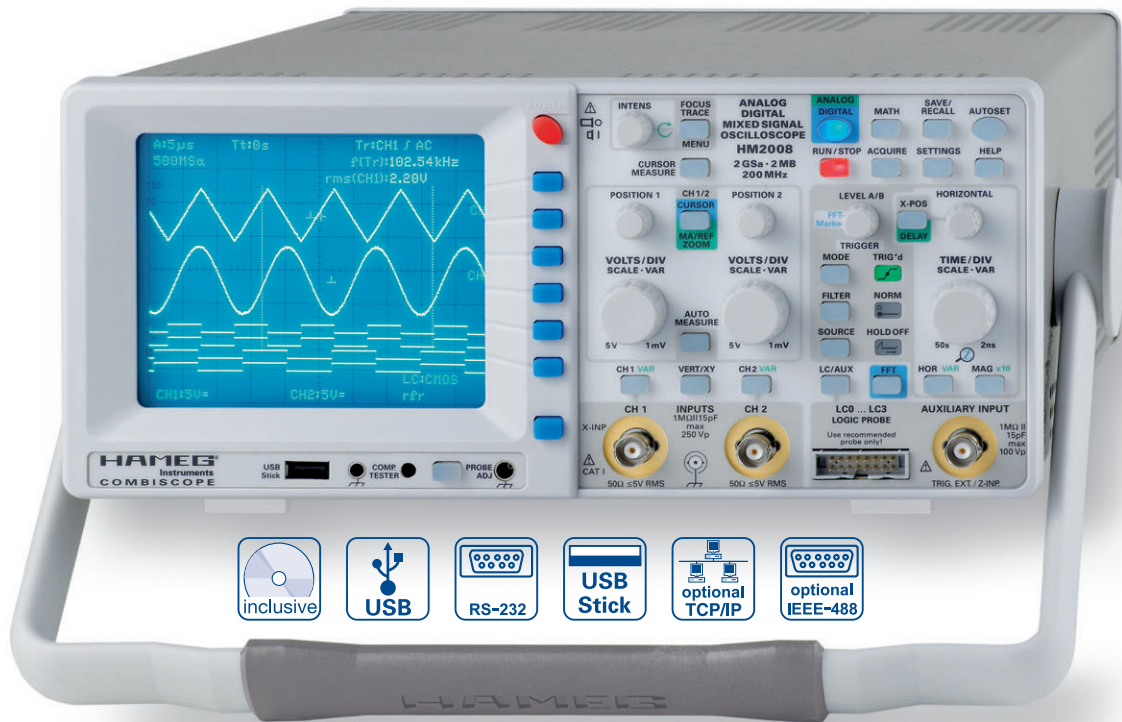
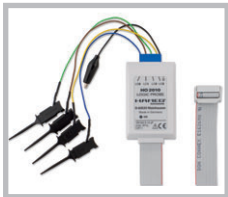


# 200 MHz Mixed Signal CombiScope® with FFT HM2008

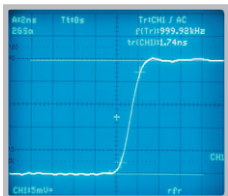
HM2008



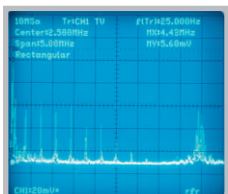
Logic Probe H02010



Rise Time Measurement  
in DSO Mode with 2 ns/cm,  
2GS/s



Frequency Analysis of a  
Video Signal with FFT



2 GSa/s Real Time Sampling, 20 GSa/s Random Sampling

2 MPts Memory per Channel, Memory **Z**oom up to 100,000:1

FFT for spectral analysis

2 Channels + 4 Logic Channels with Option H02010

Deflection coefficients: 1 mV/cm – 5 V/cm,  
with adjustable DC offset voltage;  
Time Base: 50 s/cm – 2 ns/cm

