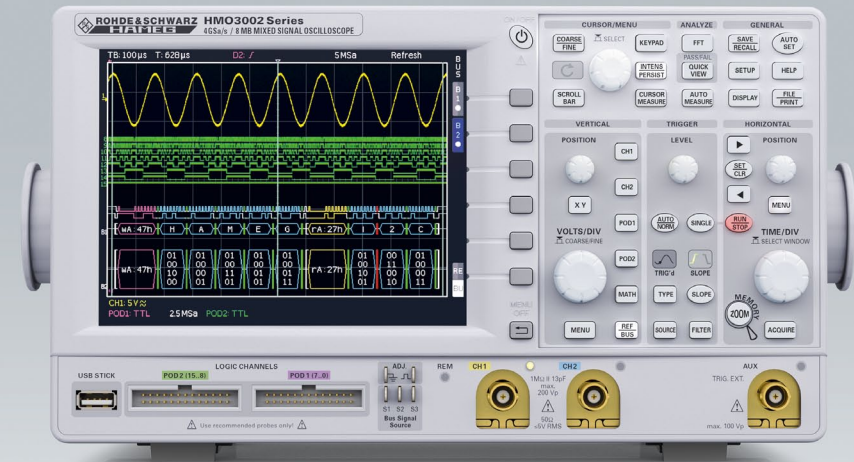
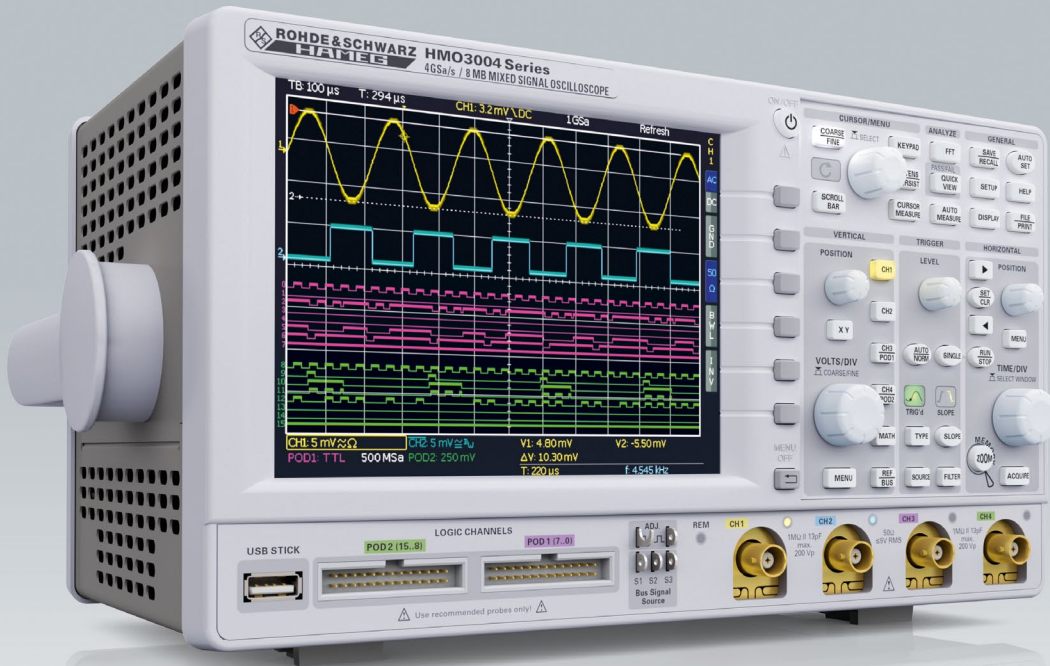


# Mixed Signal Oscilloscopes

## 300 MHz | 400 MHz | 500 MHz

### HMO3000 Series

**HAMEG**<sup>®</sup>  
Instruments  
A Rohde & Schwarz Company



# Video



HMO3000 product video:  
Scan, click or go to  
<http://youtube.com/HAMEGcom>

HMO3004 Series, 500MHz with 4 Channels

### Precise signal analysis

4 GSamples/s sampling rate  
8 MPoints memory

### Intelligent user interface

To optimize the screen display, the instrument shows and hides menus

### FFT

Superb FFT functionality

### Quick view

At the push of a button the 16 most important values of the measured signal are permanently updated and displayed

### Setup

Intuitive, multi-lingual user menu

### Help

Context-sensitive help

### Math

Wide range of programmable math functions

### Zoom

Memory zoom up to 200,000:1

### Analog channels

Vertical sensitivity of up to 1mV/div.

### Display

Superb 16.5 cm (6.5") LED-backlit TFT display

### Standard MSO functionality

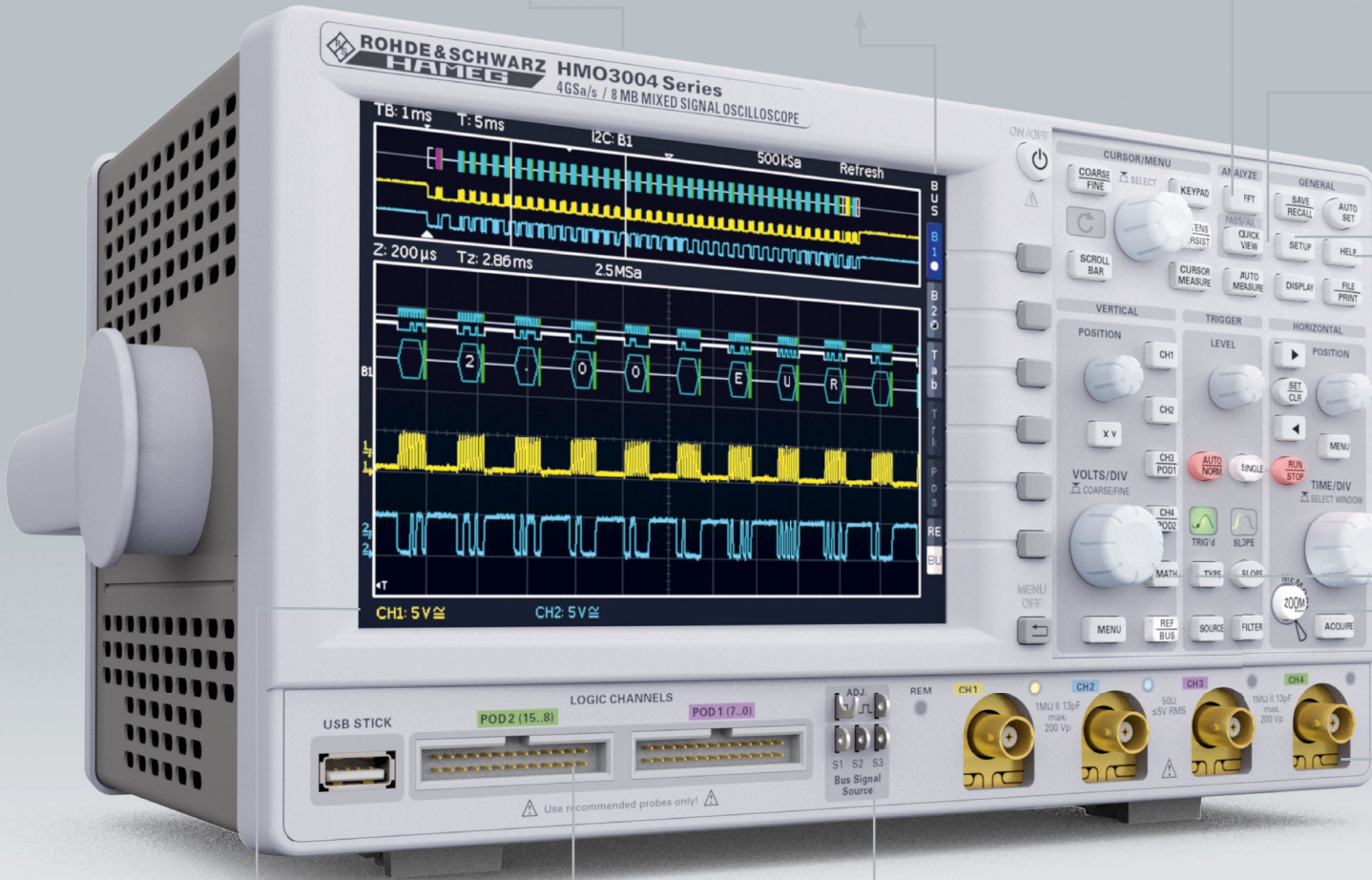
Analyze analog channels plus up to an additional 16 digital channels

