

Preface

Dear users:

Hello! Thank you for purchasing a new handheld oscilloscopes from Jin Han electronic. In order to properly use this instrument, please read the full text of this manual carefully before using the instrument, especially about the "safety precautions" part. If you have finished reading this specification, we recommend that you instructions for proper custody, together with the instrument placed or placed where you can access at any time. For future inspection during use.

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If the original purchaser from the date of purchase of the product within two years, the products are sold or transferred to third parties, the warranty period shall be the date of the products from the original buyer

from Jin Han or authorized distributors within two years. Probes and other accessories and fuses are not a guarantee of protection.

If proven applicable warranty period the product is defective, Jin Han discretion to repair the defective product without charge for parts and labor costs, or (determined by Jin Han) with an equivalent product to replace the defective product. Jin Han for warranty parts, modules and replacement products may be new or reconditioned to like new performance. All components, modules and products culvert replacement will become the property of Jin Han.

Hereinafter referred to "Customer" means, according to a statement of the rights guaranteed by the provisions of the person or entity. To obtain service under this warranty, Customer must notify the Jin Han defects during the applicable warranty period, and for the performance of services to make the appropriate arrangements. Customer shall be responsible for packaging and shipping the defective product to the service center designated Jin Han, while prepaid freight and provide a copy of proof of purchase of the original purchaser. For Hong Kong, Macao and Taiwan compatriots and overseas customers, if the product is returned to the service center, customers should be responsible for paying all shipping charges, duties, taxes and any other fees.

This warranty does not apply to any defects due to normal wear and tear accident, machine parts, the use of the product outside the scope of the provisions of, or improper use or improper or inadequate maintenance caused by failure or damage. Jin Han no obligation to provide the following services in accordance with the provisions of this warranty:

- a) Jin Han-service personnel to not to damage the product installation, repair or maintenance repairs caused;
- b) Repair damage caused by improper use or connection to incompatible equipment caused;

- c) Any damage or malfunction to use the service personnel is not Jin Han caused battery repair;
- d) Maintenance has been modified or integrated with other products (if such modification or integration increases the time or difficulty of servicing the product).

This is guaranteed by Jin Han-made for this product, used to replace any other express or implied. Jin Han and dealers refused for a particular purpose of merchantability or fitness for any implied warranty. In the case of breach of this warranty, Jin Han is responsible for the repair or replacement of defective products is the sole and exclusive remedy available to customers. No matter whether Jin Han and dealers are pre-advised of the possibility of any indirect, special, incidental or consequential damages, Jin Han and distributors of these damage are not responsible.

General safety requirements

The following safety precautions to avoid injury and prevent this product or any other product connected thereto damage. To avoid possible danger, be sure to use this product in accordance with the provisions.

Only trained personnel to perform maintenance procedures.

1. Avoid fire and personal injury

- Correct plug and pull

When the probe or test leads are connected to a voltage source Do not accessible.

- Properly connected probe

Probe ground and ground potential are the same, Do not connect the ground wire to a high voltage. And during the test, do not touch the exposed contacts and components.

- View all terminal ratings

In order to avoid the impact of fires and excessive current, please view all ratings and markings of this product. Please refer to the product before connecting the product instructions for more information about ratings.

- Do not open the machine casing operations

If the cover or panel has been removed, do not operate this product.

- Avoid exposed circuitry

Do not touch exposed connections and components of the boot.

- If you suspect a faulty product, do not operate

If you suspect that the product has failed, Please check it by qualified personnel or contact jinhandz@foxmail.com.

- Maintain adequate ventilation

- Do not operate in wet conditions

- Do not operate in flammable and explosive environment

- Please keep this product surfaces clean and dry

2. Safety Terms and mark

This manual terminology. The following terms may appear in this manual:

WARNING: Warning statements indicate might endanger the safety of life conditions and behavior.

Note: Note the statement pointed out that this product could result in property damage and other conditions and behavior.

Terms on the Product: These terms may appear on the product

DANGER: Indicates that there is a direct risk of harm exists near the mark.

WARNING: Indicates a potentially dangerous harm nearby markers.

Note: that of the product, and other potentially dangerous property

Symbols on the Product: These symbols may appear on the product



Warning of high pressure



Protective earthing



Note: please refer to the manual



Measuring ground terminal

Foreword

This manual introduces JHJDS30 series with information about the operation of the digital storage oscilloscope. Includes the following chapters in this manual:

- ◆User guide: Simple introduces the portable digital storage oscilloscope front panel, the user interface, function and probe compensation.
- ◆Function is introduced and the operation: The oscilloscope, signal generator, multimeter, recorder, the center of the serial port function and operation is introduced in detail.
- ◆Application example: Provide some measuring examples, reference for readers.
- ◆System prompts and troubleshooting:
- ◆Service and support:

This manual contains the following four hand-held digital storage oscilloscopes; specific model is shown in the table below:

Type no.	Pass way	With wide	Real-time sampling rate	The depth of the storage
JHJDS3012A	Single channel+ multimeter +signal generator + recorder + serial port center	30Mhz	250MSa/s	16Kpts
JHJDS3012E	Single channel + signal generator + recorder + serial port center	30Mhz	250MSa/s	16Kpts
JHJDS3022A	Dual channel + multimeter, signal generator + recorder + serial port center	30Mhz	250MSa/s	16Kpts ×2
JHJDS3022E	Dual channel + signal generator + recorder + serial port center	30Mhz	250MSa/s	16Kpts ×2

JHJDS30 series handheld digital storage oscilloscope provide users with simple and clear front panel function, for basic operation. Each letter or symbol of the labeled buttons are marked with appropriate functions, the user can more intuitive, conforms to the use of traditional instruments used, the user does not have to spend a lot of time to learn and

familiar with can skilled use. To speed up adjustment, easy to measure, the user can press the "AUTO" button; the instrument is suitable for waveform and gear position.

In addition to ease of use, JHJDS30 series handheld digital storage oscilloscope has faster measurement task need high performance indicators and powerful. Through 250 Msa/s real-time sampling, can be observed on the JHJDS30 series handheld digital storage oscilloscope signal faster. Powerful and analyzes waveform makes it easy to capture and analysis. Clear liquid crystal display and function of mathematical operations, making it easy for users to more quickly and clearly to observe and analysis the signal problems.

In addition, JHJDS30 series handheld digital storage oscilloscope function signal generator and digital channel is integration, the user can according to need to bring up the usual signal waveform, and can be accessed by users digital channel analysis data, greatly satisfy the user requirements.

JHJDS30 series digital oscillographic table provides unique waveform display interface and a variety of measurement functions. Can be widely used in engineering survey, out testing, automotive electronics, frequency converter, research, design, education and training, and other fields, including virtual circuit measurement and fault.

From the performance characteristics of given below, can understand the series handheld digital storage oscilloscope how to satisfy your measurement requirements.

- ◆ Set the oscilloscope, signal generator, multimeter functions in one isolated oscilloscope/oscillographic table
- ◆ You can observe signal data through serial port center
- ◆ Built-in recorder function
- ◆ A serial port center
- ◆ With digital channels
- ◆ 4.3 inch 16-bit true color TFT 400*272
- ◆ Maximum 30 MHz bandwidth, sampling rate 250 Msa/s, 16 KPTS storage depth
- ◆ Support USB firmware upgrade
- ◆ Have the edge trigger function, can automatically detect support (50Hz—60MHz)
- ◆ A variety of waveform mathematical functions together
- ◆ Support Chinese and English menu display
- ◆ Cursor support time, voltage measurement
- ◆ Automatic, normal, single trigger mode
- ◆ Support automatic shutdown function and power saving mode, the time can be set up
- ◆ The cursor function
- ◆ Screenshot of waveform can be retained and through the USB into the computer
- ◆ Bring support to facilitate placement

- ◆ Through the USB power supply
- ◆ Super-long standby: single battery can work continuously for 4 hours

JHJDS30 series hand held digital storage oscilloscope attachments:

JHJDS3012E/JHJDS3022E Oscilloscope

- ◆ The directions for use
- ◆ A copy of the certificate of approval
- ◆ One (JHJDS3022E has two) 1: 1/10: 1 probe
- ◆ A clipped
- ◆ Two lithium batteries
- ◆ A lithium battery charger

JHJDS3012A/JHJDS3022A Oscilloscope

- ◆ The directions for use
- ◆ A copy of the certificate of approval
- ◆ One (JHJDS3022A has two) 1: 1/10: 1 probe
- ◆ A clipped
- ◆ A pair of pens and multimeter
- ◆ Two lithium batteries
- ◆ A lithium battery charger

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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:

△General inspection

△The front panel and the user interface

△Holding a storage oscilloscope connected input

△Functional check

△The probe compensation

1.1 General inspection

When you get a new JHJDS30 series with oscilloscope, it is strongly recommended that you follow the steps below to check the oscilloscope.

Check whether there is damage caused by transportation:

If it is found that serious breakage or foam cushion packaging carton, please keep, until the

whole machine and accessories by electrical and mechanical tests.

Check the attachment:

About providing detail of attachment, in front of this manual in the attachment. You can refer to this check attachment for missing or damaged. If you find attachment missing or damaged, please contact in charge of the business of dealers.

