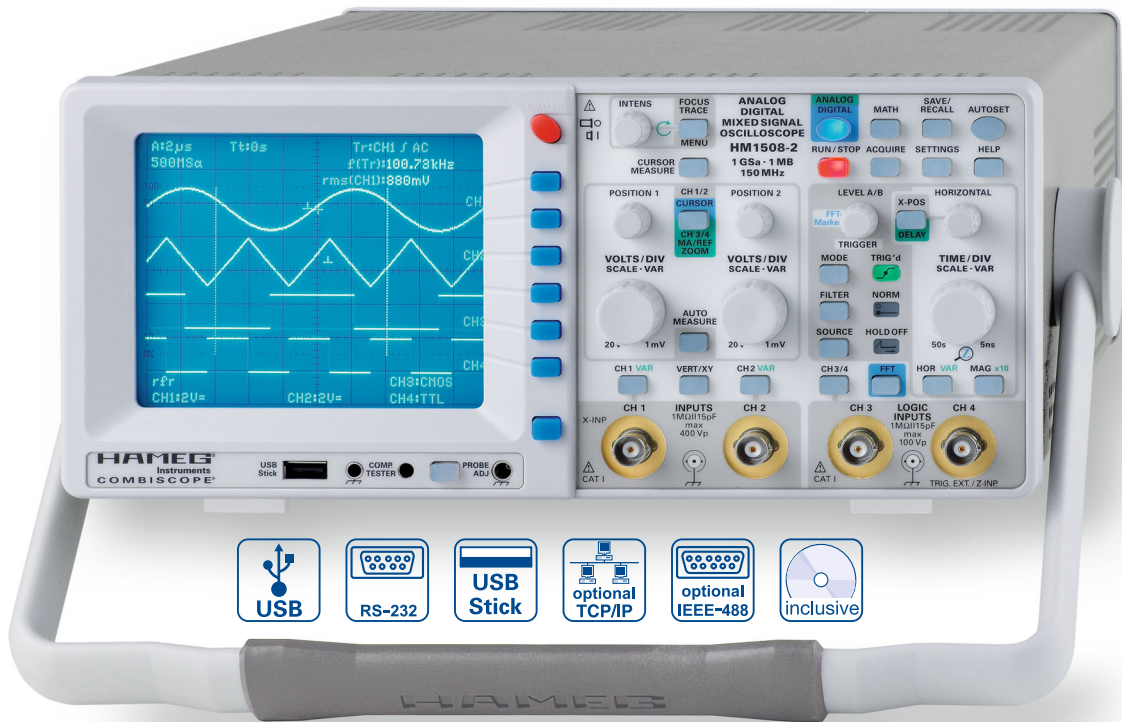
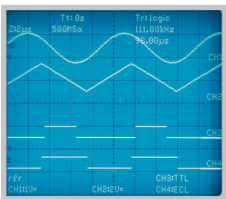


# 150 MHz Mixed Signal CombiScope® with FFT HM1508-2

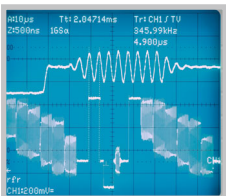
HM1508-2



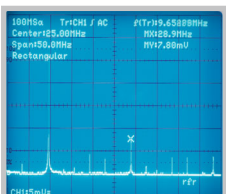
DSO mode:  
4-channel display of 2 analog  
and 2 logic signals



DSO mode: Signal portion  
expanded with zoom  
(burst in one line)



Frequency Analysis  
with FFT



- 1GSa/s Real Time Sampling, 10GSa/s Random Sampling
- 1MPts Memory per Channel, Memory Zoom up to 50,000:1
- FFT for spectral analysis
- 4 Channels (2 analog, 2 logic inputs)
- Deflection coefficients 1mV/div....20V/div.,  
Time Base 5 ns/div....50 s/div.
- 8-Bit Low Noise Flash A/D Converters
- Acquisition modes: Single, Refresh, Average, Envelope,  
Roll, Peak-Detect
- Front USB-Stick Connector for Screenshots
- USB/RS-232, optional: IEEE-488 or Ethernet/USB
- Signal display: Yt, XY and FFT;  
Interpolation: Sinx/x, Pulse, Dot Join (linear)
- See HM1500-2 for analog mode

