R&S®EPL1000
EMI TEST RECEIVER

Speed. Flexibility. Compliance.

Product Brochure
Version 01.00

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

The R&S®EPL1000 is the perfect device for quick, precise and compliant EMI measurements up to 30 MHz. The R&S®EPL1000 fully complies with CISPR 16-1-1. With the added features of a spectrum analyzer and a signal and tracking generator, the R&S®EPL1000 is ideal for various lab applications.

With its very fast time domain scan, the R&S®EPL1000 can check all frequencies of a CISPR band A and B in a single shot, so measurements can be made quickly and large frequency segments can be checked gapless over extended periods of time, if necessary. Built-in preselection ensures a high dynamic range and enables the acquisition of short pulses. For detailed signal analysis, the R&S®EPL1000 offers a spectrogram function and IF analysis.

Automation simplifies measurements and ensures exact reproducibility of test sequences. For example, all lines connected to a Rohde&Schwarz LISN can be checked for CISPR band A and B at the push of a button. Comparing results to configured limit values is also automatic, and the R&S®EPL1000 displays the result of the entire measurement as PASS/FAIL. Using the integrated report generator, the result and the measurement details can easily be saved and printed.

With the optional integrated signal generator including a tracking generator function, the transfer functions of components used for measurements can be quickly and easily determined, without an additional device.

Battery operation, 12 V to 24 V DC input, a carrying bag and other accessories enable very flexible deployment of the R&S®EPL1000.

These and many more functions, as well as compliance with CISPR 16-1-1, make the R&S®EPL1000 the ideal instrument for conducted voltage and current measurements in the frequency range from 5 kHz to 30 MHz. Measuring radiated emissions is equally possible. Typical application areas are precompliance measurements, precertification and certification in line with IEC, EN, CISPR and FCC.

KEY FEATURES

- ► Preselection filters
- ► Time domain scan
- ► Tracking generator
- ► Battery operation
- ► Pulse protected input

BENEFITS

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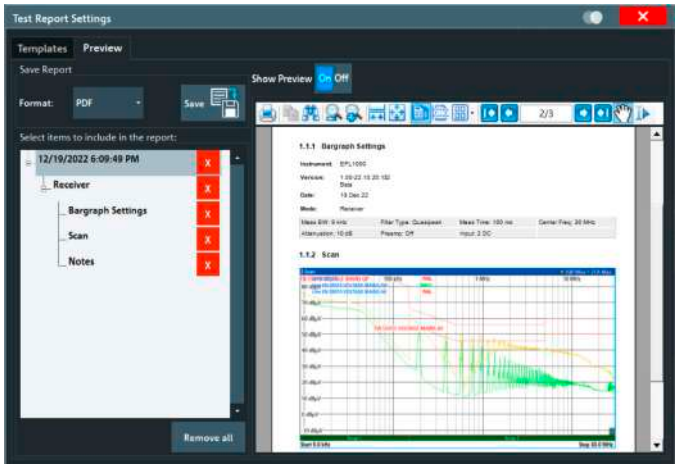
PRECISE AND STANDARD-COMPLIANT EMI IDENTIFICATION

The R&S®EPL1000 meets the requirements of CISPR 16-1-1 and additionally supports the decadic 6 dB bandwidths required by MIL-STD-461 and DO-160. This allows the R&S®EPL1000 to be used during development and for certification of a wide range of electrical products.

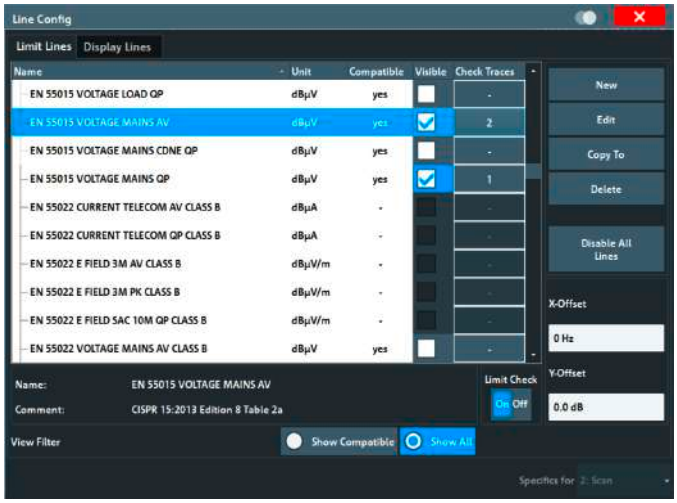
The relevant features include:

- EMI detectors: peak, quasi-peak, CISPR-average, RMS-average (CISPR 16-1-1)
- EMI bandwidth (6 dB)
  - 200 Hz, 9 kHz, 120 kHz and 1 MHz (CISPR 16-1-1)
  - 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz and 1 MHz (MIL-STD-461 and DO-160)
- Preselection to increase dynamic range (filters for CISPR band A and B)
  - Identify short pulses
  - Identify small signals in the presence of strong signals
- Transducer factors to include used accessory characteristics (for example cable attenuation or LISN characteristics)
  - Simple definition/quick import
  - Library covering most of the Rohde&Schwarz accessories
  - Record of new transducer factors with integrated tracking generator function (part of R&S®EPL1-B91 internal generator option)
  - Selection of one or more
- Signal level adaptation to correctly measure strong or weak signals
  - Pulse protected input
  - Attenuation up to 55 dB in 1 dB steps
  - Preamplifier with 20 dB gain
  - Autoranging function for automated optimization of the signal adaptation to make maximum use of the dynamic range and to avoid overload within the signal processing chain
- Limit line display and checking to easily evaluate measurement results
  - Easy definition of limit lines
  - Library with more than 170 EMI limit lines based on the latest versions of common EMI standards (CISPR/EN, FCC, MIL-STD-461 and DO-160) for fast and accurate configuration of measurements
- Report generation to easily record, document and exchange results
  - User-defined layout and content definition through templates
  - On-screen display and save of reports (pdf and Word file format)

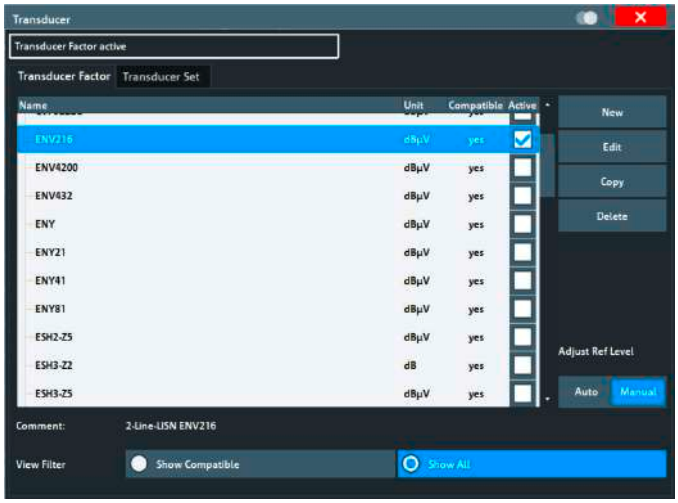
Layout definition and preview of test reports.



Selection of limit lines and assignment to individual traces.



Selection of one or more transducers.