Check the machine:

If it is found that the appearance of instrument, the operation of the instrument or failed the performance test, please contact in charge of the business of selling or dealer. If the instrument damage caused by the transport, please pay attention to keep the packaging. Notify the transportation department and in charge of the business of selling or dealers. We will arrange for you repair or replacement.

1.2 The front panel and the user interface

When you get an oscilloscope, you need to be familiar with its front panel. This chapter will detail oscillographic table layout and how to use the front panel keys. Please read this chapter carefully before any action.

The front panel and key layout (picture 1-1) :

The front panel of buttons in addition can be displayed on the interface menu allows you to

directly use some function. Shown on the interface menu provides all of the advanced features.

Function description (Figure 1-1) :

- | | |
|---|--|
| 1. display | 10. HORIZ: Display the HORIZ menu |
| 2. F1~F5: Multi-function selection buttons | 11. TRIG: Display the TRIG menu |
| 3. PRW: Power on/off button | 12. MATH: Display the MATH menu |
| 4. MENU: The menu button | 13. MEAS: Display the measurement menu |
| 5. Adjust the trigger level | 14. Adjust the vertical voltage notch |
| 6. Set the time base and horizontal displacement waveform | 15. Adjust the horizontal position |
| 7. The cursor keys | 16. CH1: Display the CH1 menu |
| 8. CH2: According to channel 2 menu | 17. AUTO: Automatically set |
| 9. OK: Identify key | 18. RUN: Run/stop |



Figure 1-1

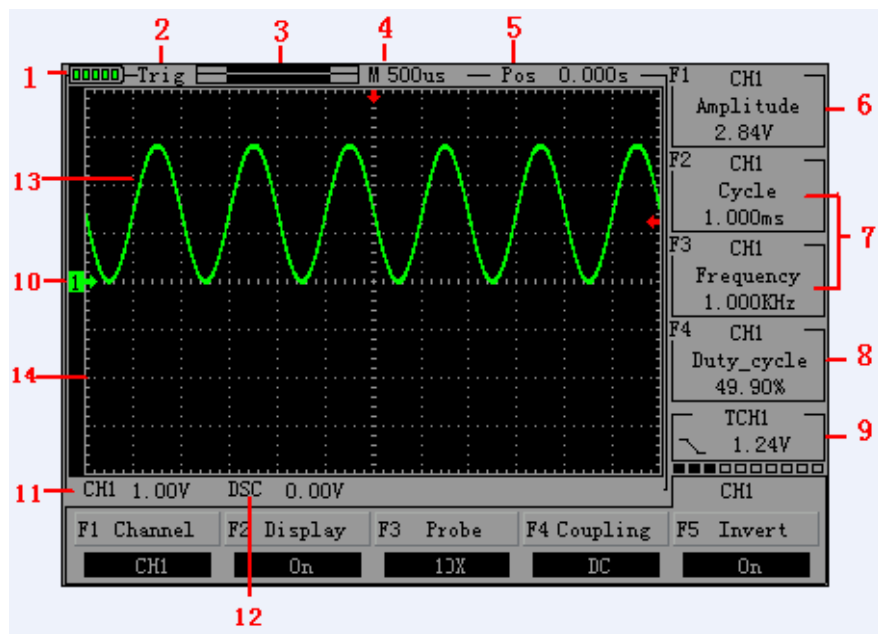


Figure 1-2 screens

Display interface, as shown in figure 1-2

Oscilloscope interface description:

1. According to the battery
2. According to state trigger
3. Display the current waveform in memory location
4. Show the level of time
5. Displays the wait time trigger signal
6. According to signal amplitude
7. Display, frequency signal cycle
8. According to duty ratio
9. Display trigger position
10. According to channel 1
11. According to channel 1 voltage notch
12. According to the relative horizontal displacement
13. waveform

14. The grid

1.3 Holding a storage oscilloscope connected input

Instructions :

1. The oscilloscope probe
 2. Oscilloscope input
 3. Oscilloscope digital channel input
 4. The signal generator output
 5. stents
 6. Is clipped
 7. Multimeter to test the pen
 8. Multimeter input pin,
- four round pins are respectively 10 a current, current mA stall, grounding, voltage
- Note: figure 1-3 for single channel oscilloscope connected input, dual-channel oscilloscope connected input is from left



figure 1-3

to right CH1 and CH2 and CH3, OUT (i.e., channel 1, 2, digital channel and signal generator output)

1.4 Functional 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 they hear the buzzer rang it let go.

2. Set the switch on the oscilloscope probe to 10 x and will probe and oscilloscope channel 1 The connection. Aim the probe on the connector slot CH1 coaxial cable splice pieces of the convex

Press key, can be connected, and then spin to the right to tighten the probe.

3. Place the probe of the probe and grounding clip connected to the corresponding connection end of the signal generator

(suggest enter 1 KHZ, about 3 v peak value of square wave).

4. 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.

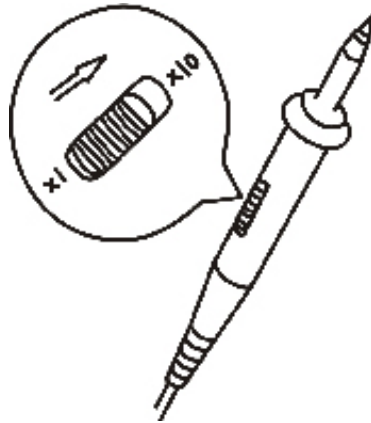


Figure 1-4 probe set

1.5 the probe

1. The safety of the probe

Probe body surrounding protection Settings can protect the fingers to prevent electric shock. Prior to any measurement, connect the probe to the oscilloscope and grounding terminal.

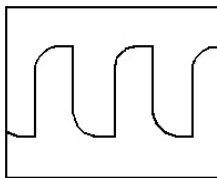
2. The probe compensation (see the probe specification)

In the first connect the probe to any input channel, this adjustment is required, make the probe to the input channel. Without compensation correction probe will lead to a measurement error or mistakes. If the adjustment probe compensation, please click the following steps:

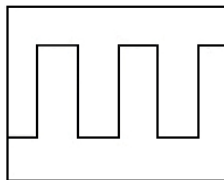
(1) the channel attenuation is set to 10 x, will probe options menu to probe on the switch is set to 10 x, and the oscilloscope probe connected to channel 1. Such as using the probe hook head, should ensure that contact with the probe and reliable.

(2) the probe end connected to the signal generator output connector, clamp and signal generator is connected to ground wire connector, according to channel, and then press the "AUTO" button (automatically).

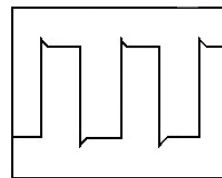
(3) Check shows the shape of the waveform. As shown in figure 1-5.



Owe to compensate



Compensation OK



Spillover compensation

Figure 1-5

(4) If necessary, adjust the probe, repeated operation when necessary.

1.6 Preliminary using oscilloscope display signal automatically

JHJDS30 series hand held digital storage oscilloscope has the function of signal automatically set. According to the input signal, can automatically adjust parameters such as voltage, time base and trigger mode, so as to achieve the best state of signals. Automatically set to work, the requirements of the measured signal frequency is greater than or equal to 50 Hz.

This part mainly discusses the preliminary use the oscilloscope's customer to do a demonstration of automatic display signal but not introduce all the functions



Figure 1-6 boot screen

of holographic. The specific steps are as follows:

(1) the oscilloscope after equipped with batteries, long press the oscilloscope in the top right corner of the red "PRW"

Key, until I heard a buzzer sound can let go, oscilloscope into at this time
Boot screen, as shown in figure 1-6

(2) enter the boot screen, can choose instrument by selecting the button F1 ~ F5
Mode, the default is selected "oscilloscope", selected after about 3 s or so
Automatically entered into the oscilloscope operating interface.

(3) will probe from the oscilloscope channel 1 (CH1) and probe to 10 x gear, pull it
After grounding clip to receive the signal

(4) press the "CH1", then press "F3" will probe set to 10 x

(5) will probe needle comes into contact with the need to test signal source, press the "AUTO"
button,

At this point, the oscilloscope is automatically set vertical, horizontal and trigger system,
and will be

Waveform display the best effect of the signal.

The second chapter Oscilloscope operation

The user from the previous chapter have probably learned how to set the JHJDS30 series oscilloscope from the menu bar. This chapter will detail the oscilloscope each function Settings. The content of this chapter is as follows:

- △ End connections
- △ Delta automatic measurement
- △ Delta display system
- △ Delta vertical system
- △ Delta level system
- △ Delta trigger system
- △ Delta storage system
- △ Delta secondary system
- △ Delta cursor measurement
- △ Delta mathematical functions

2.1 End connections

As shown in figure 2-1: from left to right in the order:

CH1、CH2、CH3、OUT

CH1: Used to display signal input connection

CH2: Digital channel input connection

OUT: The output of the signal generator
end connections



Figure 2-1 connection

Note: the figure 2-1 for single channel oscilloscope connector diagram, double-channel holographic CH1 and CH2 for signal input port, CH3 for digital channel input port.

2.2 Automatic measurement

JHJDS30 series hand held digital storage oscilloscope/oscillographic table with functions of automatic setting. According to the input signal, can automatically adjust voltage rank, time

base and trigger way to best display form.

“AUTO” the function of the button to automatically set the button.

