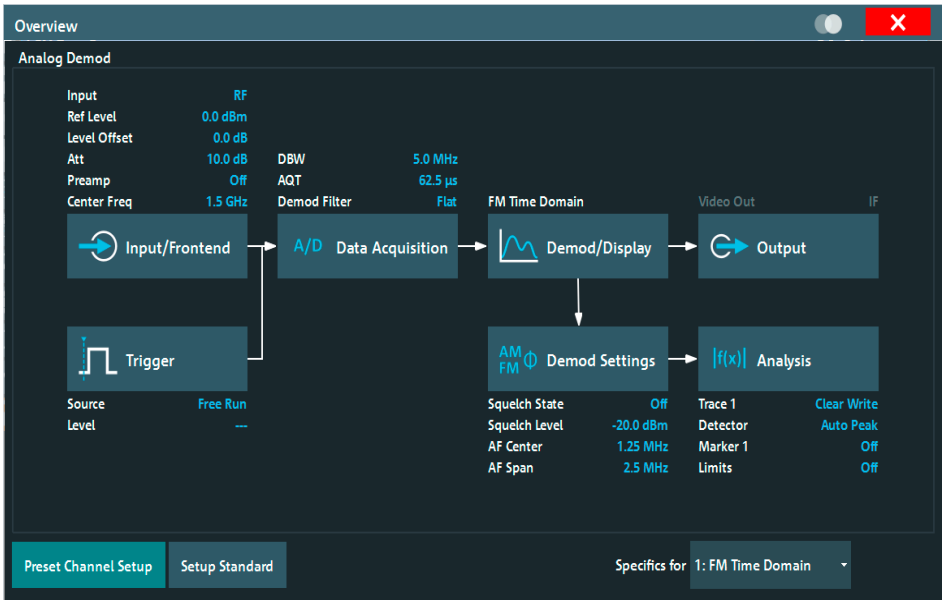
The R&S®FPL1-K7 option adds analog demodulation capabilities to the R&S®ZNL to determine amplitude, frequency and phase modulated signals while measuring other components such as residual FM and synchronous modulation. Typical R&S®FPL1-K7 applications include:

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

Digital demodulation

The R&S®ZNL with the R&S®ZNLx-B1 spectrum analysis option has up to 40 MHz analysis bandwidth to analyze and demodulate digitally modulated single-carrier signals. The R&S®ZNL receives and digitalizes a signal, which the R&S®VSE vector signal explorer software on the R&S®ZNL or an external PC [1] then analyzes.

[1] For further information, see R&S®VSE product brochure (PD 3607.1371.12) and www.rohde-schwarz.com/product/vse.



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

THE 3-IN-1 ANALYZER: RF POWER METER UP

Precise power measurements

The R&S®FPL1-K9 option supports R&S®NRP power sensors [1] and enables precise power measurements. It requires the R&S®ZNLx-B1 spectrum analyzer option.