FAST MEASUREMENTS THANKS TO TIME DOMAIN SCAN

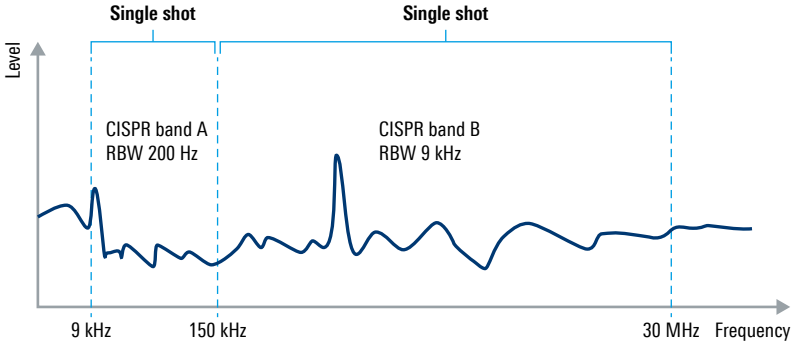
Superfast measurement

The R&S®EPL1000 can measure an entire CISPR band (A or B) in a single measurement. This is done using FFT in full compliance with the requirements of CISPR 16-1-1. Larger frequency segments can be measured automatically in multiple steps using time domain scan (TDS). Up to three traces can be activated with different detectors, including CISPR detectors. This enables very fast standard-compliant EMI measurements directly with the detector required by the standard. Dividing the measurement into preview and final measurements is not necessary, but this is supported by the R&S®EPL1000 as an alternative method (automatic sequence of preview measurement, peak search and final measurement).

Fast and reliable detection of sporadic emissions

Highly parallelized measurements enable long and gapless checking of relatively large frequency segments. Every emission in the measured frequency segment (e.g. CISPR band B) is detected, no matter how short. For measuring intermittent disturbances, the measurement time can be as long as 100 s. As all detected emissions of a measurement belong to the same time segment, any dependencies in the emissions can be easily recognized.

Parallelization of the measurements within the CISPR bands by time domain scan



Times for common detectors and measurement times for CISPR bands A and B with associated RBW

Detectors	Measurement time	Total time [1]
Peak	0.1 s	0.5 s
	1 s	1.4 s
	15 s	15.4 s
Quasi-peak and CISPR-average	1 s	3 s
	15 s	17 s

[1] Necessary settling times for a valid measurement are included and automatically considered by the R&S®EPL1000.

Checking a laptop power supply in CISPR band B. The measurement takes just 3 s for one line with a measurement time of 1 s. All signal components are captured seamlessly in the same time frame.

AUTOMATION OF MEASUREMENTS

Automatic measurement of multiple frequency segments with individual settings

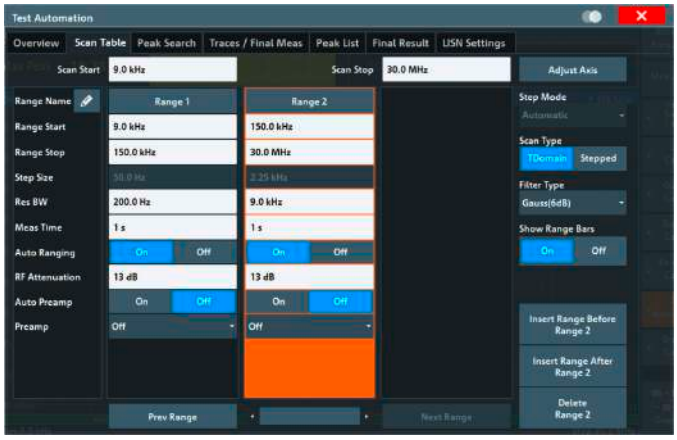
The scan table enables the definition of multiple frequency ranges with individual measurement settings. This way, for example, the RBW can be defined individually for CISPR band A and B. Using the configured settings, the R&S®EPL1000 automatically measures all defined frequency ranges sequentially.

Automatic measurement of multiple lines connected to a LISN

Line impedance stabilization networks (LISNs) from Rohde&Schwarz connected to the R&S®EPL1000 with an R&S®EZ-21 control cable can be remotely controlled by the R&S®EPL1000, including selection of the line to be measured by the R&S®EPL1000. This function allows all lines connected to a LISN to be measured automatically. On the R&S®EPL1000 GUI, the user simply selects the lines to be measured automatically.

Preview and final measurement

The R&S®EPL1000 also supports conventional level determination with only one frequency measured at a time (stepped scan). To reduce the total time, the measurement can be divided into preview and final measurement with peak search. With this method, final measurement is usually performed only for critical frequency points (peaks) using a detector required by the standard with a longer measurement time, allowing the total time to be considerably reduced. Preview measurement, peak search and final measurement with evaluation can be completely automated in the R&S®EPL1000.



Scan table with two segments for CISPR bands A and B.

The result of automatic measurement of a LED lamp in line with EN 55015. CISPR bands A and B are fully measured with quasi-peak and CISPR-average detectors on the neutral and live lines. The results are evaluated using the associated limit lines. The result is indicated as PASS/FAIL. The entire measurement is made at the push of a button in just about 13 s (1 s measurement time plus required settling time per segment and line).

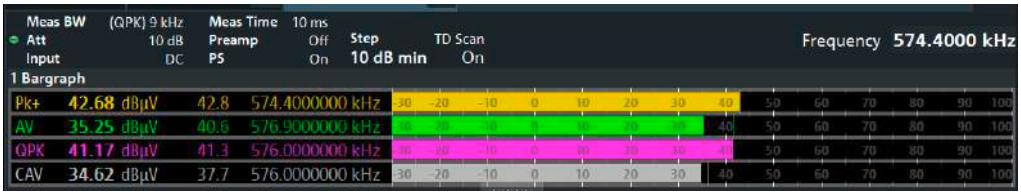
COMPREHENSIVE EMI ANALYSIS FUNCTIONS

Level at a frequency: bargraph display

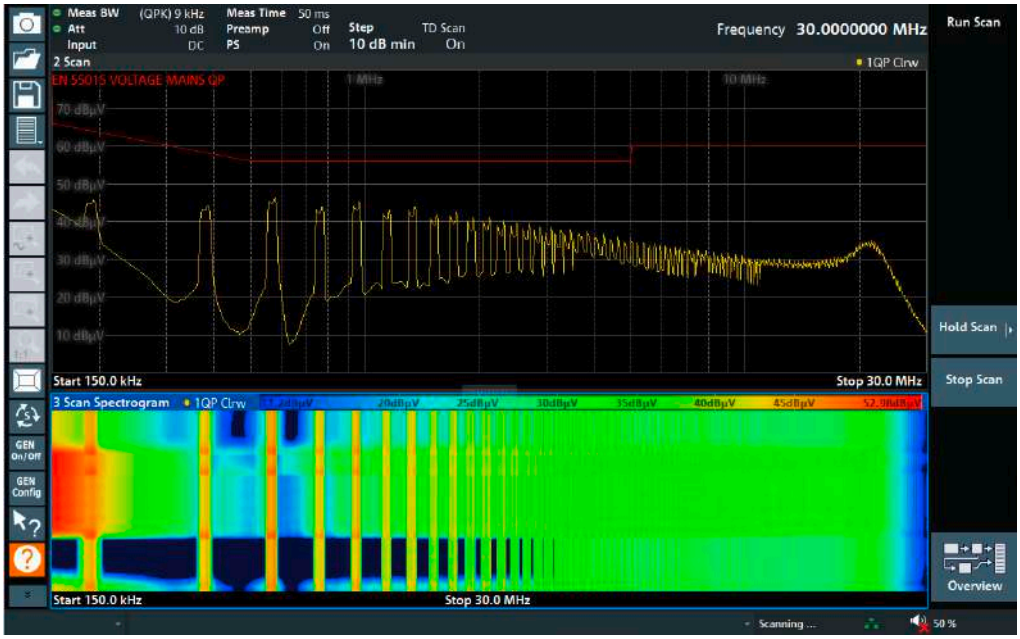
The bargraph display visualizes the level at a selected frequency. Instantaneous and maximum values are also displayed. Up to four graphs, each with its own detector, can be displayed at the same time. This function enables quick and easy analysis of the level at a frequency.

