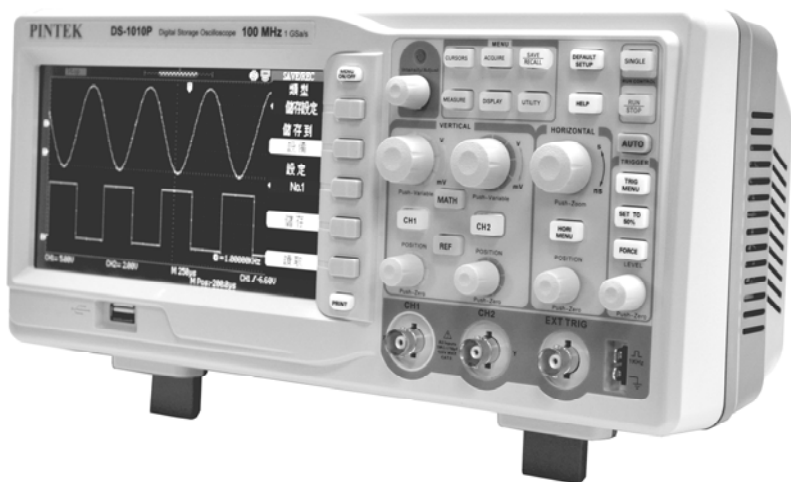


Digital Storage Oscilloscope

數位示波器

DS-1010P

100MHz With USB Interface



INSTRUCTION MANUAL

使用說明書

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DS-1010P

100MHz Digital Storage Oscilloscope

Safety Precautions

Carefully read the following safety precautions to avoid personal injuries and prevent damage to the instrument and any products connected to it. To avoid potential hazards, please use the instrument as specified:

1. Only qualified technician should perform service procedures.

2. To Avoid Fire or Personal Injuries.

3. Use Proper Power Line:

Use only the special power line of the instrument which is approved by local state.

4. Ground the Instrument:

The instrument grounds through the protective terra conductor of the power line. To avoid electric shock, the ground conductor must be connected to the earth. Make sure the instrument is grounded correctly before connecting its input or output terminals.

5. Connect the Signal Wire Correctly:

The potential of the signal wire is equal to the earth, so do not connect the signal wire to a high voltage. Do not touch the exposed contacts or components.

6. Look Over All Terminals' Ratings:

To avoid fire or electric shock, please look over all ratings and sign instruction of the instrument. Before connecting the instrument, please read the manual carefully to gain more information about the ratings.

7. Do not Operated with Suspected Failures:

If you suspect that there is a damage of the instrument, please let a qualified service personnel check it.

8. Avoid Circuit or Components Exposed:

Do not touch exposed contacts or components when the power is on.

9. Do not Operated in Wet/Damp Conditions.

10. Do not Operated in an Explosive Atmosphere.

11. Keep the Surface of the Instrument Clean and Dry.

- Do not store or leave the instrument in direct sunshine for long periods of time.






- To avoid damages to the instrument or probe, please do not leave them in fog, liquid, or solvent.
- Disconnect the instrument from all power sources, and then clean it with a soft wet cloth.
- Clean the loose dust on the outside of the instrument and probe with a soft cloth. When cleaning the LCD, take care to avoid scarifying it.
- To avoid damages to the surface of the instrument and probe, please do not use any corrosive liquid or chemical cleanser.
- Make sure that the instrument is completely dry before restarting it to avoid short circuits or personal injuries.

Safety Terms and Symbols

(1) **Terms on the product.** These terms may appear on the product:

DANGER:	Indicates direct injuries or hazards that may happen.
WARNING:	Indicates potential injuries or hazards that may happen.
CAUTION:	Indicates potential damages to the instrument or other property that may happen

(2) **Symbols on the product.** These symbols may appear on the product:

	Hazardous Voltage
	Protective Earth Ground
	Warning
	Earth Ground
	Power Switch

General Inspection

1. Inspect the shipping container:

Keep the damaged shipping container or cushioning material until the contents of the shipment have been completely checked and the instrument has passed both electrical and mechanical tests.

The consigner or carrier will be responsible for damages to the instrument resulting from shipment. **PINTEK** would not provide free maintenance or replacement.

2. Inspect the instrument:

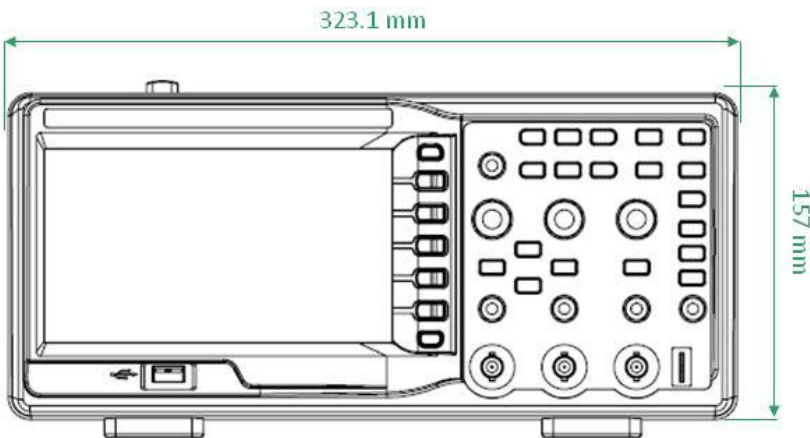
If there are instruments found damaged, defective or failure in electrical and mechanical tests, please contact **PINTEK**.

3. Check the accessories:

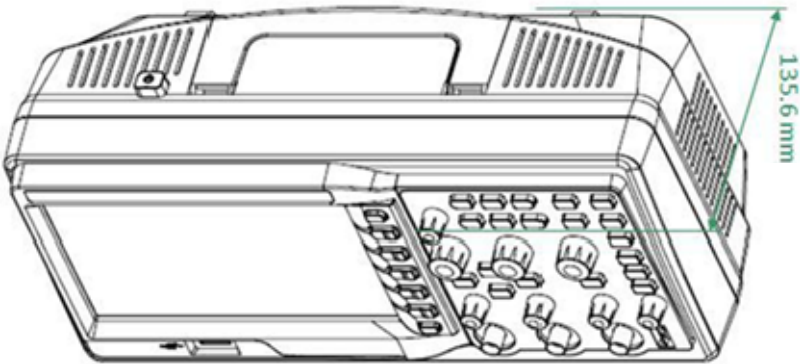
Please check the accessories according to the packing list. If the accessories are incomplete or damaged, please contact your **PINTEK** sales representative.

Appearance and Dimension

Front View:

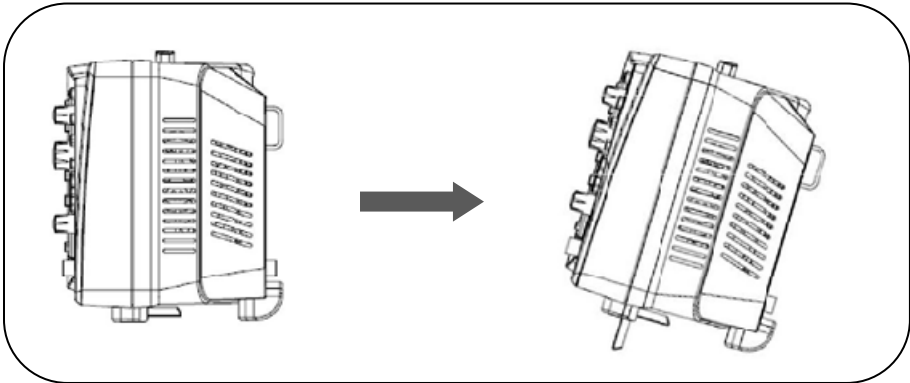


Side View:



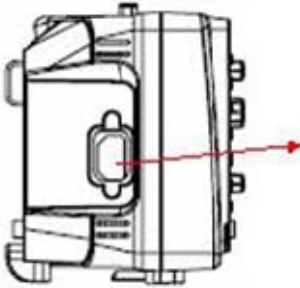
Adjust the Supporting Legs

Adjust the supporting legs properly to use them as stands to tilt the oscilloscope upwards for stable placement as well as easier operation and observation of the instrument.



Connect to AC Power Supply

The oscilloscope accept 100~240V, 45~440Hz AC power supply. Please use the power cord provided as accessories to connect the instrument to the power source as shown in the figure below.



Power socket

Note: In want of replacing the fuse, please return the instrument to the factory that produced it to have it repaired by qualified service personnel authorized by **PINTEK**.

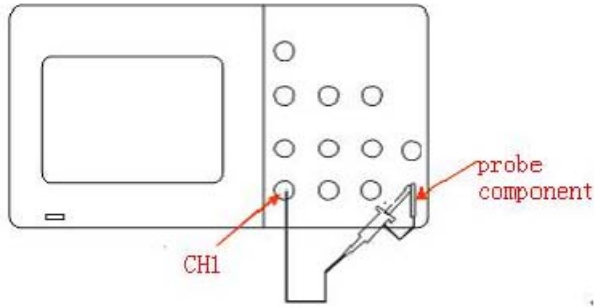
Power-on Inspection

When the scope is energized, press the power key at the top of it to turn it on. During the start-up progress, the instrument performs a series of self-test items and you can hear the sound of relay switching. After the self-test completes, the welcome interface displays immediately.