- If multiple channel signal, has the lowest frequency signal channel as a trigger source.
- Found no signal, it will access a signal channel 1, press the “AUTO” button.

2.3 Display system

Table 2-1 menu display system function

Function menu	Set	Instructions
Display type	Vector	Showed by means of connection between the sampling points
Display mode	Y-T	According to relative to the time scale (horizontal) vertical voltage
	X-Y	Display (no the single channel oscilloscope)
Display brightness	Back-light	Can be set from 1 to 5

Color	/	Colour or black and white display
Language	/	In Chinese or English

Display system Settings

1. The backlit Settings: press "MENU" button, find the backlight Settings, press "F5" key set the backlight, namely the brightness.
2. Language: press "MENU" button, find language setting, press "F2" setting language, can be set up, both Chinese and English display interface.
3. The color Settings: press "MENU" button, find the color Settings, press "F3" button to set the color, can be set up two display color and black and white
4. Mode: press "MENU" button, find the mode setting, press "F1" setting mode, can be set Y - T or x-y mode display
5. Long press "MENU" button, can choose interface, enter the instrument function by F1 ~ F5 select button to choose. As shown in figure 2-2

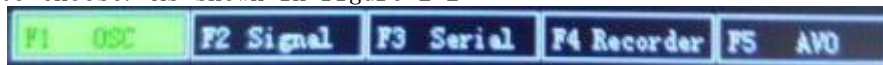


Figure 2-2 Instrument selection interface function

2.4 The vertical system

JHJDS30 series handheld digital storage oscilloscope every channel has an independent operating menu. When press the CH1 and CH2 bond, the operating menu will be displayed at the bottom of the screen.

To change the CH1 and CH2 vertical Settings, follow these steps:

1. Press the CH1 and CH2 bond, function menu will be displayed at the bottom of the screen.
2. Press the F1 ~ F5 to choose various states.

Now you can see the below menu:

CH1 menu:

CH1 1.00V DSC 0.00V				CH1
F1 Channel	F2 Display	F3 Probe	F4 Coupling	F5 Invert
CH1	On	1X	DC	On

CH2 menu:

CH1 1.00V DSC 0.00V				CH2
F1 Channel	F2 Display	F3 Gear	F4 Retain	F5 Invert
CH2	On	X1	000	Off

Figure 2-3 channel 1, 2 menu item

Table 2-2 in detail the function of each menu item

channel	CH1	channel 1
---------	-----	-----------

	CH2	channel 2
Accordinging	open	Open the display waveform
	close	Disable display waveform
The probe	1X	According to the probe, select one of the attenuation coefficient to keep vertical deflection coefficient correctly. There are three : 1X、10X、100X
	10X	
	100X	
coupling	ac	Stop the dc component input signal
	dc	By the input signal of ac and dc component
Reverse phase	open	Open the inverse function
	close	Close the inverse function

1. Set the channel coupling

In applying to the CH1 channel signal, for example, measured signal is a square wave signal containing ac component.

● CH1, for example, enter a contains the dc component of the signal.

Press the "CH1"→"F4" select Settings to communicate. Only allow ac component, dc component is filter. Waveform display as shown in figure 2-4.

- Press the "CH1"→"F4" option set to dc. Ac and dc component were allowed through. Waveform display as shown in figure 2-5.

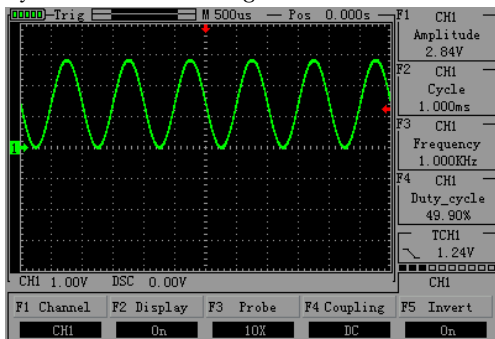


Figure 2-4 coupled dc

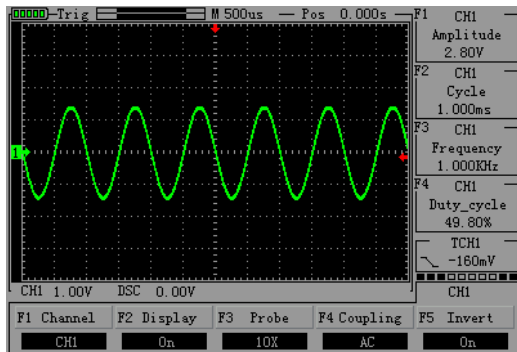


Figure 2-5 coupled ac

2. Probe the proportion set

In order to coordinate the attenuation coefficient of the probe, needs to adjust the corresponding probe in the channel operation menu attenuation ratio. If attenuation coefficient for X10 probe, oscilloscope probe proportion of input channels should be set to 10 x, to ensure that show the information of gear and measuring data is correct.

According to the following operation adjustment channels menu probes attenuation coefficient of

scale:

Press CH1 and CH2 key, press the F3 choose appropriate Settings, the Settings will be saved to you to change the Settings again. As shown in figure 2-6

- Press "CH1"→"F3" set the probe for 10 x

3. Waveform reverse set

- Press the "CH1"→"F5" will reverse phase can be set to "on" see waveform inverse, as shown in figure 2-7

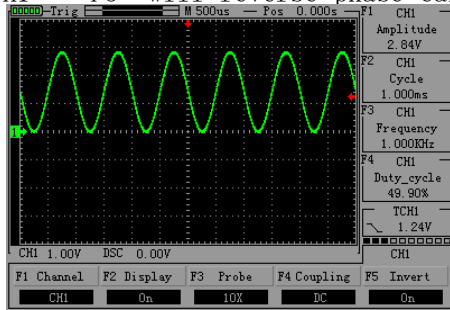


Figure 2-6 set probe 10 x

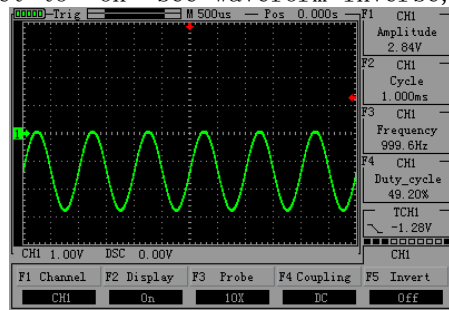


Figure 2-7 waveform inverse

4. Waveform display Settings

By setting allows any channel of waveform display or not.
for example:To set the waveform does not display the CH1 channel

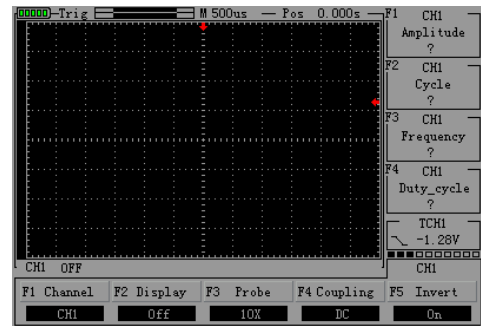




Figure 2-8

- Press "CH1"→"F2", set the CH1 channel does not display The waveform. As shown in figure 2-8

5.V/vertical adjustment Settings

In regulating the vertical v/cell, v/range is 100 mv/div - 50 v/div (probe 10 x), stepping in 1-2-5 ways, or 10 mv/div - 5 v/div 1 x (probe), 1 v/div - 500 - v/div (100 x) probe. Take the case of CH1 channel:

- Such as setting the vertical direction of 2.00 V/div, To probe is set to 1 x gear as an example

- Press "  " to adjust the vertical v/case, at the same time can press "  " to move up, down

the entire waveform. As shown in figure 2-9

- Such as setting the vertical direction of 1.00 V/div, operation steps as above. As shown in figure 2-10

●Set the waveform relatively level move up or down. As shown in figure 2-11

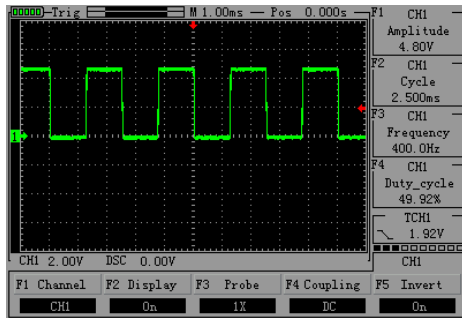


Figure 2-9 set 2 v/vertical

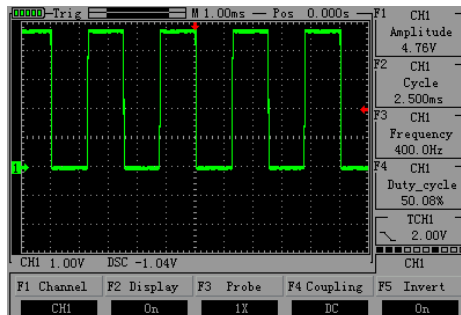


Figure 2-10 sets 1 v/vertical

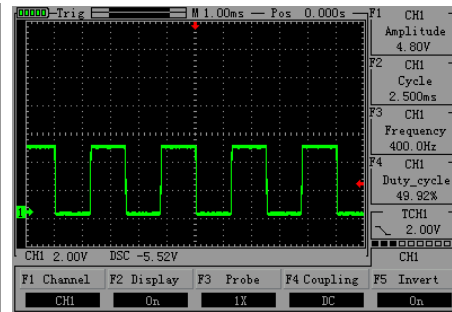


Figure 2-11 move the waveform

2.5 The level of system

System Settings level scale and level trigger point position, horizontal center of the screen calibration is waveform time benchmark (reference). Change the horizontal scale can lead to waveform relative to the screen center expansion or contraction. Horizontal position change the position of the waveform is relative to the trigger point.

