Sorandy X10 Oscilloscope Graph Multimeter User Manual

Oscilloscope Graph Multimeter User Manual

Contents

Limited Guarantee and Limited Liability

The Company guarantees that this product will be free fram any defects in material and workmanship for one year from the date of purchase. This warranty does not apply to for damage caused by accident, negligence, misuse, alteration, contamination or improper operation or handling. The Distributor shall not be entitled to give any other guarantee in the name of the Company. If you need warranty service during the warranty period, please contact your nearest authorized service center to obtain product return authorization information; Then send the product to the service center with a description of the product problem.
This guarantee is the only compensation you can receive. In addition, the company does not provide any express or implied warranties, such as the imptied warranties for a particular purpose.
In addition, the Company shail not beliable for any special, indirect, incidental or consequential damage or loss of any kind arising out of any cause or presumption, and because some states of countries do not allow limitations on implied warranties and incidental or consequential damage, the above limitations and provisions of liability may not apply to you.

Summarize

The hand-held oscilloscope adopts double injection molding process, has beautiful appearance design, small size. convenient to carry and flexible operation; Function button menu interface is clear and intuitive, the screen adopts 3.98-inch TFT full-angle color screen, the multimeter type is 20000 counts:
The product combines oscilloscope and multimeter functions as one, superior performance, powerful functions, can be used in a variety of measurement scenarios. to meet the needs of users more measurement.

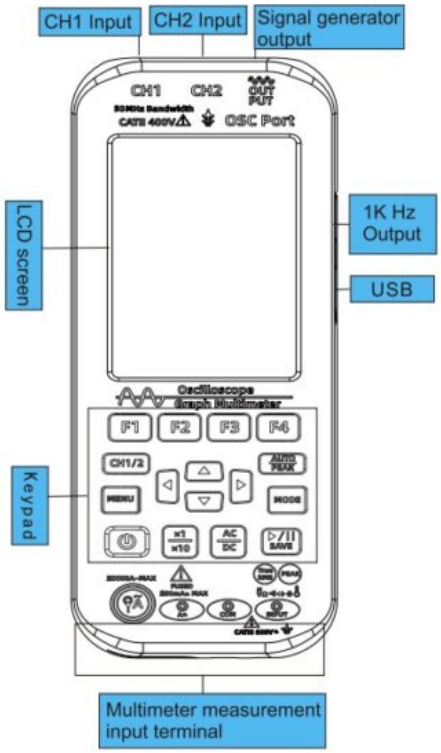
Safety Notice

To avoid electric shock, fire, and personal injury, read the safety ecautions before use. Use the product onty for the purpose which it is intended, othenvise the protection provided by product may be diminished.

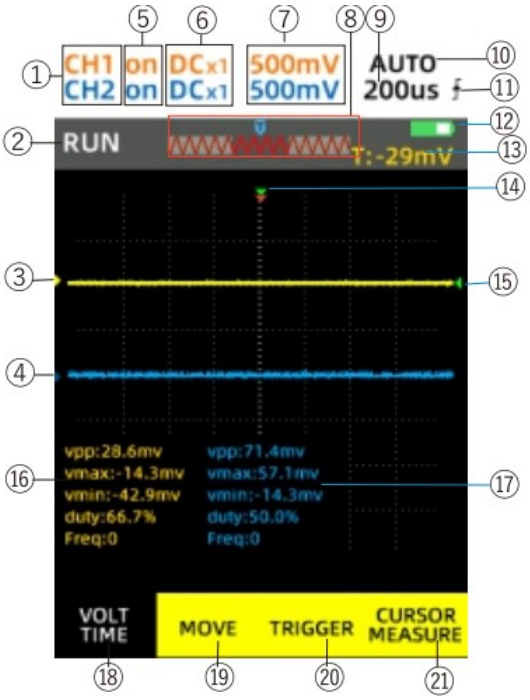
- Please check the case for cracks or plastic defects before ising the product. Carefully check the insulators near the nput ports.
- Please fotlow this Manual, use the correct input port and orrect gear setting, and measure within the range specified this Manual.
- Do not use this product around explosive gases and vapors in humid environments.
- Please hold your finger behind the guard of the stylus probe.

- When the product is connected to the circuit under test, do ot touch the unused input port.
- Disconnect the test pen from the circuit before changing the est gear.
- When the DC voltage to be measured is higher than 36V, or he AC vottage is higher than 25V, it may cause serious injury d0 the human body, and users should pay attention to avoid tactric shock.
- Please select the correct test gear and range to avoid damage 9 the instrument or personal injury.
- Do not use this product with the front or back cover open.
- When the battery is low, it may affect the accuracy of the test esults, please charge it in time.
- The probe ground wire is the same as the ground potential. Nhen connecting the USB cable to charge, the probe ground vire is prohibited fram clamping to the high voltage voltage, stherwise it will damage the product or hurt the human body.
- When using the oscilloscope probe to measure voltage higher han (AC25V or DC36V), please ensure that the product USB rotection cover is closed to agoid human contact with exposed netal parts, otherwise it may cause human injury.

