Handheld Oscilloscope Multimeter

Oscilloscope · Multimeter　2-in-1

HANDHELD OSCILLOSCOPE MULTIMETER · USER MANUAL

Model **OM-1**



■ Oscilloscope / Multimeter 2-in-1 · Direct waveform

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This manual describes the safe operation, functions and specifications of the OM-1 handheld oscilloscope multimeter — a combination of a digital oscilloscope and a digital multimeter sharing one input for both modes; just connect the test leads to measure waveforms, no oscilloscope probe required.

In the Box

- OM-1 meter × 1
- TYPE-C cable × 1 (for charging and data transfer)
- Test leads × 1 set
- Carrying pouch × 1
- User manual × 1

1 Safety

1.1 General safety requirements

To avoid electric shock, fire and personal injury, read the following safety precautions before use and use the product only for its intended purpose.

- Before use, inspect the case for cracks or missing plastic; pay particular attention to the insulation around the input ports.
- Use the correct input ports and function/range settings, and measure only within the specified ranges.
- Do not use the product around explosive gas or vapour, or in humid environments.
- Keep your fingers behind the finger guards of the test probe tips.
- Do not touch unused input ports while the instrument is connected to the circuit under test.
- Disconnect the test leads from the circuit before changing the function setting.
- Voltages above 36 V DC or 25 V AC may cause a severe shock hazard; avoid electric shock.
- Select the correct function and range to avoid instrument damage or personal injury.
- Do not use the instrument with the front or rear cover removed.

1.2 Switching between charging and measuring

A low battery may affect measurement accuracy; charge the instrument promptly. The oscilloscope input port and the charging port share the same ground potential, so charging and measuring cannot be performed at the same time. A slide switch (charge-or-COM switch,

see section 2.1) is provided at the ports; slide it before charging or measuring.

1.3 Measurement limits

> Multimeter measurements must not exceed the rated maximum of 600 V; the maximum input of the oscilloscope mode is 300 V (DC + AC peak). Do not measure voltages above these limits to avoid damaging the instrument or risking personal injury.

2 Parts and keys



Fig. 1 Six-view diagram

①	Charging indicator
②	Keypad
③	Display
④	Hold / Save key (HOLD/SAVE, left side)

⑤	Auto / Mode key (AUTO/MODE, left side)
⑥	Oscilloscope and multimeter signal input (INPUT, top view)
⑦	Charging and data-transfer port (top view)
⑧	Common (COM) input terminal (top view)
⑨	Power key (POWER, right side)
⑩	Kickstand (rear)

2.1 Measurement input ports



Fig. 2 Measurement input ports (top view)

⑥	Signal input: insert the red test lead; used for oscilloscope signals and for AC/DC voltage, resistance, capacitance, frequency, diode and continuity measurements
⑦	Charging and data-transfer port (TYPE-C)
⑧	Common (COM) input terminal: the common input for all measurements
	Charge-or-COM switch (right of the TYPE-C port): left position = measuring (data cable cannot be inserted); right position = charging (COM test lead cannot be inserted)

2.2 Key functions

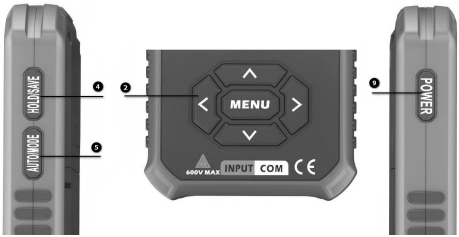


Fig. 3 Keypad

POWER key: press and hold for 2 s to switch the instrument on or off; in multimeter mode, a short press enters relative (REL) measurement.

HOLD/SAVE key: in oscilloscope mode, a short press stops (STOP) or resumes (RUN) acquisition; in multimeter mode, a short press holds or releases the reading; a long press captures and stores the current screen.

AUTO/MODE key: in oscilloscope mode, a short press automatically captures the waveform; in multimeter mode, a short press changes the range; a long press toggles between oscilloscope and multimeter modes.

MENU key: a short press selects menus or switches functions; a long press opens the extended menu.

Arrow keys: short presses move the waveform or adjust function parameters.