Horizontal position of the change is to display waveform changed position relative to the level

of trigger point.

- Time base (TIME/DIV)

Use the buttons below to change the base size, says horizontal on each of the big length of time

- Press the " " button to change the level of scale, in order to enlarge or reduce waveform.

If you want to stop the waveform acquisition, then press "RUN" button can be realized. As shown in figure 2-12,2-13

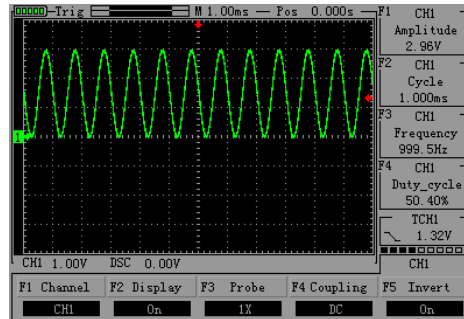


Figure 2-12

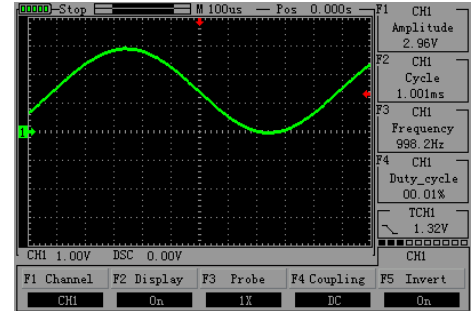


Figure 2-13

- Press the " " button to adjust the channel

wave forms of horizontal position. According to the change of the time base and its amplitude changes. As shown in figure 2-14

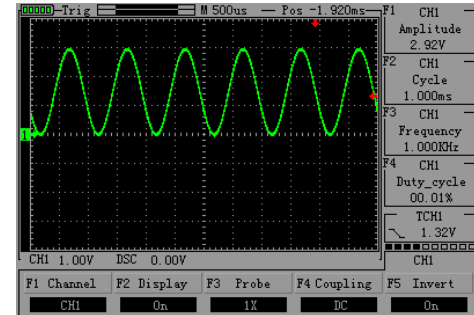


Figure 2-14 level mobile waveform

2.6 The trigger system

Trigger determines the digital storage oscilloscope when to begin to collect data and display waveform. Once the trigger is set correctly, he can convert unstable display into meaningful waveform. TRIG control menu key;

- Trigger control

Trigger mode: the oscilloscope triggering method for edge trigger.

- Edge-triggered: when a trigger signal to the edge of a given electricity at ordinary times, trigger. Edge trigger mode is on the edge of the input signal trigger threshold. When "edge-triggered", namely along the falling edge, the trigger in the rise of the input signal.

Table 2-3 edge-triggered menu function table



source	CH1	Set the CH1 to source trigger signal
	CH2	Set the CH2 to source trigger signal
slope	rising	Select trigger signal is rising along the trigger
	falling	Choose falling edge trigger signal in the trigger
triggered	automatic	Set up under the condition of no detected trigger can also collect waveform
	normal	Set up only when the trigger condition collecting waveform
	single	Set when detected a trigger to collect a waveform, then stop

Instructions:

Set the source:

1, press "TRIG" display trigger menu, according to the signal input, press "F1" choose "CH1" or "CH2".

Set the trigger level

2, press the "CH1" button, then press "" button to adjust the lower left panel channel 1 mark; Click "TRIG" and press "" button on the right side panel again adjusting trigger flag arrow, according to the trigger marks relative channel 1 position and the current vertical per division on behalf of the voltage value to set the trigger level size.

Set up the slope,

3, press "F3" button to choose the slope for the "up" or "down".

Set the trigger mode:

4, press "F4" choose "automatic", "normal" or "single". As shown in figure 2-15, 2-16

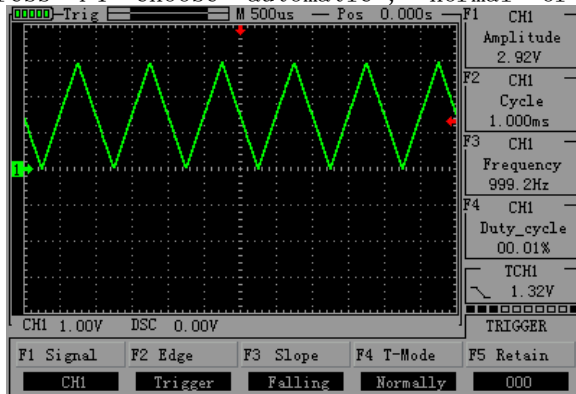


Figure 2-15 normal trigger

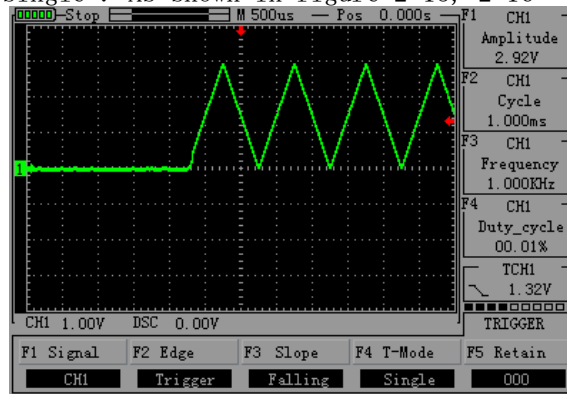


Figure 2-16 single trigger

2.7 The storage system

JHJDS30 series hand held digital storage oscilloscope reference waveform can be stored in the two groups (Ref - A, the Ref - B), 6 set of screen shots to oscilloscope in internal storage.

- First find a screen shot interface press "MENU"→"F4" Screen shot is set to "off"
- Reference waveform storage: press the "MATH" find reference waveform Settings→ "F1" Settings stored reference waveform Ref - A, then press "OK" button, which shows "SAVING" reference waveform is saved
- See the reference waveform: according to the "MATH"→"F1"→"F3" open the Ref - A reference waveform, as shown in figure 2-17

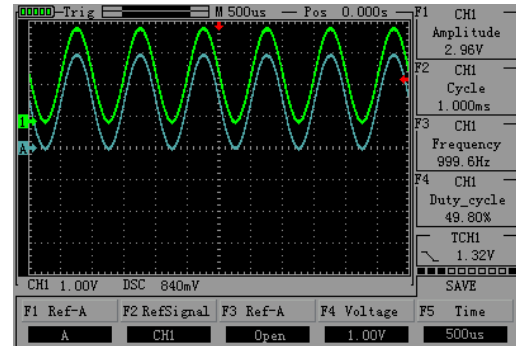


Figure 2-17 check the reference waveform

- Intercepting waveforms images: press "MENU" can be set to find the screenshot of the page - "F4" the screenshot is set to "on", then press "OK" to save screenshots, need to save a screenshot, press "F5" set the screenshots serial number. Used in this manual waveform images are from an oscilloscope screenshots, etc.

- Low check capture images:

Turn off the oscilloscope first, and then connect the oscilloscope and computer with USB data cable is good, and at the same time, press the "OK" button and "PRW" button on the screen to the bright can let go; At this point, the computers will be prompted to have U disk inserted, open the U disk can see pictures of interception. After the operation, please click on the computer to exit the U disk mode, then disconnect the cable, long press oscillograph "PRW" button to turn it off.

2.8 Auxiliary system

- Auxiliary function by pressing the "MENU" MENU and F1 ~ F5 selection function key set. "MENU" button pop-up auxiliary system feature set MENU. Table 2-4

Table 2-4 auxiliary function table menu

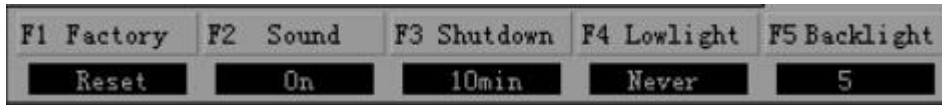
The function menu	Directions
voice	Set the voice "on" or "off"
Automatic shutdown	Can be set up "ten minutes", "30 minutes after shutdown or" Never "(Never) to turn it off
Save electricity	Can be set up for 20 seconds, "40 seconds," 60 seconds "and" enter power saving mode after the "300 seconds" or "Never" mode
Factory pattern to restore	Restore the factory Settings

Settings: press "MENU" find auxiliary function MENU page, → Press "F2" set the voice "on" or "off".

Set up automatic shutdown: press "MENU" find auxiliary function MENU page, → Press "F3" set the automatic shutdown time.

Settings save electricity: press "MENU" find auxiliary function MENU page, → Press the "F4" set time to save power.

Set up the factory pattern recovery: press "MENU" find auxiliary function MENU page, press "F1" → "F5" the recovery of oscillograph.