### Bus signal source

To create SPI, I<sup>2</sup>C, UART and counter test-signals

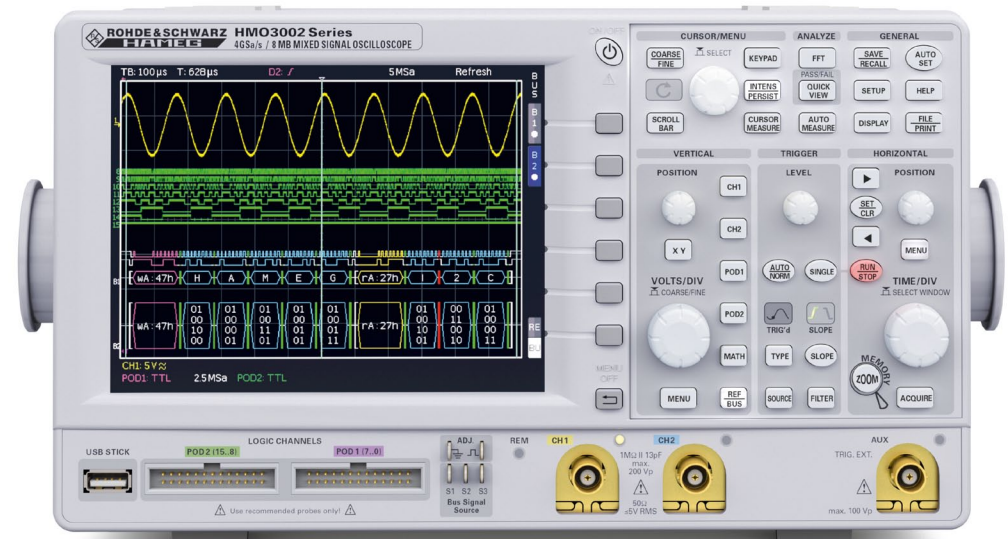
### Fan

Maximum noise reduction by temperature-controlled fan



# up to 500 MHz...

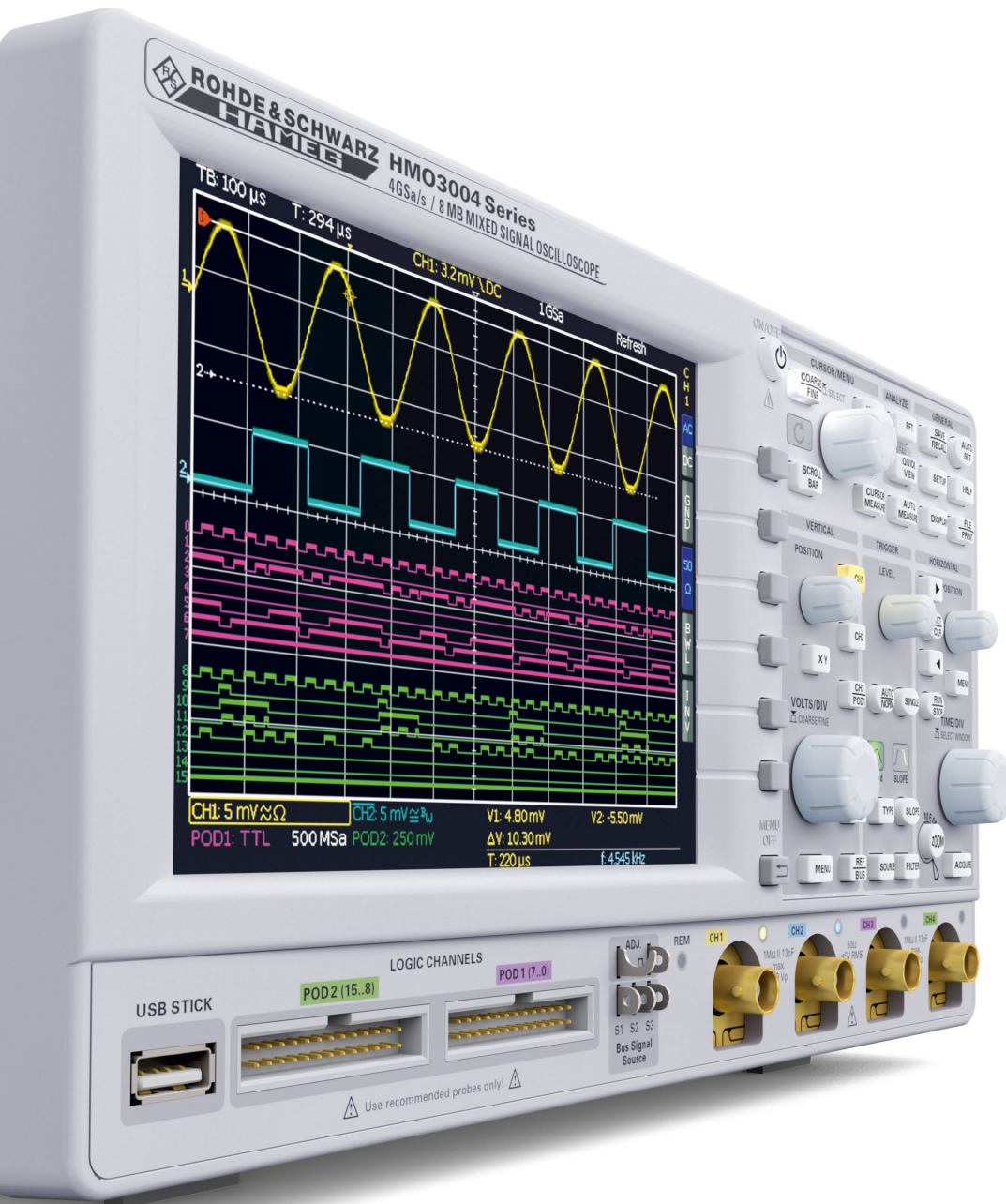
High sensitivity, multi-functionality and a great price – that's what distinguishes the HAMEG HMO3000 oscilloscope series.



## Key facts

- ▮ 4GSa/s real time, low noise flash A/D converter
- ▮ 8 MPts memory, zoom up to 200,000:1
- ▮ MSO functionality included as standard (HO3508/HO3516 logic probe with 8/16 channels required)
- ▮ Automatically or manually adjustable memory depth
- ▮ Vertical sensitivity up to 1 mV/div.
- ▮ Trigger modes: slope (A/B), pulse width, video, logic, serial buses (optional), hold-off
- ▮ Serial bus trigger and hardware accelerated decode incl. list view.  
Options: I<sup>2</sup>C + SPI + UART/RS-232 (HOO10/HOO11), CAN + LIN (HOO12)
- ▮ 28 auto-measurement parameters plus statistics, formula editor, ratio cursor
- ▮ 6-digit hardware counter
- ▮ FFT up to 64 kPts (dBm, dBV,  $V_{rms}$ )
- ▮ Pass/fail test based on masks
- ▮ Automatic search for user-defined events
- ▮ Display: 12 div. x-axis, 20 div. y-axis (Virtual Screen)
- ▮ 2x USB for mass storage, Ethernet/USB dual interface for remote control

Application	How the HAMEG HMO3000 meets your needs
Engineering lab	<ul style="list-style-type: none"> <li>▮ Adjustable memory depth</li> <li>▮ Advanced math functions available as standard, math on math possible</li> <li>▮ Automeasurement for 28 user-defined parameters</li> <li>▮ Memory zoom function up to 200,000:1</li> </ul>
Analog circuit design	<ul style="list-style-type: none"> <li>▮ Low-noise amplifier and A/D converter</li> <li>▮ 1 mV/div. sensitivity</li> <li>▮ 50 Ω/1 MΩ input impedance, switchable</li> <li>▮ Bandwidth upgrades via software options</li> </ul>
Embedded debugging	<ul style="list-style-type: none"> <li>▮ Mixed signal option (MSO) with 16 logic channels</li> <li>▮ Serial bus trigger and hardware-accelerated decode</li> <li>▮ 6-digit hardware counter</li> <li>▮ Superb FFT functionality</li> </ul>
Production environment	<ul style="list-style-type: none"> <li>▮ Remote control for automated data acquisition</li> <li>▮ Pass/fail tests based on user-defined masks with error signal output</li> <li>▮ Automatic signal measurement at the push of a button</li> <li>▮ USB/RS-232, Ethernet or GPIB (IEEE 488) interfaces</li> </ul>
General purpose and education	<ul style="list-style-type: none"> <li>▮ Fast boot time</li> <li>▮ Low-noise, intelligent temperature management</li> <li>▮ Extended display size through Virtual Screen technology</li> <li>▮ DVI-D output for external display</li> </ul>



# Precise Signal Analysis

An excellent sampling rate in combination with a large memory depth is the key for precise signal analysis. The highly resolved measurement data and the powerful zoom function expose even minor signal details.

