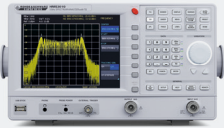





# Spectrum analyzers

Type/designation	Frequency range	DANL (sensitivity)	TOI	RBW	Portability
<b>HMS-X spectrum analyzer</b> 	100 kHz to 1.6 GHz/3 GHz (depending on options)	<ul style="list-style-type: none"> <li>–104 dBm (typ.)</li> <li>With EMC option: –135 dBm (typ.)</li> </ul>	+10 dBm (typ.)	<ul style="list-style-type: none"> <li>10 kHz to 1 MHz, 200 kHz (–3 dB)</li> <li>With EMC option: 100 Hz to 1 MHz, 200 kHz (–3 dB)</li> </ul>	Benchtop
<b>R&amp;S®FSC spectrum analyzer</b> 	9 kHz to 3 GHz/6 GHz (depending on model)	<ul style="list-style-type: none"> <li>&lt; –141 dBm (1 Hz), –146 dBm (1 Hz) (typ.)</li> <li>&lt; –161 dBm (1 Hz), –165 dBm (1 Hz) (typ.) with R&amp;S®FSC-B22 preamplifier option</li> </ul>	> 10 dBm, 15 dBm (typ.) (frequency = 1 GHz)	10 Hz to 3 MHz	<ul style="list-style-type: none"> <li>Compact dimensions</li> <li>Benchtop</li> </ul>
<b>R&amp;S®FSH handheld spectrum analyzer</b> 	9 kHz/100 kHz to 3.6 GHz/8 GHz (depending on model)	<ul style="list-style-type: none"> <li>&lt; –141 dBm (1 Hz), –146 dBm (1 Hz) (typ.)</li> <li>&lt; –161 dBm (1 Hz), –165 dBm (1 Hz) (typ.) with preamplifier</li> </ul>	<ul style="list-style-type: none"> <li>&gt; +10 dBm, +15 dBm (typ.) (300 MHz to 3.6 GHz)</li> <li>&gt; +3 dBm, +10 dBm (typ.) (3.6 GHz to 8 GHz)</li> </ul>	1 Hz to 3 MHz	<ul style="list-style-type: none"> <li>Handheld</li> <li>Ruggedized</li> <li>Low weight: 3 kg (6.6 lb) with battery</li> <li>Up to 4.5 h battery- powered operation</li> <li>Ideal for field applications</li> </ul>
<b>R&amp;S®FSL spectrum analyzer</b> 	9 kHz to 3 GHz/6 GHz (depending on model)	<ul style="list-style-type: none"> <li>&lt; –140 dBm (1 Hz)</li> <li>&lt; –152 dBm (1 Hz), –162 dBm (1 Hz) (typ.) with preamplifier</li> </ul>	+18 dBm (typ.)	<ul style="list-style-type: none"> <li>300 Hz to 10 MHz (standard)</li> <li>10 Hz to 10 MHz (with R&amp;S®FSL-B7 option)</li> </ul>	<ul style="list-style-type: none"> <li>Ruggedized housing</li> <li>Optional battery pack and DC power supply</li> </ul>

## Other instruments with spectrum analysis capability

R&S®ZVH cable and antenna analyzer, with R&S®ZVH-K1 option

▷ [page 34](#)



R&S®ZVL vector network analyzer, with R&S®ZVL-K1 option

▷ [page 35](#)



R&S®ESL EMI test receiver

▷ [page 39](#)



R&S®RTE digital oscilloscope (FFT-based spectrum analysis)

▷ [page 22](#)

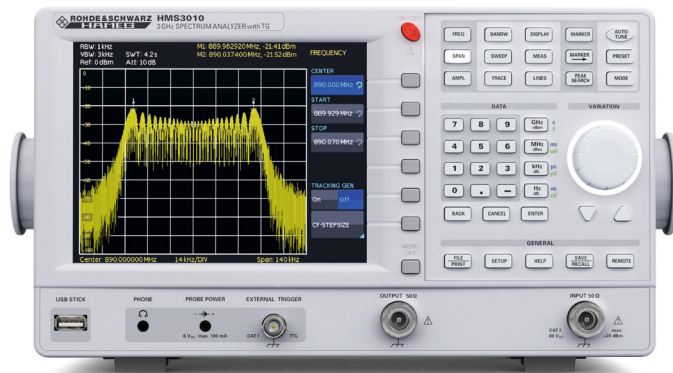


R&S®RTO digital oscilloscope (FFT-based spectrum analysis)

▷ [page 24](#)



