UPO1000CS Series Digital Phosphor Oscilloscope

Quick Start Guide

REV 1

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UNI-T®

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Statement

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1. Safety Requirement

This section contains information and warnings that must be followed to keep the instrument operating under safety conditions. In addition, user should also follow the common safety procedures.

Safety Precautions

Warning	**Please follow the following guidelines to avoid possible electric shock and risk to personal safety.**
	Users must follow the following conventional safety precautions in operation, service and maintenance of this device. UNI-T will not be liable for any personal safety and property loss caused by the user's failure to follow the following safety precautions. This device is designed for professional users and responsible organizations for measurement purposes. Do not use this device in any way not specified by the manufacturer. This device is only for indoor use unless otherwise specified in the product manual.

Safety Statement

Warning	**"Warning" indicates the presence of a hazard. It reminds users to pay attention to a certain operation process, operation method or similar. Personal injury or death may occur if the rules in the "Warning" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Warning" statement.**
Caution	**"Caution" indicates the presence of a hazard. It reminds users to pay attention to a certain operation process, operation method or similar. Product damage or loss of important data may occur if the rules in the "Caution" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Caution" statement.**
Note	**"Note" indicates important information. It reminds users to pay attention to procedures, methods and conditions, etc. The contents of the "Note" should be highlighted if necessary.**

Safety Sign

	**Danger**	It indicates possible danger of electric shock, which may cause personal injury or death.
	**Warning**	It indicates that you should be careful to avoid personal injury or product damage.
	**Caution**	It indicates possible danger, which may cause damage to this device or other equipment if you fail to follow a certain procedure or condition. If the "Caution" sign is present, all conditions must be met before you proceed to operation.
	**Note**	It indicates potential problems, which may cause failure of this device if you fail to follow a certain procedure or condition. If the "Note" sign is present, all conditions must be met before this device will function properly.

	**AC**	Alternating current of device. Please check the region's voltage range.
	**DC**	Direct current of device. Please check the region's voltage range.
	**Grounding**	Frame and chassis grounding terminal.
	**Grounding**	Protective grounding terminal.
	**Grounding**	Measuring grounding terminal.
	**OFF**	Main power off.
	**ON**	Main power on.
	**Power Supply**	Standby power supply: when the power switch is turned off, this device is not completely disconnected from the AC power supply.
CAT I		Secondary electrical circuit connected to wall sockets through transformers or similar equipment, such as electronic instruments and electronic equipment; electronic equipment with protective measures, and any high-voltage and low-voltage circuits, such as the copier in the office.
CAT II		CATII: Primary electrical circuit of the electrical equipment connected to the indoor socket via the power cord, such as mobile tools, home appliances, etc. Household appliances, portable tools (e.g. electric drill), household sockets, sockets more than 10 meters away from CAT III circuit or sockets more than 20 meters away from CAT IV circuit.
CAT III		Primary circuit of large equipment directly connected to the distribution board and circuit between the distribution board and the socket (three-phase distributor circuit includes a single commercial lighting circuit). Fixed equipment, such as multi-phase motor and multi-phase fuse box; lighting equipment and lines inside large buildings; machine tools and power distribution boards at industrial sites (workshops).
CAT IV		Three-phase public power unit and outdoor power supply line equipment. Equipment designed to "initial connection", such as power distribution system of power station, power instrument, front-end overload protection, and any outdoor transmission line
	**Certification**	CE indicates a registered trademark of EU.
	**Certification**	UKCA indicates a registered trademark of United Kingdom.
	**Certification**	ETL indicates a registered trademark of Intertek.
	**Waste**	This product complies with the marking requirements of WEEE Directive (2002/96/EC). This additional label indicates that this electrical / electronic product must not be discarded in household waste.
	**EFUP**	This environment-friendly use period (EFUP) mark indicates that dangerous or toxic substances will not leak or cause damage within this indicated time period. The

		environment-friendly use period of this product is 40 years, during which it can be used safely. Upon expiration of this period, it should enter the recycling system.