3 Display and menus

3.1 Oscilloscope display

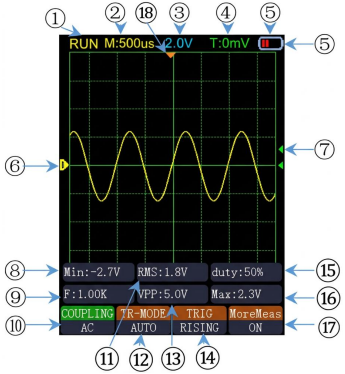


Fig. 4 Oscilloscope display

①	Run status	RUN: auto acquisition; WAIT: waiting for trigger (flashing); T·D: triggered waveform captured; STOP: acquisition stopped, waveform locked
②	Time base	Current horizontal time-base setting
③	Voltage scale	Current vertical voltage scale setting
④	Trigger level	Current trigger voltage setting
⑤	Battery	Battery status and charging indication
⑥	Waveform	Measured signal waveform
⑦	Trigger cursor	Current trigger level position
⑧	Min	Minimum amplitude of the waveform
⑨	Frequency	Frequency of the measured waveform
⑩	V/t menu	Up/Down keys adjust the voltage amplitude; Left/Right keys adjust the time scale
⑪	RMS	Root-mean-square value of the waveform
⑫	Move menu	Arrow keys move the waveform position

⑬	Vpp	Peak-to-peak value of the waveform
⑭	Trigger menu	Up/Down keys adjust the trigger level
⑮	Duty	Duty cycle of the waveform
⑯	Max	Maximum amplitude of the waveform
⑰	Coupling menu	Up/Down keys select DC / AC coupling
⑱	Horizontal position	Horizontal trigger point position of the waveform

3.2 Multimeter display

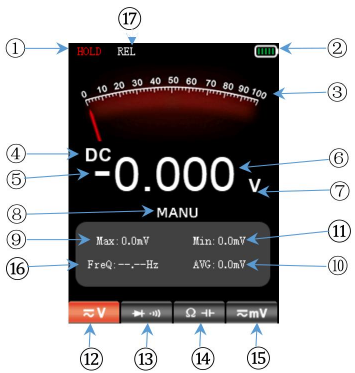


Fig. 5 Multimeter display

①	HOLD	Press HOLD to keep the current reading
②	Battery	Battery status and charging indication
③	Analogue pointer	Pointer indicates the scale position of the main reading
④	Function symbols	Current function symbol: AC, DC, resistance, capacitance, diode, buzzer

⑤	Minus sign	Displayed for negative values
⑥	Main display	Multimeter reading, 9999 counts maximum
⑦	Unit symbol	Unit of the measured value
⑧	Ranging	AUTO: auto range; MANU: manual range (press AUTO/MODE to select the range)
⑨	Max	Maximum reading during measurement
⑩	AVG	Average reading during measurement
⑪	Min	Minimum reading during measurement
⑫	Voltage	AC/DC voltage; press MENU to toggle AC / DC
⑬	Diode / continuity	Press MENU to toggle diode or continuity test
⑭	Resistance / capacitance	Press MENU to toggle resistance or capacitance
⑮	Millivolt	AC/DC millivolt measurement; press MENU to toggle AC / DC
⑯	FreQ	Frequency of the AC signal
⑰	REL	Short press POWER to enter relative (REL) measurement

3.3 Menu interface

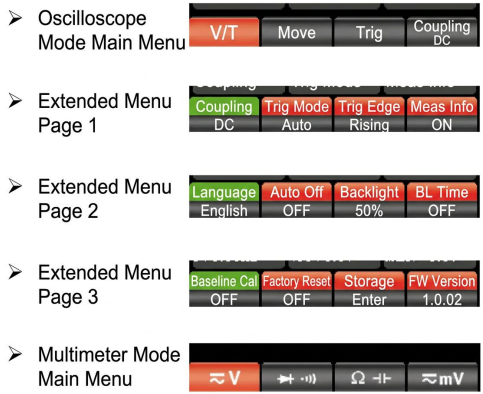


Fig. 6 MENU key menu interface

- Main menu (oscilloscope mode): V/t / Move / Trigger / Coupling
- Extended menu, page 1: Coupling / Trigger mode / Trigger edge / Measure info
- Extended menu, page 2: Language / Auto power off / Backlight level / Backlight time
- Extended menu, page 3: Baseline cal. / Factory reset / Storage mode / SW version
- Main menu (multimeter mode): function switching

In this manual the above screens are referred to as the main menu and extended menus pages 1, 2 and 3, and the multimeter menu.

