R&S®FSW-K54
EMI Measurement Application
Detecting and eliminating electro-magnetic interference

ROHDE&SCHWARZ

Test & Measurement

Product Brochure | 01.00

R&S®FSW-K54 EMI Measurement Application

At a glance

The R&S®FSW-K54 EMI measurement application adds EMI diagnostic functionality to the R&S®FSW signal and spectrum analyzer's range of functions. For precompliance measurements in preparation for certification, the R&S®FSW-K54 option includes EMI bandwidths for commercial and military applications, detectors such as peak, quasi-peak, CISPR-average and RMS-average, limit lines and correction factors.

Product configuration in three steps	
Step 1: Select the measuring instrument	
Analyzer	**R&S®FSW signal and spectrum analyzer**
Spectrogram measurement	•
AM/FM demodulator	•
AUX port	•
Step 2: Add options	
EMI measurement application	**R&S®FSW-K54**
CISPR 16-1-1 (Ed. 3.1) weighting detectors	•
CISPR 16-1-1 (6 dB bandwidths)	•
Parallel detectors (max. 6 traces)	•
Measurement marker function	•
Marker demodulation	•
Logarithmic and linear sweep display	•
Sweep points	max. 200 001
Limit lines	•
Correction factors for accessories	•
Frequency table	max. 16 points
Remote control of V-networks (LISN) (e.g. R&S®ENV216/R&S®ENV4200)	manual
Step 3: Add automation	
EMI software (PC-based)	**R&S®ES-SCAN**
Definition of test sequences	•
Interactive test sequence control	•
Peak search with final measurement	•
Report generation	•
Frequency table	max. 500 points
Remote control of V-networks (LISN) (e.g. R&S®ENV216/R&S®ENV4200)	automatic

All electronic devices must pass electromagnetic compatibility (EMC) tests in order to obtain market approval by regulatory boards. Throughout the development process, observing EMC limits is a critical factor, one that impacts the time-to-market. It is therefore essential to be able to assess and influence the EMC behavior of products during the product development design phase.

The R&S®FSW-K54 option allows users to analyze the effectiveness of shielding measures and the effects of changes in the circuit or design prior to EMC testing. Developers can use the R&S®FSW to reliably detect and eliminate all types of interferers in the spectrum, including narrowband and wideband interferers, intermittent interferers and interferers that drift in frequency. Using the integrated AM/FM demodulator to identify ambient interferers, for example during open area testing, makes it possible to exclude these frequencies in the final measurement. A spectrogram measurement provides information about the signal amplitude and frequency versus time.

Key facts

- Standard-compliant EMI detectors: peak, quasi-peak, CISPR-average, RMS-average
- EMI bandwidths for commercial and military standards
- Trace wizard with up to six parallel traces
- Measurement markers linked to various EMI detectors
- Marker peak search function with color coding in frequency table
- Limit lines and transducers for typical measurement tasks
- Choice of linear or logarithmic scale on frequency axis
- Up to 200 001 sweep points for higher spectrum resolution
- AM/FM audio demodulation for easier identification of interferers
- Remote control of V-networks (LISN) via built-in AUX port

R&S®FSW-K54 EMI Measurement Application

Benefits and key features

EMI detectors in line with CISPR 16-1-1

- Flexible allocation of standard-compliant EMI detectors such as peak, quasi-peak, CISPR-average and RMS-average for all traces
- Fast, easy-to-read diagnostic measurements with high result reproducibility
- Easy detection of critical disturbance signal amplitudes

Measurement bandwidths in line with CISPR and MIL-STD

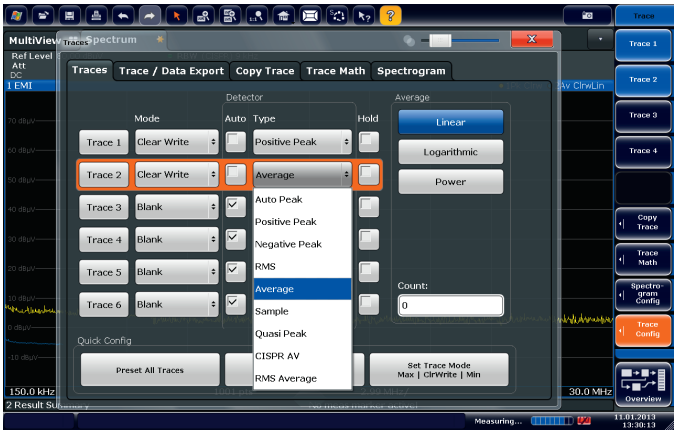
- Use of 6 dB bandwidths (CISPR from 200 Hz to 1 MHz, MIL-STD from 10 Hz to 1 MHz) for diagnostic measurements during development

Measurement markers for evaluating EMI

- Simplified targeted analysis through measurement markers on the disturbance signal frequency
- Direct comparison of limits through linking measurement markers to traces (max. 6) and associated EMI detector
- Automatic searching for disturbance maxima for reliable detection of interferers
- Critical frequencies entered in a peak list for fast evaluation with respect to EMI emission limits

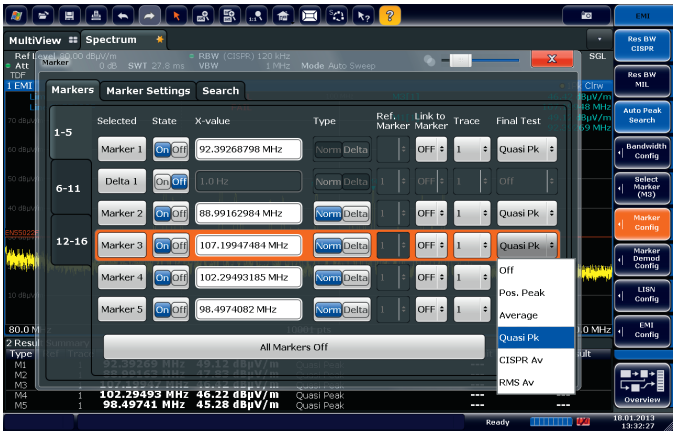
Marker demodulation

- Fast and reliable identification of AM and FM signals; known ambient interferers can be excluded from final measurement



Trace detector selection.

