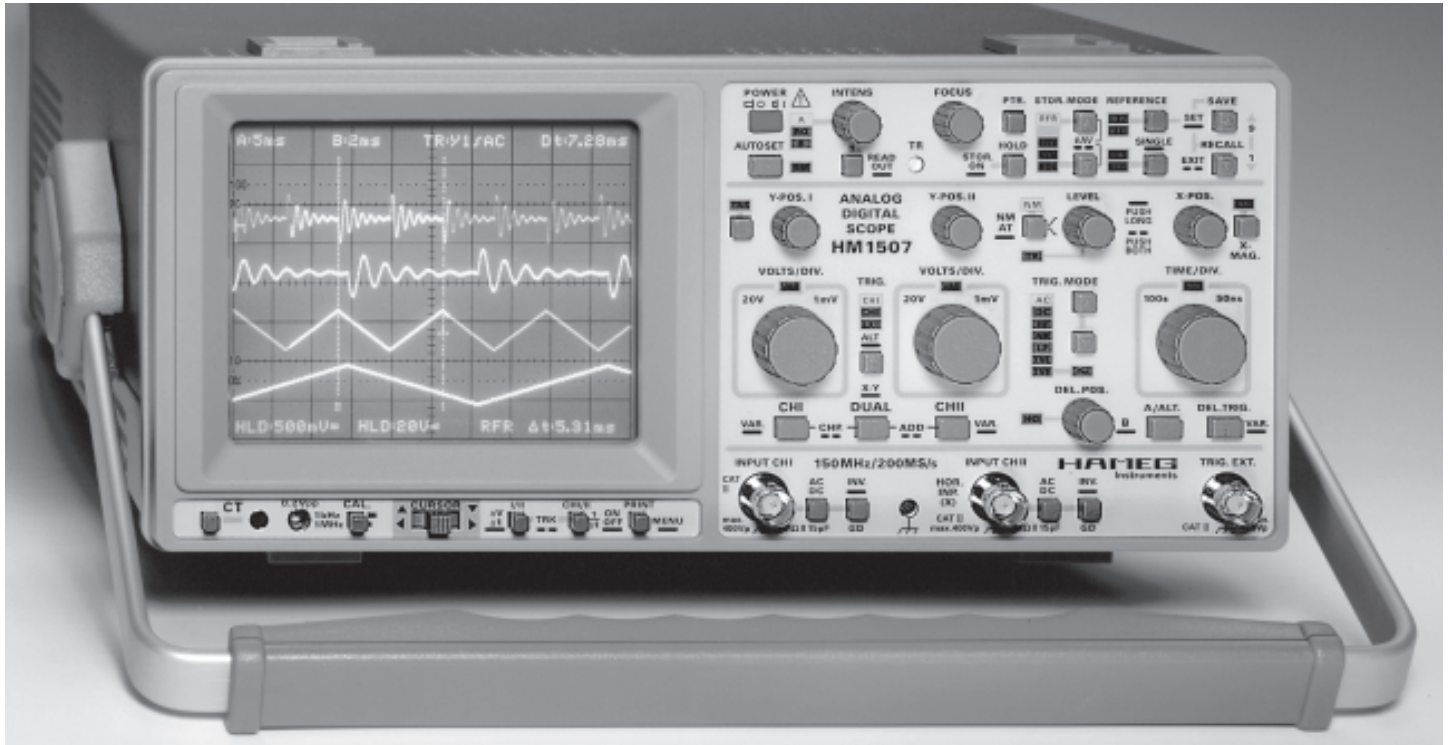


The Analog- Digital Scope HM1507-3 with Autoset, Save / Recall & Readout



- DC to 150MHz, Trigger: DC to 250MHz, 2 Channels: 1mV-20V
- Real Time Sample Rate 200MSa/s, Cursor Measure.: $\Delta U, \Delta t, 1/\Delta t$

The Technique

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. With rectangular signals the instrument's own overshoot is less than 1%. 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 not only the signal itself but also a freely selectable expanded section in mixed mode, according to the time base and trigger delay settings. This function is available in both analog and digital modes. In contrast to analog operation there is no intensity reduction in digital mode, even if high expansion ratios are chosen. Low noise **8 bit flash converters** are used to digitize the signals to be analyzed. A so called dot join function linearly connects successive points to display curves without any gap. The scope digitize and store any signal with more than 2000 samples per sweep. The well proven **CRT** is suitable to reproduce signals in this high horizontal resolution. **200MS/s** allows a clear display of single shot (real time) events up to frequencies of 20MHz. To display variations of a signal over several samples it is recommended to use the envelope or the average mode.

Another important feature is the pre/post trigger function that 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 HM1507-3 features a peak-detect function which allows the automatic capture and storage of non repetitive signals. Signals down to **5ns** wide can be detected at timebase settings up to 5 μ s/div.

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 alphanumeric characters. Autoset also initiates automatic cursor settings for time and frequency measurement (digital only) as well as voltage measurement. In analog and digital mode, the cursor functions enable the user to analyze a signal while watching the numeric readout for voltage difference, time difference, or frequency values. 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. 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. Supported by a **Built-in calibrate menu**, closed-case adjustment procedures of the vertical-, trigger- and storage amplifiers are possible.

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. The instrument may be **remotely controlled** by any **personal computer** via its **built-in serial interface** in all relevant functions. A suitable software program is supplied with the scope on delivery.

