Introduction of JDS2022S/JDS2012S/JDS2023 series handheld digital oscilloscope

Model	Handwidth	Real time sampling rate	Memory depth
JHJDS2012S	Single channel 25MHZ	Single channel 200MSa/s	2Kpts
JHJDS2022S	Double channel 25MHZ	Double channel 200MSa/s	2Kpts×2
JHJDS2023	Single channel 20MHZ	Single channel 200MSa/s	2Kpts

The First Chapter Introductory guide

JHJDS30 series portable digital storage oscilloscope is small, lightweight portable instruments. To provide customers with convenient and easy to operate, the front panel can perform basic tests.

This chapter mainly elaborates how to perform the following tasks:

△ The front panel and the user interface

△ General inspection and functional check

△ The probe compensation

△ Match the decay factor of probe

1.1 Rudimentray knowledge of the front panel and the user interface

Before use,it is strongly recommended that you should fellow the guides below to get rudimentary knowledge of the front panel and the user interface.

JHJDS2022S oscilloscope offer a brief and clear front panel for your convenient operation.There are each functional keys blow the screen.The “MENU” is menu operational key which can be used to set different options of menu. The red key is power button to control ON/OFF by long pressing it.Other functional keys can be used to enter different function menu or given function application.As shown in Figure 1-1

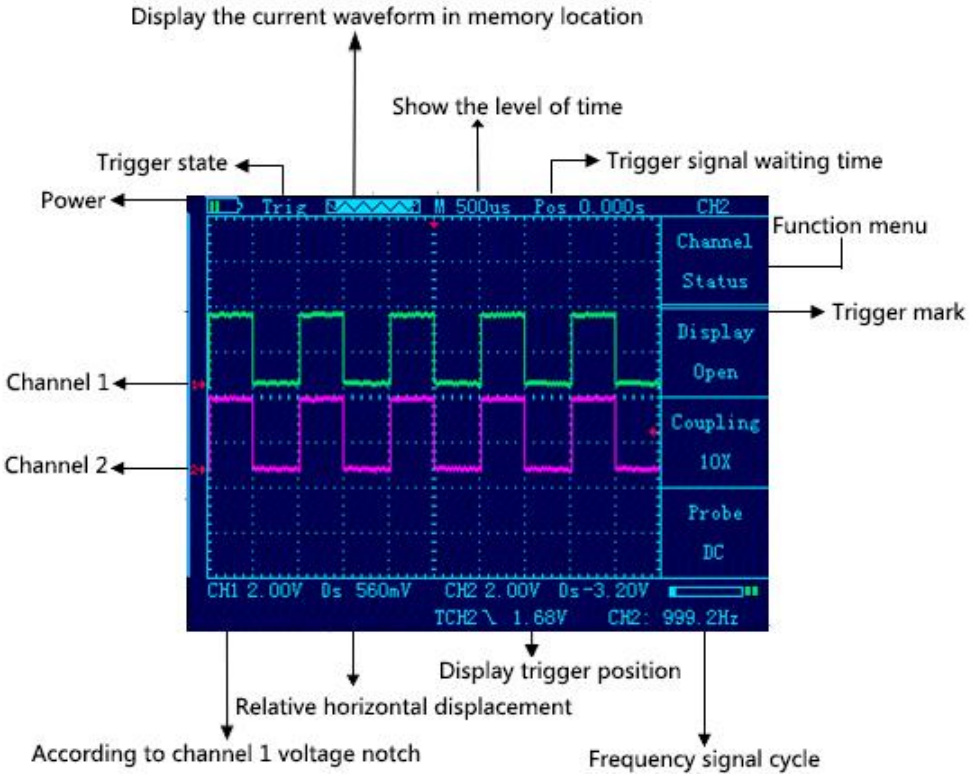
JHJDS2012S series digital oscilloscope with menu in English.As shown in Figure 1-2

JHJDS2023 series digital oscilloscope with menu in English.As shown in Figure 1-3

P 1-1 2022S

Pic 1-2 2012S

P 1-3 JDS2023



P 1-4 interface display

1.2Functional check

First of all to the oscilloscope to do a quick examination to determine whether the instrument work is very normal Necessary. Please follow the following steps:

1. After confirm the oscilloscope has been installed on the battery, long press on the oscilloscope panel "PRW" button, Until when the interface display open.
2. Set the switch on the oscilloscope probe to X1 and connect probe and oscilloscope channel 1. Aim the slot of probe at connection of CH1,press,then rotate right to tighten the probe.

3. Set the CH1 menu attenuation coefficient of the probe is 10 x (CH1 - > F3 key order
Select 10 x). Press the AUTO button and wait for a moment, this screen will display frequency
1 KHZ, peak value to 3 v square wave signal.
Open 5. Close the CH1 and CH2, repeat steps 2 and 3.

