Valert
O1X 3 In 1 Smart Oscilloscope Graph Multimeter

Valert O1X 3 In 1 Smart Oscilloscope Graph Multimeter Instruction Manual

Contents

Valert

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Security Information

Warning

- People who use this meter should pay special attention to it because the improper use might cause electric shock or damage to the meter. Please follow the actual safety rules and safety measures as specified in the manual.
- To fully use the function of this meter and ensure its safe operation, please read and follow its usage methods in the specification carefully.

This meter matched the technical requirement of a digital multimeter GB/T13978-2008 and the safety requirement of an electronic measuring meter GB 4793.5-2008(IEC 61010 -031:2002). It belongs to secondary pollution and its over-voltage standard is CAT III 600V.

- Please follow the safe operation guide and ensure the safe use of this meter.
- Proper use and maintenance of the meter will give you a satisfied service.

1. Users must follow the standard safety rules when using it :
    - Need some universal protection to avoid electric shock.
    - To avoid misuse of the meter.
2. Check if there is any damage on this meter or not in the process of transportation when receive it.
3. Check if there is any damage on this meter or not when preserved, loaded, and delivered in poor condition.

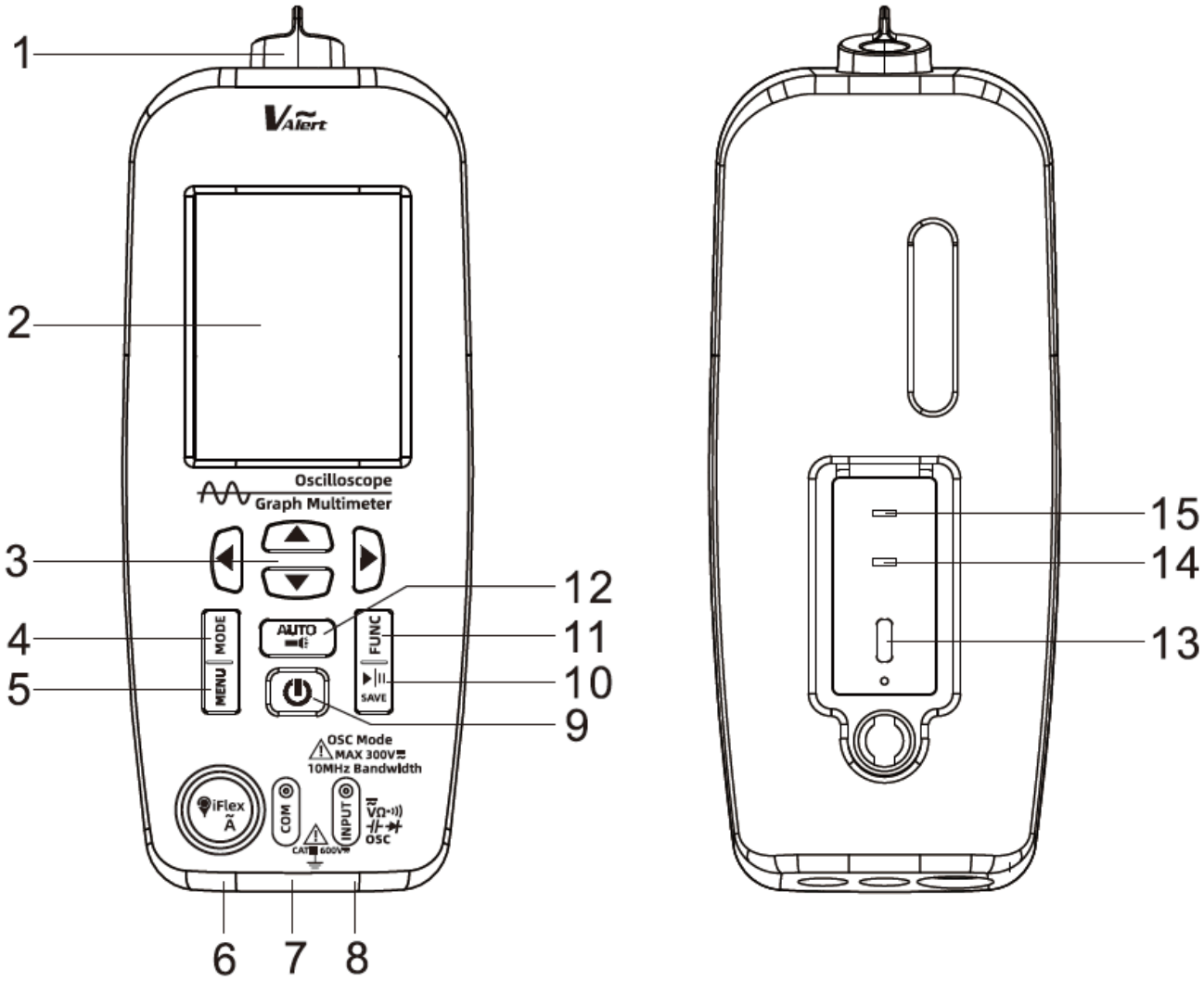
4. The test lead must be in good condition. Check whether there is any damage to its insulation or not and if the meter's metal wire is exposed or not before using it.
5. The correct function and measuring range must be guaranteed when using it.
6. Don't overtake the indicating value of protection extent of every measuring range when testing.
7. Don't touch the top of the test lead (the metal part) when linking the meter with the measuring circuit.
8. When testing, if the voltage tested is over 60V DC or 30V AC (RMS), please keep your fingers behind the test lead protector.
9. When the measuring terminal voltage is over 600V DC or 600V AC, please stop testing the voltage.
10. The oscilloscope mode only supports a maximum voltage of ± 300V, please do not input a higher voltage.
11. Before turning the switch to change the testing function, the test lead was removed from the measuring circuit.
12. When using oscilloscope mode, the maximum input voltage cannot exceed 300V DC or AC.
13. Do not measure resistance, capacitance, diodes, and lines when the line is energized.
14. When using current, resistance, capacitor, diode, and circuit breaker, the user should avoid linking the meter with a voltage source.
15. Don't test capacitance before the capacitor is fully discharged.
16. Don't use the meter under the explosive gas, steam, or dust environment.
17. If there is any abnormality or malfunction in the meter, the user should stop using it.
18. Multimeters should not be used unless the meter bottom shell and the battery cover are completely clasped in place.

