HZ530 Near-Field Probe Set

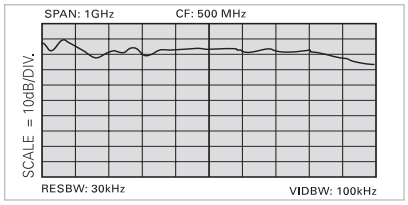
The HZ530 Probe Set consists of three active broadband probes for EMI diagnosis. The probes are designed for connection to a HAMEG spectrum analyzer with input impedance of 50 Ω. The probes can be powered by the spectrum analyzer or batteries. The slim format ensures easy access to the test object even in cramped test environments.

The H-field probe provides a signal that is proportional to the magnetic field strength to the spectrum analyzer. This makes it possible to localize sources of interference with relatively high precision.

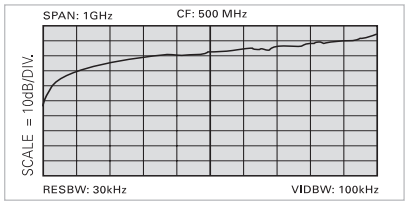
The high-impedance probe can be used to determine interference levels on contacts, lines and printed circuit boards.

The E-field probe is the most sensitive of the three probes. It can be used to assess the total effect of shielding and filtering in a tested unit.

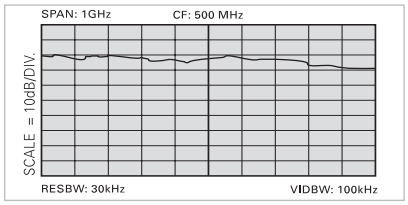
Typical frequency response E-field probe



Typical frequency response H-field probe



Typical frequency response High impedance probe



Technical specifications at 23 °C ± 2 °C

Frequency Range:	100 kHz to 1 GHz
Supply Voltage:	6 V DC from Spectrum Analyzer or batteries (4x Mignon/AA, not included)
Supply Current:	approx. 10 – 24 mA DC
Probe Dimensions:	40 x 90 x 195 mm
Cabinets:	plastic, internal electrical shielding
Set includes:	1 E-field probe 1 H-field probe 1 high-impedance probe 1 BNC cable 1.5 m 1 power cable Operator's Manual Robust carrying case

www.hameg.com

HAMEG Instruments GmbH · Industriestr. 6 · D-63533 Mainhausen · Tel +49 (0) 6182 800 0 · Fax +49 (0) 6182 800 100 · www.hameg.com · info@hameg.com

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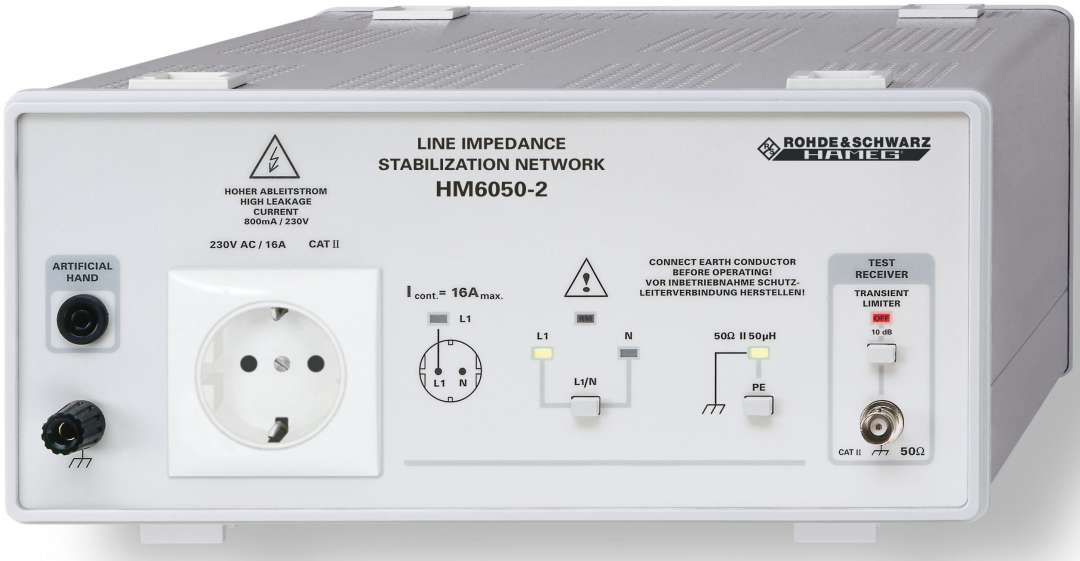
Line Impedance Stabilization Network
HM6050-2

