R&S®ZNLE
VECTOR NETWORK ANALYZER

Measurements as easy as ABC

3 year warranty

Product Brochure
Version 05.00

ROHDE & SCHWARZ

Make ideas real

AT A GLANCE

The R&S®ZNLE makes vector network analyzer measurements as easy as ABC: easy to configure, easy to calibrate, easy to measure. The renowned high-quality design, an innovative user interface and its compact size make the R&S®ZNLE ideal for basic VNA applications.

The R&S®ZNLE is a two-port vector network analyzer that can be used for bidirectional measurements of S-parameters S_{11}, S_{21}, S_{12} and S_{22} on passive components.

Configuring the R&S®ZNLE requires only three decisions:
► Choose the frequency range
► Decide whether you need a GPIB interface
► Decide whether you need to perform time domain analysis or distance-to-fault measurements

The analyzer is available with a frequency range from 100 kHz (with R&S®ZNLE-B100 option) up to 20 GHz (R&S®ZNLE18 in overrange). The optional GPIB interface lets you connect a controller to remotely control the R&S®ZNLE.

As a standalone instrument, the R&S®ZNLE does not require an external PC to configure the setup. You can start measuring immediately after you switch on the instrument. The time domain analysis option (R&S®ZNL-K2) and distance-to-fault measurements option (R&S®ZNL-K3) enhance the R&S®ZNLE with essential features for general purpose testing.

KEY FEATURES

► Frequency range from 100 kHz to 20 GHz (R&S®ZNLE18 in overrange)

► Two-port vector network analyzer with a full S-parameter test set for bidirectional measurements on passive components

► Wide dynamic range of up to typ. 120 dB

► Measurement bandwidths from 1 Hz to 500 kHz

► Fast measurements, i.e. 8.7 ms for 401 points (100 kHz IFBW, 200 MHz span, correction off)

► Compact size (depth of 24 cm) and low weight (6 kg)

► Standalone instrument with 10.1" WXGA touchscreen

► Windows 10 operating system

BENEFITS

An economical instrument with solid performance

User interface with multitouch screen

Clearly structured user interface

Standard instrument for use in a lab

AN ECONOMICAL INSTRUMENT WITH SOLID PERFORMANCE

USER INTERFACE WITH MULTITOUCH SCREEN

The R&S®ZNLE is a plug&play vector network analyzer containing everything needed to start a measurement. With a fully integrated powerful PC platform running the Windows 10 operating system, the R&S®ZNLE is a complete standalone analyzer. The solid-state hard disk delivers fast boot time and the reliability required for demanding applications. Configure measurements right on the R&S®ZNLE and save valuable bench space since there is no need for a mouse, keyboard and external monitor. Simply plug in the instrument and start measuring.

Compact vector network analyzer
Vector network analyzers such as the R&S®ZNLE characterize electronic networks by measuring the magnitude and phase of S-parameters. Featuring an instrument depth of less than 24 cm and weighing only around 6 kg, the R&S®ZNLE is the most compact instrument in its class.

Low trace noise for high accuracy
The R&S®ZNLE offers a low trace noise of typ. 0.001 dB (at 10 kHz measurement bandwidth). This allows highly accurate, stable and repeatable measurements even at wider IF bandwidths. Using larger measurement bandwidths, the R&S®ZNLE can perform faster measurements while delivering excellent trace stability.

High measurement speed
The R&S®ZNLE is up to 10 times faster than similar instruments. With a measurement speed of 9.6 ms for 201 points (100 kHz IFBW, 200 MHz span, full two-port calibration) and fast LAN or IEC/IEEE data transfer, the R&S®ZNLE meets the speed requirements encountered in production and in everyday testing.

Wide 10.1" WXGA multitouch screen
The wide 10.1" multitouch screen is perfect for displaying setups and arranging measurements as required by the current application. Simply drag&drop to adapt the layout to your needs. The multitouch capability of the R&S®ZNLE lets you do more than just move the traces around with the touch of a finger. You can also use gesturing to zoom in and out.