Marks

- Double insulation protection. (II Level)
- CAT III In accordance with the IEC-61010-1 standard over-voltage(installation) level III, pollution level 2, CAT III means the level ofpulse withstand voltage protection provided.
- CE Matched EC(EU) standard.
- Electrical grounding.

Product Description

Part Name



1. Flashlight and voltage sensing area
2. LCD screen
3. Up, down, left, and right buttons
4. Mode button
5. Menu button
6. Flexible current clamp input terminal
7. COM terminal
8. Positive input terminal
9. Power button
10. Run, Stop/Save button
11. Function switching button
12. Flashlight/auto button
13. USB terminal
14. Signal output negative
15. Signal output positive

Button Description

- **Power button:**

Long press for 2 seconds: Power ON/OFF.

- AUTO **Flashlight/auto button**

  Short press: In oscilloscope mode, press this button to automatically adjust the measurement waveform display.

  Long press for 2 seconds: Turn on or off the flashlight.
- **MODE: Mode button:**

  Short press: Switching between multimeter mode and oscilloscope.
- **MENU: Menu button:**
  - Short press: Press this key in multimeter mode to clear and recalculate the maximum, minimum, and average values;
  - Press this key in oscilloscope mode to enter menu settings.
- **FUNC: Function switching button:**
  - **Short press:** Press this button to switch between different measurement functions in the multimeter mode, including voltage, resistance, capacitance, millivolt voltage, flexible current clamp current, and voltage sensing. Oscilloscope mode: Press this button to adjust and select the oscilloscope functions, including voltage/time base, movement, triggering, and coupling (DC/AC).

▶|II

- SAVE **Run, Stop/Save button:**
  - Short press: The multimeter mode is the HOLD function; The oscilloscope mode is selected as RUN/STOP.
  - Long press for 2 seconds: Save the current screen as an image.

