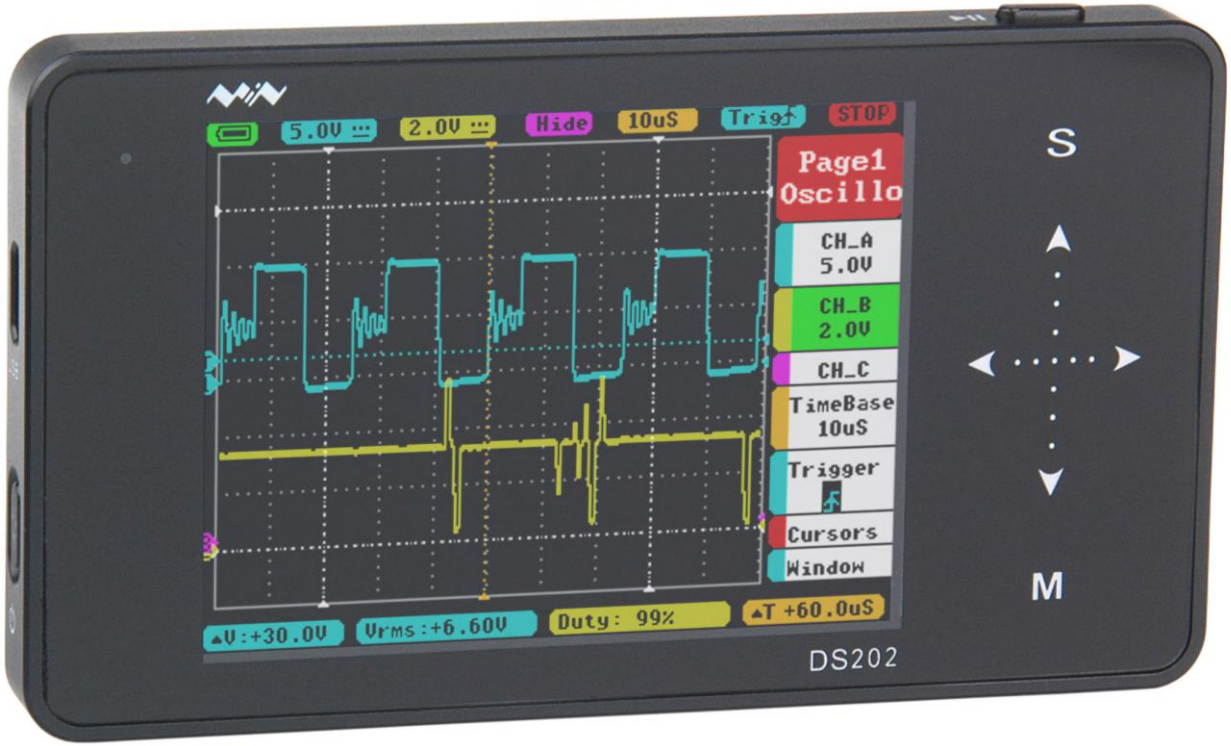
DS202 User Manual V1.0

Contents



一、Quick Details

- DS202 pocket size oscilloscope is a 2-channel digital oscilloscope. You will find it compact and fashionable because it is merely 10mm tall and enjoys an aluminum alloy appearance. It has a touch screen with 320*240 color display. It supports SD card USB flash disk storage and USB charging. It is widely applicable in academic experiment, electronics maintenance, electronic engineering tasks, etc.

二、Specifications

- Analog bandwidth：1MHz
- Max sample rate：10MSa/s
- Max sample memory depth：8K
- Analog input impedance：1MΩ
- Max input voltage: ±40V(X1 probe)
- Coupling：AC/DC
- Vertical Sensitivity: 20mv/Div~10V/Div (stepping in by 1-2-5mode)
- Horizontal sensitivity：1uS/Div~2S/Div（1-2-5stepping）
- Math waveforms: –A,-B，A+B，A-B，RecA，RecB，RecC
- Triggering Mode: Auto，Normal，Single，None，Scan
- Rising/Falling Edge Trigger
- Vertical precise,Horizontal Precise Measurement
- Waveform Functions Auto measurement: frequency,cycle time, duty cycle, peak voltage, RMS voltage, Average voltage and DC voltage
- Signal Generator/10Hz~1MHz square wave(duty adjustable) or 10Hz~20Khz Sine/Square/Triangle/Sawtooth wave
- U disk Waveform storage of 8MB,can store waveform data and waveform image
- Power supply internal 550mAh Lithium battery/external USB port
- Display Full Color TFT LCD(320X240 pixels)
- Capacitive touchscreen: support input by finger sliding
- Dimension (100mm X 56.5mm X 10.7mm)

三、Important Safety Information

- **WARNING:** Failure to follow these safety instructions could result in personal injuries, or damage to the device or other connected products. Read carefully all the following safety precautions before using your device.
  - **Use appropriate power cord.** Please use dedicated power cord which has been certified in your country/region
  - **Connect & disconnect properly.** Do not plug/unplug when the probe or the test lead is connected to the voltage source. Before you plug/unplug current probes, please disconnect power to the circuit under test.
  - **Observe all terminal ratings.** To reduce risk of fire, electric shock and device damage, please do not measure signals at DC40V or above. Please read the User Manual carefully to learn more about ratings before connection.
  - **Do not operate in a humid environment**.
  - **Do not operate in a potentially inflammable/explosive atmosphere**.
  - **Please keep the surface of the product clean & dry.**

四、Operating Temperature and Humidity

- Temperature：
  - Operating Conditions： +0 ℃ to +50 ℃
  - Non-operating Conditions： -20 ℃ to +60 ℃
- Humidity：
  - Operating Conditions： High Temperature：40 ℃ to 50 ℃， 0% to 60%RH
  - Operating Conditions： Low Temperature：0 °C to 40 ℃，10% to 90%RH
  - Non-operating Conditions：High Temperature：40 ℃ to 60 ℃，5% to 60%RH
  - Non-operating Conditions：Low Temperature：0 °C to 40 ℃，5% to 90%RH

五、General Inspection

■ When you get a new DS202 oscilloscope, you are advised to inspect the product by the following steps.

● Inspect damages caused by shipping.

If the packaging carton or the protection pad is seriously damaged, keep the package until the oscilloscope & accessories pass the electrical and the mechanical test.

● Inspect the product.

Please contact the company if the following problems occur: 1) product surface is damaged, 2) product doesn't work properly, 3) product does not pass performance test.

If the damage is resulted from shipping, please keep the package and contact the company for repair or exchange.

六、Inspecting

■ Make a quick inspectionof functions to ensure the product is working soundly. Please perform following steps:

● Turn on the power and access the homepage of the oscilloscope.

● Connect the oscilloscope with standard signals (e.g. square wave 20KHz， Vpp=5V), set the switch on probe tip as 1X, plug oscilloscope probe to the Input Channal.Check whether the measured signal value is the same as the standard value; it can be calibrated if the margin is small.