Clearly structured user interface
The R&S®ZNLE features a user interface that is simple and clearly structured. Configure measurements in just a few steps. Drag and drop traces, channels and diagrams to achieve your ideal layout. Save, reload and switch between different setups by tapping on the touchscreen.
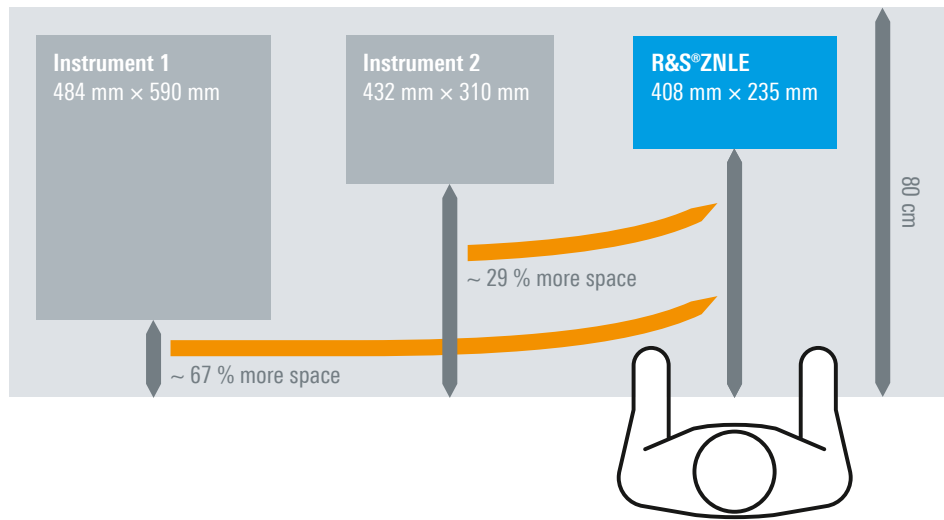
Undo/redo softkey for user-friendly operation
Use the undo and redo softkeys to cancel and restore measurement configurations. Check the influence of a measurement setting and revise it quickly, without having to reconfigure the entire measurement. To restart a setup from scratch, just press the Preset key.

Fully integrated context-sensitive help menu
Thanks to the fully integrated help menu, help is just a click away. In every dialog window, the R&S®ZNLE has a help button that takes you directly to the relevant section of the user manual. The help softkey is located on the left side of the display and can be accessed at any time. An integrated search function lets you quickly find different topics and functions.

Comparison of footprint of different VNAs

Instrument 1 484 mm × 590 mm	Instrument 2 432 mm × 310 mm	R&S®ZNLE 408 mm × 235 mm

~ 29 % more space

~ 67 % more space

80 cm

Overview of the R&S®ZNLE user interface. Here the wizard for easy configuration of S-parameters and the context-sensitive help menu are open.
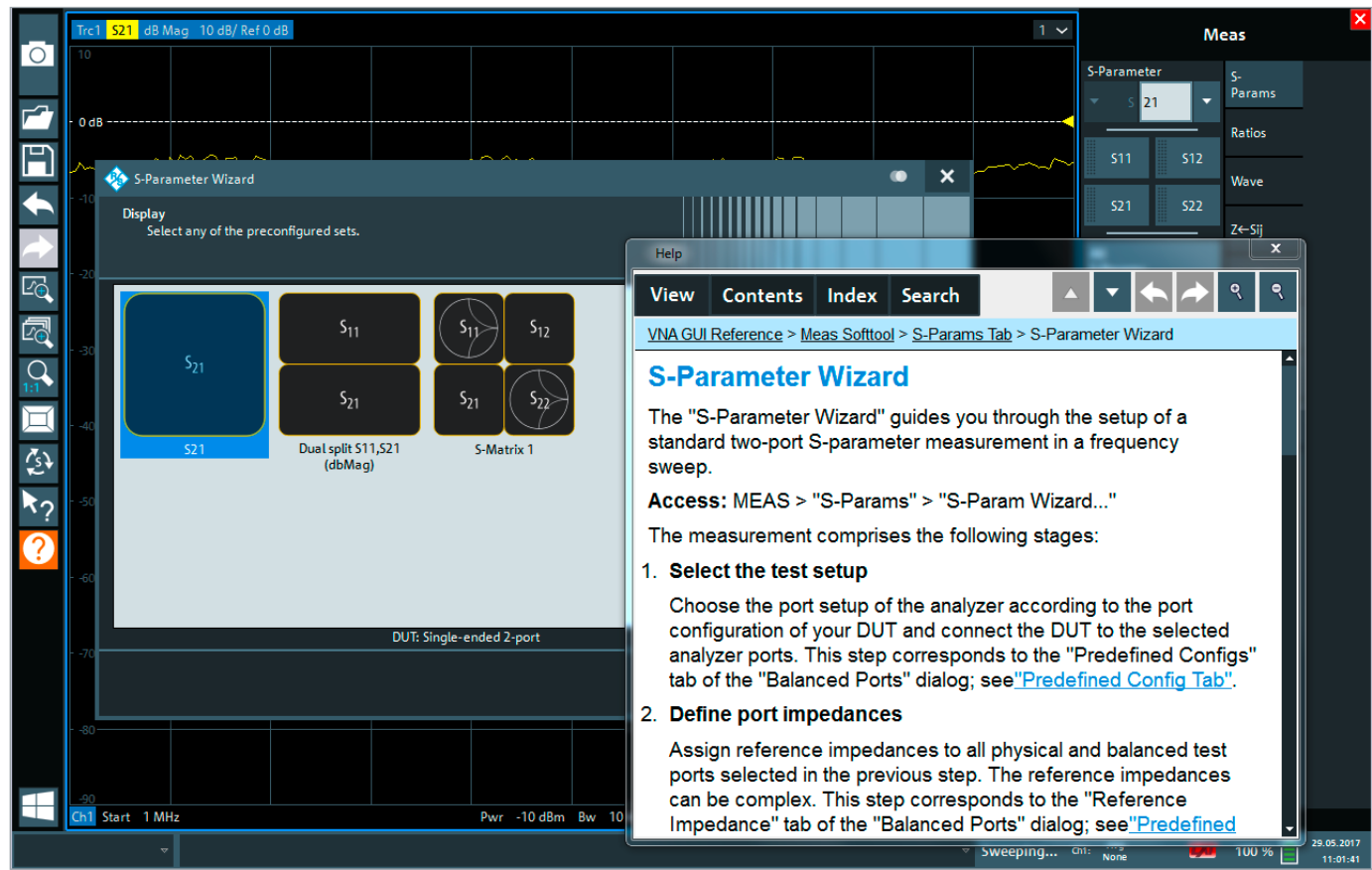
CLEARLY STRUCTURED USER INTERFACE