LCD full display symbol

	AC voltage and DC voltage mode
	Resistance, Continuity, Diode mode
	Capacitance mode
	AC millivolt and DC millivolt mode
	Flexible current clamp current mode
	Voltage sensing mode
	Terminal Prompt

Specifications

Overview

1. **Display:** 2.8 inch TFT screen.
2. Support multimeter mode and oscilloscope mode.
3. Auto range.
4. True RMS display.
5. Support data hold.
6. **Maximum display value of the multimeter:** 6000 digits.
7. **Polarity indication:** Automatic indication, with '-' indicating negative polarity.
8. **Over range display:** 'OL' or '- OL'.
9. **Sampling rate:** approximately 3 times per second.
10. Auto Power Off can be set to 10 minutes, 30 minutes, 60 minutes, and no power-down.
11. **Working temperature and humidity:** 0-40 °C, 0-80% RH.
12. **Storage temperature and humidity:** -10~60 °C, 0~70% RH.
13. **Power supply:** Built-in 2500mA lithium battery.
14. **Working height:** up to 2000 meters.
15. **Size:** 187mm * 74mm * 40.5mm.
16. **Weight:** 209g.

Technical index

Test conditions: environmental temperature 18 °C to 28 °C, relative humidity <80%RH.

1. Oscilloscope

Characteristics		Explanation
Bandwidth		10 MHZ
Sampling frequency		48MSa/s
Input	Coupling	DC, AC
	Impedance	1MΩ
	Ratio	x1, x10
	Max voltage	±300V
Horizontal	Sampling rate	1. 5Sa/s - 48MSa/s
	Sweep	100ns/div - 20s/div
	Time base accuracy	20ppm
	Sampling depth	64KB
Vertical	Sensitivity	20mV/div - 100V/div
	Low-frequency response	>10Hz
	Rise time	<10ns
	Gain accuracy	±3%
Measure	Automatic measurement	Frequency, period, peak to peak, maximum, minimum, rms value
Trigger	Trigger Mode	Automatic, normal, single shot
	Trigger Edge	Rising edge, falling edge

2. **DC voltage**

Range	Resolution	Accuracy
60.00mV	0.01mV	±(1.0%+3counts)
600.0mV	0.1mV	±(0.8%+3counts)
6.000V	0.001V	±(0.8%+3counts)
60.00V	0.01V	±(0.8%+3counts)
600.0V	0.1V	±(1.0%+5counts)

- **Input impedance:** 10M Ω
- **Maximum input voltage:** 600V

3. **AC voltage(True RMS)**

Range	Resolution	Accuracy
60.00mV	0.01mV	±(1.2%+5counts)
600.0mV	0.1mV	±(1.0%+3counts)
6.000V	0.001V	±(1.0%+3counts)
60.00V	0.01V	±(1.0%+3counts)
600.0V	0.1V	±(1.2%+5counts)

- **Input impedance:** 10M Ω
- **Maximum input voltage:** 600V
- **Frequency range:** 40~1000Hz

4. **Flexible current clamp current (AC)**

Range	Resolution	Accuracy
600.0A(60mV Input) 6000A(600mV Input)	0.1A 1A	±（1.0%+5counts） ±（0.8%+5counts）

The correspondence between current and voltage is 1mV/10A, and the final numerical display accuracy depends on the accuracy of the flexible current clamp; The recommended matching current coil ratio/sensitivity is 100mV/KA.

5. **Resistance**

Range	Resolution	Accuracy
600.0Ω	0.1Ω	±（1.2%+5counts）
6.000kΩ	0.001kΩ	±（1.0%+3counts）
60.00kΩ	0.01kΩ	±（1.0%+3counts）
600.0kΩ	0.1kΩ	±（1.0%+3counts）
6.000MΩ	0.001MΩ	±（1.2%+5counts）
60.00MΩ	0.01MΩ	±（1.5%+5counts）

