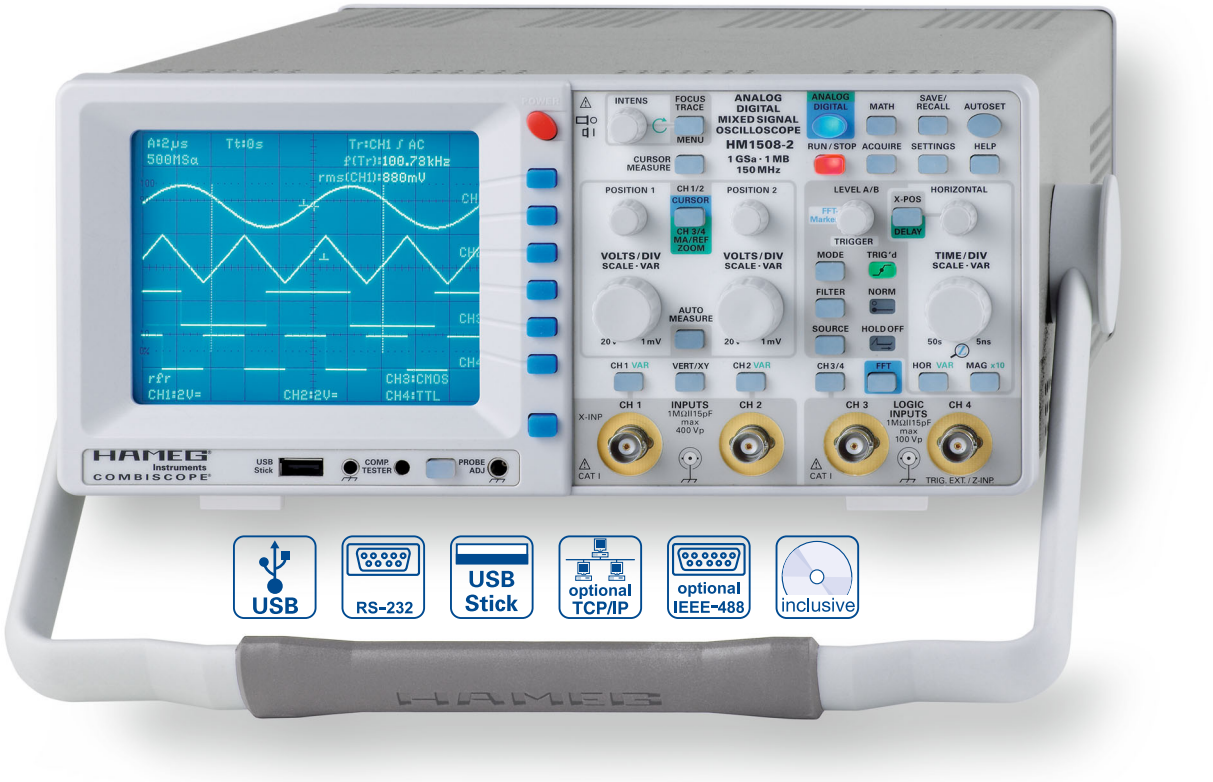
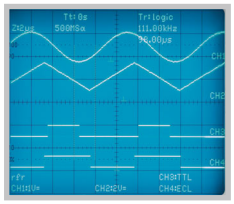
HAMEG Instruments

150MHz Mixed Signal CombiScope® with FFT HM1508-2

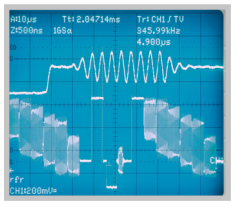
HM1508-2



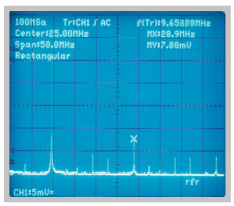
DSO mode:
4-channel display of 2 analog and 2 logic signals



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 50s/div....5ns/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

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

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 div....+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:	CH 4 (0.3 V_{pp}, 150 MHz)
Coupling:	AC, DC
Max. input voltage:	100 V (DC +peak AC)
Digital mode:	
Logic:	AND/OR, TRUE/FALSE
Source:	CH1 or 2, CH3 and CH4
State:	X, H, L
Pre/Post Trigger:	-100 %...+400 % related to complete memory
Analog mode	
2nd Trigger	
Min. signal height:	5 mm
Frequency range:	0...250 MHz
Coupling:	DC
Level control range:	-10 div....+10 div.