七、Battery Charging

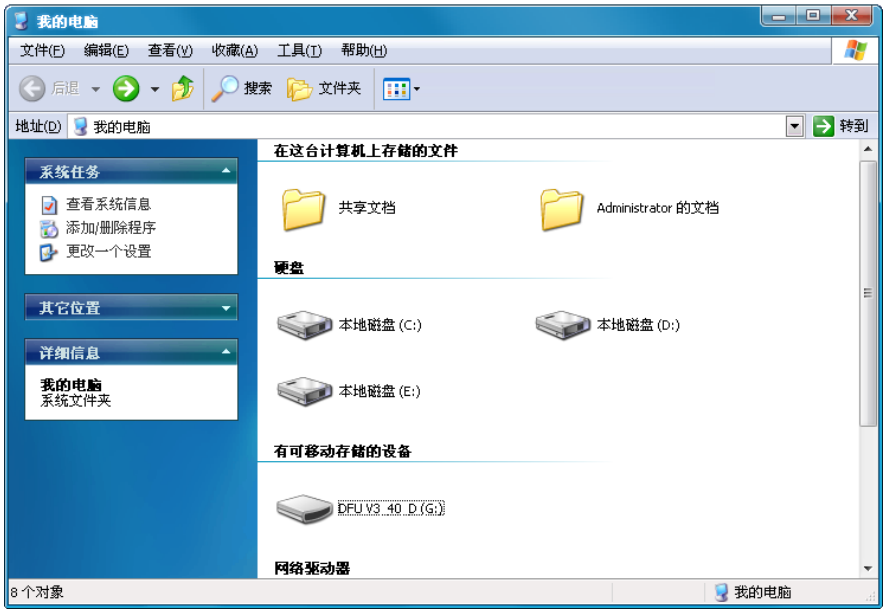
■ When the battery voltage status turns to "  ", or display brightness is relatively dim, please charge the battery in time. Charging is available in both power-on and off mode. When the battery is being charged, the LED will light on until the charging process is finished.

■ In case of any problems, long press "⏻" Power Button for eight seconds to force Shut Down.

八、Firmware upgrades

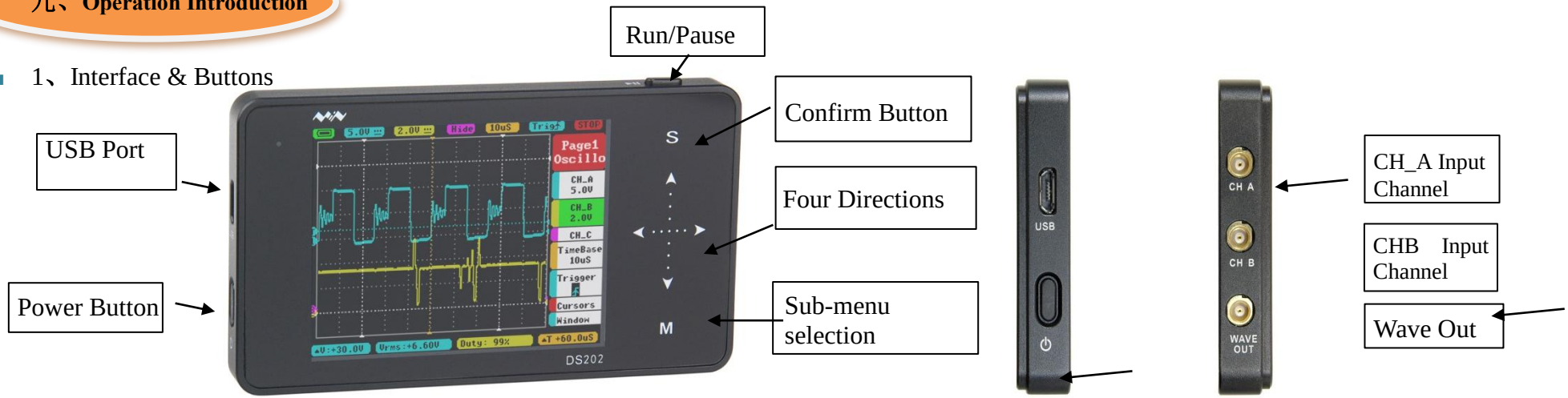
- To upgrade the firmware, please perform following steps:
  - 1. Visit www.minidso.com, and download the latest firmware for your oscilloscope to your PC.
  - 2. Long press DS202's Power Button ⏻ for 4 seconds to enter DFU firmware upgrade mode. Then the indicating light will flicker.
  - 3. Use USB data cord to connect DS202 to your PC, and a removable hard disk named "DFU V3_40_D" will appear on your PC. Copy the hex firmware to the root directory of that disk. After the extension of the firmware changes from "hex" to "rdy", restart DS202. Then the upgrading process is finished.

1. Copy file from your PC to the virtual USB disk
2. After the extension changes from "hex" to "rdy", the firmware is upgraded.



九、Operation Introduction

- 1、Interface & Buttons



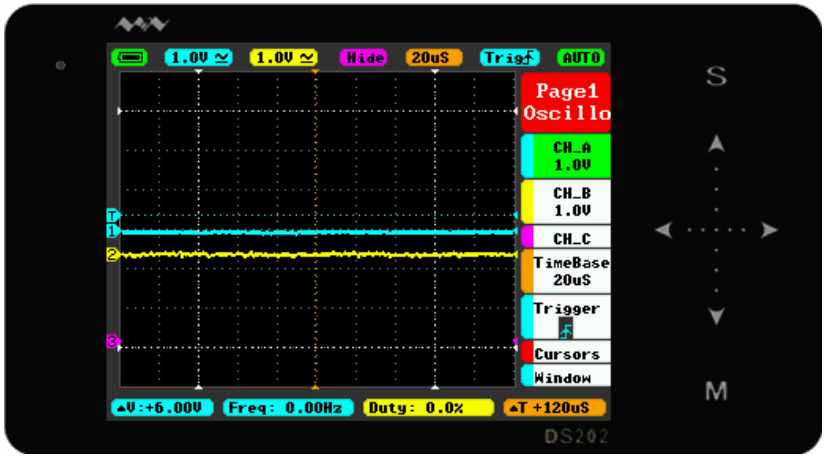
- The below table introduces buttons and their functions :

Button	Function
➢‖	Run/Pause
	Save current parameter/screen display（Long press）
S	Menu display/hide
	Sub-menu confirmation
➢	Upward selection/(Slide Up)
➢	Downward selection/(Slide Down)
➢	Reset Parameters(Press Left/Reduce, Slide Left)
➢	Reset Parameters(Press Right/Increase, Slide Right)
M	Sub-menu On/Off

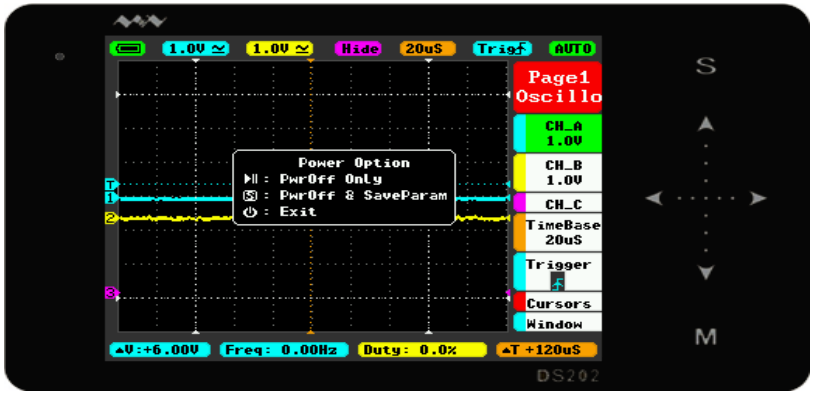
Note that each item's color in Parameter Area is the same as that in Measurement Area.