6. **Capacitance**

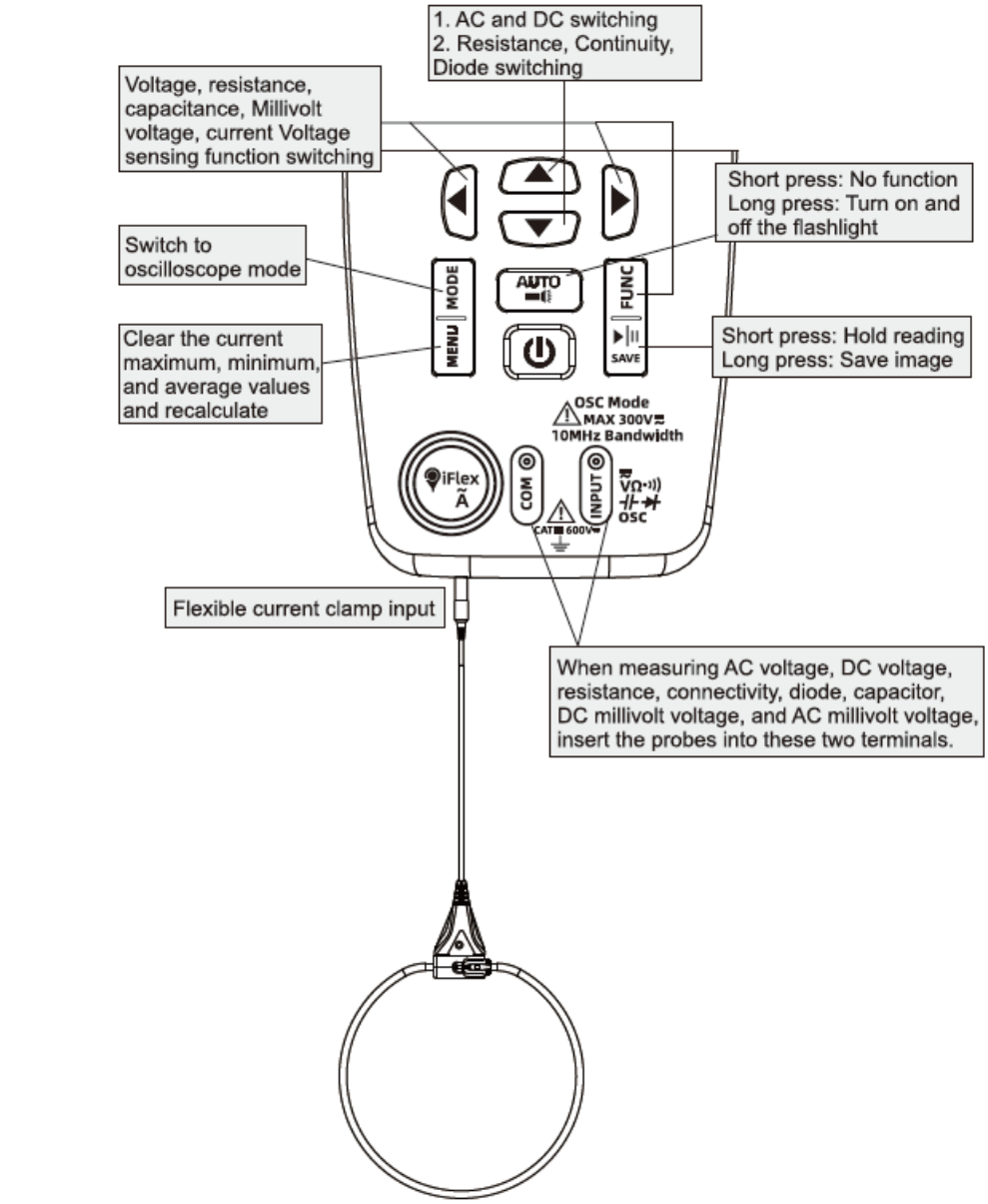
Range	Resolution	Accuracy
99.99nF	0.01nF	±（5.0%+20counts）
999.9nF	0.1nF	±（4.5%+5counts）
9.999μF	0.001μF	±（4.5%+5counts）
99.99μF	0.01μF	±（4.5%+5counts）
999.9μF	0.1μF	±（4.5%+5counts）
9.999mF	0.001mF	±（5.0%+10counts）
99.99mF	0.01mF	±（5.0%+10counts）