# 150 MHz Mixed Signal CombiScope® HM1508-2

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

## Vertical Deflection

<b>Channels:</b>	
<b>Analog:</b>	2
<b>Digital:</b>	2 + 2 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), Addition Logic Signal Channels: CH 3 and CH 4
<b>X in XY-Mode:</b>	CH 1
<b>Invert:</b>	CH 1, CH 2
<b>Bandwidth (-3 dB):</b>	2 x 0...150 MHz
<b>Rise time:</b>	< 2.3 ns
<b>Bandwidth limiting (selectable):</b>	approx. 20 MHz (5 mV/div...20 V/div.)
<b>Deflection Coefficients(CH 1,2):</b>	14 calibrated steps
1 mV...2 mV/div. (10 MHz)	± 5 % (0...10 MHz [-3 dB])
5 mV...20 V/div.	± 3 % (1-2-5 sequence)
variable (uncalibrated):	> 2.5:1 to > 50 V/div.
<b>Inputs CH 1, 2:</b>	
<b>Input Impedance:</b>	1 MΩ    15 pF
<b>Coupling:</b>	DC, AC, GND (ground)
<b>Max. Input Voltage:</b>	400 V [DC + peak AC]
<b>Y Delay Line (analog):</b>	70 ns
<b>Measuring Circuits:</b>	Measuring Category I
<b>Digital mode only:</b>	
<b>Logic Channels:</b>	CH 3, CH 4
<b>Select. switching thresholds:</b>	TTL, CMOS, ECL
<b>User definable thresholds:</b>	3
<b>within the range:</b>	-2 V...+3 V
<b>Analog mode only:</b>	
<b>Auxiliary input:</b>	CH 4: 100 V (DC + peak AC)
<b>Function (selectable):</b>	Extern Trigger, Z (unblank)
<b>Coupling:</b>	AC, DC
<b>Max. input voltage:</b>	100 V (DC + peak AC)

## 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 div...+10 div.
<b>Operating modes:</b>	Slope/Video/Logic
<b>Slope:</b>	Rising, falling, both
<b>Sources:</b>	CH 1, CH 2, alt. CH 1/2 (≥ 8 mm, 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>	CH 4 (0.3 V <sub>pp</sub> , 150 MHz)
<b>Coupling:</b>	AC, DC
<b>Max. input voltage:</b>	100 V [DC + peak AC]
<b>Digital mode:</b>	
<b>Logic:</b>	AND/OR, TRUE/FALSE
<b>Source:</b>	CH1 or 2, CH3 and CH4
<b>State:</b>	X, H, L
<b>Pre/Post Trigger:</b>	-100%...+400% related to complete memory
<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 div...+10 div.

## Horizontal Deflection

<b>Analog mode</b>	
<b>Operating modes:</b>	A, ALT (alternating A/B), B
<b>Time base A:</b>	50 ns/div...0.5 s/div. (1-2-5 sequence)
<b>Time base B:</b>	50 ns/div...20 ms/div. (1-2-5 sequence)
<b>Accuracy A and B:</b>	± 3 %
<b>X Magnification x10:</b>	to 5 ns/div.
<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>Bandwidth X-Amplifier:</b>	0...3 MHz [-3 dB]
<b>X Y phase shift &lt; 3°:</b>	< 220 kHz

## Digital mode

<b>Time base range (1-2-5 sequence)</b>	
<b>Refresh Mode:</b>	5 ns/div...20 ms/div.
<b>with Peak Detect:</b>	2 ms/div...20 ms/div. (min. Pulse Width 10 ns)
<b>Roll Mode:</b>	50 ms/div...50 s/div.
<b>Accuracy time base</b>	
<b>Time base:</b>	50 ppm
<b>Display:</b>	± 1 %
<b>MEMORY ZOOM:</b>	max. 50,000:1
<b>Bandwidth X-Amplifier:</b>	0...150 MHz [-3 dB]
<b>XY phase shift &lt; 3°:</b>	< 100 MHz