Main Interface

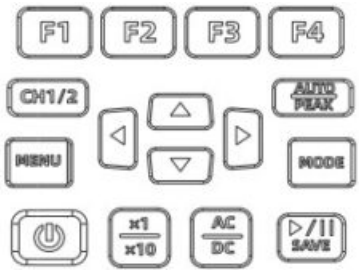


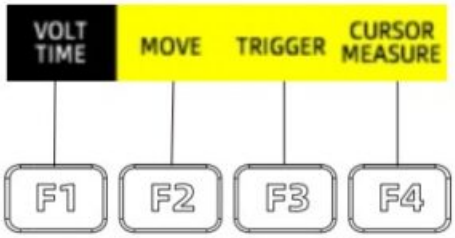
Oscilloscope Mode Main Screen Description


1
CH1
CH2
5
on
on
6
DCx1
DCx1
7
500mV
500mV
8
9
AUTO
200us
10
11
12
2
RUN
T:-29mV
13
14
3
15
4
vpp:28.6mv
vmax:-14.3mv
vmin:-42.9mv
duty:66.7%
Freq:0
16
vpp:71.4mv
vmax:57.1mv
vmin:-14.3mv
duty:50.0%
Freq:0
17
VOLT
TIME
MOVE
TRIGGER
CURSOR
MEASURE
18
19
20
21

No.	Name	Instructions
1	Trigger channel	CH1 is channel 1, and CH2 is channel 2
2	Running status	Status: Stop/Run
3	Ch 1	CH1 waveform is displayed in yellow
4	Ch2	CH2 waveform is displayed in blue
5	Channel switch	CH1/CH2 On-off state
6	Attenuation	Channel attenuation factor
7	Voltage scale	Vertical voltage scale value
8	Time base	Timebase position in storage depth
9	Time base scale	Horizontal time base scale value
10	Wave Mode	Auto/Normal/Single
11	Trigger mode	Rising or falling edge
12	Battery level	Battery status and charging status
13	Trigger level	Trigger voltage value
14	Vertical flip-flop	Vertical voltage position triggered
15	Horizontal trigger	Horizontal timebase position of the trigger
16	CH1 Parameters	Specific parameters of CH1
17	CH2 Parameters	Specific parameters of CH2
18	Voltage/ Time base menu	Press up key to increase the voltage amplitude, Press down key t o lower the voltage amplitude; Adjustable range:20mV/div - 10V/diy Press left key left to enlarge the time base, Press right arrow key t o reduce the time base; Adjustable range:lOns/div-20s/div
19	Wave movement	Press the up/down button to adjust the upper and lower positions of the waveform, and press the left and right keys to adjust the left and right positions of the waveform
20	Trigger cursor	Press the up and dow keys to adjust the position of the trigger cursor
21	Measuring cursor	Press F4 to switch the measurement cursor selection, and press u p and down arrow keys to adjust the measurement cursor position

Description of Panel Function Keys





F1-F4 key: corresponding to the function menu displayed on the display screen, select the corresponding function by pressing the key.

Arrow keys: The up, down, and left arrow keys are used for progressive adjustment of related Settings, moving cursor positions, and navigation menu selections.

CH1/2 key: Short pres in the oscilloscope mode to switch the oscilloscope channel.

AUTO/PEAK key: Short press this key in the oscilloscope mode to automatically obtain the measurement waveform;
In the multimeter mode: Switch to the voltage peak measurement mode. (This mode is only valid for AC voltage)

MENU key: This key is the menu key. Press this ke to display the system function menu on the screen. You can navigate through the key.

MODE key: This key is a mode conversion key. Press this key to switch between oscilloscope, generator, and multimeter modes.

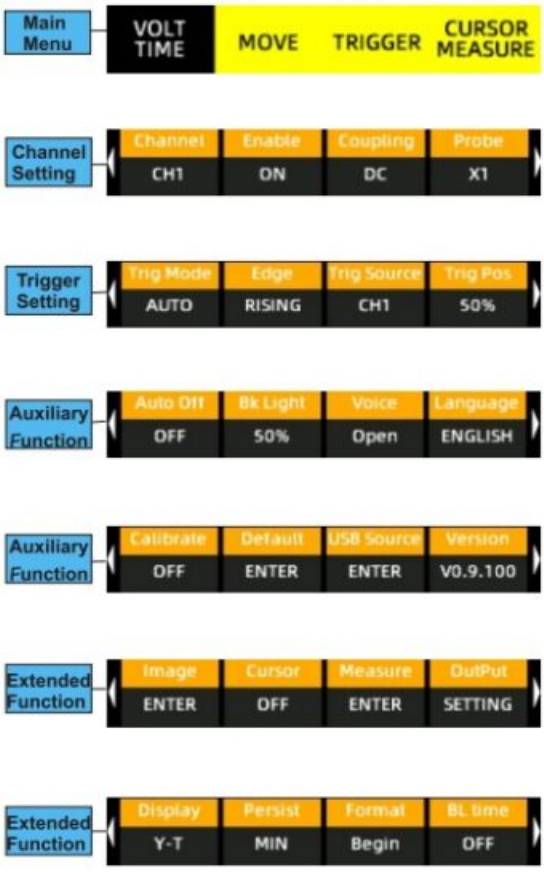
Power button: Press power button for 1S to power on the meter, Press and hold for 3S while the meter is on, and wait until the progress bar of the screen shuts down..

X1/X10 key: Press this key in the oscilloscope mod to switch oscilloscope attenuation gear, and press this key in the multimeter mode to clear the average value calculation and recalculate.

AC/DC key: Press this key in the oscilloscope mode to switch the oscilloscope AC/DC channe This key is valid only in oscilloscope mode.

SAVE key: Press this key to stop/run in the oscilloscope mode. Press and hold to save the screenshot.
In the multimeter mode, short press to pause or cancel, press and hold 3s to save the screenshot.

Menu



Oscilloscope Function Introduction

1. Probe Inspection

> Security:

To avoid electric shock when using the probe, ensure that your finger is located behind the safety ring on the probe body. When the probe is connected to a high voltage power supply. do not touch the metal parts on top of the probe. The measurement voltage must not exceed the probe specification (1X range up to 150V, 10X range up to 300V), otherwise the instrument may be damaged.

