allosun® 奥胜®

HANDHELD DIGITAL OSCILLOSCOPE

手持式彩屏示波表

Model: EM1230

Users Manual

2 in 1 Handheld Color Screen Oscilloscope

Oscilloscope Function &
Digital Multimeter Function

Your Professional Choice!

Brief introduction. 3
General Safety Requirement. 4
Package Checklist. 5
The following items are included in this Instrument. 5
Chapter I Recognizing this product. 6
1. Product Description. 6
1.1 Front Pane. 6
1.2 Measurement port. 7
2. Panel keyboard and display interface. 8
2.1 Panel function keys. 8
2.2 Display Interface. 9
3. The main measurement function and menu structure 10
3.1 The main measurement function. 10
3.2 Menu structure. 10
Chapter II Use instrument. 19
1. Oscilloscope. 19
1.1 Test connection. 19
1.2 Oscilloscope measurement applications. 20
2. DMM. 24
2.1 Test the connection. 24
2.2 Multimeter. 24
Chapter Ⅲ Interface and Software. 26
Chapter Ⅳ Maintenance and repair. 28
Chapter Ⅴ Warranty. 30
Chapter Ⅵ Technical Specifications. 31

Brief introduction

EM1230 is a 25MHz digital storage oscilloscope,6000 words True RMS Digital Multimeter functions integrated multifunctional handheld instrument, ideal for field use.

The main function

- 2-channel ,25MHz digital storage oscilloscope
- True 6000 words RMS digital multimeter

Features

- 100MSa / s real-time sampling rate, 25MHz real-time bandwidth
- Automatic tracking measurement: automatic tracking based on external input signal to adjust the vertical amplitude \ horizontal time base and trigger stalls, without human intervention
- Large dynamic measurement range: no extended probe leads directly measure range from 10mV/div to 500V/div
- Screen can display 4 measurement parameters：the user can choose RMS, peak, average, frequency, period, in 22 kinds of parameters as needed, etc.
- Two kinds of cursor measurement mode selection
- 320 * 240 dot TFT LCD,
- Built-in battery, AC and DC
- Recorder --- continuous track record up to 12 hours of event
- Standard USB interface, through the PC software can easily communicate with a computer for data analysis and test results archive

General Safety Requirement

Carefully read the following safety information to avoid personal injury and the damages of this product or any other connected products. To avoid all possible dangers, this product only should be used in stated range.

Only an eligible technologist has the maintenance right

Avoiding fire or personal injury

Use the proper power adapter. Use only the power supply or sanctified power adapter.

Connect or disconnect correctly. Do not connect or disconnect probes and test leads at will when they are connected to the power.

Notice all terminals' ratings. To avoid electrical shock or fire, notice carefully all ratings and signs of this product. And read carefully the users manual to get more information about the ratings before connect to this product.

Do not operate the meter without its cover. Do not use the meter if its cover or panel has been unloaded.

Avoid touching bare circuit. Do not touch the bare nodes or parts of the product with power on.

Do not operate with dubious troubles. If you have dubious troubles on the product, let an eligible technologist have a check.

Do not operate under a humid environment.

Do not operate under an explosive environment.

Keep the meter clean and dry.

Safety terms and signs

This manual is possible to show following terms

⚠ **Warning.** The word Warning indicates that the condition or the operation maybe cause personal injury.

⚠ **Carefully.** The word Carefully indicates that the condition or the operation maybe cause the damages of this product or other properties

Package Checklist

The following items are included in this Instrument

No.	Description	Quantity	Remark	
1	Handheld Oscilloscope	1		
2	Li Battery Pack	1	installed	
3	AC/DC Power Adapter	1		
4	Oscilloscope Probes	1		
5	Multimeter Test Leads	2	(red, black)	
6	USB Cable	1		
7	Current Probe	1	Optional	
8	Users Manual	1		

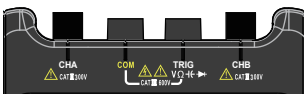
Chapter I.Recognizing this product

1、 Product Description

1.1 Front Pane

The Product is a handheld portable products, AC and DC power supply, 3.7V lithium battery inside the instrument; external AC-DC adapter with 220/5V can provide external power and charge the lithium battery inside the instrument instrument

1.2 Measurement port



CHA、 CHB： External signal input test port, CHA and CHB either as single-channel oscilloscope can also be used as a dual-channel oscilloscope in the oscilloscope mode.