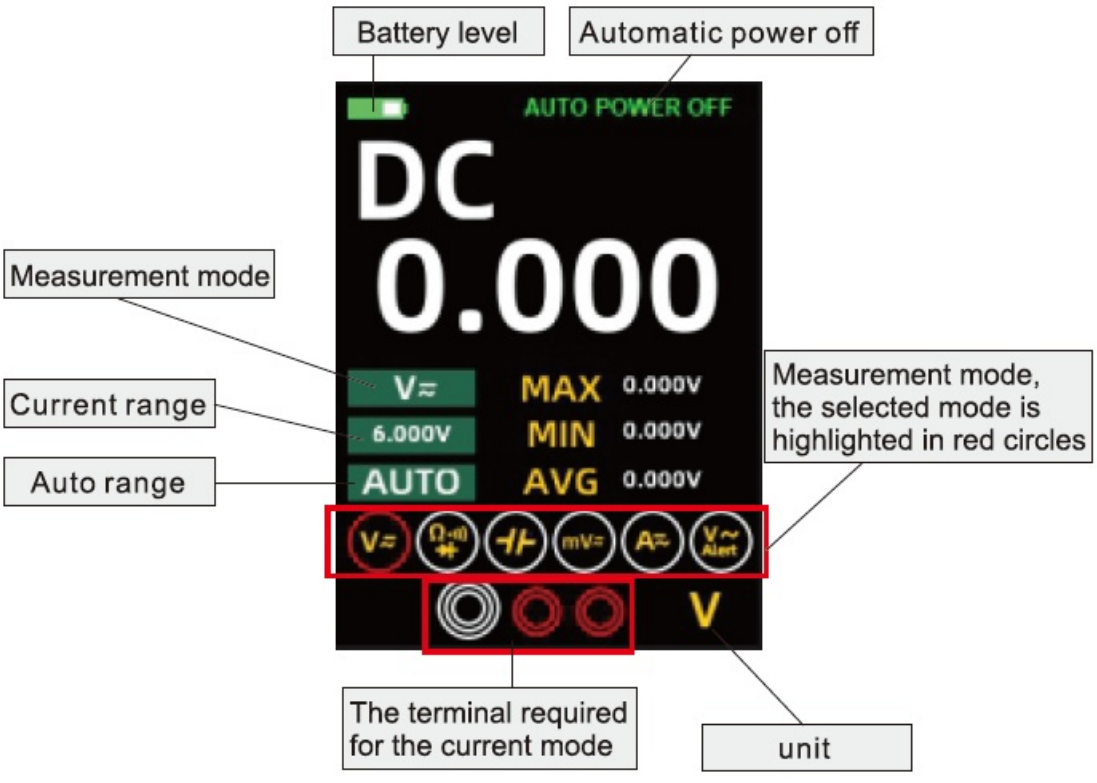
7. **Other**

Function	Explanation
Continuity	If the resistance <50Ω,the buzzer sounds.
VAlert Voltage sensing	Based on the sensed signal strength, the buzzer emits different frequency alarms, and icon changes color to green, yellow, and red, corresponding to low, medium, and high signal strength.
Diode	0.000V~3.000V
Auto power off	It can be set to 5 minutes, 30 minutes, 60 minutes or not to shut down in the menu.

