

User Manual



Limited Warranty and Scope of Liability

- This product comes with a one-year warranty from the date of purchase. The warranty does not cover fuses (blown), general accessory damage, or damage caused by accidents, negligence, misuse, modification, contamination, or abnormal operating conditions.
- Note: If the product experiences lag or crashes during use, please restart it.

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Overview

This product is a handheld, ultra-thin digital instrument combining oscilloscope and multimeter functions. It features an elegant design, a compact and portable body, and a 3.2-inch TFT color screen with a clear and intuitive menu interface. The display supports one-click switching between horizontal and vertical modes. With silicone buttons, the operation is simple and flexible, allowing one-click switching between oscilloscope and multimeter functions. The oscilloscope and multimeter share a common input terminal, enabling waveform measurement simply by inserting the test leads without requiring an oscilloscope probe.

Safety Instructions

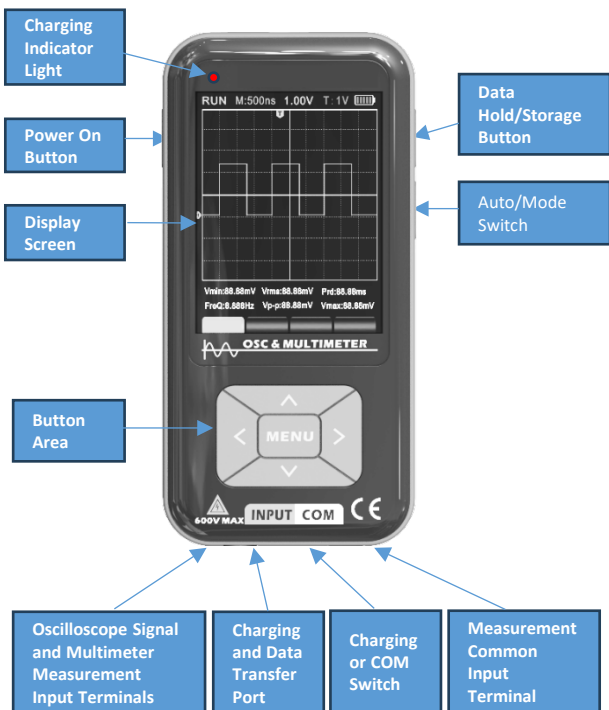
To avoid potential electric shock, fire, or personal injury, please read the safety precautions before use. Use the product only for its intended purpose, as improper use may compromise its protective features.

Before using the product, inspect the casing for cracks or damage. Pay special attention to the insulation near the input ports.

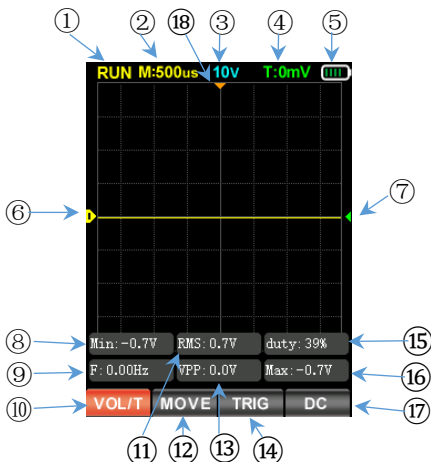
Follow this ****User Manual**** to use the correct input ports and appropriate settings. Ensure measurements are conducted within the specified range outlined in this manual.

- Do not use this product in environments with explosive gases, vapors, or in wet conditions. Keep your fingers behind the protective barriers of the test probe tips. Avoid touching unused input terminals when the product is connected to the circuit under test. Disconnect the test leads from the circuit before changing the measurement range or mode.
- When the DC voltage exceeds 36V or the AC voltage exceeds 25V, there is a risk of serious harm to the user. Exercise caution to prevent electric shock. Select the correct measurement mode and range to avoid damage to the instrument or personal injury.
- Do not use this product with the front or rear cover removed. Low battery voltage may affect the accuracy of test results; please recharge the battery promptly.
- Since the oscilloscope input port and charging port share the same ground potential, charging and measurement cannot be performed simultaneously. Therefore, an anti-misoperation toggle switch is installed at the ports. The switch must be toggled accordingly for either measurement or charging use.