Level versus frequency and time: spectrogram function

The spectrogram function is ideal for capturing and analyzing signal properties over both time and frequency. The user can select either 2D or 3D presentation and quickly measure results with markers. This function is especially helpful when the signal or sporadic signal components need to be analyzed over time.



Bargraph display with four detectors.



Analysis of the emissions of a LED lamp while changing the brightness levels. The measurement was made with a quasi-peak detector.

Level at a frequency versus time: zero span

The level over time at a selected frequency is displayed as a trace. Level and time values can be determined quickly and exactly using markers. This can for example be helpful to determine the period of periodic interferers to specify an appropriate measurement time.

IF analysis (R&S®EPL1-K56 option)

The R&S®EPL1000 offers IF analysis as an option. This can be combined with the bargraph display and a spectrogram function. Marker functions enable precise measurement.

AM/FM audio output

AM and FM audio output can help understand the characteristic of an interferer or to easily identify ambient interferers, for example during open area testing. Audio output is possible via the integrated loudspeaker or the headphone output. Comprehensive analysis functions for the modulation parameters of AM, FM and PM signals can be activated with the R&S®FPL1-K7 keycode option.

Spectrum analysis

In addition to the various EMI-specific measurement functions, the R&S®EPL1000 includes spectrum analysis functions, equivalent to those offered by a modern spectrum analyzer.

Analysis of the emissions of a LED lamp at 576 kHz versus time. The trigger function ensures a stable display. A period of 20 ms was measured using the marker functions.

Analysis of the emissions of a LED lamp at 576 kHz using bargraph display in combination with IF spectrum and spectrogram function. The dynamic behavior of the signal, especially in the range of 560 kHz to 585 kHz, is clearly visible.

SIMPLE INTEGRATION INTO EMI TEST SYSTEMS

Integration into networks

The R&S®EPL1000 can be integrated into TCP/IP networks via its Ethernet interface. A GPIB interface (R&S®FPL1-B10) can additionally be integrated as an option.

Integration into any desired software applications via SCPI command set

Using SCPI commands, the functions of the R&S®EPL1000 can be controlled and measurement results can be retrieved. This enables integration into EMC measurement system software as well as any other software applications.

Integration into ELEKTRA EMC test software

R&S®ELEKTRA EMC test software is a complete solution that controls EMC test systems. The R&S®ELEMI-E essential EMI test software as base option for EMI measurements helps users define, perform, evaluate and archive EMI measurements in line with current EMI standards. Users can quickly generate correct and reproducible results. R&S®ELEKTRA also supports the R&S®EPL1000.

For more information, see the R&S®ELEMI-E essential EMI test software product brochure (PD 3607.6021.12) and the R&S®ELEKTRA EMC test software product brochure (PD 5216.3695.12).

Use of R&S®EPL1000 with R&S®ELEKTRA

VERSATILE REMOTE CONTROL FUNCTIONS

Remote control of R&S®LISNs

R&S®LISNs, such as the R&S®ENV216, can be remotely controlled via a proprietary interface integrated in the R&S®EPL1000. This way, the line to be measured can be selected on the R&S®EPL1000. This is especially helpful when the LISN and the R&S®EPL1000 are not in the same location. Suitable cables are available with lengths of 3 m or 10 m (R&S®EZ-21).

Remote control via remote desktop (Microsoft)

The R&S®EPL1000 can easily be operated remotely with a remote desktop connection. The R&S®EPL1000 screen display, along with an interactive visual simulation of the R&S®EPL1000 controls, is displayed on the client computer. This allows remote operation in the usual way as if the user was sitting directly at the device.

Access via web server

A connection with the web server integrated in the R&S®EPL1000 can be established by simply entering the IP address in the browser. This allows the instrument to be used remotely, just like with remote desktop. Multiple users can access the instrument at the same time from different computers and see the same user interface. The web server also supports simple data exchange with the R&S®EPL1000.

FOR STATIONARY, PORTABLE AND OUTDOOR USE

Operation in a rack, in the lab or on the go

Fold-out feet on the bottom and a carrying handle on the top of the R&S®EPL1000 enable flexible deployment in the lab. Professional installation in a 19" rack is easy using the R&S®EPL1-Z6 rackmount kit. The R&S®EPL1-Z1 protective hard cover for the front of the instrument and the R&S®EPL1-Z2 carrying bag – a perfect fit for the R&S®EPL1000 – make transportation easy and safe. A Kensington lock can be used to secure the instrument.

Flexible power supply, including an integrated rechargeable battery

With an input voltage range of 110 V to 240 V, the R&S®EPL1000 can be connected to all customary AC power sources. If an AC power source is not available, the integrable 12 V to 24 V DC input (R&S®FPL1-B30) can be used as an alternative. And if no external power source is available, the R&S®EPL1000 is still usable thanks to the integrated rechargeable battery (R&S®FPL1-B31). For an especially long operating time, the batteries can be exchanged (R&S®FPL1-Z4/R&S®FSV-B34). This makes outdoor measurements far away from power sources easy (such as in-situ measurements).

Use in direct sunlight

The R&S®FPL1-Z5 antiglare display film noticeably reduces reflections from the screen. This is especially helpful for use in direct sunlight.

Data protection when the instrument is used at different locations or by different users

The memory pack (SSD) of the R&S®EPL1000, together with the associated controller unit, can easily be exchanged (R&S®EPL1-B19). This allows easy and very reliable removal of sensitive measurement data from the instrument. If the R&S®EPL1000 is transferred without a memory pack, no data can be handed over with the instrument. After the recipient inserts a replacement SSD including controller unit, the R&S®EPL1000 is again fully ready to use.

