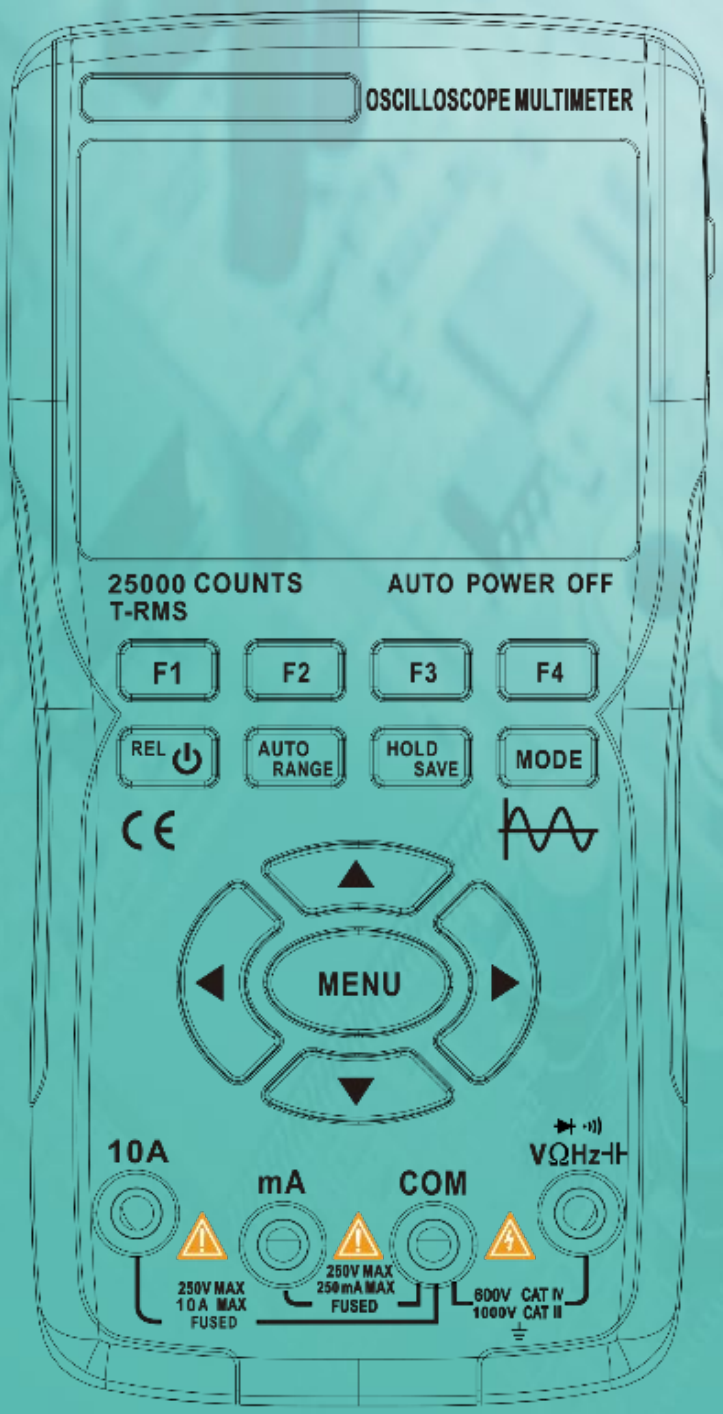
User Manual



Limited Warranty and Scope of Rights and Responsibilities

This product is eligible for a one-year warranty from the date of purchase.

This warranty does not cover blown fuses, damage to general accessories, or damage caused by accidents, negligence, misuse, modifications, pollution, and abnormal operating environments.

Note: If there is a situation of freezing or crashing during use, please restart.

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Overview

This handheld oscilloscope adopts a dual injection molding process, featuring a beautiful appearance, compact size, convenient portability, and flexible operation. The functional buttons have a clear and intuitive menu interface. The screen utilizes a 3.5-inch IPS full-view color display, with a multimeter display of up to 25,000 counts. This product integrates the functions of an oscilloscope, signal generator, and multimeter into a three-in-one device. With superior performance and powerful functionality, it can be used in various measurement scenarios, meeting a wide range of user measurement needs.

Safety Instructions

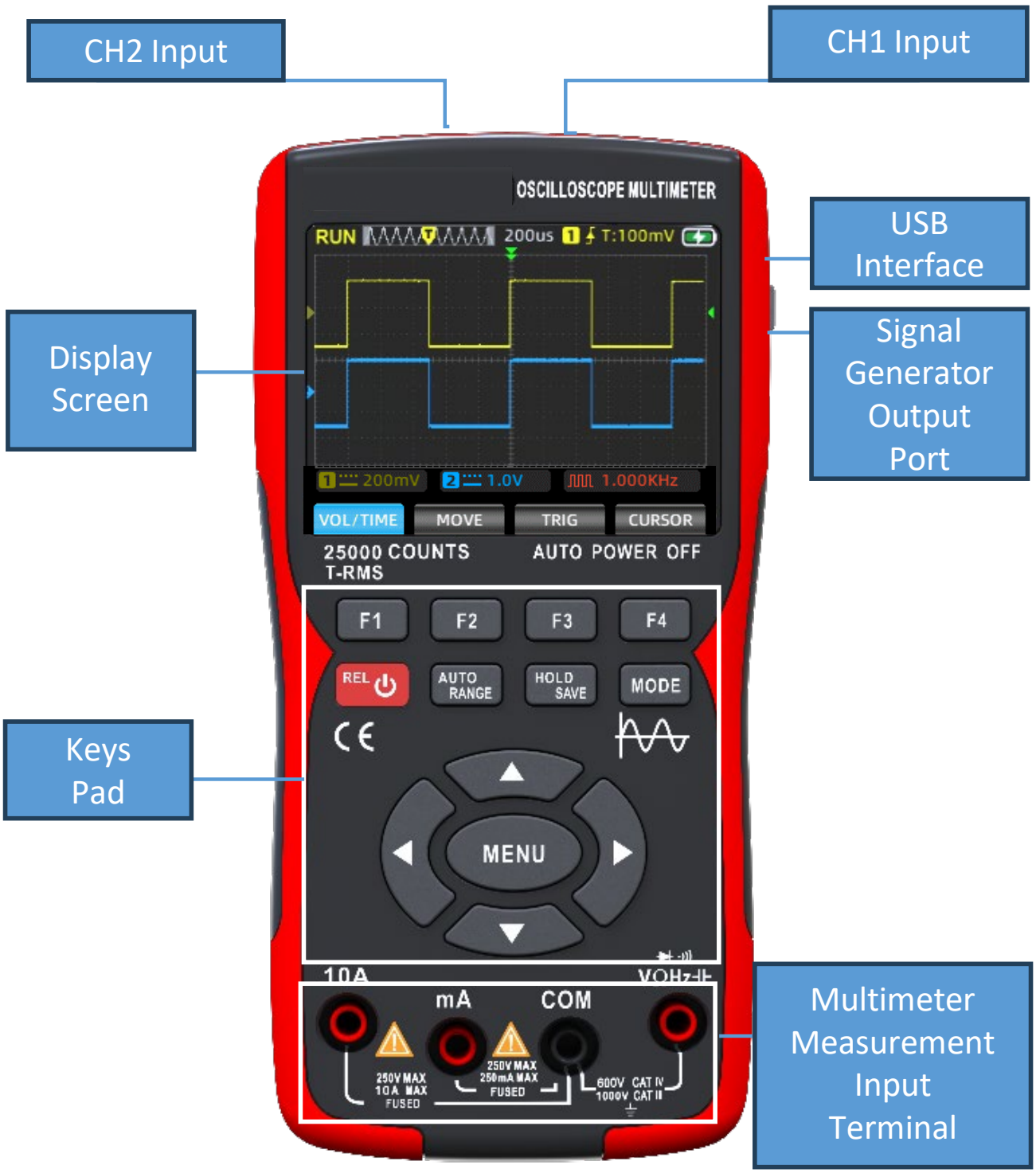
To avoid possible electric shock, fire hazards, and personal injury, please read the safety precautions before using. Use the product only for its designated purpose, as using it otherwise may compromise the protection it provides.