10.1" high-resolution display
▶ 1280 × 800 pixel

Softkey bar
▶ Quick access to key tools
▶ Hardware settings at a glance

Numerical keypad
▶ With unit keys for frequency and level

Toolbar
▶ With standard application functions such as print, save/open file, undo/redo, help

Function keys

System keys
▶ For setup, presets, settings, etc.

Two USB 2.0 ports
▶ For storage media
▶ For connecting accessories

Control knob

Status bar

Port 1

Port 2/RF input

STANDARD INSTRUMENT FOR USE IN A LAB

In development, it is often necessary to measure passive components quickly. The R&S®ZNLE not only delivers solid RF performance, it also offers features that make your life easier.

Calibration units for quick calibration
The R&S®ZNLE calibration wizard guides you through the calibration process. Manual calibration kits and automatic calibration units are supported.

The analyzer's automatic 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®ZNLE. It only takes a few steps to calibrate the setup. This is especially an advantage in production environments, helping you save time and maximize throughput.

The following calibration procedures are available:
▶ Reflection normalization open or short
▶ Reflection OSM (OSL)
▶ Enhanced reflection normalization OM or SM
▶ Transmission normalization (response calibration)
▶ Transmission normalization both (response calibration)
▶ One path two ports
▶ TOSM (SOLT)
▶ UOSM (only with calibration unit)

De/embedding functionality and fixture compensation
It is often necessary to characterize single components that are specified together with a matching network. The R&S®ZNLE can embed the DUT into virtual matching networks to achieve realistic conditions when simulating the DUT in its operational environment. The R&S®ZNLE offers a choice of predefined matching network topologies. It is also possible to read *.snp files into the R&S®ZNLE and use them for deembedding/embedding.

The fixture compensation feature corrects the measurement results by compensating for the effect of a test fixture.

Time domain analysis and distance-to-fault (DTF) measurements
Some measurements require the characterization of a specific component of a composite DUT (for example an antenna of an IoT device). With the R&S®ZNL-K2 option, the R&S®ZNLE lets you analyze the DUT in the time domain and use the time gating function to isolate the required circuit section.

The distance-to-fault measurements option (R&S®ZNL-K3) lets you detect cable discontinuities, which is important for example for base station antenna installation. You can select from a range of common cable types with predefined velocity factor and frequency-dependent attenuation, or create your own cable profiles. The R&S®ZNL-K2 and R&S®ZNL-K3 options use internal DC extrapolation. The optional frequency extension down to 100 kHz (R&S®ZNLE-B100) is helpful as it provides improved accuracy.