SPECIFICATIONS IN BRIEF

Specifications in brief		
RF input		50 Ω, N connector (female); integrated pulse limiter
Frequency range		5 kHz to 30 MHz
Attenuator setting range		0 dB to 55 dB, in 1 dB steps
Preselection bandwidths (–6 dB), nominal	10 Hz to 150 kHz	fixed lowpass filter
	150 kHz to 30 MHz	38 MHz, fixed bandpass filter
Preamplifier	switchable	20 dB (nom.); located between preselection and first mixer
EMI filters (–6 dB)		10/100/200 Hz, 1/9/10/100/120 kHz, 1 MHz
Noise indication (receiver mode)	termination = 50 Ω, average detector (AV), RF attenuation = 0 dB, preamplifier on/off	
	9 kHz ≤ f < 100 kHz, bandwidth = 200 Hz	< –25 dBµV/–15 dBµV
	100 kHz ≤ f < 150 kHz, bandwidth = 200 Hz	< –25 dBµV/–15 dBµV
	150 kHz ≤ f < 1 MHz, bandwidth = 9 kHz	< –9 dBµV/+1 dBµV
	1 MHz ≤ f < 10 MHz, bandwidth = 9 kHz	< –16 dBµV/–4 dBµV
	10 MHz ≤ f < 30 MHz, bandwidth = 9 kHz	< –12 dBµV/–4 dBµV
Detectors	standard	min. peak, RMS and average
	CISPR in line with CISPR 16-1-1:2019	max. peak, quasi-peak, CISPR-average and RMS-average
Maximum number of traces		6
Time domain scan examples for total time		see table on page 5
IF analysis	R&S®EPL1-K56	
Span		max. 10 MHz
Resolution bandwidths		10 Hz to 100 kHz in 1/2/3/5 sequence
Detector		sample
Internal generator	R&S®FPL1-B91	50 Ω, N connector (female)
Operating modes		tracking generator, CW generator, power sweep
AF demodulation types		AM and FM (loudspeaker and phone jack)
Display		21 cm LC TFT color display (10.1"), 1280 × 800 pixel (WXGA resolution)
Remote control interfaces		
LAN interface		10/100/1000BASE-T, RJ-45
GPIB interface (IEC/IEEE bus control)	R&S®FPL1-B10	interface in line with IEC 625-2 (IEEE 488.2); 24 pin Amphenol connector (female)
User port (LISN remote control)		25 pin D-Sub (female)
USB interfaces	front	2 ports, type A plug, version 2.0
	rear	2 ports, type A plug, version 3.1
Power supply		
AC supply		100 V to 240 V ± 10%, 50 Hz to 60 Hz ± 5%
DC power input voltage range	R&S®FPL1-B30	12 V to 24 V (nom.), 10.4 V to 28 V
Battery operating time	R&S®FPL1-B31	2 h (nom.)
Dimensions	W × H × D	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)
Net weight (nom.)	without options	6.9 kg (15.2 lb)
	with internal battery	8.6 kg (18.95 lb)
Recommended calibration interval		1 year

ORDERING INFORMATION

Designation	Type	Order No.	Retrofitted by
Base unit			
EMI test receiver, 5 kHz to 30 MHz	R&S®EPL1000	1350.4444.10	
Hardware options			
Internal generator, 5 kHz to 30 MHz	R&S®EPL1-B91	1350.4073.02	factory only
Replacement SSD, including controller unit	R&S®EPL1-B19	1350.4450.02	user
OCXO, precision frequency reference	R&S®FPL1-B4	1323.1902.02	service only
GPIB interface	R&S®FPL1-B10	1323.1890.02	user
DC power supply for 12 V/24 V supply voltage	R&S®FPL1-B30	1323.1877.02	user
Lithium-ion battery pack, with controller unit for internal battery slot	R&S®FPL1-B31	1323.1725.02	service only
Keycode options			
IF analysis	R&S®EPL1-K56	1350.4067.02	user (keycode)
Modulation analysis application (AM, FM, PM)	R&S®FPL1-K7	1323.1731.02	user (keycode)

Designation	Type	Order No.
EMC test software		
Essential EMI test software	R&S®ELEMI-E	5601.0030.02
License dongle	R&S®EMCPC	5601.0018.02
Recommended extras		
Soft carrying bag for transport and outdoor operation	R&S®EPL1-Z2	1350.4309.02
H-style shoulder harness (requires R&S®FPL1-Z2 option)	R&S®EPL1-Z3	1350.4315.02
Spare lithium-ion battery pack	R&S®FPL1-Z4	1323.1677.02
Antiglare display film for outdoor operation	R&S®FPL1-Z5	1323.1690.02
19" rackmount kit	R&S®EPL1-Z6	1350.4321.02
Lithium-ion battery charger for charging spare batteries	R&S®FSV-B34	1321.3950.02
Control cable for R&S®ENV216/R&S®ENV432/R&S®ENV420		
Length: 3 m	R&S®EZ-21	1107.2087.03
Length: 10 m	R&S®EZ-21	1107.2087.10
Calibration		
Accredited calibration	R&S®ACAEPL1000	3599.0699.03
Documentation of calibration values	R&S®DCV-2	0240.2193.09

Service options		
Extended warranty, one year	R&S®WE1	Contact your local Rohde&Schwarz sales office for more information.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
Extended warranty with accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

FROM PRESALES 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 project stages:

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

Service at Rohde&Schwarz
You're in great hands

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

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&measurement, technology systems and networks&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.

www.rohde-schwarz.com

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

Rohde&Schwarz training
www.training.rohde-schwarz.com

Rohde&Schwarz customer support
www.rohde-schwarz.com/support

PD 3683.7819.12 | Version 01.00 | March 2023 (ja)
R&S®EPL1000 EMI Test Receiver
Data without tolerance limits is not binding | Subject to change

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3683.7819.12 01.00 PDP/PDW 1 en

R&S®EPL1000
EMI TEST RECEIVER

Specifications

Data Sheet
Version 02.00

ROHDE&SCHWARZ
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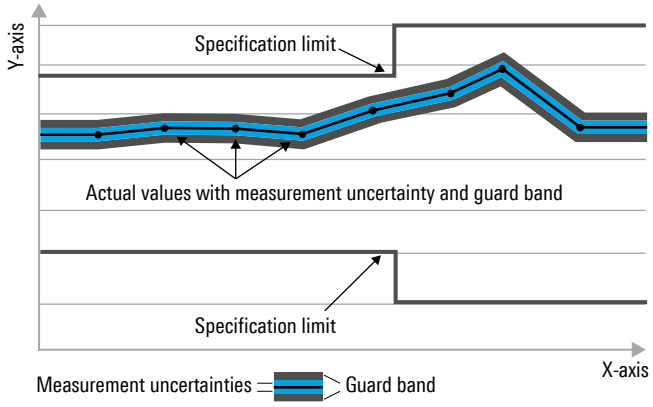
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