> Manual Probe Compensation:

When connecting a probe to an oscilloscope for the first time, it is recommended to perform the following compensation checks, as uncompensated or offset probes can cause measurement errors. If probe compensation is required, perform the following steps:

1. Power on, connect the probe to the signal input terminal, and input 4V/1KHz square wave signal.
2. Press the AUTO key on the panel! to view the waveform.

> Manual Probe Compensation:

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1. Power on, connect the probe to the signal input terminal, and input 4V/1KHz square wave signal.
2. Press the AUTO key on the panel to view the waveform.

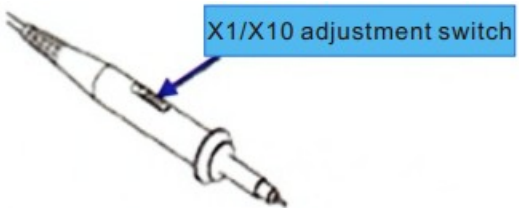
3. If you need to adjust, you can adjust the capacitance on the probe to change the compensation state; The adjustment tool is an accessory adjustment rod or a suitable non-metal handle adjustment rod that comes with the probe.

The adjustment method is shown in the following figure

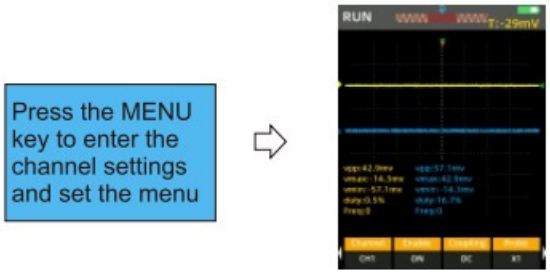
> Probe Attenuation Setting:

The probe attenuation factor 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

oscilloscope system setting, when the multiple of the switch is set to X1, the multiple of the oscilloscope is set to X1, when the muttiple of the switch is set to X10, the multiple of the oscilloscope is set to X10.



2. Channel Setting



1. Press F1 to switch between CH1 and CH2 and select the channel to be configured.

2. Press F2 to enable or disable the channel switchover. The waveform of the current channel is displayed when the channel switchover is on.

3. Press F3 to select the coupling mode of the channel as DC or AC, or directly press the panel shortcut key AC/DC to switch.

4. Press F4 key to switch probe attenuation between X1 and X10, this setting should match the attenuation switch on the oscilloscope probe; If the switch is set to X1, the oscilloscope is set to X1, if the switch is set to X10, the oscilloscope is set to X10, or you can directly press the shortcut button X1/X10 on the panel to switch.

3. **Auto Setting**

When encountering uncertain waveforms during measurement or when you want to avoid tedious manual Settings, press the AUTO key to automatically identify the waveform type sine wave or square wave) and adjust the control mode to accurately display the waveform of the input signal.

4. **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 F1 key on the oscilloscope main interface, select the voltage/time menu, and use the upper and lower arrow keys on the panel to increase or decrease the voltage setting: Use the left and right arrow keys on the panel to increase or decrease the time setting.

X1 probe attenuation Settings: Adjust the range from 20mV/div to 10Vidiv, X10 probe attenuation Settings. Adjustment range :200mVidiv to 100V/div Vertical position: press F2 on the main screen and select the waveform move menu. The up arrow key moves the waveform position up, and the down arrow key moves the waveform position down.

1. Horizontal ruler: Use the left and right keys to change the horizontal tuler (time base). When you change the level ruler, the waveform enlarges or shrinks relative to the center of the screen. The right key decreases the time base, and the left arrow key increases the time base.

5. **Horizontal System**

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

2. Horizontal position: Select the waveform Move menu and use the left and right keys to move the waveform around. Press and hold the MENU key to return the horizontal cursor to the center (0 time base) position.

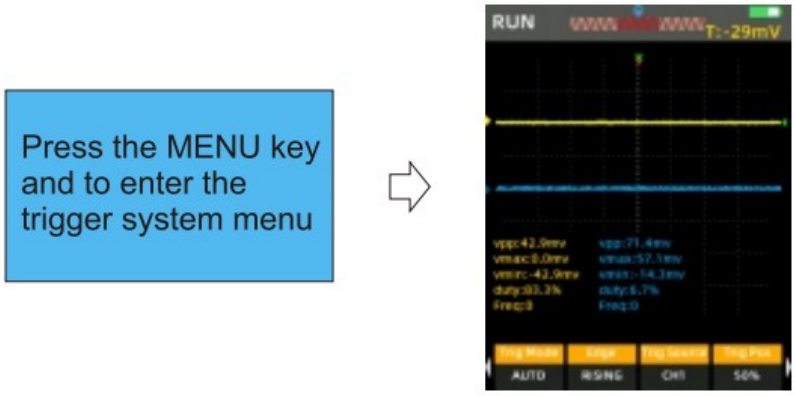
3. Rolling mode: When the horizontal time base is set to 200ms/div, the oscilloscope automatically enters rolling mode. Trigger and horizontal position Settings are not controlled in scroll mode; The waveform rolls from left to right. The rolling mode is suitable for low-speed signals and allows long-term observation of waveform

changes according to measurement needs.

6. **Trigger System**

In oscilloscope measurement, it is often necessary to observe and analyze waveforms that exhibit specific or significant differences (continuous or instantaneous). This can be done by configuring the trigger system.

When the collected signal meets the set conditions, the system automatically collects the current waveform and displays it on the interface.