Bandwidth selection.



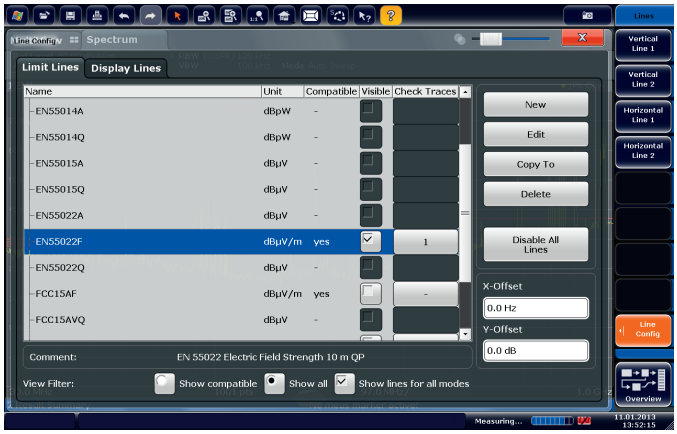
Measurement marker configuration.

EMI limit lines

- Selection of limit lines in accordance with international standards included
- Easy generation, editing and use of customer-specific limit lines
- Fast pass-fail testing using activated limit lines

Frequency-dependent correction value tables

- Database with correction value tables for EMI accessories such as antennas, clamps, line impedance stabilization networks (LISN), pulse limiters, preamplifiers, cables and attenuators
- Easy generation, editing and storage of new correction value tables
- High accuracy by including correction values for frequency-dependent accessories in the trace
- Combination of several correction tables possible, for example for an antenna, a cable and a preamplifier, to compensate for the entire test setup



Limit lines.

Correction value table.

Logarithmic spectrum display

The spectrum display with logarithmic frequency axis makes it easy to analyze measurement results over a wide frequency range and to display limit lines, test reports and measurement documentation in accordance with standards. Measurement results can be better compared with results from test receivers.

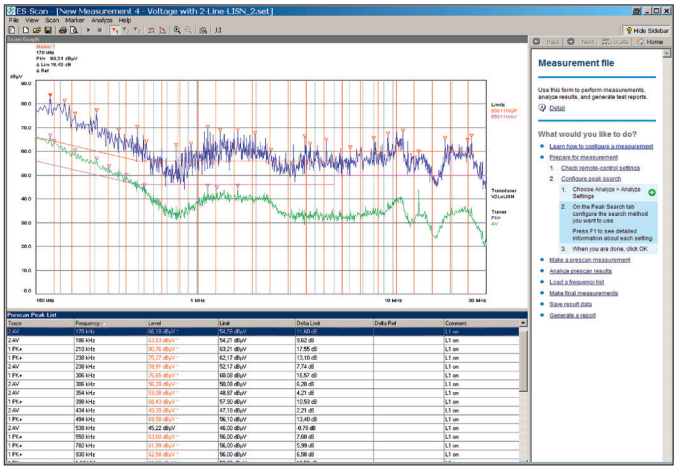
Spectrogram function

The R&S®FSW spectrogram display allows users to analyze the behavior of disturbance signals versus time. Measured spectra are recorded and displayed as vertical lines lined up next to each other. Color coding indicates the amplitude. The spectrum and spectrogram are displayed simultaneously on the screen.

Selection menu for LISNs.

Spectrogram display.

Application



R&S®ES-SCAN EMI software.

R&S®ES-SCAN EMI software

R&S®ES-SCAN allows users to remotely control simple tests on the R&S®FSW with R&S®FSW-K54. R&S®ES-SCAN is a cost-effective, user-friendly Windows software package that was specially developed for EMI diagnostic measurements during development. The main EMI measurement requirements in accordance with commercial standards have been combined in an easy-to-use application: measurement settings and storage, scan data acquisition and display with automatic data reduction, peak search with acceptance limit and selection of subranges, final measurement with worst-case determination, report generation and measurement data storage.

R&S®EMC32-EB EMI measurement software

The R&S®EMC32-EB application software is ideal for large-scale EMC systems containing masts, turntables or absorbing clamps/slideways. The R&S®FSW with R&S®FSW-K54 can be fully integrated to remotely control automatic test sequences, including report generation.

Ordering information

Designation	Type	Order No.
Base unit		
EMI Measurement Application	R&S®FSW-K54	1313.1400.02
Supported T&M equipment families		
Signal and Spectrum Analyzer	R&S®FSW	1312.8000.xx [1]
Recommended extras		
Control Cable for R&S®ENV216/R&S®ENV4200, length: 3 m	R&S®EZ-21	1107.2087.03
Control Cable for R&S®ENV216/R&S®ENV4200, length: 10 m	R&S®EZ-21	1107.2087.10
Adapter for R&S®EX-21 Control Cable to remotely control R&S®ENV216/R&S®ENV4200 V-networks with R&S®FSW	R&S®EZ-27	1142.8271.02
External accessories		
EMI Software	R&S®ES-SCAN	1308.9270.02
EMI Measurement Software	R&S®EMC32-EB	1300.7010.02
EMI Auto Test Option for R&S®EMC32-EB	R&S®EMC32-K10	1117.6840.02

[1] Depending on model.

For R&S®FSW data sheet, see PD 5214.5984.22 and www.rohde-schwarz.com