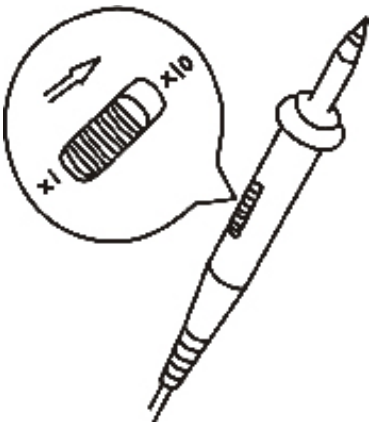


Figure 1-4 probe set

1.3Probe

1.the safety of probe

There is a protection setting around the probe to protect fingers from electric shock.

Before any measurement, link the probe to oscilloscope and make electrical grounding.

2.probe compensation(see the probe specification)

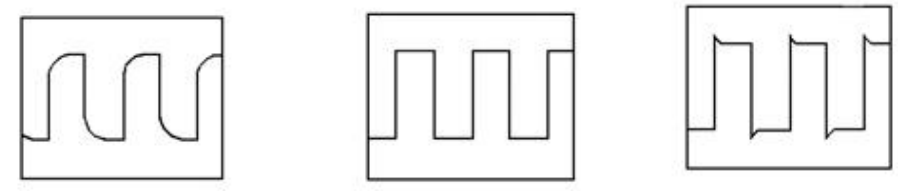
In the first time connect the probe to any input channel, probe compensation is required to matching the probe and channel. Or the probe will lead to a measuring error. Follow the steps below when adjust probe compensation.

(1) set the attenuation of channel and probe to 10X, then connect the probe to channel 1.If use the hook probe, make sure the connection with the probe is reliable.

(2) Connect the probe to signal generator output channel, earth clamp should be linked to generator connection, display the channel, then press the "AUTO" button.

(3) Check the shape of the waveform. As shown in figure 1-5.

(4) Adjust the probe and repeat the operation if necessary.



F 1-5

The Second Chapter Function introduce and operation

To use the oscilloscope effectively, you need to understand the follow function:

Menu and control button	connector	AUTO setting	Default setting	Vertical system
Level system	Triggering system	Display system	Storage system	Support system

2.1 menu and control button:

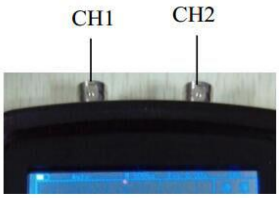
JHJDS2022S JHJDS2012S JHJDS2023

All model:

CH1,CH2	Display the CH1,CH2 setting menu
CH/AVΩ	Press “CH” enter oscilloscope mode, press “SG” enter multi meter mode
	The power button
OSC/SG	Press “OSC” enter oscilloscope mode, press “SG” enter generator mode
AUTO	Auto set control state of oscilloscope and realize the one key trigger function between 50hz-40Mhz, available for both CH1 and CH2
TRIG	**Display “trigger” control menu**
HORI	**Display “level” control menu**
RUN	**Gather or stop gathering waveform. notice: when stop, you can**

	adjust vertical gears and horizontal timebase within limites, amount to extend the waveform in level or vertical direction
MENU	**Function menu interface, enter the waveform storage interface when first press, enter the display setting interface when second press, enter the system setting interface when third time**
	**To enlarge/shrink or move display cursor in scope, to adjust range in multimeter**
	**To move display cursor or waveform in scope, to chose test mode in multimeter**
OK	**To Save the current waveform**
F1,F2,F3	**Correspond to the first/second/third option menu in setting function, shortcut key in scope and multimeter**

2.2 Connection

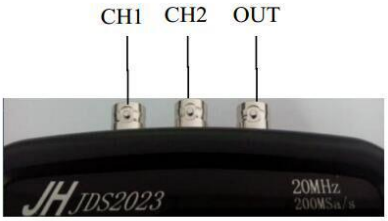


JHJDS2022S

Figure 2.1

JHJDS2012S

Figure 2.2



JHJDS2023

Figure 2.3

In F2.1 CH1 and CH2 are input connections of scope
In F2.2 CH1 is input connection of scope, COM port and VΩ is to connect black and red probe
In F2.3 CH1 is analog channel input connection of scope,CH2 is digital channel input connection of scope, OUT is output connection of generator

2.3 Automatic setup

JDS2022S/JDS2012S/JDS2023 digital oscilloscopes are with functions of automatic setting. According to the input signal, the scope could automatic adjust voltage gears/timebace/trigger mode to show the best waveform.
"AUTO" is the automatic setup button.

2.4 Default setting

Oscilloscope is set to default setting mode before it leaves factory. Press "MENU", switch to "Firm-mode Restore" interface, then chose "F3" to restore factory setting.

2.5 Vertical System

CH1,CH2 channel and setting
Each channel is with independent vertical menu. Every item is separate set according to different channel. Press "CH1" or "CH2" button, System will show

operate menu of CH1 or CH2.