Horizontal Deflection

Analog mode	
Operating modes:	A, ALT (alternating A/B), B
Time base A:	0.5 s/div....50 ns/div. (1-2-5 sequence)
Time base B:	20 ms/div....50 ns/div. (1-2-5 sequence)
Accuracy A and B:	± 3 %
X Magnification x10:	to 5 ns/div.
Accuracy:	± 5 %
Variable time base A/B:	cont. 1:2.5
Hold Off time:	var. 1:10 LED-Indication
Bandwidth X-Amplifier:	0...3 MHz (-3 dB)
X Y phase shift ‹ 3°:	‹ 220 kHz
Digital mode	
Time base range (1-2-5 sequence)	
Refresh Mode:	20 ms/div....5 ns/div.
with Peak Detect:	20 ms/div....2 ms/div. (min. Pulse Width 10 ns)
Roll Mode:	50 s/div....50 ms/div.
Accuracy time base	
Time base:	50 ppm
Display:	± 1 %
MEMORY ZOOM:	max. 50,000:1
Bandwidth X-Amplifier:	0...150 MHz (-3 dB)
XY phase shift ‹ 3°:	‹ 100 MHz

Digital Storage

Sampling rate (real time):	Analog channels: 2 x 500 MSa/s, 1 GSa/s interleaved; Logic Channels: 2 x 500 MSa/s
Acquisition (random sampling):	10 GSa/s
Bandwidth:	2 x 0...150 MHz (random)
Memory:	1 M-Samples per Channel
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:	Sinx/x, Dot Join (linear),
Delay:	1 Million x 1/Sampling Rate to 4 Million x 1/Sampling Rate
Display refresh rate:	max.170/s at 1 MPts
Display:	Dots (acquired points only), Vectors (partly interpolated), optimal (complete memory weighting and vectors)
Reference Memories:	9 with 2 kPts each (for recorded signals)
Display:	2 signals of 9 (free selectable)

FFT Mode

Display X:	Frequency Range
Disaplay 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 x 20

Operation/Measuring/Interfaces

Operation:	Menu (multilingual), Autoset, help functions (multilingual)
Save/Recall (instrument parameter settings):	9
Signal display:	max. 4 signals or 4 traces
analog:	CH 1, 2 (Time Base A) in combination with CH 1, 2 (Time Base B)
digital:	CH 1, 2 and CH 3, 4 or ZOOM or Reference or Mathematics
USB Memory-Stick:	
Save/Recall external:	
Instrument settings and Signals:	CH 1, 2 and CH 3, 4 or ZOOM or Reference or Mathematics
Screen-shot:	as Bitmap
Signal display data (2k per channel):	Binary (SCPI-Data), Text (ASCII-Format), CSV (Spread Sheet)
Frequency counter:	
6 digit resolution:	› 1 MHz...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-}
also in digital mode:	V_{rms}, V_{avg}
Cursor Measurements:	
Analog mode:	Δt, 1/Δt (f), t_r, 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 (HO720)
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 div. x 10 div.
Acceleration voltage:	approx. 14 kV

General Information	
Component tester	
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 ±10 %, CAT II
Power consumption:	47 Watt at 230 V, 50 Hz
Protective system:	Safety class I (EN61010-1)
Operating temperature:	+5°C...+40°C
Storage temperature:	-20°C...+70°C
Max. 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, Operating manual, 4 Probes 10:1 with attenuation ID (HZ200), Windows Software for control and data transfer
Optional accessories:
HO730 Dual-Interface Ethernet/USB,
HO740 Interface IEEE-488 (GPIB),
HZ70 Opto-Interface (with optical fiber cable)

HM1508-2E/051108/ce · Subject to alterations · © HAMEG Instruments GmbH® · DQS-certified in accordance with DIN EN ISO 9001:2000, Reg.-No.: DE-071040 QM
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