Safety Requirements

Warning	
Preparation before use	Please connect this device to AC power supply with the power cable provided; The AC input voltage of the line reaches the rated value of this device. See the product manual for specific rated value. The line voltage switch of this device matches the line voltage; The line voltage of the line fuse of this device is correct.
Check all terminal rated values	Please check all rated values and marking instructions on the product to avoid fire and impact of excessive current. Please consult the product manual for detailed rated values before connection.
Use the power cord properly	You can only use the special power cord for the instrument approved by the local and state standards. Please check whether the insulation layer of the cord is damaged or the cord is exposed, and test whether the cord is conductive. If the cord is damaged, please replace it before using the instrument.
Instrument Grounding	To avoid electric shock, the grounding conductor must be connected to the ground. This product is grounded through the grounding conductor of the power supply. Please be sure to ground this product before it is powered on.
AC power supply	Please use the AC power supply specified for this device. Please use the power cord approved by your country and confirm that the insulation layer is not damaged.
Electrostatic prevention	This device may be damaged by static electricity, so it should be tested in the anti-static area if possible. Before the power cable is connected to this device, the internal and external conductors should be grounded briefly to release static electricity. The protection grade of this device is 4KV for contact discharge and 8KV for air discharge.
Measurement accessories	Measurement accessories are of lower class, which are definitely not applicable to main power supply measurement, CAT II, CAT III or CAT IV circuit measurement.
Use the input / output port of this device properly	Please use the input / output ports provided by this device in a properly manner. Do not load any input signal at the output port of this device. Do not load any signal that does not reach the rated value at the input port of this device. The probe or other connection accessories should be effectively grounded to avoid product damage or abnormal function. Please refer to the product manual for the rated value of the input / output port of this device.
Power fuse	Please use power fuse of specified specification. If the fuse needs to be replaced, it must be replaced with another one that meets the specified specifications (Class T,

	rated current 5A, rated voltage 250V) by the maintenance personnel authorized by UNI-T.
Disassembly and cleaning	There are no components available to operators inside. Do not remove the protective cover. Maintenance must be carried out by qualified personnel.
Service environment	This device should be used indoors in a clean and dry environment with ambient temperature from 0 ℃ to 40 ℃. Do not use this device in explosive, dusty or humid air.
Do not operate in humid environment	Do not use this device in a humid environment to avoid the risk of internal short circuit or electric shock.
Do not operate in flammable and explosive environment	Do not use this device in a flammable and explosive environment to avoid product damage or personal injury.
Caution	
Abnormity	If this device may be faulty, please contact the authorized maintenance personnel of UNI-T for testing. Any maintenance, adjustment or parts replacement must be done by the relevant personnel of UNI-T.
Cooling	Do not block the ventilation holes at the side and back of this device; Do not allow any external objects to enter this device via ventilation holes; Please ensure adequate ventilation, and leave a gap of at least 15 cm on both sides, front and back of this device.
Safe transportation	Please transport this device safely to prevent it from sliding, which may damage the buttons, knobs or interfaces on the instrument panel.
Proper ventilation	Poor ventilation will cause the device temperature to rise, thus causing damage to this device. Please keep proper ventilation during use, and regularly check the vents and fans.
Keep clean and dry	Please take actions to avoid dust or moisture in the air affecting the performance of this device. Please keep the product surface clean and dry.
Note	
Calibration	The recommended calibration period is one year. Calibration should only be carried out by qualified personnel.

2. Introduction of UPO1000CS Series Digital Phosphor Oscilloscope

UPO1000CS series contains the following 2 models.

Model	Analog Channels	Bandwidth
UPO1202CS	2	200MHz
UPO1102CS	2	100MHz

3. Getting Started Guide

This chapter introduces on using the oscilloscope for the first time, the front and rear panels, the user interface, as well as the built-in help system.