Connect the Probe

Connect the probe:

- (1) Connect the BNC terminal of the probe to one of the channel BNC connector on the front panel.
- (2) Connect the probe tip to the circuit point to be tested and the ground alligator clip of the probe to the ground terminal of the circuit.

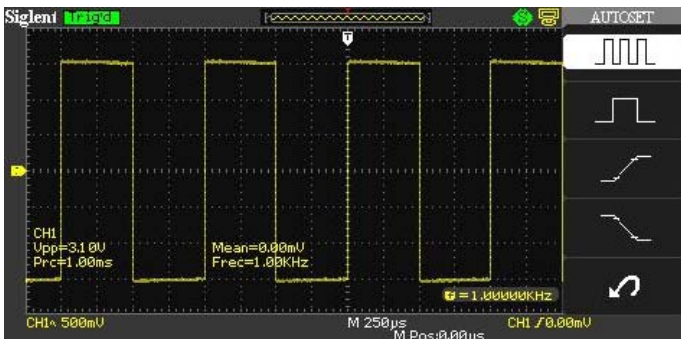


Function Inspection

1. Press “DEFAULT SETUP” to restore the oscilloscope to its default settings.
2. Connect the ground alligator clip of the probe to the Ground Terminal on the front panel.
3. Use the probe to connect the CH1 Input Terminal and the Compensation Signal Output Terminal on the front panel.



4. Press “AUTO”.
5. Observe waveforms on the screen. In normal condition, the display should be several square waveforms as is shown below:



6. Test channel 2 in the same method. If the square waveforms do not display like figure above, please perform “Probe Compensation”.




Note:

To avoid electric shock when using the probe, please firstly make sure that the insulated wire of the probe is in good condition, and do not touch the metallic part of the probe when it is connected to a high voltage.

Probe Compensation

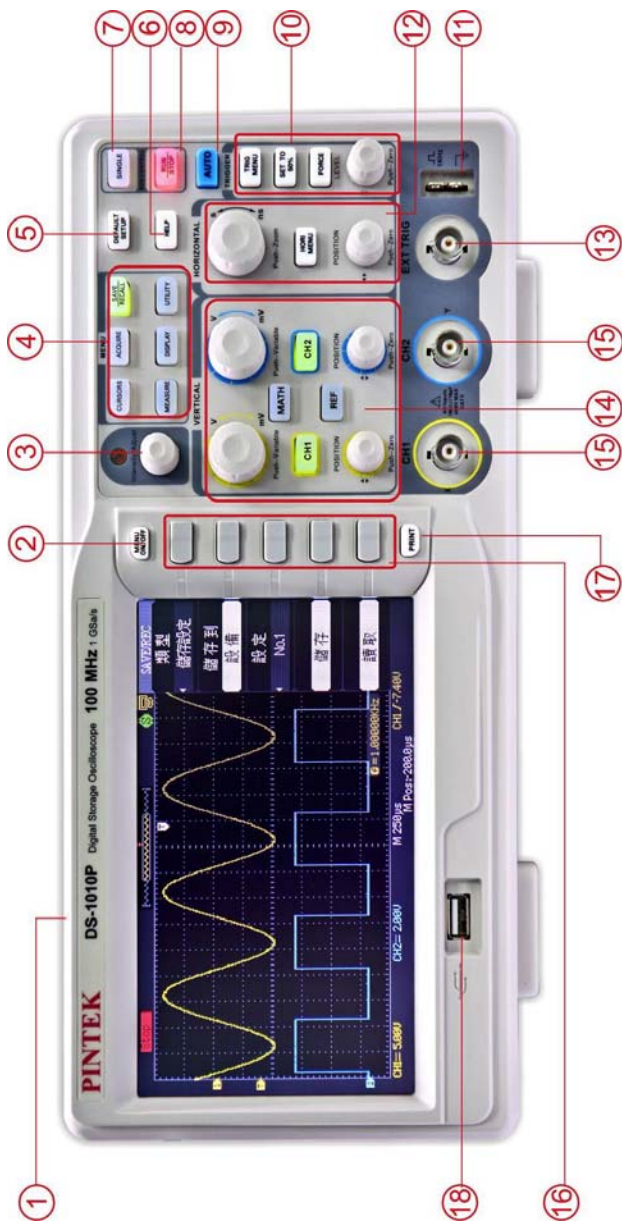
You should properly compensate the probe at first use of it. Non-compensated or inadequate compensated probe may cause inaccurate measurement. The following steps are about probe compensation:

1. Perform step 1, 2, 3 and 4 of “Function Inspection”.
2. Check the displayed waveforms and compare them with the following figure.

	Under Compensated
	Compensated Correctly
	Over Compensated

3. Use a nonmetallic driver to adjust the low-frequency compensation adjustment hole on the probe until the waveform changes to be correct as the figure above.

Function Introduction of Front Panel



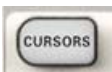
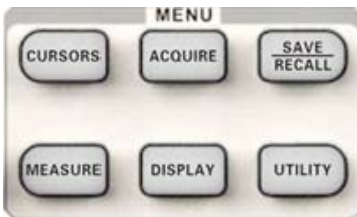
- ① **Power On/Off.**
- ② **Menus On/Off.**
- ③ **Universal Knob.**



Adjust waveform brightness While the light above the knob is dark, adjusting the knob will change the waveform brightness, which ranges from 30%~100%. Turning clockwise means increase while counterclockwise means decrease. You can also select “intensity” in “DISPLAY” menu and then adjust the knob to change the waveform brightness.

Universal knob When the light above the knob is lighted, you could select anyone submenu by adjusting the knob under the current menu. In addition, it can also be used to modify parameters and input filename.

- ④ **Function Menus.**



: Press the button to enter the cursor measurement function menu. The instrument provides three measure modes: Manual, Track and Auto.



: Press the button to enter the acquire function menu, under which you could set the acquisition mode, sampling mode and dot inserting mode.



: Press the button to enter the file save and recall function menu. There are four types of file to be saved which are respectively setups, waveforms, picture and CSV, and additionally the factory setup are supported.



: Press the button to enter the measurement function menu. There are three measure types: voltage, time and delay. Each kind of them contains many measurement parameters, you could press any of them to display the corresponding value.



: Press the button to enter the display function menu, under which you could set waveform display type, persist time, waveform brightness, display format, menu display and so on.



: Press the button to enter the utility function menu, under which you could set the corresponding function of the system, some parameters like Sound, Language, Interface and so on. In addition, some advanced functions are also supported such as Self Calibration, Firmware Update, Pass/Fail test.

⑤ Default Setup.



: Press the button to restore the oscilloscope to its default settings. The default voltage scale and time base are respectively 1v/div and 500us.

⑥ Help.



: Press the button to enable HELP function, and then press down any menu to display corresponding help information. To display the submenus help information of the current menu, firstly you should open the current menu, and then press down the "HELP" button, the last step is to select any submenu you want.

⑦ **Single:**



: Press the button to turn the trigger mode to “Single”.

⑧ **Run/Stop:**

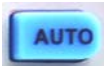


: Press the button to set the state of the instrument to “RUN” or “STOP”.

When in “RUN”, the indicator light displays yellow;

When in “STOP”, it displays red.

⑨ **AUTO.**



: Press the button to enable the waveform auto setting function. The oscilloscope will automatically adjust the horizontal time base, vertical scale and trigger mode according to the input signal to make the waveform displays in a perfect state.

⑩ **Trigger Control Area:**



: Press the button to open trigger menu under which five trigger modes are supported.



: Press the button to set trigger level to the middle of the maximal voltage and the minimal voltage to quickly stabilize the current waveform.



: Press the button to make the signal trigger forcefully.



: Modify the trigger level. Turn it clockwise or counterclockwise to increase or decrease the level. The trigger level will move up or down and the value in the message box at the lower-left corner of the screen will change as the trigger level changes. Press it down to reset the trigger level to the screen vertical center.

⑪ Probe Compensation.

⑫ Horizontal Control Area:



: Press the button to open horizontal control menu under which you can turn on/off the delay sweep function and switch the save modes between “long save” and “normal save”.



: Modify the trigger position. The trigger point will move left or right relative to the center of the screen when you adjust the knob. The waveform will move left or right and the trigger position message at the lower-left corner of the screen will also change as the position changes. Press the knob to quickly reset the trigger position to zero.



: Modify the horizontal time base. Turn it clockwise or counterclockwise to decrease or increase the time base. The waveform will display expanded or compressed and the time base message at the nether side of the screen will change as the time base changes. Press down the knob to quickly switch to the delay

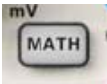
sweep state.

⑬ **EXT TRIG Terminal.**

⑭ **Vertical Control Area:**



: Input channels. These two channels are marked with different colors to distinguish different input channels and their waveforms. Pressing the channel button will turn on the corresponding channel as well as its menu, and pressing it twice continuously will turn off the channel.



: Press the button to enable math function which includes five operations: adding, subtracting, multiplying, dividing and FFT.



: Press the button to enable the reference waveform function. By recalling the previously saved waveform, we could compare it with the current waveform to decide circuit failures.



: Modify vertical position of the current waveform. Turn clockwise to increase the position while turn counterclockwise to decrease it. The waveform will move up or down and the position message at the lower-left corner of the screen will change along. Press down the knob to quickly reset the vertical position to zero.



: Modify vertical scale of the current channel. Turn clockwise to decrease the voltage scale while turn counterclockwise to increase it. The amplitude of the waveform will

enlarge or reduce and the scale message at the lower-left corner of the screen will also change as the scale changes. Press down the knob to quickly switch the vertical scale adjustment modes between “Coarse” and “Fine”.