COM： Oscilloscope and multimeter measurements common ground port

TRIG:

1）Oscilloscope mode：Used in SCOPE mode to trigger (or start) acquisitions from an external source

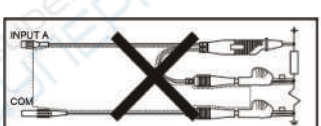
2）Multimeter mode：DC voltage \ AC voltage \ Resistance \ Continuity \ Diode \ capacitance \ current measurement input ports

Note:

1、Note that each port safety limit, do not exceed the maximum test range。

2、The multimeter testing current mode, you must use the current probe

3、Note that proper grounding



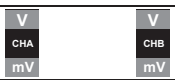
(Incorrect Grounding)

(Correct Grounding)

A ground loop can be created when you use two ground leads connected to different ground potentials. This can cause excessive current through the grounding leads

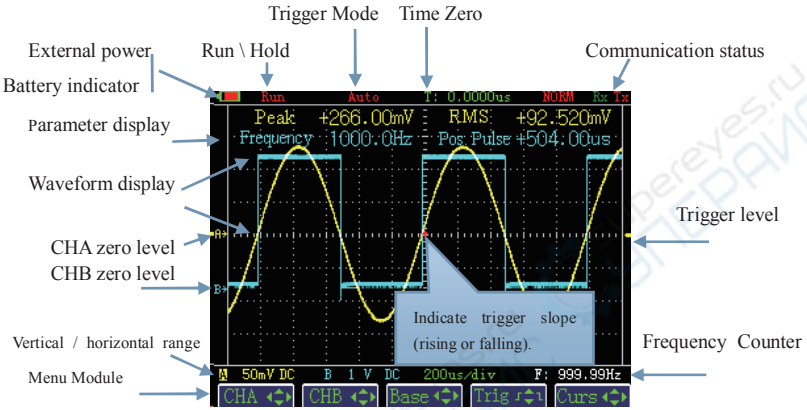
2 Panel keyboard and display interface

2.1 Panel function keys

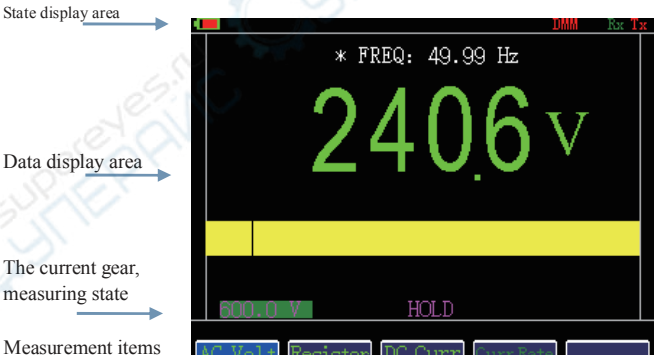
key	Description
	Function keys: The function assigned to each key is indicated by the Function Key Label displayed above the key on the bottom display  In most of the menu to return to the previous menu
	Run \ hold, lock screen
	Sets automatic ranging on and off (toggle). When on, the top right display shows AUTO. When this function is set on, it searches for the best range and time base settings and once found it tracks the signal. When this function is off, you should manually control ranging.
	In oscilloscope mode, use the key to adjust the CHA \ CHB channel vertical amplitude sensitivity
	Oscilloscope mode，Press the key, making the timebase adjustment effectively
	Menu softkey
	Move up and down a waveform \ trigger level \ voltage cursor; Manually change the sensitivity level of the base, multimeter voltage \ resistance \ capacitors \ Current gear change;  Can also be used as a return to the previous menu key
	Moves a waveform or Time cursor right and left; Ranges amplitude up and dow or Change the trigger edge; Move around and select the current coefficient bits，Menu selection
	Turns the power on and off (toggle). When you turn the power on, previous settings are activated.

2.2 Display Interface

2.2.1 Oscilloscope



2.2.2 DMM



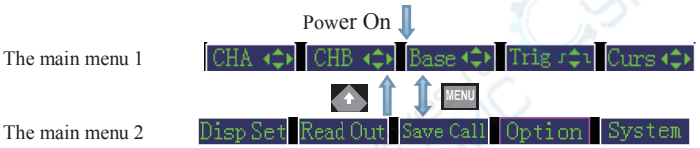
3、The main measurement function and menu structure

3.1 The main measurement function

The instrument has the oscilloscope, multimeter measurement function, wherein, the oscilloscope and multimeter are two independent measuring function.

3.2 Menu structure

The menu has two major main menu module, divided into two screen display，Press MENU key switch, each screen 5 menu module

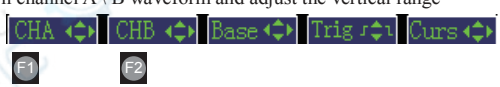


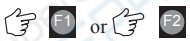
3.2.1 Oscilloscope menu operation

- **The vertical range**

1）Move up and down channel A \ B waveform and adjust the vertical range

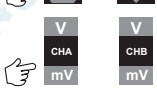
The main menu ：





Effective corresponding channel A, or channel B.