Oscilloscope Main Unit Description



Oscilloscope Display Interface Description



1	Operation Status Display	RUN: Automatic waveform capture in progress WAIT: Normal trigger mode, flashing, waiting for trigger signal T'D: Triggered waveform data has been captured STOP: Current waveform is locked, capture has stopped
2	Timebase Scale	Displays the current set horizontal timebase scale value
3	Voltage Scale	Displays the current set vertical voltage scale value
4	Trigger Level	Displays the current set trigger voltage value
5	Battery Display	Shows the battery status and charging indicator

6	Waveform	Displays the measured signal waveform
7	Trigger Cursor	Displays the current trigger level position
8	Minimum Value	Displays the minimum amplitude of the measured waveform
9	Frequency	Displays the frequency value of the measured waveform
10	Voltage and Timebase Menu	This menu allows adjustments of channel voltage and timebase: • Press the up arrow to increase the voltage amplitude, press the down arrow to decrease it. • Press the left arrow to decrease the time scale, press the right arrow to increase it.
11	Root Mean	Displays the RMS value of the measured waveform
12	Move Menu	In this menu, use the arrow keys to adjust the waveform's position
13	Peak-to-Peak Value	Displays the peak-to-peak value of the measured waveform
14	Trigger Menu	In this menu, use the up/down arrows to adjust the waveform's trigger level
15	Duty Cycle	Displays the duty cycle of the measured waveform
16	Maximum Value	Displays the maximum amplitude of the measured waveform
17	Coupling Menu	Depending on the AC/DC nature of the measured signal, use the up/down arrows to select DC/AC coupling mode
18	Horizontal Position	Displays the horizontal trigger point position of the measured waveform

Button Function Description



- **POWER Button:** Press and hold for 2 seconds to turn the device on/off. In multimeter mode, a short press enters relative (REL) measurement mode.
- **HOLD/ SAVE Button:** In oscilloscope mode, a short press toggles between STOP and RUN. In multimeter mode, a short press toggles the data hold function (hold/cancel hold).
Press and hold to capture the current screen and save it to memory.
- **AUTO/MODE Button:** In oscilloscope mode, a short press automatically acquires the measurement waveform. In multimeter mode, a short press switches the measurement range.
Press and hold to switch between oscilloscope and multimeter modes.
- **MENU Button:** A short press selects menus or switches functions. A long press opens the extended menu.
- **Up Arrow Button:** A short press moves the waveform up or adjusts function parameters.
- **Down Arrow Button:** A short press moves the waveform down or adjusts function parameters.
- **Left Arrow Button:** A short press moves the waveform left or adjusts function parameters.
- **Right Arrow Button:** A short press moves the waveform right or adjusts function parameters.

Menu Interface Description

- Oscilloscope Mode Main Menu



- Page 1 - Extended Menu



- Page 2 - Extended Menu



- Page 3 - Extended Menu



- Multimeter Mode Main Menu



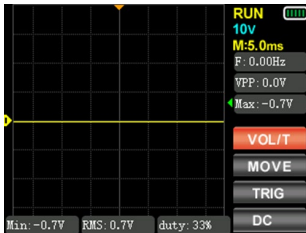
Note: The following descriptions of the menu interface are referred to as Main Menu, Page 1 Menu, Page 2 Menu, Page 3 Menu, Multimeter Main.

Horizontal and Vertical Screen Display Switching

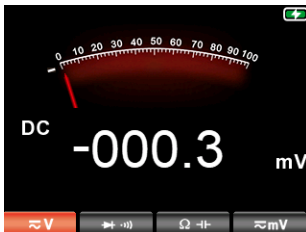
The instrument display interface offers both vertical and horizontal screen modes, allowing users to adjust based on their specific usage scenarios.

Setting Method:

1. In the oscilloscope interface, briefly press the POWER button to switch between modes.



2. In the multimeter interface, press and hold the MENU button to switch.



Oscilloscope Function Introduction

● Waveform Measurement

1. Switch the instrument to oscilloscope mode.
2. Connect the red and black test leads to the corresponding ports.
3. Use the test leads to probe both ends of the circuit under test.
4. Observe the waveform displayed on the screen and read the relevant values.