> Trigger cursor Settings:

On the home screen, press F3 and select the Trigger Cursor menu. Use the left and right arrow keys to adjust the horizontal trigger cursor Position, and use the up and down keys to adjust the vertical trigger cursor position. Quring the adjustment process, the trigger level value in the upper right comer of the screen will change accordingly (the trigger level value refers to the level baseline position).

> Trigger mode Settings:

Press the MENU key to enter the menu, then press the left and right keys to enter the menu to find the trigger mode, and press F1 to select the trigger mode.

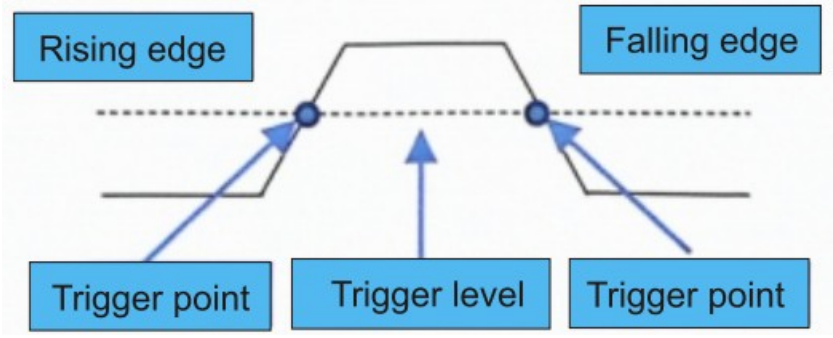
1.Auto: Automatically refreshes waveform records in real time without waveform pause.

2. Normal: When the amplitude of the captured signal reaches the set trigger level, the trigger system locks and maintains the waveform on the screen. The oscilloscope continues to capture continuously, updating the waveform on the screen based on each trigger event, creating a continuous trigger.

3. Single: When the amplitude of the captured signal reaches the set trigger level, the trigger system locks and maintains the waveform on the screen. After waveform collection is completed, the oscilloscope enters the triggered state and stops signal collection. To trigger again, press the SAVE key to cancel the stop and enter the waiting state.

> Trigger edge:

Press the MENU key to enter the menu, than press the left and right keys to enter the menu to find the trigger edge, and press F2 to select the trigger edge and set it to rise or fall.



Rise edge trigger: Triggers the rise of the signal amplitude identified by the system.

When the amplitude reaches the trigger level, the trigger is activated.

Falling edge trigger: Trigger the system to identify signal amplitude decline process.

When the amplitude reaches the trigger level, the trigger is activated.

> Trigger source Settings:

According to your measurement needs, press F3 to select the trigger source and select CH1 or CH2.

> Trigger location:

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

7. **Numerical measurement**

> Automatic measurement:

When measuring the unknown signal waveform, press the AUTO key, and the measuring system automatically identifies and adjusts the waveform amplitude and time base. The matching waveform is then displayed on the screen.

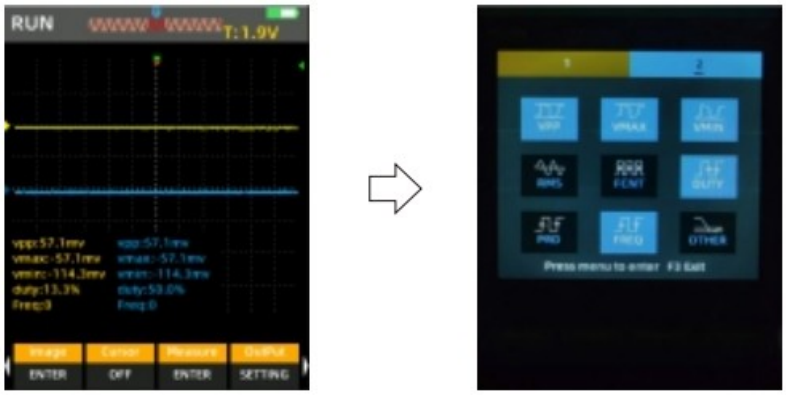
> Manual measurement:

Manually set the predicted waveform voltage, time base, cursor position, trigger, coupling mode, probe attenuation, etc. The measuring circuit is connected with the oscilloscope probe to observe the waveform and telated measurement values.

> Figures show:

Press the MENU key to enter the menu, then press the left and right arrow keys to enter the menu to find the measurement data, press F3 key to pop up the corresponding number option on the screen. The up, down, left, and right arrow keys select the parameters to be displayed.

Press MENU to confirm the selection. The measured values include peak-to-peak, maximum, minimum, root mean square, frequency, duty cycle, period, frequency meter and others – 9 sets of values. Due to limited screen space, the CH1 and CH2 can display up to eight sets of values each. The user can select the required value according to the measurement needs, press the F3 key to exit, the screen will display the selected measurement vatue.



8. XY Display Mode

Press the MENU key to enter the menu, then press the left and right arrow keys to enter the menu to find (display mode), press F1 key to select the X-Y display moda, then the screen switches to the vertical display of CH1 and CH2. Based on the frequency ratio and phase difference of the measured signal from CH1 and CH2, it produces variations of various shapes and Lissajas patterns.

9. **Afterglow Time**

   Press the MENU key to enter the menu, press the left and right keys to find (afterglow time), press F2 key to select the afterglow time, and adjust the duration according to the measurement needs: minimum, 500ms, 1S, 10S, unlimited.

