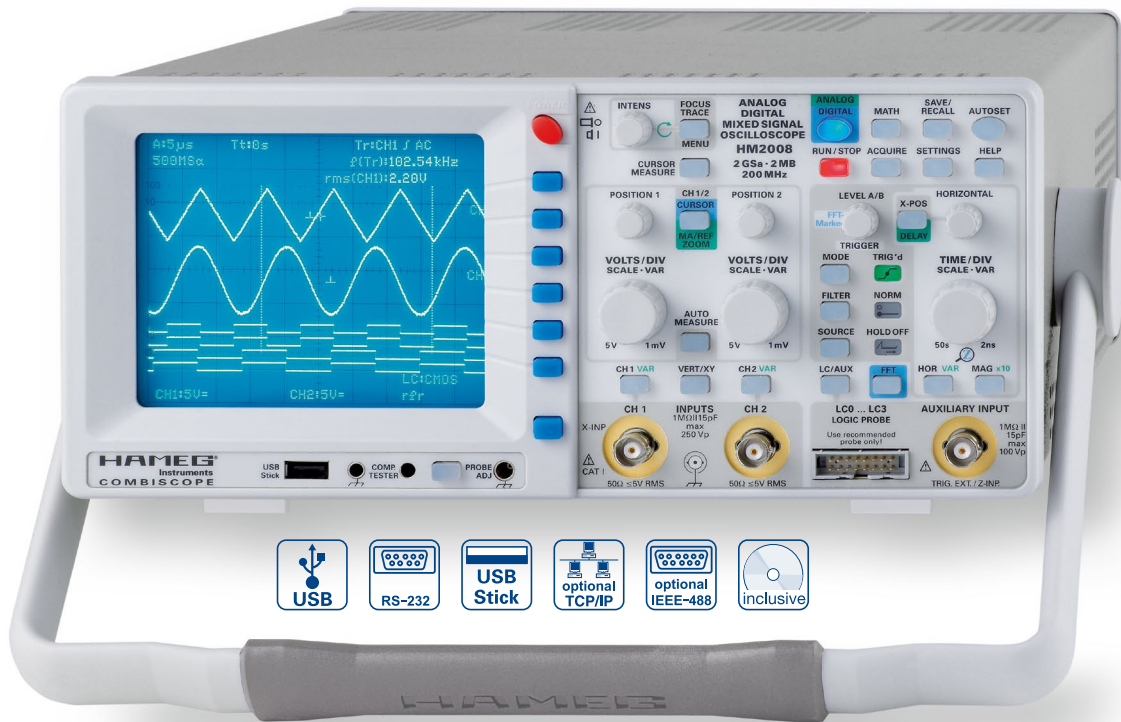
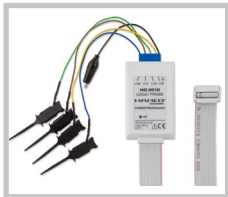


200MHz Mixed Signal CombiScope® HM2008

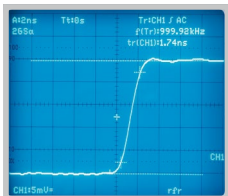
HM2008



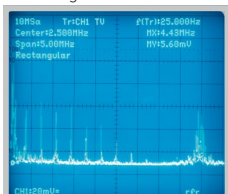
Logic Probe H02010



Rise Time Measurement in DSO Mode with 2ns/div., 2GSa/s



Frequency Analysis of a Video Signal with FFT



- ✓ 2GSa/s Real Time Sampling, 20GSa/s Random Sampling
- ✓ 2MPts Memory per Channel, Memory Zoom up to 100,000:1
- ✓ FFT for Spectral Analysis
- ✓ 2 Channels + 4 Logic Channels with Option H02010 (MSO)
- ✓ Deflection Coefficients 1mV/div....5V/div., with adjustable DC Offset Voltage; Time Base 2ns/div....50s/div.
- ✓ Acquisition Modes: Single, Refresh, Average, Envelope, Roll, Peak-Detect
- ✓ Front USB-Stick Connector for Screenshots
- ✓ USB/RS-232, optional: IEEE-488 (GPIB) or Ethernet/USB
- ✓ Signal Display: Yt, XY and FFT; Interpolation: Sinx/x, Pulse, Dot Join (linear)
- ✓ Adjustable Input Impedance 1MΩ/50Ω
- ✓ See HM2005-2 for Analog Mode

200 MHz Mixed Signal CombiScope® HM2008

All data valid at 23°C after 30 minutes warm-up.

Vertical Deflection

Channels:	
Analog:	2
Digital:	2 + (additionally with Option HO2010) 4 Logic Channels
Operating Modes:	
Analog:	CH 1 or CH 2 separate, DUAL (CH 1 and CH 2 alternate or chopped), Addition
Digital:	Analog Signal Channels: CH 1 or CH 2 separate, DUAL (CH 1 and CH 2) or Addition. Logic Signal Channels (LCH 0...3) switchable.
X in XY-Mode:	CH 1
Invert:	CH 1, CH 2
Bandwidth [-3 dB]:	2 x 0...200 MHz
Rise time:	<1.75 ns
Bandwidth Limiter (switchable): approx. 20 MHz (1 mV/div...5V/div.)	
Deflection Coefficients (CH 1, 2): 12 calibrated steps	
1...2 mV/div.:	±3% (0...100 MHz [-3 dB])
5 mV...5V/div.:	±3% (1-2-5 sequence)
variable (uncalibrated):	>1 mV/div...5V/div., continuous
Inputs CH 1, 2:	
Impedance:	1 MΩ 13 pF
Coupling:	DC, AC, 50 Ω, GND (ground)
Offset control:	
1 mV, 2 mV	±0.2 V
5...50 mV	±1 V
100 mV...5 V	±20 V
Max. Input Voltage:	250 V (DC + peak AC), 50 Ω <5V _{rms}
Y Delay Line (analog):	70 ns
Measuring Circuits:	Measuring Category I
Analog mode only:	
Auxiliary input:	
Function (selectable):	Ext. Trigger, Z (unblank in analog mode)
Coupling (Ext. Trig./Z):	all/AC, DC
Max. input voltage:	100 V (DC + peak AC)
Digital mode only:	
Logic Channels in combination with Option HO2010:	
Quantity	4 (LCH 0...3)
Select. switching thresholds:	TTL, CMOS, ECL (common for all)
User definable thresholds:	2
within the range:	-2...+8 V (common for all)