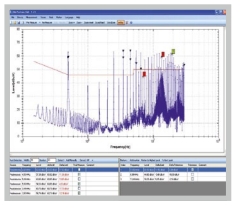
HM6050-2



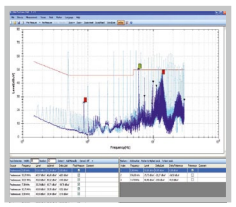
- ☑ Measurement of Line-conducted Interferences within the Range from 9kHz...30MHz (CISPR 16)
- ☑ Selectable Transient Limiter
- ☑ Artificial Hand Connector

HM6050-2K
(UK Version, 230V)
HM6050-2S
(US Version, 115V)

Measurement
of Line-conducted
Interference: Fail



Measurement
of Line-conducted
Interference: Pass



Technical Specifications at 23°C ±2°C

Frequency Range:	9kHz...30MHz
Impedance Characteristics:	Z = 50Ω || (50µH + 5Ω), Error <20% under terms of VDE 876T1
Max. Current:	16A
Line Voltage/Frequency:	230V/50...60Hz, CAT II
Artificial Hand:	220pF + 511Ω
PE (selectable):	50µH || 50Ω

Transient Limiter

Frequency Range:	150kHz...30MHz
Transmission Loss:	10dB (+1.5/-0.5dB)

Connectors

Measurement Output:	50Ω BNC
Power Supply Socket for DUT:	Standard German (UK, US) wall outlets
Artificial Hand:	4mm banana socket
Line Cord:	fixed

Miscellaneous

Operating Temperature:	10...40°C
Power Supply:	HM6050-2D (DE Version) 230V ±10%, 50...60Hz HM6050-2K (UK Version) 230V ±10%, 50...60Hz HM6050-2S (US Version) 115V ±10%, 50...60Hz
Safety Class:	Safety class I (IEC1010-1/VDE 0411)
Dimensions and Weight:	285 x 125 x 380mm (W x H x D), approx. 6kg

HM6050-2E/140812 · C&E · Subject to change without notice · © HAMEG Instruments GmbH® · DQS-certified in accordance with DIN EN ISO 9001:2008, Reg.-No.: 071040 QM08
HAMEG Instruments GmbH · Industriestr. 6 · D-63533 Mainhausen · Tel +49 (0) 6182 8000 · Fax +49 (0) 6182 800100 · www.hameg.com · info@hameg.com