Notes:

- a. This instrument measures voltage waveforms directly using test leads without requiring oscilloscope probes.

Test lead inputs may exhibit some power frequency interference signals in a no-load environment, but this will not affect actual measurement results.

b. In oscilloscope mode, the maximum input voltage for this instrument is 300V. Do not measure voltages exceeding this specification to avoid damaging the instrument.

- c. If the waveform cannot be fully displayed during measurement, use the auto-set function or manually adjust the relevant parameters to achieve the desired display effect.

Auto-set

If you encounter uncertain waveforms during measurement or wish to avoid the hassle of manual settings, press the AUTO button. The oscilloscope will automatically identify the waveform type (sine or square wave) and adjust the control mode to accurately display the input signal's waveform.

Auto-set is intended as an auxiliary measurement tool, allowing for quick capture of more regular signals. However, not all signals can be automatically recognized. For special signals or more precise measurements, manual settings are still necessary.

Oscilloscope Function Introduction

● Vertical System Settings

The vertical system can be used to set the waveform's voltage amplitude, scale size, and position.

1. Vertical Voltage Scale Setting:

In the main menu, select "Voltage Time Base" and use the up and down keys to adjust the voltage scale. The adjustable range is 100mV to 100V/div.

2. Vertical Position Setting:

In the main menu, select "Move" and use the up and down arrow keys to adjust the vertical position of the waveform.

● Horizontal System Settings

The horizontal system can be used to set the waveform's time base scale and horizontal position.

1. Horizontal Scale Setting:

In the main menu, select "Voltage Time Base" and use the left and right keys to adjust the time base scale. The adjustable range is 100ns to 20s/div.

2. Horizontal Position Setting:

In the main menu, select "Move" and use the left and right arrow keys to adjust the horizontal position of the waveform.

3. Scrolling Mode:

When the horizontal time base is set to 250ms/div, the oscilloscope automatically enters scrolling mode. In scrolling mode, trigger and horizontal position settings are not controllable. The waveform will scroll from left to right. This mode is suitable for low-speed signals, allowing for extended observation of waveform changes based on measurement needs.

Oscilloscope Function Introduction

● **Trigger System Settings**

In oscilloscope measurements, it is often necessary to observe and analyze a specific or significant difference in a circuit's (continuous or instantaneous) waveform. This can be done using the trigger system, which allows for setting conditions. When the collected signal meets the set conditions, the system automatically captures the current waveform and displays it on the screen.

Trigger Level Setting:

In the main menu, select "Trigger" and use the up and down arrow keys to adjust the trigger level.

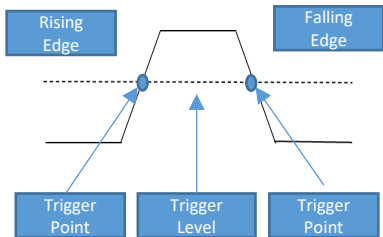
Trigger Mode Setting:

Long press the MENU button to open the first page of the extended menu, then select "Trigger Mode" and press the MENU button to choose one of the following modes:

1. Auto: Auto trigger will continuously collect and refresh the waveform without stopping the waveform display.
2. Normal: When the collected signal's amplitude reaches the set trigger level, the trigger system will lock the waveform and keep it displayed on the screen. The oscilloscope will continue collecting, and when triggered again, the waveform on the screen will update to the current one for continuous triggering.
3. Single: When the collected signal's amplitude reaches the set trigger level, the trigger system will lock the waveform and display it on the screen. Once the waveform is captured, it will display in the STOP state, and the oscilloscope will stop signal collection. To trigger again, press HOLD to cancel STOP and return to the trigger waiting state.

Oscilloscope Function Introduction

- Trigger Edge:
- Enter the first page of the extended menu, select "Trigger Edge," and set either the rising edge or falling edge.



Rising Edge Trigger:

The trigger system detects the signal amplitude during the rising process. When the amplitude reaches the trigger level, the trigger is activated.

Falling Edge Trigger:

The trigger system detects the signal amplitude during the falling process. When the amplitude reaches the trigger level, the trigger is activated.

● Language Settings

Enter the second page of the extended menu, select "Language Settings," and press the MENU button briefly to choose between Chinese or English modes.