⑮ **Channel Input Terminal.**

⑯ **Menu Select keys.**

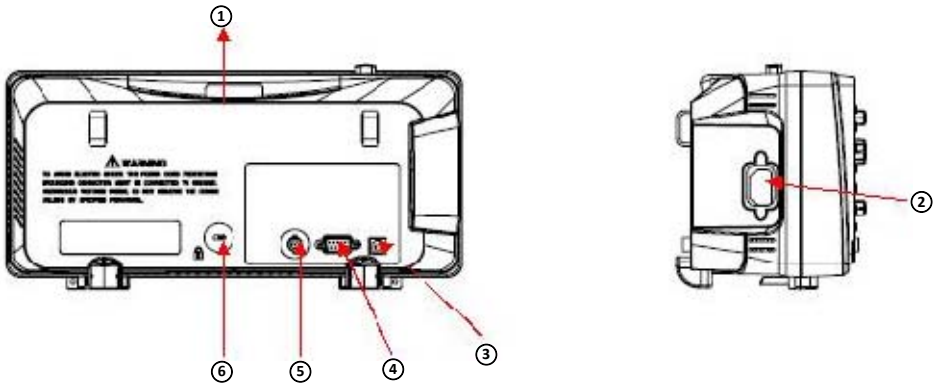
⑰ **Print Key:**



: Press the button to enable the reference waveform function. By recalling the previously saved waveform, we could compare it with the current waveform to decide circuit failures.

⑱ **USB Host Interface.**

Rear Panel Description



① **Handle:**

Pull up the handle vertically for easy carrying. Press it down if you do not need the handle.

② **AC Power Input Terminal:**

The power available of the oscilloscope is 100~240V, 45~440Hz. Please use the power cord provided as accessories to connect the instrument to AC power.

③ **USB Device Interface:**

Pick Bridge printer or PC can be connected via this interface to print the current interface of the oscilloscope or control the instrument through PC software.

④ **RS-232 Interface:**

The terminal can be used to connect the oscilloscope with a PC to update software, control remotely via special software.

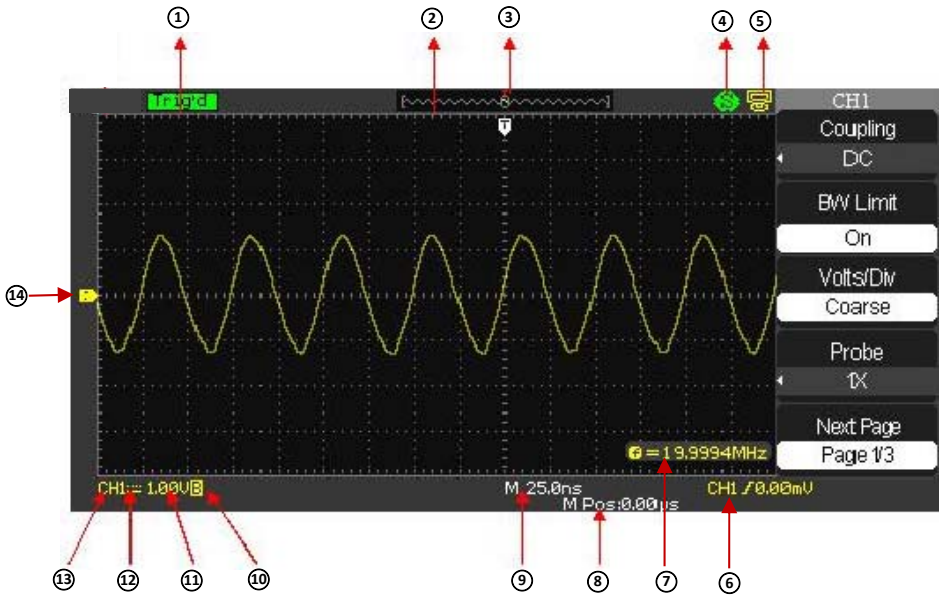
⑤ **Pass/Fail Output Terminal:**

The pass/Fail testing pulse are put out via this terminal.

⑥ **Lock hole:**

You could lock the instrument in a fixed location using a security lock (please buy it yourself) via the lock hole.

Rear Panel Description



① **Working state:**

Available working states include Ready, Auto, Trig'd, Scan and Stop.

② **Waveform memory:**

Display the position of the current waveform in the memory of the oscilloscope.

③ **Trigger position:**

Display the trigger position of the waveform in the memory and on the screen.

④ **Print:**

Display the current state of “Print Key” under the menu of “Print Setup”.


P: “Print Key” option set to “Print Picture”;


S: “Print Key” option set to “Save Picture”.

⑤ **Back USB Device:**

“Back USB” supports two types of interface: USBTMC and Printer.

⑥ **Trigger Setting:**

Trigger Level. Display the position of the current trigger level, for example: .

Trigger Type. Display the current trigger type and trigger condition. Different trigger types have different marks, for example:  means triggered on Slop side in edge trigger.

⑦ **Frequency Counter:**

Display the firmware frequency of current waveform. To display it, you should turn on the “Counter” in menu of “UTILITY”.

⑧ **Trigger Position:**

Use **HORIZONTAL POSITION Knob** to modify the parameter. Turn clockwise or counterclockwise to make the red arrowhead move right or left, which will respectively cause the decrease and increase of the parameter in the message box at the lower-left corner of the screen. Press down the knob to automatically reset the parameter to zero as well as make the red arrowhead return to its initial position.

⑨ **Horizontal Time Base:**

Represent the time of each grid on the horizontal axis of the screen. You could revolve **HORIZONTAL SCALE Knob** to modify the parameter which is variable from 2.5nS to 50S.

⑩ **BW Limit:**

If the current “BW Limit” is “On”, then the mark B displays at the lower-corner of the screen, or nothing displays. When the vertical scale is 2mV/div, the “BW Limit” turns on automatically.

⑪ **Voltage Scale:**

Represent the voltage value of each grid on the vertical axis of the screen. You could revolve VOLTAGE SCALE Knob to modify the parameter which is variable from 2mV to 10V.

⑫ **Coupling Mode:**

The oscilloscope supports three coupling mode: DC, AC and GND, each of them has unique mark displaying on the screen.

⑬ **Current Channel:**

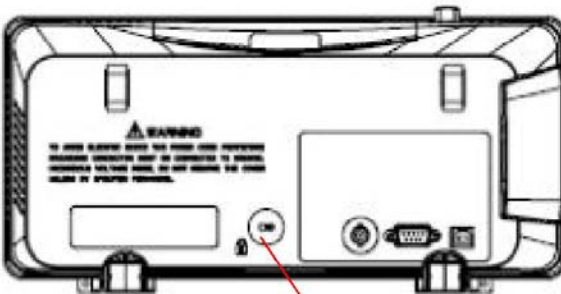
Display the current working channel. All channels can display at the same time.

⑭ **Trigger Level:**

Display the position of the trigger level. Turn the knob clockwise or counterclockwise to make the trigger level move up or down.

Using Security Lock

If needed, you could use the security lock (please buy it yourself) to lock the instrument in a fixed location. The method: align the clock with the clock hole and plug it into the lock hole vertically, turn the key clockwise to lock the instrument and then pull the key out.



Security lock hole

Specifications

All specification applies to 10X probe and All the DS-1010P Digital Storage Oscilloscopes.

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

- The oscilloscope must have been operating continuously for thirty minutes within the specified operating temperature.
- You must perform the Do Self Cal operation, accessible through the Utility menu, if the operating temperature changes by more than 5° C.
- The oscilloscope must be within the factory calibration interval.

All specifications are guaranteed unless noted “typical.”

Inputs	
Input Coupling	AC,DC,GND
Input Impedance	$1M\Omega \pm 2\% \parallel 16Pf \pm 3Pf, 50\Omega \pm 2\%$
Ch to Ch Isolation (Both channels in same V/div setting)	>100:1 at 50MHz
Maximum input Voltage	400V (DC+AC PK-PK, $1M\Omega$ input impedance, X10), CAT I
Probe Attenuator	1X,10X
Probe Attenuator Factors Set	1X,5X,10X,50X,100X,500X,1000X

Vertical System	
Vertical Sensitivity	2mV/div -10V/div
Channel Voltage Offset Range	2mV ~ 200mV: $\pm 1.6V$ 206mV ~ 10V: $\pm 40V$
Vertical Resolution	8 bit
Channels	2
Analog Bandwidth	100MHz
BW Flatness at BNC input	DC -10% of rated BW: $\pm 1dB$ 10% - 50% of rated BW: $\pm 2dB$ 50% - 100% of rated BW: $\pm 2dB/-3dB$
Lower Frequency Limit (AC -3dB)	$\leq 10Hz$ (at input BNC)
Noise Pk-Pk for 3K record	≤ 0.6 Div for average of 10 Pk-Pk readings, Fixed gain settings ≤ 0.7 Div for average of 10 Pk-Pk readings, Variable gain settings
SFDR including harmonics (measured with FFT)	$\geq 35dB$
DC Gain Accuracy	$< \pm 3.0\%$: 5mv/div to 10V/div in Fixed Gain Ranges $< \pm 4.0\%$: 2mv/div Variable Gain Ranges
DC Measurement Accuracy: All Gain settings $\leq 100mv/div$	$\pm [3\% * (reading + offset) + 1\% * offset + 0.2div + 2mv]$
DC Measurement Accuracy: All Gain settings $> 100mv/div$	$\pm [3\% * (reading + offset) + 1\% * offset + 0.2div + 100mv]$