Before using the product, check the housing for cracks or plastic damage. Carefully inspect the insulation near the input ports. Follow the instructions in this user manual, use the correct input ports, and set the appropriate range as specified in this user manual for accurate measurements.

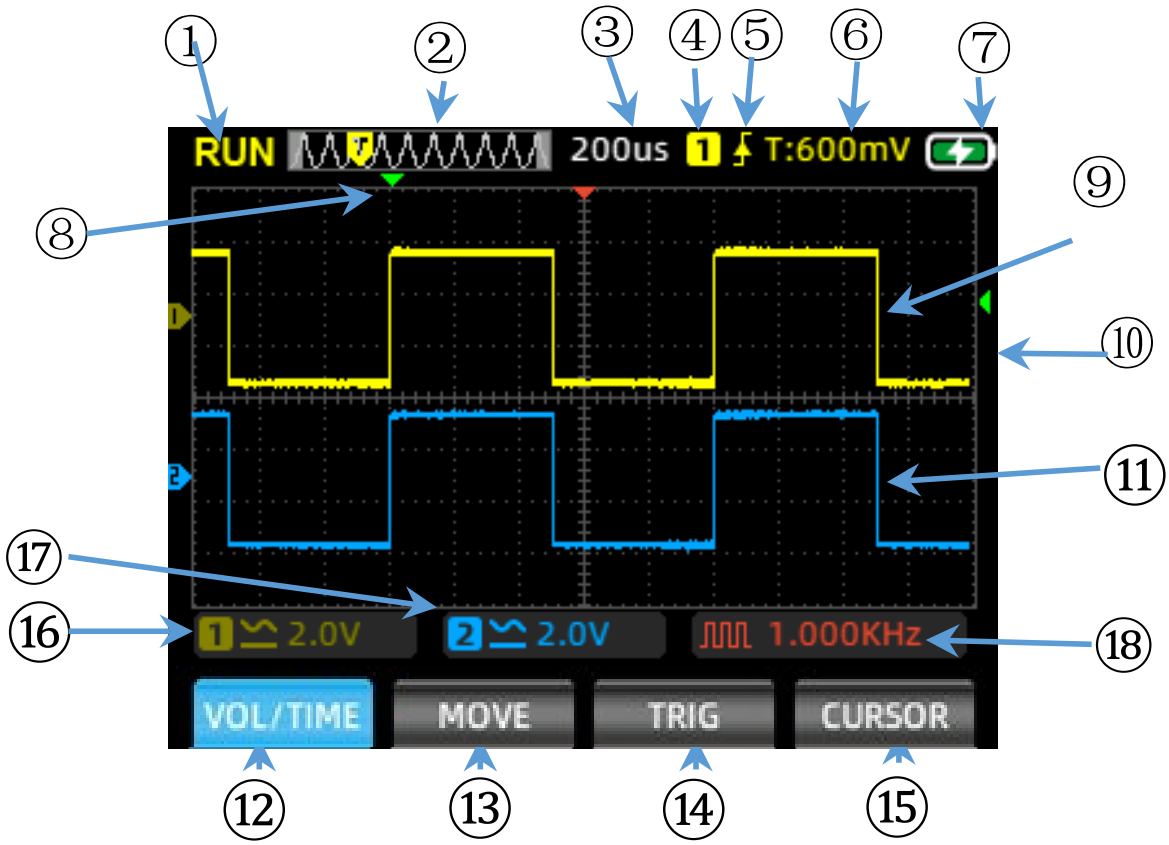
Do not use this product in the presence of explosive gases and vapors or in humid environments. Keep your fingers behind the protective shield of the test probe.

- Do not touch unused input ports when the product is connected to the circuit under test. Disconnect the test probes and the circuit before changing the test range.
- When the DC voltage under test is higher than 36V, or the AC voltage is higher than 25V, it may cause serious harm to the human body; users should be cautious to avoid electric shock.
- Select the correct test range and scale to prevent damage to the instrument or personal injury.
- Do not use this product with the front or rear cover open.
- Low battery voltage may affect the accuracy of test results; please recharge promptly.
- The ground line between the two channels is the same, and during measurements, the ground clip is always grounded or connected to the same potential.
- **The ground wire of the probe is at the same potential as the ground. When connecting the USB cable for charging, it is prohibited for the ground wire of the probe to touch high voltage, as this may result in damage to the product or pose a risk of injury.**
- **When using an oscilloscope probe to measure voltage higher than (AC25V or DC36V), ensure that the USB protective cover of the product is securely closed to prevent human contact with exposed metal parts, as this could lead to the possibility of injury.**

Main Interface



Oscilloscope Mode Main Interface

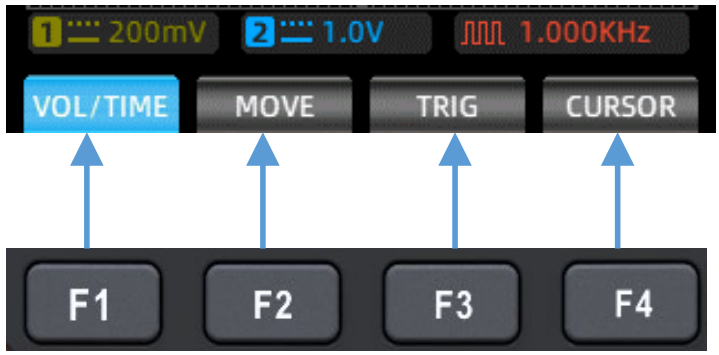


1	Operating Status Display	RUN: Automatic waveform acquisition state WAIT: Normal trigger mode, blinking waiting for trigger signal T.D: Captured triggered waveform data STOP: Lock the current waveform, acquisition stopped
2	Time Base Window	Display current time base position within the storage depth
3	Time Base Scale	Display the current set horizontal time base scale value
4	Trigger	Trigger Channel： 1 for CH1, 2 for CH2

5	Trigger Mode	Display the current trigger mode as rising edge or falling edge
6	Level	Display the current set trigger voltage value
7	Battery Level	Displaying the current battery status and charging status.
8	Horizontal Trigger	Displaying the current horizontal time base position triggered.
9	Channel1	Showing the waveform of CH1 in yellow.
10	Vertical Trigger	Displaying the current vertical voltage position triggered.
11	Channel 2	Showing the waveform of CH2 in blue.
12	Voltage/ Time Menu (VOL/TIME)	In this menu, you can adjust channel voltage and time base as follows: Press F1 to switch channels; the menu color will indicate the current channel's color setting. Press the up arrow to increase voltage amplitude, and the down arrow to decrease it. Press the left arrow to decrease time scale value, and the right arrow to increase it.
13	Waveform Movement (MOVE)	Short press F2 key to switch channels; Use the arrow keys to adjust the waveform position. Long press F2 key to return the waveform to the middle position

14	Trigger Cursor (TRIGGER)	Press the up/down keys to adjust the vertical trigger position and the left/right keys to adjust the horizontal trigger position.
15	Measurement Cursor	Press this key to select the cursor axis that needs adjustment.
16	CH1 Voltage	Displaying the coupling mode and voltage scale of Channel 1.
17	CH2 Voltage	Displaying the coupling mode and voltage scale of Channel 2.
18	Signal Generator Status	Showing the corresponding waveform shape symbol and frequency setting parameters according to the current output status of the signal generator, including square wave, pulse wave, sine wave, and triangle wave.