Coupling	**AC** **DC**	**Obstruct the DC component** **Let AC or DC component go through**
Probe	**1X** **10X** **100X**	**Chose a value according the attenuation coefficient of probe to run a correct reading of vertical deflection factor. Three kinds:1X,10X,100X**
Display	**ON** **OFF**	**Switch on waveform display** **Switch off waveform display**
Frequency	-	**Automatic show the current input frequency of singal**
Peak-peak	-	**Automatic show peak-peak value**
Max	-	**Automatic show the max voltage value**
Min	-	**Automatic show the min voltage value**
Duty cycle	-	**Automatic show the duty cycle value**

1. Setting channel coupling

Assume that signal in CH1,it is a square signal with alternating component:

● Press"CH1" →"coupling DC", set to dc coupling mode. Then the ac component and dc component of signal could be got through together.

● Press"CH1" →"coupling AC", set to ac coupling mode. Then the dc component of signal is be obstructed.

2. Probe Scale Setting

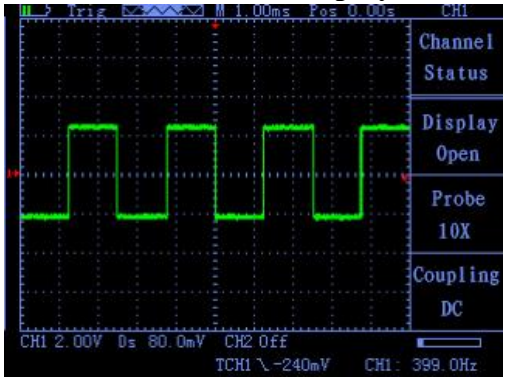
To match attenuation coefficient of probe, you need to adjust probe scale in channel menu accordingly. If the attenuation coefficient is 10:1,then the probe scale should be 10X,and so on.Or you will get a wrong date.

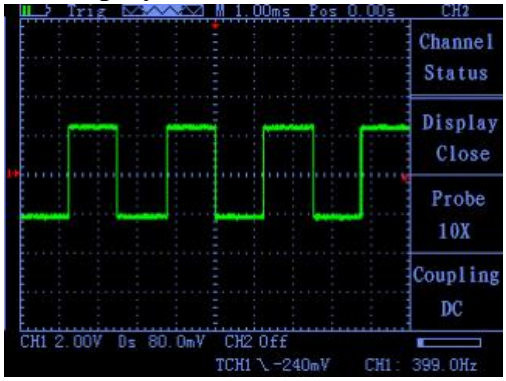
3. Waveform Display Setting

You can display waveform of any channel or not by setting.As a sample,display the waveform of CH1 but not show the waveform of CH2:

● Press "CH1" → "Display Open",it will display waveform of CH1.

● Press "CH2" → "Display Close",it will not display waveform of CH2.





4.Vertical volt/div Setting

When setting vertical volt/grid,the range is 100mV/div-50V/div(probe 10X),or 10mV/div-5V/div(probe 1X),or 1V/div-500V/div(probe 100X), stepping is 1-2.5-5,take CH1 for example:

2.6 Horizontal Systems

Use the control buttons to change the level of the horizontal scale (time base), trigger horizontal position (trigger position) in memory.Changing the horizontal scale causes the waveform relative to the screen center expansion or contraction,Change the horizontal position relative to the change point of the

Master time base	**Horizontal main time base setting is used to display the waveform**	
Master time base cursor state	**Dsiplay**	**Set cursor display or not display**
	Source	**Select the measurement signal of the cursor, That second press "HROI" enter "cursor display" screen The cursor is displayed here is the opposite of this menu**
	Type	**There are two types of time and voltage**
Cursor display	**Cursor1 Cursor 2**	**Timebase offset relative to the main vector**
	Incremental	**Cursor 2 - Cursor 1**

waveform trigger position.

Table 2-2 Main Menu of horizontal time base

● **Horizontal scale: Adjust the main group, press the "HORI" button,Press" "or" " to change the scale of the level.To zoom in or out waveform. If you want to stop waveform acquisition, press the "RUN" key can be realized. As Figure 2-10, Figure 2-11**

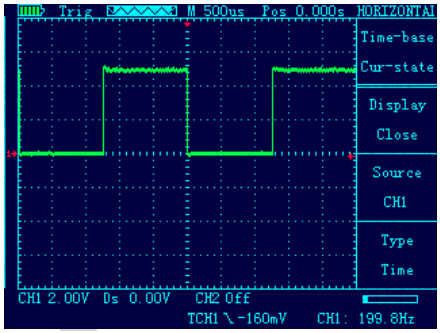


Figure 2-10

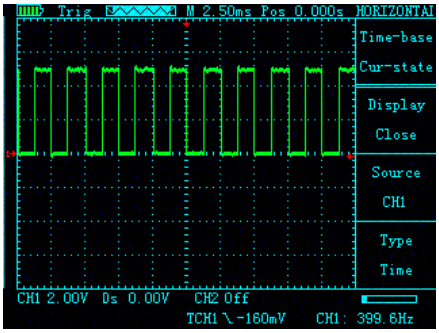


Figure 2-11

● **Horizontal Position: adjust the horizontal position of the waveform (trigger position relative to the center of the screen).Press the "HORI" button,Through " " or " "to move wavef n left or right. The key resolution vary according to time base. Press "AUTO" key can make the horizontal position return to zero.**

2.7 Trigger system

The trigger determines when the oscilloscope starts to acquire data and display waveforms.Once the trigger is set up correctly, it can convert the unstable display into meaningful waveforms.Trigger Control menu button" TRIG".