Spectrum Analyzer

1.6 GHz | 3 GHz

HMS-X

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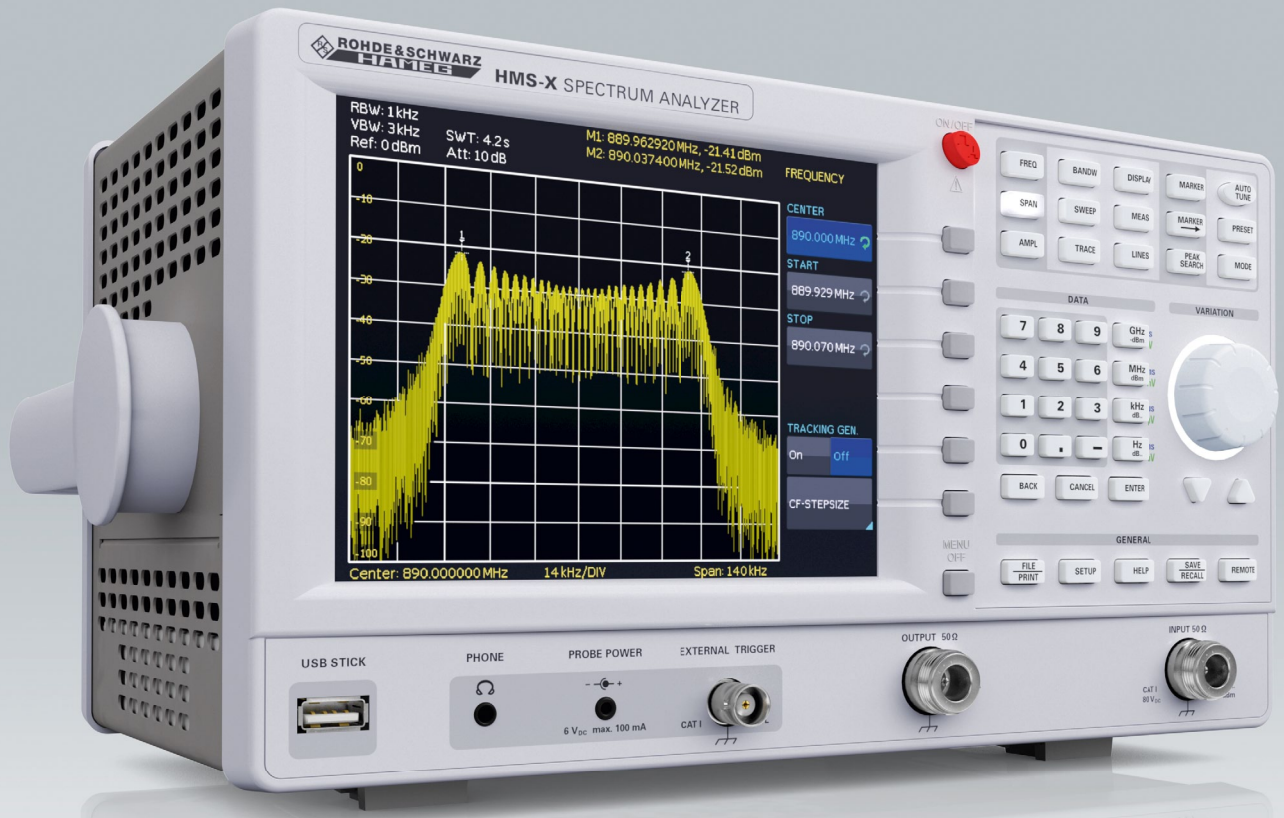
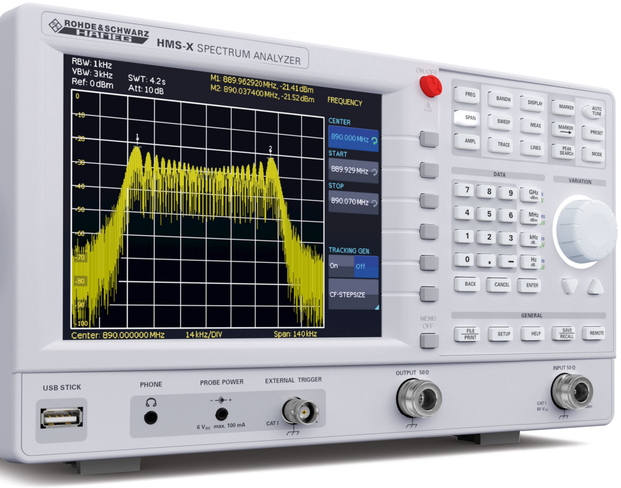


ROHDE&SCHWARZ

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 HMS-3G (HV212) option
*2 with HMS-EMC (HV213) option
*3 with HMS-TG (HV211) option

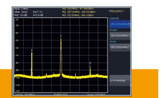
HMS-EMC | HMS-3G | HMS-TG

HMS-X

Model overview:	HMS-X with EMC option	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 HMS-X Spectrum Analyzer

You can create your 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.



HMS-EMC

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

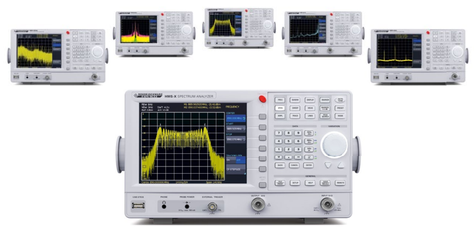
3 GHz

HMS-3G

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

HMS-TG

- This option activates the tracking generator in the instrument.



We have used the first-class hardware from our largest 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	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

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 HMS-X instrument enable you to generate the respective licence key directly on our web page http://voucher.hameg.com.