Panel Function Keys



- F1 F2 F3 F4 F1-F4 Keys: Correspond to the four functional menus displayed on the screen, and you can select the respective function by pressing the keys.
- REL **Power Button: Long press for 2 seconds to power on/off; in multimeter mode, a short press enters relative value (REL) measurement.**
- AUTO RANGE AUTO/RANGE Key: In the oscilloscope interface, a short press of this key automatically acquires measurement waveforms; in the multimeter interface, a short press toggles between automatic and manual range selection.
- HOLD SAVE HOLD/SAVE Key: In the oscilloscope interface, a short press toggles STOP/RUN functionality, and a long press saves measurement waveform data; in the multimeter interface, a short press is for data hold/cancel hold functionality.
- MODE MODE Key: Pressing this key switches between oscilloscope mode and multimeter mode.

Arrow Keys: The up, down, left, and right arrow keys are used to incrementally adjust relevant settings, move cursor positions, and navigate menu selections.

- MENU MENU Key: Pressing this key brings up the system function menu on the screen, comprising three pages that can be navigated using the left and right arrow keys.

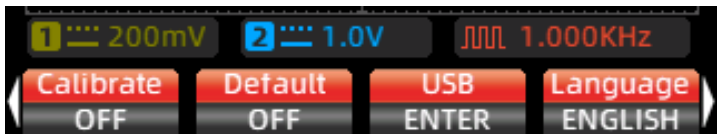
MENU Interface

- Main Menu

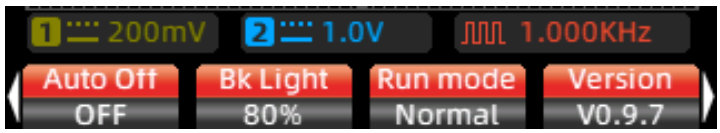
- The first page
  Channel Settings menu

- The second page
  Trigger Setup menu

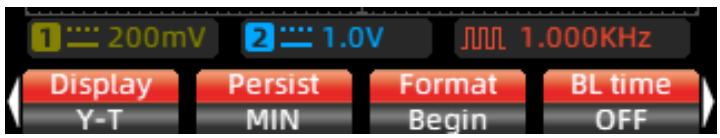
- The third page
  Auxiliary Functions menu



- The fourth page
  Auxiliary Functions menu



- The fifth page
  Extended Functions menu



- The sixth page
  Extended Functions menu

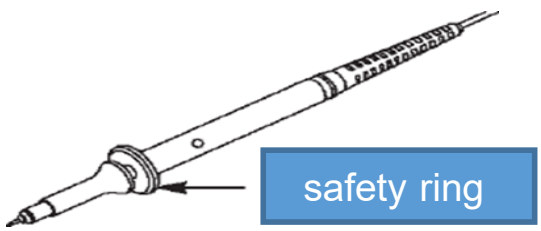
Note: The descriptions below for the menu interface are abbreviated as follows: Main Menu, Page 1 Menu, Page 2 Menu, Page 3 Menu, Page 4 Menu, Page 5 Menu, Page 6 Menu.

Introduction to Oscilloscope Functions

● Probe Check

➢ Safety:

When using the probe, to avoid electric shock, ensure that your fingers are kept behind the safety collar on the probe body. Do not touch the metal parts on the top of the probe when it is connected to a high-voltage source. The measured voltage should not exceed the specifications of the probe (maximum 150V for the 1X range, maximum 300V for the 10X range), as this may damage the instrument.

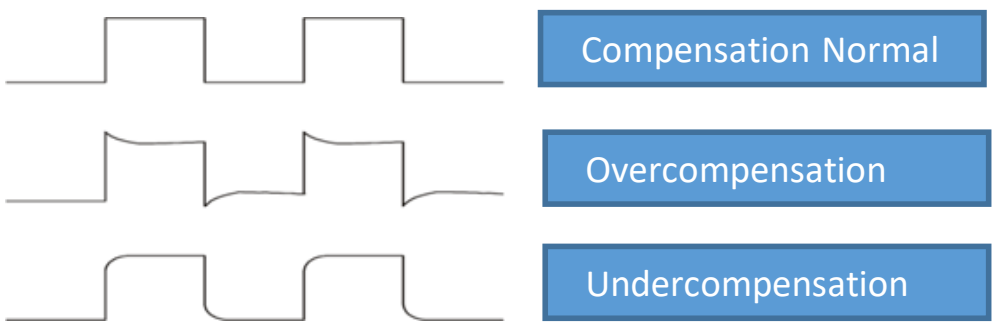


➢ Manual Probe Compensation

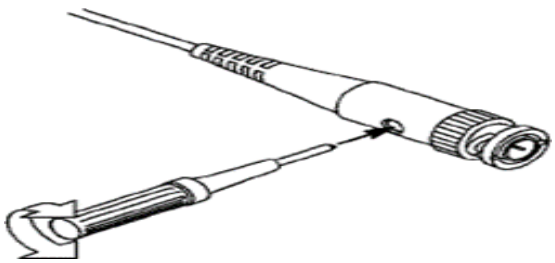
When connecting the probe to the oscilloscope for the first time, it is recommended to perform the following compensation check. Probes that have not been compensated or have compensation deviations may result in measurement errors. If probe compensation is required, please follow these steps:

1. Power on and connect the probe to the signal input terminal, inputting a 1KHz square wave signal.

2. After connecting, press the AUTO key on the panel and check the waveform display status.



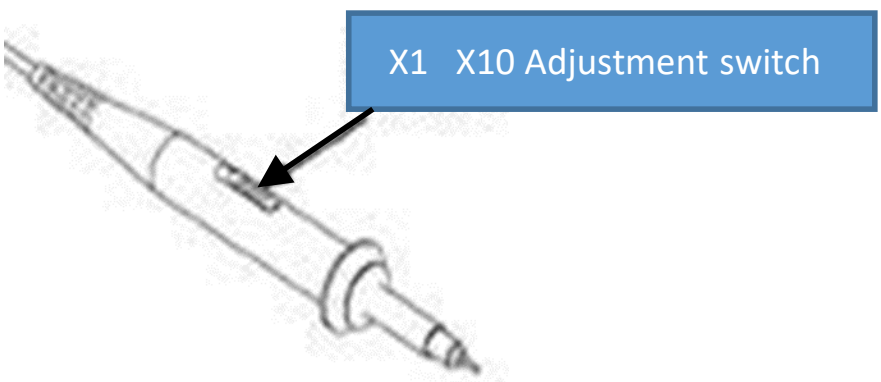
3, If it is necessary to cooperate with the adjustment, you can adjust the capacitance on the probe to change the compensation state; the adjustment tool is the accessory adjustment rod that comes with the probe or a suitable non-metallic handle adjustment rod. The adjustment method is as shown in the figure below



➢ Probe attenuation setting

The probe attenuation coefficient setting will affect the vertical scale reading of the signal. Make sure that the multiple of the attenuation switch on the probe matches the multiple of the probe attenuation option in the system settings of the oscilloscope. When the multiple of the switch is set to X1, the multiple of the oscilloscope is set to X1, and when the multiple of the switch is set to X10, the multiple of the oscilloscope is set to X10.