● **Trigger Control**

Trigger: The oscilloscope trigger mode is edge triggered.

● **Edge Trigger: When the edge of the trigger signal reaches a given level, Trigger occurs.Edge trigger is triggered on the input signal edge trigger threshold.When "Edge",That is input at the rising edge, falling edge triggered.**

Table 2-3 Edge trigger function menu

Source	CH1 CH2	Set CH1 as trigger source. Set CH2 as trigger source.
Slope	UP DOWN	Select the trigger signal to trigger on the rising edge Select the trigger signal to trigger on the falling edge
Trigger mode	Auto Normal Single	Set in the absence of detectable also can collect waveform trigger conditions Set only a triggering condition is satisfied only waveform Set capture a waveform when a trigger is detected, then stop
Operational Status	Display	Choose to display or not display the waveform after the operation status
	Operating	Provide CH1 + CH2, CH1-CH2, CH2-CH1 three operations mode

Instructions:

Set the source:

Press the "TRIG" button to display the trigger menu, according to the signal input, press the "F2" key to select "CH1" or "CH2".

2.Press "CH1", then press" "or" "adjust channel 1 mark.Press the "TRIG", then press" "" "or" "" "adjust the trigger flag arrow,According trigger flag each cell voltage value represents the relative position and the current channel a flag vertically to set the trigger level size.

Set slope:

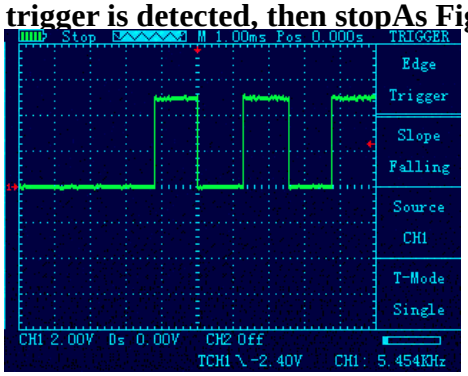
Press the "F1" key to select slope "up" or "down."

Set trigger mode:

Press the "F3" key to select "Auto", "normal" or "single."

Auto :Set in the absence of detectable also can collect waveform trigger conditions

Normal :Set only a triggering condition is satisfied only waveform Single :Set capture a waveform when a trigger is detected, then stopAs Figure 2-12



2.8 Display System

Table2-4 Display system function menu

Function Menu	Setting	Instruction
Display Type	Vector	Samples display through connection;
Format	Y-T	Display Voltage(Vertical Line)-Time(Horizontal Line) Curve
Continue	/	Waves update in Real time;
Display Lighting	BackLight	Adjust from 1 to 5;
Color	/	Full color or Blacn&White
Language	/	Simplified Chinese and English

Display System Setup

1.BackLight:Press “MENU” ,find “Setup Display” ,press” F1” to set “Backlight(Bright)” ;Adjust from 1 to 5;

2.Language:Press” MENU” ,find” Setup Display” ,press “F2” to set “Language” ;can be set to “中文” or “English” .

3.Color:Press “MENU” ,find “Setup Display” ,press “F3” ;can be set to “1” for “Black&White” ,” 2” for “Full color” .

2.9 Storage System

JHJDS2012S Series products can save two reference waveforms、six screenshots at internal memories.

JHJDS2012S Series products support USB interface,using for exporting screenshots(bmp picture) to u-disk.In addition,The saved two reference waves can be shown in “MENU-Waveform Save” .

The way to export screenshots:shut down the device,connect to computer by a usb cable,the press “OK” and “PWR” at the same time,after the screen is worked,let go;Now,you will see a U-Disk on your computer.After you get your pictures,please click Safely Remove USB Device on your computer first,then disconnect the usb cable;you should unplug the battery and then plug it at last.

Waring:Please don’t use any measure function when the usb cable is connecting with other devices,or this Instument Will Be Damaged.

