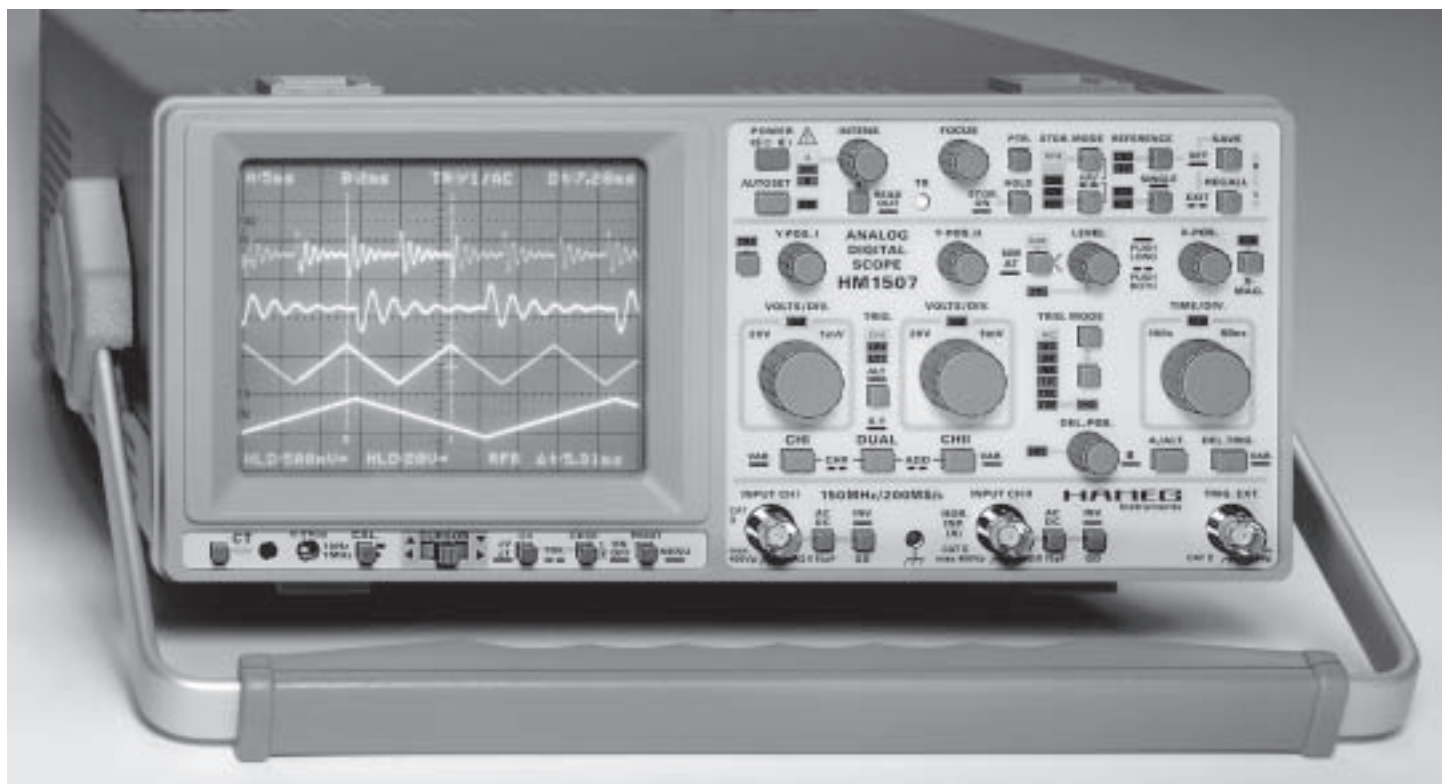# 150MHz/200MSa/s Analog-Digital Oscilloscope HM1507-3

- **DC to 150MHz, Trigger: DC to 250MHz, 2 Channels: 1mV-20V**
- **5ns Peak Detector, Adjustment Menu, Calibrator 1kHz/1MHz**
- **Autoset, Save/Recall, Readout/Cursor, RS-232 Interface**
- **Real Time Sample Rate 200MSa/s, 11 Cursor Meas. Functions**

The HM1507-3 combines **digital storage** technology and **real time analog** signal analysis. High sample rates and peak detect facility minimize aliasing while capturing different waveforms. The excellent frequency response of the signal amplifiers and the stable triggering abilities from only **5mm** peak to peak on the screen, enable the scope to display sine waves far beyond its -3dB frequency without any problems (up to 250MHz).

The instrument contains a **second trigger** system to ensure stable triggering of even asynchronous signal components. With its **second time base**, the **HM1507-3** scope is capable of displaying a freely selectable expanded section in mixed mode.

When the Autoset function is enabled, all relevant parameter settings are performed by the scope's circuitry automatically. The Setup parameters and the measured values are clearly displayed on the screen in alpha

numeric characters. Autoset also initiates automatic cursor settings for Time, Frequency and Voltage measurement.