Rise Time	<3.5ns
Overshoot Typical (using 500ps pulse)	<10% with probe or BNC input 50 ohm feed thru
Ch to Ch Skew (both channels in same V/div setting)	<1ns (Equivalent to 2 minor divisions in smallest t/div)
Math Operation	+, -, *, /, FFT
FFT	Window mode: Hanning, Hamming, Blackman, Rectangular
	Sampling points:1024
Bandwidth Limited	20MHz \pm 40% (BW Limited below 20MHz when using probe in x1)

Horizontal System	
Real Time Sampling Rate	Single Channel: 1GSa/s, Double Channel:500MSa/s (When timebase faster than 50ns/div)
Equivalent Sample Rate	The highest equivalent sampling rate is 50GSa/s
Measure Display Modes	MAIN, WINDOW, WINDOW ZOOM, ROLL, X-Y
Timebase Accuracy	\pm 50ppm measured over 1ms interval
Horizontal Scan Range	2.5nS/div ~ 50S/div
	Scan:100mS/div ~ 50S/div

Trigger System	
Trigger Types	Edge, Pulse Width, Video, Slope, Alternative
Trigger Source	CH1, CH2, EXT, EXT/5, AC Line
Trigger Modes	Auto, Normal, Single
Trigger Coupling	AC, DC, LF rej, HF rej
Trigger Level Range	CH1,CH2:±6 div from center of screen
	EXT: ±1.2V
	EXT/5: ±6V
Trigger Displacement	Pre-trigger:(Memory depth / (2*sampling)) Delay Trigger: 271.04 div
Trigger Level Accuracy(Typical) applicable for the signal of rising and falling time \geq 20ns	Internal: $\pm(0.2 \text{ div} \times \text{V/div})(\text{within} \pm 4 \text{ div from center of screen})$ EXT: $\pm(6\% \text{ of setting} + 40\text{mV})$ EXT/5: $\pm(6\% \text{ of setting} + 200\text{mV})$
Trigger Sensitivity	For fixed gain ranges 1 div: DC ~ 10MHz 1.5 div: 10MHz ~ Max BW
	EXT: 200mVpp DC ~ 10MHz 300mVpp 10MHz ~ Max BW
	EXT/5: 1Vpp DC ~ 10MHz 1.5Vpp 10MHz ~ Max BW
Pulse Width Trigger	Trigger Modes:(>, <, =) Positive Pulse Width, (>,<, =) Negative Pulse Width
	Pulse Width Range: 20ns ~ 10s
Video Trigger	Support Signal Formats: PAL/SECAM, NTSC

	Trigger Condition: odd field, even field, all lines, line Num
Slope Trigger	(>,<.=) Positive Slope,(>,<.=) Negative Slope
	Time: 20ns ~ 10s
Alternative Trigger	CH1 Trigger Type:Edge, Pulse,Video, Slope
	CH2 Trigger Type:Edge, Pulse,Video, Slope

X-Y Mode	
X-Pole input / Y Pole input	CH1 / CH2
Sample Frequency	XY Mode has a breakthrough that trad oscilloscopes restrict sample rate at 1MSa/s. Support 25KSa/s ~ 250MSa/s adjusted.

Hard Ware Frequency Counter	
Reading Resolution	1Hz
Range	DC Couple, 10Hz to Max Bandwidth
Signal Types	Satisfying all trigger signals (Except Pulse width trigger and Video Trigger)

Control Panel Function	
Auto Set	Auto adjusting the Vertical, Horizontal System and Trigger Position
Save/Recall	Support 2 Group referenced Waveforms, 20 Group setups,20 Group captured Waveforms internal Storage/Recall function and USB flash driver storage function

Measure System	
Auto Measure (32 Types)	Vpp,Vmax, Vmin, Vamp, Vtop, Vbase, Vavg, Mean,Crms, Vrms, ROVShoot, FOVShoot, RPREShoot, FPRESshoot, Rise time, Fall time, Freq, Period, +Wid, -Wid, +Dut, -Dut, BWid, Phase, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF
Cursor Measure	Manual mode, Track mode and Auto mode

Display System	
Display Mode	Color TFT 7.0in.(177.8mm) diagonal Liquid Crystal Display
Resolution	480 x 234 pixels
Display Color	24 bit
Display Contrast (Typical state)	150:1
Backlight Intensity (Typical state)	300nit
Wave Display range	8 x 18 div
Wave Display Mode	Dots, Vector
Persist	Off, 1 sec, 2 sec, 5 sec, Infinite
Menu Display	2 sec, 5 sec, 10 sec, 20 sec, Infinite
Screen-Saver	Off, 1min, 2min, 5min, 10min, 15min, 30min, 1hour, 2hour, 5hour
Skin	Classical, Modern, Tradition, Succinct

Waveform Interpolation	Sin(x)/x, Linear
Color Model	Normal, Invert
Language	Simplified Chinese, Traditional Chinese, English, Arabic, French, German, Russian, Portuguese Spanish, Japanese, Korean, Italian

Power Supply	
Input Voltage	100-240 VAC, CAT II, Auto Selection
Frequency Scope	45Hz to 440Hz
Power	50VA Max

Mechanical		
Dimension	Length	323.1mm
	Width	135.6mm
	Height	157mm
Weight	2.5Kg	

Troubleshooting

The general failures and consequential solutions are listed below. When you find them, please deal with them in the following corresponding ways. If the problem proves to be unsolvable yourself, please contact with **PINTEK** as soon as possible.

1. The screen remains dark after power on:

- (1) Check if the power is correctly connected.
- (2) Check whether the fuse is burned out. If the fuse needs to be changed, please contact with **PINTEK** as soon as possible and return the instrument to the factory to have it repaired by qualified personnel authorized by **PINTEK**.
- (3) Restart the instrument after completing inspections above.
- (4) If it still does not work normally, please contact **PINTEK**.

2. After the signal is sampled, there is no corresponding waveform displaying:

- (1) Check if the probe is correctly connected to the signal connecting cord.
- (2) Check if the signal connecting cord is correctly connected to BNC connector.
- (3) Check if the probe is correctly connected to the item under test.
- (4) Check if there are signal generated from the item under test (you can connect the probe compensation signal to the problematic channel to determine the reason to the problem).
- (5) Resample the signal.

3. The voltage amplitude measured is higher or lower than the actual value (the error usually occurs in use of the probe):

Check if the attenuation coefficient of the current channel matches with the attenuation ratio of the probe.

4. There is waveform displaying but not stable:

- (1) Check the trigger source: check whether the “Source” in menu of “TRIG” is the actual operating channel.

- (2) Check if the waveform is false: it is easy for us to regard the false waveform as the real when a high frequency signal is connected to the instrument. You'd better make sure that the current time base is correct.
- (3) Check the trigger type: "Edge" trigger suits to general signal and "Video" trigger suits to video signal. Only in correct trigger type can the waveform stably display.
- (4) Change the setting of trigger holdoff.

5. No display after pressing



Check whether the trigger Mode is "Normal" or "Single", and if the trigger level exceeds the waveform range. If yes, set the trigger level to the vertical center or change the trigger Mode to "Auto".

Note:

Press "" could automatically replace the above setting.

6. The waveform displays like ladder:

- (1) The horizontal time base may be too low, you can increase it to improve the horizontal resolution so as to make a good waveform displaying.
- (2) The lines between the sample points may also cause ladder-like displaying if the "Type" in menu of "DISPLAY" is "Vectors". Please turn the "Type" to "Dots" to solve the problem.

7. USB storage can't be recognized:

- (1) Check if the U disk can work normally.
- (2) Make sure that the U disk being used is of flash type, the instrument does not support USB of hardware type.
- (3) Make sure that the capacity of the U disk is not too large. It is suggested that the capacity of the U disk are no larger than 4 G.
- (4) Restart the instrument and then insert the U disk to check.
- (5) If it is still in abnormal use, please contact with PINTEK.

Maintenance and Cleaning

1. Daily Maintain:

DO not store or leave the instrument in where the LCD display will be exposed to direct sunlight for long periods of time

CAUTION!

To avoid damage to the instrument or probes, do not expose them to sprays, liquids, or solvents.

2. Cleaning:

If this instrument requires cleaning, disconnect it from all power sources and clean it with a mild detergent and water. Make sure the instrument is completely dry before reconnecting it to a power source.

To clean the exterior surface, perform the following steps:

(1) Remove loose dust on the outside of the instrument and probes with a lint-free cloth. Use care to avoid scratching the clear plastic display filter.

(2) Use a soft cloth dampened with water to clean the instrument. Use an aqueous solution of 75% isopropyl alcohol for more efficient cleaning.

Note :

To avoid damage to the surface of the instrument or probes, do not use any abrasive or chemical cleaning agents.