- MEAS: Press the "MEAS" screen will display the current measurement menu

2.9 The cursor measurement

In this mode, the cursor X or Y way come in pairs, and can be manually adjust the spacing of the cursor. Reading is the measurement of voltage or time value. Manual cursor measurement, follow these steps:

- When using the cursor, needs first to set the source into all you have to measure the channel. Press the "HORI" → "F2" select source channel (in this setting for CH1)
- Press the "F1" choose "time", "voltage" or "off"
- By clicking on the "◀", "▶", "▲", "▼" button to adjust the cursor position. as shown in figure 2-18. 2-19

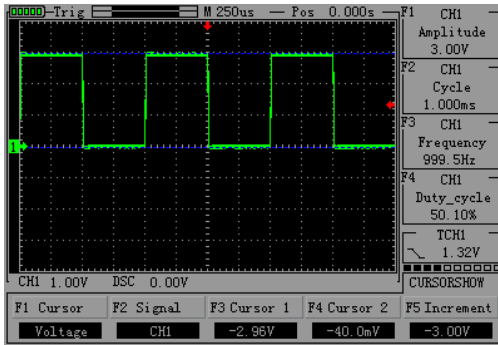


Figure 2-18 cursor voltage

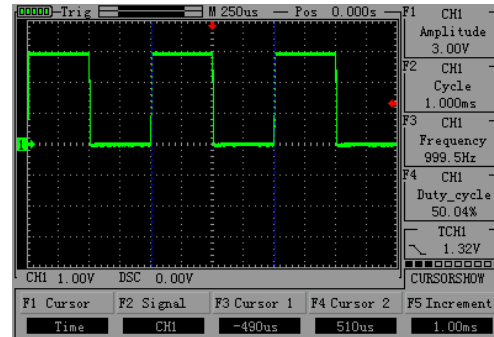


Figure 2-19 cursor measurement time

2.10 Mathematical function

Mathematical function is to display the function of the CH1 and CH2 channel wave forms as addition, subtraction

Table 2-5 math menu functions

Function menu	set	instructions
According	On or off	Set the waveform operation on or off

Operation	CH1+CH2	Channel 1 waveform + 2 waveform
	CH1-CH2	Channel 1 waveform - 2 waveform
	CH2-CH1	Channel 2 waveform - 1 waveform

● Press the "MATH" button, then press "F2" set the display "on", press "F3" choosing operation mode.

Note: only the dual-channel oscilloscope (JHJDS3022A/JHJDS3022E) have this function.

The third chapter Signal generator

This chapter mainly introduces the interface and how to use the signal generator signal

generator. Signal generator interface at a glance, is also very convenient to operate. Content summary:

△ The user interface signal generator is introduced

△ Signal generator operating instructions

△ Custom waveform signal generator

Table 3-1 generator parameters

waveform	frequency	amplitude	The offset	Duty ratio
Sine wave	1HZ~20MHZ	100mV~4V	<u>+2V</u>	/
Square wave	1HZ~5MHZ	100mV~4V	<u>+2V</u>	0%~100%
Triangle wave	1HZ~1MHZ	100mV~4V	<u>+2V</u>	/
Oblique wave	1HZ~1MHZ	100mV~4V	<u>+2V</u>	/
Custom waveform	1HZ~1MHZ	100mV~4V	<u>+2V</u>	/

3.1 The user interface signal generator is introduced

1. waveform

7. According to amplitude

- 2. frequency
- 3. amplitude
- 4. offset
- 5. Duty ratio
- 6. According to the frequency
- 8. According to duty ratio
- 9. According to the offset
- 10. According to the waveform
- 11. x, y coordinates

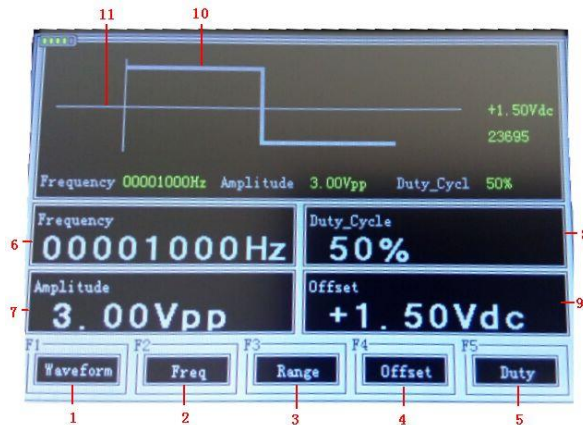


Figure 3-1 signal generator interface





3.2 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

Coefficient of frequency division 1	Formula: $((125000 * 0 \text{ xa3d}) / (65536 * 2)) * 25 / \text{frequency} + 1$
Coefficient of frequency division 2	Formula: $((\text{frequency} * (\text{points} + 1) * (\text{coefficient of frequency division 1}) * 65536 * 2) / 25000) / 250000$
points	Formula: $((\text{u32}) ((\text{u32}) ((250000 * 0 \text{ xa3d}) / (65536 * 2)) * 25000) / \text{frequency}) / \text{frequency division coefficient of 1} - 1$
data	Points out, according to the points to fill in the corresponding values

● A custom waveform instructions

① Create a new text document data calculated according to table 3-2 write a text document format and save, copy the text documents into the oscilloscope. The oscilloscope custom has two waveforms, can enter the oscilloscope waveform parameter interface to view a text document BX2 BX1, text documents.

② Into the signal generator interface, press the " → " or " " button to call a stored custom waveform, see the waveform after long press" MENU " → interface, press" F1 "into the oscilloscope waveform can be displayed from the definition.

The fourth chapter Multimeter function is introduced and the operation

Gradually in this chapter introduces the oscilloscopes multimeter functions, provides a basic

operation on menu and use examples. Multimeter use 4 mm safety rubber socket input, 10 A, mA, COM, V Ω input terminals.

Content summary:

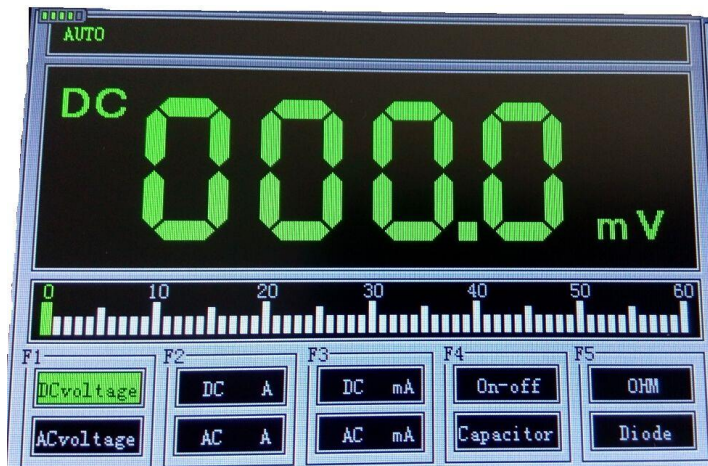
△ Multimeter interface is introduced

△ Multimeter instructions

4.1 Multimeter interface is introduced

Figure 4-1 multimeter interface

Table 4-1 Range multimeter




Measuring type	Amount of routine						
	Dc voltage	600.0mV	6.000V		60.00V		600.0V
Ac voltage	600.0mV	6.000V		60.00V		600.0V	750V
Dc current	60.00mA/600.0mA			6.000A/10.00A			
Ac current	60.00mA/600.0mA			6.000A/10.00A			
resistance	600.0 Ω	6.000 Ω	60.00k Ω	600.0k Ω	6.000M Ω	60.00M Ω	
capacitance	40.00 nF	400.0nF	4.000uF		40.00uF	400.0uF	4000uF
diode	0V~2.0V						
On and off	Below 30 Ω 600.0 Ω gear detection, voice						

Note: contact with capacitance of the test on both ends of the 30 s

4.2 Multimeter instructions

Table 4-2 multimeter operation keys function description

The keys	instructions
F1	Select "dc voltage" file shortcut, ac voltage, dc voltage switch button
F2	Select the "dc" A file shortcut keys, "dc", "communicate A" switch button
F3	Dc mA "selected" file shortcut keys, "dc mA", "communication mA" switch button
F4	Select the "on-off" file shortcut keys, "on-off", "capacity" to switch button
F5	Selected file shortcut "resistance", "resistance" and "diode" switch button
RUN	Multimeter run/maintained (HOLD) button
	Press set to manual, range can be set up by this button
AUTO	Press set to automatic

1. Dc and Ac voltage measurement

- ① Take black pens and the instrument ".com "terminal, red pens and pick up the instrument Ω V "terminals.
- ② Long, oscillographic table "PRW" button to boot and then press "F5" button (or if the oscilloscope in other interface time holding down the "MENU" button to press "F5") to switch to the multimeter function interface.
- ③ Press the "F1" button to select the dc voltage, or press the "F1" once again and switch to

the "voltage" file.

- ④ Connect the test pen to voltage or power supply under test, the display value can be read. At the same time, the red pens and receive polarity can also be through the LCD display shows the value of the positive and negative. (when the ac voltage measurement non-polarity display) the instrument defaults to "automatic" range.

2. Dc and Ac current measurements

- ① Press "F2" or "F3" will block adjustment to the required range
- ② The black pens and receiving apparatus ".com "terminal, red pens and pick up in" mA ", the largest terminal input current of 600 mA.
- ③ The measurement of pens and string into the circuit under test to read values.

Note: if the current signal under test before the unmeasured is unknown, please press "F2" to gear to the "dc" or "communication A" file.