Oscilloscope Function Introduction

● **Measurement Value Display**

Long press the MENU button to enter the first page of the extended menu, then select "Measurement Info." Press the MENU button briefly to toggle the display on or off.

The measurement values include six groups:

Min(Minimum Value) , RMS (Root Mean Square) , Duty (Duty Cycle) , F(Frequency) , VPP(Peak-to-Peak Voltage) , Max(Maximum Value)

Auto Power Off Settings

Enter the second page of the extended menu, select "Auto Shutdown," and press the MENU button or use the up and down keys to choose the auto shutdown time. You can select from 15 minutes, 30 minutes, 60 minutes, 120 minutes, or Off (no timeout). For short-term use, it is recommended to select 15 or 30 minutes for auto shutdown; for long-term continuous use, you can choose 120 minutes or Off.

● **Backlight Brightness Settings**

Enter the second page of the extended menu, select "Backlight Brightness," and press the MENU button or use the up and down keys to adjust the screen backlight brightness. The brightness levels are set at 30%, 50%, 80%, and 100%. For indoor lighting, it is recommended to set the brightness to 30%-50%, but you can adjust it to a level that is most comfortable based on different usage environments.

● **Backlight Timeout Settings**

Enter the second page of the extended menu, select "Backlight Time," and press the MENU button or use the up and down keys to set the backlight timeout: 30S, 60S, 120S, or Off (no timeout).

Oscilloscope Function Introduction

● **Baseline Calibration**

The instrument is 100% calibrated before leaving the factory. However, if there is baseline zero offset due to significant environmental temperature changes or if the instrument has not been used for a long time, a baseline calibration can be performed.

Enter the third page of the extended menu, select "Baseline Calibration," and press the MENU button to begin calibration.

Please note the following during calibration:

1. Do not connect the test leads or input signals during calibration, as this may cause calibration errors or damage the instrument.
2. Do not perform other operations during the calibration process; patiently wait until the calibration is complete.

● **Restore Factory Settings**

Enter the third page of the menu, select "Restore Factory Settings," and press the MENU button. The instrument will automatically format and restore the factory settings. Once completed, the instrument will power off.

Software Version

Enter the third page of the menu, select "Software Version," to view the current software version information of the instrument.

Oscilloscope Function Introduction

● Storage Mode

Enter the third page of the menu, select "Storage Mode" and press the MENU button to enter. The screen will switch to the USB storage interface. In this mode, you can update the instrument firmware and capture waveform images.

Firmware Upgrade:

1. Insert the included TYPE-C data cable to connect the instrument to the computer. Once connected, the computer will display a DISK 15.7MB drive.
2. Open the disk and find the "firmware" folder, then place the prepared firmware files into this folder.
3. The screen will display the program upgrade progress bar. Please wait patiently until the upgrade is complete, and do not perform any other operations during this process.

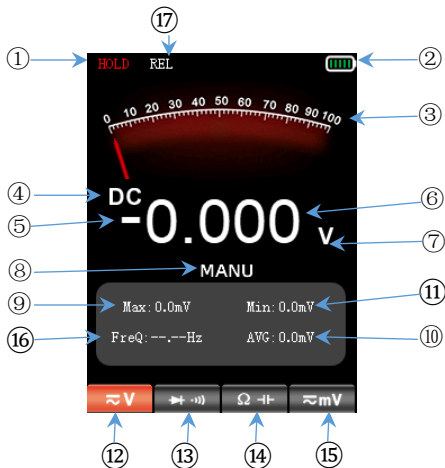
Image Saving and Retrieval:

1. To save the current measurement data or waveform, press and hold the HOLD/SAVE button. A prompt will appear on the screen to confirm the image save.
2. Insert the TYPE-C data cable to connect the instrument to the computer. Click on the USB disk and open the "pic" folder to view or download the saved waveform images to the computer for easier organization and analysis.

To exit storage mode and return to the measurement interface, press the MENU button.

Multimeter Mode Function Introduction

LCD Display Interface Description



①	HOLD	Press the HOLD to freeze the current measurement data.
②	Battery Status	Displays the current battery status and charging indicator.
③	Analog Pointer	The analog dial pointer moves according to the measured data on the main display, indicating the corresponding scale position.
④	Symbol Display	Shows the symbol corresponding to the current measurement type, including AC, DC, resistance, capacitance, diode, and buzzer symbols.