10. **Formatting**

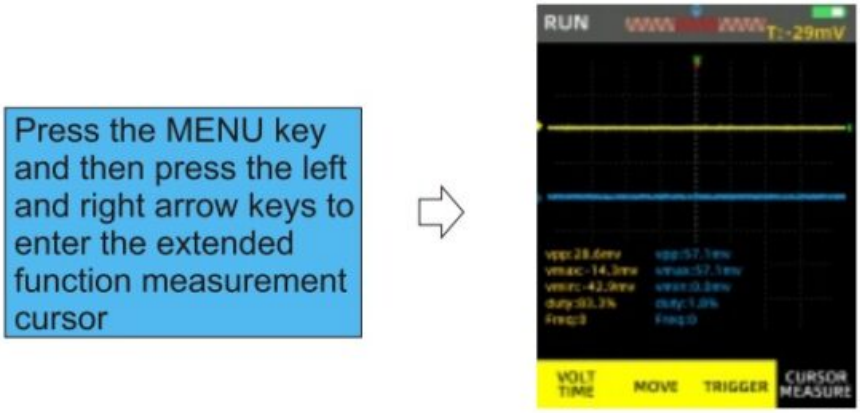
    Press the MENU key to enter the menu, press the left and right keys to find (format), press the corresponding key F3 key will format, this format will clear all the saved image data.

11. **Backlight Time**

    Press the MENU key to enter the menu, press the left and right keys to find (backlight time), press the corresponding key F4, you can adjust the backlight off time :30S, 60S, 1208. off).

12. **Cursor Measurement**

    During the waveform measurement process, specific segments of the waveform need to be captured to individually measure their amplitude or time, which gives rise to the cursor measurement function.



    You can select honzontal Cursor, Vertical Cursor, or honzontal + Vertical Cursor by selecting the Measurement Cursor menu. When the cursor axis is opened, the value appears 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 key to select the cursor axis, press the up and down keys 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 Measure cursor key to select the cursor axis, press the left and right buttons to move, and read the time value between the two cursor axes.

    > Horizontal and vertical cursor measurements

    Open the horizontal and vertical cursor axes at the same time, return to the main menu, press the Measure cursor button to select the cursor axis. Press left and right to move and read the time value between the two cursor axes. Press the up and down arrow keys to move and read the voltage between the two cursor axes.

13. **How to save the measurement waveform**

    To save the measurement waveform, press and hold the [SAVE] key.

    When the interface displays “Save” prompt, release the key oscilloscope will automatically save the current measured waveform data and store it as an image in the memory.

14. **How to browse and retrieve saved waveforms**

    1. Press the MENU key to enter the menu, and press the left and right keys to find the image browse. Press the corresponding key (F1 key) to enter the image browse page, and the saved waveform image will be displayed on the screen.

    2. Use arrow keys (up and down to select the next TAB, left and right to browse) to view and select the waveform to be viewed.

3. In the browse picture page, press the corresponding key to operate, F1 key to view the selected image, F2 delete the selected image, F3 format the memory (this will clear all the stored content), F4 exit the picture browsing.

15. **View the waveform saved on the computer**

    1. Press the MENU key to enter the menu, press the left and right keys to find (open storage), and press the corresponding key (F3 key) to enter the USB fiash drive connection mode.

    2. Connect the oscilloscope to the computer using the Type-c data cable.

    3. Click the “USB flash Drive” on the computer, open the “PHOTO” folder, and view the saved waveform. Or download the waveform to a computer for easier organization and analysis.

    4. To exit the USB drive connection mode, press the (F2) key to exit the mode and return to the measurement interface.

16. **Language Settings**

    Press the MENU key to enter the menu, press the left and right arrow keys to find (language selection), press the corresponding key (F4) to switch between Chinese and English, and choose the language of the instrument according to your personal preference.

17. **Automatic Shutdown**

    Press the MENU key to enter the menu, press the left and right arrow keys to find (automatic shutdown), and press the corresponding key (F1) to set the automatic shutdown time. Depending on the frequency of use, choose the required shutdown time 1 minute, 10 minutes, 30 minutes, 60 minutes, 120 minutes, or off (unlimited). For short-term use, consider automatic shutdown for 10 minutes or 30 minutes; For long-term continuous use, you can choose 120 minutes or unlimited.

18. **Restore Settings**

    Press the MENU key to enter the menu, press the left and right arrow keys to find tha MENU(restore the default), and press F2. The screen will display a prompt to press the [MENU] key to restart the system and restore factory Settings.

19. **Backlight Brightness**

    Press the MENU key to enter the menu, press the left and right arrow keys to find the (backlight brightness), and press the (F2) key to adjust the screen backlight brightness. The brightness level is set to 30%, 50%, 80%, 100%, and the indoor lighting is recommended to adjust the brightness to 30% or adjust according to the comfort of different use environments.

20. **Baseline Calibration**

    Instrument factory calibration is 100%. However, if a baseline shift occurs due to a large ambient temperature deviation or prolonged non-use, baseline calibration can be performed.

    1. Press the MENU key to enter the MENU, press the left and right arrow keys to find (Baseline calibration), press F1 key. The screen prompts “Unplug and press the menu key to start calibration”, then press the menu key to perform baseline calibration.

    2. During the calibration process, please note the following:

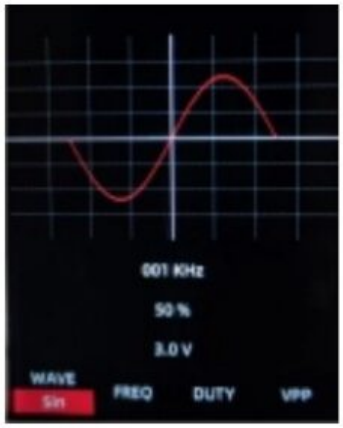
    * Do not connect the probe or input signal during calibration. otherwise it may cause calibration deviation or damage to the instrument.