Acquisition modes: Single, Refresh, Average, Envelope,  
Roll, Peak-Detect

Front USB-Stick Connector for Screenshots

USB/RS-232, optional: IEEE-488, Ethernet/USB

Signal display: Yt, XY and FFT;  
Interpolation: Sinx/x, Pulse, Dot Join (linear)

Adjustable input impedance 1 M $\Omega$ /50  $\Omega$

## 200 MHz CombiScope® with FFT HM2008

### Vertical Deflection

<b>Channels:</b>	
<b>Analog:</b>	2
<b>Digital:</b>	2 + (additionally with Option HO2010) 4 Logic Channels
<b>Operating Modes:</b>	
<b>Analog:</b>	CH 1 or CH 2 separate, DUAL (CH 1 and CH 2 alternate or chopped), Addition
<b>Digital:</b>	Analog Signal Channels CH 1 or CH 2 separate, DUAL (CH 1 and CH 2) or Addition. Logic Signal Channels (LCH 0 – 3) switchable.
<b>X in XY-Mode:</b>	CH 1
<b>Invert:</b>	CH 1, CH 2
<b>Bandwidth [-3 dB]:</b>	2 x 0 – 200 MHz
<b>Rise time:</b>	< 1,75 ns
<b>Bandwidth Limiter [switchable]:</b>	approx. 20 MHz (1 mV/cm – 5 V/cm)
<b>Deflection Coefficients (CH 1, 2):</b> 12 calibrated steps	
1 mV – 2 mV/cm:	± 3% (0 – 100 MHz [-3 dB])
5 mV – 5 V/cm:	± 3% (1-2-5 sequence)
variable (uncalibrated):	> 1 mV/cm to 5 V/cm, continuous
<b>Inputs CH 1, 2:</b>	
<b>Impedance:</b>	1 MΩ    13 pF
<b>Coupling:</b>	DC, AC, 50 Ω, GND (ground)
<b>Offset control:</b>	
1 mV, 2 mV	± 0.2 V
5 mV – 50 mV	± 1 V
100 mV – 5 V	± 20 V
<b>Max. Input Voltage:</b>	250 V (DC + peak AC), 50 Ω < 5 V <sub>rms</sub>
<b>Y Delay Line (analog):</b>	70 ns
<b>Measuring Circuits:</b>	Measuring Category I
<b>Analog mode only:</b>	
<b>Auxiliary input:</b>	
<b>Function (selectable):</b>	Ext. Trigger, Z (unblank in analog mode)
<b>Coupling (Ext. Trig./Z):</b>	all / AC, DC
<b>Max. input voltage:</b>	100 V (DC + peak AC)
<b>Digital mode only:</b>	
<b>Logic Channels in combination with Option HO2010:</b>	
<b>Quantity</b>	4 (LC 0 – 3)
<b>Select. switching thresholds:</b>	TTL, CMOS, ECL (common for all)
<b>User definable thresholds:</b>	2
<b>within the range:</b>	-2V to +8V (common for all)

### Triggering

<b>Analog and Digital Mode</b>	
<b>Automatic (Peak to Peak):</b>	
<b>Min. signal height:</b>	5 mm
<b>Frequency range:</b>	10 Hz – 250 MHz
<b>Level control range:</b>	from Peak- to Peak+
<b>Normal (without peak):</b>	
<b>Min. signal height:</b>	5 mm
<b>Frequency range:</b>	0 – 250 MHz
<b>Level control range:</b>	-10 cm to +10 cm
<b>Operating modes:</b> Slope/Video/Logic	
<b>Slope:</b>	positive, negative, both
<b>Sources:</b>	CH 1, CH 2, alt. CH 1/2 (≥ 8mm, analog mode only), Line, Ext.
<b>Coupling:</b>	
<b>AC:</b>	10 Hz – 250 MHz
<b>DC:</b>	0 – 250 MHz
<b>HF:</b>	30 kHz – 250 MHz
<b>LF:</b>	0 – 5 kHz
	Noise Rej. switchable
<b>Video:</b> pos./neg. Sync. Impulse	
<b>Standards:</b>	
	525 Line / 60 Hz Systems
	625 Line / 50 Hz Systems
<b>Field:</b>	even/odd/both
<b>Line:</b>	all/line number selectable
<b>Source:</b>	CH 1, CH 2, Ext.
<b>Indicator for trigger action:</b>	LED
<b>External Trigger via:</b>	AUXILIARY INPUT (0.3 V <sub>pp</sub> , 0 – 200 MHz)
<b>Coupling:</b>	AC, DC
<b>Max. input voltage:</b>	100 V (DC + peak AC)
<b>Digital mode:</b>	
<b>Pre/Post Trigger:</b>	-100% to +400% relative to complete memory
<b>Logic (with Option HO2010):</b>	AND/OR, TRUE/FALSE

