Data sheet



Version 01.00

February 2003

Portable System for EMF Measurements R&S®TS-EMF

Accurate measurements of electromagnetic fields caused by transmitter systems

Versatile
- Wide frequency range from 80 MHz to 2.5 GHz
- Short-term and long-term measurements
- Editable measurement packets

Accurate
- High sensitivity and wide dynamic range
- Evaluation in compliance with radio services
- High measurement accuracy

Convenient
- Isotropic sensor
- Compact design
- Preconfigured

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R&S®TS-EMF – the solution for EMF measurements

General

The Portable System R&S®TS-EMF measures electromagnetic fields in the environment. The measurements are necessary as a basis for discussions about the effects of electromagnetic radiation.

Owing to its wide frequency range from 80 MHz to 2.5 GHz, the system complies with all common radio services:

- Mobile radio (GSM, CDMA and UMTS)
- DECT
- *Bluetooth*™
- WLAN (802.11b)
- Sound broadcasting
- TV broadcasting

The frequency-selective measurements determine total emission but also permit assignment to specific radio services. Graphical and numeric result display with reference to a limit value simplifies evaluation.



R&S®TS-EMF applications

User-friendly operation

The R&S®RFEX system software, which has been specially designed for measuring the effects of electromagnetic fields on the environment (EMCE), provides the user with predefined measurement packets for individual emitters. On site, only the required measurement packets and the measurement mode (single or long-term measurement) need to be selected. Equipped with an isotropic antenna, the measurement system is easy to operate and carries out measurements independently of direction and polarization.

During measurements, the sensor can be held in hand or installed on a tripod with the aid of the supplied adapter.

Measurement results are stored in Excel or ASCII format. While ASCII format permits export to any application, Excel supports graphical and numeric display of packet-specific results and total emission. In addition to result display in V/m and W/m^2, values can be evaluated with reference to a (definable) limit value. All results can thus be seen at a glance. The 30 strongest emitters of a measurement packet are graphically displayed for detailed analysis.

Compact design

Due to the compact design of the R&S®TS-EMF, mobile and stationary measurements can be performed. The system can be accommodated in the R&S®FSH3 carrying bag (depending on laptop size).

System design

The frequency-selective EMF measurement system consists of the following components:

- R&S®FSH3, a portable, robust and reliable spectrum analyzer
- An isotropic sensor for accurate field-strength measurements independent of signal direction and polarization
- R&S®RFEX, easy-to-operate system software that can be flexibly configured for versatile EMF measurements

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Configurable

With the aid of the R&S®RFEX system software, the R&S®TS-EMF can be adapted to special tasks. All main parameters, especially the measurement packets, limit values and measurement times, can be defined by the user so that additional radio services and country- and customer-specific requirements can be met. Data stored in ASCII format can also be processed in other applications if required. All raw data from a measurement is available for detailed analyses.

One system for various measurements

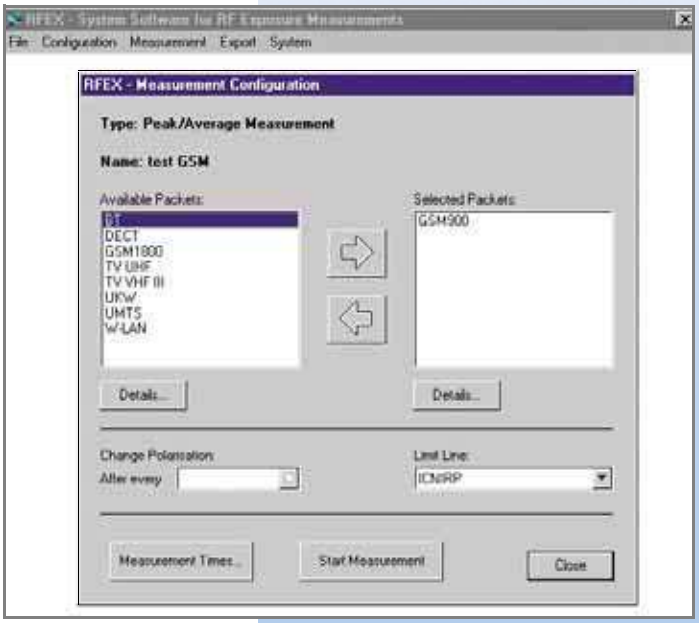
- Overview measurement
- Maximum field strength of an area (also in buildings)
- Measurement with averaging (referenced to limit values)
- Long-term measurement (minutes to days)
- Field-strength characteristic

The requirements of sites and measurement tasks can be met with great flexibility.

Accurate measurements

The predefined measurement packets of the R&S®RFEX system software for EMF measurements ensure optimum detection of individual radio services. Faulty measurements due to incorrect settings can thus be avoided particularly when pulsed signals are measured.

Owing to the high sensitivity and wide dynamic range of the system, even low field strengths can be accurately measured and emissions far below the ICNIRP limit can be detected. In addition, accurate measurements can be carried out at extended distances from the base station, the field-strength characteristic can be obtained and "before/after" comparisons (for renovations or expansions) can also be performed.



Software R&S® RFEX for measurements using measurement packets



R&S® TS-EMF system with R&S® FSH3 carrying bag

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Specifications

Frequency range	80 MHz to 2.5 GHz isotropic reception due to orthogonally arranged antenna elements that can be electronically switched
Field-strength measurement range	approx. 1 mV/m to 100 V/m[1)]
Sensor connecting cable	2 m (detached sensor operation via long cables possible, see Recommended extras)
Sensor connectors	1 × N, 1 × 9-contact Sub-D (switch)
Tripod adapter	¼-inch thread (for standard tripod)
Power supply, mobile	internal NiMH battery, 4-hour operation; alternatively, external 15 V to 20 V DC
Power supply, AC	100 V to 240 V AC, 50 Hz to 60 Hz
Operating temperature range	0 °C to + 50 °C
Ambient conditions for sensor	–10 °C to +50 °C, safety class IP54
Weight	3.5 kg

Requirements for laptop/PC (not part of equipment supplied)	
Operating system	Windows 2000, Windows XP
Hard disk space	min. 4 Mbyte
Display resolution	min. 800 × 600
Interfaces	1 × USB 1 × RS-232-C (alternatively: 2 × USB with USB – RS-232-C converter)
Equipment supplied	– Spectrum Analyzer R&S®FSH3 – Isotropic sensor – EMF Software R&S®RFEX – Converter (for sensor control) – Cable set – Carrying bag for R&S®FSH3

[1)] In the case of high field strengths, controller and R&S®FSH3 must be operated in a shielded environment.

Ordering information

Designation	**Type**
Portable System for EMF Measurements	R&S®TS-EMF
Recommended extras	
1 set of sensor cables (8 m)	
Tripod	

More information at
www.rohde-schwarz.com
(search term: TS-EMF)

Certified Quality System ISO 9001 DQS REG. NO 1954 QM

Certified Environmental System ISO 14001 DQS REG. NO 1954 UM

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