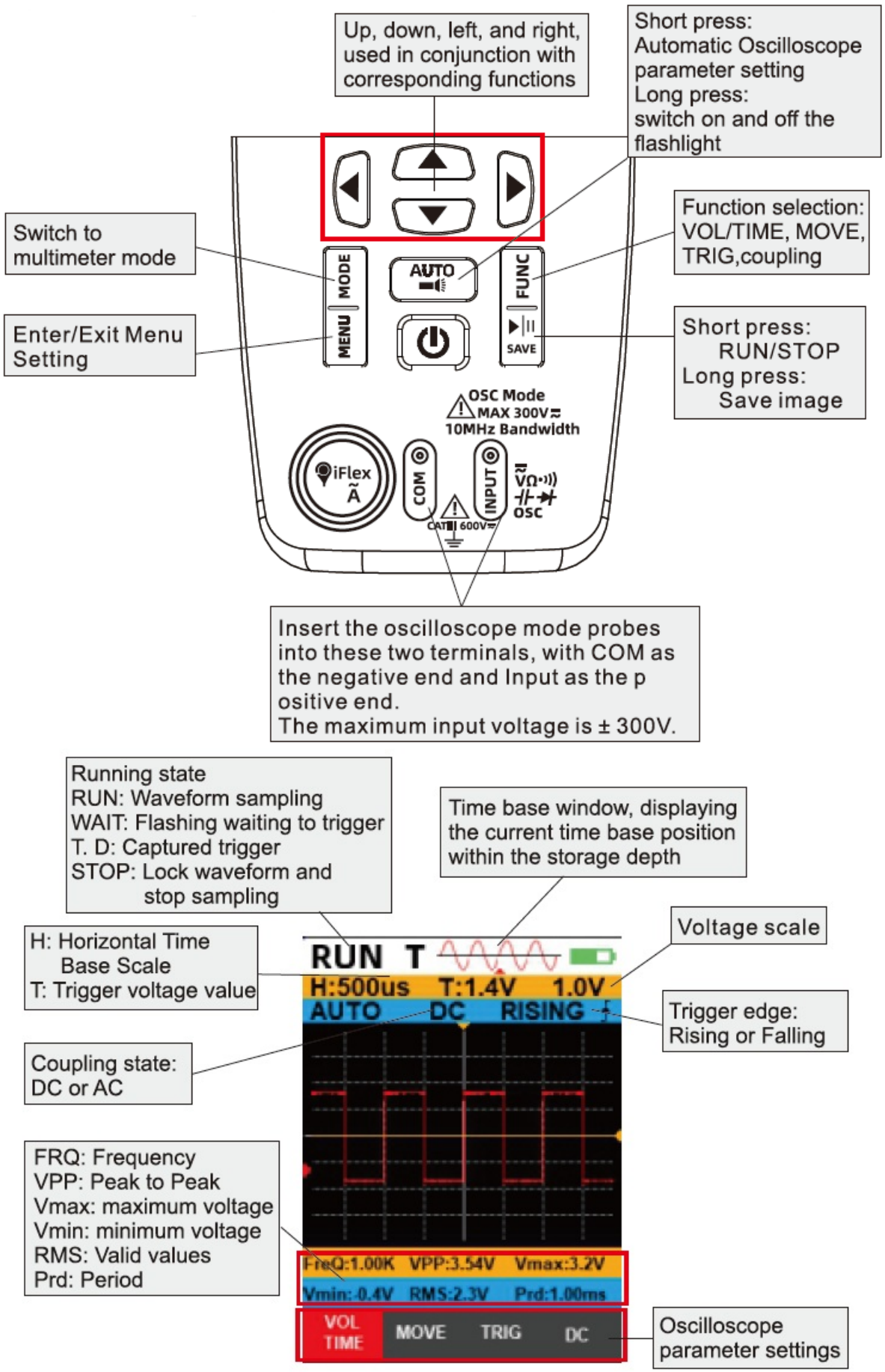
Operation Instructions

Multimeter operation:


1. AC and DC switching
2. Resistance, Continuity, Diode switching
Voltage, resistance, capacitance, Millivolt voltage, current Voltage sensing function switching
Short press: No function
Long press: Turn on and off the flashlight
Switch to oscilloscope mode
MODE
AUTO
FUNC
MENU
SAVE
Clear the current maximum, minimum, and average values and recalculate
Short press: Hold reading
Long press: Save image
OSC Mode
MAX 300V
10MHz Bandwidth
iFlex
COM
INPUT
OSC
Flexible current clamp input
When measuring AC voltage, DC voltage, resistance, connectivity, diode, capacitor, DC millivolt voltage, and AC millivolt voltage, insert the probes into these two terminals.