A remarkable feature of the scope is the built in calibrator, a **1kHz/1MHz square wave generator**. It allows frequent checking of the instrument's frequency response, from the probe tip to the display on the screen. It also permits high frequency alignment of the probes. A **built in adjustment menu** allows closed case adjustment.

With all of the new **HAMEG** scope range, microprocessors manage the front panel inputs, calculations, and other control functions. In addition, **32 bit RISC processors** accelerate the digital signal processing.

Low noise **8 bit flash converters** are used to digitize the signals to be analyzed. The dot join function linearly connects successive points within display curves without gaps.

The scope digitizes and stores any signal with more than 2000 samples per sweep. The well proven **CRT** is ideal to reproduce signals with this high horizontal resolution.
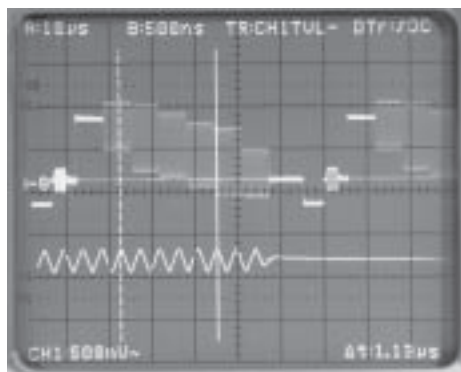
200MSa/s allows a clear display of single shot (real time) events up to frequencies of 20MHz.

To display reduce variations of a signal over several samples it is recommended to use the envelope or the average mode. Pre/post trigger function enables the user to analyze signal components that occur before/after the trigger event.

Two full size **reference memories** allow the comparison of signals with those already stored in memory. The scope features a peak detect function in TB ranges from 100s/div to 5µs/div. It facilitates the capture of pulses (5ns) which normally would not be seen.
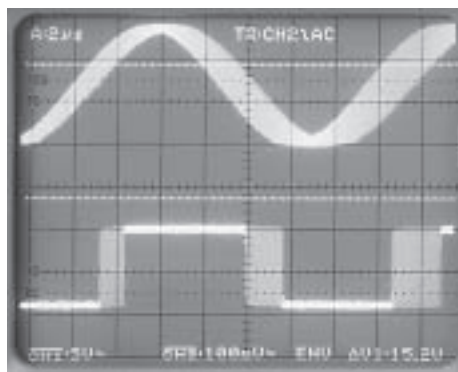
The instrument may be **remotely controlled** by any **PC** via its **built in serial RS-232 interface** in all relevant functions. A suitable software program is supplied with the scope on delivery.

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Autoset performs all relevant parameter settings automatically for the best readout of the signal on the screen, even with input signals as small as 5mV. Any Autoset parameter can be changed manually to fit special needs. The set up parameters and the result of the selected measurement function are displayed on the screen.
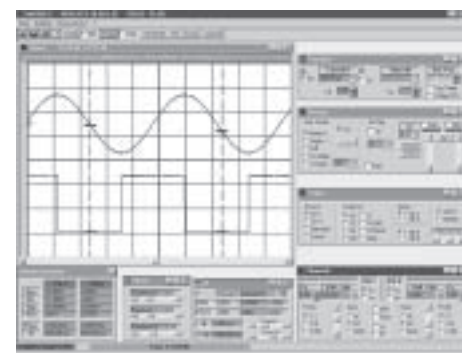
Another feature is the storage capability for **nine** complete parameter set ups, which may be stored and recalled simply by pressing the appropriate front panel key (SAVE/RECALL Mode). **Eleven** cursor measuring functions and two reference memories facilitate instrument settings.

The Software AS100E

The **HAMEG** Oscilloscope PC software allows you to control the instrument functions and the transfer of signal data to a PC via the built in RS-232 interface. The software is compatible with **Windows® 9x, ME, NT4.0, 2000** and **XP**. Analysis and documentation on a PC in storage mode are easy tasks. The actual version can be downloaded under **www.hameg.com**. In addition FFT analysis software and Power Line Harmonics analysis soft-ware is available on request.

The screen photo shows a composite video signal with burst. The two time bases of the **HM1507-3** are operating in the mixed mode. Since the burst is asynchronous to other components of the **TV signal**, a second trigger circuit is required. It can display the **signal and** the **burst** concurrently in **two curves**.

When signals are displayed in the envelope mode, the influence of jitter effects, amplitude changes and aberrations can be demonstrated significantly. The scope builds the envelope curve by storing the minimum and maximum values over a number of consecutive sampling periods.

