Spectrum Analyzer

1.6 GHz | 3 GHz

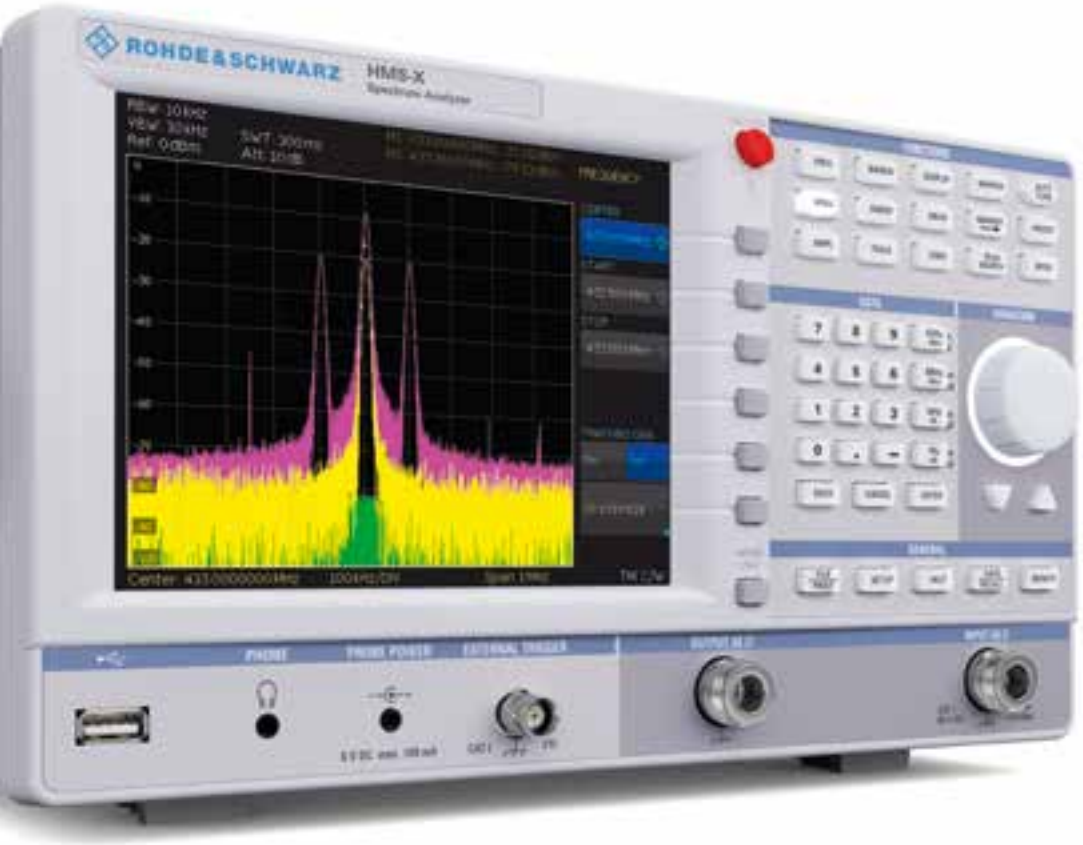
R&S®HMS-X

ROHDE&SCHWARZ

Test & Measurement

Product Brochure | 02.00

1 Basic Unit + 3 Options



Key facts

- Frequency range: 100 kHz to 1.6 GHz/3 GHz*[1]
- Spectral purity greater than -100 dBc/Hz (at 100 kHz)
- SWEEP from 20 ms to 1000 s
- Detectors: auto-, min-/max.-peak, sample, RMS, average, quasi-peak*[2]
- Miscellaneous marker/Δmarker and peak functions
- Tracking generator*[3]
  - Frequency range: 5 MHz to 1.6 GHz/3 GHz*[1]
  - Output level: -20 dBm to 0 dBm
- Directly export data to USB flash drive, RS-232/USB dual interface for remote control
- Fanless design and fast boot time