2、Power On/Off (Shut down)

- In the Shutdown state, press "⏻" Power Button for 2 Seconds to Start(Left illustration, the default entry to APP1), long press "⏻" Power Button for 4 seconds to enter DFU mode (Right illustration, Upgrade mode)

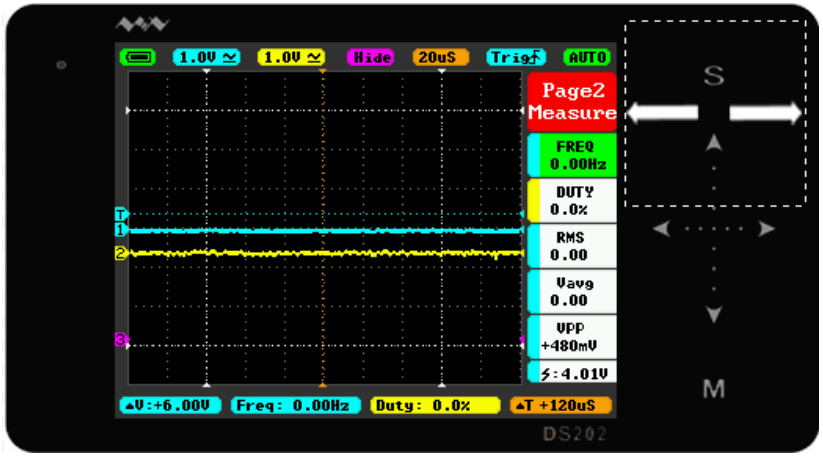


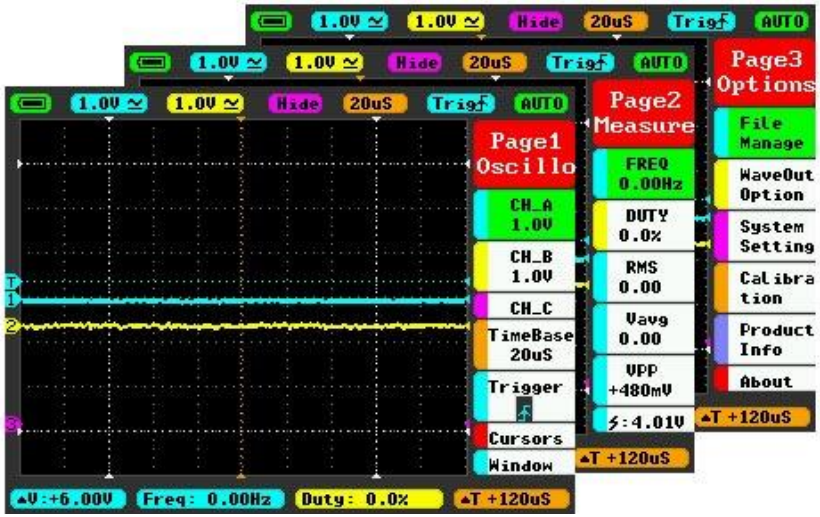
- Press "➢||" Run/Pause to Power On and enter APP2(if APP2 is not installed, then entry the DFU mode)
- In the Power On state, press "⏻"Power Button for 2 seconds to pop-up "Power off" menu, according Icon operation Choose Power Off.
- In the Power On state, long press "⏻" Power Button for 8 seconds to force Shut Down.



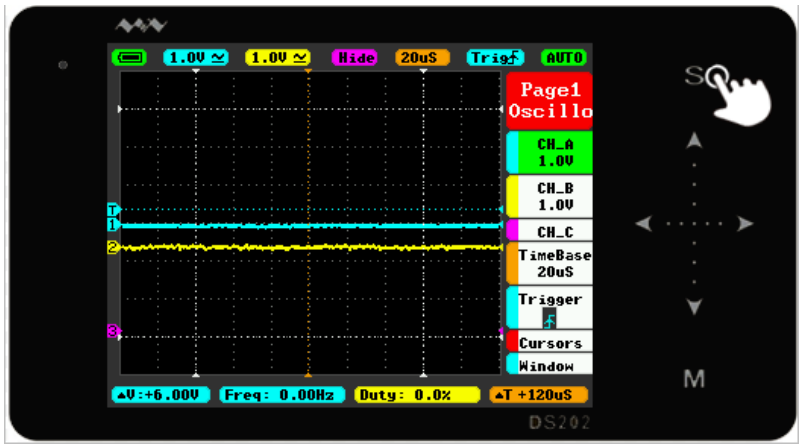
3、Basic Operation

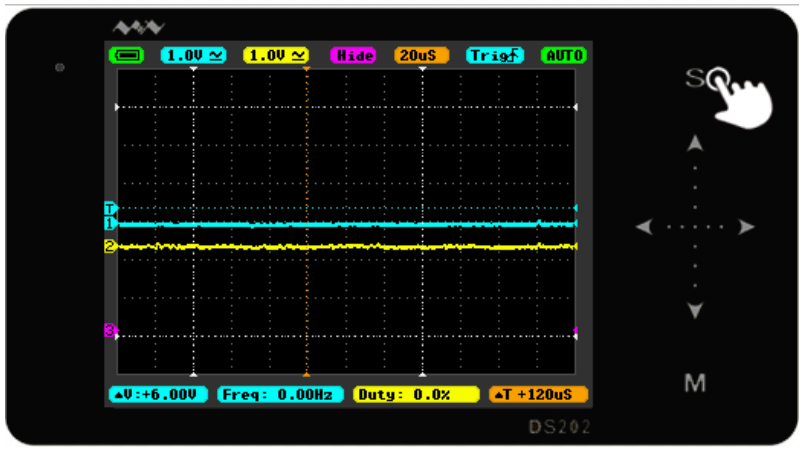
- In the Main Menu interface, you can switch between the Main Menu pages by sliding horizontally on the upper Touch area.