3.1 General Inspection

It is recommended to inspect the instrument follow the steps below before using the UPO1000CS series for the first time.

(1) Check for Damages Caused by Transport

If the packaging carton or the foam plastic cushions are severely damaged, please contact the UNI-T distributor of this product immediately.

(2) Check Attachment

Please check appendix for the list of accessories. If any of the accessories are missing or damaged, please contact UNI-T or local distributors of this product.

(3) Machine Inspection

If the instrument appears to be damaged, not working properly, or has failed the functionality test, please contact UNI-T or local distributors of this product.

If the equipment is damaged due to shipping, please keep the packaging and notify both the transportation department and UNI-T distributors.

3.2 Before Use

To perform a quick verification of the instrument's normal operations, please follow the steps below：

(1) Connect to the Power Supply

The power supply voltage range is from 100 VAC to 240 VAC, the frequency range is 45 Hz to 440 Hz. Connect the oscilloscope to the power supply line that came with the oscilloscope or any power supply line that meets the local country standards. Turn on the power button, which on the back of the oscilloscope. The soft power button  in the front of the oscilloscope should be on red.

(2) Boot Check

Press the soft power button  and the light should change to green. The oscilloscope will show a boot animation, and then enter the normal interface.

(3) Connect Probe

Use probe in the attachment and connect it BNC terminal to the channel 1 BNC terminal of the oscilloscope. Connect the probe's main alligator clip to the "Compensating signal terminal" and the ground clip is connected to the "Ground terminal" shown below. The output of the compensating signal should be a 3 Vpp amplitude, default frequency is 1 kHz.

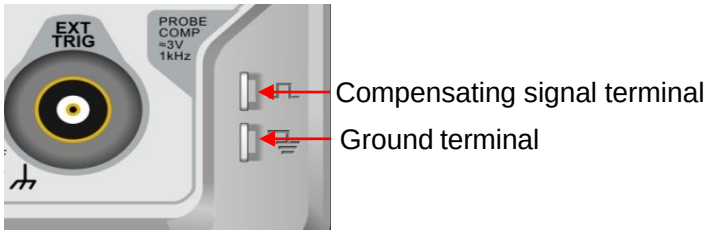


Figure 1 Compensating Signal and Ground Terminal

(4) Function Check

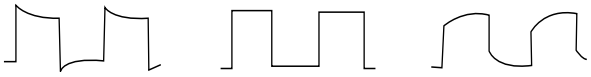
Press the AUTO key, a 3 Vpp 1 kHz square ware should appear. Repeat step 3 for all channels.

(5) Probe Compensation

When the probe is connected to any input channel for the first time, this step might be required in order to match the probe and the input channel. Probes that are not compensated may lead to measurement errors or mistake. Please follow the following steps:

① Set the attenuation coefficient in the probe menu and the switch on the probe to 10x, and connect the probe to CH1. Make sure the probe's connector is properly connected with the oscilloscope. Connect the probe's main clip and ground clip to the oscilloscope's compensating signal and ground terminal respectively. Open CH1 and press the AUTO button.

② View displayed waveforms



Excessive Compensation Correct Compensation Insufficient Compensation

Figure 2 Compensating Calibration of Probe

③ If the displayed waveform is look like the above "Insufficient Compensation" or "Excessive Compensation", use a non-metallic screwdriver to adjust the probe's variable capacitance until the display matches the "Correct compensation" waveform.

Warning: To avoid electric shock when measuring high voltage using the probe, please ensure that the probe insulation is in good condition and avoid physical contact with any metallic part of the probe.

