USER MANUAL

OSCILLOSCOPE

PCE-OC 50

ENGLISH



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

NOTICE TO USERS

- This manual provides a detailed introductions to the product. Please read this manual carefully ensure obtain the best state of the product.
- Do not use the instrument in flammable and explosive environments.
- Waste batteries and instruments cannot be disposed of together with household waste. Please dispose of them in accordance with relevant national or local laws and regulations.
- If there are any quality issues with the device or if you have any questions about using the device, please contact PCE Instruments.

PRODUCT INTRODUCTION

PCE-OC 50 is a fully functional, highly practical, three in one dual channel digital oscilloscope designed for the maintenance industry and development industry. This device is equipped with three main functions of oscilloscope, multimeter, and signal generator. The Oscilloscope adopts FPGA+MCU+ADC hardware architecture, with a sampling rate of 50MS/s, 10Mhz analog bandwidth, built-in high-voltage protection module, maximum support measurement of peak voltage of ± 400V; Support for saving and viewing waveform screenshots for analysis .The multimeter has a 4-digit 10000 point true effective value and supports AC/DC voltage and current measurement, as well as capacitance, resistance, diode, on/off and other measurement functions.
Whether used by professionals, factories, schools, enthusiasts, or families, it is an ideal multi-functional instrument. Equipped with a built-in DDS function signal generator, it can output 7 types of function signals, with a maximum output of 2MHz for all signals and a step of 1Hz; The output frequency, amplitude, and duty cycle are adjustable. Using a 2.8 inch 320*240 resolution high-definition LCD display screen with a built-in 3000mAh rechargeable lithium battery, the standby time can reach up to 6 H. Provide users with more and stronger practical functions in a compact size, while also having good portability.

DEVICE INTRODUCTION

1 - Function signal generator output port
2 - Oscilloscope CH2
3 - Oscilloscope CH1
4 - Screen display
5 - Buttons
6 - Multimeter Input



7 - Restoration
8 - Charging interface
9 - Charge indicator



DEVICE PARAMETER

Display screen	2.8 inch HD color screen
Resolution ratio	320*240
Charging specifications	TYPE-C (5V/1A)
Battery	3000mAh lithium battery
Support functions	Oscilloscope, Signal generator, Multimeter (view functional parameters for details)
Standby time	6h (laboratory theoretical maximum)
Product volume	167*89*35mm
Weight	300g