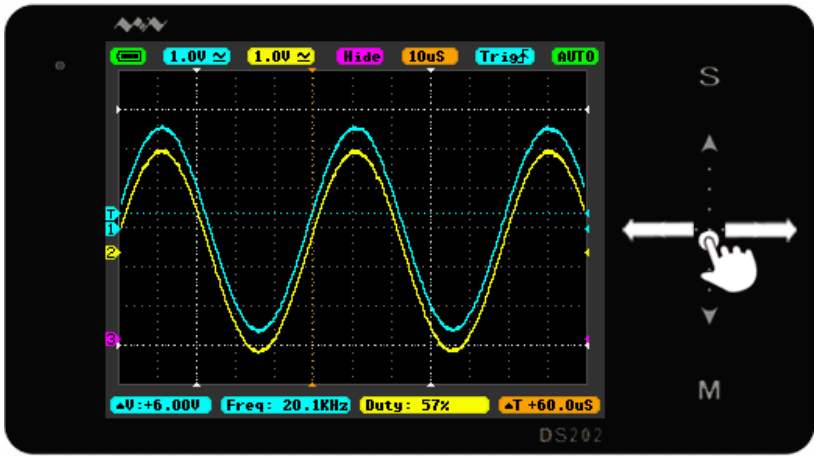


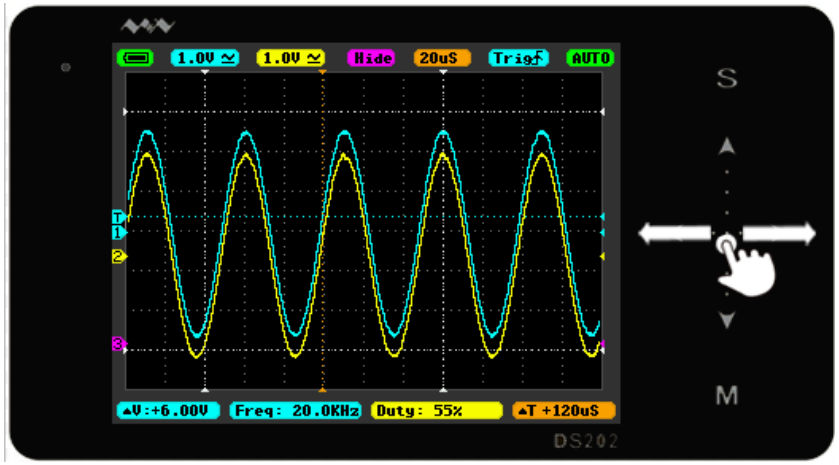
- In the Main Menu interface, tap “S” button, to switch the Main Menu to Display/Hide

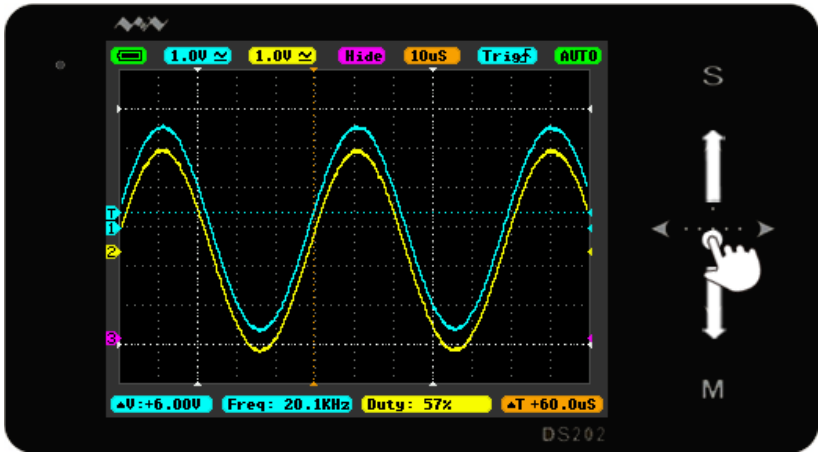


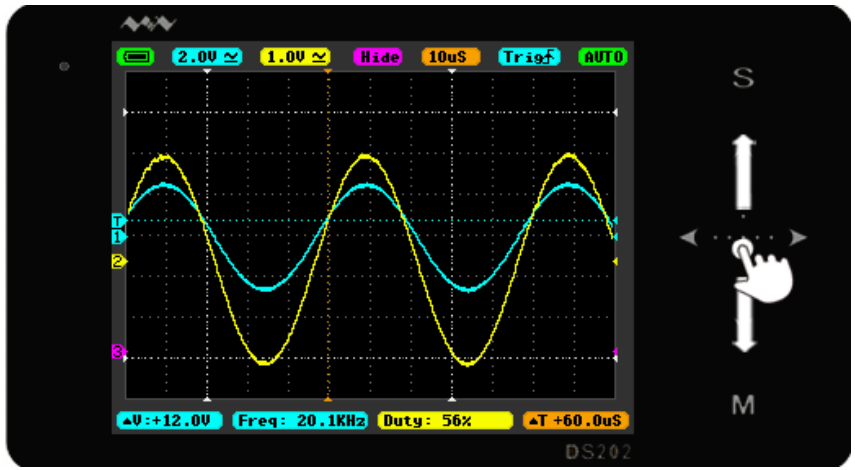


- When the Main Menu is hidden, you can horizontally Slide ⮜⋯⮞ to change the TimeBase, or vertically slide ⮝ • • • • ⮟ to change voltage.