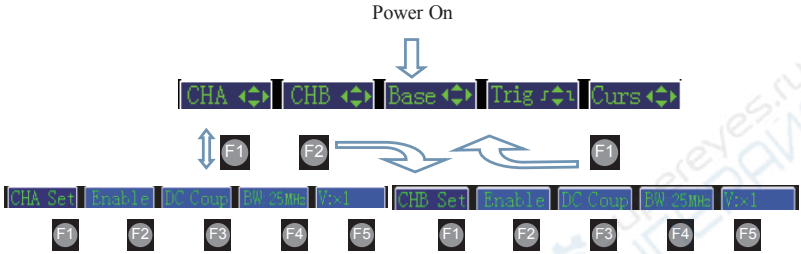
Move up and down waveforms.



Adjust the vertical range

Adjust the vertical range: 10mV/div ~ 500V/div(No probe attenuation，1:1）

2）Channel A\B other settings



F2 **Enable / disable the channel CHA / CHB:**

The instrument can display the input A or B input signal waveform in dual-channel oscilloscope mode, the input A and input B signals simultaneously displayed.if the user wants to measure individual signals, selectable single-channel oscilloscope mode, simply connect the input A that to the input B closed; Conversely, if the user wants to simultaneously measure two signals ,directly using dual-channel oscilloscope mode while connected to input A, input B.

F3 Select CHA / CHB signal coupling, **DC coup/AC coup**

DC Coupling allows you to measure and display both the DC and AC components of a signal. AC Coupling blocks the DC component and passes the AC component only.

F4 Select the CHA/CHB bandwidthlimit**BW25MHz/BW10KHz**

There are cases where you may want to filter out noises in order to see a better signal. This can be especially true when ignition noise is present. The instrument provides a noise filter for each input channel which reduces the bandwidth from its normal 25MHz to10KHz. You can enable or disable CH A Filter or CH B Filter using the INSTRUMENT SETUP menu. When enabled, the FILTER indicator appears on the screen.。

F5 Select the CHA/CHB voltage probe attenuation coefficient

V:×1/ V:×10/ V:×100/ V:×1000/ V:×10000

Or select the CHA/CHB current probe conversion coefficient

1mA/mV;10mA/mV;0.1A/mV;1A/mV;10A/mV

You can according to the probe type CHA or CHB (voltage probe, current probe) to select its

corresponding attenuation factor or conversion factor

- **Time base range**

Main Menu 

F3 Effective timing adjustment function, ↑ ↓ or s nS Horizontal compression expansion wave;

← → Moves the waveform in the horizontal direction

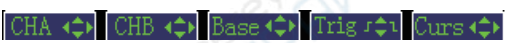
Time base range: 10ns/div ~ 2h/div

- **Trigger**

TRIGGER is a set of conditions that determine whether and when acquisitions start. The following will determine the trigger conditions

a) Trigger Edge; b）Trigger Level; c）Trigger Source; d）Trigger mode

1）Changing the trigger edge and trigger level

Main Menu 

F4 Effective trigger function

↑ or ↓ Move up and down the trigger level

← or → Changing the trigger edge ,If you select↑ , trigger occurs at a rising(positive) edge of the signal. If you select↓ , trigger occurs at a falling(negative) edge of the signal.

2） Change the trigger mode and select the trigger source

Main Menu to continue F4 Go to Trigger Set menu

F2 Select CHA trigger; F3 Select CHB trigger;

F4 Select the external signal as the trigger source;

F5 Select trigger mode: **AUTO** \ **NORMAL** \ **SINGLE**

AUTO: The instrument always performs acquisitions, i.e., it always displays the signals on the input.

NORMAL: If NORMAL is selected, a trigger is always needed to start an acquisition

SINGLE: SINGLE allows you to perform single acquisition to snap events that occur only once. R/H is used to start a next single acquisition.

F1 Return to the previous menu

- **Cursor**

A cursor is a vertical line or a horizontal line placed over the displayed waveform to measure values at certain points.The instrument can measure signal details by using Cursors ,Single cursor mode is suitable for absolute measurements, dual cursor suitable relative measurement。

1）Single cursor measurement mode

Main Menu 

F5 Effective single cursor mode, a red horizontal line and a red vertical line appears on the screen, representing the VOLTS and TIME cursors for measuring relative to the reference (amplitude and time) offset value。

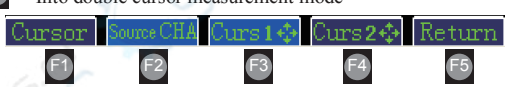
↑ or ↓ Move the cursor up and down the VOLTS cursor ; higher than the zero level line is positive, below the zero level line is negative.