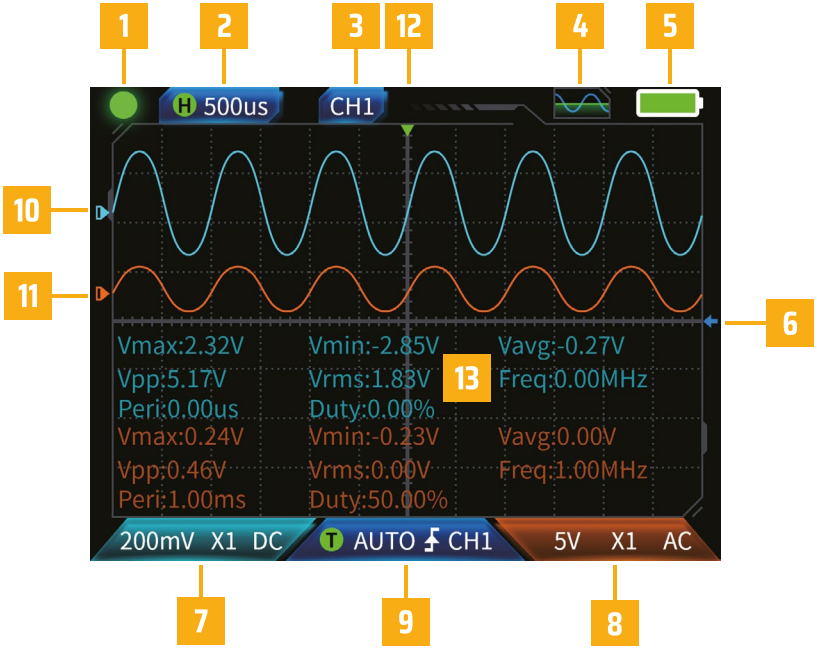
BUTTONS & FUNCTIONS INTRODUCTION

Oscilloscope - Key Operation Instructions

Button	Operation	Function
	Short press	Power ON /OFF
MENU	Short press	Home page (function selection page)
CH1	Short press	When it is currently CH1: CH1 setting When it is currently CH2: switch to CH1
CH2	Short press	When it is currently CH2: CH2 setting When it is currently CH1: switch to CH2
AUTO	Short press	AUTO
	Long press	Baseline correction*
	Short press	Running stop
	Long press	50% centered
SAVE	Short press	Save
	Long press	Enter the Nine Palace Grid
 MOVE	Short press	Waveform movement
	Long press	Quick access to the oscilloscope
 CURSOR	Short press	Trigger Movement
	Long press	Quick access to signal generator
 TRIGGER	Short press	Trigger settings
	Long press	Quick access to the multimeter
 PRM	Short press	Parameter selection
	Long press	Show measurement parameters/ Hide measurement parameters

*The baseline calibration process takes a long time, please be patient and do not operate the equipment during the calibration process. If the equipment is accidentally operated and the calibration is interrupted, please recalibrate. (Baseline calibration requires removing the probe)

Oscilloscope - Interface Description



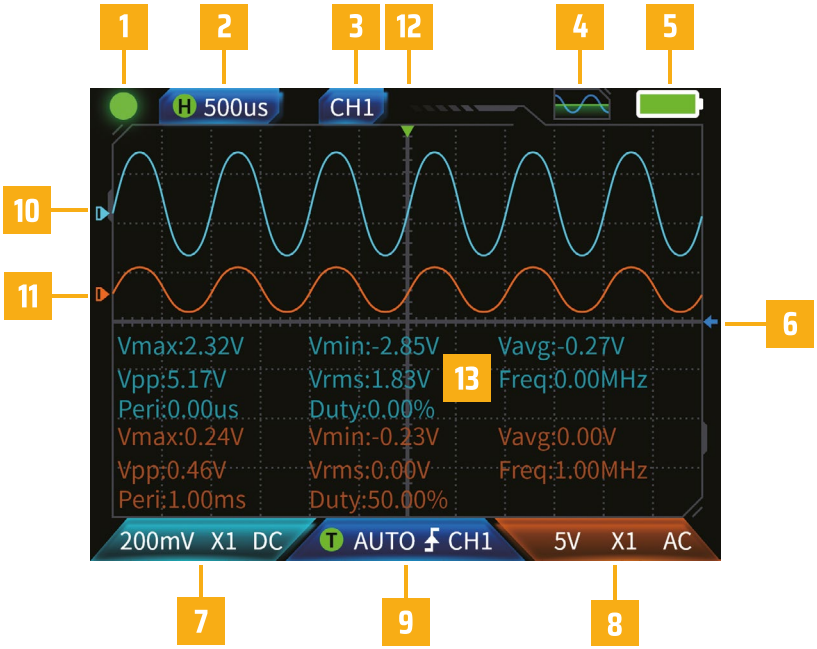
1 - Operation pause indication: Press the button to pause the waveform and then press the waveform acquisition button again to run.

2 - Time base: 50ns ... 10s, in no other modes on the oscilloscope page, press the LEFT and RIGHT direction keys to adjust the time base.

3 - Indicates the current operating channel: Short press CH1 and CH2 switching, indicating that the direction key is the waveform of the moving channel.