4. Front Panel

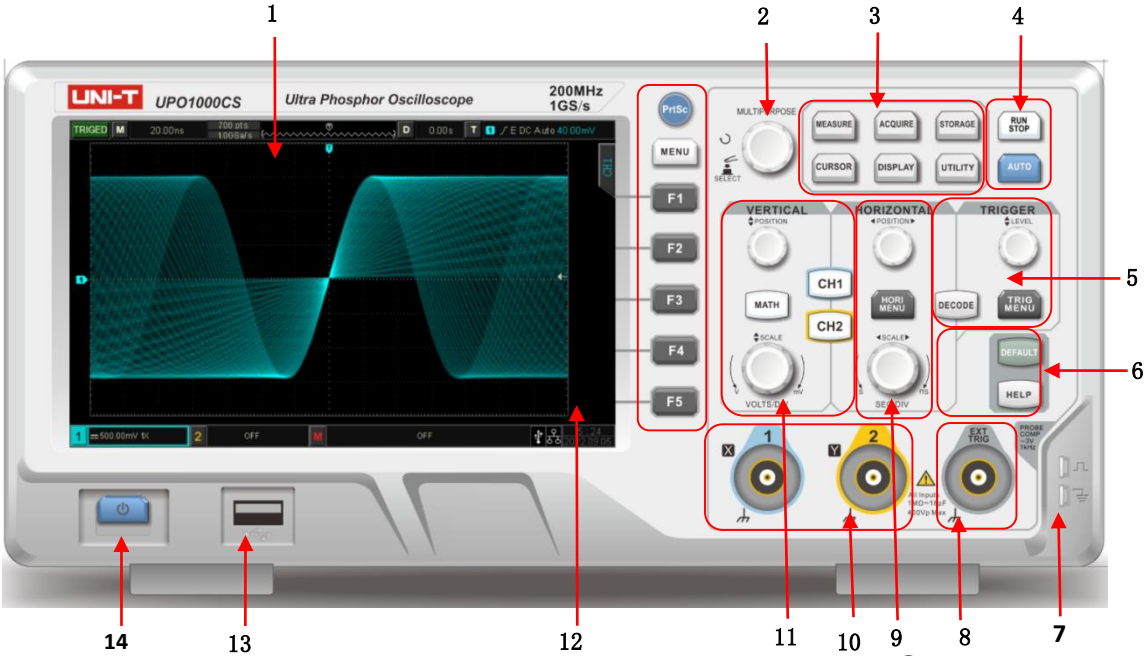


Figure 3 Front Panel

Table 1 Description of Front Panel

NO.	Description	NO.	Description
1	Screen display area	8	EXT (External trigger input) terminal
2	Multipurpose knob	9	Horizontal control area
3	Function menu	10	Analog channel input terminal
4	Run/Stop, Automatic setting	11	Vertical control area
5	Trigger control	12	Control menu, copy key
6	Default, Help menu	13	USB HOST interface
7	Compensation signal and Ground terminal	14	Soft Power on/off