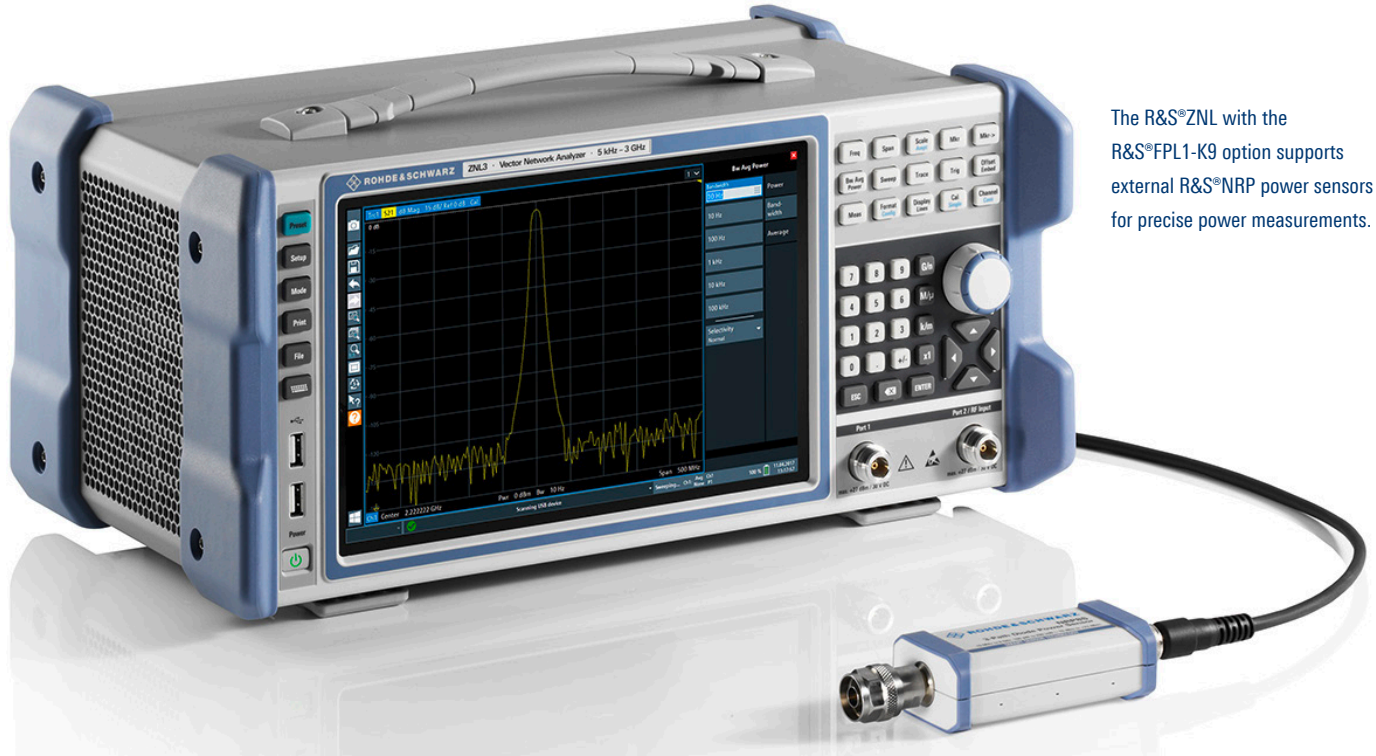
Power sensors can be connected via USB or the ruggedized power sensor connector included with the R&S®FPL1-B5 additional interface option.

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

[1] For a complete list of R&S®NRP power sensors supported by R&S®FPL1-K9, please refer to the product brochure (PD 3606.7147.32).



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



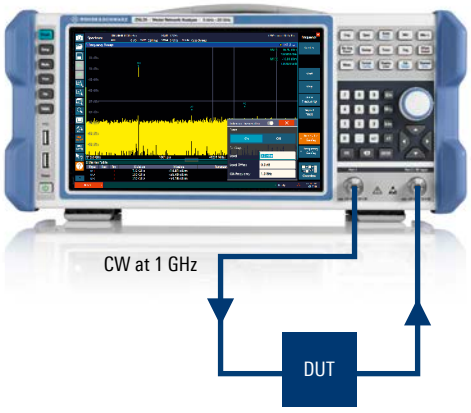
The R&S®ZNL with the R&S®FPL1-K9 option supports external R&S®NRP power sensors for precise power measurements.