Operating modes		• receiver mode • analyzer mode

Frequency

Frequency range		5 kHz to 30 MHz
Frequency resolution		0.01 Hz
Scaling		linear, logarithmic [1]
Reference frequency, internal, nominal		
Accuracy		(time since last adjustment × aging rate) + temperature drift + calibration accuracy
Aging per year	standard	1×10^{-6}
	with R&S®FPL1-B4 OCXO reference frequency option	1×10^{-7}
Temperature drift (0 °C to +50 °C)	standard	1×10^{-6}
	with R&S®FPL1-B4 OCXO reference frequency option	1×10^{-7}
Achievable initial calibration accuracy	standard	5×10^{-7}
	with R&S®FPL1-B4 OCXO reference frequency option	5×10^{-8}
Receiver scan		
Scan		max. 10 subranges with different settings
Scan types		stepped, time domain
Measurement time	stepped scan, per frequency	50 µs to 100 s
	time domain scan, per subrange	50 µs to 100 s
Number of trace points		10 000 000
Frequency step size	stepped scan	min. 1 Hz
	time domain scan	0.25 × resolution bandwidth
Time domain scan		
Frequency segment processed in parallel	RBW = 200 Hz	0.66 MHz
	RBW = 9 kHz	29.85 MHz
	RBW = 120 kHz	24.6 MHz
	RBW = 1 MHz	25.6 MHz
FFT overlap factor		≥ 93 %
Frequency readout (analyzer mode)		
Marker resolution		0.01 Hz
Uncertainty		±(marker frequency × reference uncertainty + 10 % × resolution bandwidth + ½ (span / (sweep points – 1)) + 1 Hz)
Number of sweep (trace) points	default value	1001
	range	101 to 100001
Marker tuning frequency step size	marker step size = sweep points	span / (sweep points – 1)
	marker step size = standard	span / (default sweep points – 1)
Frequency counter resolution		1 Hz
Count accuracy		±(frequency × reference uncertainty + ½ (last digit))
Display range for frequency axis		0 Hz, 10 Hz to maximum frequency
Resolution		0.1 Hz
Maximum span deviation		0.1 %
Sweep time range	span = 0 Hz	1 µs to 8000 s
	span ≥ 10 Hz, RBW ≥ 100 kHz	1 ms to 8000 s [2]
	span ≥ 10 Hz, RBW < 100 kHz	75 µs to 8000 s [3]
Sweep time accuracy	span = 0 Hz	0.1 % (nom.)
	span ≥ 10 Hz, RBW ≥ 100 kHz	3 % (nom.)

[1] Not with internal generator in tracking mode.

[2] Net sweep time without additional hardware settling time.

[3] Time for data acquisition for FFT calculation.

Preselection and preamplifier

Preselection		
State	receiver mode	always on
	analyzer mode	on/off (selectable)
Number of preselection filters		2
Bandwidths (–6 dB), nominal	10 Hz to 150 kHz	fixed lowpass filter
	150 kHz to 30 MHz	38 MHz, fixed bandpass filter
Preamplifier	switchable	
Location		in the signal path between preselection and first mixer
Gain		20 dB (nom.)

IF and resolution bandwidths

EMI filters		
Bandwidths (–6 dB)		10/100/200 Hz, 1/9/10/100/120 kHz, 1 MHz
Bandwidth uncertainty		< 3 %
Shape factor 60 dB:6 dB		< 4
Sweep filters and FFT filters		
Resolution bandwidths (–3 dB)	sweep filters	100 kHz to 10 MHz in 1/2/3/5 sequence
	FFT filters	1 Hz to 50 kHz in 1/2/3/5 sequence
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 5 (nom.)
Channel filters (analyzer mode)		
Bandwidths (–3 dB)		100/200/300/500 Hz, 1/1.5/2/2.4/2.7/3/3.4/4/4.5/5/6/7.5/8.5/9/ 10/12.5/14/15/16/20/21/25/30/50/100/ 150/192/200/300/500 kHz, 1/1.228/1.5/2/3/3.75/5/10 MHz
Bandwidth uncertainty		< 2 % (nom.)
Shape factor 60 dB:3 dB		< 2 (nom.)
Video bandwidths	analyzer mode	1 Hz to 10 MHz in 1/2/3/5 sequence
Signal analysis bandwidth (equalized)	standard, analyzer mode	10 MHz (nom.)

Level

Display range		displayed noise floor up to +30 dBm
Maximum input level		
DC voltage	input	0 V
CW RF power	RF attenuation = 0 dB	
	RF preamplifier off	20 dBm (= 0.1 W)
	RF preamplifier on	13 dBm (= 0.02 W)
	RF attenuation ≥ 10 dB	
	RF preamplifier off	30 dBm (= 1 W)
	RF preamplifier on	23 dBm (= 0.2 W)
Pulse spectral density	RF attenuation = 0 dB, preselection on, RF preamplifier off	97 dB µV/MHz
Maximum pulse voltage	RF attenuation ≥ 10 dB	
	input	450 V
Maximum pulse energy	RF attenuation ≥ 10 dB, 10 µs	
	input	20 mWs
Intermodulation		
1 dB compression (two-tone)	RF attenuation = 0 dB, preselection off, RF preamplifier off	+10 dBm (nom.)
	RF attenuation = 0 dB, preselection on, RF preamplifier off	+ 10 dBm (nom.)
	RF attenuation = 0 dB, preselection on, RF preamplifier on	–15 dBm (nom.)

Third-order intercept point (TOI)	RF attenuation = 0 dB, preselection on, RF preamplifier off, level = 2 × –20 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	20 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> 15 dBm, 20 dBm (typ.)
	RF attenuation = 0 dB, preselection off [4], RF preamplifier off, level = 2 × –20 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	20 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> 20 dBm, 23 dBm (typ.)
	RF attenuation = 0 dB, preselection on, RF preamplifier on, level = 2 × –45 dBm, Δf > 5 × RBW or 10 kHz, whichever is larger	
	f_{in} < 10 MHz	–10 dBm (nom.)
	10 MHz ≤ f_{in} < 30 MHz	> –8 dBm
Second-harmonic intercept (SHI)	RF attenuation = 0 dB, level = –13 dBm, preselection off, RF preamplifier off	
	1 MHz < f_{in} ≤ 30 MHz	45 dBm (nom.)

Sensitivity

Noise indication (receiver mode)	RF attenuation = 0 dB, RF preamplifier off, termination = 50 Ω, average detector (AV)	
	9 kHz ≤ f < 100 kHz, BW = 200 Hz	< –15 dBµV
	100 kHz ≤ f < 150 kHz, BW = 200 Hz	< –15 dBµV
	150 kHz ≤ f < 1 MHz, BW = 9 kHz	< +1 dBµV
	1 MHz ≤ f < 30 MHz, BW = 9 kHz	< –4 dBµV
	RF attenuation = 0 dB, RF preamplifier on, termination = 50 Ω, average detector (AV)	
	9 kHz ≤ f < 100 kHz, BW = 200 Hz	< –25 dBµV
	100 kHz ≤ f < 150 kHz, BW = 200 Hz	< –25 dBµV
	150 kHz ≤ f < 1 MHz, BW = 9 kHz	< –9 dBµV
	1 MHz ≤ f < 10 MHz, BW = 9 kHz	< –16 dBµV
	10 MHz ≤ f < 30 MHz, BW = 9 kHz	< –12 dBµV
Displayed average noise level (DANL, analyzer mode)	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, sample detector, +20 °C to +30 °C	
	RF preamplifier off, preselection off	
	5 kHz ≤ f < 1 MHz	< –145 dBm, –152 dBm (typ.)
	1 MHz ≤ f < 30 MHz	< –150 dBm, –155 dBm (typ.)
	RF preamplifier off, preselection on	
	5 kHz ≤ f < 1 MHz	< –142 dBm, –147 dBm (typ.)
	1 MHz ≤ f < 30 MHz	< –142 dBm, –147 dBm (typ.)
	RF preamplifier on, preselection on (gain: 20 dB (nom.))	
	1 MHz ≤ f < 10 MHz	< –155 dBm, –158 dBm (typ.)
	10 MHz ≤ f < 30 MHz	< –152 dBm, –156 dBm (typ.)
Spurious responses	input level ≤ –13 dBm, sweep optimization: auto or dynamic, scaling linear	
Residual spurious response	RF attenuation = 0 dB	
	f ≤ 2 MHz	< –90 dBm (nom.)
	2 MHz ≤ f < 30 MHz	< –110 dBm
Level display (receiver mode)		
Level display	analog	bargraph display, separately for each detector
	digital	numeric, 0.01 dB resolution
Detectors	maximum 4 selectable	maximum peak, minimum peak, RMS, average, quasi-peak, CISPR-average, RMS-average
Units of level axis		dBm, dBµV, dBmV, dBµA, dBpW, dBpT
RF spectrum		
Logarithmic level axis		10 dB to 200 dB, in steps of 10
Frequency axis		linear or logarithmic
Number of traces		6
Detectors		maximum peak, minimum peak, RMS, average, quasi-peak, CISPR-average, RMS-average

[4] Preselection off is only available in analyzer mode. In receiver mode the preselection is permanently on.