4 - Function model generator interface status prompt:
There are 8 states:

- off
- sine wave
- square wave
- triangular wave
- full wave
- half wave
- noise wave
- DC



5 - Battery indicator light: Full and low battery. When the battery level is low, a pop-up window will prompt that the battery level is low, and it will automatically shut down after the countdown ends.

6 - Trigger level: Trigger voltage condition, short press the CURSOR button to adjust the trigger cursor. The interface appears, indicating the adjustment of the trigger voltage. At this point, short press the UP and DOWN buttons of the direction keys to adjust the trigger.

7 - Oscilloscope channel 1 setting: When the operating channel is CH2 in use, short press CH1 to switch. When the operating CH1 is in use, short press CH1 will pop up a window to set the switch, magnification (X1, X10), and coupling (AC, DC) of oscilloscope channel 1. At this point, press the direction keys to set up, down, left, and right.

8 - Oscilloscope channel 2 setting: When operating the channel is CH1 in use, short press CH2 to switch. When operating the channel CH2, short pressing CH2 will pop up a window to set the switch, magnification (X1, X10), and coupling (AC, DC) of oscilloscope channel 2. At this point, press the direction keys to set up, down, left, and right.

9 - Trigger setting: Used to set the trigger mode, trigger channel, and mtrigger type. Short press the TRIGGER button to pop up the settings. At this point, press the direction key to set up, down, left, and right.

10 - Channel 1 waveform: When operating the CH1, short press the MOVE button to set the movement waveform, the interface appears represent waveform movement, and use the UP and DOWN buttons on the direction keys to move channel 1 waveform.

11 - Channel 2 waveform: When operating the CH2, short press the MOVE button to set the movement waveform, the interface appears represent waveform movement, and use the UP and DOWN buttons on the direction keys to move channel 2 waveform.

12 - Left and right cursors: Short press the MOVE button, the interface appears represent waveform movement, use direction keys LEFT and RIGHT buttons to move the cursor.

13 - Parameter measurement display:
Short press the PRM button to pop up and set the parameters to be measured.
Long press the PRM button, all measurements will not be made, and the measured parameters will not be displayed in the interface.

Oscilloscope - waveform screenshot saving

» **Save screenshot:**
Short press the SAVE button and a pop-up prompt will pop up SAVING...; Expected to pop up SAVED save successfully in 2 seconds. At this point, the waveform interface has stored images in BMP format, and the image name will be named „img _number". It can be viewed and deleted by the machine itself, or inserted into TYPEC to connect to the computer for viewing.

» **View screenshot:**
Long press the SAVE button to enter the view saved waveform screenshot page, and press START/STOP to enter the saved waveform screenshot interface, 
corresponds to the four buttons in sequence MOVE / CURSOR / TRIGGER / PRM. When selecting multiple waveforms, the direction keys select the corresponding waveform, and the START/STOP button selects it.

NOTICE! The storage is full and must be manually deleted before saving again.

Oscilloscope - Parameters

Channel	Dual channel
Sample rate	50M
Analog bandwidth	10M (dual channel independent 10M)
Storage depth	32kb
Impedance	1MΩ
Time Base Range	50ns ... 10s
Vertical sensitivity	20mV / div-10V / div (X1)
Maximum measured voltage	±400V
Trigger mode	Auto / Normal / Single
Trigger type	Rising edge, Falling edge
Display mode	YT / Scroll
Coupling method	AC / DC
Save waveform screenshot	Yes
Export waveform images	Yes