3. On and off the test

- (1) Take black pens and the instrument ".com "terminal, red pens and pick up the instrument Ω " V "terminals.
- (2) by pressing the "F4" button to select "on-off" file.
- (3) when the test is less than 30 Ω resistance or lines, the built-in buzzer will sound.

4. Capacitance measurement

- (1) take black pens and the instruments of ".com "terminal, red pens and pick up the instrument Ω " V "terminals.
- (2) by pressing the "F4" key to switch to the "capacity".
- (3) the measurement pens and connect to stay for about 30 seconds on both ends of the capacitor, can read the capacitance value.

5. Resistance measurement

- (1) Take black pens and the instrument ".com "terminal, red pens and pick up the instrument Ω " V "terminals.
- (2) Press "F5" button to select "resistance".
- (3) On both ends of the resistance under test to measure the pens and connection, the display value can be read, also can be set manually if necessary Range.

6. Diode test

- 1) Take black pens and the instruments of ".com "terminal, red pens and pick up the instrument Ω " V "terminals.
- (2) Press "F5" key to switch to the "diode" file.
- (3) Take pens and test in the diode under test or the ends of the line, a reading. (measured diode readings for diode conduction voltage drop)

Note:

- A. The instrument shows a forward and reverse pressure drop, when the diode reverse connection, instrument display value is negative.
- B. Diode and on-off range default are "automatic", not manually range.
- C. When testing on and off, to ensure "voices" has been open, otherwise, the buzzer will not sound.

Settings can be carried out in accordance with the following steps:

Long press "MENU" button, then press "F1" into the interface, and then press the "MENU" button, find the voice operation MENU, press "F2" will be set to "on" sound.

7.Data remain functional

Press the "RUN" button on the instrument, is showing the data will remain on the screen, screen displays the word "HOLD" among, even if the input signal to change or eliminate, value will not change.

Note 1: when using a multimeter to measure, the oscilloscope probe do not grounded!

Note 2: please select correct measuring gear and measured again after range!

The fifth chapter The recorder and center using the serial port

This hand-held oscillograph with signal generator function not only, also integrated with recorder and serial port center function, greatly convenient for all aspects of customer demand. Recorder can automatically record the waveform, a serial port center can be real-time monitoring data from the serial port through digital channels and display on the screen. This chapter, the main content is as follows:

△ The use of the recorder

△ Delta serial center operations

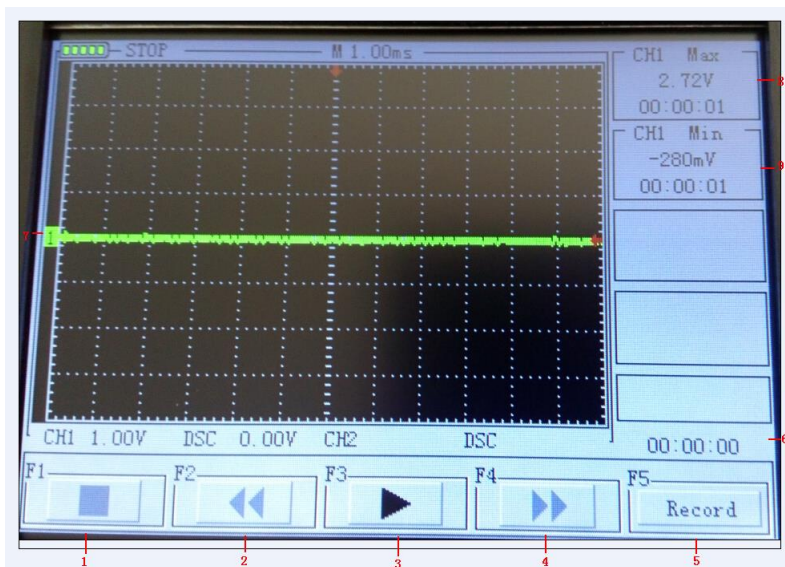
5.1 The use of the recorder

- First enter the recorder interface: hold down the "PRW" button, enter the boot interface press "F4" key to enter the recorder interface (or in other interface such as the oscilloscope can be long press "MENU" -> "F4"). Figure 5-1
- Enter the interface, the screen in the middle horizontal line in the state of moving from

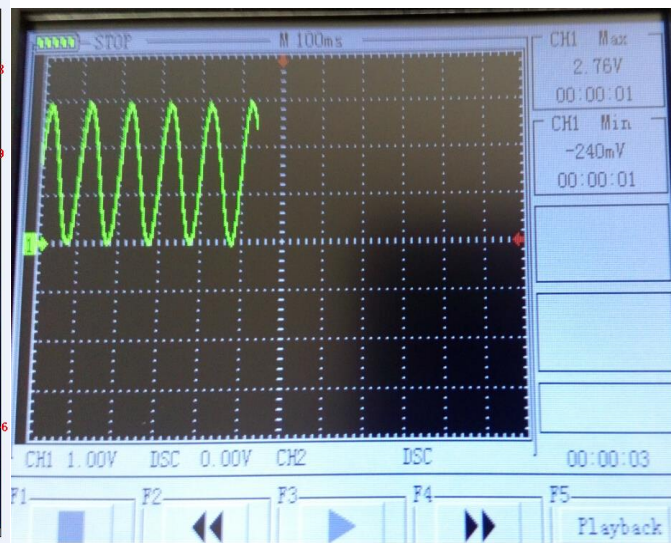
left to right, connect the probe to the oscilloscope, to record the signal, and then contact to enter record state, press "F3" in "F1" button to stop recording.

● After recording the waveform record can press "F5" playback waveform. As shown in figure5-2

Note: the recorder to record waveform frequency range of 20 Hz waveform, records need to access the oscilloscope interface manually adjust the time base for 100 ms above waveform display.



5-1 The recorder interface



5-2 Record the playback

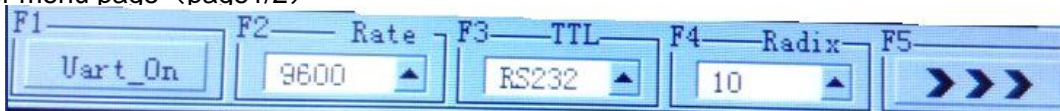
5.2 A serial port center operations

- First enter the oscilloscope interface: hold down the "PRW" button, enter the boot interface

according to the "F1" button to enter the oscilloscope operating interface, and then press "CH2" -> "F3" will gear is set to 1 x. (this step is very important)

- To probe the gears is set to 1 x.
- Into the heart of the serial interface: long press "MENU" -> "F3". Menu interface is as follows:

A serial port center menu page (page1/2)



A serial port center menu page (page2/2)



Table 5-1

Menu item		Instructions
-----------	--	--------------

Serial port	Serial port, serial port	Open or close a serial port
Baud rate	1200~512000	Set the serial port baud rate, can be set to 1200 ~ 512000 a total of 13 kinds of baud rate
TTL	RS232、TTL	Set the communication level mode
Into system	10 16	Set the data type
▶▶▶▶	/	Turn to next page menu
Data bits	8 9	Set the data transmission digits
Check digit	NO ODD EVEN	Set the parity bit
Stop bit	1 0.5 2 1.5	Set the stop bit
File	SAVE NOSAVE	Set to save or not save the file
◀◀◀◀	/	Turn to the previous page menu

● A simple test

Here simple test data from the computer serial port, the operation is as follows:

(1) Open the master computer "serial" serial debugging tools, such as set the baud rate to 9600, 8 bits, check the NO, 1 stop bit to send data base "11 22". As shown in figure 5-3

(2) is set to the same as (1) at the center of the serial port Settings, by F1 ~ F5 to select a menu item, and then by pressing the "▲" or "▼", selected set parameters, finally press the "OK" key.

(3) Open the computer serial port, and set to cycle to send (here to send a set to 1000 ms), press "F1" key to open the serial port serial center

At this point from the display window can observe the hexadecimal computer serial port to send data "11 22". As shown in figure 5-4

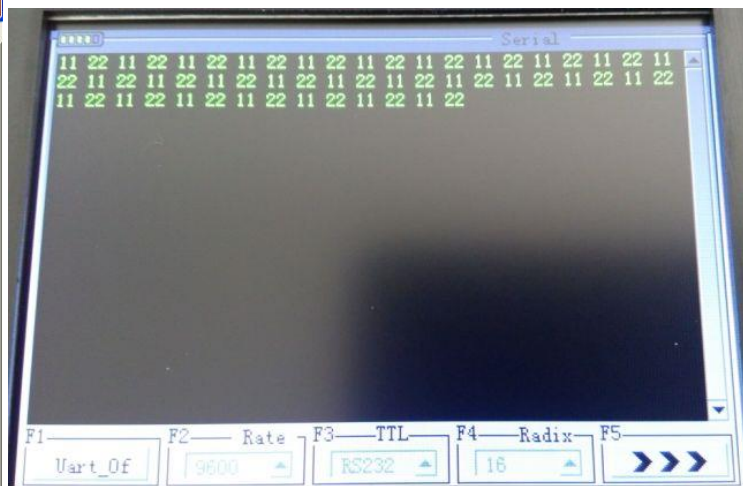
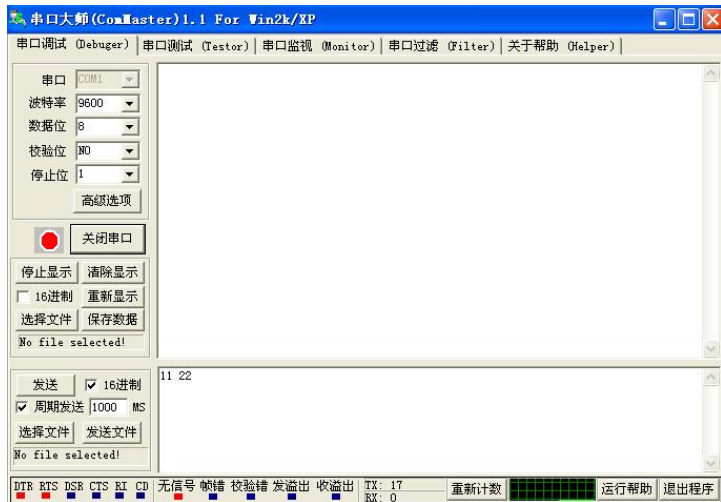


Figure 5-3 master serial port

Figure 5-4 center of serial interface

The sixth chapter Examples of application

6.1 Simple signal measurement

An unknown signal observation circuit, rapid display and measure the signal frequency and amplitude.