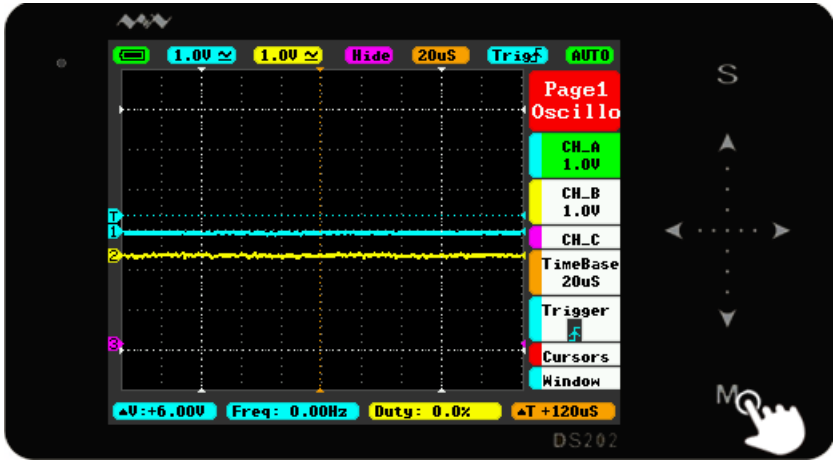


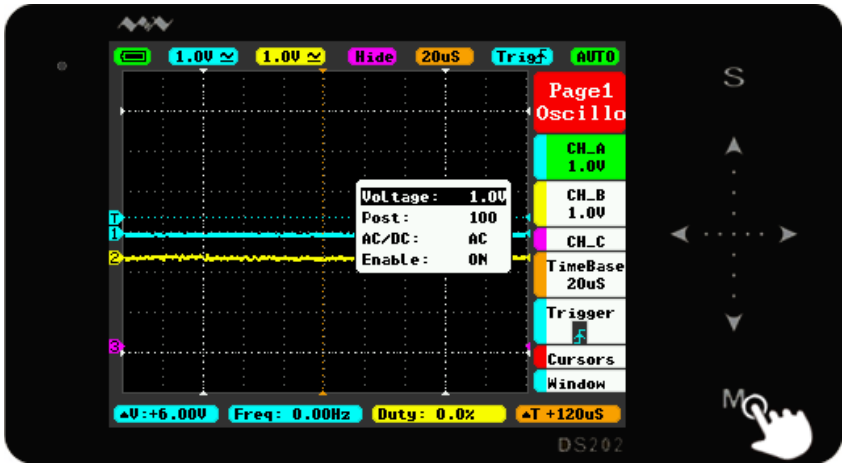




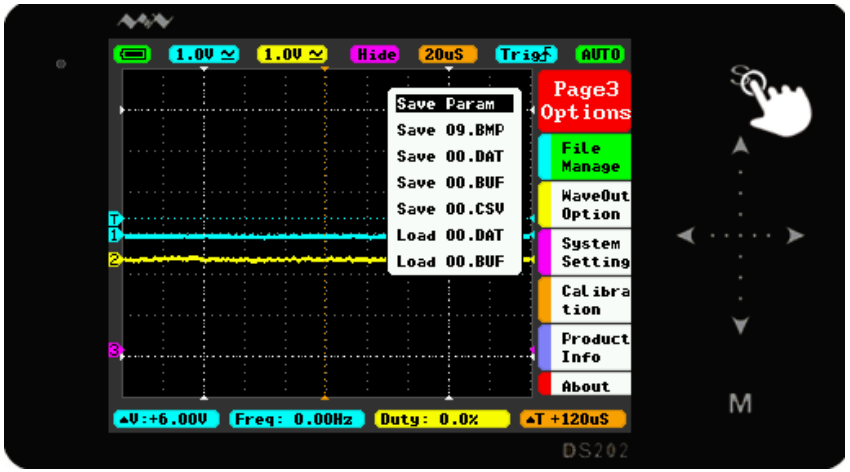


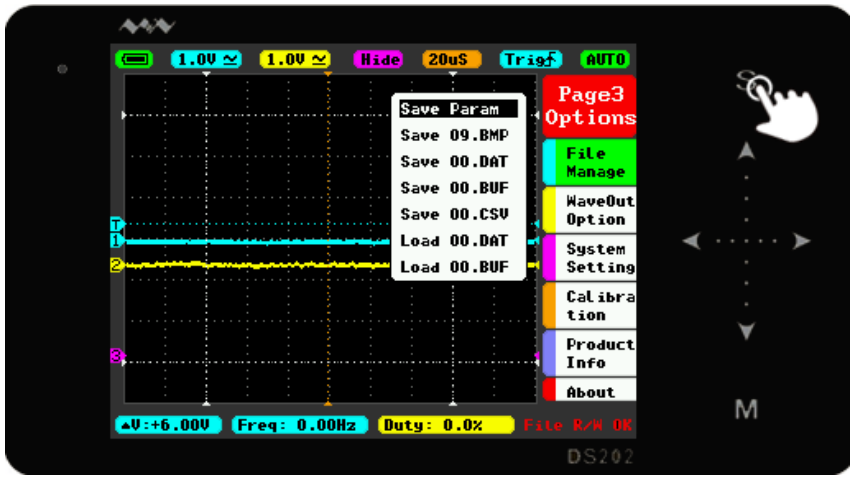
- In the Main Menu interface, tap “M” Button to switch the Sub-menu to Display/Hide.



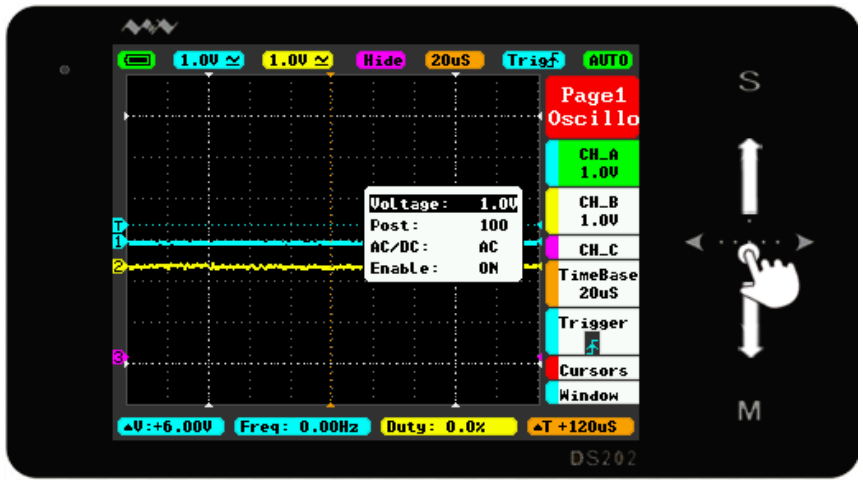


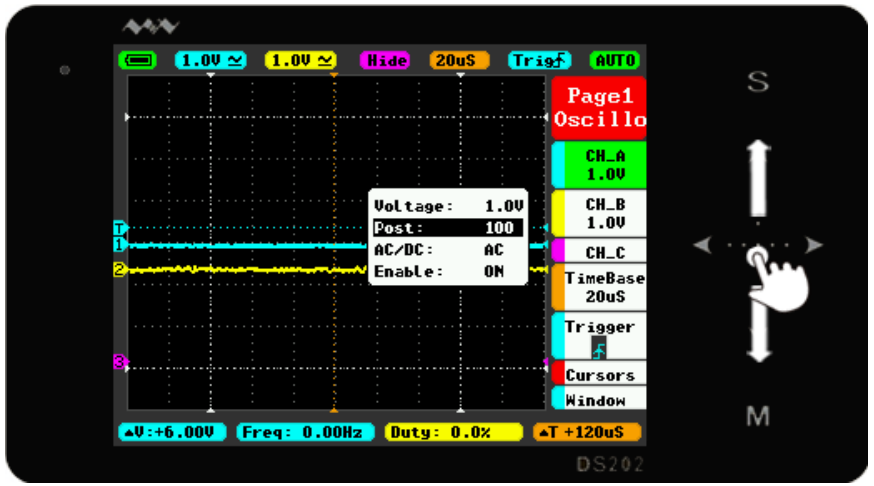
- In the Sub-menu interface, tap “S” Button to confirm the selection of operation.



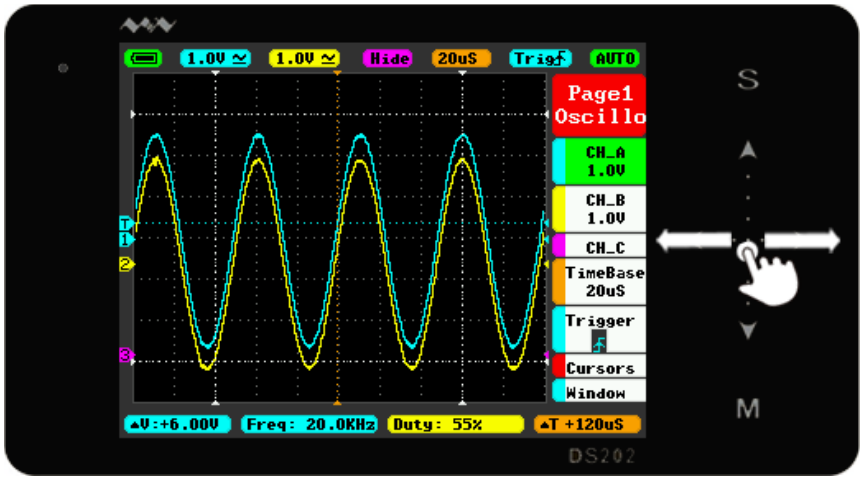


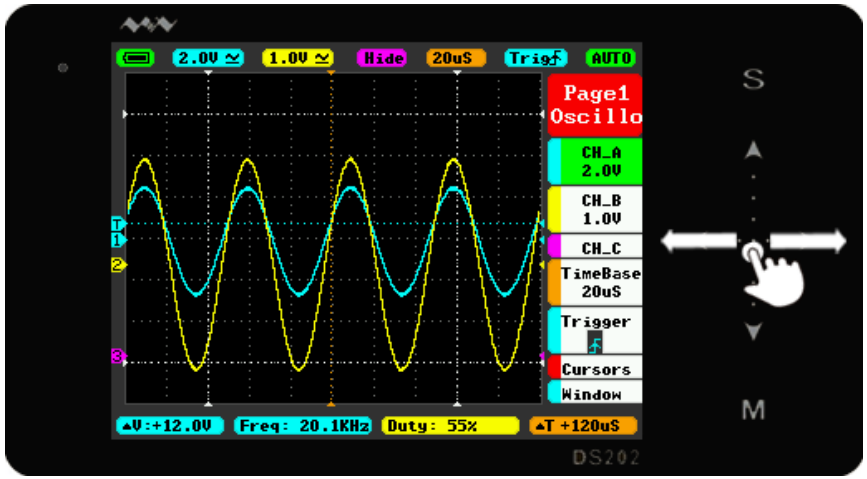
- In the Main Menu or Sub-menu interface, tap "⮝""⮟"or vertically Slide"⮝…⮟"to select items upward or downward.