Depending on their requirements users can choose between three 2-channel-versions and three 4-channel-versions with bandwidths between 300 and 500 MHz.

	500 MHz	400 MHz	300 MHz
4 channel	<b>HMO3054</b>	<b>HMO3044</b>	<b>HMO3034</b>
2 channel	<b>HMO3052</b>	<b>HMO3042</b>	<b>HMO3032</b>

## Key facts

Sampling rate (per analog channel)	2 GSa/s
Maximum sampling rate	4 GSa/s
Memory depth per channel	4 MPts.
Maximum memory	8 MPts.
Maximum number of logic channels	16
Input impedance	1 M $\Omega$ / 50 $\Omega$
V/div. @1 M $\Omega$	1 mV/div. to 5 V/div.
V/div. @50 $\Omega$	1 mV/div. to 1 V/div.

# Bandwidth Upgrade

Should your requirements change, then so does the HMO3000, as the 300 and 400 MHz models can be extended to 500 MHz bandwidth via software upgrades whenever required.

- For 300 MHz models with options HOO352 (2 channel) and HOO354 (4 channel).
- For 400 MHz models with options HOO452 (2 channel) and HOO454 (4 channel).

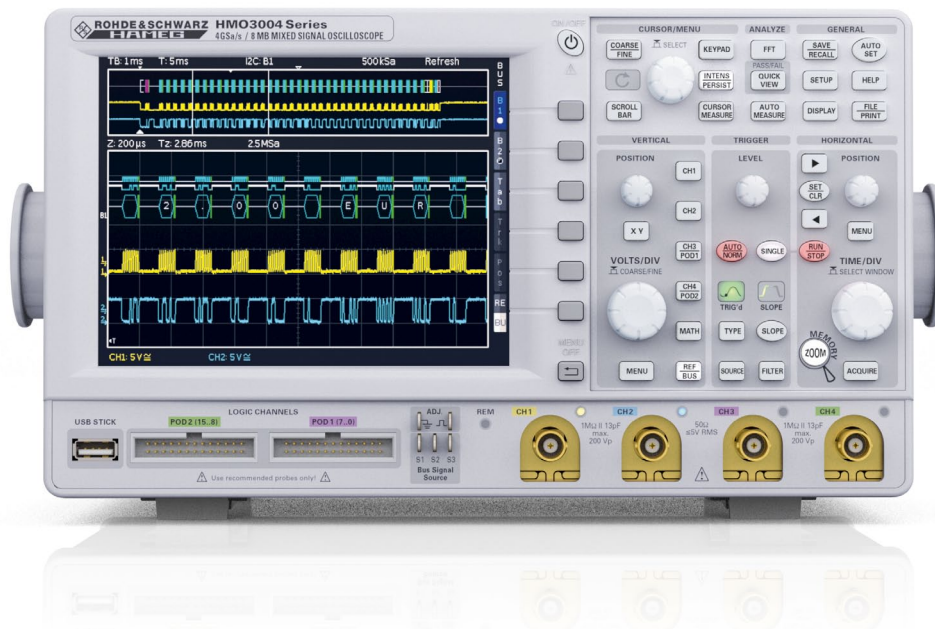
## Options

HOO352 / HOO354

HOO452 / HOO454

300 MHz  
>>>  
500 MHz

400 MHz  
>>>  
500 MHz



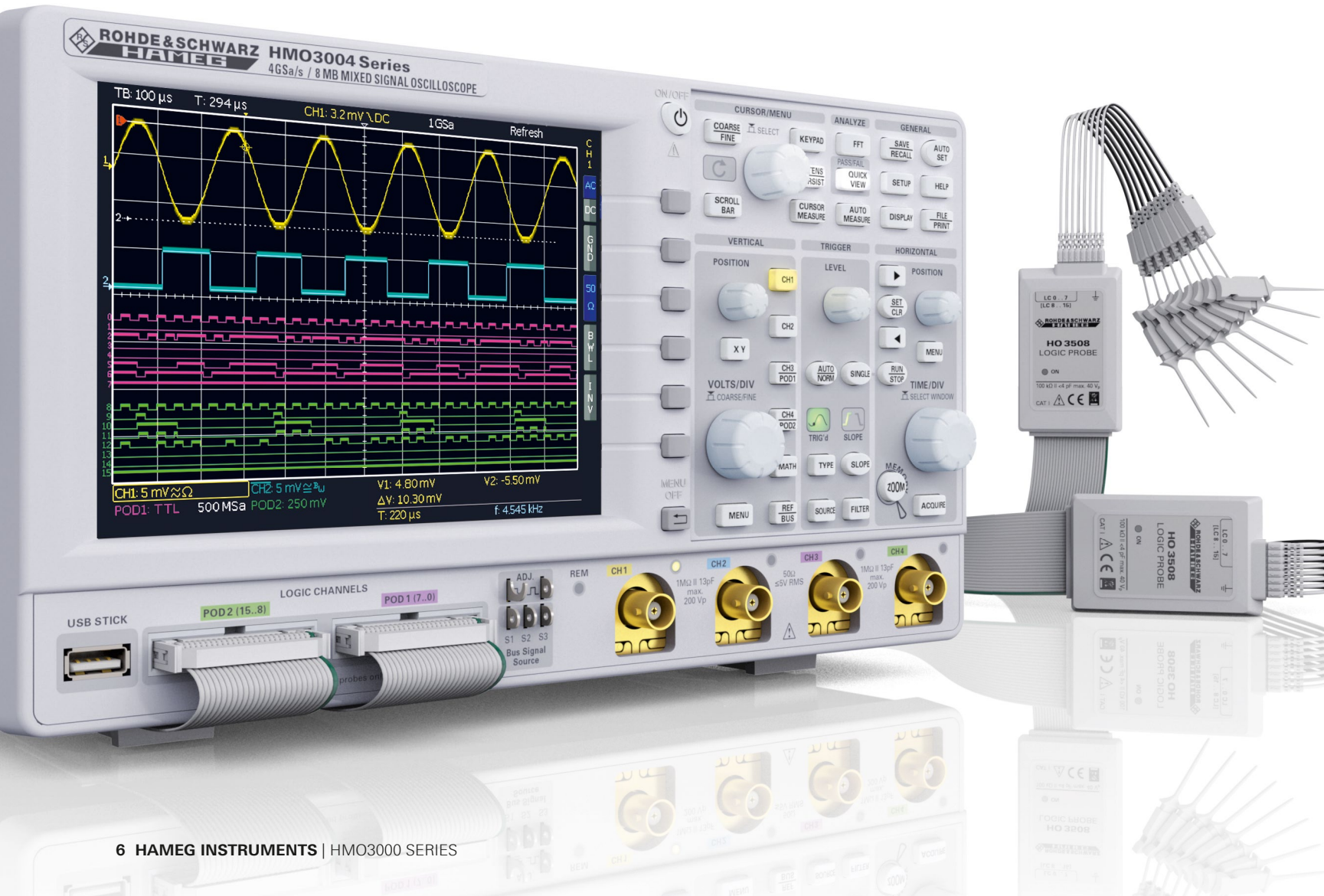
# 500 MHz



300 MHz | 400 MHz

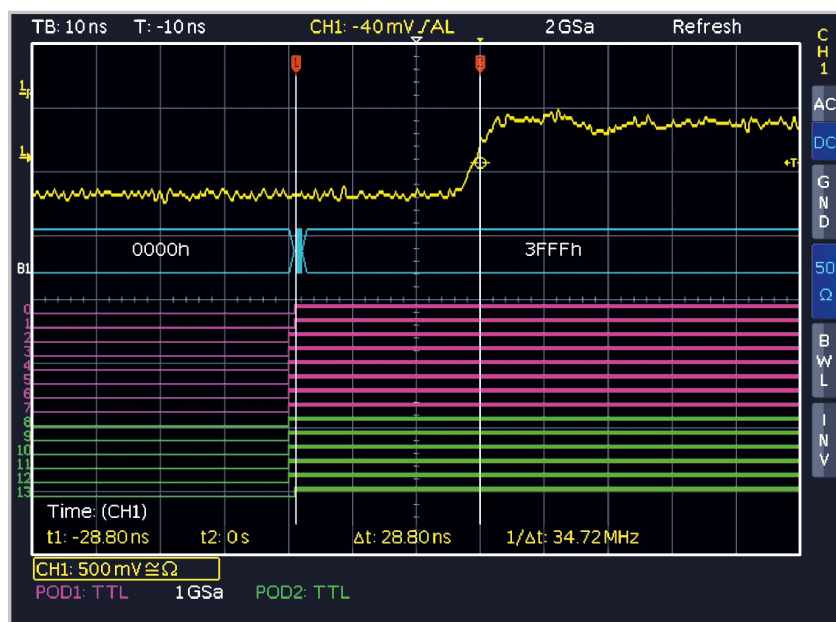
# Always a MSO

The mixed signal functionality is always included in the HMO3000 series with no software option being necessary to unlock it.



