

USER MANUAL

HANDHELD OSCILLOSCOPE

HPS140MK2



TABLE OF CONTENTS

Safety information	3
During Use	3
Specifications & features	4
Quick use of the oscilloscope	5
Front panel	5
Top and bottom	5
Replacing the batteries	6
Short menu	6
Extended menu	7
Hold function	7
Use the markers and recall the memory	8
Component test mode	9



To all citizens of the European Union
Important environmental information about this product

This symbol on this unit or the package indicates that disposal of this unit after its lifecycle could harm the environment. Do not dispose the unit (or batteries if used) as unsorted municipal waste; it should be disposed by a specialized company for recycling. This unit should be returned to your distributor or to a local recycling service. Respect the local environmental rules.

If any doubt contact your local authorities about waste disposal rules.

Safety : General rules concerning safe.

To ensure your safety, please observe these safety measures. In no way these are complete. As safety requirements vary, please check with your local authorities, in order to comply with local requirements.

WARRANTY

This product is guaranteed against defects in components and construction from the moment it is purchased and for a period of TWO YEAR starting from the date of sale. This guarantee is only valid if the unit is submitted together with the original purchase invoice. VELLEMAN Ltd. limits its responsibility to the reparation of defects or, as VELLEMAN Ltd. deems necessary, to the replacement or reparation of defective components. Costs and risks connected to the transport, removal or placement of the product, or any other costs directly or indirectly connected to the repair, will not be reimbursed by VELLEMAN Ltd. VELLEMAN Ltd. will not be held responsible for any damages caused by the malfunctioning of a unit.

SAFETY INFORMATION

Overvoltage / installation categories

CAT II: A CAT II-rated meter is suitable for measurements on mono-phase appliances that are connected to the mains by means of a plug and circuits in a normal domestic environment. E.g. household appliances, portable tools...

Provided that the circuit is at least 10m apart from a CAT III- or 20m apart from a CAT IV-environment.

Pollution degree

Pollution degree 2: Only nonconductive pollution occurs.

Occasionally, temporary conductivity caused by condensation is to be expected. (home and office environments fall under this category).

DURING USE

- Never exceed the limit values for protection. These values are listed in the specifications.
- Do not touch unused terminals when the unit is linked to a circuit which is being tested.
- When carrying out measurements on a TV set or switching power circuits, always remember that the meter may be damaged by high amplitude voltage pulses at test points.
- Always be careful when working with voltages above 60Vdc or 30Vac rms. Keep your fingers behind the probe barriers at all times during measurement.
- Use a measuring probe with an insulated connector when measuring voltages exceeding 30V.
- For X10 probe: match the frequency response to the oscilloscope input by adjusting the compensation trimmer on the probe, see probe manual.



PROTECTIVE POUCH FOR VELLEMAN INSTRUMENTS
HPSP1

FEATURES

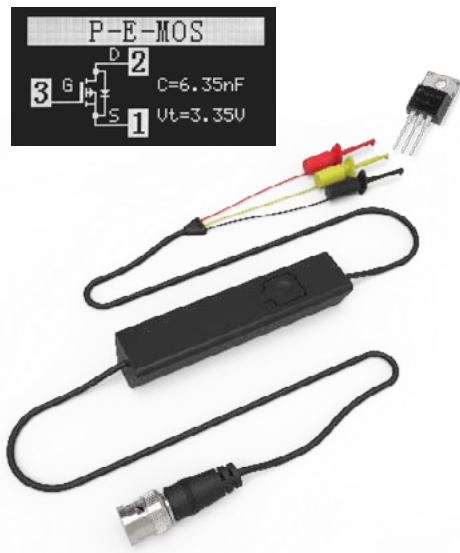
- 40 Mega samples/sec in real time
- bandwidth up to 10MHz
- full auto range option
- sensitivity down to 0.1 mV
- signal markers for amplitude and time
- memory hold function
- optional:
 - **HPS141**: component tester for pocket scope HPS140MK2
 - **HPSPR1**: X10 measuring probe
 - **HPSP1**: Velleman Instruments pouch