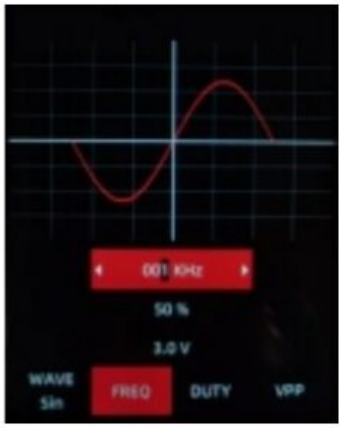
    * Do not perform other operations during calibration. Wait patiently for the calibration to complete.

Signal Generator Function Introduction

> Set the output waveform of the signal generator

Navigate to the signal output menu or press MODE to switch to signal output mode. The screen will display the output signal Settings window.



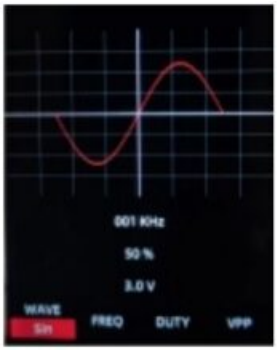


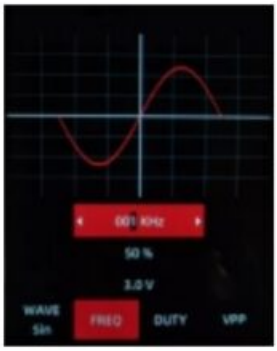
1. There are four sets of Settings in the signal setting window. If the border color of the setting field changes to red, the field is selected for configuration. Use the up and down arrow keys to change the selected field. When selected, the border color changes to yellow, and the left and right arrow keys can adjust the parameters of the selected field.
2. The first field is used for output waveform type setting, the second field is used for frequency setting, the third field is used for duty cycle setting, and the fourth word field is used for amplitude setting. (Corresponding button F1-F4)
3. Select a field and press the corresponding keys or the up and down arrow keys to adjust the parameters. The border color of the field selected by the left and right arrow keys becomes gray.
4. After all parameters are set, connect the probe of the oscilloscope to the signal output port and then start measuring.

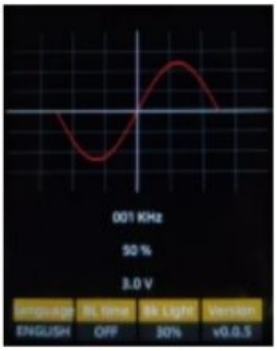
   Note: In the current mode, when the signal output waveform is pulse wave, sine wave, sawtooth wave, oscilloscope maximum measurement time base limit is 100us. If you switch to the recovery time base, the signal output is set to a square wave.

Signal generator mode signal output

In the oscilloscope mode. press the MENU key to enter the menu and find the signal output. Press the corresponding key or MODE to enter the output setting interface of the signal generator.







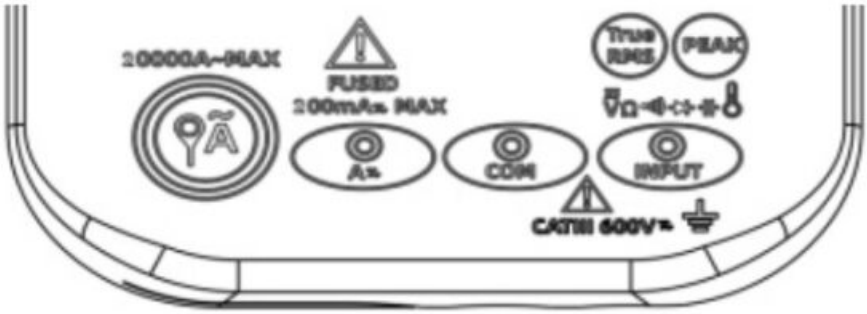
1. Use the corresponding key (F1-F4) or the up and down arrow keys to select the output waveform as sine wave, square wave, triangle wave, half wave, full wave, sawtooth wave or straight wave. The on-screen display window synchronously displays the corresponding waveform.
2. Press F2 to set the frequency value, press F2 to confirm or deselect, and press the jeft and right arrow keys to select the number of digits that need to be adjusted. The up and down arrow keys add or subtract the value.

3. Press F3 key to adjust the duty cycle, press F3 to confirm or deselect, press left and right arrow keys to select the number of digits to be adjusted, and the upper and lower arrow keys add or subtract the value (duty cycle is only valid under square wave).
4. Press F4 key to set the amplitude. Short press left, right, up and down arrow keys to add or subtract the value.
5. Press the MENU key, the menu will be displayed at the bottom of the screen. You can press the corresponding key to adjust the language, backlight time, and backlight brightness.
6. If you want to return to the oscilloscope or multimeter interface, press the MODE key to switch modes.