2.10 Auxiliary Systems

Auxiliary function can be enabled by press “MENU” 、“F1” “F2” “F3” . "MENU" button to pop up the system function settings menu. Table 2-5

Table 2-5

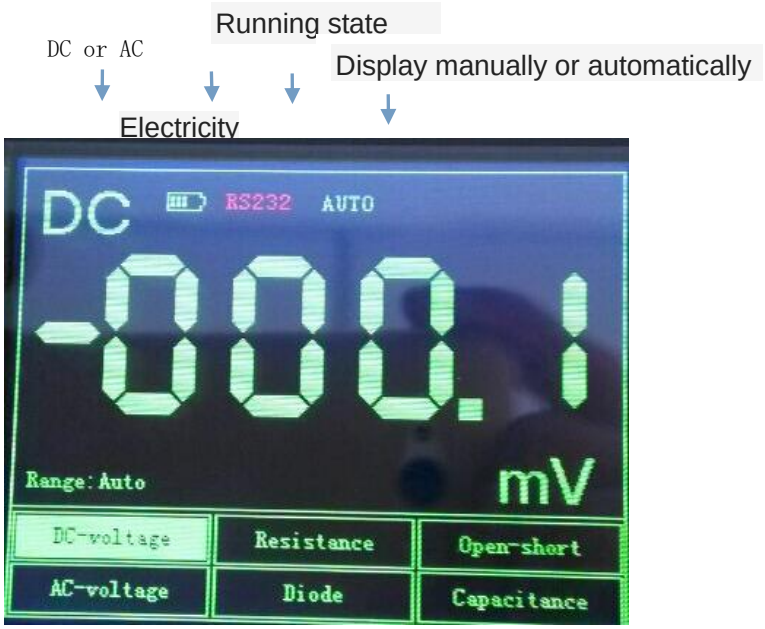
Menu	Setting	Instruction
Low power	Sound	Open or Close
	Auto Shut Down	10min 、30min、or Never(means if no opearting within this times,the system will shut down)

	Low light	**20s、40s、60s、300s or Never(means if no opearting within this times,the system will start Low Light Mode)**	
Set Manufacturers	**Screenshot Settings**	**PRCSRC**	**Open or Close**
		Picture	**Max value is 6**
	Firm-mode Restore	**Restore factory settings**	

2.11 Multimeter function and operation

This device can be used as a Multimeter or OSC; Can be used for measuring DC and AC voltage, resistance, capacitance, diode, buzzer-off . This device uses TFT full color display, and has a range display, olarity display, overload display, battery power display.

Measure Type	**Range**					
DC Voltage	**60.0mv**	**6.0v**	**60.0**	**600.0v**	**1000V**	
AC Voltage	**60.0mV**	**6.0v**	**60.0**	**600.V**	**750V**	
Resistance	**600.Ω**	**6.0kΩ**	**60．kΩ**	**600.0kΩ**	**6.MΩ**	**60.00MΩ**
Capacitance	**40nf**	**400nF**	**4.0 uF**	**400.uF**	**4000.uF**	
Diode	**0V-2**					
Buzzer-off	**Below 30,buzzer alarm**					



Measure Method:

Table2-7 Multimeter Operation Key Function

Key	Description
Multimeter	Press this key to enter Multimeter Mode.
◀ ▶	Press “◀” or ▶ ” to select Mesure Type
▲ ▼	Press “▲” or ▼ ” to tune the Range
F1	Shortcut for “DC Voltage” measure.
F2	Shortcut for “Resistance” measure.
F3	Shortcut for “Buzzer-Off” measure.
RUN/STOP	Multimeter’s RUN/HOLD key.

Note 1: Multimeter’s default range is "Auto" position, for manually setting the range, first predicted your Measurements..

Note 2:Display screen show flashing “RS232” means Multimeter is running;” MANU” means manually set the range.

1. DC and AC Voltage measuring

The Black Pen connect to the COM interface on the top of the device(the black interface),and the Red Pen connect to VΩ interface(the red interface)

Press “ON/OFF” key until the system is started,then press “Multimeter” key to switch to Multimeter Function.

③ Press “◀” or “▶” to select “DC voltage” or “AC Voltage” measuring.” DC Voltage” has a Shortcut,” F1” .

④ Connect the test pen to the measured voltage,the device will read the value and show on the screen(it can also read negative value.).AC Voltage has no polarity.This device’s default Range is “Auto”,you can press “ ” or “ ” to c▲nge the R▼ge.

2. Resistance measuring

① Press “  or “  to select Resistance mesuare.it has a shortcut,” F2”.

② Put the pen on the two side of the resistor,device can read it’s value.Maybe you shoud set the Range manually.

3. Capacitance measuring

① Press “  ” or “  ” to select Capacitance mesuare.

② Put the pen on the two side of the capacitance,device can read it’s value.

Note: Capacitance measuring can’t set Range.

4. Diode and Buzzer-off measuring

① Press “  ” or “  ” key to select “Diode” or “Buzzer-off” measuring.Buzzer-off measuring has a shortcut ,” F3”.

② Put the pen on the two side of the Diode or the line,device can read it’s value.(The value when measuring diode,it’s diode Conduction voltage drop)

③ When mesuareing resistance is below 30Ω

Attention:

a.The device has forward and reverse voltae,when the diode connected reversed,the value is negative.

b.Diode and Buzzer-off mearusing only have “Auto” Range.

c.When measuring,must keep “Sound” On,or the Buzzer can’t alarm.