SPECIFICATIONS

- input range: 1 mV to 20V / division in 14 steps
- input coupling: DC, AC and GND
- time base: 250ns to 1 h per division
- readouts: DC, AC + DC, True RMS, dBm, Vpp, Min-Max. ($\pm 2.5\%$)
- white OLED display
- power supply: 4 x 1.5V AAA batteries (not incl.)
- operating time: up to 8 hours (on Alkaline batteries)



MEASURING PROBE FOR
VELLEMAN INSTRUMENTS
HPSPR1



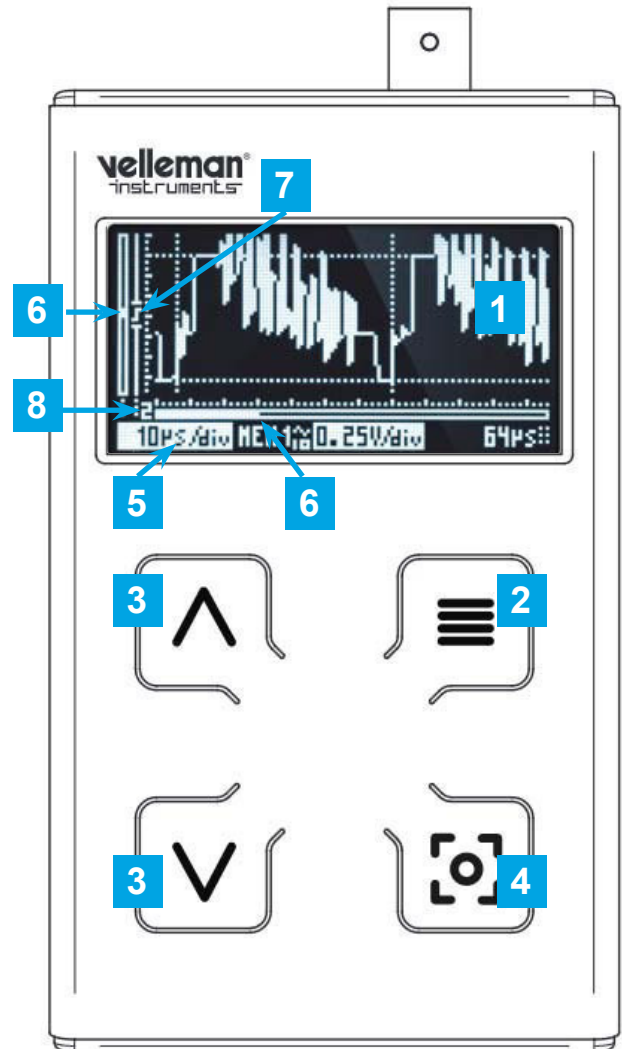
COMPONENT TESTER
HPS141

QUICK USE OF THE OSCILLOSCOPE

After turning ON, a start-up screen appears, also indicating the firmware build version. During this time, some calibrations are performed, so it can take a few seconds before the oscilloscope is ready to use. The scope always starts in full auto set-up mode. This mode can be used for most (repetitive) signals. Set the input coupling to "DC" if very low frequencies or DC voltages are measured (see further).

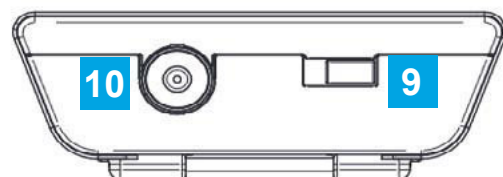
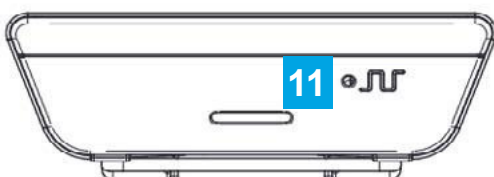
FRONTPANEL

1. signal and menu display
2. menu button / menu selection up
3. up and down set buttons
4. hold button / menu selection down
5. parameter indicators
6. signal position indicators (X and Y scroll bar)
7. trigger level and slope indicators
8. last selected function indicator