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

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

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. HAMEG 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.

EMC precompliance sets

HAMEG 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 HMS-X incl. HMS-EMC option
- Probe set HZ530
- Line impedance stabilization network (LISN) HM6050-2
- HMExplorer software

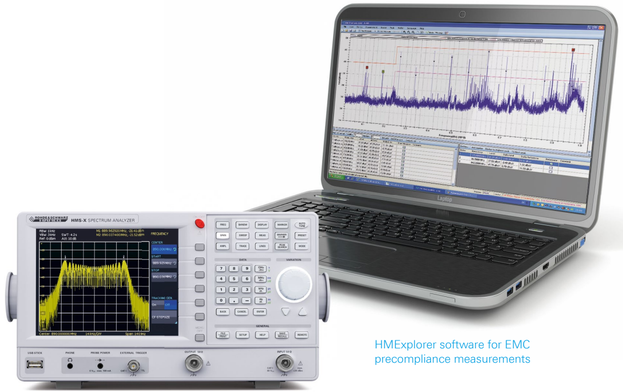
HMS-X | HMS-EMC

3 GHz EMC-SET2

Differences to SET1:

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

HMS-X | HMS-EMC | HMS-3G



HMExplorer software for EMC precompliance measurements

Spectrum analyzer HMS-X

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

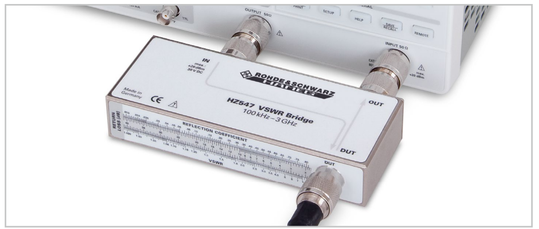
1 GHz probe set HZ530

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 HMS-X, option HMS-TG required, option HMS-3G recommended

Near-field probe set 3 GHz HZ540 | HZ550

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:

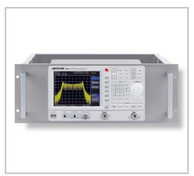
- E-field probe
- H-field probe
- High impedance probe
- µH-field probe (HZ550)
- Radiation probe (HZ550)

Alternative version HZ540L | HZ550L

Same specification as HZ540 | HZ550, but with low capacitance probe instead of high impedance probe

HZ46

4 RU 19" rackmount kit



HZ99

Carrying case for protection and transport

HO730

Ethernet/USB dual interface card

HO740

Interface IEEE-488 (GPIB), galvanically isolated

HZ530

Near-field probe set 1 GHz

Spectrum analyzer HMS-X Firmware: ≥ 2.022

Frequency	
Frequency range:	100 kHz to 1.6 GHz
	100 kHz to 3 GHz*1
Temperature stability:	±2 ppm (0 to 30 °C)
Aging:	±1 ppm/year
Frequency counter*2:	
Resolution	1 Hz
Accuracy	±(Frequency x tolerance of reference)
Span setting range:	0 Hz (zero span) and 100 Hz to 1.6 GHz
Basic unit	0 Hz (zero span) and 100 Hz to 3 GHz*1
Spectral purity, SSB phase noise:	
30 kHz from carrier (500 MHz, +20 to 30 °C)	<-85 dBc/Hz*2
100 kHz from carrier (500M Hz, +20 to 30 °C)	<-100 dBc/Hz
1 MHz from carrier (500MHz, +20 to 30 °C)	<-120 dBc/Hz
Sweep time:	
Span = 0 Hz	2 ms to 100 s
Span > 0 Hz	20 ms to 1000 s, min. 20 ms/600 MHz
Resolution bandwidths (-3 dB):	10 kHz to 1 MHz in 1–3 steps, 200 kHz
	100 Hz to 1 MHz in 1–3 steps, 200 kHz*2
Tolerance	
≤300 kHz	±5% typ.
1 MHz	±10% typ.
Resolution bandwidths (-6 dB):	200 Hz, 9 kHz, 120 kHz, 1 MHz*2
Video bandwidths:	1 kHz to 1 MHz in 1–3 steps
	10 Hz to 1 MHz in 1–3 steps*2