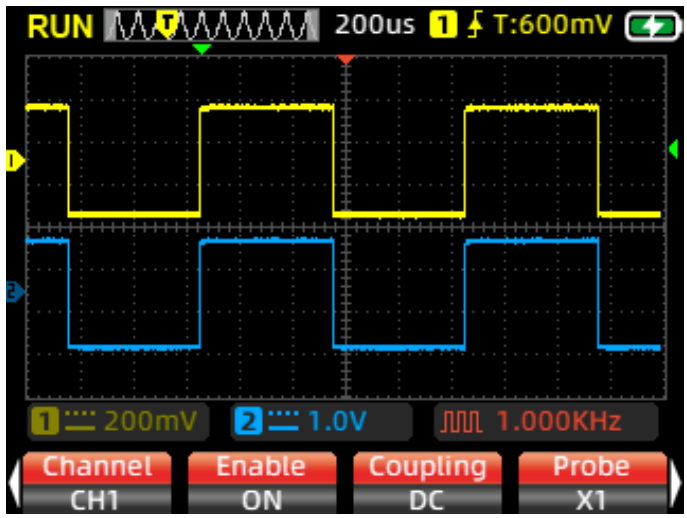
Remarks: When the probe is set to y1, the probe marked with a specifi cation of 6M2/X1 will limit the bandwidth of the oscilloscope to 6MM inp ut. To use the full band of the oscilloscope, make sure to set the switch to 10 or use a probe with a higher specification.



Introduction to Oscilloscope Functions

● Channel Settings

Press the MENU key to display the first page of the channel settings menu



1. Press F1 to switch between CH1 and CH2, selecting the channel that needs to be configured.

2. Press F2 to toggle between open and closed. When open, the screen displays the waveform of the current channel, and when closed, the screen does not display the current channel waveform.

3. Press F3 to select the coupling mode for the channel as DC or AC.

4. Press F4 to switch the probe attenuation between X1 and X10. This setting should match the attenuation switch on the oscilloscope probe; set the oscilloscope to X1 if the switch is set to X1 and X10 if the switch is set to X10.

● Automatic Setup

When encountering uncertain waveforms during the measurement process or wishing to avoid tedious manual settings, press the AUTO key. The oscilloscope will automatically identify the waveform type (sine or square wave) and adjust the control mode to accurately display the waveform of the input signal.

Introduction to Oscilloscope Functions

● Vertical System

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

Vertical voltage scale setting: Press the F1 key on the oscilloscope's main interface to select the Voltage/Time menu. Use the panel's upper direction key to increase the voltage setting and the lower direction key to decrease the voltage setting.

Probe attenuation setting for X1: Adjustment range from 20mV/div to 10V/div

Probe attenuation setting for X10: Adjustment range from 200mV/div to 100V/div

Vertical position: Press the F2 key on the main interface to select the Waveform Move menu. Use the upper direction key to move the waveform position up and the lower direction key to move it down.

● Horizontal System

Press the F1 key on the main interface to select the Voltage/Time menu.

1. Horizontal scale: Use the left and right direction keys to change the horizontal scale (time base). When changing the horizontal scale, the waveform will zoom in or out relative to the screen center. The right direction key decreases the time base, and the left direction key increases the time base.

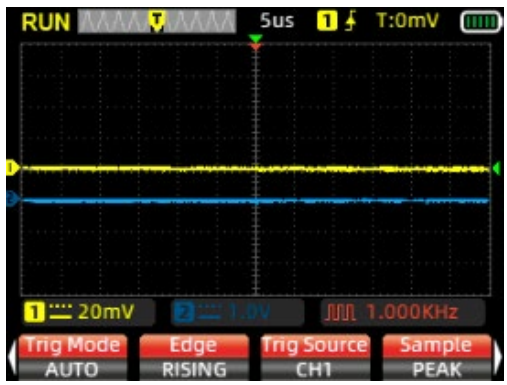
2. Horizontal position: Select the Waveform Move menu, use the left and right direction keys to move the waveform position left or right. Long-press the MENU key to return the horizontal cursor to the center (0-time base) position.

3. Scroll Mode: When the horizontal time base is set to 200ms/div, the oscilloscope automatically enters Scroll Mode. In Scroll Mode, triggering and horizontal position settings are not controlled; the waveform scrolls from left to right. Scroll Mode is suitable for low-speed signals and allows for long-term observation of waveform changes according to measurement needs.

● Trigger System

In oscilloscope measurements, it is often necessary to observe and analyze waveforms that exhibit specific or prominent differences (continuous or instantaneous). This can be achieved by configuring the trigger system. When the acquired signal meets the set conditions, the system automatically captures and displays the current waveform on the screen.

Press the MENU key, and then press the right direction key to enter the second-page trigger system menu.



Trigger Cursor Setting:

Press the F3 key on the main interface to select the Trigger Cursor menu. Use the left and right direction keys to adjust the horizontal trigger cursor position and the up and down direction keys to adjust the vertical trigger cursor position. During adjustment, the trigger level value in the upper right corner of the screen will change accordingly (the trigger level value is referenced to the horizontal baseline position).

Trigger Mode Setting:

On the second menu, press F1 to select the trigger mode.

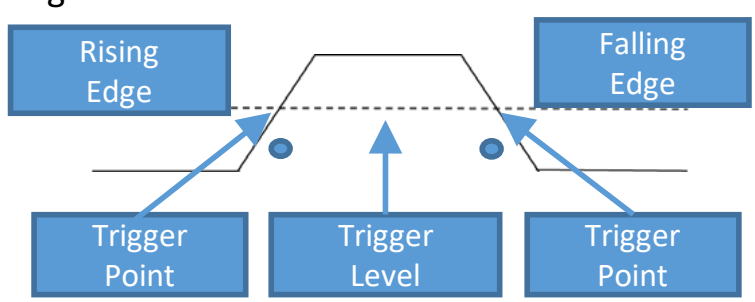
1. Auto: Auto triggering continuously refreshes the waveform record inreal-time, without the waveform pausing.

2. Normal: When the amplitude of the captured signal reaches the set trigger level, the trigger system locks and holds the waveform on the screen. The oscilloscope continues continuous acquisition, updating the waveform on the screen with each trigger event, creating continuous triggering.

3. Single: When the amplitude of the captured signal reaches the set trigger level, the trigger system locks and holds the waveform on the screen. The waveform acquisition is completed, and the oscilloscope enters the STOP state, stopping signal acquisition. To trigger again, press HOLD to cancel STOP and enter the waiting-trigger state.

Trigger Edge:

On the second-page menu, press F2 to select the trigger edge and set it to rising or falling.



Rising Edge Trigger: The trigger system recognizes the rising process of the signal amplitude. When the amplitude reaches the trigger level, the trigger is activated.

Falling Edge Trigger: The trigger system recognizes the falling process of the signal amplitude. When the amplitude reaches the trigger level, the trigger is activated.

Trigger Source Setting:

Based on measurement needs, press F3 to select the trigger source, choosing between CH1 or CH2.

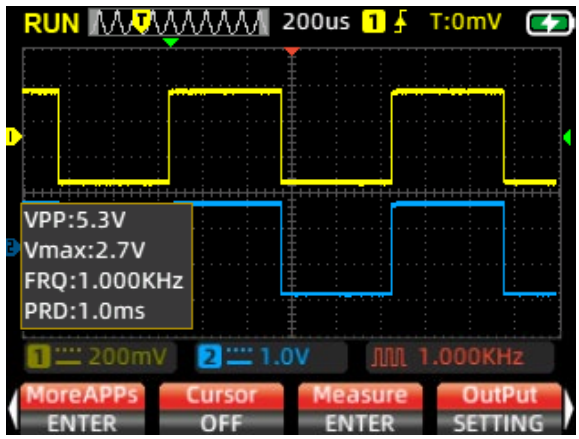
Trigger Position:

Press F4 to automatically adjust the trigger position to the 50% middle position.