Specifications HM1507-3

Reference Temperature: 23°C ±2°C

Vertical Deflection

Operating modes: Channel I or II separate both Channels (alternated or chopped)
Chopper frequency: approx. 0.5MHz
Sum or **Difference:** from CH I and CH II
Invert: CH I and CH II
XY-Mode: via channel I (Y) and channel II(X)
Frequency range: **DC** to **150MHz** (-3dB)
Rise time: <2.3ns
Overshoot: ≤1%
Deflection coefficient: 14 calibrated positions from **1mV/div** to **20V/div** in 1-2-5 sequence, variable 2.5:1 to min. **50V/div**
Accuracy in calibrated positions
1mV/div – 2mV/div: ±5% (DC-10MHz (-3dB))
5mV/div – 20V/div: ±3% (DC-150MHz -3dB)
Input impedance: 1MΩ II 15pF
Input coupling: DC-AC-GD (ground)
Input voltage: max. 400V (DC + peak AC)
Delay line: approx. **70ns**

Triggering

Automatic (peak to peak)**:** 20Hz-250MHz (≥0.5div.)
Normal with level control: DC-250MHz (≥0.5div.)
Indicator for trigger action: LED
Slope: positive or negative
Sources: Channel I or II, line and external
ALT. Triggering: CH I/CH II (≥ 0.8div.)
Coupling: AC (10 – 250MHz)
          DC (0 – 250MHz)
          HF (50kHz – 250MHz)
          LF (0 – 1.5kHz)
          NR (Noise reject)0 - 50MHz (≥ 0.8div.)
Triggering time base B: normal with level control and slope selection (0 – 250 MHz)
External: ≥0.3V$_{pp}$ (0 – 150MHz)
Active TV Sync. Separator: field & line, + / –

Horizontal Deflection

Analog Time Base:
Accuracy in calibr. position 3%; 1-2-5 sequence
A: **0.5s – 50ns/div**.
B: **20ms – 50ns/div**.
Operating modes: **A** or **B**, alternate **A/B**
Variable: 2.5:1 up to 1.25s/div.
X-MAG. x10 (±5%) max. 5ns/div.
Hold off time: variable to approx. 10:1
Bandwidth X-amplifier: 0 – 3MHz (-3dB)
X-Y phase shift: <3° below 220kHz
Digital Time Base:
Accuracy: 3%; 1-2-5 sequence
A: **100s – 0.1µs/div**.
    Peak detect: **100s – 5µs/div**.
B: **20ms – 0.1µs/div**.
    Peak detect: **20ms – 5µs/div**.
Operating modes: **A** or **B**, alternate **A/B**
X-MAG. x10 (±5%): **10ns/div**.
Bandwidth X-Amplifier: 0 – 20MHz (-3dB)
X-Y phase shift: <3° below 20MHz
Input X-amplifier: via Channel II
Sensitivity: see CH II

Digital Storage

Operating modes: Refresh, Roll, Single, XY Peak detect, Average (2 to 512), Envelope
Dot Join function: linear
Acquisition (real time)**:**
8 bit flash A/D max. **200MSa/s**
Peak detect: **5ns**
Display refresh rate: max. 180/s
Memory & display: 2k x 8bit per channel
Reference memory: 2k x 8bit per channel
Resolution (samples/div.)**: X** 200/div.
                         Y 25 /div.
                         XY 25 x 25/div.
Pre-/Post Trigger: 25,50,75,100, -25,-50,-75%

Operation / Control

Manual: front panel switches
Auto Set: signal related automatic parameter selection
Save & Recall: 9 user defined parameter settings

Readout & Cursor (analog/digital)

Display of parameter settings and other functions on the screen. Trigger point indication. Cursor measurement of ΔU, Δt or 1/Δt (frequency), separate or in tracking mode.
Readout intensity: separately adjustable.

Interface

PC (control, signal data)**:** **RS-232** interface
Option: **HO79-6** Multifunction Interface
          HZ70 Opto-Interface
Output formats (HO79-6)**:** PCL, Post Script HPGL, EPSON

Component Tester

Test voltage: max. 7V$_{rms}$ (o/c).
Test current: max. 7mA$_{rms}$ (s/c)
Test frequency: approx.50Hz
One test lead is grounded (Safety Earth)

General Information

CRT: D14-375GH, 8x10cm internal graticule
Acceleration voltage: approx. 14kV
Trace rotation: adjustable on front panel
Calibrator: 0.2V ±1%, ≈ 1kHz/1MHz (tr <4ns)
Line voltage: 100-240V AC ±10%, 50/60Hz
Power consumption: approx. 47 Watt at 50Hz
Min./Max. ambient temperature: 0°C...+40°C
Protective system: Safety class I (IEC1010-1)
Weight: approx. 6.5 kg (12.4lbs)
Color: techno-brown
Cabinet: **W** 285, **H** 125, **D** 380 mm
Lockable tilt handle

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Accessories supplied: Operators Manual, Software on CDR, Line Cord, 2 Probes 10:1