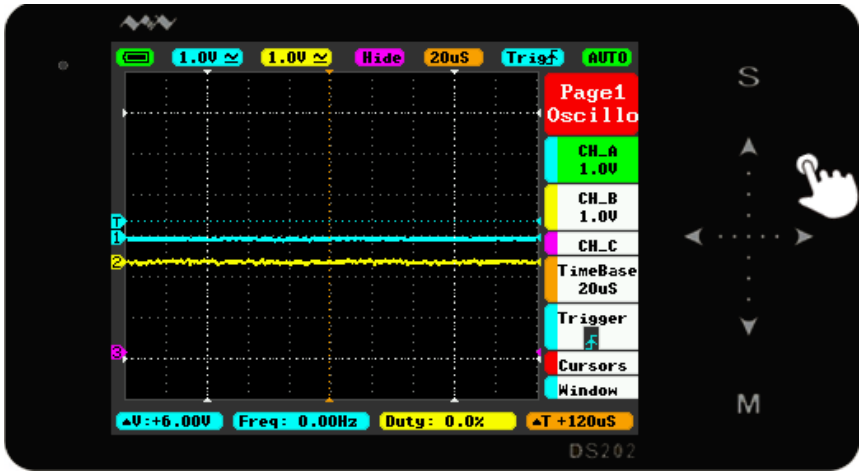


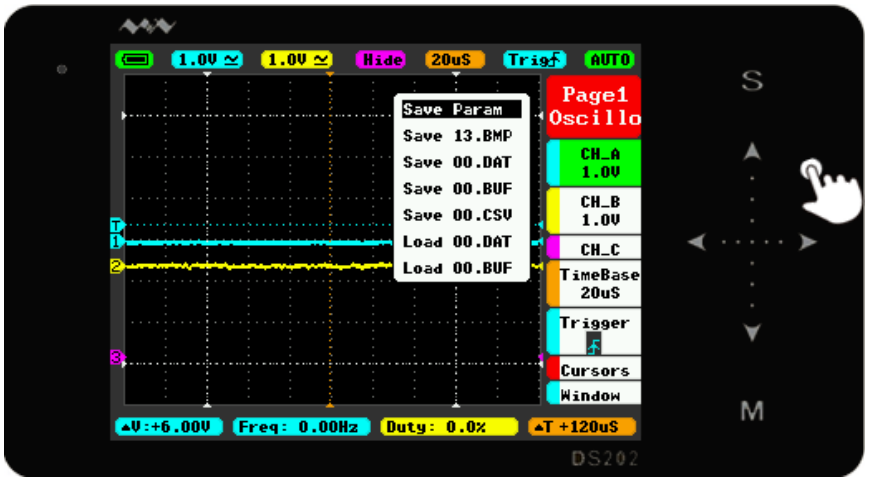
- In the Main Menu or Sub-menu interface, tap "⮜" "⮞" Button or horizontally Slide "⮜⋯⮞" to adjust the Menu parameters. (When you move positions in the Sub-menu interface, tap and hold your finger for continuous operation).



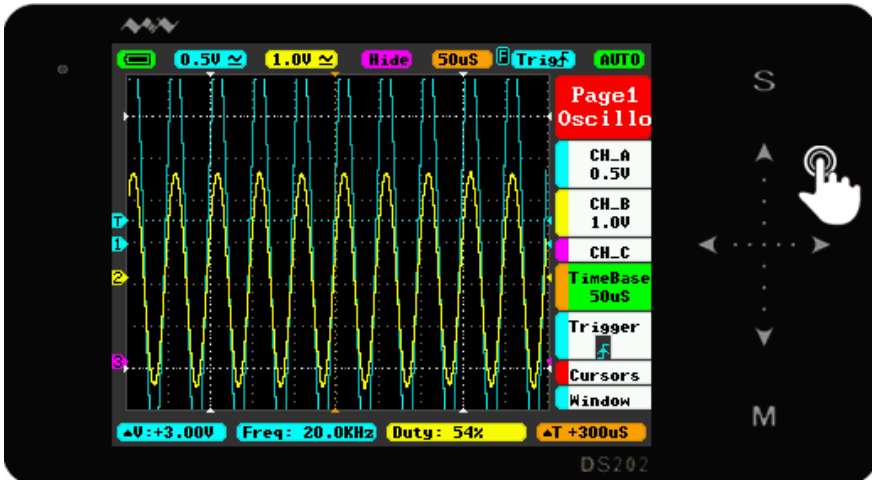


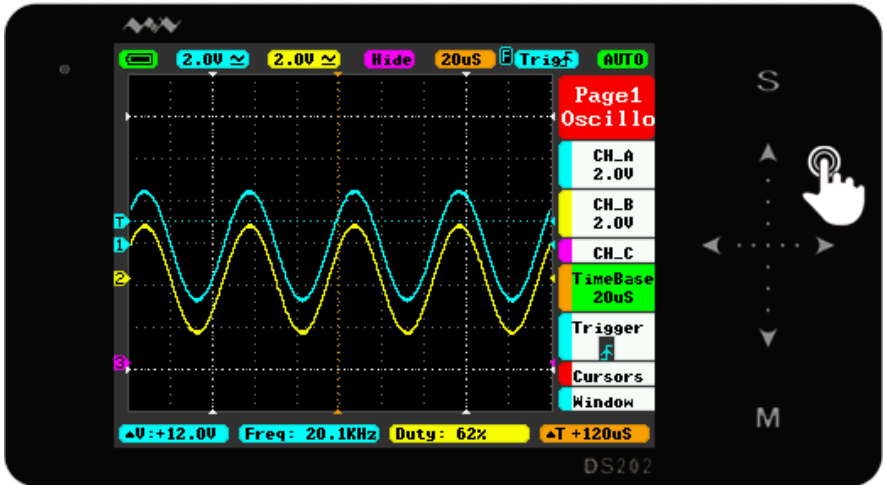
- In the Main Menu or Sub-menu interface, tap and hold an non-button identification area to Display/Hide file management sub-menu.