Oscilloscope Functions Introduction

- **Numeric Measurement:**

Press the MENU key and then press the right direction key to enter the sixth-page menu

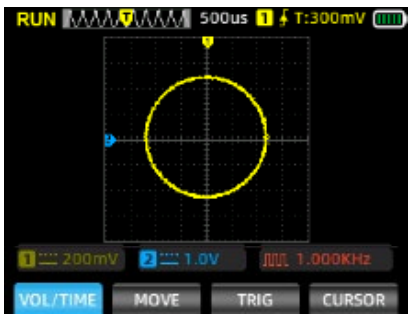


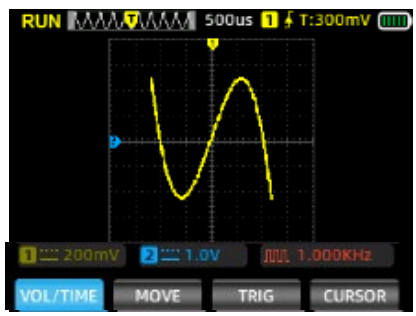
- Automatic Measurement: When measuring an unknown signal waveform, press the AUTO key, and the measurement system will automatically recognize and adjust the waveform amplitude and time base. It will then display the matched waveform on the screen.
- Manual Measurement: Manually set parameters such as predicted waveform voltage, time base, cursor position, trigger, coupling mode, and probe attenuation. Connect the measurement circuit with the oscilloscope probe to observe the waveform and related measured values.
- Numeric Display: Press the F3 key to bring up the relevant numerical options on the screen. The measured values include peak-to-peak value, maximum value, minimum value, root mean square, frequency, duty cycle, period, and frequency meter – a total of 8 groups of values. Due to limited screen space, CH1 and CH2 can display up to 4 groups of values each. You can check the desired values according to measurement needs, press F3 to exit after selection, and the screen will display the selected measured values.

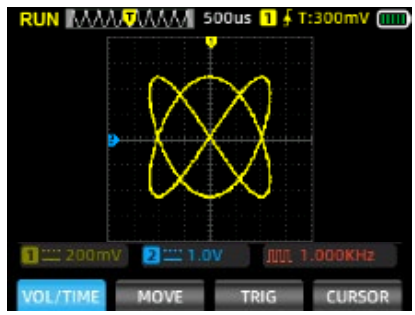
Oscilloscope Functions Introduction

- **XY Display Mode:**

Enter the fifth page of the extended function menu and press F1 to select the X-Y display mode. At this point, the screen switches to the vertical display of CH1 and CH2. Based on the frequency ratio and phase difference of the measured signals from CH1 and CH2, it generates various shapes and changes **in** Lissajous patterns.





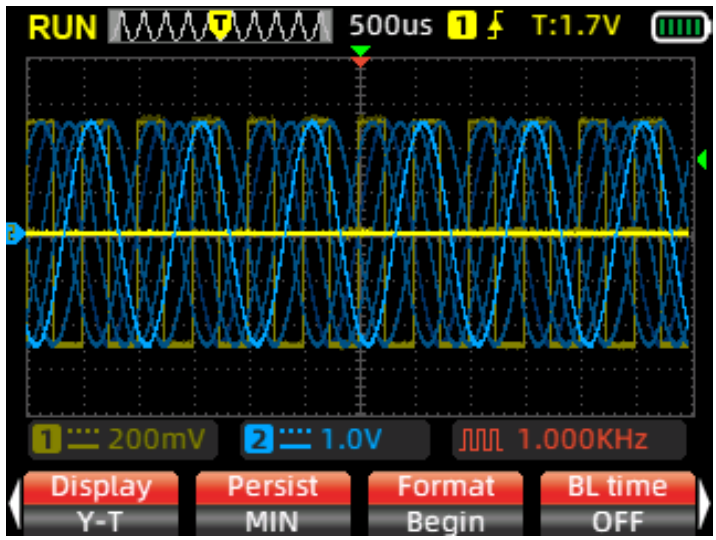


- **Persistence Time:**

Enter the fifth page of the extended function menu and press F2 to select the persistence time. Adjust the persistence time according to measurement needs: mi**nimum, 500ms, 1S, 10S, infinite.**

- **Format:**

Enter the fifth page of the extended function menu and press F3 to format. After completion, it will clear the saved waveform images.



- **Backlight Time:**

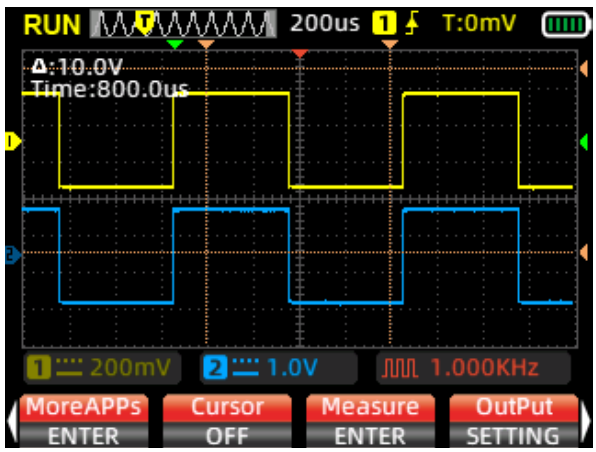
Enter the fifth page of the extended function menu and press F4 to set the backlight off time: 30S, 60S, 120S, Off (infinite).

Oscilloscope Functions Introduction

- **Cursor Measurement:**

Typically, during the waveform measurement process, there is a need to capture a specific segment of the waveform to individually measure its amplitude or time. This gives rise to the cursor measurement function.

Press the MENU key, then press the right arrow key to enter the sixth page of the extended function menu.



By selecting the Measurement Cursor menu, you can choose Horizontal Cursor, Vertical Cursor, or Horizontal + Vertical Cursor. After opening the cursor axis, numerical values will be displayed in the upper left corner of the screen.

Horizontal Cursor Measurement: Open the horizontal cursor axis, return to the main menu, press the Measurement Cursor button, choose the upper and lower cursor axes to move, and read the voltage value between the two cursor axes.

Vertical Cursor Measurement: Open the vertical cursor axis, return to the main menu, press the Measurement Cursor button, choose the left and right cursor axes to move, and read the time value between the two cursor axes.

Horizontal and Vertical Cursor Measurement: Open both horizontal and vertical cursor axes simultaneously, return to the main menu, press the Measurement Cursor button, choose the upper, lower, left, and right cursor axes to move, and read the values between the upper and lower, as well as left and right cursors.

Oscilloscope Functions Introduction

- **How to Save Measurement Waveforms:**

To save a measurement waveform, press and hold the [Save] key for 2 seconds. Release the key when the screen displays the 'Save' prompt. The oscilloscope will automatically save the current measured waveform data, sequentially numbered, and store it as images in the memory.

- **How to Browse and Retrieve Saved Waveforms:**

1. Enter the sixth menu, press F1 to enter the extended applications. The screen will show saved waveform images.

2. Use the arrow keys (up, down, left, right) to navigate and select the waveform you want to view.

3. Press the [MENU] key to confirm and open the selected image.

4. Press F3 to delete the image.

- **To access saved waveforms on a computer:**

1. Enter the third menu, press F3 to enter data save mode.

2. Connect the oscilloscope to the computer using a TYPE-C data cable.

3. Click on "USB Disk" on the computer and open the "pic" folder to review saved waveforms.

4. Alternatively, download the waveforms to the computer for more convenient organization and analysis.

Press the [F2] key to return to the measurement interface.