⑤	Negative Sign	Displays a negative sign when a negative value is measured.
⑥	Main Display	Shows the multimeter measurement value, with a maximum display of 9999 digits.
⑦	Unit Symbol	Displays the unit symbol corresponding to the measured data.
⑧	Measurement Mode	Auto Range (AUTO): The multimeter automatically selects the appropriate measurement range. Manual Range (MANU): Press the AUTO/MODE button to select and switch between specified measurement ranges.
⑨	Max:	Displays the maximum reading during measurement.
⑩	AVG:	Displays the average reading during measurement.
⑪	Min:	Displays the minimum reading during measurement.

⑫	Voltage Range:	Measures AC and DC voltage. Press MENU to switch between AC/DC.
⑬	Diode/ Continuity Range:	In this range, press MENU to switch between diode or continuity measurement.
⑭	Resistance/ Capacitance Range:	In this range, press MENU to switch between resistance or capacitance measurement.
⑮	Millivolt Range:	Measures AC and DC millivolt voltage. Press MENU to switch between AC/DC.
⑯	FreQ	Displays the frequency of the measured AC signal.
⑰	REL	Short press the POWER button to enter relative value measurement mode.

Measurement Input Terminals



①	Red Probe Input Terminal Used for the following measurements: 1. Oscilloscope signal measurement 2. AC/DC voltage 3. Resistance 4. Capacitance 5. Frequency 6. Diode 7. Continuity
②	Charging and Data Transfer Port
③	Charging or COM Switch: When the switch is in the left position, measurement can be performed, but the data cable cannot be inserted for charging. When the switch is in the right position, charging is enabled, but the COM probe cannot be used for measurement.
④	Common Measurement COM Input Terminal This is the common input terminal for all measurements.

Measurement Method

Measuring AC Voltage and DC Voltage

1. Insert the black test lead into the COM terminal and the red test lead into the V Ω Hz terminal.
2. To measure voltages less than 100mV, you can select the AC/DC mV range; to measure voltages greater than 100mV, you can select the AC/DC voltage range.
3. Touch the correct test points on the circuit with the test probe.
4. Read the voltage value displayed on the screen.

- The measured voltage must not exceed the rated maximum testing value (600V), as this could damage the instrument and pose a risk to personal safety.
- When measuring high-voltage circuits, it is essential to avoid touching the high-voltage circuit.

Measuring Resistance

1. Insert the black test lead into the COM terminal and the red test lead into the V Ω Hz terminal.
2. Use the button to switch to the resistance mode.
3. Touch the test points of the desired circuit with the test probes.
4. Read the resistance value displayed on the screen.

- Before measuring resistance, ensure that the power supply to the circuit under test is turned off and all capacitors are fully discharged.
- Do not apply any voltage while in this mode.

Testing Continuity

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Use the button to switch to the continuity mode.
3. Connect the test leads to the two points of the circuit under test. If the built-in buzzer sounds, it indicates a short circuit.

Measuring Diodes

1. Use the button to switch to the diode mode.
2. Connect the red test lead to the positive terminal of the diode under test and the black test lead to the negative terminal. Then, read the forward voltage displayed on the screen. If the test lead polarity is reversed or the diode is damaged, the screen will display " OL ".

- Do not apply voltage in continuity or diode mode.
- Before testing, ensure that the power supply to the circuit is turned off and all high-voltage capacitors are discharged.

Measuring Capacitance

1. Insert the black test lead into the COM terminal and the red test lead into the V Ω Hz terminal.
2. Use the button to switch to the capacitance mode.
3. Connect the red test probe to the positive terminal of the capacitor under test and the black test probe to the negative terminal of the capacitor under test.
4. After the reading stabilizes, read the capacitance value displayed on the screen.

- Before testing, disconnect the circuit power supply and discharge all high-voltage capacitors.

Maintenance and Care

Do not attempt to repair this product or modify the circuit unless you are qualified and have the appropriate calibration, performance testing, and repair operation instructions, except for replacing the battery and fuse.

To clean the product

Use a damp cloth and mild cleaner to clean the exterior of the device. Do not use corrosive agents or solvents. Dust or moisture in the test ports may affect the accuracy of the readings.