*[1] with R&S®HMS-3G (HV212) option

*[2] with R&S®HMS-EMC (HV213) option

*[3] with R&S®HMS-TG (HV211) option

Model overview	R&S®HMS-X with EMC Option	R&S®HMS-X basic unit
Amplitude measurement range	-114 dBm to +20 dBm	-104 dBm to +20 dBm
DANL	typ. -135 dBm	typ. -104 dBm
Resolution bandwidth	100 Hz to 1 MHz, 200 kHz (-3 dB), 200 Hz, 9 kHz, 120 kHz, 1 MHz (-6 dB)	10 kHz to 1 MHz, 200 kHz (-3 dB)
Video bandwidth	10 Hz to 1 MHz	1 kHz to 1 MHz

Your R&S®HMS-X Spectrum Analyzer

You can create your R&S®HMS spectrum analyzer by combining a basic unit with any of three available options. In case of growing requirements, upgrade vouchers allow you to upgrade your instruments with all options at any point in time.

R&S®HMS-EMC

- This option activates all the functions that are required for EMC precompliance measurements. The preamplifier option has been integrated into the new R&S®HMS-EMC option.

3 GHz

R&S®HMS-3G

- The frequency range is increased from 1.6 GHz to 3 GHz with this option.

R&S®HMS-TG

- This option activates the tracking generator in the instrument.

We have used the first-class hardware from our HMS spectrum analyzer and developed a new and flexible instrument concept. It can be individually configured, combined and upgraded for your applications.

HMS previous models	R&S®HMS-X
HMS1000E	HMS-X
HMS1000	HMS-X + EMC*
HMS1010	HMS-X + EMC* + TG
HMS3000	HMS-X + EMC* + 3G
HMS3010	HMS-X + EMC* + 3G + TG

* The preamplifier function is an integral part of the HMS-EMC option

EMC Precompliance

Not only do unexpected results in test labs during EMC compliance measurements translate into extra costs, quite often they also cause a substantial delay for your project. Rohde&Schwarz offers effective and cost-efficient tools for EMC precompliance measurements which allow you to successfully prevent possible surprises before the actual onset of a problem.

Our HMExplorer software for your EMC measurements is included with every HMS-X spectrum analyzer with activated EMC option.

HMExplorer software for EMC precompliance measurements

Spectrum analyzer R&S®HMS-X

EMC precompliance sets

Rohde&Schwarz offers product sets for your EMC precompliance measurements, which include all necessary instruments to analyse typical EMC problems. Depending on your requirements, you can choose between a 1 GHz and a 3 GHz combination.

1 GHz EMC-SET1

- Spectrum analyzer R&S®HMS-X incl. R&S®HMS-EMC option
- Probe set R&S®HZ530
- Line impedance stabilization network (LISN) R&S®HM6050-2
- HMExplorer software

3 GHz EMC-SET2

Differences to SET1:

- HMS-3G option additional
- 3 GHz probe set HZ540 instead of HZ530

Line impedance stabilization network for line conducted measurements LISN HM6050-2

1 GHz probe set HZ530

3 GHz probe set HZ540 (fig. similar)

Recommended Accessories

3 GHz VSWR bridge HZ547

This unit is used to measure the voltage standing wave ratio (VSWR) and reflection coefficient of a device under test with an impedance of 50 Ω. Typical test devices include attenuators, terminations, frequency switches, amplifiers, cables and mixers.

3 GHz VSWR bridge for R&S®HMS-X, option R&S®HMS-TG required, option HMS-3G recommended

Near-field probe set 3 GHz HZ540

Near field probe set for comparative measurements with built-in preamplifier covering frequency ranges from 1 MHz to 3 GHz, designed for the 50 Ω N-connectors of the HMS-X:

- E-field probe
- H-field probe
- High impedance probe

HZ46

4 RU 19" rackmount kit

HZ99

Carrying case for protection and transport

R&S®HO732

Ethernet/USB dual interface card

R&S®HO740

Interface IEEE-488 (GPIB), galvanically isolated

HZ530

Near-field probe set 1 GHz

Upgrade at any time

You can easily upgrade all three available options at any later point in time with option upgrade vouchers available at your dealer.

The voucher number and the serial number of your R&S®HMS-X instrument enable you to generate the respective licence key directly on our web page http://voucher.rohde-schwarz.com.