Level display (analyzer mode)		
Logarithmic level axis		1 dB to 200 dB, in 1 dB steps
Linear level axis		10 % of reference level per level division, 10 divisions or logarithmic scaling
Number of traces		6
Trace detector		maximum peak, minimum peak, auto peak (normal), sample, RMS, average
Trace functions		clear/write, maximum hold, minimum hold, average, view
EMI detectors		quasi-peak, RMS-average, CISPR average
Measurement marker detector		maximum peak, average, quasi-peak, RMS-average, CISPR-average
Setting range of reference level		–130 dBm to (–13 dBm + RF attenuation – RF preamplifier gain), in steps of 0.01 dB
Units of level axis		dBm, dBµV, dBmV, dBµA, dBpW, V, A, W
Level measurement uncertainty		
Absolute level uncertainty at 16.667 MHz	RBW = 10 kHz, level = –10 dBm, reference level = –10 dBm, RF attenuation = 10 dB	
	+20 °C to +30 °C	
	preselection off	< 0.3 dB (σ = 0.1 dB)
	preselection on	< 0.4 dB (σ = 0.14 dB)
	0 °C to +50 °C	
	preselection off	< 0.5 dB (σ = 0.17 dB)
	preselection on	< 0.6 dB (σ = 0.2 dB)
Frequency response referenced to 16.667 MHz	RF attenuation = 10/20/30/40 dB, preselection off, RF preamplifier off, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.3 dB (σ = 0.1 dB)
	RF attenuation = 10/20/30/40 dB, preselection on, RF preamplifier off, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.8 dB (σ = 0.27 dB)
	any setting of RF attenuation and preselection, RF preamplifier off, 0 °C to +50 °C	
	5 kHz ≤ f < 30 MHz	< 1 dB (nom.)
	RF attenuation ≤ 20 dB, RF preamplifier on, preselection on, +20 °C to +30 °C	
	5 kHz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 30 MHz	< 0.8 dB (σ = 0.27 dB)
Attenuator switching uncertainty	f = 50 MHz, 0 dB to 55 dB, referenced to 10 dB attenuation	< 0.2 dB (σ = 0.07 dB)
Uncertainty of reference level setting		0 dB [5]
Bandwidth switching uncertainty	referenced to RBW = 10 kHz and sweep type FFT	
	sweep type = FFT (RBW < 100 kHz)	< 0.1 dB (nom.)
	sweep type = sweep (RBW ≥ 100 kHz)	< 0.2 dB (nom.)
Nonlinearity of displayed level		
Logarithmic level display	S/N > 16 dB, 0 dB to –50 dB	< 0.1 dB (σ = 0.07 dB)
Linear level display	S/N > 16 dB, 0 dB to –70 dB	5 % of reference level (nom.)
CISPR detectors	CISPR band A/B	in line with CISPR 16-1-1:2019
Total measurement uncertainty	signal level from 0 dB to –50 dB below reference level, S/N > 20 dB, sweep time = auto, sweep type = FFT, RF attenuation = 10/20/30/40 dB, preselection off, RF preamplifier off, span/RBW < 100, confidence level = 95 %, +20 °C to +30 °C	
	1 MHz ≤ f < 30 MHz	0.5 dB
	signal level from 0 dB to –50 dB below reference level, S/N > 20 dB, sweep time = auto, sweep type = FFT, RF attenuation = 10/20/30/40 dB, preselection on, RF preamplifier off/on, span/RBW < 100, confidence level = 95 %, +20 °C to +30 °C	
	1 MHz ≤ f < 30 MHz	0.8 dB

[5] The setting of the reference level affects only the graphical representation of the measurement result on the display, not the measurement itself. Therefore, the reference level setting causes no additional uncertainty in measurement results.

Measurement speed

Receiver mode		
Time domain scan	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 100 ms, peak detector	500 ms (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 1 s, peak detector	1.4 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 1 s, quasipeak and CISPR-average detector	≤ 3 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 15 s, peak detector	15.4 s (meas.)
	CISPR band A, 9 kHz to 150 kHz, RBW = 200 Hz or CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz; measurement time = 15 s, quasipeak and CISPR-average detector	≤ 17 s (meas.)
Local measurement and display update rate	1001 sweep points, sweep optimization set to “speed”	5 ms (200/s) (nom.)
Maximum sweep rate, remote operation [6, 7]	trace average = on	0.9 ms (1100/s) (nom.)
Remote measurement and LAN transfer [6]		3.2 ms (357/s) (nom.)
Marker peak search [6]		1.9 ms (nom.)
Center frequency tune + sweep + sweep data transfer [6]		16 ms (nom.)

Trigger functions

Trigger		
Trigger source		free run, video, external, IF power, I/Q power
Trigger offset	span ≥ 10 Hz	0 s to 20 s
	span = 0 Hz	(–sweep time) to 20 s
Maximum deviation of trigger offset		±10 ns
IF power trigger (analyzer mode)		
Sensitivity	minimum signal power	–60 dBm + RF attenuation – RF preamplifier gain
	maximum signal power	–15 dBm + RF attenuation – RF preamplifier gain
IF power trigger bandwidth		10 MHz (nom.)
Gated sweep		
Gate source		video, external, IF power,
Gate delay		0 s to 20 s, minimum resolution: 10 ns
Gate length		10 ns to 20 s, minimum resolution: 10 ns
Maximum deviation of gate length		±10 ns

[6] Measured with a PC equipped with Intel® Core™ i7 2.8 GHz and Gigabit LAN interface.

[7] Measurement is performed with a sweep count of 1000. The indicated speed is the average speed of 1 sweep.

I/Q data

Interface		GPIB or LAN interface
Memory length		max. 25 Msample I and Q
Word length of I/Q samples		14 bit
Sampling rate	standard	100 Hz to 16 MHz
Maximum signal analysis bandwidth (equalized)	standard	12.8 MHz
Signal analysis bandwidth ≤ 10 MHz		
Amplitude flatness	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±0.3 dB (nom.)
Deviation from linear phase	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±1° (nom.)
Signal analysis bandwidth ≤ 30 MHz		
Amplitude flatness	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±0.5 dB (nom.)
Deviation from linear phase	f_{center} ≥ 12 MHz and (1.25 × signal analysis bandwidth)	±1.5° (nom.)