5. Rear Panel

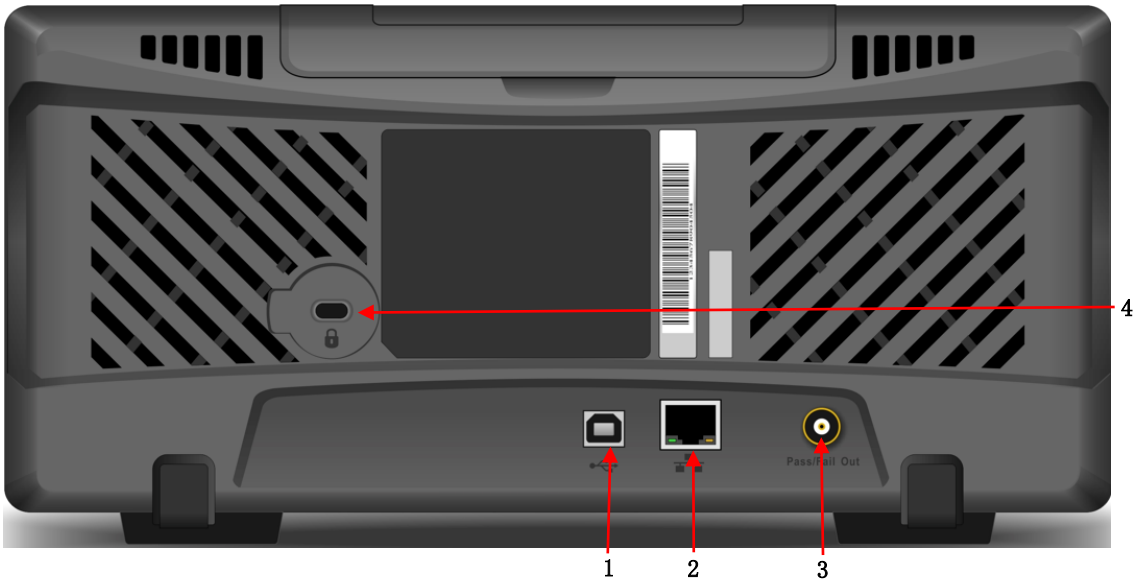


Figure 4 Rear Panel

Table 2 Description of Rear Panel

NO.	Description	NO.	Description
1	USB Device interface	3	Pass/Fail output terminal
2	LAN interface	4	Safety lock