- **Language Setting:** Enter the third menu, press F4, and choose between Simplified Chinese or English as the oscilloscope language based on personal preferences.
- **Auto Shutdown:** Enter the fourth menu, press F1 to select the auto shutdown time. Depending on usage frequency, choose from 1 minute, 10 minutes, 30 minutes, 60 minutes, 120 minutes, or turn off (infinite). For short-term use, consider 15 or 30 minutes auto shutdown; for long continuous use, select 120 minutes or infinite.
- **Restore Settings:** Enter the third menu, press F2. The screen will display a prompt. Press the [MENU] key to reboot the system and restore factory settings.

Oscilloscope Functions Introduction

- **Run Mode:**

The oscilloscope is equipped with two operating modes: Normal mode and High-Speed mode. Enter the fourth menu, press F3 to toggle between them. Depending on the measurement signal, if the input signal is less than 30MHz, it is recommended to use Normal mode. If the measurement signal frequency is higher than 30MHz, it is advisable to switch to High-Speed mode.

Normal Mode: Maximum sampling rate 200MSa/s, Maximum measurement bandwidth 30MHz; Lower power consumption, more power-efficient.

High-Speed Mode: Maximum sampling rate 280MSa/s, Maximum measurement bandwidth 50MHz; Higher power consumption.

- **Backlight Brightness:**

Enter the fourth menu, press F2 to adjust the screen backlight brightness. Brightness levels are set at 30%, 50%, 80%, and 100%. For indoor lighting, it is recommended to adjust the brightness to 30%, or adjust it according to the comfort level in different usage environments.

- **Baseline Calibration:**

The instrument is factory-calibrated at 100%. However, if there is a baseline offset due to large environmental temperature deviations or prolonged periods of non-use, baseline calibration can be performed.

1. Enter the third menu, press F1, and the screen will prompt "Unplug the plug and press the menu key to start calibration."

2. Press the MENU key to start the calibration.

During calibration, please note the following:

1. Do not connect the probe or input signal during calibration, as it may cause calibration deviation or damage to the instrument.

2. Do not perform other operations during the calibration process. Wait patiently until the calibration is complete.

Signal Generator Functions Introduction

- Setting the Signal Generator Output Waveform:

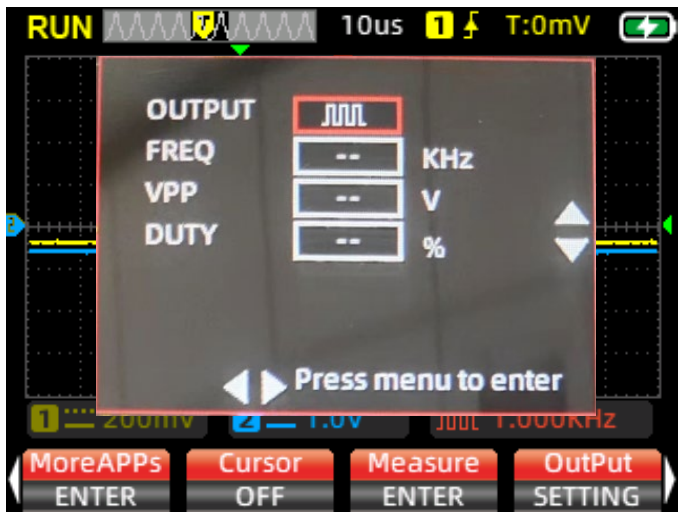
Navigate to the sixth page menu and press the F4 key for signal output settings. The screen will display the output signal settings window.

1. The signal settings window has four groups of settings. The border color of a setting field turns red to indicate it is currently selected for configuration. Use the up and down arrow keys to change the selected field. The border color turns yellow when selected, and the left and right arrow keys adjust the parameters of the selected field.

2. The first field is for output waveform type settings, the second field is for frequency settings, the third field is for amplitude settings, and the fourth field is for duty cycle settings.

3. After selecting the desired field for configuration, press the MENU key to confirm. The border color of the selected field turns yellow. Use the left and right arrow keys to set the output waveform type or parameters for the selected field. After configuring the parameters for the field, press the MENU key again to confirm. The border color will turn red. Use the down arrow key to proceed to the next group of settings and repeat the process in the same manner.

4. After completing all parameter settings, press the F4 key to exit the configuration window. The waveform symbol and frequency that have been set will appear in the lower right corner of the screen.

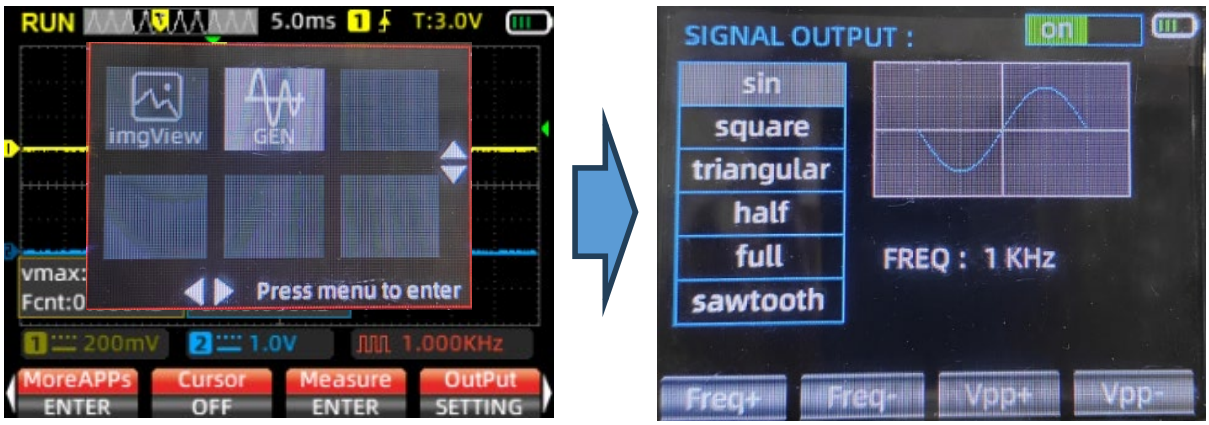


5. Connect the oscilloscope probe to the signal output port and begin the measurement.

Note: In the current mode, when the signal output waveform is pulse wave, sine wave, and sawtooth wave, the oscilloscope's maximum measurement time base is limited to 100us. If you switch to the restore time base, the signal output will be set to square wave.

● Signal Generator Mode Signal Output

Enter the sixth page menu, press the F1 key to access the extended applications. At this point, the screen displays options for image browsing and signal output patterns. Choose signal output, then press the MENU key to enter the signal generator output settings interface.



1. Use the up and down arrow keys to select the output waveform as sine wave, square wave, triangle wave, half-wave, full-wave, or sawtooth wave. The screen display window synchronously shows the corresponding waveform.

2. Use the left and right arrow keys to switch the frequency unit between 1Hz and 1KHz.

3.Press the F1 key to increase the frequency setting value. Short presses of F1 cause a single increment in frequency, while long presses result in continuous changes.

4.Press the F2 key to decrease the frequency setting value. Short presses of F2 cause a single decrement in frequency, while long presses result in continuous changes.

5.Press the F3 key to increase the duty cycle setting value. Short presses of F3 cause a single increment in duty cycle, while long presses result in continuous changes.