Audio demodulation

AF demodulation types		AM and FM
Audio output		loudspeaker and phone jack
Marker stop time in analyzer mode		100 ms to 60 s

Inputs and outputs

RF input		
Impedance		50 Ω
Connector		N female
VSWR	RF attenuation ≥ 10 dB, receiver mode or analyzer mode with preselection on	
	9 kHz ≤ f < 30 MHz	< 1.2
	RF attenuation ≤ 10 dB, receiver mode or analyzer mode with preselection on	
	9 kHz ≤ f < 30 MHz	< 2.0
	RF attenuation ≥ 10 dB, analyzer mode with preselection off	
	9 kHz ≤ f < 30 MHz	< 1.5 (nom.)
Setting range of attenuator	input	0 dB to 55 dB, in 1 dB steps
USB interfaces	front	2 ports, type A plug, version 2.0
	rear	2 ports, type A plug, version 3.1
Reference output		
Connector		BNC female
Impedance		50 Ω
Output frequency	internal reference	10 MHz
	external reference	same as reference input signal
Level		> 0 dBm (nom.)
Reference input		
Connector		BNC female
Impedance		50 Ω
Input frequency range		10 MHz ± 5 ppm
Required level		> 0 dBm into 50 Ω
External trigger/gate input		
Connector		BNC female
Trigger voltage		0.5 V to 3.5 V
Input impedance		10 kΩ
IEC/IEEE bus control		interface in line with IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0
Connector		24 pin Amphenol female
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0
LAN interface		10/100/1000BASE-T
Connector		RJ-45
External monitor		
Connector		DisplayPort rev. 1.3

User port		
Connector		25 pin D-Sub female
Output		TTL compatible, 0 V/5 V, max. 15 mA
Input		TTL compatible, max. 5 V
Noise source control and power sensor		
Connectors	for R&S®NRP-Zxx power sensors	7 pin LEMOSA female
	for noise source control	BNC female
Noise source control output voltage		0 V/28 V, switchable, max. 100 mA (nom.)
IF/video/demod out (analyzer mode)		
Connector		BNC female, 50 Ω
IF out		
Bandwidth		equal to RBW setting
IF frequency		25 MHz
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	0 dBm (nom.)
Video out		
Bandwidth		equal to VBW setting
Output scaling	logarithmic display scale	logarithmic
	linear display scale	linear
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	1 V (nom.), open circuit
Audio output		
Loudspeaker		built-in, volume adjustable
AF out		
Connector		3.5 mm mini jack
Output impedance		10 Ω
Open-circuit voltage		up to 1.5 V, adjustable

General data

Display		21 cm LC TFT color display (10.1")
Resolution		1280 × 800 pixel (WXGA resolution)
Pixel failure rate		$< 1 \times 10^{-5}$
Data storage		
Internal	standard	solid-state drive (SSD) 128 Gbyte
External		supports USB 2.0/3.1 compatible memory devices
Environmental conditions		
Temperature	operating temperature range	+0 °C to +50 °C
	storage temperature range	–20 °C to +70 °C
Climatic loading	without condensation	+40 °C at 85 % relative humidity, in line with EN 60068-2-30,
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm constant amplitude (1.8 g at 55 Hz); 55 Hz to 150 Hz, acceleration: 0.5 g constant; in line with EN 60068-2-6
	random	8 Hz to 500 Hz, acceleration: 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E method no. 516.4 procedure I, MIL-PRF-28800F
EMC		in line with EMC Directive 2014/30/EU including IEC/EN 61326-1 [8, 9], IEC/EN 61326-2-1, CISPR 11/EN 55011 [8], IEC/EN 61000-3-2, IEC/EN 61000-3-3

[8] Emission limits for class B equipment.

[9] Immunity test requirement for industrial environment (EN 61326 table 2).

Recommended calibration interval		1 year
Power supply		
AC supply	with battery option	100 V to 240 V ± 10 %, 50 Hz to 60 Hz ± 5 %
Current consumption	without options	nom. 2.16 A (at 100 V) to 0.95 A (at 240 V)
	with internal battery (R&S®FPL1-B31 option in charge mode)	nom. 3 A to 1.5 A
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test mark		CE, KCC, UKCA
Dimensions and weight		
Dimensions	W × H × D	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)
Net weight, nominal	without options	6.9 kg (15.2 lb)
	with internal battery	8.6 kg (18.95 lb)

Options

R&S®FPL1-B30 DC power input 12 V/24 V

Input voltage range	DC	12 V to 24 V (nom.), 10.4 V to 28 V, switch-on voltage > 11 V (meas.)
Input current	V_{in} = 12 V/24 V	13 A/6.5 A (nom.)
	V_{in} = 12 V/24 V, operating mode, without internal batteries (R&S®FPL1-B31)	6.8 A/3.2 A (meas.)
	V_{in} = 12 V/24 V, operating mode, internal batteries in charge mode	11 A/5 A (meas.)
	V_{in} = 12 V/24 V, instrument standby mode, internal batteries in charge mode	6.5 A/3.0 A (meas.)
Temperature	operating temperature range	0 °C to +40 °C
	storage temperature range	–20 °C to +70 °C

R&S®FPL1-B31 internal lithium-ion battery

Operating time		2 h (nom.)
Charge time	standby mode, AC supply	< 2 h (nom.)
	standby mode, external DC supply (R&S®FPL1-B30)	< 2 h (nom.)
	operating mode	< 4 h (nom.)
Temperature	operating temperature range, discharge	0 °C to +50 °C
	operating temperature range, charge	0 °C to + 45 °C
	storage temperature range	–20 °C to +60 °C [10]

R&S®FSV-B34 charger (only needed for charging spare batteries)

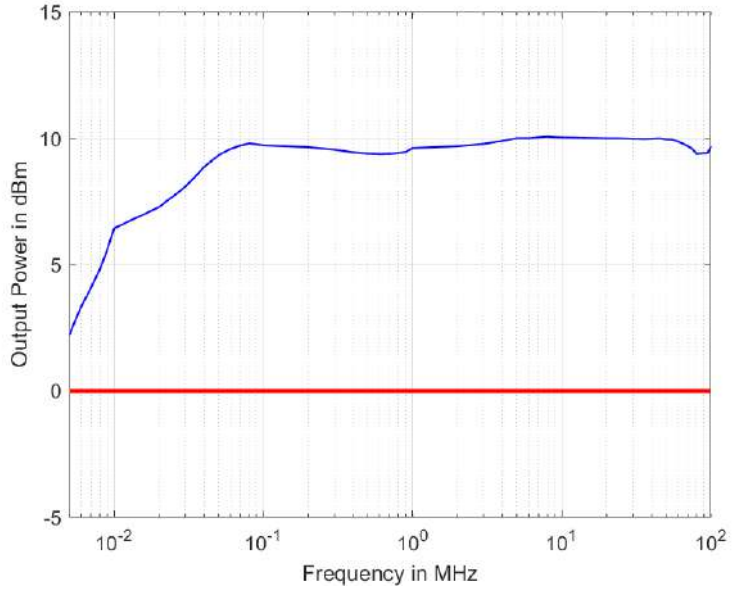
AC input voltage range		100 V to 240 V ± 10 % (nom.)
AC supply frequency		50 Hz to 60 Hz (nom.)
Power consumption		max. 300 W (nom.)
Number of charger bays		4
Dimensions	W × H × D	400 mm × 127 mm × 203 mm (15.75 in × 5 in × 8 in)
Net weight		3.1 kg (6.9 lb)