3.4 Portrait / landscape switch

The display offers portrait and landscape modes, switchable as required:

1. In the oscilloscope screen, short press POWER to switch.



Fig. 7 Oscilloscope display

2. In the multimeter screen, long press MENU to switch.

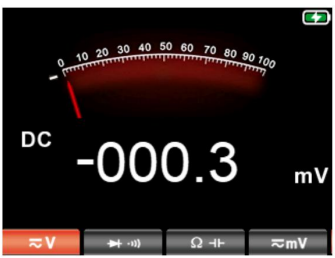


Fig. 8 Multimeter display

4 Oscilloscope functions

4.1 Waveform measurement

1. Switch the instrument to oscilloscope mode.
2. Connect the red and black test leads to the correct ports.
3. Probe the two points of the circuit under test.

4. Observe the waveform and read the measured values.

> The instrument measures voltage waveforms directly via the test leads — no oscilloscope probe is needed. With no signal connected, some mains-frequency interference may appear; this is normal and does not affect measurement results. If the waveform is not displayed completely, use Auto Set or adjust the parameters manually.

4.2 Auto set

When an unfamiliar waveform appears, or to avoid tedious manual setup, press AUTO: the oscilloscope recognises the waveform type (sine or square) and adjusts its controls to display the input signal accurately.

Auto set is an aid for quickly capturing regular signals. Not all signals can be recognised automatically; special signals and fine measurements still require manual settings.

4.3 Vertical system

The vertical system sets amplitude, scale and position of the waveform.

1. Vertical scale: select "V/t" in the main menu and use the Up/Down keys; range 100 mV to 100 V/div.
2. Vertical position: select "Move" in the main menu and use the Up/Down keys to move the waveform.

4.4 Horizontal system

The horizontal system sets the time-base scale and horizontal position.

1. Horizontal scale: select "V/t" in the main menu and use the Left/Right keys; range 100 ns to 20 s/div.
2. Horizontal position: select "Move" in the main menu and use the Left/Right keys to move the waveform.

3. Roll mode: at a time base of 250 ms/div the oscilloscope enters roll mode automatically; trigger and horizontal position controls are disabled and the waveform scrolls from left to right. Roll mode suits low-speed signals and allows long-term observation of waveform trends.

4.5 Trigger system

The trigger system captures a specific or distinctive (continuous or transient) waveform: once the trigger condition is set, the instrument automatically captures and displays the waveform when the acquired signal meets the condition.

- Trigger level: select "Trigger" in the main menu and adjust the level with the Up/Down keys.
- Trigger mode: long press MENU to open extended menu page 1, select "Trigger mode", then press MENU to choose:

1. Auto: acquires and refreshes waveforms continuously; the waveform does not stay.
2. Normal: when the signal reaches the trigger level, the waveform is locked on screen while acquisition continues; on the next trigger the display updates (continuous triggering).
3. Single: when the signal reaches the trigger level, the waveform is locked, STOP is shown and acquisition stops; press HOLD to clear STOP and re-arm.

- Trigger edge: select "Trigger edge" in extended menu page 1 and set rising or falling edge.

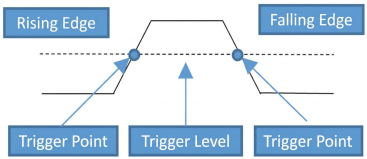


Fig. 9 Trigger edge

Rising edge: the trigger recognises the rising amplitude and fires when it reaches the trigger level; falling edge: the trigger recognises the falling amplitude and fires when it reaches the trigger level.

4.6 Measurement values

Long press MENU to open extended menu page 1, select "Measure info", then short press MENU to toggle it on or off. The values are: Min, RMS, duty, frequency (F), peak-to-peak (VPP) and Max.

4.7 System settings (extended menu page 2)

- Language: short press MENU to select Chinese or English.
- Auto power off: 15 / 30 / 60 / 120 minutes or Off (unlimited). For short sessions 15 or 30 minutes is recommended; for long continuous use choose 120 minutes or Off.
- Backlight level: 30% / 50% / 80% / 100%. Indoors, 30% to 50% is recommended; adjust to taste.
- Backlight time: 30 s / 60 s / 120 s or Off (unlimited).

4.8 Baseline calibration

The instrument is 100% calibrated before leaving the factory. If a baseline zero offset appears after a large temperature change or a

long idle period, calibrate the baseline: open extended menu page 3, select "Baseline cal." and press MENU to start.