*Before cleaning the product, please remove all input signals.

Battery Charging

When the battery icon in the upper-right corner of the screen shows "", it is time to charge the device. The steps are as follows:

1. Connect the TYPE-C cable to a DC 5V output adapter for charging.
2. Connect the TYPE-C cable to a computer's USB port for charging.
3. While charging, the screen will display the " " symbol.
4. When fully charged, the screen will display the " " symbol.

During the charging process, the red charging indicator light in the upper-right corner will be lit, and it will turn off once the battery is fully charged.

Technical Specifications

<i>Multimeter General Technical Specifications</i>	
Display Screen (TFT)	9999 counts
Range	Auto/Manual
Material	ABS+TPE
Sampling Rate	3 times/second
True RMS	√
Data Hold	√
Screen Backlight	√
Low Battery Warning	√
Auto Power Off	√

<i>Mechanical Technical Specifications</i>	
Dimensions	143*71*21mm
Weight	160g
Battery Type	1300 mAh / 3.7V rechargeable battery * 1
Warranty Period	One year

<i>Environmental Technical Specifications</i>		
Operating Environment	Temperature	0~40°C
	Humidity	<75%
Storage Environment	Temperature	-20~60°C
	Humidity	<80%

Multimeter Technical Specifications

Function	Range	Resolution	Accuracy
DC Voltage (V)	999.9mV	0.1mV	±(0.5%+3)
	9.999V	0.001V	
	99.99V	0.01V	
	600.0V	0.1V	
DC Voltage (mV)	9.999mV	0.001mV	
	99.99mV	0.01mV	
AC Voltage (V)	999.9mV	0.1mV	±(1.0%+3)
	9.999V	0.001V	
	99.99V	0.01V	
	600.0V	0.1V	
AC Voltage (mV)	9.999mV	0.001mV	
	99.99mV	0.01mV	
AC Voltage Frequency Response: 40 Hz ~ 1 kHz			

Function	Range	Resolution	Accuracy
Resistance	99.99Ω	0.01Ω	±(1.0%+3)
	999.9Ω	0.1Ω	±(0.5%+3)
	9.999kΩ	0.001kΩ	
	99.99kΩ	0.01kΩ	
	999.9kΩ	0.1kΩ	±(1.5%+3)
	9.999MΩ	0.001MΩ	
	99.99MΩ	0.01MΩ	±(3.0%+5)

Function	Range	Resolution	Accuracy
Capacitance	9.999nF	0.001nF	±(5.0%+20)
	99.99nF	0.01nF	±(2.0%+5)
	999.9nF	0.1nF	
	9.999µF	0.001µF	
	99.99µF	0.01µF	
	999.9µF	0.1µF	
	9.999mF	0.001mF	±(5.0%+5)
	99.99mF	0.01mF	
Frequency (Measurement is limited to 100 kHz in the AC voltage range)	99.99Hz	0.01Hz	±(0.1%+2)
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	
Diode	√		
Continuity	√		

Oscilloscope Technical Specifications

Features		Description
Bandwidth	5MHz	
Sampling	Sampling Method	Real-time Sampling Rate
	Real-time sampling	48 MSa/s
Channels	1	Single Channel
Input	Input Coupling	DC, AC
	Input Impedance	10M Ω ,@16pf
	Maximum Input Voltage	< 300 V (DC + AC peak)
Horizontal	Sampling Rate Range	1.5Sa/s - 48MSa/s
	Waveform Interpolation	(sinx)x
	Sweep Speed Range	100ns/div - 20s/div
	Time Base Accuracy	20ppm
	Record Length	Up to 64 Kbyte
Vertical	Sensitivity	100mV/div - 100V/div
	Displacement Range	4 divisions (positive/negative)
	Analog Bandwidth	5MHZ
	Low Frequency Response	Greater than 10 Hz
	Rise Time	Less than 100 ns
	DC Gain Accuracy	$\pm 3\%$
Measurement	Measurement Information	Frequency, Peak-to-Peak, Maximum, Minimum, RMS, Duty Cycle
Trigger	Trigger Mode	Auto, Normal, Single
	Trigger Edge	Rising Edge, Falling Edge