Multimeter Mode

No.	Name	Instructions
1	Battery level	Displays the battery status and charging status
2	Main display	Displays multimeter measurements
3	Mode	Measurement mode
4	Range	Current mode range
5	Auto range	Automatic range switching
6	HOLD	Press SAVE key to pause the data display
7	Mode	Display the current selected measurement mode is highlighted re d. Press the left, right, up, and down arrow keys to switch gears
8	Auto shutdown	Displays the time to set automatic shutdown
9	Peak mode	Press PAEK switch to peak mode (this mode is only valid for AC v oltage)
10	Maximum value	Displays the maximum read value
11	Minimum value	Displays the minimum read value
12	Average value	Displays the average value
13	Terminal prompt	Displays the terminal to be selected for current mode
14	Unit	Displays the unit of the measured data

Terminal:



	Flexible current clamp measuring terminal (S2000A)
	Current measuring terminal (s200mA)
	COM terminal
	Terminal for the following measurements: AC/DC voltage Resistance Capacitance Connectivity Diode Temperature

> Measure AC voltage and DC voltage

1. Insert the black probe into the COM terminal and the red probe into the INPUT terminal.
2. If the measured voltage is less than 200mV, press the left and right arrow keys to select the millivolt gear. Press the up and down arrow keys to switch between AC and DC. If the measured voltage is greater than 200mV, press the left and right arrow keys to select the V gear, and press the up and down arrow keys to switch between AC and DC.
3. Use the probe to contact the correct test point in the circuit.
4. Read the voltage displayed on the screen.

* The measuring voltage must not exceed the rated maximum test value, otherwise it may damage the instrument and endanger personal safaty.
* When measuring high-voltage circuits, direct contact with high-voltage Components must be avoided.

> Measuring AC current and DC current

1. If the current is low, insert the black probe into the COM terminal and the red probe into the 200mA terminal. High current measurement requires the flexible current clamp to be directly inserted into the 2000A terminal to test (select according to the maximum test value of the two terminals and the estimated value of the current to be measured); Press the teft and right arrow keys to enter the current gear.
2. Press the up and down arrow keys to switch between DC and AC mode.
3. Connect the probe or flexible current clamp line correctly to read the current value displayed on the screen.

* The measured current shall not exceed the rated maximum test value, otherwise it may damage the instrument and endanger personal safety.
* It is strictly prohibited to input voltage in this gear state.

> Measuring Resistance

1. Insert the black probe into the COM terminal and the red probe into the INPUT terminal.
2. Press the right and left arrow keys to enter the resistance mode.
3. Contact the desired circuit test point with the stylus probe
4. Read the resistance vatue measured on the display

* Before measuring resistance, make sure that all power supplies of the circuit under test are turned off and all capacitors are fully discharged.
* Itis strictly prohibited to input voltage in this gear state.

> Connectivity Test

1. Insert the black probe into the COM terminal and the red probe into the INPUT terminal.
2. Press the up and down arrow keys in the resistance mode to select the connectivity mode.
3. Connect the probe to two points of the circuit to be tested. If the built-in buzzer sounds, it indicates that there is a short circuit.

> Measuring Diode

1. Insert the black probe into the COM terminal and the red probe into the INPUT terminal.
2. Press the up and down arrow key to enter the diode mode.

3. Connect the red probe to the positive electrode of the diode under test, and the black probe to the negative electrode of the diode under test, and then read the forward bias displayed on the display screen.
   If the polarity of the test wire is opposite to the polarity of the diode, or the diode is damaged, the screen is displayed as “OL”.
   * Itis strictly prohibited to input voltage in on-off and diode gear state.
   * Before testing, disconnect the power supply of the circuit and discharge all high-vottage capacitors.

> Measuring Capacitance

1. Insert the black probe into the COM terminal and the red probe into the INPUT terminal.
2. Press the right and left arrow keys to enter the capacitance mode.
3. Connect the red probe to the positive electrode of the capacitor to be measured, and the black probe to the negative electrode of the capacitor to be measured.
4. After the reading is stable, read the capacitance vatue displayed on the display screen.

* Before testing, disconnect the power supply of the circuit and discharge all high-voltage capacitors.
* Itis strictly prohibited to input voltage in this mode.

>Measuring Temperature

1. Insert the black probe of the thermocouple into the COM terminal and the red probe into the INPUT terminal.
2. Press the left and right arrow keys to enter the temperature mode, which displays room temperature by default. Press the up and down arrow keys to convert degrees Celsius/Fahrenheit.
3. Contact the point to be measured with the temperature probe of the thermocouple.
4. Read the temperature displayed on the display.

> Multimeter Extension Function

In multimeter mode, press the MENU key and the screen will display the following extended menu:
F1-F4 corresponds to the menu key.

1. Switch between Chinese and English.
2. Automatic shutdown time is 1 minute, 10 minutes, 30 minutes, 60 minutes, 120 minutes or disable (no automatic shutdown time limit).
3. Adjust the backlight brightness to 30%, 50%, 80% or 100% of the screen brightness.
4. The backlight duration is 30S, 60S, 120S, and disable.
5. Format: Press the up and down arrow keys to confirm formatting (Formatting will clear all saved images).
6. Data transmission:use Type-c data cable to connect the computer to browse the stored pictures, press F1 to

exit.

7. Picture management: You can view and manage the saved pictures on the meter.
8. Version number is the version of the program currently in use.

Technical Index

> Technical Specifications of Multimeters

Display	**TFT color screen**
Display Range	20000 counts
Sampling Rate	3Sa/s
True RMS	✔
HOLD	✔
Backlight	✔
Low Battery	✔
Auto Power-off	✔

> Mechanical Index

Size	216.6°84.5°36.0mm
Weight	384g (With battery)
Baterry	18650*2

> Environmental Indicators

Working Environment	Temperature	0~40°C
	Humidity	<75%
Storage Environment	Temperature	-20-60°C
	Humidity	<80%