R&S®HMS-X options	Option code*1	Voucher code*2
EMC option incl. preamplifier	R&S® HMS-EMC	HV213
Bandwidth upgrade to 3 GHz	R&S® HMS-3G	HV212
Unlock built-in tracking generator	R&S® HMS-TG	HV211

*1 available only with purchase of R&S®HMS-X basic unit
*2 activate R&S®HMS-X options at any time after purchase of R&S®HMS-X basic unit

Accessories included:
Line cord, printed operating manual, CD, software

Recommended accessories:

HO732	Dual-interface ethernet/USB
HO740	Interface IEEE-488 (GPIB), galvanically isolated
HZ530	Near-field probe set 1 GHz for EMI diagnostics
HZ540	Near-field probe set 3 GHz for EMI diagnostics
HZ547	3 GHz VSWR bridge for HMS-X, incl. HMS-TG option
HZ46	4RU 19" rackmount kit
HZ72	GPIB-cable 2 m
HZ99	Carrying case for protection and transport
HZ520	Plug-in antenna with BNC connection

R&S®HMS-X Spectrum analyzer – Specifications (from firmware version 2.250, all specifications at 23°C after 30 minutes warm-up)

Frequency	
Frequency range	
basic unit	100 kHz to 1,6 GHz
with HMS-3G (HV212) option	100 kHz to 3 GHz
Accuracy of the internal reference	±2 x 10^{-6}
Temperature stability	±2 x 10^{-6} (0°C to +30 °C)
Aging (per year)	±1 x 10^{-6}
Frequency counter (with HMS-EMC (HV213) option)	
Resolution	1 Hz
Accuracy	±(frequency x tolerance of reference)
Span range	
basic unit	0 Hz (Zero Span), 100 Hz to 1.6 GHz
with HMS-3G (HV212) option	0 Hz (Zero Span), 100 Hz to 3 GHz
Spectral purity, SSB phase noise (with HMS-EMC (HV213) option)	
30 kHz from carrier (500 MHz, +20°C to +30 °C)	<-85 dBc/Hz
100 kHz from carrier (500 MHz, +20°C to +30 °C)	<-100 dBc/Hz
1 MHz from carrier (500 MHz, +20°C to +30 °C)	<-120 dBc/Hz
Sweep time	
f_{span} = 0 Hz (zero span)	2 ms to 100 s
f_{span} > 0 Hz	20 ms to 1000 s, min. 20 ms per 600 MHz
Resolution bandwidths (-3 dB)	
basic unit	10 kHz to 1 MHz (in 1 to 3 steps), 200 kHz
with HMS-EMC (HV213) option	100 Hz to 1 MHz (in 1 to 3 steps), 200 kHz
Tolerance	
f ≤ 300 kHz	±5 % typ.
f > 1 MHz	±10 % typ.
Resolution bandwidths (-6 dB)	
with HMS-EMC (HV213) option	CISPR: 200 Hz, 9 kHz, 120 kHz, 1 MHz
Video bandwidths	
basic unit	1 kHz to 1 MHz (in 1 to 3 steps)
with HMS-EMC (HV213) option	10 Hz to 1 MHz (in 1 to 3 steps)
Amplitude	
Display range	Average noise level displayed up to +20 dBm
Amplitude measurement range	
basic unit	-104 dBm to +20 dBm (typ.)
with HMS-EMC (HV213) option	-114 dBm to +20 dBm (typ.)
Max. voltage at HF input	80 V DC
Max. power at HF input	20 dBm (permanently), 30 dBm (temporarily for max. 3 min)
Intermodulation-free range	
TOI products, 2 x -20 dBm (-10 dBm ref. level)	66 dB (typ.) (typ. +13 dBm third-order-intercept)
signal distance ≤2 MHz	60 dB (typ., +10 dBm TOI)
signal distance >2 MHz	66 dB (typ., +13 dBm TOI)