DS-1010P

100MHz 數位數波器

使用安全須知：

瞭解下列安全性預防措施，以避免人身傷害，並防止本產品或與之相連的任何其他產品受到損壞。為避免可能發生的危險，請務必按照規定使用本產品。

- (1) 使用適當的電源線：只允許使用所在國家認可的本產品專用電源線。
- (2) 將產品接地：本產品通過電源電纜的保護接地線接地。為了防止電擊，接地導體必須與地面相連，在與本產品的任何輸入或輸出終端連接之前，請務必將本產品正確接地。
- (3) 正確連接信號線：信號地線與地電位相同，請勿將地線連接到高電壓上。
- (4) 查看所有終端額定值：為了防止火災或電擊危險，請查看本產品的所有額定值和標記說明。請在連接產品前閱讀產品手冊，以便瞭解有關額定值的詳細資訊。
- (5) 懷疑產品出故障時，請勿操作 如懷疑本產品有故障，請聯繫制造商授權的維修人員進行檢測。任何對於本產品的維護、調整或零件的更換必須由授權的維修人員執行。
- (6) 使用合適的過壓保護：確保沒有過電壓（如由雷電造成的電壓）到達該產品，否則可能導致操作人員遭受電擊。
- (7) 防靜電保護：靜電會造成儀器損壞，應盡可能在防靜電區進行測試。在連接電纜到儀器之前，應將其內外導體短暫接地以釋放靜電。
- (8) 保持良好的通風：通風不當會引起儀器溫度升高，進而引起儀器損壞。使用時應保持良好的通風，定期檢查通風口和風扇。
- (9) 請勿開蓋操作：請勿在儀器機箱打開時運行本產品。
- (10) 使用合適的保險絲：只允許使用本產品指定規格的保險絲。
- (11) 防靜電保護：靜電會造成儀器損壞，應盡可能在防靜電區進行測試。在連接電纜到儀器之前，應將其內外導體短暫接地以釋放靜電。
- (12) 請勿在潮濕環境下操作。
- (13) 請勿在易燃易爆環境中操作。
- (14) 注意搬運安全：為避免儀器在搬運過程中滑落，造成儀器面板上的按鈕、旋鈕或介面等部件損壞，請在搬運儀器的過程中注意安全
- (15) 保持產品表面清潔和乾燥。
 - 存放或放置儀器時，請勿使液晶顯示器長時間受陽光直射。






- 為避免損壞儀器或探頭，請勿將其置於霧氣、液體或溶劑中。
- 使用質地柔軟的抹布擦拭儀器和探頭外部的浮塵。清潔液晶顯示幕時，注意不要劃傷透明的塑膠保護幕。
- 使用一塊用水浸濕的軟布清潔儀器，請注意斷開電源。
- 為避免損壞儀器或探頭的表面，請勿使用任何磨蝕性試劑或化學清潔試劑。
- 在重新通電使用前，請確認儀器已乾透，避免因水分造成電氣短路甚至人身傷害。

安全術語和標記

(1) 本產品上使用的術語。以下術語可能會出現在本產品上：

DANGER:	表示標記附近有直接傷害危險存在。
WARNING:	表示標記附近有潛在的傷害危險存在。
CAUTION:	表示對本產品及其他財產有潛在的危險存在。

(2) 本產品上使用的標記。以下標記可能會出現的本產品上：

	警告高壓
	保護性終端
	小心
	測量接地端
	電源開關

一般性檢查

1. 檢查運輸包裝:

如運輸包裝已損壞，請保留被損壞的包裝和防震材料，直到貨物經過完全檢查且儀器通過電性和機械測試。

因運輸造成的儀器損壞，由發貨方和承運方聯繫賠償事宜，本公司恕不進行免費維修或更換。

2. 檢查整機:

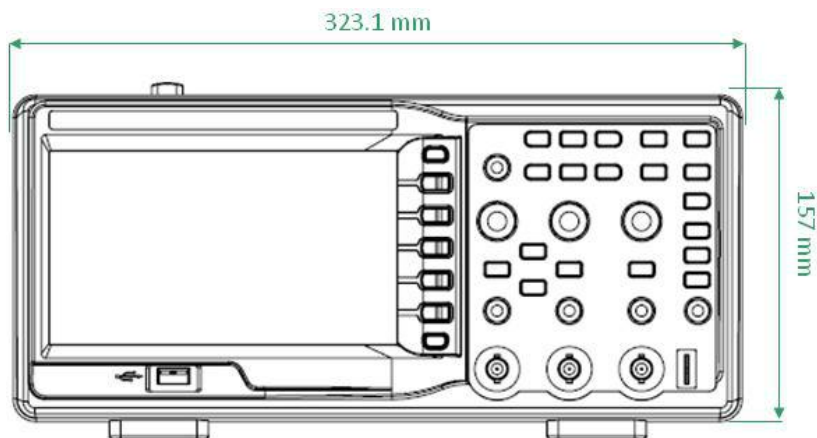
若存在機械損壞或缺失，或者儀器未通過電性和機械測試，請聯繫當地經銷商。

3. 檢查隨機附件:

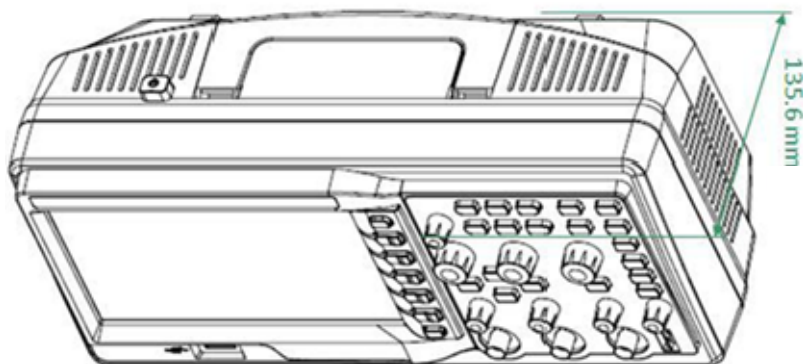
請根據裝箱單檢查隨機附件，如有損壞或缺失，請聯繫當地經銷商。

外觀尺寸

正視圖:

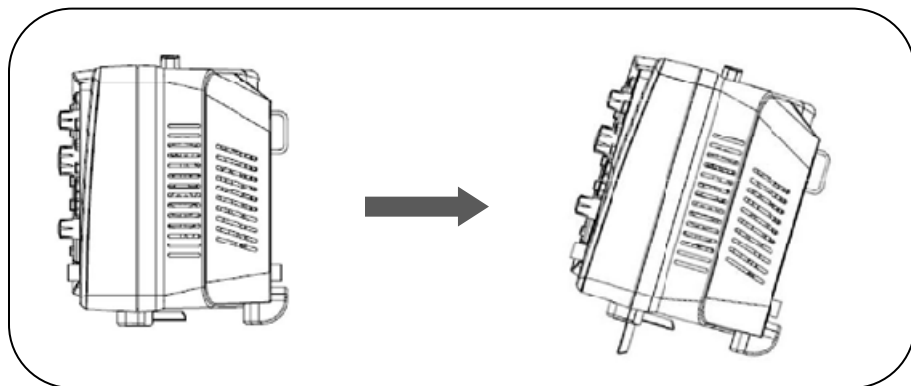


側視圖：



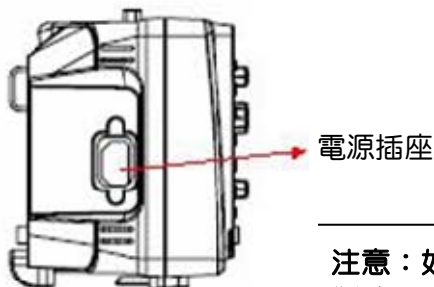
調節支撐腳

適當的調整支撐腳，將其作為支架使示波器向上傾斜，以穩定放置示波器，便於更好的操作和觀察顯示幕。



連接電源

本示波器可輸入交流電源的規格為：100-240V，45-440HZ。請使用附件提供的電源線按下圖所示將示波器與電源連接。



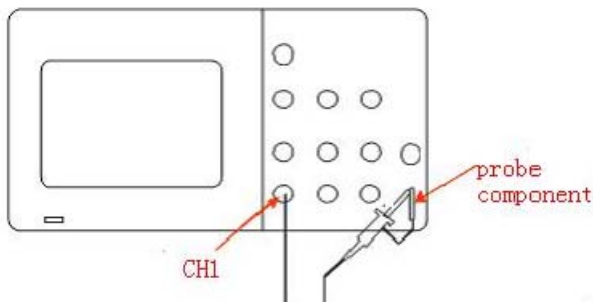
注意：如需更換保險絲，請將儀器返廠，由製造商授權的維修人員進行更換。

開機檢查

當示波器處於通電狀態時，先打開示波器背後的電源開關，再按前面板螢幕下方的電源鍵即可啟動示波器。開機過程中示波器執行一系列自檢，您可以聽到繼電器切換的聲音。自檢結束後出現開機畫面。

連接探頭

- (1) 將探頭的 BNC 端連接到前面板的通道 BNC 連接器。
- (2) 將探針連接至待測電路測試點中，並將探頭接地鱷魚夾連接至電路接地端。

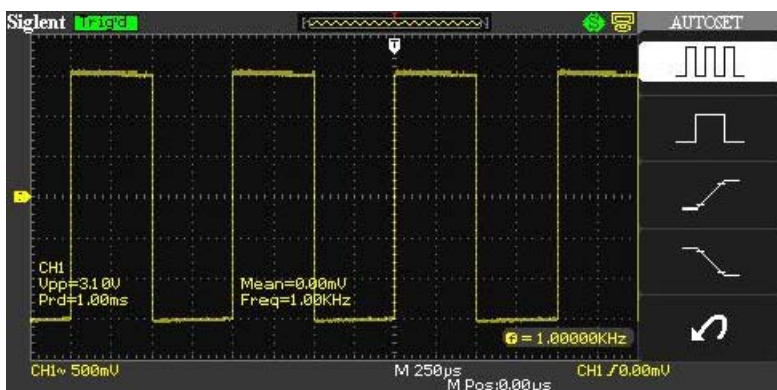


功能檢查

1. 按“DEFAULT SETUP” 將示波器恢復為默認設置。
2. 將探頭的接地鱷魚夾與探頭補償信號輸出端下面的“接地端”相連。
3. 使用探頭連接示波器的通道輸入端，探頭另一端連接探頭元件。