## HMS-X Spectrum Analyzer



### The spectrum analyzer platform from HAMEG

- Frequency range: 100 kHz to 1.6 GHz/3 GHz<sup>1)</sup>
- Spectral purity: > -100 dBc (1 Hz) (at 100 kHz)
- Sweep: 20 ms to 1000 s
- Detectors: auto/min./max. peak, sample, RMS, average, quasi-peak<sup>2)</sup>
- Various markers/delta markers and peak functions
- Tracking generator<sup>3)</sup>
  - Frequency range: 5 MHz to 1.6 GHz/3 GHz<sup>1)</sup>
  - Output level: -20 dBm to 0 dBm
- Direct export of data to USB flash drive, RS-232/USB dual interface for remote control
- Fanless design and fast boot time

<sup>1)</sup> With HMS-3G (HV212) option.

<sup>2)</sup> With HMS-EMC (HV213) option.

<sup>3)</sup> With HMS-TG (HV211) option.

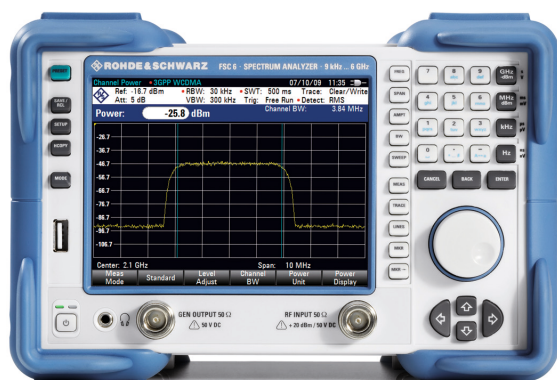
Description	HMS-X option <sup>4)</sup>	Voucher code <sup>5)</sup>
Activation of built-in tracking generator	HMS-TG	HV211
Bandwidth upgrade to 3 GHz	HMS-3G	HV212
EMC option with preamplifier	HMS-EMC	HV213

<sup>4)</sup> Available only with purchase of HMS-X base unit.

<sup>5)</sup> For activation of HMS-X options at any time after purchase.

Application	How the HAMEG HMS-X meets your needs
EMI precompliance measurements	<ul style="list-style-type: none"> <li>■ Free EMI software</li> <li>■ Easy-to-use optional near-field probe sets</li> </ul>
RF measurements	<ul style="list-style-type: none"> <li>■ High accuracy</li> <li>■ High sensitivity</li> </ul>
Filter characteristics, antennas	<ul style="list-style-type: none"> <li>■ Built-in tracking generator (with HMS-TG/HV211 option)</li> <li>■ Optional VSWR bridge</li> </ul>
Education and service	<ul style="list-style-type: none"> <li>■ Fast boot time</li> <li>■ Easy to use</li> <li>■ Lightweight</li> <li>■ DVI output as standard for connection to data projector or external monitor</li> </ul>

## R&S®FSC Spectrum Analyzer



### Professional spectrum analysis – compact and cost-efficient

The R&S®FSC is a compact, cost-efficient solution that offers all essential features of a professional spectrum analyzer with Rohde & Schwarz quality.

#### Key facts

- Frequency range: 9 kHz to 3 GHz or 6 GHz
- Resolution bandwidths from 10 Hz to 3 MHz
- High sensitivity: < -141 dBm (1 Hz);  
with optional preamplifier: < -161 dBm (1 Hz)
- High third-order intercept: > 10 dBm, 15 dBm (typ.)
- Low measurement uncertainty: < 1 dB
- Internal tracking generator (models .13/.16)
- Power meter and preamplifier option
- Storage of measurement results on USB flash drive
- LAN and USB interfaces for remote control and transfer of measurement data
- R&S®FSCView software for simple documentation of measurement results
- Compact dimensions
- Low power consumption (12 W)

#### Models

Designation	Type
Spectrum Analyzer, 9 kHz to 3 GHz, model .03	R&S®FSC3
Spectrum Analyzer, 9 kHz to 3 GHz, with tracking generator, model .13	R&S®FSC3
Spectrum Analyzer, 9 kHz to 6 GHz, model .06	R&S®FSC6
Spectrum Analyzer, 9 kHz to 6 GHz, with tracking generator, model .16	R&S®FSC6