Amplitude	
Display range:	Average noise level displayed up to +20 dBm
Amplitude measurement range:	
	Typ. -104 to +20 dBm
	Typ. -114 to +20 dBm*2
Max. permissible DC at HF input:	80 V
Max. power at HF input:	20 dBm, 30 dBm 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)
(at distance between signals ≤2 MHz)	60 dB typ. (+10 dBm TOI)
(at distance between signals >2 MHz)	66 dB typ. (typ. +13 dBm TOI)

DANL (Displayed average noise level):	
(RBW 10 kHz, VBW 1 kHz, ref. level ≤-30 dBm 10 MHz to 1.6 GHz/3 GHz*1)	-95 dBm, typ. -104 dBm
(RBW 100 Hz, VBW 10 Hz, Ref. Level ≤-30 dBm 10 MHz to 1.6 GHz/3 GHz*1)	-115 dBm*2, typ. -135 dBm*2
Preamp. deactivated	typ. -124 dBm*2
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)	-70 dBc typ.
(2 to 3 GHz)	-55 dBc*1
2nd harmonic receive frequency:	
(mixer level -40 dBm)	-60 dBc typ.
Level display:	
Reference level	-80 to +20 dBm in 1 dB steps
Display range	100 dB, 50 dB, 20 dB, 10 dB
	linear*2
Logarithmic display scaling	dBm, dBµV, dBmV
Linear display scaling	Percentage of reference level*2
Measured curves:	1 curve and 1 memory curve
Trace mathematics:	A-B (curve-stored curve), B-A
Detectors:	Auto-, Min-, Max-Peak, Sample, RMS, Average
	Quasi-Peak*2
Failure of level display:	<1.5 dB, typ. 0.5 dB
(ref. level -50 dBm, 20 to 30 °C)	

Marker/Deltamarker	
Number of marker:	8
Marker functions:	Peak, next peak, minimum, center = marker, frequency, reference level = marker level, all marker on peak
Marker displays:	Normal (level, log.), delta marker, noise marker
	Normal (lin.), (frequency) counter*2

Inputs/Outputs	
HF Input:	N socket
Input impedance	50 Ω
VSWR (10 MHz to 1.6 GHz/3 GHz*1)	<1.5 typ.
Output tracking generator*3:	N socket
Output impedance	50 Ω
Frequency range	5 MHz to 1.6 GHz/3 GHz*1
Output level	-20 to 0 dBm, in 1 dB steps

Trigger input:	BNC female
Trigger voltage	TTL
Ext. reference input/output:	BNC females
Reference frequency	10 MHz
Essential level (50 Ω)	10 dBm
Supply output for field probes:	6 Vdc, max. 100 mA (2.5 mm DIN jack)
Audio output (Phone):	3.5 mm DIN jack
Demodulation	AM and FM (internal speaker)

Miscellaneous	
Display:	16.5 cm (6.5") TFT Color VGA Display
Save/Recall memory	10 complete device settings
Trigger	Free run, Single Trigger, external Trigger
	Video Trigger*2
Interfaces:	Dual-Interface USB/RS-232 (HO720), USB-Stick (frontside), USB-Printer (rear side), DVI-D for ext. monitor
Power supply:	105/253 V, 50 to 60 Hz, CAT II
Power consumption:	Max. 40 W at 230 V, 50 Hz
Protection class:	Safety class I (EN61010-1)
Operating temperature:	+5 to +40 °C
Storage temperature:	-20 to +70 °C
Rel. humidity:	5 to 80% (non condensing)
Dimensions (W x H x D):	285 x 175 x 220 mm
Weight:	3.6 kg

*1 with activated HMS-3G option
*2 with activated HMS-EMC option
*3 with activated HMS-TG option

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

Recommended accessories:

HO730	Dual-interface ethernet/USB
HO740	Interface IEEE-488 (GPIB), galvanically isolated
HZ530	Near-field probe set 1 GHz for EMI diagnostics
HZ540/550	Near-field probe set 3 GHz for EMI diagnostics
HZ540L/550L	Near-field probe set 3 GHz for EMI diagnostics
HZ547	3 GHz VSWR bridge for HMS-X incl. HMS-TG option
HZ13	Interface cable (USB) 1.8 m
HZ14	Interface cable (serial) 1:1
HZ21	Adapter N (plug) - BNC (socket)
HZ46	4RU 19" rackmount kit
HZ72	GPIB-cable 2 m
HZ99	Carrying case for protection and transport
HZ520	Plug-in antenna with BNC connection
HZ525	50 Ω-termination, N plug
HZ560	Transient limiter
HZ575	75/50 Ω converter