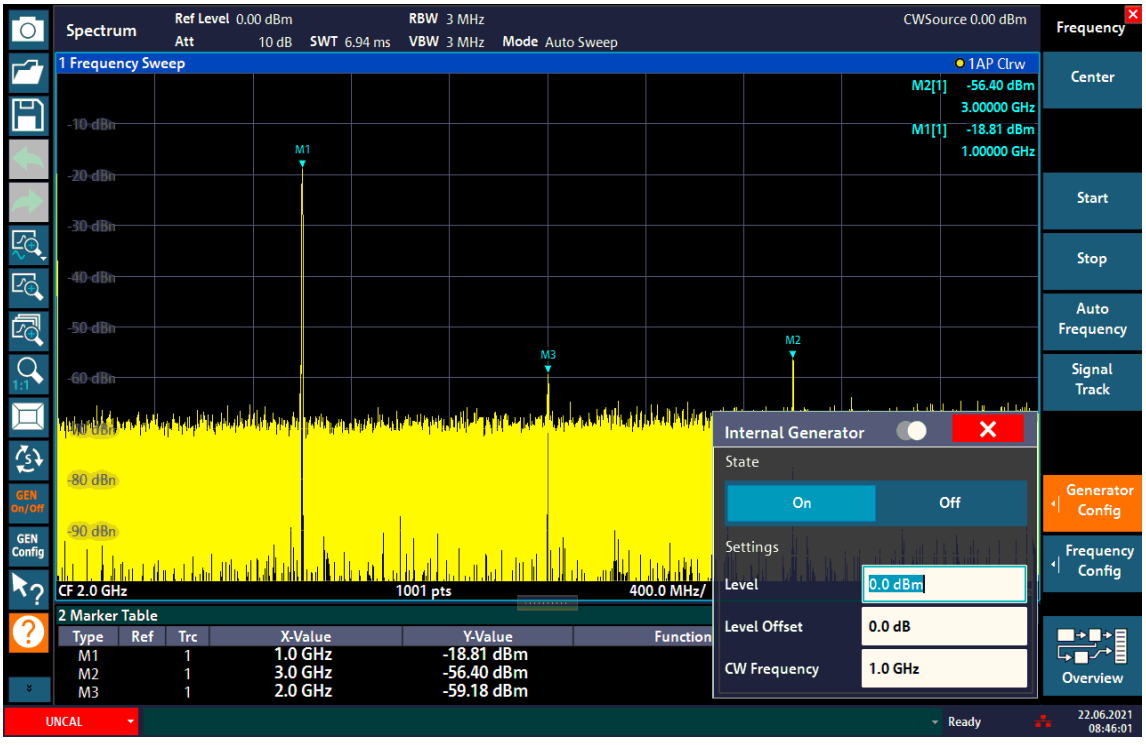
Independent continuous wave (CW) source

All R&S®ZNL models with the R&S®ZNLx-B1 spectrum analyzer option in combination with R&S®ZNL-K14 independent CW source option can measure the output frequency spectrum of a DUT connected to port 2, with the DUT input driven by a CW signal from port 1.

The R&S®ZNL-K14 option allows for a more detailed analysis of the DUT frequency response and can measure parameters such as harmonics and search for spurious frequency components. The option also enables measurements on frequency-converting DUTs if an external signal source is present.

R&S®ZNL-K14 measurement concept





Frequency sweep of a common mode transformer output signal using a CW input signal of 0 dBm at 1 GHz.

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 that can be arranged and combined as needed. Different instrument setups can be saved and reloaded and switching between setups is easy.

The R&S®ZNL has several marker functions to efficiently analyze measured traces:

- Over 100 markers are available per trace (up to 16 in spectrum analyzer mode). Results are represented in different formats such as magnitude, phase, impedance, admittance and VSWR.
- The marker unit can be selected 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, bandwidth measurement, etc.

Users can also define limit lines to verify DUT compliance with specified values and required standards. Limit lines can be defined as linear or logarithmic or a mathematical formula can be applied.

Large 10.1" multitouch screen for convenient operation

The large 10.1" multitouch screen can be used to arrange measurement tasks and move and combine traces, channels and diagrams with the drag&drop function.

Integrated PC

The fully integrated, powerful PC platform uses the Windows 10 operating system and transforms the R&S®ZNL into a standalone solution. No external PCs or controllers are needed. The solid state hard disk ensures fast boot times and high reliability to satisfy even 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 analyzers, spectrum analyzers and power meter measurements. Measurements are updated in real time and can be accessed directly by tapping the desired window.