4. 按“ AUTO ”鍵。
5. 觀察示波器顯示幕上的波形，正常情況下應顯示下圖所示波形：



6. 用同樣的方法檢測其他通道。若螢幕顯示的方波形狀與上圖不符，請執行下一節“探頭補償”。




注意：

為避免使用探頭時被電擊，請首先確保探頭的絕緣導線完好，並且在連接高壓源時不要接觸探頭的金屬部分。

探頭補償

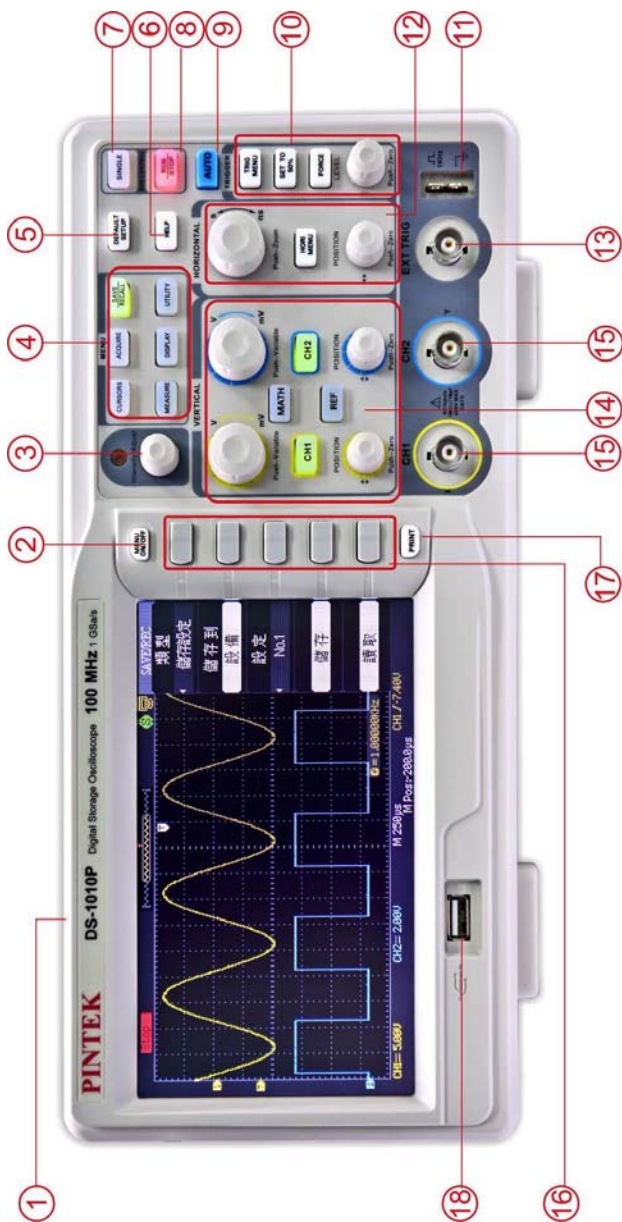
首次使用探頭時，應進行探頭補償調整，使探頭與示波器輸入通道匹配。未經補償或補償偏差的探頭會導致測量偏差或錯誤。探頭補償步驟如下：

1. 執行上一節“功能檢查”中的步驟 1、2、3 和 4。
2. 檢查所顯示的波形形狀並與下圖對比。

	欠補償
	補償適當
	過補償

3. 用非金屬質地的改錐調整探頭上的低頻補償調節孔，直到顯示的波形如上圖“補償適當”。

前面板功能解說



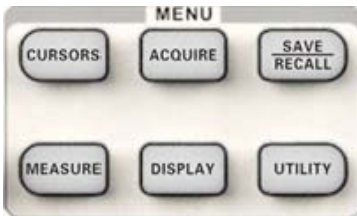
- ① 電源開關。
- ② 功能表開關。
- ③ 多功能旋鈕:




調節波形亮度：非功能表操作時，旋轉該旋鈕可調節波形顯示的亮度，亮度可調範圍為 30%-100%。順時針轉動增大波形亮度，逆時針轉動減小波形亮度。也可按“DISPLAY”，選擇“波形亮度”功能表，使用該旋鈕調節波形亮度。


多功能旋鈕：功能表操作時，按下某個功能表軟體後，若旋鈕上方指示燈被點亮，此時轉動該旋鈕可選擇該功能表下的子功能表，按下該旋鈕可選中當前選擇的子功能表，指示燈也會熄滅。另外，該旋鈕還可用於修改參數值、輸入檔案名等。


- ④ 功能表:





：按下該鍵進入游標測量菜單。示波器提供手動測量、追蹤測量和自動測量三種游標測量模式。

：按下改按鍵進入採樣設置功能表。可設置示波器的獲取方式、內插方式和採樣方式。

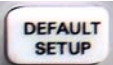
：按下該鍵進入檔存儲/讀取介面。可存儲/讀取的檔類型包括設置存儲、波形存儲、圖像存儲和 CSV 存儲，另外，還可讀取出廠設置。

：按下該鍵進入測量設置菜單。包含的測試類別有電壓測量、時間測量和延遲測量，每種測量菜單下又包含多種子測試，按下相應的子測試功能表即可顯示當前測量值。

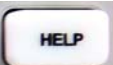
：按下該鍵進入顯示設置功能表。可設置波形顯示類型、餘輝時間、波形亮度、網格亮度、顯示格式（XY/YT）、螢幕正反向、網格、功能表持續時間和介面方案。

：按下該鍵進入系統功能設置功能表。設置系統相關功能和參數，例如揚聲器、語言、介面等。此外，還支持一些高級功能，例如自校正、軟體升級和通過測試等。

⑤ 默認設置:

：按下該鍵進入系統默認設置介面。系統默認設置下的電壓檔位為 1V，時脈檔位為 500us。

⑥ 幫助資訊:

：按下改按鍵開啓幫助資訊功能。在此基礎上依次按下各功能功能表鍵即可顯示相應功能表的幫助資訊。若要顯示各功能功能表下子菜單的幫助資訊，則需先打開當前功能表介面，然後按下 HELP 鍵，選中相應的子功能表鍵即可。再次按下該按鍵可關閉幫助資訊功能。

⑦ 單次觸發:



：按下該鍵將示波器的觸發方式設置為“單次”。單次觸發設置檢測到一次觸發時採集一個波形，然後停止。

⑧ 運行控制:

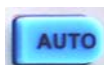


：按下該鍵可將示波器的運行狀態設置為“運行”或“停止”。

“運行”狀態下，該鍵黃燈被點亮;

“停止”狀態下，該鍵紅燈被點亮。

⑨ 波形自動設置:



：按下該鍵開啓波形自動顯示功能。示波器將根據輸入信號自動調整垂直檔位、水平時脈以及觸發方式，使波形以最佳方式顯示。

⑩ 觸發控制:



：按下該鍵打開觸發功能功能表。本示波器提供邊沿、脈衝、視頻、斜率和交替五種觸發類型。



：按下該鍵可快速穩定波形。可自動將觸發電位的位置設置為約是對應波形最大電壓值和最小電壓值間距的一半。



：在 Normal 和 Single 觸發方式下，按該鍵可使通道波形強制觸發。



：修改觸發電位。順時針轉動旋鈕增大觸發電位，逆時針轉動減小觸發電位。修改過程中，觸發電位線上下移動，同時螢幕左下角的觸發電位值相應變化。按下該按鈕可快速將觸發電位恢復至對應通道波形零點。

⑪ 探頭元件。

⑫ 水平控制：



：按下該鍵可打開水平控制功能表。在該菜單下可打開或關閉延遲掃描功能。



：POSITION: 修改觸發位移。旋轉旋鈕時觸發點相對於螢幕中心左右移動。修改過程中，所有通道的波形同時左右移動，螢幕左下角的觸發位移資訊也會相應變化。按下該按鈕可快速重定觸發位移（或延遲掃描位移）。



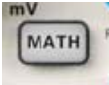
：SEC/DIV: 修改水平時脈檔位。順時針旋轉減小時脈，逆時針旋轉增大時脈。修改過程中，所有通道的波形被擴展或壓縮，同時螢幕下方的時脈資訊相應變化。按下該按鈕可快速切換至延遲掃描狀態。

⑬ 外觸發輸入端。

⑭ 垂直控制:



：模擬輸入通道。四個通道標籤用不同顏色標識，且螢幕中波形顏色和輸入通道連接器的顏色相對應。按下通道按鍵可打開相應通道及其菜單，連續兩次按下則可關閉該通道。



：按下該鍵打開數學運算功能表，可進行加、減、乘、除、FFT運算。



：按下該鍵可打開參考波形功能。可將實測波形與參考波形相比較，以判斷電路故障。



：POSITION: 修改對應通道波形的垂直位移。順時針轉動增大位移，逆時針轉動減小位移。修改過程中波形會上下移動，同時螢幕左下角彈出的位移資訊會相應變化。按下該按鈕可快速重定垂直位元移。