**HAMEG logic probes** are not linked to a specific instrument serial number. This allows their use with all digital HAMEG oscilloscopes in the HMO series.

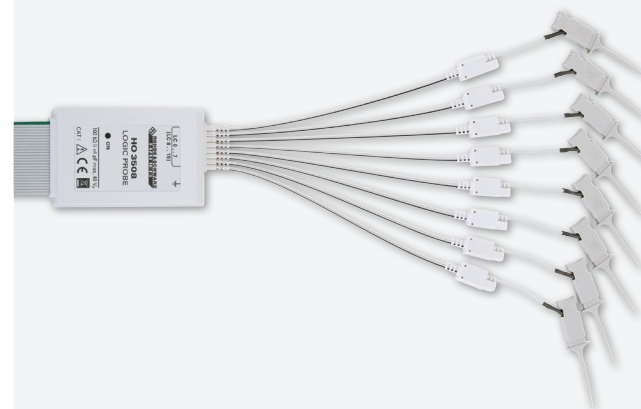
HAMEG is offering the new HMO3000 series exclusively as a mixed-signal oscilloscope. The great advantages of these instruments are best illustrated by taking a look at how ADCs (Analog Digital Converter) or DACs (Digital Analog Converter) are integrated. These transformer modules include an analog signal on the one side and a digital signal on the other side. As with HAMEG's new HMO3000 series, MSOs allow developers the assessment of the time component for both signal types on one monitor. As shown in the image below the latency time of a DAC can be determined with one simple cursor measurement. Therefore a MSO allows developers to devote their full attention to the circuit without having to waste energy on the measurement setup.



14 bit DAC signal change

HAMEG is focusing resolutely on the increasing significance of the mixed-signal oscilloscopes. Consequently, all HAMEG HMO oscilloscopes are full-scale MSOs, even the smaller models with a bandwidth as low as 70 MHz. As a result, HAMEG customers will not need to speculate if they should purchase an instrument with or without logic connectors. As the MSO functionality is invariably included, all instruments correspondingly offer a secure future. It is also unnecessary to initially activate the mixed-signal functions via software options, as is the case with other suppliers.

### Optional: Logic probe HO3508



- ▮ **Logic probe HO3508 fits to all HMO series oscilloscopes**  
(also available as double pack HO3516)
- ▮ No hardware lock to a specific device
- ▮ 8 logic channels available on each logic probe
- ▮ Signal threshold adjustable for each logic pod

#### Specifications HO3508

Channels	8
Input impedance	100 kΩ    <4 pF
Max. input frequency	350 MHz
Max. input voltage	40 V (DC + peak AC)
Measuring category	CAT I
Cable length	approx. 1 m

# Frequency Analysis

Due to the outstanding FFT functionality of the HMO series oscilloscopes signals can also be analysed in the frequency domain with up to 65,536 points. Additional practical tools such as cursor measurement as well as peak-detect-functions are also available. They allow engineers to complete their analysis significantly faster, also in the frequency domain.

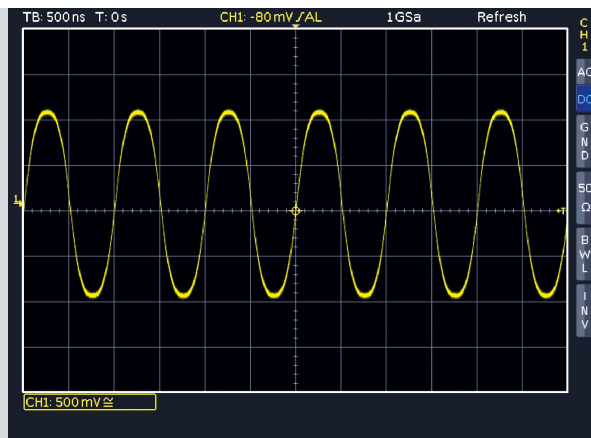


Figure 1: A sinusoid signal that at first sight appears undistorted

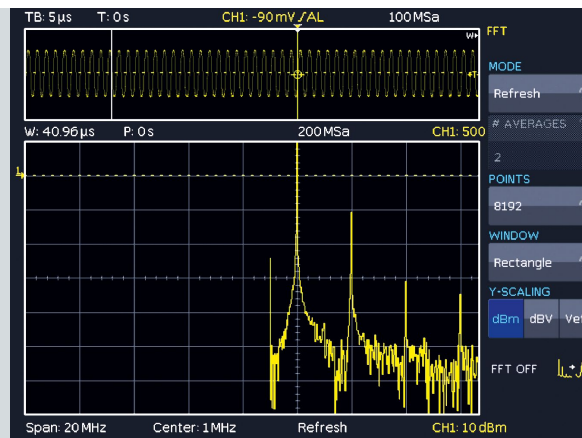


Figure 2: The frequency spectrum exposes the signal distortion

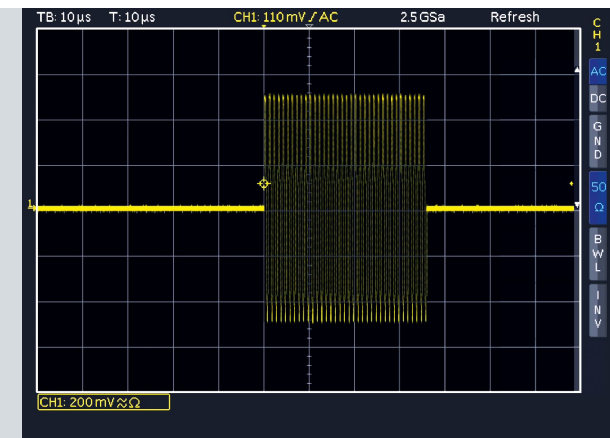


Figure 3

## Easy analysis in frequency domain

Quite often the distortion of input signals cannot be detected with the naked eye. For instance, the sine wave signal displayed in figure 1 appears to be undistorted. Only the frequency spectrum (figure 2) - available with just one touch of a button - clearly displays additional harmonics that occur as harmonic oscillations for multiples of the basic frequency.

For non-periodic input signals most instruments offer the option to trigger the spectrum at just the right moment to then check it in "STOP" mode at a later time. However, at that point, many oscilloscopes with FFT functionality calculate the spectrum only once and store the result in the memory. The base time signal will no longer be used for the calculation. Consequently, an investigation of all parts of the signal will no longer be possible.

HMO series oscilloscopes work differently: Since FFT is also active for previously stored signals, it is possible to subsequently analyze any sections of those signals captured in single shot mode or stop mode with an adjustable window width. Figure 3 shows a sine burst signal in the time domain. Pushing the FFT button will switch the oscilloscope into the frequency domain. Users can choose between various measurement windows like the



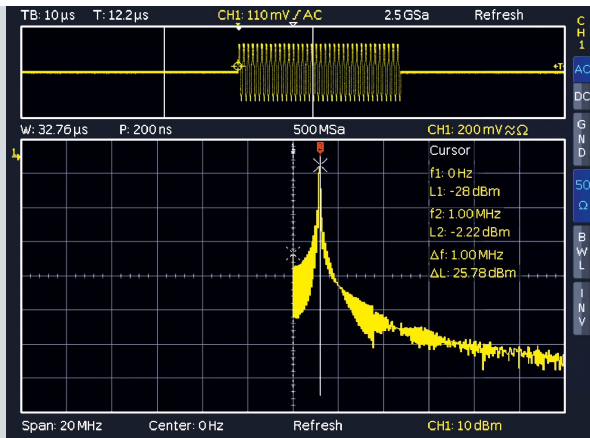


Figure 4

„rectangular“ type that has been used in figure 4. Although this window type captures frequencies at a high degree of accuracy, it is also accompanied by more noise. In order to suppress this disturbing interference users can for instance choose the Hanning window. The impact on the spectrum is visible in figure 5 (see device screen).