Operation

Like all members of the new series of **HAMEG** oscilloscopes the HM1507-3 combines a wide range of useful functions with an easy to use operator interface. The logically designed layout and the proven functionality of the keys and knobs make additional menu keys avoidable. Even inexperienced oscilloscope users will soon become familiar with these instruments.

The easiest way to display signals of low complexity is the use of the **Autoset** function. The scope's logic circuitry performs all relevant parameter settings automatically for the best readout of the signal on the screen. The set up parameters and the result of the selected measurement function are clearly displayed on the screen. Another feature is the **storage capability** for **nine complete parameter**

settings, which may be **stored** and **recalled** randomly by pushing the relevant front panel key. It includes beam intensity and cursor parameters settings.

The **cursor functions** enable the user to analyze a signal while watching the **numeric readout** for the **voltage difference, time difference, or frequency**.

Applications

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 and amplitude changes can be demonstrated significantly. The scope builds the envelope curve by storing the minimum and maximum values over a number of consecutive sampling periods. For ease of operation the envelope curve can be stored in one of the reference memories and be displayed in combination with a currently measured signal.

Software

The measurement software **SP107** is a part of the **HM1507-3**, controlled by a PC via the built-in **RS-232** Interface.

Specifications HM1507-3

Vertical Deflection

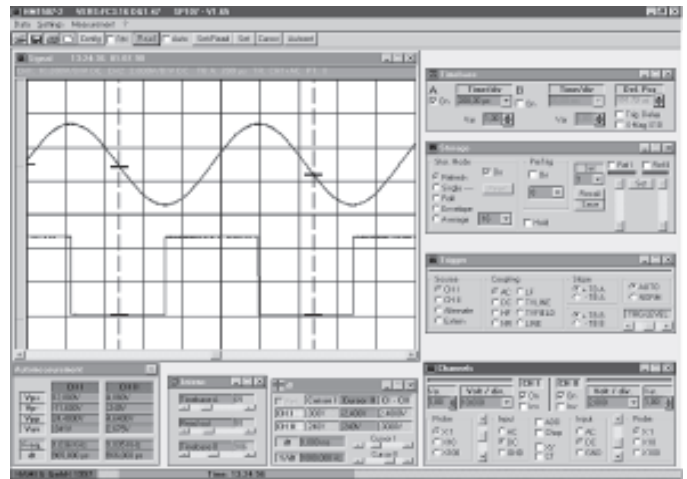
Operating modes: Channel I or II separate both Channels (alternated or chopped)
Chopper frequency: approx. 0.5MHz
Sum or Difference: from CH I and CH II
Invert: CH I and CH II
XY-Mode: via channel I (Y) and channel II(X)
Frequency range: DC to 150MHz (-3dB)
Risetime: <2.3ns
Overshoot: ≤1%
Deflection 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%
Input impedance: 1MΩ II 15pF
Input coupling: DC-AC-GD (ground)
Input voltage: max. 400V (DC + peak AC)
Delay line: approx. 70ns

Triggering

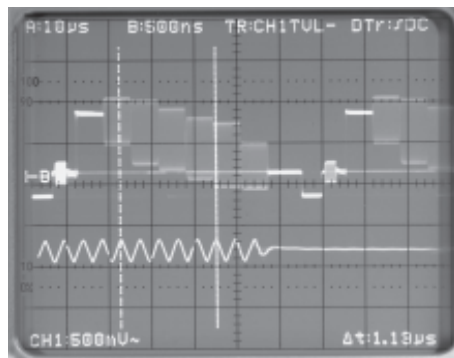
Automatic (peak to peak): 20Hz-250MHz (≥0.5div.)
Normal with level control: DC-250MHz (≥0.5div.)
Indicator for trigger action: LED
Slope: positive or negative
Sources: Channel I or II, line and external
ALT. Triggering: CH I/CH II (≥ 0.8div.)
Coupling: AC (10 – 250MHz)
DC (0 – 250MHz)
HF (50kHz – 250MHz)
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, + / -

Windows® compatible Oscilloscope Software

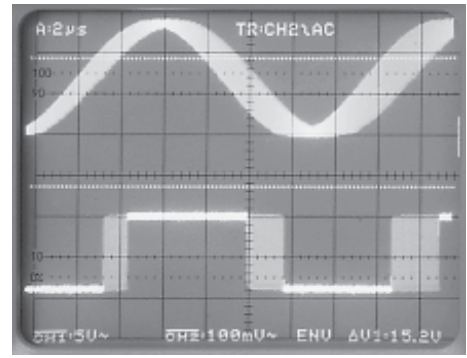
- Instrument Settings
- Receive Data
- Export Data
- Ref. Comparison
- Calculation Routines
- Documentation



SP107 software screen shot



Screen shot of a video signal. Burst disp. via 2nd TB.



Screen shot of signals in envelope mode.

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.
Holdoff 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: automatically
Acquisition (real time)
 8 bit flash A/D max. 200MS/s
Peak detect: 5ns
Display refresh rate: max. 180/s
Memory & display: 2k x 8bit per channel
Reference memory: 2 waveforms 2k x 8bit
Saved in: (EEPROM).
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. Triggerpoint indication. Cursor measurement of ΔU, Δt or 1/Δt (frequency), separate or in tracking mode.
Readout intensity: separately adjustable.

Interface

PC remote control: built in RS232 interface
Option: HO79-6 Multifunction-Interface
 IEEE-Bus, RS232, and Centronics
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: D14-375GY, 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

Subject to change without notice

5/00

Accessories supplied: Operators Manual, 4 Disks, Line Cord, 2 Probes 10:1