Battery level
Automatic power off
AUTO POWER OFF
DC
0.000
Measurement mode
V≈
MAX 0.000V
Current range
6.000V
MIN 0.000V
Auto range
AUTO
AVG 0.000V
Measurement mode, the selected mode is highlighted in red circles
V
The terminal required for the current mode
unit

Oscilloscope operation:



- **Automatic settings:**

  When the measurement waveform is uncertain or the manual setting is avoided short press AUTO, and the

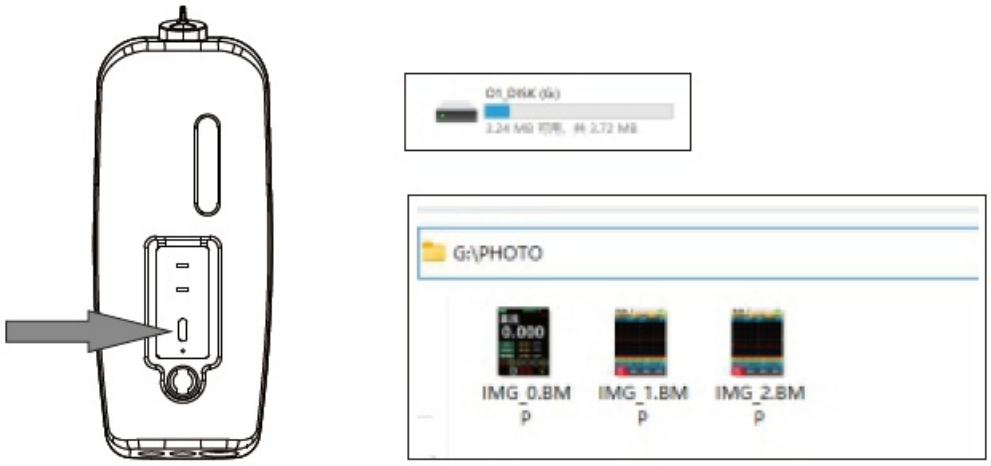
oscilloscope will automatically adjust the time base parameters, starting voltage, etc. to obtain an accurate and suitable waveform for observation.

- **Voltage/Time Base Adjustment:**
  Press the FUNC key to select the VOL/TIME base adjustment function, press the direction keys to set the voltage scale value up and down, and press the direction keys to set the time scale value left and right.
- **Move:**
  Press the FUNC key, select the move function, and press the direction keys to adjust the waveform position up or down relative to the center of the screen; Pressing the direction keys to adjust the waveform position left or right is equivalent to moving the center of the screen to the left or right.
- **Trigger:**
  1. **Cursor setting:** Press the FUNC key to select the trigger function, press the direction keys to move up and down to trigger the cursor position, and the screen T value (trigger voltage) also changes accordingly.
  2. **Trigger method:** Press the MENU key to pop up the setting window, and then press the direction key to select the trigger method option left and right. The up and down direction keys are used to select different trigger methods, including automatic, normal, and single.
     - **Automatic:** Real-time collection and refresh of waveforms without retaining them.
     - **Normal:** When the amplitude of the collected signal reaches the set triggering level, the triggering system will lock the waveform and display it on the screen. The oscilloscope will continue to collect data, and when triggered again, the screen will update to the current new waveform.
     - **Single time:** When the amplitude of the collected signal reaches the set triggering level, the triggering system will lock the waveform and display it on the screen. The system will stop collecting and display STOP; To trigger again, press the RUN key to start waiting for the next trigger.
  3. **Trigger edge:** Press the MENU key to pop up the setting window, and then press the direction key to select the trigger edge option left and right. The direction keys up and down are used to select different trigger edges, with up and down options.
     - **Rising edge:** When the trigger system recognizes a signal that changes from small to large and reaches the set trigger voltage, the trigger is successful.
     - **Falling edge:** When the triggering system recognizes the signal changes from large to small and reaches the set triggering voltage, the trigger is successful.
- **Coupling method:**
  Press the FUNC key, select the far right menu option at the bottom of the screen, and display it as DC or AC. Press the direction keys to switch up and down; It is recommended to choose DC coupling when measuring DC signals and AC coupling when measuring AC signals.
- **Coupling method:**
  Press the FUNC key, select the far right menu option at the bottom of the screen, and display it as DC or AC. Press the direction keys to switch up and down; It is recommended to choose DC coupling when measuring DC signals and AC coupling when measuring AC signals.
- **Attenuation:**
  Press the MENU key to pop up the settings window, and then press the arrow keys to select the attenuation option left and right. The arrow keys up and down are used to select the x1 or x10 attenuation ratio. It is recommended to choose x1 attenuation ratio when the measured signal is less than ± 40V, and the x10 attenuation ratio when the signal is greater than ± 40V. The maximum input signal of the oscilloscope should not exceed ± 300V.