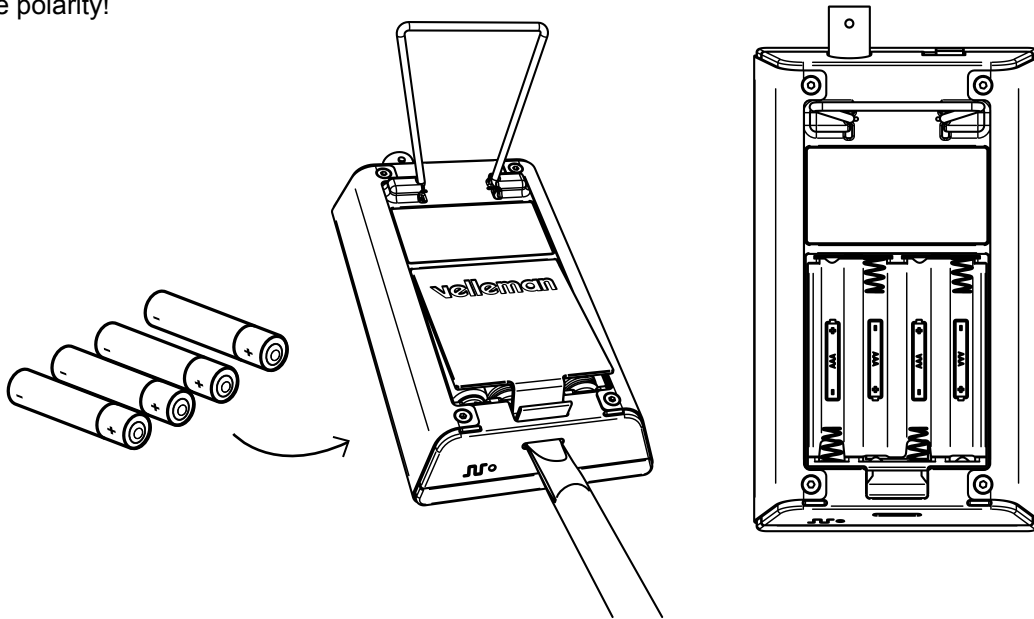
TOP AND BOTTOM

9. on/off switch
10. BNC input connector: maximum input 100Vp!
11. X10 probe test signal



CHANGING THE BATTERIES

4 x AAA
Watch the polarity!



SHORT MENU

Access the short menu by briefly pressing the menu button.

The short menu is used to change the most common parameters like volts per division or time- base. For more advanced functions, the extended menu can be used.

Parameters in reverse= auto-range mode.

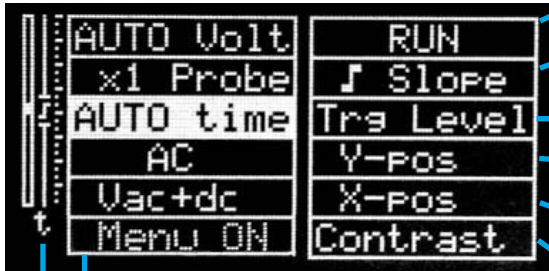
- Enlarge or reduce the signal vertically by adjusting the voltage per division.
- Adapt the scope readout to the probe setting "x1" or "x10".
- Time base: More or less signal cycles will be visible by modifying the time per division.
- Select the input coupling AC / DC or choose a zero reference level (GND).
- Select the desired voltage readout (Volt, dB, audio power measuring...).

Note: The menu will exit automatically if no button is pressed for a few seconds, or exit by a long press on the menu button.

Hint: In most settings, hold the UP or DOWN button pressed to activate the auto-range function.

EXTENDED MENU



- > Access by keeping the menu button pressed.
- > Scroll in the menu by using the menu or hold button.
- > Modify a selection by using the up and down buttons.



The screenshot shows a menu with two columns of options:

AUTO Volt	RUN
x1 Probe	↓ Slope
AUTO time	Trg Level
AC	Y-Pos
Uac+dc	X-Pos
Menu ON	Contrast

Annotations with arrows pointing to the menu items:

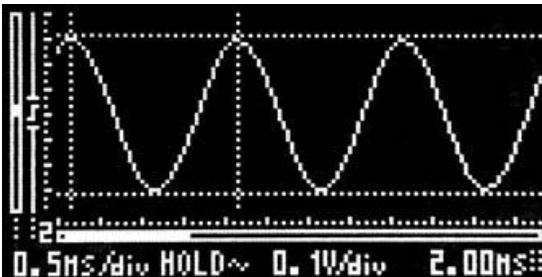
- Select the desired trigger mode (run, normal).
- Select the triggering at a falling  or rising  edge of the input signal.
- Adjust the trigger level.
- Move the signal vertically over the display (Y scroll bar).
- Move the signal horizontally over the display (X scroll bar).
- Increase or decrease the contrast until the desired contrast is reached

Additional notes:

- *If **MENU OFF** is selected, then the short menu will be replaced with a fast selection: pressing the menu button briefly will switch between Volt (V) / Time (t) and Input coupling selection
- *Select **COMPONENT TESTER** to use the component tester ([HPS141](#)). See p. 8 for a full manual on this.