> Do not connect test leads or any input signal during calibration, otherwise the calibration may be skewed or the instrument damaged. Do not perform any other operation during calibration; wait until it completes.

4.9 Factory reset

Select "Factory reset" in extended menu page 3 and press MENU; the instrument formats itself, restores factory settings and switches off when finished.

4.10 Software version

Select "SW version" in extended menu page 3 to view the current software version.

4.11 Storage mode

Select "Storage mode" in extended menu page 3 and press MENU; the screen switches to the USB storage interface, where firmware updates and waveform images are handled.

- Firmware update: connect the instrument to a computer with the supplied TYPE-C cable; a DISK 15.7 MB drive appears. Open the firmware folder on the drive and place the firmware files inside. An update progress bar appears on screen; wait until the update completes and do not operate the instrument meanwhile.
- Saving and retrieving images: long press HOLD/SAVE to save the current screen; connect the instrument to a computer via the TYPE-C cable and open the pic folder to view or download the saved waveform images.

In storage mode, press MENU to exit and return to the measurement screen.

5 Multimeter functions

5.1 Measuring AC/DC voltage

1. Insert the black lead into the COM port and the red lead into the signal input.
2. For voltages below 100 mV select the millivolt function; above 100 mV select the voltage function; press MENU to toggle AC / DC.
3. Touch the correct test points of the circuit with the probe tips.
4. Read the voltage on the display.

5.2 Measuring resistance

1. Insert the black lead into the COM port and the red lead into the signal input.
2. Switch to the resistance function (press MENU in the Ω/|| function).
3. Touch the test points of the circuit with the probe tips.
4. Read the resistance on the display.

> Before measuring resistance, confirm that all power in the circuit under test is off and all capacitors are fully discharged. Never apply a voltage in the resistance function.

5.3 Continuity test

1. Insert the black lead into the COM port and the red lead into the signal input.
2. Switch to the continuity function.
3. Touch the two points of the circuit with the probe tips; the built-in buzzer sounds if they are shorted.

5.4 Diode test

1. Switch to the diode function.
2. Connect the red probe to the anode and the black probe to the cathode of the diode under test, then read the forward voltage. If the polarity is reversed, or the diode is defective, the display shows OL.

> Never apply a voltage in the continuity and diode functions; disconnect the circuit power and discharge all high-voltage capacitors before testing.

5.5 Measuring capacitance

1. Insert the black lead into the COM port and the red lead into the signal input.
2. Switch to the capacitance function.
3. Connect the red probe to the positive and the black probe to the negative terminal of the capacitor.
4. Read the capacitance once the reading is stable.

6 Specifications

6.1 General specifications

Display	3.2" IPS colour display, 9999 counts
Ranging	Auto / manual
True RMS	Yes
Sample rate	3 readings/s
Hold / backlight / low-battery / auto power off	Yes

Material	ABS + TPE
Dimensions	146 × 20 × 75 mm
Weight	200 g (with battery)
Power	1300 mAh / 3.7 V rechargeable battery × 1 (TYPE-C charging)
Warranty	One year

6.2 Environmental specifications

Operating temperature / humidity	0 to 40 °C, < 75 % RH
Storage temperature / humidity	−20 to 60 °C, < 80 % RH

6.3 Multimeter specifications

Function	Range	Resolution	Accuracy
DC voltage	999.9 mV	0.1 mV	±(0.5 % + 3)
DC voltage	9.999 V	0.001 V	±(0.5 % + 3)
DC voltage	99.99 V	0.01 V	±(0.5 % + 3)
DC voltage	600.0 V	0.1 V	±(0.5 % + 3)
DC millivolt	9.999 mV	0.001 mV	±(0.5 % + 3)
DC millivolt	99.99 mV	0.01 mV	±(0.5 % + 3)
AC voltage	999.9 mV	0.1 mV	±(1.0 % + 3)
AC voltage	9.999 V	0.001 V	±(1.0 % + 3)
AC voltage	99.99 V	0.01 V	±(1.0 % + 3)
AC voltage	600.0 V	0.1 V	±(1.0 % + 3)
AC millivolt	9.999 mV	0.001 mV	±(1.0 % + 3)
AC millivolt	99.99 mV	0.01 mV	±(1.0 % + 3)

AC voltage frequency response: 40 Hz to 1 kHz.