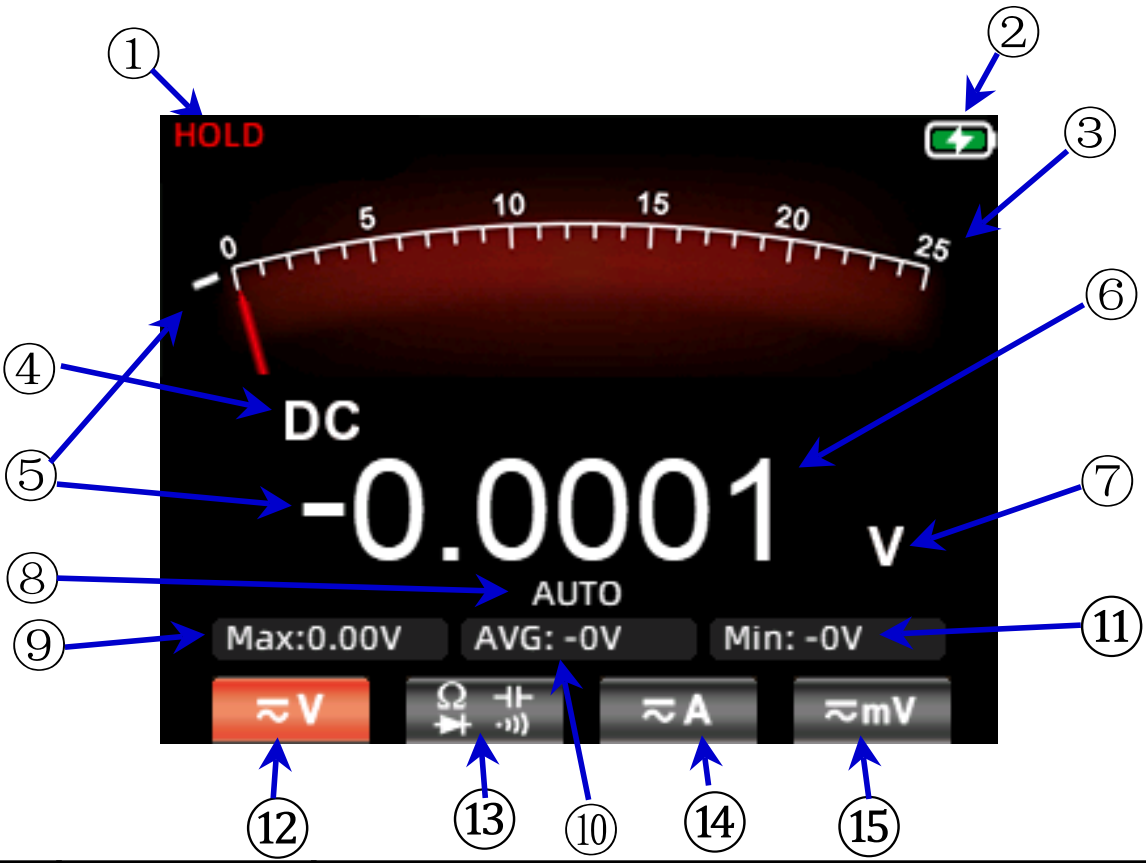
6.Press the F4 key to decrease the duty cycle setting value. Short presses of F4 cause a single decrement in duty cycle, while long presses result in continuous changes.

7.Press the MENU key to toggle the ON/OFF switch at the top right corner of the screen, simultaneously enabling and disabling signal output.

8.To return to the oscilloscope interface, press the MODE key to exit.

Introduction to Multimeter Mode

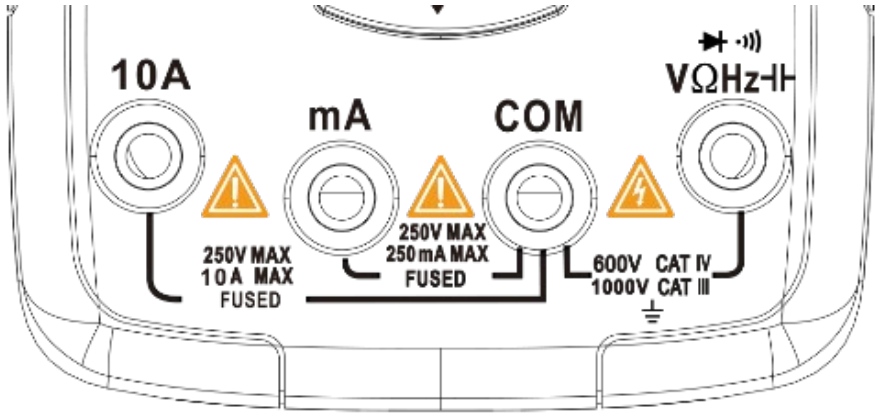
LCD (Enter by pressing the MODE button)



①	HOLD	Pressing the HOLD button on the panel will freeze the current displayed data.
②	Battery level	Display the current battery level status and charging indication.
③	Analog pointer	The dial's analog pointer changes position according to the main display measurement data, indicating the corresponding scale position.
④	symbol display	Display the current corresponding measurement type symbol, including AC, DC, resistance, capacitance, diode, and buzzer symbols.
⑤	Negative sign	When a negative value occurs, the screen will display a negative sign prompt.

⑥	Main display	Displays the multimeter measurement value, with a maximum display of 25,000 counts.
⑦	Unit symbol	Displays the unit symbol of the measured data.
⑧	Testing mode	Automatic Range (AUTO): The multimeter automatically selects the appropriate testing range. Manual Measurement (MANU): Press the RANGE key to manually select and switch to a specified testing range.
⑨	Max:	Displays the maximum reading during measurement.
⑩	AVG：	Displays the average reading during measurement.
⑪	Min： Hz:	In DC voltage, resistance, and capacitance measurements, it displays the minimum value (Min). In AC voltage and current measurements, it displays the frequency (Hz) of the AC signal.
⑫	Voltage range	Press F1 to select the voltage measurement range and press F1 again to select AC/DC mode switching.
⑬	Resistance, capacitance, diode, continuity range	Press F2 to enter the resistance measurement range. In the resistance measurement range, press F2 to enter the continuity range. In the continuity range, press F2 to enter the diode range. In the diode range, press F2 to enter the capacitance range.
⑭	Current range	Press F3 to switch to the current measurement range.
⑮	Millivolt range	In the current measurement interface, the original F4 menu displays the mA range.

Multimeter Input Terminal



10A	Input port for current measurement (≤9.999A)
mA	Input port for current measurement (≤250mA)
COM	Common (return) port for all measurements
V Ω Hz	Input port for the following measurements: AC/DC voltage Resistance Capacitance Frequency Continuity Diode

Measurement Method

Measuring AC Voltage and DC Voltage

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. If measuring voltage less than 250mV, press the F4 key once to select the millivolt range or press twice to enter the AC millivolt range. If measuring voltage greater than 250mV, press the F1 key once to enter the DC voltage range or press twice to enter the AC voltage range.
3. Use the probe tips to contact the correct testing points in the circuit.
4. Read the voltage value displayed on the screen.

- The measured voltage must not exceed the rated maximum test value, as it may damage the instrument and pose a risk to personal safety. When measuring high-voltage circuits, it is essential to avoid direct contact with the high-voltage components.

Measuring AC Current and DC Current

1. Insert the black probe into the COM terminal and the red probe into the 10A terminal or mA terminal (choose based on the maximum test value of the two terminals and the estimated value of the current to be measured); press the F3 key on the panel to select the current menu; after entering the current menu, the F4 key corresponds to the mA current.
2. Press the corresponding menu key again to switch between DC and AC.

3. Disconnect the circuit under test, and connect the meter probes in series with the circuit before restoring power. Read the displayed current value on the screen.

- The measured current should not exceed the rated maximum test value to avoid damaging the instrument and jeopardizing personal safety. If the magnitude of the current to be measured is unknown, perform a preliminary test on the A-terminal, then select the test port and range based on the displayed value. It is strictly prohibited to apply voltage in this mode.

Measuring Resistance

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. Press the F2 key to enter the resistance mode.
3. Use the probe tips to touch the desired circuit test point.
4. Read the displayed resistance value on the screen.