System settings:

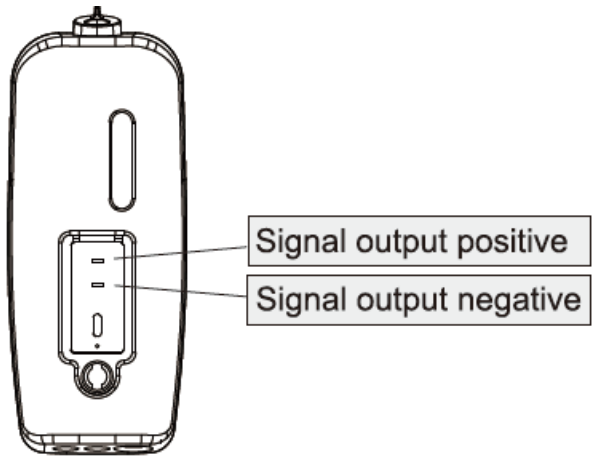
Press the MENU key in oscilloscope mode to enter or exit menu mode; In menu mode, press the arrow keys left and right to select menu items, and press the arrow keys up and down to adjust the settings.

- **Low power mode:**
  When the low-power mode is set to off, the screen brightness remains constant, that is, the brightness remains unchanged according to the set value; When set to on, there is no operation within 1 minute, and the screen brightness is automatically dimmed to save power.
- **Restore default:**
  After restoring the default operation, all menu settings will be restored to the factory default values, and the USB flash drive will also be formatted.
- **Saving images and exporting:**
  Long press and hold the SAVE key for 2 seconds, and the current screen display will be saved as an image in the device. To view saved images, you need to connect the device to the computer via USB and view it on the computer.
  1. Select the export option in the menu, and the screen displays “USB MODE”.
  2. Use a TYPE-C data cable to connect the device to the computer, and generate a USB drive with the “O1_DISK” drive letter on the computer.
  3. Open the ‘PHOTO’ file to view the image.
  4. Exit USB mode and press the up button of the directional key.



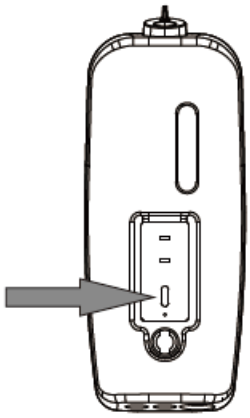
- **Self-calibration:**
  When there is a deviation in the baseline due to a large environmental temperature deviation or prolonged unused use, baseline calibration can be performed before use. Do not insert a probe or input signal during baseline calibration, as it may cause deviation.

- **Waveform output:**
  The signal output port outputs a fixed square wave signal with a parameter of 3V/1KHz. Please pay attention to the positive and negative polarity during measurement and avoid contact with metal parts. (Subsequent versions will upgrade to support sine wave, triangular wave, and PWM waveforms without prior notice.)



Maintenance

1. **General maintenance**
   - Clean the meter casing regularly. Do not clean with chemical solvents
   - Keep the meter input jack dry and clean.
   - If the meter is abnormal, please stop using it and return it for calibration and maintenance.
2. **Replace the fuse**
   This meter has a replaceable fuse built-in. If the fuse is damaged, the instrument casing needs to be opened and replaced with a new fuse before use. The replaceable fuse model is 250V/10A, 5x20mm. Please be sure to proceed under the guidance of professional personnel.
3. **Charge**
   When the device prompts low or low battery, please charge it first before using it
   - Shut down the meter and remove test leads.
   - Remove the protection case.
   - Plug the Type-C power cord into the charging port for charging, and the indicator light will be red during charging.



Documents / Resources

	Valert O1X 3 In 1 Smart Oscilloscope Graph Multimeter [pdf] Instruction Manual O1X, O1X 3 In 1 Smart Oscilloscope Graph Multimeter, 3 In 1 Smart Oscilloscope Graph Multi meter, Smart Oscilloscope Graph Multimeter, Oscilloscope Graph Multimeter, Graph Multimeter, Multimeter

References

- User Manual