● To quickly display the signal, please click the following steps:

(1) Set probe menu attenuation coefficient to 10 x, and set the switch on the probe to 10 x, connect the probe to the oscilloscope channel 1 (CH1).

(2) Long press "PRW" button, then press "F1" to enter the oscilloscope (or if the oscilloscope in other functional interface, press "MENU" -> "F1").

(3) Will probe received corresponding clamp circuit, CH1 probe were connected to the circuit.

(4) Press the "AUTO" button.

Digital storage oscilloscope is automatically set to waveform shows best. Based on this, you can further adjust the vertical and horizontal gear of waveform, until the waveform display meet your requirements.

● For automatic measurement signal voltage and time parameter

Digital storage oscilloscope can be automatic measurement for most display signal, to measure the signal frequency and peak value, please click the following steps:

(1) Press the "AUTO" button, can quickly measure the current waveform.

(2) Page, according to the CH1 button that can be observed frequency and peak values.

At this point, the frequency and peak values measured values are displayed on the screen on the right side position. As shown in figure 6-1

6.2 The cursor measurement

The digital storage oscilloscope can be automatically measured a variety of waveform parameters. All of the automatic measurement parameters can be measured by the cursor. Use the cursor can be quickly on the waveform on time and voltage measurements.

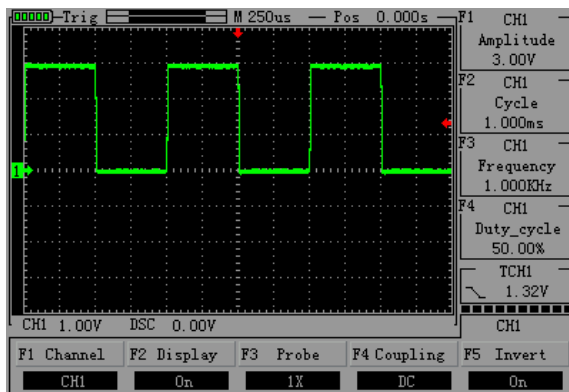


Figure 6-1 square wave

● Measuring the square wave signal peak voltage

CHI channels, for example, to measure the square-wave signal peak voltage, please click the following steps:

- (1) Press the "HORI" button to enter the main base state of the cursor Settings.
- (2) Press "F1" button sets the cursor type to "voltage", press "F2" button to set the source to

the CH1.

(3) Through the cursor display window to see the cursor 1 and 2 cursor location (relative to the middle of zero voltage reference is horizontal) and delta (the cursor 2 - light the differential pressure after 1).

(4) By "▲", "▼" button to adjust the position of the cursor 2 "◀", "▶" buttons to adjust the position of the cursor 1; And the position of their change and incremental will update the display the cursor display window in real time. As shown in figure 6-2, 6-3

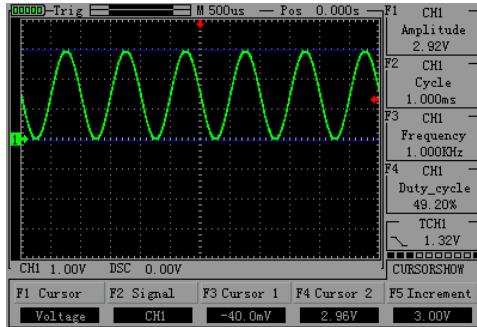


Figure 6-2 cursor to measure
6.3 To capture a single signal

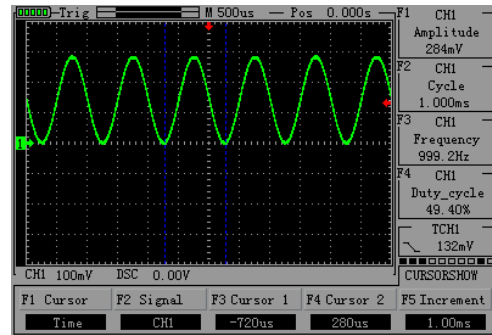


Figure 6-3 cursor measure

Advantages and characteristics of digital storage oscilloscope is possible to easily capture pulse, burr and other non periodic signal, if capture a single signal, you first need to signal has certain prior knowledge, to set the trigger level and trigger along. If the signal uncertainty may be triggered by automatic or normal way to look at the first, to identify the trigger level and trigger along.

Steps are as follows:

- As aforesaid set probe and CH1 channel attenuation coefficient to 10 x.

- To trigger the set:

- (1) Click CH1 - press "F3" button, set the coupling to the "dc".

- (2) press "TRIG" button, display the edge-triggered menu Settings.

- (3) under this menu, press "F1" set edge type for the "slope", press "F2" button to set the source to the CH1, press "F3" button to set the trigger mode for the "single".

- (4) according to the "RUN" button, the left upper corner of the screen shows "Ready", waiting for the signal to conform to the trigger condition. If a signal to set the trigger condition, namely, sampling time, displayed on the screen. Using this function can be easy to catch a chance, for example, the sudden low level: sets the edge trigger to drop along the trigger, press "RUN" button to start waiting, when there is a low level occurs, the machine

will automatically trigger and trigger a before and after a period of time waveform recorded. Triggered by "HORI" can change the location of the horizontal position, resulting in different lengths of negative delay trigger, is advantageous for the observation of high level before and after the waveform. As shown in figure 6-4

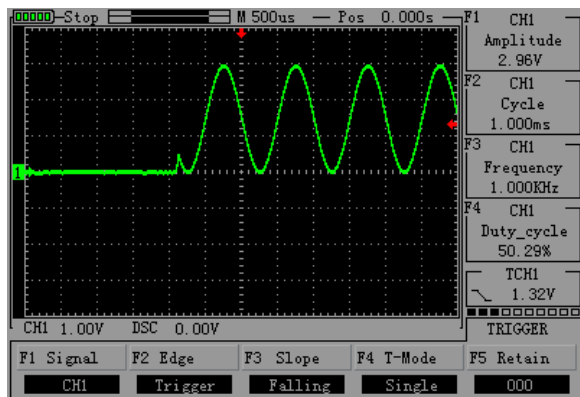


Figure 6-4 To capture a single signal

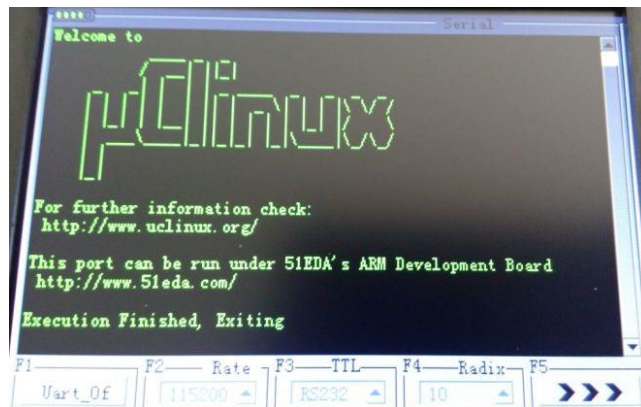


Figure 6-5 Serial print uclinux system startup information

6.4 A serial port center print uclinux start information


This example introduces using oscilloscope serial print center uclinux startup information. First of all, into the oscilloscope interface set channel 2 (CH2) to X1, then probe received CH2, clamp to a serial port GND, probe by serial port TXD port. Finally, will enter the center of a serial port baud rate is set to 115200, the data set to decimal and opens a serial port. When to start the uclinux system can be observed in the screen of oscillograph serial print uclinux startup information. As shown in figure 6-5

6.5 Generate sine wave signal

This handheld digital storage oscilloscope with function signal generator, the signal generator can produce sine wave, square wave, triangle wave, oblique wave four kinds of wave shape. Here signal generator to generate sine signal (3 v, 1 KHZ) flash is as follows:

① Long press "PRW" button, then press "F2" into the signal generator interface (or if the oscilloscope in other functional interface, long press "MENU" -> "F2")

② Enter the operation interface, press "F1" set the waveform type, in this setting for sine wave.

③ Press "F2" button, and then by pressing the "  " button to adjust the signal frequency size adjustment and press the " OK "key, in this setting is 1 KHZ.