> Multimeter Technical Specifications

Feature	Range	Resolution	Accuracy
DC Voltage (V)	2.0000V	0.0001V	± (0.8%+3)
	20.000V	0.001V	
	200.00V	0.01V	± (1.0%+5)
	1000V	0.1V	
DC Voltage (mV)	20.000mV	0.001mV	± (1.0%+5)
	200.00mV	0.01mV	± (0.8%+3)
AC Voltage (V)	2.0000V	0.0001V	± (1.0%+3)
	20.000V	0.001V	
	200.00V	0.01V	± (1.2%+5)
	750V	0.1V	
AC Voltage (mV)	20.000mV	0.001mV	± (1.2%+5)
	200.00mV	0.01mV	± (1.0%+3)
AC vol age frequency response: 40Hz-1kHz			
DC Current (mA)	20.000mA	0.001 mA	± (1.0%+3)
	200.00mA	0.01mA	
AC Current (mA)	20.000mA	0.001 mA	± (1.2%+5)
	200.00mA	0.01mA	
Flexible current clamp/AC Current(A)	200.0A	0.1A	± (1.0%+5)
	2000A	1A	
The current clamp is AC/50Hz, and the mapping between current and voltage is1mv/10A; The matching current clamp is 100mv@1000A			

Feature	Range	Resolution	Accuracy
Resistance	200.00Ω	0.01Ω	± (1.2%+5)
	2.0000kΩ	0.0001kΩ	± (1.0%+3)
	20.000kΩ	0.001kΩ	
	200.00kΩ	0.01kΩ	
	2.0000MΩ	0.0001MΩ	± (1.2%+5)
	20.000MΩ	0.001MΩ	± (1.5%+5)
	200.00MΩ	0.01Mf1	
Capacitance	999.99nF	0.01nF	± (5.0%+20)
	9.999uF	0.001p F	+(4 5%+5)
	999.99uF	0.01pF	
	99.999mF	0.001mF	± (5.0%+10)
Temperature	(-20-1000)°C	1°C	±(2.5%+5)
	(-4-1832)°F	1°F	
Diode		✔	
Connectivity		✔	

> Signal Generator Technical Indicators

Waveform Type	Sine wave, Square wave, Triangular wave, Half wave, Full wave, Sawtooth wave, DC
Frequency Range	OHz~2MHz
Channel	1
Output Amplitude	0.1V~3.0V
Resolution	1Hz
Square-wave Duty Cycle	1%~99%

> Oscilloscope Technical Indicators

Character		Instructions
Bandwidth	50MHZ	Dual channel real-time sampling
Sampling	Sampling mode	Real-time sampling
	Sampling rate	250MSa/s
Channel	2	Dual channel DC, AC
INPUT	Input coupling	DC/AC
	Input impedance	1MΩ , @16pF
	Probe attenuation	X1, X10
	Maximum input voltage	X1 range <150V, X10 range <300V(DC + AC peak)
Horizontal	Sampling rate range	1.5Sa/s- 250MSa/s
	Waveform interpolation	(sinx)x
	Sweep range	10Ons/div-20s/div
	Time base accuracy	20ppm
	Storage depth	128Kbyte
Vertical	Sensitivity	20mV/div-10V/div
	Displacement range	4 squares (plus or minus)
	Analog bandwidth	50MHZ
	Frequency response	>10HZ
	Rise time	<10ns
	DC gain accuracy	±3%
Measure	Automatic measurement	Period, Frequency, Peak-to-Peak value, Maximum value, Minimum value, Duty cycle, Root mean square
Trigger	Trigger mode	Auto, Normal, Single
	Trigger edge	Rising edge, Falling edge
Display mode		VT, XY, Roll
Afterglow time		Minimum, 500ms, 1S, 10S, Unlimited

Caution

1. Be sure to check the instruction manual before use, and be familiar with the use method and performance parameters of the meter.
2. Should be at temperature: 0~40°C (32~104°F); Humidity: 20%~90%RH; It works at room temperature without strong magnetic field.
3. Use it with care to avoid collision, falling or other damage.
4. During use, if there are abnormal phenomena or faults, stop using and contact maintenance personnel for maintenance.

5. Avoid use in hot, humid or easily disturbed environments.
6. After use, the instrument should be placed in a dry place to avoid direct sun or rain.

Maintenance and Repair

1. Notice

   Users should avoid collision, heavy dust, high temperature, humidity, strong magnetic field and other excessive harsh conditions to use the instrument; Store the battery in a dry, non-corrosive gas environment.

   Do not place the battery near a heat source or fire source. and avoid direct sunlight. Otherwise, the instrument will be damaged. If the measurement deviation in the use of the instrument is large, please first check whether the battery is insufficient, try to restart, if you can not eliminate the fault, please contact the store where you purchased the equipment or the nearest service center, do not disassemble or modify the equipment in any way, otherwise the warranty service will be affected.

   (The company does not assume any responsibility for problems caused by unauthorized modifications or repairs)

   * Clean the instrument housing regularly with a damp cloth and a small amount of detergent, do not use abrasive or chemical solvents.

   * Remove all input signals before cleaning the product.
2. Charge the battery

   If the “ ” symbol appears on the screen, it should be used after charging, otherwise the measurement accuracy will be affected.

   1) Use Type-c data cable connect to the DCSV output adapter for charging.

   2) Or use Type-c data cable connect to the USB port of the computer for charging.

   3) When charging, the “ ” symbol is displayed on the screen.

   4) When fully charged, the screen displays the ” * symbol.

   5} During the chargin: with the Type-c data cable, the built-in red indicator light of the “BE bution will be lit, and it will be automatically extinguished after it is full.

Documents / Resources

	Sorandy X10 Oscilloscope Graph Multimeter [pdf] User Manual X10, X10 Oscilloscope Graph Multimeter, Oscilloscope Graph Multimeter, Graph Multimeter, Multimeter

References

- User Manual