Ways to setup:

（1）Press “OSC” key to start OSC mode,and press “MENU”,then find “Set Low power”.

（2）Press F2 to Open or Close Sound.

5. Data Hold Function

"Run / Stop" button is pressed on the instrument, the data will remain being displayed on the display even if the input signal changes, or eliminate, the value is not changed

Waring 1:When using Multimeter,the OSC dector must not connect to GROUND.

Waring 2:Please select the appropriate Range before measure object.

Waring 3:When the usb cable is connect to other devices,must not measur,or the device will be damaged.

Chapter III Application Examples

3.1 Singal measure

Measure an unknown singal,and show it’s value immediately.

If you want show the value immediately ,please do as fllows:

Set the probe menu attenuation coefficient as 10X, and switch the probe to 10X.

Connect the CH1 probe to the test point.

③ Press “AUTO” key.

The OSC will automatically set the optimun vaveform display.Then you can adjust the Vertical or Horizontal scale,until the waveform meets your requirements.

Automatic measure singal’s voltage and time parameter.

The OSC can automatic measure most signals.To measure the frequency and peak-peak,follw the steps:

Press “AUTO” key,show current waveforms.

Press “CH1” key to turn the page,and you can observed frequency and peak-peak.

At this time, frequency, and peak measurements are shown in the "F2" and "F3" corresponding position.See Figure 3-1.

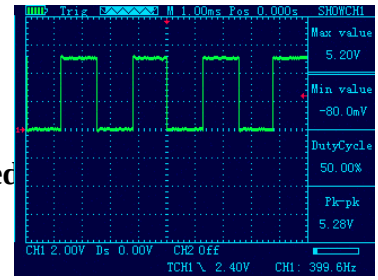


Figure 3-1

3.2 Cursor measure

This OSC can automatic measure a variety of waveform parameters.All measurement parameters can be measured by the cursor.Use the cursor,can measure the waveform parameters quickly.

Measuring the peak voltage of square wave signal.

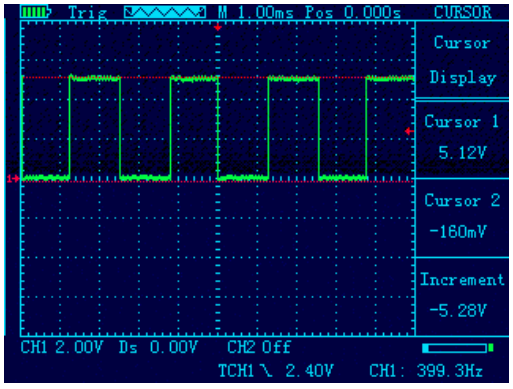
Take the CH1 for example.if you want to measure the peak voltage of a square wave signal,do as follows:

Press “HORI” key to enter the main base cursor state seting.

②Press “F1” key to set the cursor “ON”;Press “F2” key to set the source as “CH1”;press “F3” key to set the type of the cursor “Voltage”.

③Press “HORI” key again to see location of cursor 1 and cursor 2(relative to the intermediate zero volate reference level) and increment(V_cursor2-V_cursor1)

④ Press “ ” and “ ” to tune the position of cursor 2,“ ” and “ ” to tune the position of cursor 1;and there position and increment will updating on the screen in Real-time.See Pic 3-2 and Pic 3-3.



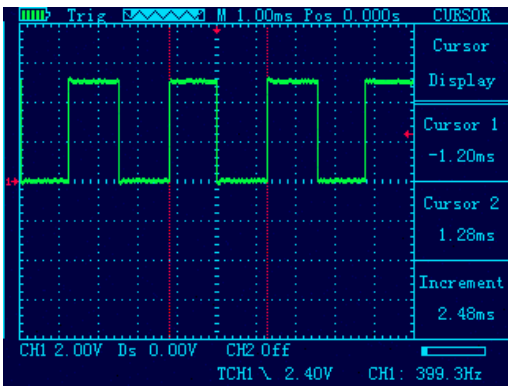


Figure 3-2 **Figure3-3**

3.3 Capture the Single Signal

Digital storage oscilloscope advantages and features that could easily capture the aperiodic signal pulses, glitches, etc. To capture a single signal, this signal first need to have some prior knowledge, in order to set the trigger level along. If the case of a signal of uncertainty, you can automatically trigger mode or normal first observation to determine the trigger level along.

Steps are as follows:

1、As aforementioned, set the attenuation coefficient of probe and CH1 channel to 10X.

2、Trigger settings:

Press "CH1 key" → press "F3" key to set the coupling to "DC."

Press the "TRIG" button to display the edge trigger menu settings.

③ In this menu,press "F1" key to set the edge type "slope down",press "F2" key to set the source "CH1",press "F3" key to set the trigger mode to "single".