④ Press "F3" button, and then by pressing the "▲▼◀▶" button to adjust the signal amplitude size, adjust good after press "OK" button, the set to 3 v

⑤ Press "F4" button, and then by pressing the "▲▼◀▶" button to adjust the signal offset, adjust good after press "OK" button, in this setting is + 0.00.

After all set, finally shows the waveform is shown in figure 6-6, shown in figure 6-7:

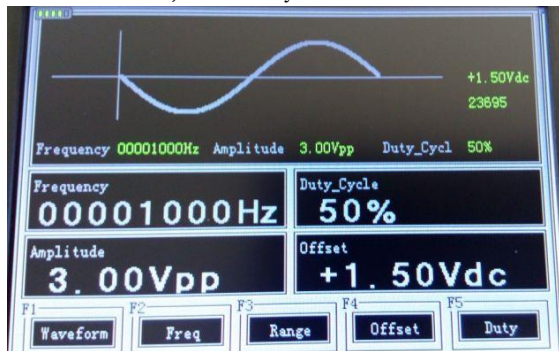


Figure 6-6 generate sine wave

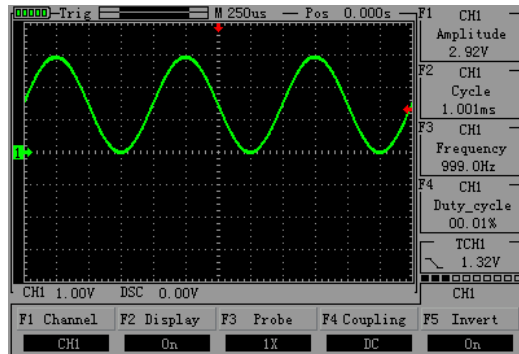


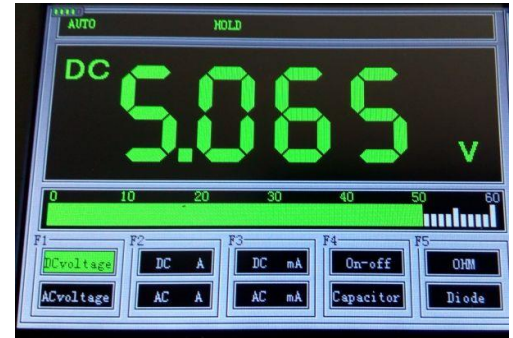
Figure 6-7 sine wave

6.6 Multimeter to measure dc voltage

● Using automatic (AUTO) to measure dc voltage

- ① Long press "PRW" button, then press "F5" multimeter into the interface (Or if the oscilloscope in other functional interface, long press "MENU" → "F5")
- ② Press the "F1" button to select "dc voltage".
- ③ The multimeter pens and the dc voltage under test.

As shown in figure 6-8



The seventh Chapter System prompts and troubleshooting

Figure 6-8 DC voltage

7.1 Message system

SAVEING: When stored waveform or screenshot, the system will have the prompt show, and in the middle of the screen has a progress bar.

CLOSING: After startup when long press "PRW", when the battery is too low, or when to oscilloscope set off time, system will have the hint, and in the middle of the screen has a progress bar.

USER1 RUNNING:Waveform signal generator can run

USER3 NO FILE:Signal generator no waveform file

7.2 Fault handling

1. If you press the "PRW" oscilloscope still black screen, no any display, please follow the steps below:

- (1) open the instrument battery back cover, and check whether there is a battery power supply or leakage, bilge gas, etc
- (2) if you have a multimeter to measure the lithium battery voltage on both ends (normal is not lower than 3.0 V)
- (3) check finished, restart the instrument.
- (4) if still can't normal use this product, please contact us.

2, after the acquisition signal, the picture does not appear in the signal waveform, please follow the steps below:

- (1) check whether the probe is normal on the signal cables.
- (2) check signal cable is normal on the BNC.
- (3) check whether the probe is connected to the normal object under test.
- (4) check whether the object under test signal.
- (5) to collect the signal again.

3, the measured voltage amplitude value is 10 times greater than the actual value or small 10

times:

Check whether the channel attenuation coefficient is consistent with actual use of probes attenuation ratio.

4, a waveform display, but can not be stabilized:

Check whether triggering menu of trigger source set is consistent with the actual signal input by the channel.

5, press the "RUN" button without any display:

Check whether the trigger menu trigger mode is in a "normal" or "single", and the trigger level is beyond waveform range. If so, will trigger level center, or set the trigger mode to "AUTO".

6, waveform display ladder shaped:

This phenomenon is normal. May level when the gear is too low, increase the level of time base can improve horizontal resolution, improves the display.

The eighth Chapter Service and support

8.1 Warranty profile (JHJDS30xxx series portable digital storage oscilloscope)

Guarantee the production and sales of products of the company, two years from the date of delivery in authorized dealer, there will be no material and process defects. As in the detailed rules of product warranty to prove defective, we will repair or replacement service. In addition to the profile or guarantee the use of any of the warranty, we do not make any express or implied, including but not limited to implied warranties of merchantability and special applicability. The company for indirect, special, or shall not be liable for the resulting damage.

Appendix A: technical specifications

Unless otherwise specified, all technical specifications are used to set the attenuation switch as 10 x of the probe and the series oscilloscope. To verify the oscilloscope is in line with the technical specifications, the oscilloscope must meet the following conditions:

- Oscilloscope must be within the specified operating temperature run continuously for more than thirty minutes.
- If the operating temperature range, reach or exceed 5 degrees are calibrated, in addition to the specifications marked "typical", all specifications are guaranteed.
- Low oscilloscope must belong to the factory calibration period.

Technical specifications

Input	
Input coupling	AC, DC
Input impedance	1M Ω \pm 2% 20pF \pm 5pF
Maximum input voltage	40 v (X1 probe); 400 v (probe X10) measurable voltage 220 v; (probe X100) 1000 v voltage can be obtained
Probe attenuation	1X, 10X
Probe attenuation coefficient setting	1X, 10X, 100X
Signal acquisition system	
Sampling methods	Real-time sampling and random sampling

The depth of the storage	16K
Acquisition mode	Sampling, peak detection
Vertical system	
Vertical sensitivity	1 x 10 mv - 5 v (probe), 100-50 mv v (probe 10 x) 1 v to 500 v (100 x) probe (1-2.5-5 step)
Vertical accuracy	+3% -
Vertical resolution	8bit
bandwidth	30MHz
Level of system	
Real-time sampling rate	250 MSa/s
Horizontal scanning range	10 ns - 50 ms (1, 2.5, step 5), 100-5 s ms Scan (Scan)
Trigger system	

Model	Automatic, normal and single
Type	Rising and falling edge
Automatic detection	Support (50 hz to 60 MHZ)
Mathematical operations	CH1+CH2、CH1-CH2、CH2-CH1
Measurement system	
The cursor measurement	The cursor support time and voltage
Measuring way	Automatic , manual
Measurement	Amplitude, frequency, duty cycle, cycle
Equipment	
Screen	4.3 -inch 16-bit true color TFT 400 * 272
Battery	Section 3000 + mA lithium batteries (single battery for 4 hours)
Size	220*128*37 (mm)
Signal generator	

Frequency	Sine wave (0 hz - 20 MHZ), square wave (0 hz - 5 MHZ), triangular wave/oblique wave (0 hz - 1 MHZ)
Duty ratio	0% - 100%
Amplitude	100mV - 4V
Offset	<u>+</u> 0V - 2V
Recorder	
Time base	100ms-5s
length	To be determined
A serial port center	
Baud rate	115200-1200
Data bits	8,9
Check digit	NO
Stop bit	1, 0.5, 2,1.5
Into the system	10,16

Multimeter	Amount of routine							
DC	600.0mV		6.000V		60.00V		600.0V	1000V
AC	600.0mV		6.000V		60.00V		600.0V	750V
Dc current	60.00mA/600.0mA				6.000A/10.00A			
Ac current	60.00mA/600.0mA				6.000A/10.00A			
Resistance	600.0Ω	6.000kΩ	60.00kΩ	600.0kΩ	6.000MΩ	60.00MΩ		
Capacitance	40.00 nF	400.0nF	4.000uF	40.00uF		400.0uF	4000uF	
Diode	0V~2.0V							
On and off	Below 30 Ω 600.0 Ω gear detection, voice							
Maximum resolution	6000 點							

Appendix B: Daily maintenance and cleaning

Daily maintenance

Do not to store your instrument or placed in a liquid crystal display long under direct sunlight.

Please do not let the spray, liquid and solvent on the instrument or probe, in order to avoid damage to the instrument and probe.

Please use the battery to charge batteries in time.

Clean

According to the operation often examine instruments and probes. Please click the following steps to the outer surface of the cleaning equipment:

1. Use soft cloth to wipe the instrument and probe the outside of the dust. Clean LCD screen, be careful not to scratch the transparent plastic protective screen.
2. Use a piece of soft cloth to wipe wet but not dripping instruments, please

remove the battery before wiping. Can use downy cleaner or clean water scrub. Do not use any corrosive chemical reagent in order to avoid damage to the instrument and probe.

Warning: before replace the battery, please make sure the instrument is completely dry, to avoid electrical short circuit damage caused by moisture instrument.