R&S®EPL1-B91 internal generator

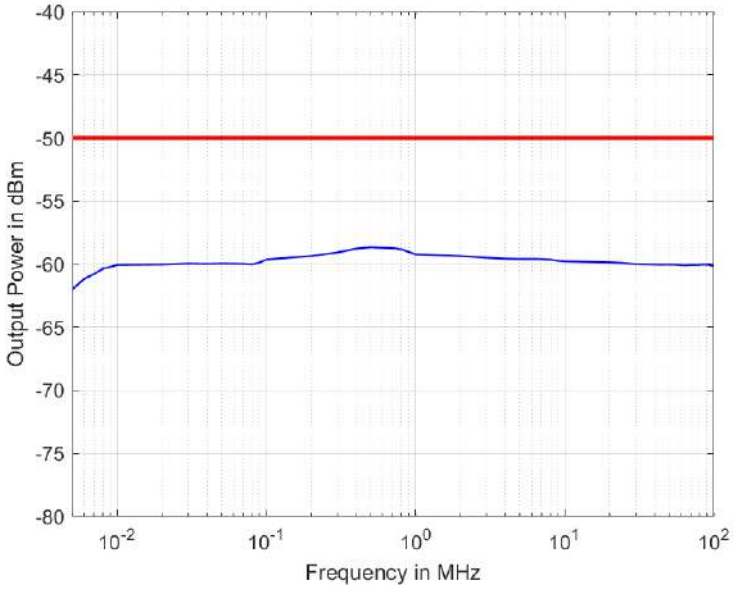
Modes		tracking generator
		independent source
		power sweep
Frequency		
Frequency range		5 kHz to 30 MHz
Setting resolution	independent CW source	0.01 Hz
Frequency offset		
Setting range		0 Hz to 30 MHz
Setting resolution		0.01 Hz
Spectral purity		
SSB phase noise	frequency = 15 MHz, output level = 0 dBm	
	carrier offset = 10 kHz	< –102 dBc (1 Hz), –108 dBc (1 Hz) (typ.)
	carrier offset = 100 kHz	< –105 dBc (1 Hz), –111 dBc (1 Hz) (typ.)
	carrier offset = 1 MHz	< –117 dBc (1 Hz), –130 dBc (1 Hz) (typ.)
Harmonics	output level = 0 dBm, +20 °C to +30 °C	
	5 kHz ≤ f < 100 kHz	< –30 dBc (nom.)
	100 kHz ≤ f ≤ 30 MHz	< –30 dBc
Non-harmonic spurious	output level = 0 dBm	
	1 kHz < offset from carrier ≤ 4 MHz	–35 dBc (nom.)
	offset from carrier > 4 MHz	< –35 dBc, –45 dBc (typ.)

[10] The battery packs should be stored in an environment with low humidity, free from corrosive gas at a recommended temperature range < +21 °C. Extended exposure to temperatures above +45 °C could degrade battery performance and life.

Level		
Specified level range		–50 dBm to 0 dBm
Setting resolution		0.1 dB
Setting range		–60 dBm to +10 dBm
Absolute level uncertainty	frequency =16.667 MHz, +20 °C to +30 °C, output level = –10 dBm, frequency offset = 0 Hz	< 0.5 dB
Frequency response	output level = –10 dBm, referenced to level at 16.667 MHz, +20 °C to +30 °C, frequency offset = 0 Hz	
	100 kHz ≤ f ≤ 30 MHz	< 1 dB
Level nonlinearity	for specified level range, referenced to –10 dBm output level, +20 °C to +30 °C, f ≥ 100 kHz	≤ 2 dB, < 0.5 dB (typ.)



Maximum output power versus frequency, level in dBm (meas.)



Minimum output power versus frequency, level in dBm (meas.)

Dynamic range	RBW = 1 kHz, f = 30 MHz	115 dB (nom.)
Power sweep		
Specified level range		–50 dBm to 0 dBm
Setting resolution		0.1 dB
Setting range		–60 dBm to +10 dBm
GEN output		
Connector		N female, 50 Ω
VSWR		1.5 (nom.)
Reverse power		
DC voltage		50 V
CW RF power		30 dBm (= 1 W)
Maximum pulse voltage		150 V
Maximum pulse energy	pulse duration: 10 µs	1 mWs

R&S®EPL1-K56 IF analysis

Level display (receiver mode)		
IF spectrum		
Span		max. 10 MHz
Resolution bandwidths		10 Hz to 100 kHz, in 1/2/3/5 sequence
Detector		sample
Logarithmic level axis		10 dB to 200 dB, in steps of 10 dB
Frequency axis		linear
Number of traces		3

Ordering information

Designation	Type	Order No.
EMI test receiver	R&S®EPL1000	1350.4444.10
Accessories supplied: power cable, quick start guide		

Options

Designation	Type	Order No.	Retrofittable	Remarks
OCXO reference frequency	R&S®FPL1-B4	1323.1902.02	yes	retrofit in service center
GPIB interface	R&S®FPL1-B10	1323.1890.02	yes	user-retrofittable
Replacement SSD including controller unit	R&S®EPL1-B19	1350.4450.02	yes	user-retrofittable mounted on PC board, including analyzer firmware
DC power supply, 12 V/24 V	R&S®FPL1-B30	1323.1877.02	yes	user-retrofittable
Internal lithium-ion battery	R&S®FPL1-B31	1323.1725.02	yes	retrofit in service center; including 2 battery packs and internal charging unit
Internal generator 5 kHz to 30 MHz	R&S®EPL1-B91	1350.4073.02	no	
Firmware				
AM/FM/PM measurement demodulator	R&S®FPL1-K7	1323.1731.02		
IF analysis	R&S®EPL1-K56	1350.4067.02		
EMC test software				
Essential EMI test software	R&S®ELEMI-E	5601.0030.02		
License dongle	R&S®EMCPC	5601.0018.02		

Recommended extras

Designation	Type	Order No.
Protective hard cover	R&S®EPL1-Z1	1350.4296.02
Soft carrying bag for transport and outdoor operation	R&S®EPL1-Z2	1350.4309.02
H-style shoulder harness (requires R&S®EPL1-Z2 option)	R&S®EPL1-Z3	1350.4315.02
Spare lithium-ion battery pack	R&S®FPL1-Z4	1323.1677.02
Anti-glare display film for outdoor operation	R&S®FPL1-Z5	1323.1690.02
Lithium-ion battery charger for charging spare batteries	R&S®FSV-B34	1321.3950.02
19" rackmount kit	R&S®EPL1-Z6	1350.4321.02
Control cable for R&S®ENV216/R&S®ENV432/R&S®ENV420		
Length: 3 m	R&S®EZ-21	1107.2087.03
Length: 10 m	R&S®EZ-21	1107.2087.10
Accredited calibration	R&S®ACAEPL1000	Contact your local Rohde & Schwarz sales office.

Service options		
Extended warranty, one year	R&S®WE1	Contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
Extended warranty with accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [11]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW4)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [11] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 to AW4)
Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs [11] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

[11] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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