- Before measuring resistance, ensure that all power sources in the circuit being tested are turned off, and all capacitors are completely discharged.
- It is strictly prohibited to apply voltage in this range.

Testing continuity

1. Insert the black test lead into the COM terminal, and the red test lead into the VΩHz terminal.
2. Switch to the continuity mode by pressing the F2 key when in the resistance range.
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 Diode

1.In the continuity mode, press F2 to enter the diode test mode.

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

- Prohibition of Voltage Input in Continuity and Diode Modes:
- It is strictly prohibited to apply voltage in the continuity and diode measurement modes.
- Before testing, disconnect the power source of the circuit and discharge all high-voltage capacitors.

Measuring Capacitance

1. Insert the black probe into the COM terminal and the red probe into the VΩHz terminal.
2. In the diode mode, press the F2 key once to enter the capacitance mode.
3. Connect the red probe to the positive terminal of the capacitor and the black probe to the negative terminal of the capacitor.
4. Once the reading stabilizes, read the capacitance value displayed on the screen.

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

Multimeter Extended Functions

When in multimeter mode, press the MENU key, and the screen will display the following extended menu:

F1: Switch language between Chinese and English.
F2: Set the auto-off time to 1 minute, 10 minutes, 30 minutes, 60 minutes, 120 minutes, or turn off (no auto-off time limit).
F3: Adjust the backlight brightness to 30%, 50%, 80%, or 100% screen brightness.
F4: Open/close the serial port output menu. When the serial port output is open, connect the upper computer to the signal generator output port (serial port output end). Set the serial port baud rate to 115200. When successfully connected, the multimeter will update and send measurement data to the upper computer in real time at a rate of 3 times per second. This allows real-time monitoring and saving analysis of measurement values.
Note: As the ground of the serial port output end is the same as the ground of the oscilloscope probe, do not use the probe to measure circuit waveforms synchronously when connecting the upper computer to the serial port, as there is a risk of damaging the equipment.

Maintenance and Care

Except for battery and fuse replacement, do not attempt to repair this product or alter its circuit unless you have the necessary qualifications and possess corresponding calibration, performance testing, and maintenance operation instructions.

Cleaning the Product

Use a damp cloth and mild detergent to clean the casing. Do not use corrosive or solvent-based cleaners. Dust or moisture on the test ports may affect the accuracy of readings.

*Before cleaning the product, remove all input signals.

Battery Charging

When the battery icon in the top right corner of the screen displays  , prompt charging is required. Follow these steps:

1.Connect the TYPE-C data cable to a DC 5V output adapter for charging.

2. Connect the TYPE-C data cable to a computer's USB port for charging.

3. While charging, the screen displays the  symbol.

4. When fully charged, the screen displays the  symbol.

5. During the instrument charging process, the built-in red  light on the power button will illuminate. When the battery is fully charged, the red light will flash or go out.

Battery Storage

If the instrument is not used for an extended period (such as more than 6 months), it should be charged to 50%-70% and stored in a cool, dry environment. If the lithium battery shows signs of rust, leakage, swelling, etc., it should be immediately removed and disposed of.

Battery Replacement

The lithium battery in the instrument can be recharged repeatedly but is still a consumable item. If you observe a significant reduction in standby time, replace it with the same model of 18650 lithium battery. Refer to the fuse replacement steps for the replacement method.

Note: When installing the battery, pay attention to the correct polarity.

Fuse Replacement

When the fuse blows or malfunctions, follow these steps to replace it:

1. Before replacing the fuse, remove the test leads and turn off the instrument.
2. Unscrew the four screws securing the back cover of the product and remove the back cover.
3. Remove the old fuse and replace it with a new one of the same model.
4. Reattach the back cover and tighten the screws.

Technical Specifications

General Technical Specifications for Multimeter	
Display (IPS)	25000 counts
Range	Automatic/Manual
Material	ABS+TPE
Sampling Rate	3 times per second
True RMS	√
Data Hold	√
Screen Backlight	√
Low Battery Indicator	√
Auto Power Off	√

Mechanical Technical Specifications	
Dimensions	177*89*40mm
Weight	390g (340g without battery)
Battery Type	18650 battery * 1
Warranty Period	1 year

Environmental Specifications		
Operating Environment	Temperature	0~40℃
	Humidity	＜75%
Storage Environment	Temperature	-20~60℃
	Humidity	＜80%

Multimeter Technical Specifications

Function	*Range*	*Resolution*	*Accuracy*
DC Voltage (V)	2.5000V	0.0001V	±(0.05% +3)
	25.000V	0.001V	
	250.00V	0.01V	
	1000.0V	0.1V	
DC Voltage (mV)	25.000mV	0.001mV	
	250.00mV	0.01mV	
AC Voltage (V)	2.5000V	0.0001V	±(0.5%+3)
	25.000V	0.001V	
	250.00V	0.01V	
	750.0V	0.1V	
AC Voltage (mV)	25.000mV	0.001mV	
	250.00mV	0.01mV	
AC Voltage Frequency Response: 40Hz~1kHz			

Function	*Range*	*Resolution*	*Accuracy*
DC Current（A）	2.5000A	0.0001A	±(0.5%+3)
	10.000A	0.001A	
DC Current（mA）	25.000mA	0.001mA	±(0.5%+3)
	250.00mA	0.01mA	
AC Current（A）	2.5000A	0.0001A	±(0.8%+3)
	10.000A	0.001A	
AC Current（μA/mA）	25.000mA	0.001mA	±(0.8%+3)
	250.00mA	0.01mA	
AC Current Frequency Response：40Hz~1kHz			
Resistance	250.00Ω	0.01Ω	±(0.5%+3)
	2.5000kΩ	0.0001kΩ	±(0.2%+3)
	25.000kΩ	0.001kΩ	
	250.00kΩ	0.01kΩ	
	2.5000MΩ	0.0001MΩ	±(1%+3)
	25.00MΩ	0.01MΩ	
	250.0MΩ	0.1MΩ	±(5.0%+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	9.999Hz	0.001Hz	±(2.0%+2)
	99.99Hz	0.01Hz	±(0.1%+2)
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
Diode	√		
Continuity	√		

Oscilloscope Specifications

Characteristics		Description
Bandwidth	50MHZ	Dual Channel
Sampling	Sampling Method	Real-time sampling
	Sampling Rate	200M/280MSa/s
Channels	2	Dual Channel
Input	Input Coupling	DC, AC
	Input Impedance	1MΩ,@16pf
	Attenuation	X1, X10
	Maximum Input Voltage	X1 range <150V, X10 range <300V (DC+AC peak)
Horizontal	Rate Range	1.5Sa/s - 280MSa/s
	Interpolation	(sinx)x
	Sweep Range	10ns/div - 20s/div
	Time Base	Accuracy 20ppm
	Record Length	Up to 128Kbyte
Vertical	Sensitivity	20mV/div - 10V/div
	Offset Range	4 grids (positive and negative)
	Analog Bandwidth	50MHZ
	Low-Frequency	More than 10Hz
	Rise Time	Less than 10ns
	DC Gain Accuracy	±3%
Measurement	Auto Measurement	Period, frequency, peak-to-peak value, maximum value, minimum value, RMS, duty cycle, frequency meter
Trigger	Trigger Modes	Auto, normal, single
	Trigger Edges	Rising edge, falling edge
Signal Generator Output		Sine wave, square wave, sawtooth wave, half wave, full wave
Operating Modes		Normal mode 200MSa/s, High-speed mode 280MSa/s
Display Modes		YT, XY, Roll
Persistence Mode		Minimum, 500ms, 1S, 10S, Infinite