Function	Range	Resolution	Accuracy
Resistance	99.99 Ω	0.01 Ω	±(1.0 % + 3)
Resistance	999.9 Ω	0.1 Ω	±(0.5 % + 3)
Resistance	9.999 kΩ	0.001 kΩ	±(0.5 % + 3)
Resistance	99.99 kΩ	0.01 kΩ	±(0.5 % + 3)
Resistance	999.9 kΩ	0.1 kΩ	±(0.5 % + 3)
Resistance	9.999 MΩ	0.001 MΩ	±(1.5 % + 3)
Resistance	99.99 MΩ	0.01 MΩ	±(3.0 % + 5)
Diode	Yes		
Continuity	Yes		
Capacitance	9.999 nF	0.001 nF	±(5.0 % + 20)
Capacitance	99.99 nF	0.01 nF	±(2.0 % + 5)
Capacitance	999.9 nF	0.1 nF	±(2.0 % + 5)
Capacitance	9.999 µF	0.001 µF	±(2.0 % + 5)
Capacitance	99.99 µF	0.01 µF	±(2.0 % + 5)
Capacitance	999.9 µF	0.1 µF	±(2.0 % + 5)
Capacitance	9.999 mF	0.001 mF	±(5.0 % + 5)
Capacitance	99.99 mF	0.01 mF	±(5.0 % + 5)
Frequency	99.99 Hz	0.01 Hz	±(0.1 % + 2)
Frequency	999.9 Hz	0.1 Hz	±(0.1 % + 2)
Frequency	9.999 kHz	0.001 kHz	±(0.1 % + 2)
Frequency	99.99 kHz	0.01 kHz	±(0.1 % + 2)
Frequency	999.9 kHz	0.1 kHz	±(0.1 % + 2)

In the AC voltage function, frequency can be measured up to 100 kHz.

6.4 Oscilloscope specifications

Bandwidth	5 MHz
Channels	1 (single channel)

Sampling	Real-time sampling
Real-time sample rate	48 MSa/s
Sample rate range	1.5 Sa/s to 48 MSa/s
Input coupling	DC / AC
Input impedance	10 MΩ @ 16 pF
Maximum input voltage	< 300 V (DC + AC peak)
Sweep range	100 ns/div to 20 s/div
Time-base accuracy	20 ppm
Interpolation	(sinx)/x
Record length	Up to 64 Kbyte
Vertical sensitivity	100 mV/div to 100 V/div
Position range	±4 divisions
Low-frequency response	> 10 Hz
Rise time	< 100 ns
DC gain accuracy	±3 %
Measurements	Frequency, Vpp, Max, Min, RMS, duty cycle
Trigger modes	Auto / Normal / Single
Trigger edge	Rising / falling

7 Maintenance

Except for replacing the battery and the fuse, do not attempt to repair the product or alter its circuits unless you are qualified and have the corresponding calibration, performance test and service instructions.

7.1 Cleaning

Clean the case with a damp cloth and a mild detergent; do not use abrasives or solvents. Dust or moisture in the test ports may affect the accuracy of readings. Disconnect all input signals before cleaning.

7.2 Charging the battery

When the low-battery icon appears at the top-right of the screen, charge the battery promptly:



Fig. 10 Battery symbols (low / charging / full)

1. Charge via a DC 5 V adapter using the TYPE-C cable.
2. Or charge via a computer USB port using the TYPE-C cable.
3. While charging, the charge symbol is shown and the red charging indicator lights up.
4. When fully charged, the full-battery symbol is shown and the red indicator goes out.

8 Warranty

This product is covered by a one-year warranty from the date of purchase. The warranty does not cover blown fuses, damage to general accessories, or damage caused by accidents, negligence, abuse, modification, contamination or abnormal operating conditions.

If the instrument freezes or hangs during use, restart it.

For continuous product improvement, the manufacturer reserves the right to change specifications without prior notice.

9 Compliance

9.1 Waste disposal and environmental protection (WEEE)

- Waste electrical and electronic equipment must be collected separately and must not be disposed of with household waste. Remove the built-in battery and dispose of it in accordance with local regulations; never burn it.

9.2 Directives and standards

This product complies with the applicable EU low-voltage and electromagnetic-compatibility directives (CE).

Notes

For calibration dates, test results and service history.