Alternating vector network analyzer measurements and spectrum analyzer measurements can be performed with the test sequencer in MultiView mode.



In MultiView mode, all active measurements are displayed simultaneously. A vector network analyzer measurement (two different representations) is displayed alongside a spectrum analyzer measurement.

FULLY PORTABLE – IDEAL FOR FIELD USE

The unique R&S®ZNL hardware concept combines multiple functions in a low-weight compact form factor. Depending on the options, the R&S®ZNL weighs between 6 kg and 8 kg.

Battery and DC power supplies for field use

The R&S®ZNL has a carrying handle and an optional battery pack (R&S®FPL1-B31), making it fully portable and ideal for field use and quick transfers between lab workstations.

With the 12 V/24 V DC power supply (R&S®FPL1-B30), the R&S®ZNL can be operated in a vehicle.

Transport and field use accessories

When transporting or using the R&S®ZNL in the field, the optional R&S®FPL1-Z2 transport bag protects it from damage and dirt. Side vents and a transparent top cover allow portable operation while it remains safely stored in the bag. A carrying vest holster (R&S®FPL1-Z3) is also available.

For outdoor use in challenging light conditions, an anti-glare film (R&S®FPL1-Z5) is available for the display to improve contrast and protect the screen from scratches.

Calibration accessories are also portable

The economy 2-port calibration kits in the R&S®ZN-Z1xx series are robust and lightweight for easy carrying in a transport bag or neck strap. If you want to simplify calibration, while reducing operator errors and improving calibration repeatability, the R&S®ZN-ZE1xx economy calibration units are ideal and offer the same portability. Their flexible connector configuration concept addresses all use cases for N-types, a 3.5 mm or a 2.92 mm connectors for frequencies ranging from 5 kHz up to 26.5 GHz.

The new configurable R&S®ZN-ZE104, R&S®ZN-ZE109, R&S®ZN-ZE118 and R&S®ZN-ZE126 calibration units provide great performance in a compact, lightweight and economic solution.



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 are easy to access.