：VOLTS/DIV: 修改當前通道的垂直檔位。順時針轉動減小檔位，逆時針轉動增大檔位。修改過程中波形幅度會增大或減小，同時螢幕左下角的檔位元資訊會相應變化。按下該按鈕可快速切換垂直檔位調節方式為“粗調”或“細調”。

⑮ 模擬通道輸入端。

⑯ 功能表選項。

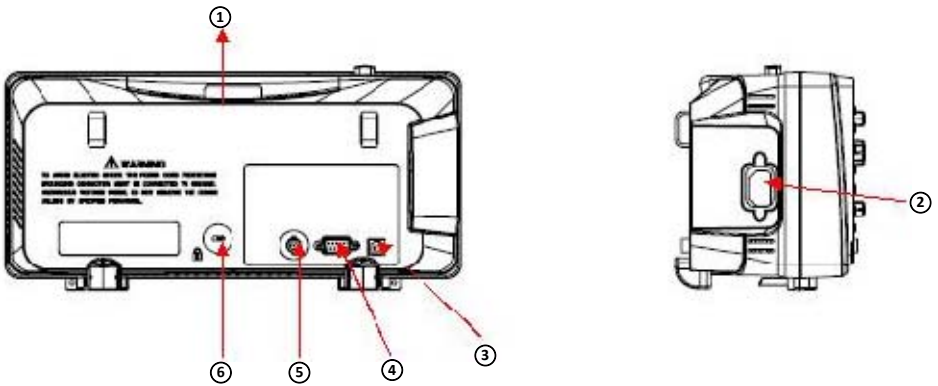
⑰ 列印:



: 按下該鍵將執行列印功能。若當前已連接印表機，並且打印機處於閒置狀態，按下該鍵將執行列印功能。

⑱ USB端子。

後面板功能解說



① 手柄:

Pull up the handle vertically for easy carrying. Press it down if you do not need the handle.

② AC電源輸入端:

本示波器的供電要求為 100-240V，45-440Hz。請使用附件提供的電源線將示波器連接到 AC 電源中。

③ USB Host:

通過該介面可以將波形檔、設置檔、csv 檔和 bmp 檔保存至可移動存儲設備中。

④ RS-232 介面:

通過該介面可連接印表機列印示波器當前顯示介面,或連接 PC,通過 PC 端軟體對示波器進行控制。

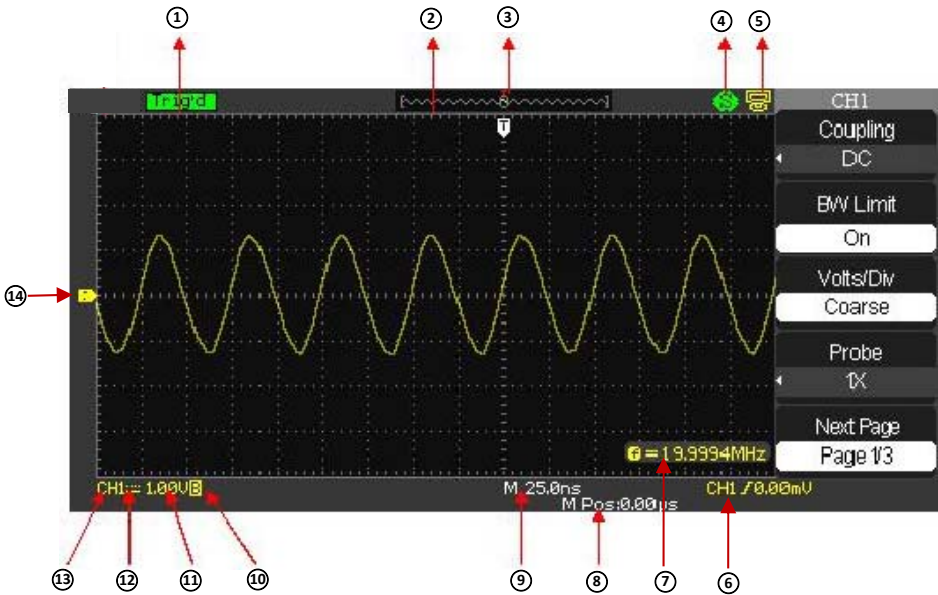
⑤ Pass/Fail 輸出口:

通過該埠輸出 Pass/Fail 檢測脈衝。

⑥ 鎖孔:

可以使用安全鎖通過該鎖孔將示波器鎖在固定位置。

用戶介面



① 運行狀態:

可能的狀態包括 Ready(準備)、Auto(自動)、Triq ' d(觸發)、Scan (掃描)、Stop(停止)。

② 波形記憶體:

顯示當前螢幕中的波形在記憶體中的位置。

③ 觸發位置:

顯示波形記憶體和螢幕中波形的觸發位置。

④ 列印設置:

顯示列印設置功能表中【列印鈕】的當前狀態。

P: 【列印鈕】設置為【列印圖像】。

S: 【列印鈕】設置為【儲存圖像】。

⑤ 後 USB 介面:

顯示“後 USB □”的當前設置。




【後 USB □】設置為【USBTMC】



【後 USB □】設置為【印表機】

⑥ 觸發設置:

觸發電位值。顯示當前觸發電位的位置，例如: **CH1/640mV**; 觸發類型。顯示當前選擇的觸發類型及觸發條件設置，選擇不同觸發類型時顯示不同標誌。例如:  表示在“邊沿觸發”的上升沿處觸發。

⑦ 頻率顯示:

顯示當前觸發通道波形的頻率值。UTILITY 功能表中的“頻率計”設置為“開啓”才能顯示對應信號的頻率值，否則不顯示。

⑧ 觸發位移:

使用水平 POSITION 旋鈕可以調節該參數。向右旋轉旋鈕使得箭頭（初始位置為螢幕正中央）向右移動，觸發位移（初始值為 0）相應減小；向左旋轉旋鈕使得箭頭向左移動，觸發位移相應增大。按下該鍵參數自動被設為 0，且箭頭回到螢幕正中央。

⑨ 水平時脈:

表示螢幕水平軸上每格所代表的時間長度。使用 S/DIV 旋鈕可以修改該參數，可設置範圍為 1nS-50S。

⑩ 帶寬限制:

若當前帶寬為開啓，則顯示 B 標誌，否則，無任何標誌顯示。當電壓檔位元為 2mV 時，帶寬限制自動開啓。

⑪ **電壓檔位元:**

表示螢幕上垂直軸上每格所代表的電壓大小。使用 VOLTS/DIV 可以修改該參數，可設置範圍為 2mV-5V。

⑫ **耦合方式:**

顯示當前波形的耦合方式。示波器有直流、交流、接地三種耦合方式，且分別有相應的三種顯示標誌。

⑬ **當前通道:**

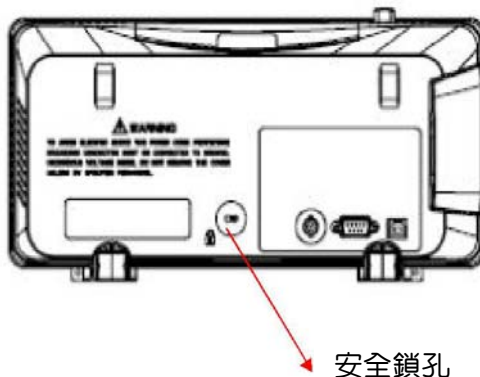
顯示當前正在操作的通道。可同時顯示兩個通道標誌。

⑭ **觸發電位標誌:**

顯示當前波形觸發電位的位置所在。向左或向右旋轉觸發電位旋鈕 LEVEL，此標誌會相應地向下或向上移動。

使用安全鎖

如有必要，您可以使用安全鎖（請自行購買）將示波器鎖在固定位置。方法如下：沿與後面板垂直的方向對準鎖孔將鑰匙插入，然後順時針旋轉鎖定示波器，最後拔出鑰匙。



技術規格

所有技術規格都適用於衰減開關設定為 10X 的探頭和 DS1010P 數位示波器。要驗證示波器是否符合技術規格，示波器必須首先符合以下條件：

- 示波器必須在指定的操作溫度內連續運行了三十分鐘以上。
- 如果操作溫度的變化範圍達到或大於 5 度，就必須執行“自校正”，通過“輔助功能”功能表可以進行此操作。
- 示波器必須屬於出廠校正期限內。

除標有“典型”字樣的技術規格以外，所有技術規格都保證符合要求。

輸入	
輸入耦合	直流、交流、接地(AC,DC,GND)
輸入阻抗	1MΩ±2% 16Pf±3Pf,50Ω+/-2%
通道至通道隔離 (兩通道同時在相同V/div 設定)	>100:1 at 50MHz
最大輸入電壓	400V (DC+AC PK-PK, 1MΩ input impedance, X10), CAT I
探頭衰減	1X,10X
探頭衰減係數設定	1X,5X,10X,50X,100X,500X,1000X

垂直系統	
垂直靈敏度	2mV/div -10V/div
通道電壓偏移範圍	2mV ~ 200mV: ±1.6V 206mV ~ 10V: ±40V
垂直解析度	8 bit
通道數	2
類比頻寬	100MHz