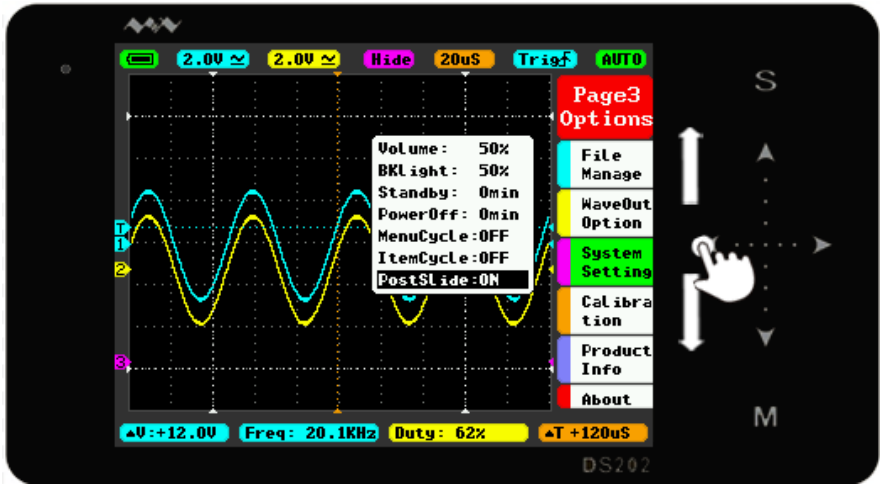


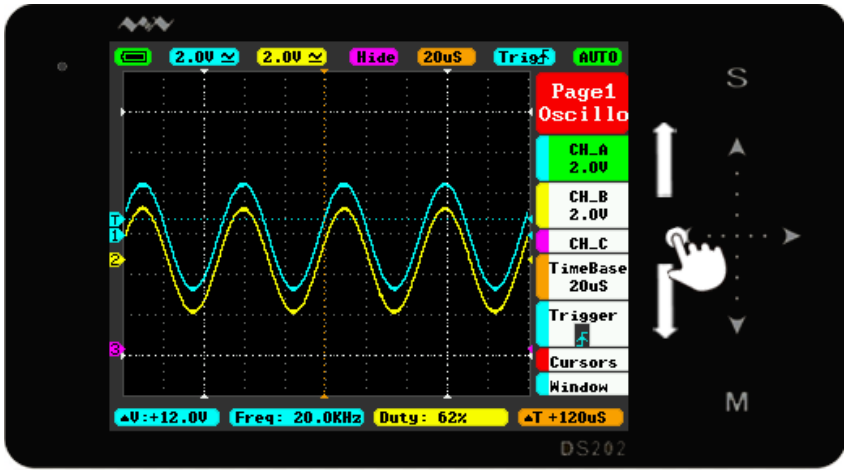
- When you turn on Auto Fit in Trigger, double-tap the non-button identification area, the device will automatically adjust the amplitude, the time base, and the trigger grid.

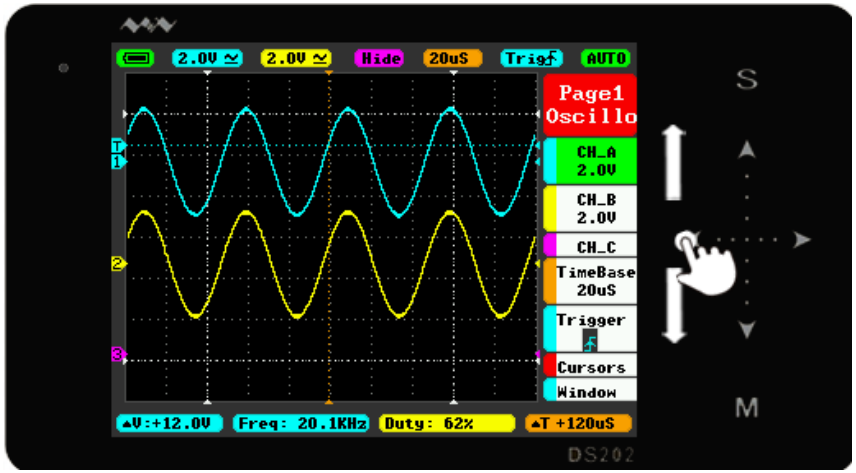




- In the System Setting interface, when “PostSlide” is On, vertically slide up/down the Touch area in the left to adjust the position.