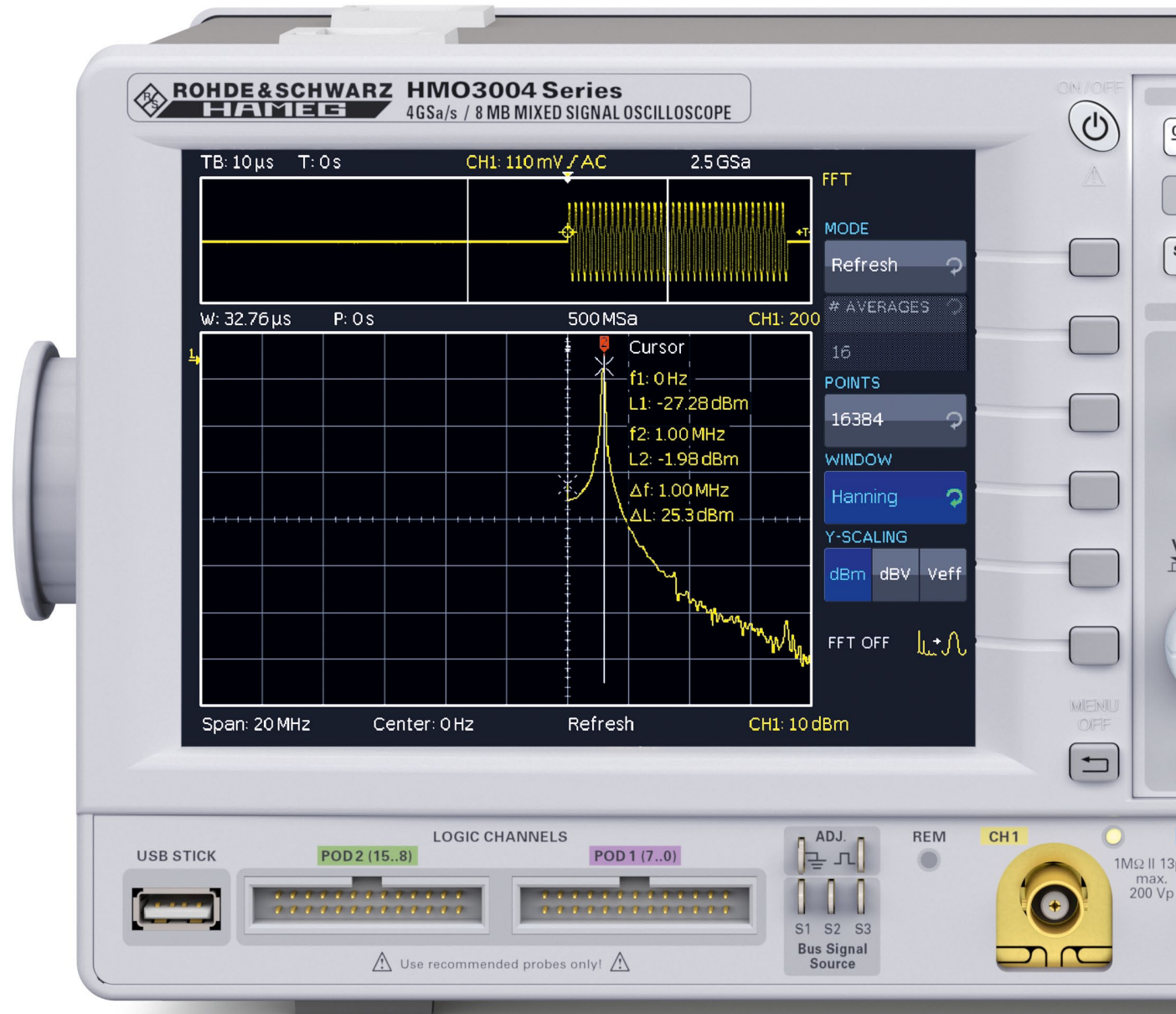
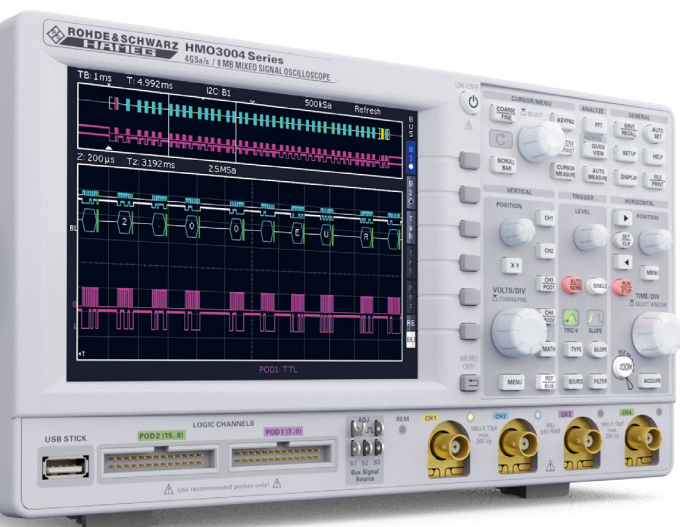


Figure 5

# Serial Bus Analysis

I<sup>2</sup>C, SPI, CAN or LIN – in terms of interaction with the outside world for embedded systems, it is safe to say that these are the most commonly used communication protocols. The new HMO3000 series by HAMEG Instruments offers you hardware-accelerated signal triggering and decoding for all of these protocols. You can upgrade your instrument via software licence keys with those functions required to develop your application:

- HOO10: Analysis of I<sup>2</sup>C, SPI and UART/RS-232 signals on analog and logic channels
- HOO11: Analysis of I<sup>2</sup>C, SPI and UART/RS-232 signals on all analog channels
- HOO12: Analysis of CAN and LIN signals on analog and logic channels

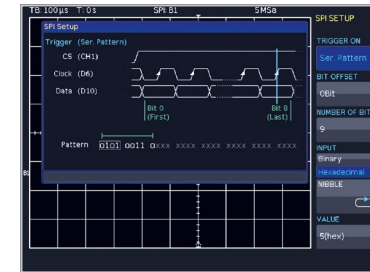


## Serial bus trigger types:

- I<sup>2</sup>C: Start, Stop, ACK, nACK, Address/Data
- SPI: Start, End, Serial Pattern (32Bit)
- UART/RS-232: Startbit, Frame Start, Symbol, Pattern
- LIN: Frame Start, Wake Up, Identifier, Data, Error
- CAN: Frame Start, Frame End, Identifier, Data, Error

## HOO10/HOO11

SPI/I<sup>2</sup>C/UART/RS-232 bus analysis for all oscilloscopes of the HMO series



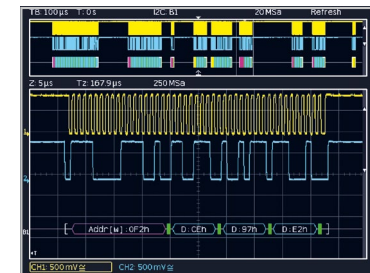
SPI bus trigger setup

## HOO12

CAN/LIN bus analysis for all oscilloscopes of the HMO series



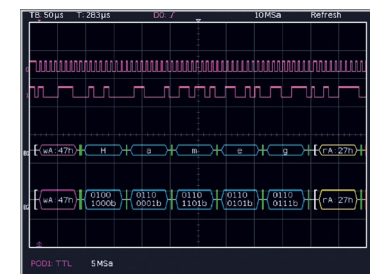
CAN bus configuration



I<sup>2</sup>C bus hex decoding on the analog channel



CAN bus list display



I<sup>2</sup>C bus ASCII und binary



HEX decoded CAN bus signal

**HMO3004 series 4 channel mixed signal oscilloscope**  
**HMO3002 series 2 channel mixed signal oscilloscope**  
**HMO3032 [HMO3034] 300MHz**  
**HMO3042 [HMO3044] 400MHz**  
**HMO3052 [HMO3054] 500MHz**  
**Firmware: ≥ 5.0**

Display	
Display:	16.5cm (6.5") VGA Color TFT
Resolution:	640 x 480 Pixel
Backlight:	LED 500cd/m <sup>2</sup>
Display area for traces:	50Pts/div.
without menu	400 x 600 Pixel (8 x 12 div.)
with menu	400 x 500 Pixel (8 x 10 div.)
Color depth:	256 colors
Intensity steps per channel:	0 to 31
Channel display:	False color, inverse brightness
Bus display:	up to 2 busses, parallel busses, serial busses (option), decoding of the bus values in ASCII, binary, decimal or hexadecimal format; Table view of the decoded data
Virtual Screen	20 div. vertical for all Math-, Logic-, Bus- and Reference Signals
LED brightness:	2 steps