<b>Source:</b>	Logic Channel 0 – 3
<b>State:</b>	X, H, L
<b>Analog mode:</b>	
<b>2nd Trigger</b>	
<b>Min. signal height:</b>	5 mm
<b>Frequency range:</b>	0 – 250 MHz
<b>Coupling:</b>	DC
<b>Level control range:</b>	-10 cm to +10 cm

### Horizontal Deflection

<b>Analog Time Base</b>	
<b>Operating modes:</b>	A, ALT (alternating A/B), B
<b>Time base A:</b>	0.5 s/cm – 20 ns/cm (1-2-5 sequence)
<b>Time base B:</b>	20 ms/cm – 20 ns/cm (1-2-5 sequence)
<b>Accuracy A and B:</b>	± 3%
<b>X Magnification x10:</b>	to 2 ns/cm
<b>Accuracy:</b>	± 5%
<b>Variable time base A/B:</b>	cont. 1:2.5
<b>Hold Off time:</b>	var. 1:10 (LED-Indication)
<b>Analog XY Mode</b>	
<b>Bandwidth X-Amplifier:</b>	0 – 3 MHz [-3 dB]
<b>XY phase shift:</b>	< 3° < 220 kHz
<b>Digital Time Base</b>	
<b>Time base range (1-2-5 sequence)</b>	
<b>Refresh mode:</b>	50 s/cm – 2 ns/cm
<b>with Peak Detect:</b>	50 s/cm – 500 ns/cm (min. Pulse Width 10 ns)
<b>Roll Mode:</b>	50 s/cm – 50 ms/cm
<b>Accuracy time base</b>	
<b>Time coefficient:</b>	50 ppm
<b>Display:</b>	± 1%
<b>MEMORY ZOOM:</b>	max. 100,000:1
<b>Digital XY Mode</b>	
<b>Bandwidth X-Amplifier:</b>	0 – 200 MHz [-3 dB]
<b>XY phase shift:</b>	< 3° < 200 MHz

### Digital Storage

<b>Sampling Rate (real time):</b>	Analog channels: 2 x 1 GSa/s or 2 GSa/s interleaved; Logic Channels: max. 4 x 500 MSa/s
<b>Sampling Rate (random sampling):</b>	20 GSa/s (1-Channel mode) 25 GSa/s (2-Channel mode)
<b>Bandwidth:</b>	2 x 0 – 200 MHz (Random)
<b>Memory:</b>	2 M-Samples per channel
<b>Operating modes:</b>	Refresh, Average, Envelope, Roll: Free Run/Triggered, Peak-Detect
<b>Resolution (vertical):</b>	8 Bit (25 Pts/cm)
<b>Resolution (horizontal):</b>	
<b>Yt:</b>	11 Bit (200 Pts/cm)
<b>XY:</b>	8 Bit (25 Pts/cm)
<b>Interpolation:</b>	Sinx/x, Dot Join (linear)
<b>Delay:</b>	2 Million x (1/Sampling Rate; max.) 8 Million x (1/Sampling Rate; max.)
<b>Display refresh rate:</b>	max. 170/s at 2 MPts
<b>Display:</b>	Dots (acquired points only), Vectors (interpolation), Optimal (complete memory weighting and vector display)
<b>Reference Memories:</b>	9 with 2 kPts each (for recorded signals)
<b>Display:</b>	2 signals of 9 (freely selectable)