DANL (displayed average noise level) (ref. level ≤-30 dBm, frequency range 10 MHz to 3 GHz)	
10 kHz (RBW), 1 kHz (VBW)	-95 dBm (typ. -104 dBm)
100 Hz (RBW), 10 Hz (VBW) with HMS-EMC (HV213) option	-115 dBm (typ. -135 dBm)
Preamplifier with HMS-EMC (HV213) option	-124 dBm (typ.)
Inherent spurious	
ref.-level ≤-20 dBm, f >30 MHz, RBW ≤100 kHz	<-80 dBm
Input related spurious (mixer level ≤-40 dBm)	
Carrier offset: 1 MHz to 1.6 GHz	-70 dBc (typ.)
1.6 GHz to 3 GHz with HMS-3G (HV212) option	-55 dBc (typ.)
2nd harmonic receive frequency	
Mixer level: -40 dBm	-60 dBc (typ.)
Level display	
Reference level	-80 dBm to +20 dBm in 1 dB steps
Display range	
basic unit	100 dB, 50 dB, 20 dB, 10 dB
with HMS-EMC (HV213) option	linear
level display error (ref. level -50 dBm, 20°C to 30 °C)	<1.5 dB (typ. 0.5 dB)
Display scaling	
logarithmical	dBm, dBµV, dBmV
linear, with HMS-EMC (HV213) option	percentaged from reference level
Measured curves	1 curve and 1 memory curve
Trace mathematics	A-B (curve-stored curve), B-A
Detectors	
basic unit	auto-, min/max. peak, sample, RMS, average
with HMS-EMC (HV213) option	same as basic unit, quasi-peak in addition
Marker and delta marker	
Number of markers	8
Marker functions	peak, next peak, minimum, center to marker, frequency, reference level to marker level, all marker on peak
Marker display	
basic unit	normal (level, logarithmic), delta marker, noise marker, normal (linear)
mit HMS-EMC (HV213) option	(frequency) counter
Connectors	
HF Input	
Connector	N socket
Input impedance	50 Ω
VSWR (10 MHz to 3 GHz)	<1.5 (typ.)

Tracking generator output	
Connector	N socket
Output impedance	50 Ω
Frequency range	
basic unit	5 MHz to 1.6 GHz
with HMS-3G (HV212) option	5 MHz to 3 GHz
Output level	-20 dBm to 0 dBm (in 1 dB steps)
Trigger input	
Connector	BNC socket (TTL)
Trigger types	
basic unit	free run, single trigger, external trigger
with HMS-EMC (HV213) option	same as basic unit, video trigger in addition
External reference input / output	
Connectors	BNC socket
Reference frequency	10 MHz
min. level (50 Ω)	10 dBm
Interfaces	
for mass storage	2x USB-host (type A), FAT16/32
for remote control	HO720 dual interface: RS-232 / USB-device (type B)
Optional interfaces	HO732 dual interface: Ethernet (RJ45) / USB-device (type B) HO740 interface: IEEE-488 (GPIB)
Video output	DVI-D (480p, 60Hz), HDMI compliant
Save and recall	on internal file system (up to 10 device settings) or external USB memory (max. 4 GB)
Additional connectors	
Supply output for field probes	6 V DC, max. 100 mA (2.5 mm DIN jack)
Audio output	3.5 mm DIN jack
Demodulation	AM and FM (via internal speaker)
General Characteristics	
Display	
screen size / type	16.5 cm (6,5") VGA color TFT
resolution	640 x 480 (LED)
Power supply	
AC supply	105 V to 253 V, 50 Hz to 60 Hz, CAT II
power consumption	40 W (typ.)
Safety	safety class I (EN61010-1)
Temperature	
operating temperature range	+5 °C to +40 °C
storage temperature range	-20 °C to +70 °C
Rel. humidity	5% to 80% (without condensation)
Mechanical data	
dimensions (W x H x D)	285 x 175 x 220 mm
weight	3.6 kg

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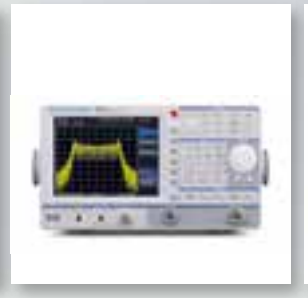


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