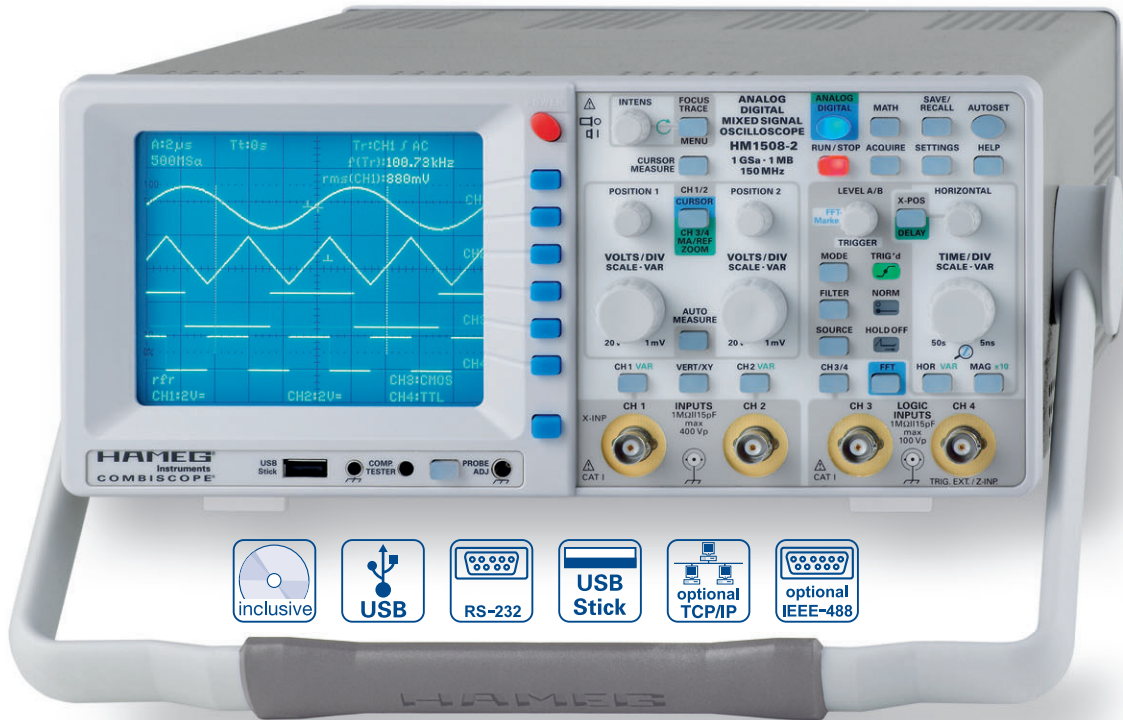
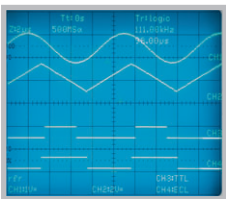


# 150 MHz Mixed Signal CombiScope® with FFT HM1508-2

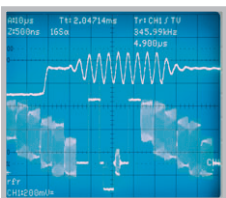
HM1508-2



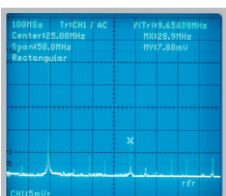
DSO mode:  
4-channel display of 2 analog  
and 2 logic signals