## Digital Storage

<b>Sampling rate (real time):</b>	Analog channels: max. 2 x 500MSa/s or 1 x 1 GSa/s (interleaved); Logic Channels: 2 x 500MSa/s
<b>Acquisition (random sampling):</b>	10 GSa/s
<b>Bandwidth:</b>	2 x 0...150 MHz (random)
<b>Memory:</b>	2 x 1 MPts (analog); 2 x 1 MPts (logic)
<b>Operating modes:</b>	Refresh, Average, Envelope/ Roll: Free Run/Triggered, Peak-Detect
<b>Resolution (vertical):</b>	8 Bit (25 Pts/div.)
<b>Resolution (horizontal):</b>	
<b>Yt:</b>	11 Bit (200 Pts/div.)
<b>XY:</b>	8 Bit (25 Pts/div.)
<b>Interpolation:</b>	Sinx/x, Dot Join (linear),
<b>Delay:</b>	1 Million x 1/Sampling Rate to 4 Million x 1/Sampling Rate
<b>Display refresh rate:</b>	max. 170/s at 1 MPts
<b>Display:</b>	Dots (acquired points only), Vectors (partly interpolated), optimal (complete memory weighting and vectors)
<b>Reference Memories:</b>	9 with 2 kPts each (for recorded signals)
<b>Display:</b>	2 signals of 9 (free 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, Blackman
<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 (instrument parameter settings):</b>	9
<b>Signal display:</b>	max. 4 signals or 4 traces
<b>analog:</b>	CH 1, 2 (Time Base A) in combination with CH 1, 2 (Time Base B)
<b>digital:</b>	CH 1, 2 and CH 3, 4 or ZOOM or Reference or Mathematics
<b>USB Memory-Stick:</b>	
<b>Save/Recall external:</b>	
<b>Instrument settings and Signals:</b>	CH 1, 2 and CH 3, 4 or ZOOM or Reference or Mathematics
<b>Screen-shot:</b>	as Bitmap
<b>Signal display data (2k per channel):</b>	Binary (SCPI-Data), Text (ASCII-Format), CSV (Spread Sheet)
<b>Frequency counter:</b>	
<b>6 digit resolution:</b>	> 1 MHz...250 MHz
<b>5 digit resolution:</b>	0.5 Hz...1 MHz
<b>Accuracy:</b>	50 ppm
<b>Auto Measurements:</b>	
<b>Analog mode:</b>	Frequency, Period, V <sub>dc</sub> , V <sub>pp</sub> , V <sub>p+</sub> , V <sub>p-</sub>
<b>also in digital mode:</b>	V <sub>rms</sub> , V <sub>avg</sub>
<b>Cursor Measurements:</b>	
<b>Analog mode:</b>	Δt, 1/Δt (f), t <sub>r</sub> , ΔV, V to GND, ratio X, ratio Y

<b>plus in digital mode:</b>	$V_{pp}$ , $V_{p+}$ , $V_{p-}$ , $V_{avg}$ , $V_{rms}$ , pulse count
<b>Resolution Readout/Cursor:</b>	1000 x 2000 Pts, Signals: 250 x 2000
<b>Interfaces (plug-in):</b>	USB/RS-232 (H0720)
<b>Optional:</b>	IEEE-488, Ethernet/USB

#### Mathematic functions

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

#### Display

<b>CRT:</b>	D14-375GH
<b>Display area (with graticule):</b>	8 div. x 10 div.
<b>Acceleration voltage:</b>	approx. 14 kV

#### General Information

<b>Component tester</b>	
<b>Test voltage:</b>	approx. $7V_{rms}$ (open circuit), approx. 50 Hz
<b>Test current:</b>	max. $7mA_{rms}$ (short circuit)
<b>Reference Potential :</b>	Ground (safety earth)
<b>Probe ADJ Output:</b>	1 kHz/1 MHz square wave signal $0.2V_{pp}$ ( $tr < 4 ns$ )
<b>Trace rotation:</b>	electronic
<b>Line voltage:</b>	105...253 V, 50/60 Hz $\pm 10\%$ , CAT II
<b>Power consumption:</b>	47 Watt at 230 V, 50 Hz
<b>Protective system:</b>	Safety class I (EN61010-1)
<b>Operating temperature:</b>	+5°C...+40°C
<b>Storage temperature:</b>	-20°C...+70°C
<b>Rel. humidity:</b>	5%...80% (non condensing)
<b>Dimensions (W x H x D):</b>	285 x 125 x 380 mm
<b>Weight:</b>	5.6 kg

**Accessories supplied:** Line cord, Operating manual, 4 Probes 10:1 with attenuation ID (HZ200), Windows Software for control and data transfer

#### Optional accessories:

H0730 Dual-Interface Ethernet/USB,  
H0740 Interface IEEE-488 (GPIB),  
HZ70 Opto-Interface (with optical fiber cable)

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