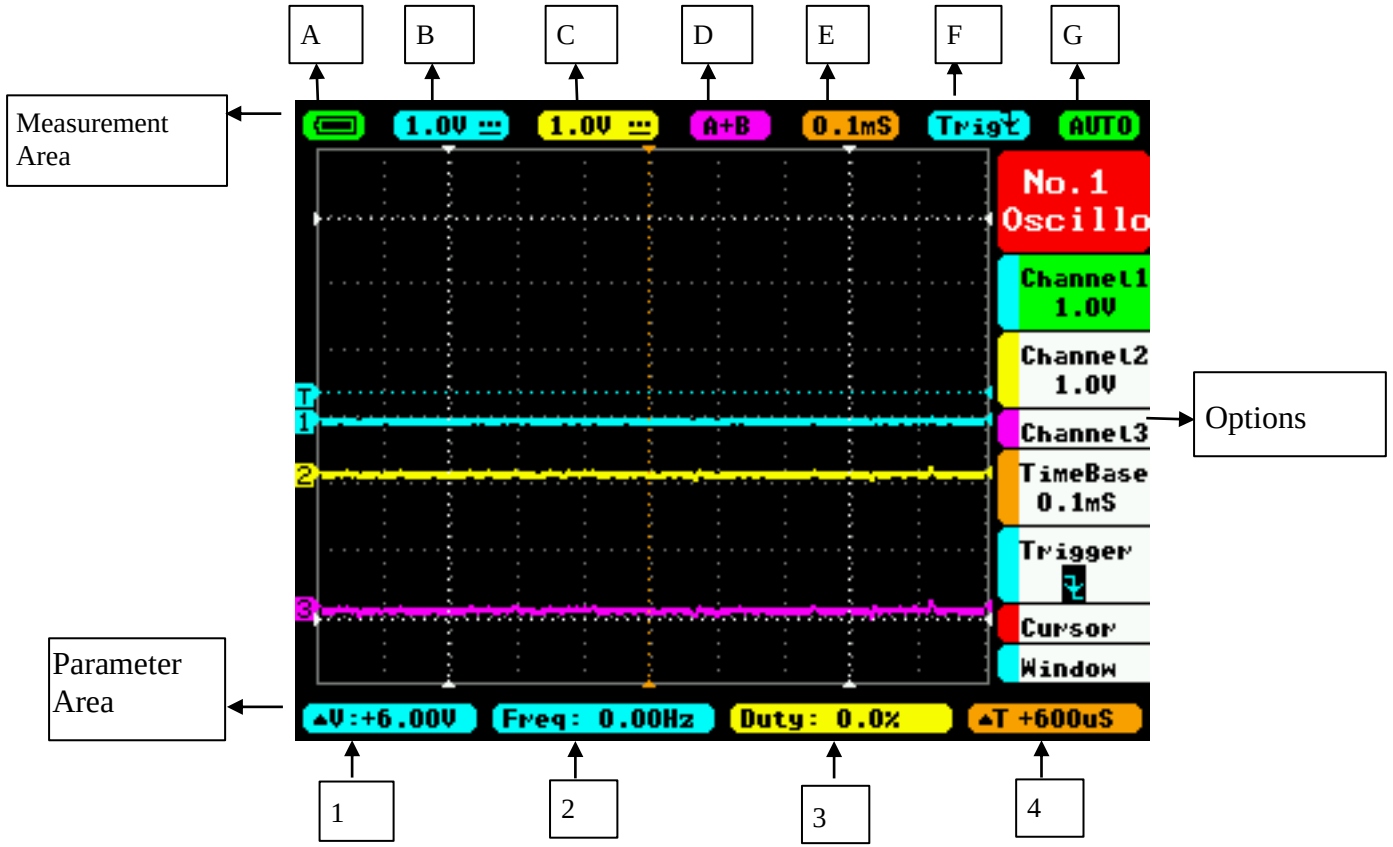




十、Interface

1、Screen

- The display is depicted below



- 1、Parameter Area Intro

Menu	Item	Function（Operation：Tap“⮝⮟⮜⮞” or Slide）
A		Powered by Battery /Powered via USB/Full Battery
B	20mV—10V（stepping in by 1-2-5mode）AD/DC	(Channel A)y-axis voltage per grid, AC/DC coupling
C	20mV—10V（stepping in by 1-2-5mode）AD/DC	(Channel B) y-axis voltage per grid ,AC/DC coupling
D	(-A)/(-B)/(A+B)/(A-B)/ RecA/RecB/RecC	(-A): CH_A waveform reverses (-B): CH_B waveform reverses (A+B): CH_A waveform overlaps with CH_B waveform ; (A-B): CH_A waveform minors CH_B waveform; RecA: Reload the last waveform saved in CH_A RecB: Reload the last waveform saved in CH_B RecC: Reload the last waveform saved in CH_C
E	0.1uS—1S（stepping in 1-2-5mode）	Timebase (x-axis voltage per grid)
F	⮦ ⮤	Trigger mode: falling edge trigger/rising edge trigger
G	AUTO/NORM/SINGL/Slow Scan/Instant Scan/Ran/Pause	Auto/Normal/Single/Slow Scan/Instant Scan/Run/Pause

2、 Measurement Area Intro

Item	Function
1	ΔV=V1-V2
2	Measured Value (Blue corresponds with Channel A; Yellow with Channel B)
3	Measured Value (Blue corresponds with Channel A; Yellow with Channel B)
4	ΔT=T2-T1

3、Specific Parameter Intro

Choose the items in parameter area through tapping "⮝"/"⮟" buttons or sliding in, tap "M" button to access parameter setting menu, tap"⮝"/"⮟"or Slide in Choose the parameter item, and then tap "⮜"/"S" or Slide in to change the parameter value of the place where the cursor blinks.

Menu	Specific	Options	Functions	Sub-options and Descriptions
Page1 Oscillo	CH_A	Voltage	CH_A y-axis voltage per grid	20mV/50mV/0.1V/0.2V/0.5V/1.0V/2.0V/5.0V/10V
		Post	Adjust CH_A waveform position upward/downward in the window	Position：5-198
		AC/DC	CH_A coupling	AD/DC
		Enable	CH_A display/hide	ON/OFF
	CH_B	Voltage	CH_B y-axis voltage per grid	20mV/50mV/0.1V/0.2V/0.5V/1.0V/2.0V/5.0V/10V

		Post	Adjust CH_B waveform position upward/downward in the window	Position：5-198
		AC/DC	CH_B coupling	AD/DC
		Enable	CH_B display/hide	ON/OFF
	CH_C	Match	Calculation between CH_A waveform and CH_B waveform	–A,-B，A+B，A-B，RecA，RecB,RecC
		Post	Adjust CH_C waveform position upward/downward in the window	Position：5-198
		Enable	CH_C display / hide	ON/OFF
	TimeBase	TimeBase	X-axis voltage per grid	1.0us-2.0s(1-2-5 stepping)
	Trigger	Syncmode	Syncmode trigger mode selection	AUTO/NORM/SINGL/NONE/SCAN
				Automation/Normal/Singular/Instant Scan
		Trigmode	Choose the Triggering Mode	Rising edge/Falling edge Triggering mode
		Source	Choose the Triggering chennel	CHA/CHB
		Threshol	Horizontal Triggering Position Level	Position：5-198
		Enable	Display/Hide Horizontal Triggering Position Level	ON/OFF

		Auto Fit	Auto adjustment	ON/OFF
	Cuosor	T1.Post	Time measurement cursorT1	Position：5-198
		T2.Post	Time measurement cursorT2	Position：5-198
		Enable.T	Hide/Display Measurement Cursor	ON/OFF
		V1.Post	Voltage Measurement Cursor V1	Position：5-198
		V2.Post	Voltage Measurement Cursor V2	Position：5-198
		Enable.V	Hide/ Display Voltage Measurement Cursor	CHA/CHB/OFF
	Window	Post	Horizontal movement to view waveform	Dependes sample memory depth
		Depth	Internal storage depth	1k～8k
		Enable	Display/Hide Trigger line cursor	ON/OFF
Page2 Measure	FREQ	Source	Choose the Measurement channel	CHA/CHB
		Type	Choose the Measurement Type	FREQ/ DUTY/ RMS/ Vavg/ Vpp/ Vmax/ Vmin
				Freq/Duty/Vmax/Vmin/Vpp/Vavr/Vrms

		Enable	Display/Hide measurement window	ON/OFF
	DUTY	Source	Choose the Measurement channel	CH_A/CH_B
		Type	Choose the Measurement Type	FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
				FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
		Enable	Display/Hide measurement window	ON/OFF
	VPP	Source	Choose the Measurement channel	CHA/CHB
		Type	Choose the Measurement Type	FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
				FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
		Enable	Display/Hide measurement window	ON/OFF
	Vavg	Source	Choose the Measurement channel	CHA/CHB
		Type	Choose the Measurement Type	FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
				FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
		Enable	Display/Hide measurement window	ON/OFF
	Min	Source	Choose the Measurement channel	CHA/CHB
		Type	To choosethe Measurement	FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin

			Type	FREQ/DUTY/RMS/Vavg/Vpp/Vmax/Vmin
		Enable	Display/hide measurement window	ON/OFF
		Vbat	Battery voltage	
Page3 Setting	File Manage	Save Param	Save current parameter settings	Tap “S”button to Save/Load files
		Save Bmp	Save bmp file (waveform image) to the built-in U disk.(Shortcut: long press”Run/Pause”button	
		Save Dat	Save dat file to built-in U disk	
		Save Buf	Save buf file (sampling data in buffering area) to built-in U disk	
		Save Csv	Save csv file (export sampling data in buffering area) to built-in U disk	
		Load Dat	Load dat file	
		Load Buf	Load buf file	
	WaveOut Option	Type	Output signal type	squar/sine/triangle/sawtooth
		Freq	Output signal frequecy	Squar（10Hz-1Mhz）sine/triangle/sawtooth（10Hz-20kHz）
		Duty	Output signal duty cycle	10%-90%
	System Setting	Volume	Adjust buzzer volume	10%-90%

		Bklight	Adjust backlight brightness	10%-90%
		Standby	Adjust standby time	1min-30min
		PowerOff	Auto Shut Down time	1min-30min
		MenuCycle	Main Menu option cycle	ON/OFF
		ItemCycle	Sub-menu option cycle	ON/OFF
		PostSlide	Ripid Slide post	ON/OFF
	Calibration	Calibrate Zero	Tap “S”button, Auto Calibration window pops up retap “S”to perform Auto Calibration,after Auto Calibration is completed, tap “S”button to confirm saving the calibrated data.	
		Restore Data	Tap “S”button,from a pop-up window, you can select Restall in the dialog that appears,then tap “S”to perform Auto Calibration,after Auto Calibration is completed, tap “S”button to confirm saving the calibrated data.	
	Product Info	DeviceSN	device serial number	
		Hardware	Hardware version number	
		MCU Type	processor type	
		LCD Type	LCD screen mode	
		USB Disk	U Disk capacity	
		DFU Type	DFU version	
		APP Type	APP version	
	About	Related ancillary information		