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



Frequency Analysis  
with FFT



1 GSa/s Real Time Sampling, 10 GSa/s Random Sampling

1 MPts Memory per Channel, Memory  up to 50,000:1

FFT for spectral analysis

4 Channels (2 analog, 2 logic inputs)

Deflection coefficients: 1 mV/cm – 20 V/cm,  
Time Base: 50 s/cm – 5 ns/cm

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, Ethernet/USB

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

# 150 MHz Mixed Signal CombiScope® HM1508-2

Valid at 23 °C after a 30 minute warm-up period

## 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>Bandwith limiting (selectable):</b>  | about 20 MHz (5 mV/cm – 20V/cm)   |
| <b>Deflection Coefficients(CH 1,2):</b> | 14 calibrated steps   |
| 1 mV – 2 mV/cm (10 MHz)                 | ± 5 % (0 – 10 MHz [-3 dB])  |
| 5 mV – 20V/cm                           | ± 3 % (1-2-5 sequence)  |
| variable (uncalibrated):                | > 2.5:1 to > 50V/cm   |
| <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>              | 400V [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 to +3 V  |
| <b>Analog mode only:</b>                |   |
| <b>Auxiliary input:</b>                 | CH 4: 100V (DC + peak AC)   |
| <b>Function (selectable):</b>           | Extern Trigger, Z (unblank)   |
| <b>Coupling:</b>                        | AC, DC  |
| <b>Max. input voltage:</b>              | 100V (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 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 (≥ 8 mm, analog mode only), Line, Ext.   |
| <b>Coupling:</b>                     | <b>AC:</b> 10 Hz–250 MHz<br><b>DC:</b> 0 – 250 MHz<br><b>HF:</b> 30 kHz–250 MHz<br><b>LF:</b> 0–5 kHz<br>Noise Rej. switchable |
| <b>Video:</b>                        | pos./neg. Sync. Impulse  |
| <b>Standards:</b>                    | 525 Line/60 Hz Systems<br>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 (0.3V <sub>pp</sub> , 150 MHz)  |
| <b>Coupling:</b>                     | AC, DC   |
| <b>Max. input voltage:</b>           | 100V (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% to +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 cm to +10 cm |

## Horizontal Deflection

|   |   |
|---|---|
| <b>Analog mode</b>                      |   |
| <b>Operating modes:</b>                 | A, ALT (alternating A/B), B                 |
| <b>Time base A:</b>                     | 0.5 s/cm – 50 ns/cm (1-2-5 sequence)        |
| <b>Time base B:</b>                     | 20 ms/cm – 50 ns/cm (1-2-5 sequence)        |
| <b>Accuracy A and B:</b>                | ± 3 %                                       |
| <b>X Magnification x10:</b>             | to 5 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>Bandwidth X-Amplifier:</b>           | 0 – 3 MHz [-3 dB]                           |
| <b>X Y phase shift &lt; 3°:</b>         | < 220 kHz                                   |
| <b>Digital mode</b>                     |   |
| <b>Time base range (1-2-5 sequence)</b> |   |
| <b>Refresh Mode:</b>                    | 20 ms/cm – 5 ns/cm                          |
| <b>with Peak Detect:</b>                | 20 ms/cm – 2 ms/cm (min. Pulse Width 10 ns) |
| <b>Roll Mode:</b>                       | 50 s/cm – 50 ms/cm                          |
| <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: 2 x 500 MSa/s, 1 GSa/s interleaved; Logic Channels: 2 x 500 MSa/s                          |
| <b>Acquisition (random sampling):</b> | 10 GSa/s  |
| <b>Bandwidth:</b>                     | 2 x 0 – 150 MHz (random)  |
| <b>Memory:</b>                        | 1 M-Samples per Channel   |
| <b>Operating modes:</b>               | Refresh, Average, Envelope/<br>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), Pulse  |
| <b>Delay:</b>                         | 1 Million x 1/Sampling Rate to<br>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, 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 (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, $V_{dc}$ , $V_{pp}$ , $V_{p+}$ , $V_{p-}$                   |
| <b>also in digital mode:</b>      | $V_{rms}$ , $V_{avg}$  |
| <b>Cursor Measurements:</b>       |  |
| <b>Analog mode:</b>               | $\Delta t$ , $1/\Delta t$ (f), $t_r$ , $\Delta V$ , 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   |

|                                |   |
|--------------------------------|---|
| <b>Mathematic functions</b>    |   |
| <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)                |

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

|                              |  |
|------------------------------|--|
| <b>General Information</b>   |  |
| <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 $0.2V_{pp}$ ( $t_r < 4$ 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>Weight:</b>               | 5.6 kg   |
| <b>Cabinet (W x H x D):</b>  | 285 x 125 x 380 mm   |
| <b>Ambient temperature:</b>  | 0 °C ...+40 °C   |

**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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