Vertical System	
Channels:	
DSO mode	CH 1, CH 2 [CH 1 to CH 4]
MSO mode	CH 1, CH 2, LCH 0 to 15 (logic channels) with 2 x Option HO3508
Auxiliary input:	Front side [Rear side]
Function	External Trigger
Impedance	1 MΩ    14 pF ±2 pF
Coupling	DC, AC
Max. input voltage	100V (DC + peak AC)
XYZ-mode:	All analog channels on individual choice
Invert:	CH 1, CH 2 [CH 1 to CH 4]
Y-bandwidth (-3dB):	300/400/500 MHz (5mV to 5V)/div. 300 MHz: 180MHz (1mV, 2mV)/div. 400/500 MHz: 200MHz (1mV, 2mV)/div.
Lower AC bandwidth:	2 Hz
Bandwidth limiter (switchable):	approx. 20 MHz
Rise time (calculated):	300 MHz: < 1.166 ns 400 MHz: < 0.875 ns 500 MHz: < 0.7 ns
DC gain accuracy:	2 % of full scale
Input sensitivity:	12 calibrated steps
CH 1, CH 2 [CH 1 to CH 4]	1mV/div. to 5V/div. (1–2–5 Stepping)

Variable	Between calibrated steps
Inputs CH1, CH2 [CH1 to CH4]:	
Impedance	1 MΩ    13 pF ±2 pF (50Ω switchable)
Coupling	DC, AC, GND
Max. input voltage	1 MΩ: 200V <sub>p</sub> , derates at 20dB/Decade to 5V <sub>rms</sub> above 100kHz 50Ω: < 5V <sub>rms</sub> , max. 30V <sub>p</sub>
Measuring circuits:	Measuring Category 0
Position range:	± 8 divs
Offset control:	
1 mV, 2 mV	± 0.2V - 8 div. * sensitivity
5 mV to 20 mV	± 1V - 8 div. * sensitivity
50 mV	± 2.5V - 8 div. * sensitivity
100mV, 200mV	± 20V - 8 div. * sensitivity
500 mV to 5V	± 50V - 8 div. * sensitivity
Logic channels:	With Option HO3508/HO3516
Select. switching thresholds	TTL, CMOS, ECL, 2 x User -2V to +8V
Impedance	100kΩ    < 4 pF
Coupling	DC
Max. input voltage	40V (DC + peak AC)

Triggering	
Trigger modes:	
Auto	Triggers automatically even when no trigger event occurs for a certain time
Norm	Always triggers when a trigger event occurs
Single	Triggers once on a trigger event
Trigger display:	LED
Trigger sensitivity:	
Intern	≥5mV/div.: 0.8 div. ≥2mV/div. to <5mV/div.: 1 div. <2mV/div.: 1.5 div.
Ext. trigger via	Auxiliary Input [Aux. Input rear side]
Ext. Sensitivity	0.5V to 10V <sub>pp</sub>
Trigger level range:	
With auto level	Adjustability of the level between the peak values of the signal
Without auto level	-8 div. to +8 div.
External	-5V to +5V
Trigger types:	
Slope:	
Slope direction	Rising, falling, both
Sources	CH 1, CH 2, Line, Ext [CH 1 to CH 4, Line, Ext.]
Coupling	
Auto level	Adjustability of the level between the peak values of the signal, 5Hz to 300/400/400 MHz
AC	5Hz to 300/400/400 MHz
DC	0 to 300/400/400 MHz

HF	30kHz to 300/400/400MHz
LF	0kHz to 5kHz, selectable for DC, Auto level
Noise rejection (low-pass)	100MHz, selectable for DC, AC, Auto level
Pulse width:	
Polarity	Positive, negative
Functions	ti>t, ti<t, ti=t, ti/=t, t1<ti<t2, not (t1<ti<t2)
Pulse duration	16 ns to 8.589 s, resolution 4 ns/1 μs
Video	Pos./neg. sync. impulse
Standards	PAL, SECAM, NTSC, PAL-M, SDTV 576i, HDTV 720p, HDTV 1080i, HDTV 1080p
Fields	Upper, lower, both
Line	All, line number selectable
Source	CH 1, CH 2, Ext. [CH 1 to CH 4]
Logic:	
Logic functions	AND, OR, TRUE, FALSE, with or without evaluation of the duration of the logic operation
Duration functions	ti>t, ti<t, ti=t, ti/=t, t1<ti<t2, not (t1<ti<t2), Timeout
Duration	4 ns to 1 s
Source	LC0 to 15
State	LC0 to 15 X, H, L
Serial Busses: (Options)	
I <sup>2</sup> C	Start, Stop, ACK, NACK, Address/Data
SPI	Start, End, Serial Pattern (32Bit)
UART/RS-232	Startbit, Frame Start, Symbol, Pattern
LIN	Frame Start, Wake Up, Identifier, Data, Error
CAN	Frame Start, Frame End, Identifier, Data, Error
Trigger Holdoff:	50 ns to >10 s
2 <sup>nd</sup> Trigger (B):	
Type	Slope trigger
Slope direction	Rising or falling
Min. signal height	0.8 div.
Source	CH 1, CH 2, Ext. [CH 1 to CH 4]
Coupling (source B/=A):	DC, HF, NR
Coupling (source B=A):	see trigger A
Level (source B/=A):	-8 div to +8 div. (adjustable separately by A)
Level (source B=A):	see level A
Frequency range	0MHz to 300/400/500 MHz
Operating modes:	
Time based	16 ns to 8.589 s, resolution 4 ns/1 μs
Event based	1 to 2 <sup>16</sup>

Horizontal System	
Domain representation:	Time, Frequency (FFT), Voltage (XY)
Representation Time Base:	Main-window, main- and zoom-window
Memory Zoom:	Up to 200,000:1
Time Base:	
Accuracy	15 ppm

## Technical Data

Aging	±5 ppm/year
Refresh operating modes	1 ns/div. to 20 ms/div.
Roll operating modes	50 ms/div. to 50 s/div.
Deskew:	-62,5 ns to +61,5 ns
Step size	500 ps
Search functions:	Slope, Pulse, Peak, Rise-/Falltime, Runt
Marker:	up to 8 user definable marker for easy navigation; automatic marker function based on search criteria

<b>Digital Storage</b>	
Sampling rate:	2 x 2 GSa/s, 1 x 4 GSa/s [4 x 2 GSa/s, 2 x 4 GSa/s] Logic channels: 16 x 1 GSa/s
Resolution (vertical):	8 Bit, HiRes 10 Bit
Memory:	2 x 4 MPts [4 x 4 MPts], 1x 8 MPts [2 x 8 MPts]
Operation modes:	Refresh, Average (1024), Envelope, Peak-Detect (500ps), Filter, Rol (free run/triggered from time base 50 ms/div. and slower), HiRes
Interpolation:	CH 1 to CH 4: Sinx/x, Pulse, Linear; LC0 to 15: Pulse
Persistence:	Off, 50 ms to ∞
Delay pretrigger:	0 to 4 Million x (1/samplerate), Interlaced x2
posttrigger	0 to 8,59 Billion x (1/samplerate)
Display refresh rate:	Up to 4,800 waveforms/s
Display:	Dots, vectors (interpolation), 'persistence'

<b>Operation/Measuring/Interfaces</b>	
Operation:	Menu-driven (multilingual), Autose, help functions (multilingual)
Frequency counter:	
0.5 Hz to 300/400/500 MHz	6 Digit resolution
Accuracy	15 ppm
Aging	±5 ppm/year
Auto measurements:	$V_{pp}$ , $V_{p+}$ , $V_{p-}$ , $V_{rms}$ , $V_{avg}$ , $V_{top}$ , $V_{base}$ , amplitude, phase, frequency, period, risetime 80/90%, falltime 80/90%, pos./neg. pulse width, pos./neg. duty cycle, standard deviation, delay, pos./neg. edge count, pos./neg. pulse count, trigger period, trigger frequency
Statistic	Min., max., mean, standard deviation, number of measurements for up to 6 Functions simultaneously
Cursor measurements:	$\Delta V$ , $\Delta t$ , $1/\Delta t$ (f), V to GND, $V_t$ related to Trigger point, ratio X and Y, pulse count, edge count, peak to peak, peak+, peak-, mean value, RMS value, standard deviation, rise time, duty cycle