Remote controllable with LAN and GPIB option
The R&S®ZNLE can be remote controlled via the integrated LAN interface. The optional GPIB interface lets you connect a controller to remotely control the R&S®ZNLE. 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, the R&S®ZNLE has virtually negligible data transfer time.
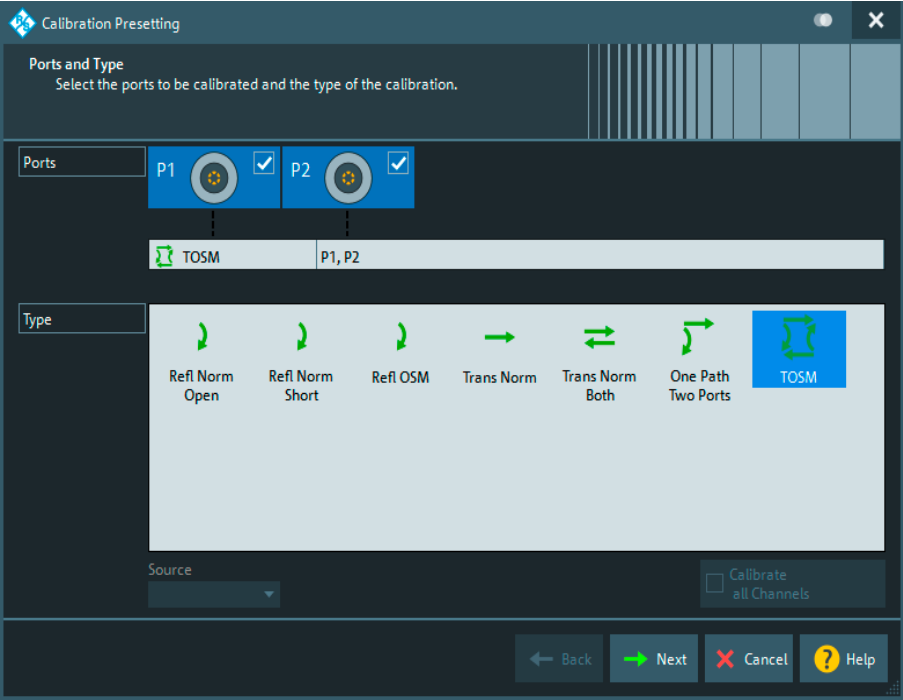
The calibration wizard provides an overview of the possible calibration methods for easy selection.


The fixture compensation menu offers a good overview of all available compensation methods.

SPECIFICATIONS IN BRIEF

Specifications in brief		
Frequency range	R&S®ZNLE3	100 kHz [1]/1 MHz to 3 GHz
	R&S®ZNLE4	100 kHz [1]/1 MHz to 4.5 GHz
	R&S®ZNLE6	100 kHz [1]/1 MHz to 6 GHz
	R&S®ZNLE14	100 kHz [1]/1 MHz to 14 GHz
	R&S®ZNLE18	100 kHz [1]/1 MHz to 18 GHz (20 GHz overrange)
Measurement time	201 points, 100 kHz IFBW, 200 MHz span, full two-port calibration	9.6 ms
Data transfer time	IEC/IEEE (201 points)	typ. 3.0 ms
	HiSLIP with 1 Gbit/s LAN	typ. 2.5 ms
Dynamic range	10 Hz measurement bandwidth	up to typ. 120 dB
Output power		up to typ. +2 dBm
Measurement bandwidths		selectable in steps of 1/1.5/2/3/5/7 · 1 Hz/10 Hz/... /100 kHz; max. upper limit: 500 kHz
Frequency resolution		1 Hz
Measurement points per trace		1 to 5001
Operating system		Windows 10

[1] With R&S®ZNLE-B100 option.