### FFT Mode

<b>Display X:</b>	Frequency Range
<b>Display Y:</b>	True rms value of spectrum
<b>Scaling:</b>	Linear or logarithmic
<b>Level display:</b>	dBV, V
<b>Window:</b>	Square, Hanning, Hamming, Blackmann
<b>Control:</b>	Center frequency, Span
<b>Marker:</b>	Frequency, Amplitude
<b>Zoom (frequency axis):</b>	up to x20

### Operation/Measuring/Interfaces

<b>Operation:</b> Menu (multilingual), Autoset, Help functions (multilingual)	
<b>Save/Recall internal:</b>	
<b>analog:</b>	9 Instrument parameter settings
<b>digital:</b>	9 Signals (each 2k) incl. instrument parameters
<b>Signal sources:</b>	CH 1, CH 2, LCH 0-3, ZOOM, Reference 1-9 or Mathematics
<b>Signal display:</b>	max. 6 signals or 6 traces

<b>USB Memory-Stick:</b>	
Save/Recall external:	
Instrument settings and Signals:	CH1, CH2, LCH 0 - 3, ZOOM, Referenz 1-9 or Mathematics
Screen-shot:	as Bitmap
Signal display data (2k per channel):	Binary (SCPI-Data), Text (ASCII-Format), CSV (Spread Sheet)
<b>Frequency counter:</b>	
6 digit resolution:	> 1 MHz – 250 MHz
5 digit resolution:	0.5 Hz – 1 MHz
Accuracy:	50 ppm
<b>Auto Measurements:</b>	
Analog mode:	Frequency, Period, $V_{dc}$ , $V_{pp}$ , $V_{p+}$ , $V_{p-}$
plus in digital mode:	$V_{rms}$ , $V_{avg}$
<b>Cursor Measurements:</b>	
Analog mode:	$\Delta t$ , $1/\Delta t$ (f), tr, $\Delta V$ , V to GND, ratio X, ratio Y
plus in digital mode:	$V_{pp}$ , $V_{p+}$ , $V_{p-}$ , $V_{avg}$ , $V_{rms}$ , pulse count
Resolution Readout/Cursor:	1000 x 2000 Pts, Signals: 250 x 2000
Interfaces (plug-in):	USB/RS-232 (H0720)
Optional:	IEEE-488, Ethernet/USB

#### Mathematic functions

Number of Formula Sets:	5 with 5 formulas each
Sources:	CH 1, CH 2, Math 1 - Math 5
Targets:	5 math. memories (Math 1 - 5)
Functions:	ADD, SUB, 1/X, ABS, MUL, DIV, SQ, POS, NEG, INV
Display:	max. 2 math. memories (Math 1 - 5)

#### Display

CRT:	D14-375GH
Display area (with graticule):	8 cm x 10 cm
Acceleration voltage:	approx. 14 kV

#### General Information

<b>Component tester</b>	
Test voltage:	approx. $7 V_{rms}$ (open circuit), approx. 50 Hz
Test current:	max. $7 mA_{rms}$ (short circuit)
Reference Potential:	Ground (safety earth)
Probe ADJ Output:	1 kHz/1 MHz square wave signal $0.2 V_{pp}$ (tr < 4 ns)
Trace rotation:	electronic
Line voltage:	105 – 253 V, 50/60 Hz $\pm 10\%$ , CAT II
Power consumption:	48 Watt at 230 V, 50 Hz
Protective system:	Safety class I (EN61010-1)
Weight:	5.6 kg
Cabinet (W x H x D):	285 x 125 x 380 mm
Ambient temperature:	0 °C ...+40 °C

**Accessories supplied:** Line cord, manual, 2 probes 10 :1 with automatic identification of the attenuation ratio (HZ200), Windows software for instrument control and data transfer.

**Optional accessories:**

H0730 Dual interface Ethernet/USB  
H0740 IEEE-488 (GPIB) interface  
HZ70 Optical interface with fiber cable

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