← or → To move the TIME cursor left and right; negative at a time reference on the left, at the right time basis is positive。

Note: a single cursor mode is effective for channel A, channel B can be read out at the same time, the double channel value

2）Double cursor measurement model

Continue F5 Into double cursor measurement mode



F2 Effective CHA or CHB cursor

F3 The cursor 1 effective ↑ or ↓ Move up and down VOLTS cursor; ← or → to move the TIME cursor left and right。

F4 The cursor2 effective ↑ or ↓ Move up and down VOLTS cursor; ← or → to move the TIME cursor left and right。

In this mode, the two cursor is only valid for the current channel, two cursor each channel for the same type of cursor, or VOLTS cursor , or TIME cursor. Each cursor to measure the relative value of the deviation between the reference and the two cursors relative

Two cursor mode can be converted to each other。

In the VOLTS cursor mode, ← or → converted to TIME cursor;

In the TIME cursor mode, ↓ or ↑ converted to VOLTS cursor.

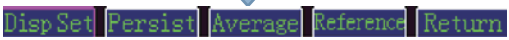
F5 or F1 Return to the previous menu

- Display Set

Main Menu

F1

Display Set menu



F1 F2 F3 F4 F5

1）**Persist**

When a new waveform display, before the waveform on the screen does not disappear immediately, but continue for some time, namely persistence time, by setting the persistence time waveform display allows more continuous, and then get a similar analog oscilloscope display

F2 →

F1 F2 F3 F4 F5

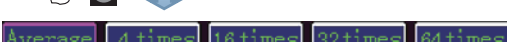
F2 F3 F4 F5 Select the persist time 1Second\2SSecond\5SSecond\Infinite

F1 or ↑ Return to the previous menu

2）**Average**

The average acquisition mode can reduce the display signal of random and unrelated noise, sampling value in real-time sampling mode, and then repeatedly sampled waveform average calculation

In the Display Set menu F3 →



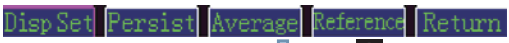
F1 F2 F3 F4 F5

F2 F3 F4 F5 Select the average time 4 times \ 164 times \ 324 times \ 64times

F1 or Return to the previous menu

3）Reference Waveform

The user can be real-time measured waveform as the standard waveform storage, so the next measurement comparison

In the Display Set menu 

F4 → 

F2 Turns the CHA Reference Waveform on and off (toggle).

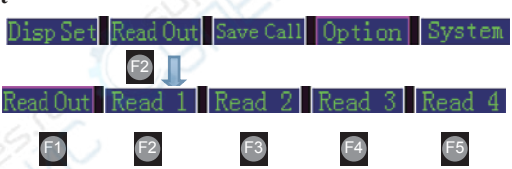
F3 Turns the CHB Reference Waveform on and off (toggle)

F4 Storage Reference Waveform

F5 Recall Reference Waveform

F1 or Return to the previous menu

- **Read Out**

Main Menu 

F2 F3 F4 F5 Set out parameter types 1 to 4

F2 Select the active channel parameter readout(CHA\CHB)；F3 or F4 Select the type of read-out

F5 Open \ close Read out on screen display

Measurement results can be displayed as numeric values (referred to as readings) and waveform.The types of readings depend on the test taking place:Maximum, minimum, peak, average, RMS and other 21 kinds of parameters for selection

F1 Or Return to the previous menu

- **Save Call**

Main Menu:

Save Call Menu:

1）Save Call Set

In the Save Call Menu F2

F2 Increase Save set location; F4 Decreased Save set location F3 or F5 ok

In the Save Call Menu F3

F2 Increase Call set location; F4 Decreased Call set location; F3 or F5 ok 。

Note: a total of 10 storage locations can be used, the factory settings in the tenth memory locations