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
	R&S®ZNL14	5 kHz to 14 GHz
	R&S®ZNL20	5 kHz to 20 GHz
Dynamic range		up to > 120 dB (spec.); up to > 130 dB (typ.)
Output power		0 dBm (spec.); typ. + 3 dBm
Trace noise		< 0.0045 dB (spec.); < 0.0025 dB (typ.)
Measurement speed		
Sweep time	401 points, two-port TOSM, 200 MHz span, 100 kHz IFBW	16.7 ms
Data transfer	over IEC/IEEE/GPIB, 201 points	3 ms (typ.)
	HiSLIP over 1 Gbit/s LAN	2.5 ms (typ.)
Measurement parameters		S-parameters (S_{xy}), wave quantities, wave ratios, impedance parameters (Z_{xy}), admittance parameters (Y), stability factors
Display formats		dB, magnitude, phase, Smith chart, polar diagram, SWR, unwrapped phase, linear magnitude, inverse Smith chart, real, imaginary, delay
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), TRL
Number of points	vector network analyzer mode	1 to 100001
	spectrum analyzer mode	101 to 100001
IF bandwidth (IFBW)		selectable in steps of 1/1.5/2/3/5/7 · 1 Hz/10 Hz/.../100 kHz; max. upper limit: 500 kHz
Spectrum analysis		
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)
	R&S®ZNL14	5 kHz to 14 GHz (1 Hz resolution)
	R&S®ZNL20	5 kHz to 26.5 GHz (1 Hz resolution)
Displayed average noise level (DANL)	RF attenuation: 0 dB	< –112 dBm (spec.); < –120 dBm (typ.)
Phase noise	1 GHz, 10 kHz offset	< –105 dBc (1 Hz); < –108 dBc (1 Hz) (typ.)
Maximum signal analysis bandwidth	with R&S®FPL1-B40 option	40 MHz
Intermodulation		
Third-order intercept point (TOI)	300 MHz ≤ f_{in} ≤ 3 GHz	> 16 dBm (spec.); > 22 dBm (typ.)
Second-harmonic intercept (SHI)	900 MHz ≤ f_{in} ≤ 13.25 GHz	70 dBm (nom.)
General features		
Limit lines	vector network analyzer mode	single, segmented, upper limit, lower limit, linear, logarithmic, based on formula
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	6
Number of markers	vector network analyzer mode	no limitation
	spectrum analyzer mode	16
General data		
Operating system		Windows 10
Display		10.1" (26.4 cm) WXGA color LCD, multitouch screen
Dimensions (W × H × D)		408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)
Weight	depending on configuration	6 kg to 7.3 kg (13.22 lb to 16 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
Vector network analyzer, 5 kHz to 14 GHz, two ports, N (f)	R&S®ZNL14	1323.0012.14
Vector network analyzer, 5 kHz to 20 GHz, two ports, 3.5 mm (m)	R&S®ZNL20	1323.0012.20
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
Spectrum analyzer function for R&S®ZNL14	R&S®ZNL14-B1	1303.8082.02
Spectrum analyzer function for R&S®ZNL20	R&S®ZNL20-B1	1303.8101.02
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
Extended power range for R&S®ZNL14	R&S®ZNL14-B22	1303.8153.02
Extended power range for R&S®ZNL20	R&S®ZNL20-B22	1303.9089.02
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
Receiver step attenuator for R&S®ZNL14, port 1	R&S®ZNL14-B31	1303.8160.02
Receiver step attenuator for R&S®ZNL14, port 2	R&S®ZNL14-B32	1303.8176.02
Receiver step attenuator for R&S®ZNL20, port 1	R&S®ZNL20-B31	1303.9095.02
Receiver step attenuator for R&S®ZNL20, port 2	R&S®ZNL20-B32	1303.9108.02
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
YIG preselector bypass [1), 6)]	R&S®FPL1-B11	1323.1619.02
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
Independent CW source	R&S®ZNL-K14	1303.8182.02
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), 2)]	R&S®FPL1-K30	1323.1760.02
R&S®VSE signal explorer software plus selected options [3)]		Please contact your local Rohde&Schwarz sales office.
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

Designation	Type	Order No.
Calibration units		
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
Calibration unit, 2 configurable ports, 5 kHz to 4.5 GHz	R&S®ZN-ZE104	1350.8040.04
Calibration unit, 2 configurable ports, 5 kHz to 9 GHz	R&S®ZN-ZE109	1350.8040.09
Calibration unit, 2 configurable ports, 5 kHz to 18 GHz	R&S®ZN-ZE118	1350.8040.18
Calibration unit, 2 configurable ports, 5 kHz to 26.5 GHz	R&S®ZN-ZE126	1350.8040.26
Cables		
N (m) to 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) to 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) to 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
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), 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
Power sensors		
Thermal power sensor, 0 Hz to 18 GHz, 100 mW	R&S®NRP18T	1424.6115.02
Thermal power sensor, 0 Hz to 33 GHz, 100 mW	R&S®NRP33T	1424.6138.02
For a list of the R&S®NRP power sensors supported by R&S®FPL1-K9, refer to the R&S®NRP brochure (PD 3606.7147.32).		

[1)] Requires R&S®ZNLx-B1 hardware option.
[2)] Requires R&S®FPL1-B5 hardware option for noise source control.
[3)] For further information on the R&S®VSE vector signal explorer software, see PD 3607.1371.12 and www.rohde-schwarz.com/product/vse.
[4)] Requires R&S®RT-ZA9.
[5)] Requires R&S®FPL1-K30 software option.
[6)] Only available for R&S®ZNL14 and R&S®ZNL20.