Application memory:	8 MByte for references, device settings and formulars
Interface:	
Internal	2x USB-Host (type A) (1x front side, 1x rear side), mass storage (FAT16/32)
Exchangeable	HO730 Dual-Interface Ethernet/USB-Device (type B)
Video OUT:	DVI-D (480p, 60 Hz) for external display, HDMI compatible
Trigger OUT:	BNC (rear side), Modes: Trigger, Mask
Optional:	USB-Device/RS-232 Dual-Interface (HO720), IEEE-488 (GPIB) (HO740)

<b>Mathematic functions</b>	
Quickmath:	ADD, SUB, MUL, DIV
Editor for formula sets:	Max. 5 formulas per formula set
Label for:	Math. memories and formula set
Sources:	All channels and math. Memories, constants
Targets:	Math. memories
Functions:	ADD, SUB, 1/X, ABS, MUL, DIV, SQ, POS, NEG, INV, SQR, MIN, MAX, LOG <sub>10</sub> , LN, Integral, Differential, High-pass filter, Low-pass filter
Display:	Up to 4 math. memories with label
Mask test:	Signal test (pass/fail) based on previously defined mask
Quickview:	Display of $V_{p+}$ , $V_{p-}$ , RMS value, rise time, fall time

<b>General Information</b>	
Probe ADJ Output:	1 kHz/1 MHz square wave signal approx. $0,2V_{pp}$ ( $t_a < 4$ ns)
Bus Signal Source (4Bit):	SPI, I <sup>2</sup> C, UART, retangle, 4Bit counter, 4Bit random pattern
Internal RTC (Realtime clock):	Date and time for stored data
Line voltage:	100 V to 240 V, AC 50 Hz to 60 Hz, CAT II
Power consumption:	Max. 70 [90] W
Protective system:	Safety class I (EN61010-1), CSA (pending)
Operating temperature:	+5 °C to +40 °C
Storage temperature:	-20 °C to +70 °C
Rel. humidity:	5% to 80% (non condensing)
Theft protection:	Kensington Lock
Dimensions (W x H x D):	285 x 175 x 220 mm
Weight:	3.6 kg
All data valid at 23°C after 30 minute warm-up.	

## Accessories included:

HO730 Ethernet/USB dual-interface card, Line cord, printed operating manual, 2/4 probes (amount=number of channels), 10:1 with attenuation ID (HZ350 400/300 MHz, HZ355 500 MHz), software-CD

## HO730

Built-in Ethernet/USB dual-interface card



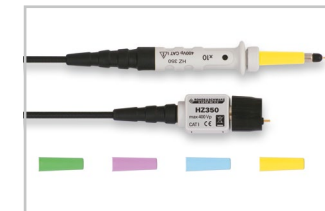
Printed operating manual and software-CD



## HZ350

400 MHz passive probe

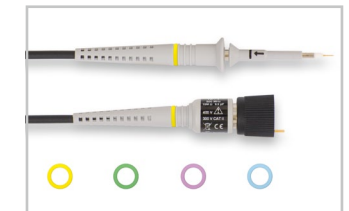
(for 400/300 MHz oscilloscopes)



## HZ355

500 MHz passive probe

(for 500 MHz oscilloscopes)



## Recommended accessories:

HOO10	Analysis of I <sup>2</sup> C, SPI and UART/RS-232 signals on analog and logic channels
HOO11	Analysis of I <sup>2</sup> C, SPI and UART/RS-232 signals on all analog channels
HOO12	Analysis of CAN and LIN signals on analog and logic channels for two buses
HO3508	Active 8 channel logic probe
HO3516	2 x HO3508, active 8 channel logic probes
HO720	USB-device/RS-232 dual-interface card
HO740	IEEE-488 (GPIB) interface card, galvanically isolated
HZ46	4RU 19" Rackmount kit
HZ99	Carrying case for protection and transport
HZ100	Differential probe 20:1/200:1
HZ115	Differential probe 100:1/1,000:1
HZ355	500 MHz passive probe 10:1 with automatic identification
HZ355DU	Upgrade from 2 x HZ350 to 2 x HZ355
HZO20	High voltage probe 1000:1 (400 MHz, 1000 V <sub>rms</sub> )
HZO30	1 GHz active probe (0.9 pF, 1 MΩ, including many accessories)
HZO40	Active differential probe 200 MHz (10:1, 3,5 pF, 1 MΩ)
HZO41	Active differential probe 800 MHz (10:1, 1 pF, 200 kΩ)
HZO50	AC/DC current probe 30 A, DC to 100 kHz
HZO51	AC/DC current probe 100/1,000 A, DC to 20 kHz

# Recommended Accessories

## HO720

USB-device/RS-232 dual-interface card



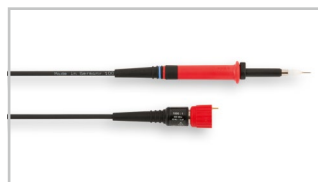
## HO740

IEEE-488 (GPIB) interface card, galvanically isolated



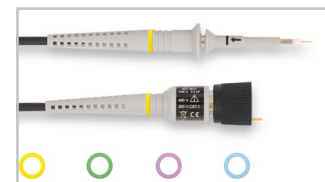
## HZO20

High voltage probe 1000:1 (400 MHz, 1000V<sub>rms</sub>)



## HZ355

500 MHz passive probe 10:1 with automatic identification



## HZ355DU

Upgrade from 2 x HZ355 to 2 x HZ355,

only available when purchasing a HMO3000 (300 MHz / 400 MHz models)

## HZO40

Active differential probe 200 MHz (10:1, 3.5 pF, 1 MΩ)



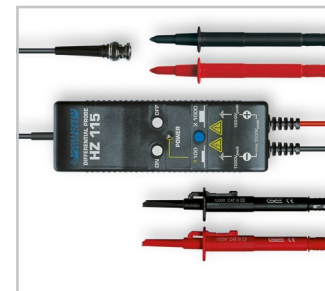
## HZO41

Active differential probe 800 MHz (10:1, 1 pF, 200 kΩ)



## HZ115

Active differential high voltage probe



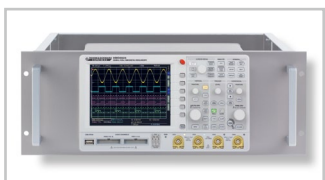
## HZ99

Carrying case for protection and transport



## HZ46

4RU 19" rackmount kit



## HZO50

AC/DC current probe 30 A, DC to 100 kHz



## HZO51

AC/DC current probe 100/1000 A, DC to 20 kHz



## HZO30

1 GHz active probe (0.9 pF, 1 MΩ, including many accessories)



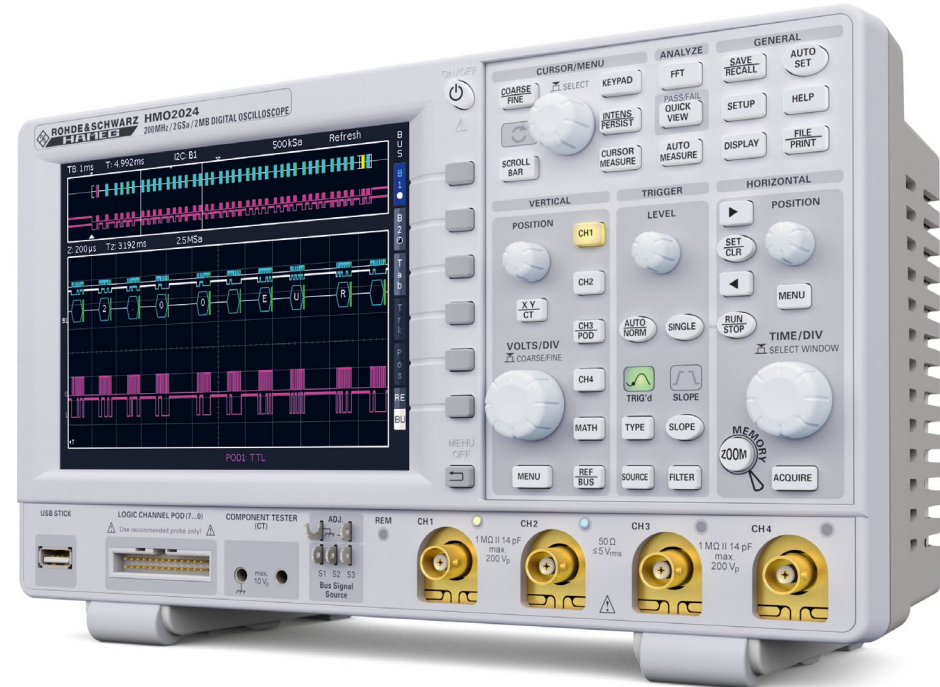
# HMO Compact Series

200 MHz | 150 MHz | 100 MHz | 70 MHz

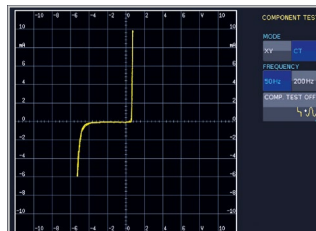
8 different models in a compact design with bandwidths from 70 to 200 MHz available with 2 or 4 channels. The mixed signal functionality is always included in the HMO compact series with no software option being necessary to unlock it.