F1 Or Return to the previous menu

2）Save Call Waveform

In the Save Call Menu F4

F2 Increase Save Data location; F4 Decreased Save Data location; F3 or F5 ok

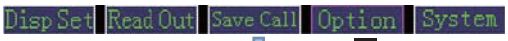
In the Save Call Menu F5

F2 Increase Call Data location; F4 Decreased Call Data location; F3 or F5 ok

F1 Or ↑ Return to the previous menu

- **User Options**

Main Menu



User Options Menu

F2 Select Language 中文\English

F3 Open \ close the screen grid

F4 →

F2 Increase the brightness of the LCD，F4 Reduce the brightness of the LCD

F1 or ↑ Or F5 Return to the previous menu

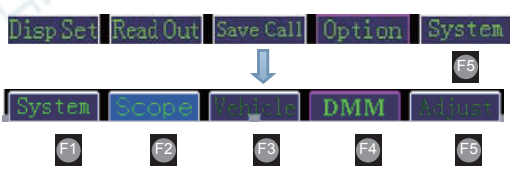
F5 →

F2 Increase the auto-off time，F4 Reducing the auto-off time

F1 or ↑ Or F5 Return to the previous menu

- **System**

Main Menu

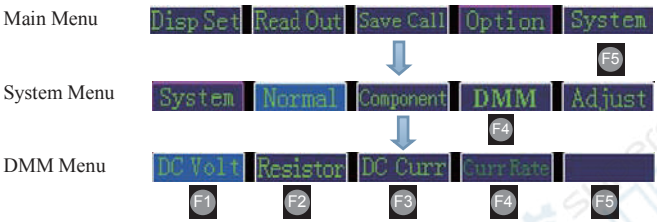


F2 Scope ,Oscilloscope mode

F4 **DMM**

☞ F5 **Adjust**，This function is not use to users

3.2.2 DMM MENU



☞ F1 Select the DC voltage \ AC voltage

☞ ▲ ▼ Manually adjust the voltage range 600mV\6V\60V\600V\1000V

☞ F2 Select the Resistance \ Continuity \ Diode \ Capacitance measurements

Note:Multimeter automatic measurement mode by default

☞ ▲ ▼

Manually adjustable resistance range:600Ω\6KΩ\60KΩ\600KΩ\6MΩ;

Manually adjustable capacitance range:6nF\60nF\600nF\6uF\60uF\600uF\6mF

☞ F3 Select DC \ AC current

☞ F4 Set current coefficient ☞ ◄ ► Select the position to be adjusted.

☞ ▲ ▼ Increased or Decrease the number

☞ F5 Return to the previous menu

☞ MENU F3 Exit multimeter mode, return the oscilloscope to measure

Chapter II、Use instrument

1、Oscilloscope

SCOPE mode provides a display of signal patterns from either CH A or CH B over times ranging from 10ns to 2Hours per division, and for voltage ranges from 10mV to 500 V full scale.

Using Single and Dual Input Scope Mode The instrument can be configured to show scope displays for either CH A or CH B signals: In DUAL INPUT SCOPE mode, both CH A and CH B may be displayed at the same time.

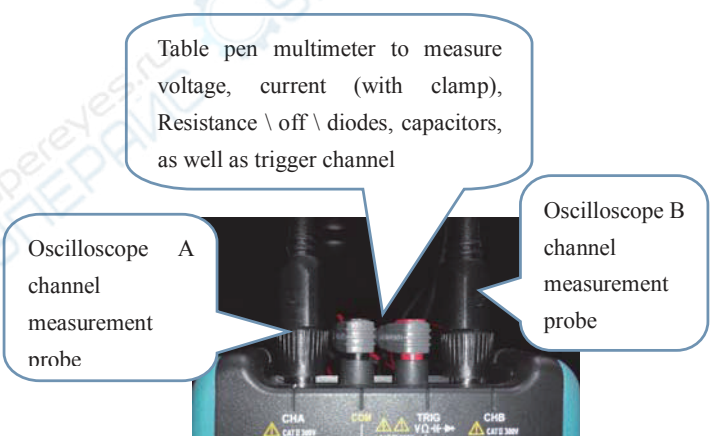
Use SINGLE INPUT SCOPE mode if you want to measure a single signal, INPUT B is turned off.
Use DUAL INPUT SCOPE mode if you want to simultaneously measure two signals.

1.1 Test connection

The figure below shows typical test connectivity applications Oscilloscope:

1) CHA, CHB connected oscilloscope probe

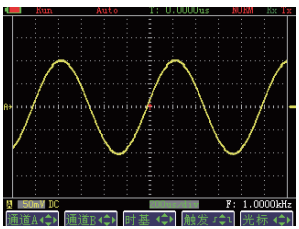
2) Channel multimeter:Multimeter Test Leads



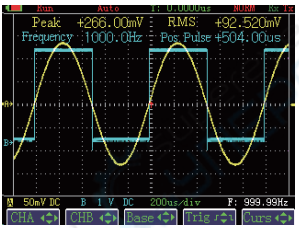
1.2 Oscilloscope measurement applications

- **Automatically capture waveform**

When you enter the scope mode, the instrument automatically optimizes vertical range, time base, and trigger settings to create a stable display. (Auto ranging is default)。



Single-channel measurements

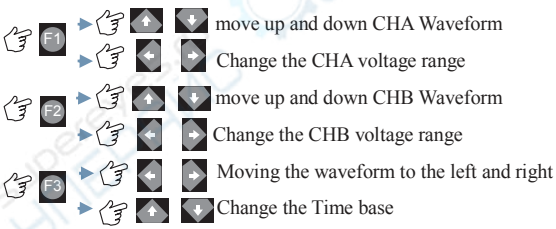


Dual-channel measurement

Automatic mode, the vertical / horizontal sensitivity status indication：

When you press one of the Voltage and Time control keys, the instrument switches to manual control of range and trigger settings