Application	How the R&S®FSC meets your needs
General-purpose spectrum analysis	<ul style="list-style-type: none"> <li>■ Quick check of spectral characteristics (harmonics, AM modulation depth, ACLR, etc.) or for diagnostic applications</li> <li>■ Service and repair centers, training centers, universities or schools</li> <li>■ High measurement accuracy</li> <li>■ High sensitivity</li> <li>■ LAN and USB interfaces</li> </ul>
Use in compact test systems	<ul style="list-style-type: none"> <li>■ Compact size allows installation of two R&amp;S®FSC or one R&amp;S®FSC and one R&amp;S®SMC100A signal generator in a single 19" rack</li> <li>■ Remote control via USB/LAN</li> <li>■ Support of R&amp;S®NRP-Zxx power sensors</li> <li>■ Only 12 W power consumption</li> <li>■ Passive cooling, i.e. no built-in fan</li> </ul>
Power measurements	Precision RF power meter with R&S®NRP-Zxx power sensors
Satellite monitoring	<ul style="list-style-type: none"> <li>■ Satellite dish positioning</li> <li>■ Link management</li> </ul>
Universal instrument	<ul style="list-style-type: none"> <li>■ Determination of transmission characteristics of cables, filters and amplifiers, up to 90 dB dynamic range (model .13 or .16 required)</li> <li>■ Location of EMC problems with near-field probes</li> </ul>

## R&S®FSH Handheld Spectrum Analyzer



### The all-in-one handheld analyzer

The R&S®FSH spectrum analyzer is rugged, handy and designed for use in the field.

#### Key facts

- Spectrum analyzer, cable and antenna tester, full two-port vector network analyzer, modulation analyzer, interference analyzer and power meter in a single device

- Frequency range: 9 kHz to 3.6 GHz or 8 GHz
- Low measurement uncertainty (< 1 dB) and high sensitivity (DANL)
- Easy operation, user-configurable test sequences (wizard) and one-click customizable report
- 20 MHz demodulation bandwidth for analyzing LTE signals
- Support of LTE FDD, TD-LTE, 3GPP WCDMA, GSM and CDMA2000® 1xEV-DO downlink analysis
- Support of LTE-Advanced carrier aggregation
- Easy-to-replace lithium-ion battery for up to 4.5 h of operation
- Rugged, splashproof housing for rough work in the field tested in line with MIL-PRF-28800 class 2
- Easy handling due to low weight (3 kg (6.6 lb)) with battery) and easy-to-reach function keys

#### Models

Designation	Type
Handheld Spectrum Analyzer, 9 kHz to 3.6 GHz, with preamplifier, model .04	R&S®FSH4
Handheld Spectrum Analyzer, 9 kHz to 3.6 GHz, with preamplifier and tracking generator, model .14	R&S®FSH4
Handheld Spectrum Analyzer, 100 kHz to 3.6 GHz, with preamplifier, tracking generator and internal VSWR bridge, model .24	R&S®FSH4
Handheld Spectrum Analyzer, 9 kHz to 8 GHz, with preamplifier, model .08	R&S®FSH8
Handheld Spectrum Analyzer, 9 kHz to 8 GHz, with preamplifier and tracking generator, model .18	R&S®FSH8
Handheld Spectrum Analyzer, 100 kHz to 8 GHz, with preamplifier, tracking generator and internal VSWR bridge, model .28	R&S®FSH8
For higher frequencies, please contact your local Rohde & Schwarz partner.	

Application	How the R&S®FSH meets your needs
RF spectrum measurements and interference hunting	<ul style="list-style-type: none"> <li>■ Various standard measurement functions (channel power, OBW, ACLR, SEM, etc.)</li> <li>■ High measurement accuracy and high sensitivity</li> <li>■ Geotagging and interference analysis</li> </ul>
Installation and maintenance of transmitter stations	<ul style="list-style-type: none"> <li>■ Cable and antenna testing (DTF, return loss, etc.)</li> <li>■ Easy operation, user-configurable test sequences (wizard) and one-click customizable report</li> <li>■ Power measurements with external directional or terminating power sensors</li> <li>■ LTE FDD, TD-LTE, 3GPP WCDMA, GSM and CDMA2000® 1xEV-DO downlink analysis</li> <li>■ Internal SWR bridge with bias tee</li> <li>■ Interference hunting</li> </ul>
Measurements of electromagnetic fields	<ul style="list-style-type: none"> <li>■ Wide frequency range</li> <li>■ Support of isotropic antenna and directional antennas</li> <li>■ Results in dBµV/m and W/m<sup>2</sup></li> <li>■ Channel power measurement function</li> </ul>
Field use	<ul style="list-style-type: none"> <li>■ Rugged housing, low weight (3 kg (6.6 lb)) and compact size</li> <li>■ Battery-operated with long battery operating time and easy-to-replace battery</li> <li>■ Fast and easy to use</li> <li>■ SD memory card for storing thousands of measurement results</li> <li>■ Portrait form factor for excellent handling in the field; MIL-PRF-28800 class 2</li> </ul>
Diagnostic applications in the lab or in service	<ul style="list-style-type: none"> <li>■ Universal instrument for spectrum measurements, vector network analysis and precise power measurements</li> <li>■ Location of EMC problems with near-field probes</li> <li>■ High measurement accuracy and high sensitivity; LAN/USB remote control</li> </ul>