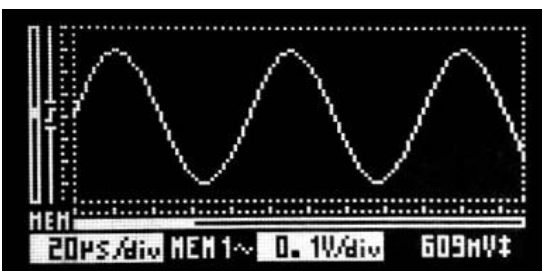
'HOLD' FUNCTION

The scope has two memories and one hold screen. The two memories are stored even after power off. Press the 'hold'-button briefly to freeze the screen.



To store:

1. Press and keep the 'hold'-button to store the frozen screen until MEM1 appears.
2. Your signal is stored in MEM1, if a signal was previous stored, this signal is moved to MEM2.
3. Press the 'hold'-button briefly to release the screen for measurements.



USE THE MARKERS AND RECALL THE MEMORY

Press the 'hold'-button briefly.

Now two menu screens can be recalled, one is short and the other is extended.

Note: If **MENU OFF** is selected, then the short menu is replaced by quick switching between the markers, V1–V2, t1–t2

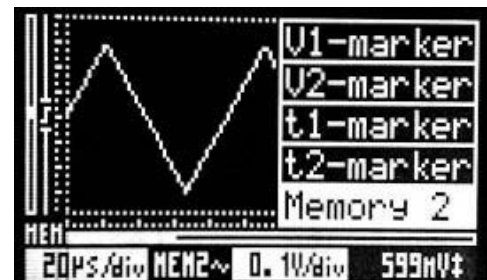
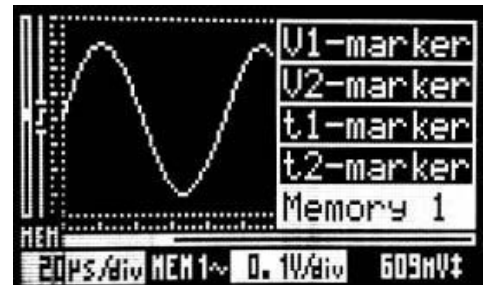
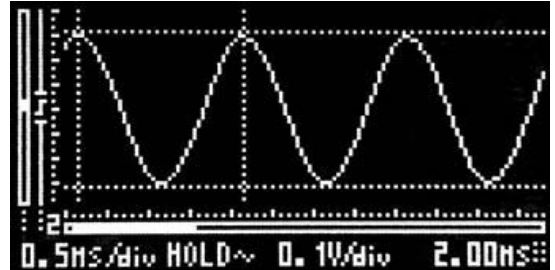
1. Press the menu button briefly to call the short menu.
OR
2. Keep the menu button pressed to call the extended menu.
3. Press the menu or hold buttons briefly to scroll in the menu.
4. Use the up or down buttons to change or selected an item.

Using the short menu you can move the signal markers for voltage and time. To recall a memory (if used) select "memory", then press up or down to switch between:

Memory 1 > Memory 2 > Current Frozen screen...

Using the extended menu you can additionally:

- change the 'time' marker readout setting (time or frequency)
- set the "x10" probe readout
- select the desired voltage readout
- move the signal in X position
- change the display contrast



U1-marker	time mark
U2-marker	x1 Probe
t1-marker	Udc
t2-marker	X-pos
Memory	Contrast

USING THE COMPONENT TESTER

In order to use the component tester, an optional adaptor (HPS141) is required.

Full manual coming soon.





ORDERCODE: HPS140MK2

REVISION: HHPS140MK2



VellemanProjects



@Vel_Projects

VELLEMAN nv - Legen Heirweg 33, Gavere (Belgium)
vellemanprojects.com