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	

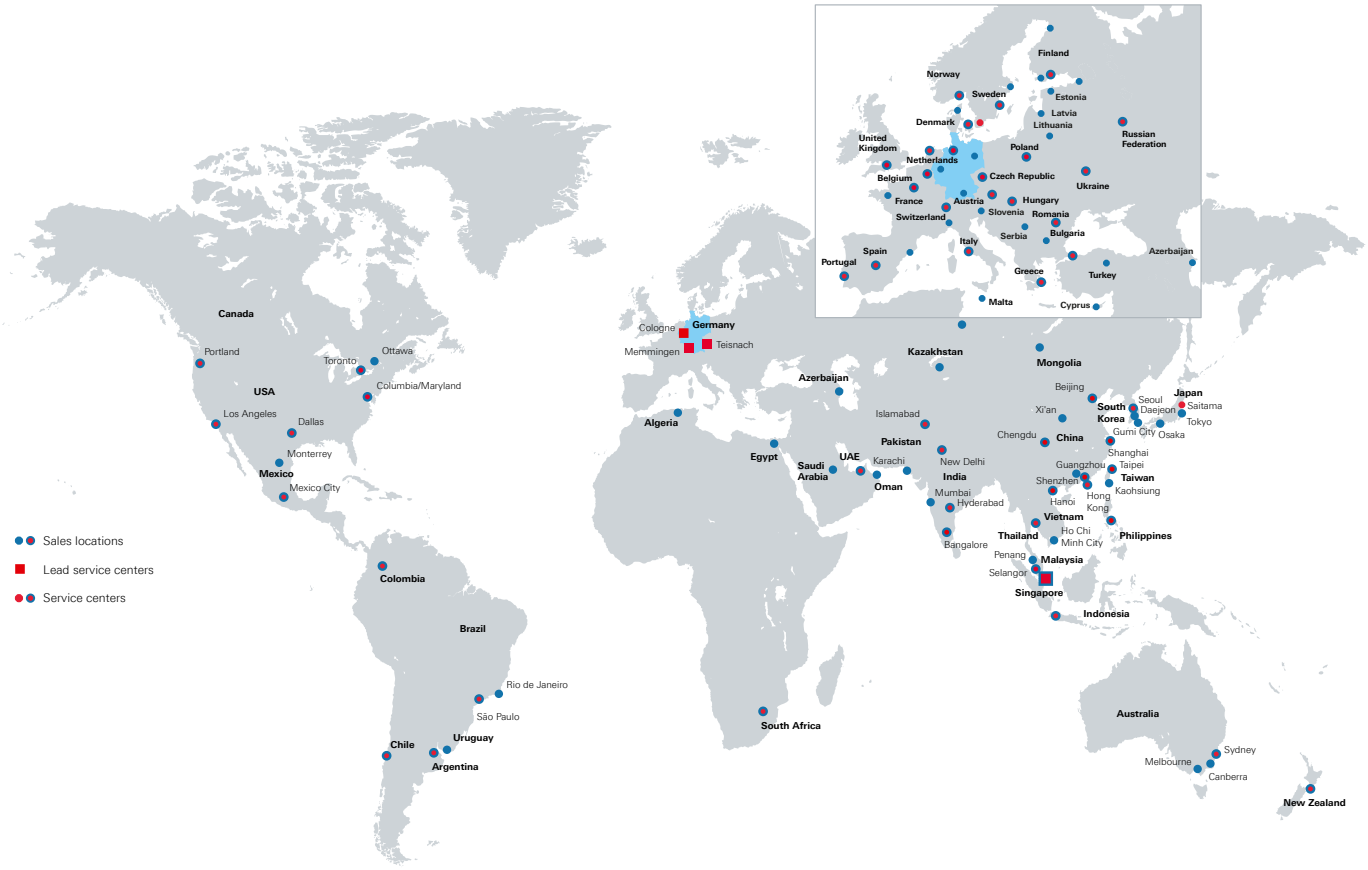
[1)] For options installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

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