## R&S®FSL Spectrum Analyzer



### High-end functions in an extremely lightweight, compact package

The R&S®FSL is an extremely lightweight, compact spectrum analyzer that is ideal for a large number of applications in development, service and production.

#### Key facts

- Cost-efficient spectrum analyzer with high-quality features
- Frequency range: 9 kHz to 3 GHz/6 GHz
- All models with and without tracking generator
- Best RF characteristics in its class
- Wide I/Q demodulation bandwidth: up to 28 MHz
- Support for WLAN and WiMAX™ testing
- High measurement accuracy
- Portable for field applications
- Compact and lightweight: < 8 kg (18 lb)
- Optional battery operation
- Easy on-site upgradeability

#### Models

Designation	Type
Spectrum Analyzer, 9 kHz to 3 GHz, model .03	R&S®FSL3
Spectrum Analyzer, 9 kHz to 3 GHz, with tracking generator, model .13	R&S®FSL3
Spectrum Analyzer, 9 kHz to 6 GHz, model .06	R&S®FSL6
Spectrum Analyzer, 9 kHz to 6 GHz, with tracking generator, model .16	R&S®FSL6
For higher frequencies, please contact your local Rohde & Schwarz partner.	

Application	How the R&S®FSL meets your needs
Evaluation of broadband signals	Its widest-in-class I/Q demodulation bandwidth of up to 28 MHz allows engineers to measure broadband wireless signals using I/Q data
Insertion loss measurements	The tracking generator models of the R&S®FSL enable the analysis of insertion loss and bandwidth filter measurements
Power measurement option	The R&S®FSL-K9 option expands the spectrum analyzer to a high-precision RF power meter when used with the R&S®NRP-Zxx power sensors
Interference analysis	The spectrogram functionality of the R&S®FSL-K14 option enables unattended signal monitoring, providing versatile interference analysis
WLAN production testing	The WLAN option creates the basis of a WLAN TX production tester

Options		
Designation	Type	Comments
OCXO Reference Frequency, aging $1 \times 10^{-7}$ /year	R&S®FSL-B4	
Additional Interfaces	R&S®FSL-B5	video out, IF out, noise source control, AUX port, connector for R&S®NRP-Zxx power sensors
TV Trigger	R&S®FSL-B6	
Narrow Resolution Filters	R&S®FSL-B7	
Gated Sweep	R&S®FSL-B8	
GPIO Interface	R&S®FSL-B10	
RF Preamplifier (3 GHz/6 GHz)	R&S®FSL-B22	
DC Power Supply, 12 V to 28 V	R&S®FSL-B30	
NiMH Battery Pack	R&S®FSL-B31	requires R&S®FSL-B30
AM/FM/φM Measurement Demodulator	R&S®FSL-K7	
Transmitter Measurements for Bluetooth® V2.0 and EDR	R&S®FSL-K8	
Power Sensor Support	R&S®FSL-K9	requires R&S®FSL-B5 or R&S®NRP-Z3/-Z4 and R&S®NRP-Zxx power sensor
Spectrogram Measurements	R&S®FSL-K14	
Analog and Digital Cable TV Measurements	R&S®FSL-K20	
Application Firmware for Noise Figure and Gain Measurements	R&S®FSL-K30	requires R&S®FSL-B5 and preamplifier
3GPP FDD BTS Application Firmware	R&S®FSL-K72	
CDMA2000® Base Station Analysis	R&S®FSL-K82	
1xEV-DO Base Station Analysis	R&S®FSL-K84	
WLAN Transmitter Measurements for IEEE 802.11a, b, g, j	R&S®FSL-K91	
Upgrade of R&S®FSL-K91 to IEEE 802.11n	R&S®FSL-K91n	
WiMAX™ IEEE 802.16-2004 OFDM Application Firmware	R&S®FSL-K92	
WiMAX™ IEEE 802.16-2009 OFDM/OFDMA Application Firmware	R&S®FSL-K93	
Upgrade from R&S®FSL-K92 to R&S®FSL-K93	R&S®FSL-K92U	
EMI Software	R&S®ES-SCAN	