Manually set：



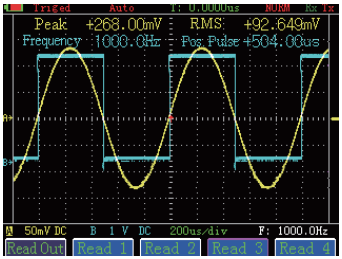
Channel set in automatic mode

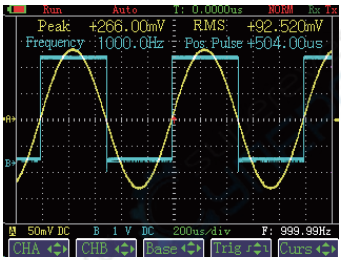
Trigger set in the automatic mode

Users can also manually change the settings

- **Read Out**

In **Read Out** Menu Settings and select the parameter type(CHA or CHB)



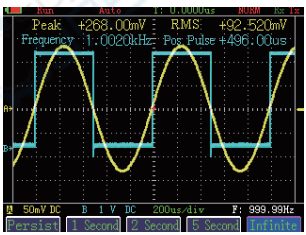


Parameter readout

- **Waveform display processing**

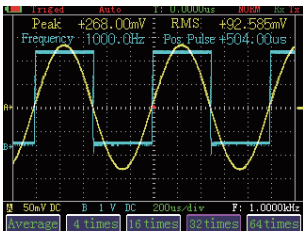
In the **Disp Set** menu Select the **persistence** and the **average** function

1） **persistence**



Infinite persistence

2） **average**

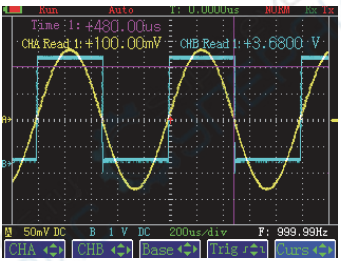


average32 times

- **Cursor measurements**

In the main menu ☞ F5 to start a single cursor mode; continue ☞ F5 to start dual cursor mode

1）Single cursor mode



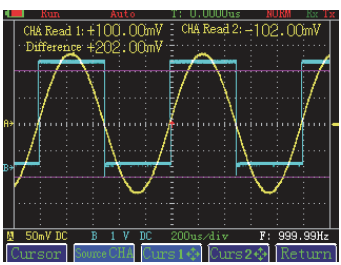
☞ ↑ ↓ Move the voltage cursor up and down

☞ ← → Move the Time cursor left and right

2）Dual cursor mode

In the voltage cursor，☞ ← or → Converted into time cursor

In the Time cursor，☞ ↑ or ↓ Converted into voltage cursor



☞ F3 Select Cursor 1

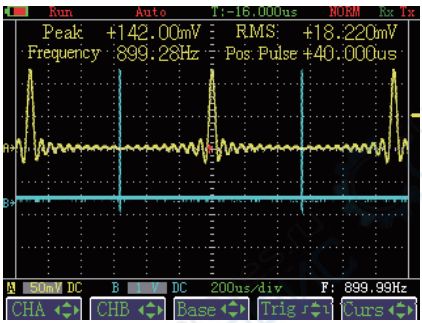
☞ F4 Select Cursor 2

☞ ↑ ↓ Move the cursor up and down

☞ ← → Move the cursor left and right

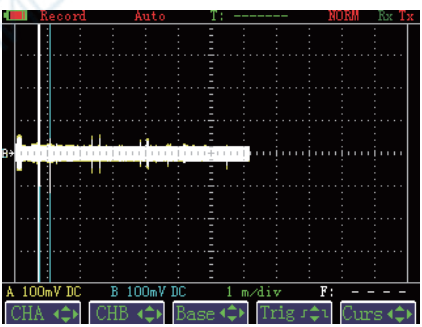
- **Scanning and recorder function**

Horizontal base in 200ms/div, or slower, the oscilloscope into a rolling screen status indication "scan", this way, the waveform scroll from left to right to update, easy to measure low-frequency signals in this manner and long period of mutation and very narrow pulse signal



Scan

Horizontal base in 10s/div, or slower, the oscilloscope into recording mode, the screen status indication "Record", the oscilloscope can record the maximum and minimum values, you can record up to 24 hours of the event。



Record

2、DMM

2.1 Test the connection

In the TRIG terminal and COM terminal directly connected multimeter pen or current probe