The R&S®ZNLE saves a lot of space on the workbench for measurements setups, e.g. to tune filters.
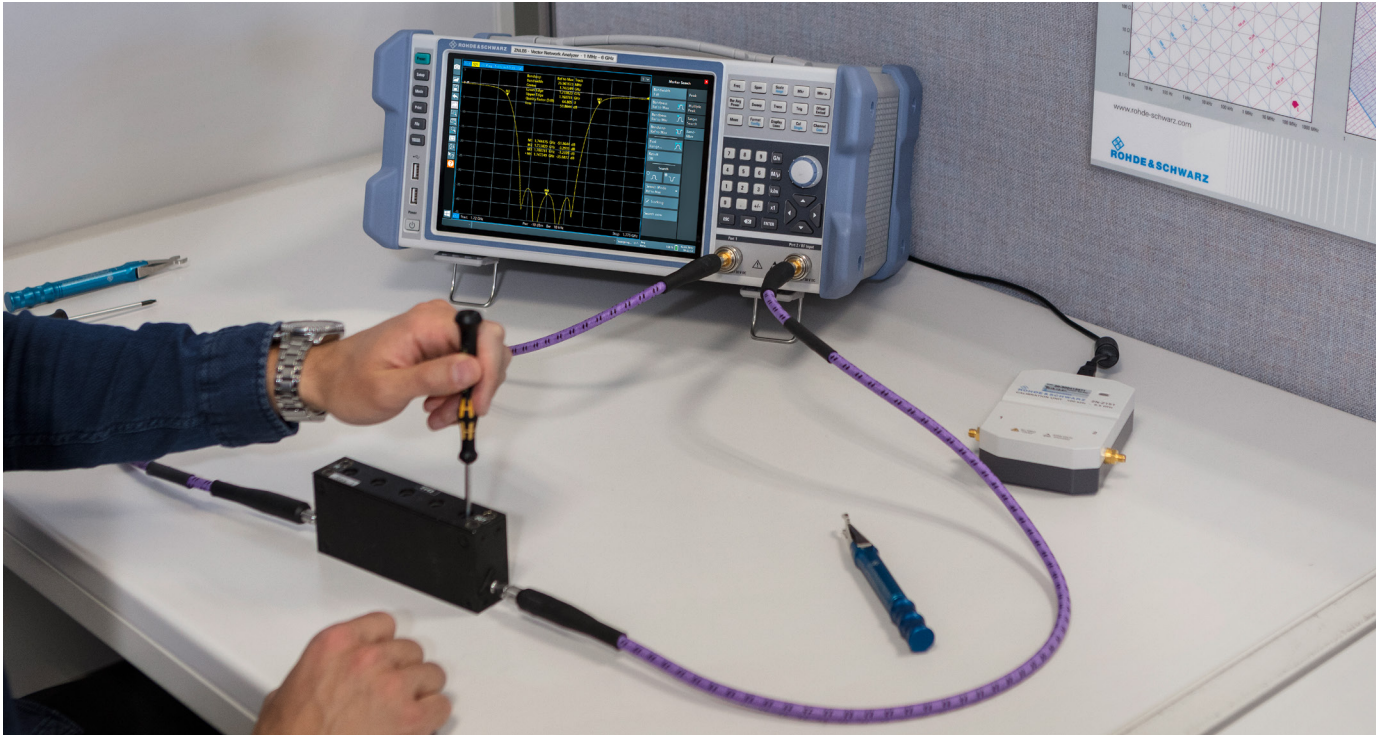
ORDERING INFORMATION

Designation	Type	Order No.
Base unit		
Vector network analyzer, 1 MHz to 3 GHz, two ports, N (f)	R&S®ZNLE3	1323.0012.53
Vector network analyzer, 1 MHz to 4.5 GHz, two ports, N (f)	R&S®ZNLE4	1323.0012.54
Vector network analyzer, 1 MHz to 6 GHz, two ports, N (f)	R&S®ZNLE6	1323.0012.56
Vector network analyzer, 1 MHz to 14 GHz, two ports, N (f)	R&S®ZNLE14	1323.0012.64
Vector network analyzer, 1 MHz to 18 GHz (20 GHz overrange), two ports, N (f)	R&S®ZNLE18	1323.0012.70
Options		
Extended frequency range, lower end, 1 MHz to 100 kHz	R&S®ZNLE-B100	1303.9272.02
GPIB interface	R&S®FPL1-B10	1323.1890.02
Time domain analysis	R&S®ZNL-K2	1323.1819.02
Distance-to-fault measurements	R&S®ZNL-K3	1323.1825.02
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, 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 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, 2 ports, 3.5 mm (f), 100 kHz to 26.5 GHz	R&S®ZN-Z53	1335.7046.32
Calibration unit, 2 ports, N (f), 100 kHz to 18 GHz	R&S®ZN-Z53	1335.7046.72
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
Accessories		
Protective hard cover	R&S®FPL1-Z1	1323.1960.02
Transport bag, transparent cover	R&S®FPL1-Z2	1323.1977.02
Carrying vest holster	R&S®FPL1-Z3	1323.1683.02
Anti-glare film	R&S®FPL1-Z5	1323.1690.02
Rackmount kit	R&S®FPL1-Z6	1323.1954.02

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

Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test and measurement, technology systems, and networks and cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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Sustainable product design

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

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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