6. User Interface

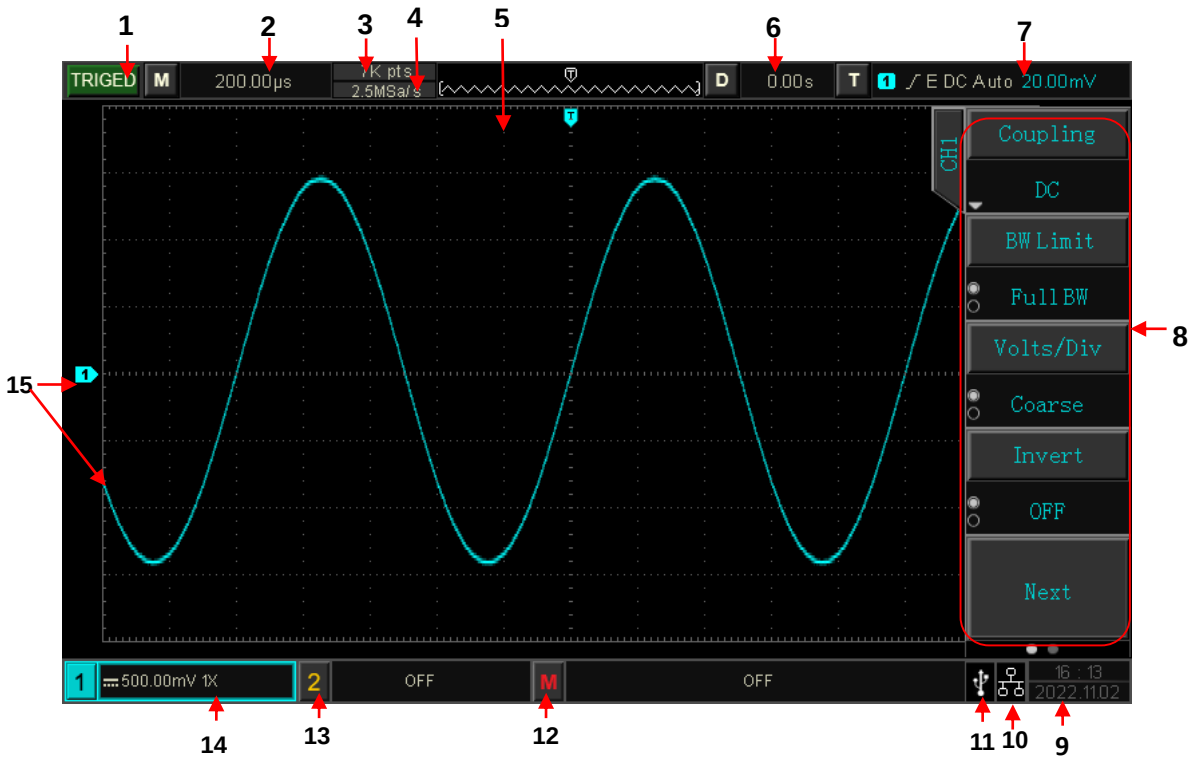


Figure 5 User Interface

Table 3 User Interface Icon

NO.	Description	NO.	Description
1	Trigger status identification	9	System time
2	Timing scale	10	LAN identification
3	Sampling rate/Storage depth	11	USB host identification
4	Waveform identification	12	MATH state identification
5	Trigger position	13	CH2 state identification
6	Horizontal displacement	14	CH1 state identification
7	Trigger information	15	Analog channel identification/Waveform
8	Operation menu		

7. Operation Menu

Symbols in the menu:

 Rotate the multipurpose knob on the front panel to select the parameter and adjust the value.

 There is a pull-down menu.

 There is a next menu.

 To input contents, press the numeric keyboard on the front panel or touch the screen to make the keyboard pop up.

 Circle number presents the total page of menu. Single page has no small circle, and two or more pages will have small circle display. Press F5 to turn pages.

8. Remote Control

UPO1000CS series digital phosphor oscilloscope communicates with the computer through USB interface and LAN interface to achieve remote control. Remote control is implemented based on the SCPI (Standard Commands for Programmable Instruments) command set.

UPO1000CS series digital phosphor oscilloscope supports three remote control modes:

a. User-defined programming.

b. Use PC software (instrument manager).

c. Web Control.

9. Troubleshooting

(1) When press the soft power button, the oscilloscope is blank screen：

a. Check whether the power is correctly connected, power supply is normal or not.

b. Check whether the power switch is really turned on, press the front panel power key and confirm green light and a relay sound is present.

c. If there is a relay sound, it indicates that the oscilloscope starts normally. Try the following operations: press the DEFAULT key, then press F1, if device returns to normal, it means backlight brightness is too low.

d. After completing the above steps, restart the oscilloscope.

e. If you still cannot use this product normally, please contact UNI-T.

(2) After signal acquisition, waveform does not appear on display：

a. Check whether both ends of the BNC cable are connected properly.

b. Check whether the output channel of the signal source is open.

c. Check whether the oscilloscope access signal channel is open.

d. Check whether the signal in the signal source has a DC offset.

e. Remove the incoming signal and check whether the baseline is in screen range (if not, self-calibration is required).

f. If you still cannot use this product normally, please contact UNI-T.

(3) The measured voltage amplitude value is 10 times larger or smaller than the actual value: Check that the channel probe attenuation coefficient settings are consistent with the used probe attenuation rate.

(4) There is a waveform displays but not stable:

a. Check the trigger source in the trigger menu and confirm that it matches the input channel of the actual signal.

b. Check the trigger type: general signals should use “Edge” trigger. Only when the proper trigger type is used, the waveform can displayed stably.

c. Change the trigger coupling to high-frequency or low-frequency to filter out the high-frequency or low-frequency noise that interferes with the trigger.

(5) No display after pressing RUN/STOP:

a. Check whether the mode at the trigger panel (TRIGGER) is on “Normal” or “Single” and whether the trigger level exceeds the waveform range.

b. If it exceeds，set the trigger level to the middle or set the mode to AUTO.

c. Press AUTO button could automatically finish the above setting.

(6) Waveform refresh is very slow:

a. Check whether the acquisition method is average and the average times are large.

b. Check whether the storage depth is the maximum.

c. Check whether the trigger release time is large.

d. Check whether the trigger is normal and the current time base is slow.

e. All the preceding causes slow refreshing of waveforms. Users can restore the factory settings so that the waveforms can be refreshed normally.

10. Appendix Contact Us