④ Press "RUN" key,the left corner of the display screen will displays "Ready",waiting for the signal meets the trigger condition occurs.If the trigger signal reaches the ertain conditions, it will displays on the screen.With this feature you can easily capture the event accidental,such as a suddenly low voltage:press" RUN" key to start the wait when there is a low level occurs, the devices will automatically trigger and the trigger waveform record before and after a period of time off." HORI" key can change the horizontal position of the trigger position,then you can get different lengths,which can easily observe the waveform. See Figure 3-4

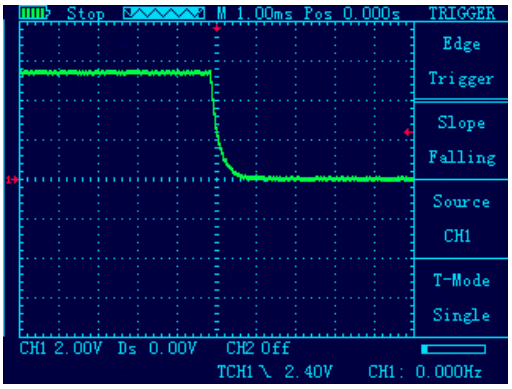


Figure 3-4

3.4 Use Multimeter to Measure DC Voltage

Use "AUTO" measure DC Voltage.

① Press "AVΩ" key,enter Multimeter mode, Auto range default.

② Press " ◀ " or " ▶ " to select "DC Voltage", or press "F1" key.

Figure 3-5

③ Put the pen on the test point,and it will read The value.See figure 3-5.

Set the Voltage Range manually.

① Press " ◀ " or " ▶ " to select "DC",or press "F1".

② Press " ▲ " or " ▼ " to adjust the range. See figure 3-6.

Chapter 4 System Tips and Troubleshooting

Figure 3-6

4.1 Prompting Message

Trigger level limit:

Horizontal position limit:

Voltage range limit:

USB storage device is connected successfully:

4.2 Troubleshooting

1.If you press the "PWR" button oscilloscope screen remains dark, no display, follow these steps:

(1) Open the instrument battery cover, check whether the power supply or battery power leakage, flatulence, etc.

(2) After the inspection is completed, restart the instrument.

(3) If you still can not properly use the product, please contact us.

2.After signal acquisition, signal waveform screen does not appear, please follow these steps:

(1) Check whether the probes is correctly connected to the signal line connection.

(2) Check whether the signal cable is properly connected to the BNC.

(3) Check whether the probe is properly connected with the analytes.

(4) Check whether the analyte signal is generated.

(5) re-acquire the signal again.

3.Measured voltage amplitude value is 10 times greater than the actual value, or 10 times smaller:

Check whether the channel attenuation factor of the probe matches the actual attenuation ratio.

4.There waveform display, but not stable:

Check the trigger source trigger menu settings are consistent with the actual signal input channels.

5.Press "RUN" button without any display:

Trigger checks whether the trigger menu in the "normal" or "Single" and the trigger level has been exceeded if the signal range. If it is, the trigger level is centered, or set the trigger mode to "AUTO" file.

Stepped waveform display:

This phenomenon is normal. When the base level is too low may stall, increasing the level of the base when the horizontal resolution can be increased to improve the display.

Chapter V service and support

5.1 Warranty Description

We guarantee the production and sale of its products, the date of shipment from authorized dealers within a year, does not appear in material and workmanship defects.As specified in the detailed product warranty proved defective, we will

provide repair or replacement service.

In addition to this summary, or use the warranty provision of the warranty, we do not make any other warranties, express or implied. The Company's indirect, special or damage arising therefrom shall not be liable.

Appendix A: Technical Specifications

Unless otherwise noted, all technical specifications are used for attenuation switch setting 10X probes and this series oscilloscopes.

To verify that the oscilloscope meets specifications, the oscilloscope must meet the following conditions:

●The oscilloscope must be more than thirty minutes of continuous operation within the specified operating temperature.

●If the operating temperature changes by more than 5 degrees, will have to be corrected, unless labeled "typical" outside the specifications, all specifications are guaranteed.

●Oscilloscope must be within the factory calibration interval.

Technical Specifications

import	
Input coupling	**AC、DC**
Input impedance	**1MΩ 25pF**
The maximum input voltage	**40V (probe X1); 400V (probe X10) can be measured 220V voltage; (probe X100) 2000V voltage can be measured**
Probe attenuation	**1X、10X**
Set the probe attenuation factor	**1X、10X、100X**
Signal acquisition system	
Sampling Method	**Real-time sampling, random sampling**
Memory depth	**4K (per channel for each 2K)**
Acquisition Mode	**Sample, Peak Detect**
Vertical System	
Vertical Sensitivity	**10mV-5V (Probe 1X) 100mV-50V (probe 10X) (1,2.5,5 step)**
Vertical accuracy	**+/-3%**
Vertical resolution	**8bit**
Bandwidth	**20MHz**
Horizontal	