Triggering

Analog and Digital Mode	
Automatic (Peak to Peak):	
Min. signal height:	5 mm
Frequency range:	10 Hz...250 MHz
Level control range:	from Peak- to Peak+
Normal (without peak):	
Min. signal height:	5 mm
Frequency range:	0...250 MHz
Level control range:	-10...+10 div.
Operating modes: Slope/Video/Logic	
Slope:	Rising, falling, both
Sources:	CH 1, CH 2, alt. CH 1/2 (≥8 mm, analog mode only), Line, Ext.
Coupling:	
AC:	10 Hz...250 MHz
DC:	0...250 MHz
HF:	30 kHz...250 MHz
LF:	0...5 kHz
Noise Rej. switchable	
Video: pos./neg. Sync. Impulse	
Standards:	
525 Line/60 Hz Systems	
625 Line/50 Hz Systems	
Field:	even/odd/both
Line:	all/line number selectable
Source:	CH 1, CH 2, Ext.
Indicator for trigger action:	LED
External Trigger via:	AUXILIARY INPUT (0.3 V _{pp} , 0...200 MHz)
Coupling:	AC, DC
Max. input voltage:	100 V (DC + peak AC)
Digital mode:	
Pre/Post Trigger:	-100...+400% relative to complete memory
Logic (with Option HO2010):	AND/OR, TRUE/FALSE
Source:	Logic Channel 0...3
State:	X, H, L
Analog mode:	

2nd Trigger

Min. signal height:	5 mm
Frequency range:	0...250 MHz
Coupling:	DC
Level control range:	-10...+10 div.

Horizontal Deflection

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

Digital Storage

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

FFT Mode

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

Operation/Measuring/Interfaces

Operation: Menu (multilingual), Autoset, Help functions (multilingual)	
Save/Recall internal:	
analog:	9 Instrument parameter settings
digital:	9 Signals (each 2k) incl. instrument parameters
Signal sources:	CH 1, CH 2, LCH 0...3, ZOOM, Reference 1...9 or Mathematics
Signal display:	max. 6 traces
USB Memory-Stick:	
Save/Recall external:	Instrument settings and Signals:
CH 1, CH 2, LCH 0...3, ZOOM, Reference 1...9 or Mathematics	
Screen-shot:	as Bitmap
Signal display data	Binary (SCPI-Data), Text (ASCII-Format), (2k per channel): CSV [Spread Sheet]
Frequency counter:	

6 digit resolution:	1...250 MHz
5 digit resolution:	0.5 Hz...1 MHz
Accuracy:	50 ppm
Auto Measurements:	
Analog mode:	Frequency, Period, V_{dc} , V_{pp} , V_{p+} , V_{p-}
plus in digital mode:	V_{rms} , V_{avg}
Cursor Measurements:	
Analog mode:	Δt , $1/\Delta t$ (f), tr, ΔV , 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:	D14-3756H
Display area (with graticule):	8 div. x 10 div.
Acceleration voltage:	approx. 14 kV

General Information

Component tester	
Test voltage:	approx. $7V_{rms}$ (open circuit), approx. 50 Hz
Test current:	max. $7mA_{rms}$ (short circuit)
Reference Potential:	Ground (safety earth)
Probe ADJ Output:	1 kHz/1 MHz square wave signal $0.2V_{pp}$ (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)
Operating temperature:	+5...+40 °C
Storage temperature:	-20...+70 °C
Rel. humidity:	5...80 % (non condensing)
Dimensions (W x H x D):	285 x 125 x 380 mm
Weight:	5.6 kg

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.

Recommended accessories:

H0730	Dual interface Ethernet/USB
H0740	IEEE-488 (GPIB) interface
H02010	4 Channel Logic Probe
HZ13	Interface cable (USB) 1.8 m
HZ14	Interface cable (serial) 1:1
HZ20	Adapter, BNC to 4 mm banana
HZ33	Test cable 50 Ω , BNC/BNC, 0.5 m
HZ34	Test cable 50 Ω , BNC/BNC, 1 m
HZ45	19"-Rackmount Kit 4RU
HZ51	Probe 10:1 (150 MHz)
HZ52	Probe 10:1 RF (250 MHz)
HZ53	Probe 100:1 (100 MHz)
HZ72	GPIB-Cable 2 m
HZ100	Differential probe 20:1/200:1
HZ109	Differential probe 1:1/10:1
HZ115	Differential probe 100:1/1000:1
HZ154	Probe 1:1/10:1 (10/100 MHz)
HZ350	Probe 10:1 with automatically identification (350 MHz)
HZ355	Slimline probe 10:1 with automatically identification (500 MHz)
HZ020	High voltage probe 1000:1 (400 MHz, $1000V_{rms}$)
HZ030	Active probe 1 GHz (0.9 pF, 1 M Ω , including many accessories)
HZ050	AC/DC Current probe 20 A, DC...100 kHz
HZ051	AC/DC Current probe 1000 A, DC...20 kHz