## Key facts

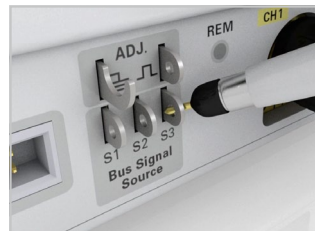
- 2 GSa/s real time, low noise flash A/D converter
- 2 MPts memory, zoom up to 50,000:1
- MSO functionality included as standard (HO3508 logic probe with 8 channels required)
- Component tester for capacitors, inductors and semiconductors
- Vertical sensitivity up to 1 mV/div.
- Trigger modes: slope (A/B), pulse width, video, logic, serial buses (optional)
- Serial bus trigger and hardware accelerated decode incl. list view.  
Options: I<sup>2</sup>C + SPI + UART/RS-232 (HOO10/HOO11), CAN + LIN (HOO12)
- 28 auto-measurement parameters plus statistics, formula editor, ratio cursor
- 6-digit hardware counter
- FFT up to 64 kPts (dBm, dBV, V<sub>rms</sub>)
- Pass/fail test based on masks
- Automatic search for user-defined events
- Display: 12 div. x-axis, 20 div. y-axis (Virtual Screen)
- 2x USB for mass storage, RS-232/USB dual interface for remote control



Small foot print



Built-in component tester



Bus signal source

HMO compact series				
Bandwidth	200 MHz	150 MHz	100 MHz	70 MHz
Model: 4 channel	HMO2024	HMO1524	HMO1024	HMO724
2 channel	HMO2022	HMO1522	HMO1022	HMO722
Sampling rate (per analog channel)	1 GSa/s			
Maximum sampling rate	2 GSa/s			
Memory depth per channel	1 MPts.			
Maximum memory	2 MPts.			
Max number of logic channels	8			
Input impedance	1 MΩ / 50 Ω		1 MΩ	
V/div. @ 1 MΩ	1 mV/div. to 10V/div.			
V/div. @ 50 Ω	1 mV/div. to 1 V/div.		n/a	
DC-offset	± 0.2V to ± 100V		-	
Component tester	■			

# From entry level to high performance. Oscilloscopes from the T&M expert.

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R&S®RTO: high performance (Bandwidths: 600 MHz to 4 GHz)

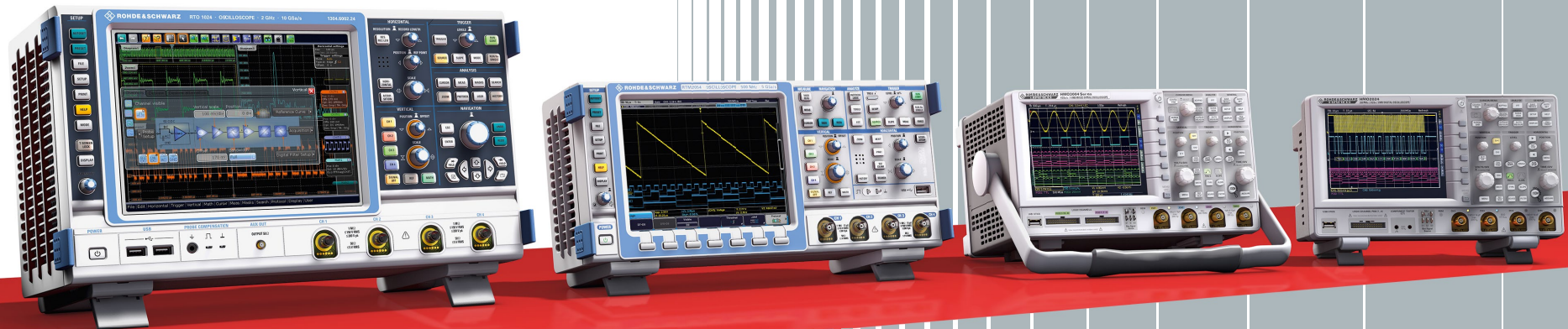
R&S®RTM: upper midrange (Bandwidths: 350 MHz and 500 MHz)

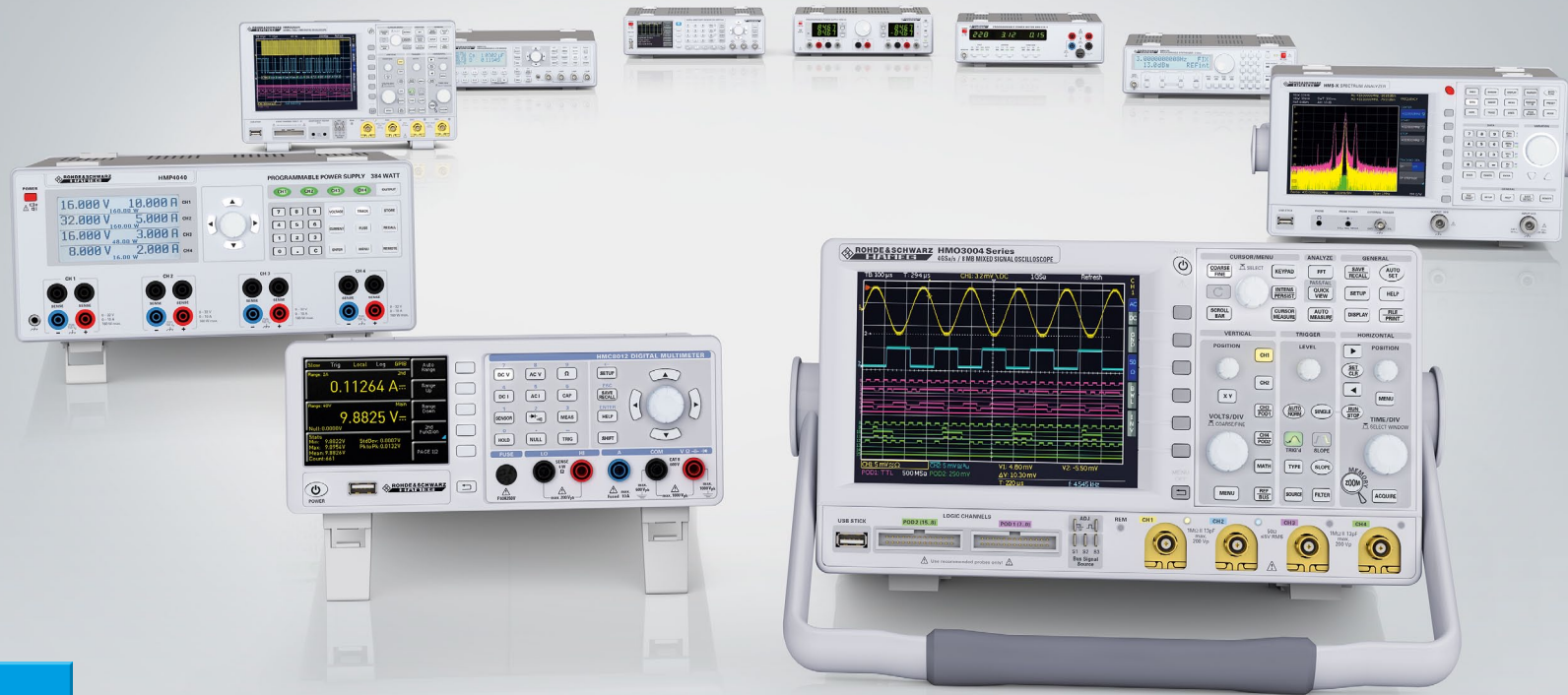
HMO3000: midrange (Bandwidths: 300 MHz to 500 MHz)

HMO Compact: value range (Bandwidths: 70 MHz to 200 MHz)

All Rohde & Schwarz oscilloscopes incorporate time domain, logic, protocol and frequency analysis in a single device.

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