2.2 Multimeter

- DC voltage measurement

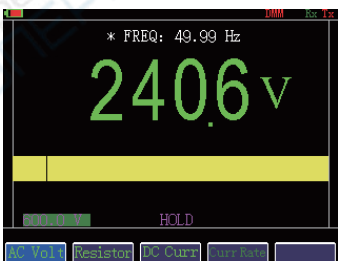
Right is automatic measurement

Manually change gears

600mV\6V\60V\600V\1000V

- AC voltage measurement

Right is automatic measurement



Manually change gears

600mV\6V\60V\600V\1000V

- Resistance measurement

Right is automatic measurement

Manually change gears

600Ω\6KΩ\60KΩ\600KΩ\6MΩ

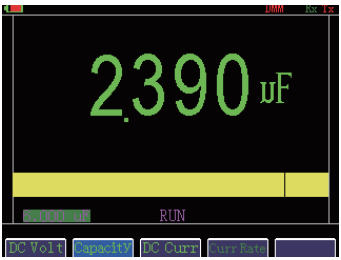
- Continuity measurement

- Diode measurements

The maximum measured diode voltage drop of 3V

- Capacitance measurement

Right is automatic measurement



Manually change gears

6nF\60nF\600nF\6uF\60uF \600uF\6mF

- Current Measurement

Use this menu option to test current with a current probe. (optional accessory)

Select the current coefficient according of the current probe "***A/V"

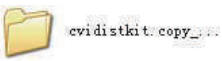
Don't forget to set the Current Probe to zero before using it for measurements.

ChapterⅢ Interface and Software

Oscilloscope can through the USB interface and the computer connection, transmission, analysis and printing data

1、Install software

1）Folder and software



Open the folder

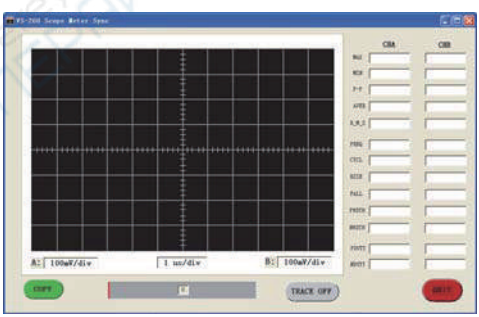
Double click  Installation of communication software

2）After the success of the installation to generate the desktop shortcut icon 

2、Use Software

Using the oscilloscope and computer via USB cable connection

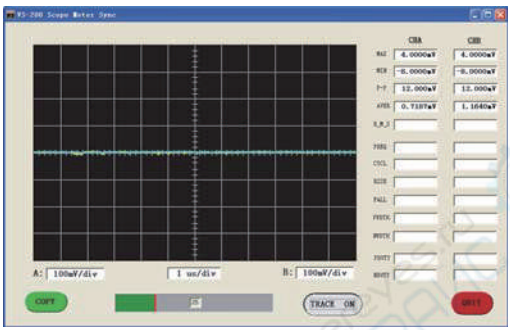
Double click  Start the software，Pop up the following interface



Available for real-time tracking (TRACE) and the copy screen operation (copy)

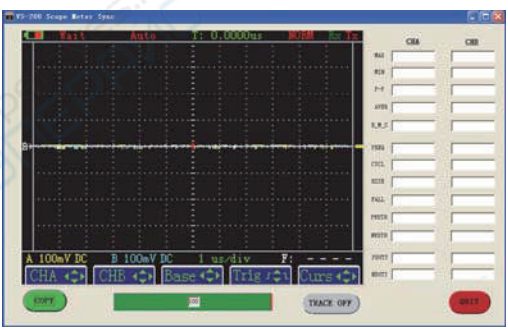
1）TRACE

Software real-time tracking changes to wave form measurement



2）copy

Executed copy screen operation



Chapter Ⅳ Maintenance and repair

- Cleaning the Instrument

Check often the Instrument and probe according to the operation conditions. To clean the surface of the Instrument, do the following:
1、Clean dusts on the surface of the Instrument and probe with fluffy cloth. Do avoid abrasion on the transparent plastic of the display filter netting.
2、Clean the meter with a damp soft cloth. And also can use water liquor containing 75% cymene and alcohol to get better cleaning effect.
Carefully.
Do not use any erosive or chemic cleanout lotion,to avoid damaging theInstrument or probe

- Storing the Instrument

Please do not store or placed the Instrument in the place where has intense electromagnetic effect or exposes long-time to the sun.

The Instrument's long-term store, which means six months since packaged, should not be over two years. If storing time is over six months, theInstrument should be took out from the package box, and repackaged to store after checking out with power on

- To charge the lithium battery

The new Instrument is not fully charged when delivered to users. The new batteries must be charged and discharged completely two or three times, can get to a optimal performance.
Be sure to use the accessories about power adapter / charger to charge the Instrument. A fully charge for the Instrument needs 2-3 hours with power off, and charge speed will be decrease with power on.