BNC輸入端頻寬平整度	DC -10% of rated BW: +/- 1dB 10% - 50% of rated BW: +/- 2dB 50% - 100% of rated BW: + 2dB/-3dB
低頻回應 (交流耦合，-3dB)	≤10Hz(at input BNC)
雜訊 Pk-Pk for 3000 筆	≤0.6 Div 平均10筆 Pk-Pk, 固定增益 ≤0.7 Div 平均10筆 Pk-Pk, 可變增益
SFDR 諧波 (FFT)	>=35dB
直流增益精確度	< ±3.0%: 5mv/div to 10V/div 固定增益 範圍 < ±4.0%: 2mv/div可變增益範圍
直流測量精確度: 全增益設定 ≤100mv/div	± [3.0%X(實際讀數 + 垂直位移讀數)+1%X 垂直位移讀數 +0.2 格+2mV]
直流測量精確度: 全增益設定 >100mv/div	± [3.0%X(實際讀數 + 垂直位移讀數)+1%X 垂直位移讀數 +0.2 格+100mV]
上升時間	<3.5ns
過激 (典型) (500ps 脈衝波)	<10% 在50 Ω
通道對通道歪斜 (兩通道同時在相同V/div 設定)	<1ns
數學模式	+, -, *, /, FFT
FFT	窗口模式: Hanning, Hamming, Blackman, Rectangular
	取樣點:1024點
帶寬限制	20MHz ± 40% (當探針增益設定為x1時, 帶寬限制低於20MHz)

水平系統	
即時取樣率	單一通道: 1GSa/s, 雙通道:500MSa/s
等效取樣率	(當時脈快於50ns/div)
量測顯示模式	最高等效取樣率為50GSa/s
時脈精確度	MAIN, WINDOW, WINDOW ZOOM, ROLL, X-Y
水平掃描範圍	± 50ppm (在任何大於1ms的時間間隔)
	2.5nS/div ~ 50S/div

觸發系統	
觸發類型	邊沿、脈寬、視頻、斜率、交替
觸發來源	CH1, CH2, EXT, EXT/5, AC Line
觸發模式	自動, 正常, 單次
觸發耦合	直流、交流、低頻抑制、高頻抑制
觸發電位範圍	CH1、CH2 距離螢幕中心 6 格
	EXT: ±1.2V
	EXT/5: ±6V
觸發位移	預觸發:存儲深度/(2*採樣率) 延遲觸發:268.04 DIV
觸發電位精確度 (典型)	內部: ±(0.2 div x V/div)(距離螢幕中心±4 div) EXT: ±(6% of 設定值 + 40mV) EXT/5: ±(6% of 設定值 + 200mV)
適用於信號上升時間 與下降時間 ≥ 20ns	固定增益範圍 1 div: DC ~ 10MHz 1.5 div: 10MHz ~ Max BW
	EXT: 200mVpp DC ~ 10MHz 300mVpp 10MHz ~ Max BW
	EXT/5: 1Vpp DC ~ 10MHz 1.5Vpp 10MHz ~ Max BW

脈寬觸發	觸發模式:(>, <, =) 正脈寬、(>,<, =) 負脈寬
	脈寬範圍: 20ns ~ 10s
視頻觸發	支援信號格式: PAL/SECAM, NTSC
	觸發條件: 奇數場、偶數場、所有行、指定行
斜率觸發	(>,<, =) 正斜率、(>,<.=) 負斜率
	時間: 20ns ~ 10s
交替觸發	CH1/ CH2 觸發類型: 邊沿、脈寬、視頻、斜率

X-Y 模式	
X-軸/Y-軸輸入	CH1 / CH2
取樣頻率	XY 方式突破了傳統低端示波器侷限在 1MSa/s 取樣率的限制; 支援 25Ksa/s ~ 250MSa/s 採樣率可調。

硬體計頻器	
讀取解析度	1Hz
範圍	直流耦合, 10Hz 到最大頻寬
信號類型	滿足所有觸發信號 (脈寬觸發與視頻觸發除外)

控制功能面板	
自動設定	自動調整垂直、水平系統與觸發位置
儲存/讀取	內建儲存/讀取功能與 USB 隨身碟儲存功能, 支援 2 組參考波形、20 組擷取波形

量測系統	
自動量測	最大值、最小值、峰峰值、幅值、頂端值、底端值、周期平均值、平均值、週期均方根、均方根、上升過激、下降過激、上升前激、下降前激、上升時間、下降時間、頻率、週期、脈寬、正脈寬、負脈寬、正占空比、負占空比、相位、FRR、FRF、FFR、FFF、LRR、LRF、LFR、LFF
(32 種類型)	手動、追蹤、自動三種模式

顯示系統	
顯示模式	彩色 TFT 7.0 吋.(177.8mm) 數位液晶顯示螢幕
解析度	480 x 234 pixels
顯示顏色	24 bit
顯示對比 (典型狀態)	150:1
背光亮度 (典型狀態)	300 nit
波形顯示範圍	8 x 18 div
波形顯示模式	點, 向量
餘暉	關閉、1 秒、2 秒、5 秒、無限
目錄顯示	2 秒、5 秒、10 秒、20 秒、無限
螢幕保護	關閉、1 分、2 分、5 分、10 分、15 分、30 分、 1 小時、2 小時、5 小時
介面	古典、現代、傳統、簡潔
波形內插	Sin(x)/x, 線性

顏色類別	正常、反相
語言	簡體中文、繁體中文、英文、法文、德文、俄文、西班牙文、日文、韓文、義大利文

電源	
輸入電壓	100~240 VAC, CAT II, 自動選擇
交流電壓頻率範圍	45Hz ~ 440Hz
消耗功率	最大 50VA

機械規格		
尺寸	長	323.1mm
	寬	135.6mm
	高	157mm
重量	2.5Kg	

故障處理

下面列舉了示波器在使用過程中可能出現的故障及排除方法。當您遇到這些故障時，請按照相應的步驟進行處理，若不能處理，請即時與製造商聯繫。

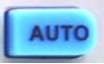
1. 如果按下電源鍵示波器仍黑屏，無任何顯示：
 - (1) 檢查電源接頭是否接好。
 - (2) 檢查電源開關是否按實。
 - (3) 檢查保險絲是否熔斷。如需更換電源保險絲，請及時與製造商聯繫，並將儀器返廠，由製造商授權的維修人員進行維修。
 - (4) 做完上述檢查後，請重新啓動示波器。
 - (5) 如果仍無法正常啓動本產品，請與製造商聯繫。

2. 採集信號後，畫面中並未出現相應波形：
- (1) 檢查探頭是否正確連接在信號連接線上。
 - (2) 檢查信號連接線是否正確連接在 BNC（通道連接器）上。
 - (3) 檢查探頭是否與待測物正常連接。
 - (4) 檢查待測物是否有信號產生。
 - (5) 重新採集一次信號。
3. 測量的電壓幅值比實際值大或者小（注意：此種情況一般在使用探頭時才出現）：
- 檢查通道衰減係數是否與探頭實際使用的衰減比例相符。

4. 有波形顯示，但不能穩定下來：
- (1) 檢查觸發信源：檢查“觸發”功能表中的信源選擇是否與實際使用的信號通道相符。
 - (2) 檢查是否為“假波”：當信號頻率很大（一般為 MHz）時，很容易出現“假波”，此時應檢查當前時脈是否為穩定觸發的時脈。
 - (3) 檢查觸發類型：一般信號應使用“邊沿觸發”方式，視頻信號應使用“視頻觸發”方式。只有應用適合的觸發方式，波形才能穩定顯示。
 - (4) 改變觸發釋抑設置。

5. 按下  鍵無任何顯示：

檢查 TRIGGER 功能表中的觸發方式是否為“正常”或“單次”，且觸發電位是否超出波形觸發範圍外。如果是，將觸發電位居中或者將觸發方式設置為“自動”。

注意：使用自動設置按鈕  可以自動完成以上步驟。

6. 波形顯示呈階梯狀：
- (1) 水平時脈檔位可能過低，增大水平時脈以提高水平解析度，可以改善顯示。

(2) 若顯示類型為向量，採樣點間以直線連接，可能造成波形階梯狀顯示。將顯示類型設置為“點”顯示方式，即可解決。

7. 隨身碟不能被識別:

- (1) 檢查隨身碟是否可以正常工作。
- (2) 確認使用的為 Flash 型隨身碟，本儀器不支援硬碟型隨身碟。
- (3) 確認使用的隨身碟容量是否過大，本示波器推薦使用不超過 4GB 的隨身碟。
- (4) 重新啟動儀器後，再插入隨身碟進行檢查。
- (5) 如果仍無法正常使用隨身碟，請與經銷商聯繫。

日常保養與清潔

1. 保養:

存放或放置儀器時，請勿使液晶顯示器長時間受陽光直射。

注意!

為避免損壞儀器或探頭，請勿將其置於霧氣、液體或溶劑中。

2. 清潔:

請根據使用情況經常對儀器和探頭進行清潔。方法如下:

拔掉電源，然後用溫和的清潔劑和水清洗，並確保儀器重新連接到電源之前完全乾燥。

- (1) 使用質地柔軟的抹布擦拭儀器和探頭外部的浮塵。清潔液晶顯示幕時，注意不要劃傷透明的塑膠保護幕。
- (2) 使用一塊用水浸濕的軟布清潔儀器，請注意斷開電源。如要更徹底地清潔，可使用 75% 異丙醇的水溶劑。

注意：

為避免損壞儀器或探頭的表面，請勿使用任何磨蝕性試劑或化學清潔試劑。在重新通電使用前，請確認儀器已乾透，避免因水分造成電氣短路甚至人身傷害。

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