Systems	
Real-time sampling rate	**200 MSa/s**
Horizontal scan range	**10nS/div-5S/div**
Trigger System	
Mode	**Auto, Normal and Single**
Type	**Rising edge trigger, falling edge trigger**
Automatic detection	**Support (50Hz-40MHz)**
Math	**CH1+CH2、CH1-CH2、CH2-CH1**
Measurement System	
Cursor measurements	**Support time and voltage cursors**
Measurements	**Manual**
Measure	**Peak and frequency**
Equipment	
Screen	**3.2-inch, 16-bit true color, TFT, 320 * 240**
Battery	**3000 + mA lithium battery (single cell about four hours of continuous work)**
Size	**202 * 100 * 35 (mm)**

Chapter VI Generator of JDS2023

Signal generator operating instructions

● **Select signal generator: in the boot after press "F2" select "signal generator; Also can be in when the oscilloscope in other operating interface, long press "MENU" into the oscilloscope function selection MENU interface, press "F2" choose "generator".**

● **After entering the signal generator interface, the following formal operation signal generator.**

① Set the waveform type: according to the "F1" button to choose their own needs of signal waveform, each time you press the "F1" can switch a waveform and displayed on the screen, choose one of waveform, press "OK" to confirm.

② Set frequency: press "F2" button and then through the "  **button to adjust the frequency size, after set, press" OK "to confirm.**

③ Set range: press "F3" button and then through the " **" button to adjust the amplitude size, after set, press" OK "to confirm.**

④ Set offset: press "F4" key and then through the "  **" button to set the offset size, after set, press" OK "to confirm.**

⑤ Set the duty cycle: press "F5" key and then through the "  **" button to adjust the size of duty ratio, after set, press" OK "to confirm.**

● **After good waveform parameter setting, can be observed through the**

oscilloscope waveform signal generator output. Example below set up an offset for the "+ 2.00", by "3 v", 10 KHZ frequency triangular wave are shown in figure 3-2 below:

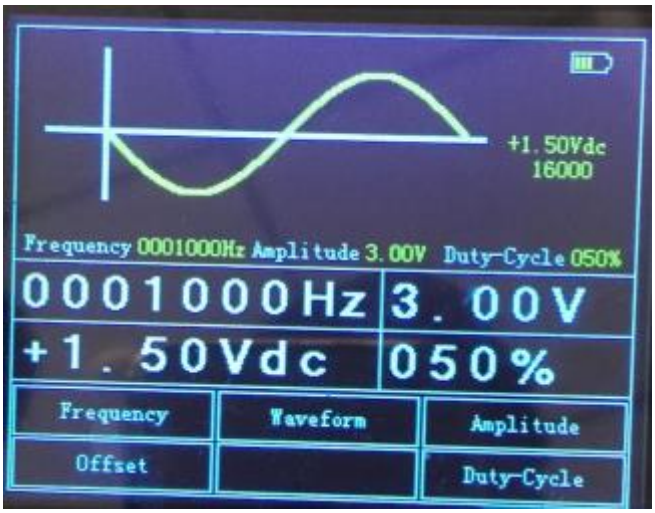


Figure 3-2 triangle wave

3.3 Custom waveform signal generator

● **Text custom waveform parameters, such as table 3-2**

Table 3-2 custom waveform parameters format

Text parameter format	**Directions**
Waveform version information	**14020 28007 00001 This three data representation of waveform version information, each must have before custom waveform**
Waveform amplitude value	**Such as: 00300 said waveform amplitude is 3 v, can be manually modify the amplitude values**
The wave offset	**Such as: 00150 said shift + 1.5 V, its head a character representation of plus or minus, 0 is positive and 1 negative, behind four characters as an offset, can be manually modify**
Waveform duty ratio	**Such as: 00050, said waveform duty ratio 50%, can be manually modify**
frequency	**Formula: 1HZ-5MHZ,others 1HZ-1MHZ**
data	**Points out, according to the points to fill in the corresponding values**

Appendix B JHJDS2012S and 2023 handheld digital storage oscilloscope accessories

Standard accessories:

● **A user manual** ● **A 1:1 / 1:10 probe** ● **A certificate**

● **Lithium battery × 1** ● **A lithium battery charger** ● **One pair of multimeter pen(only JDS2012S)**

Appendix C: routine maintenance and cleaning

Routine maintenance

Do not store or leave the instrument in where the LCD display will be exposed to direct sunlight for a long time.

Do not allow sprays, liquids and solvents touches on the instrument or probe, to avoid damage to the instrument and probe.

Please charge the battery in the battery is finished using the situation.

Clean

Regularly inspect the instrument and probe according to operating conditions.

Please follow the steps below to clean the outer surface of the instrument:

1.Use external dust soft cloth to wipe the instrument and probe. When cleaning the LCD screen, be careful not to scratch the clear plastic protective screen.

2.Use a damp but not dripping, soft cloth to wipe the instrument, please remove the battery before wiping. Use a mild detergent and water to scrub. Do not use any corrosive chemicals, to avoid damage to the instrument and probe.

WARNING: Before reinstalling the battery, make sure the instrument is completely dry to avoid water damage to equipment caused by electrical short circuit.