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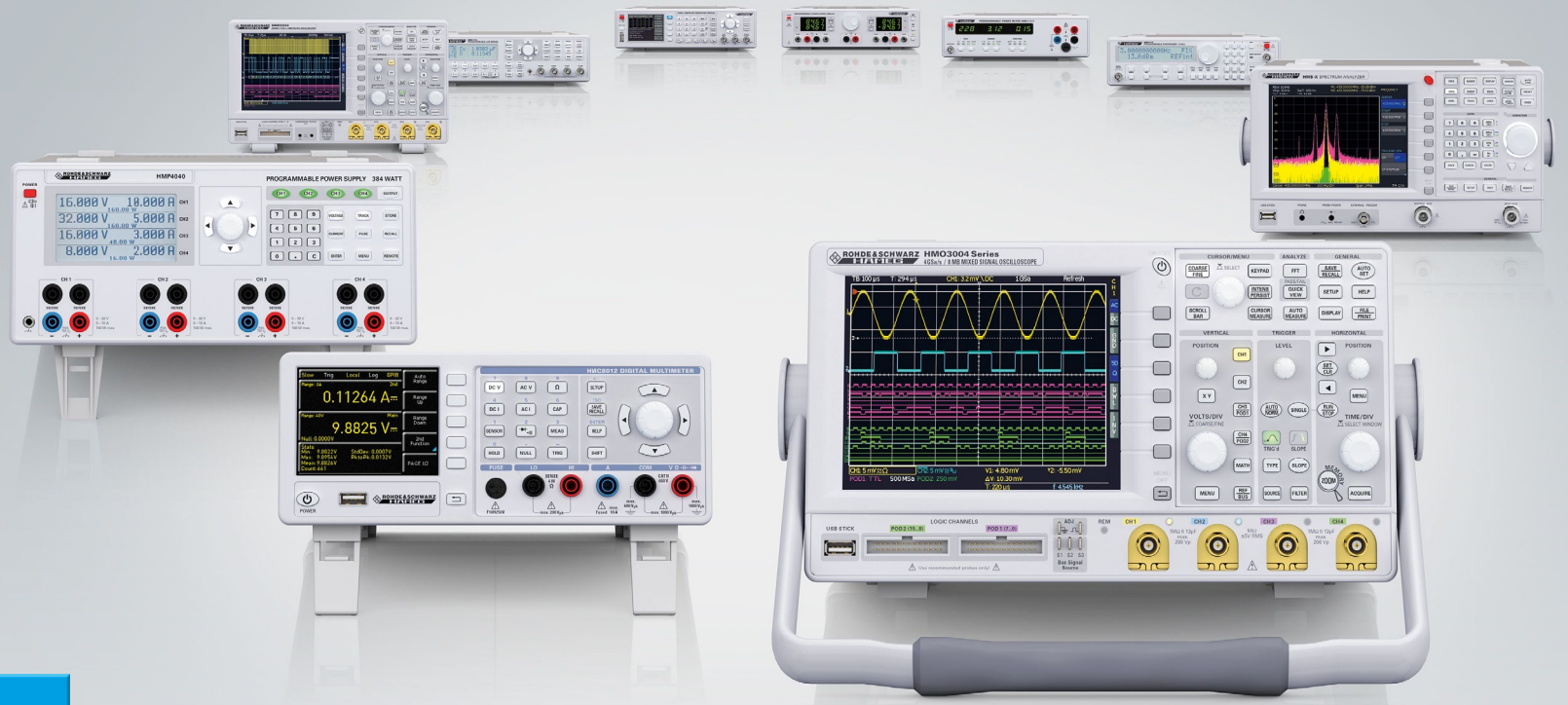

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www.hameg.com

HAMEG Instruments GmbH
Industriestr. 6 | 63533 Mainhausen | Germany | Tel +49 (0) 6182 8000