The battery can be charged or discharged hundreds times, and invalidate at last. It needs to buy a new battery when the battery's work time shortens obviously.

- Replacing and Disposing of the Li Battery Pack

Warning.

To avoid electrical shock, remove the test leads, probes and connected cables before replacing the battery pack. To replace the battery pack, do the following:

1. Disconnect the test leads, probes and connected cables.
2. Locate the battery access cover on the bottom rear. Loosen the screw with a crossed screwdriver.
3. Lift the battery access cover away, and take the battery pack out of the battery compartment. Remove the battery plug from the connector.
4. Install a new battery pack.
5. Reinstall the battery cover, and secure the screw.

⚠ **Warning.** Do not throw the battery into water

Carefully.

Do not dispose of this battery pack with other solid waste. Used batteries should be disposed of by a qualified recycler or hazardous materials handler.

- Calibration and Repair Instrument

Calibration and repair Instrument by qualified personnel to operate. Need to re calibration or repair, please contact the production factory company designated agents contact.

Chapter Ⅴ Warranty

Production factory promise the qualities and technics of each product with no defects under normal use and service. The warranty period is three years and begins on the date of shipment. Parts, product repairs and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer.

The warranty does not apply to disposable batteries or to any product which, in Production factory's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation or handling. Production factory warrants that software will operate substantially in accordance with its functional specifications for 90 days andthat it has been properly recorded on non-defective media. Production factory does not warrant that the software will be error free or operate without interruption.

Production factory authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Production factory.

If Production factory determines that the failure was caused by misuse, alternation, accident or abnormal condition of operation or handling, Production factory will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges.

This warranty is Buyer's sole and exclusive remedy ands in lieu of all other warranties, express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose.

Production factory shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, whether arising from breach of warranty of based on contract, tort, reliance or any other theory.

Chapter Ⅵ Technical Specifications

Main Technological Specifications

Oscilloscope	
Horizontal	
Bandwidth	DC-25MHz (-3dB)
Channel Number	2
Raise Time	17.5 ns
Sampling Rate	100MSa/s
Horizontal Sensitivity	10ns/div - 5s/div,With 1-2-5 Steps
Horizontal Precision	0.01% + 1 Pixel
Vertical	
Vertical Sensitivity	10mV/div - 500V/div,With 1-2-5 Steps
Vertical Precision	± (3% + 1 pixel)
Vertical Resolution	8 Bit
Maximum Input Voltage	DC or AC 600Vrms
Coupling	AC,DC
Input impedance	1MΩ ≤20pF
Trigger	
Trigger Source	CHA,CHB,External trigger
Trigger Mode	Normal, Auto, Single
Trigger Sensitivity	≤1.0div
Trigger slope	Rising and falling edge
Trigger Coupling	AC,DC

Others		
Cursor Measure	Time and Volt	
Screen Display	3.5″TFT LCD 52mm×70mm Screen; 240 ×320 Dots;	
Display Mode	Dots Display, Vectors Display	
Setup memory	10 waveforms and setup	
Reference waveforms	51 waveforms and setup	
Multimeter		
DC (V)	600mV/ 6V/ 60V/ 600V/1000V	±(1%+5 pixel)
AC (V)	600mV/ 6V/ 60V/ 600V/750V(40Hz~400Hz)	±(1.5%+5 pixel)
DC (A)	Reference the accuracy of current probe(optional)	
AC (A)	Reference the accuracy of current probe(optional)	
OHM	600Ω/6KΩ/60KΩ/600KΩ/6MΩ	±(1.0%+5 pixel)
	6 0MΩ	±(2%+5 pixel)
CAP	6nF\60nF\600nF\6uF\60uF\600uF\6mF	±(3%+5 pixel)
Diode	≤2V	
On/Off Test	Lower 5 Ω,Beep	
Battery	3.6V Lithium Battery	
Battery life	≥6 Hours	
AC Adapter	DC 5V/8W	
Dimension	222mm×114mm×50mm	
Weight	About 0.7kg	
PC Interface software	USB PC Software	

HANDHELD DIGITAL OSCILLOSCOPE

手持式彩屏示波表

Handheld Oscilloscope Color LCD Display, 2 in 1.
Waveform Output + Using the Multimeter

ZHANGZHOU EASTERN INSTRUMENT & METER CO., LTD.

Add: Eastern Technology Industrial Park, Jintang Road, Jinfeng Economic Development Zone, Xiangcheng District, Zhangzhou, Fujian, China
Tel: (+86-596) 2161506
Fax: (+86-596) 2161717
Website: www.all-sun.com
E-mail: DF@E-SUN.CN