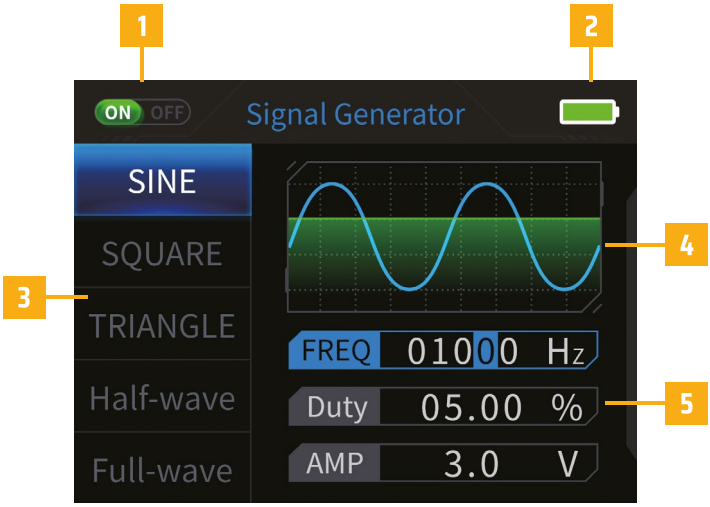
Function Signal Generator - Key Description

Button	Operation	Function
	Short press	Power ON /OFF
MENU	Short press	Home page (function selection page)
	Short press	Running stop
 MOVE	Long press	Quick access to the oscilloscope
 CURSOR	Long press	Quick access to signal generator
 TRIGGER	Long press	Quick access to the multimeter

Function Signal Generator - Parameters

Channel	Single channel
Frequency	1Hz ... 2MHz
Amplitude	0.1 ... 3.3V

Function Signal Generator - Interface Description



1 - Output status indication: When the corresponding waveform setting is not selected, press the START/STOP button to turn on/off the waveform, as shown in the figure.

2 - Battery indicator light: Full and low battery. When the battery level is low, a pop-up window will prompt that the battery level is low, and it will automatically shut down after the countdown ends.

3 - There are 7 types of output waveform selection: Sine wave / square wave / triangular wave / full wave / half wave / noise wave and DC.

4 - Waveform diagram

5 - Parameters for waveform adjustment: Sine wave (frequency, duty cycle, amplitude), square wave (frequency, duty cycle, amplitude), triangular wave (frequency, duty cycle, amplitude), full wave (frequency, amplitude), half wave (frequency, amplitude), noise wave (frequency, amplitude), DC (amplitude)

Operation: First press the direction keys UP and DOWN to select the output waveform, and then press the RIGHT button of the direction keys to enter the waveform setting parameters (complete the setting by adjusting the direction keys)

Digital Multimeter - Key Description

Button	Operation	Function
	Short press	Power ON / OFF
MENU	Short press	Home page (function selection page)
AUTO	Short press	Automatic measurement
	Short press	Data hold
SAVE	Short press	Relative measurement
 MOVE	Short press	Voltage / Resistance
	Long press	Quick access to the oscilloscope
 CURSOR	Short press	Diode Continuity test / capacitance
	Long press	Quick access to signal generator
 TRIGGER	Short press	Temperature / Live Line Detection
	Long press	Quick access to the multimeter
 PRM	Short press	High current / low current

Digital Multimeter - Interface Description



1 - Range scale bar

2 - HOLD: Data retention, short press the START/STOP button to take effect.

3 - REL: Relative measurement, only the capacitance level is valid, short press the SAVE button to take effect.

4 - Measurement display

5 - The specific measured gear

6 - Gear: The four buttons used to indicate the manual gear represent which gear to switch to (switch back to automatic short press the AUTO button), corresponding from left to right in sequence:

- MOVE - Voltage / Resistance
- CURSOR - Diode Continuity test / capacitance
- TRIGGER - Temperature / Live Line detection
- PRM - High current / low current

7 - Power indicator

Introduction to the Digital Multimeter Probe Interface

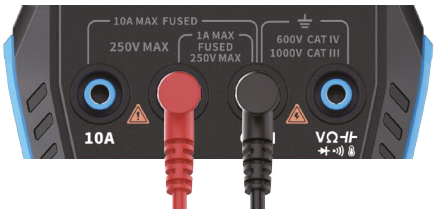
High current measurement:
Red test pen connected to 10A, black test pen connected to COM, automatically identifying AC and DC currents.

NOTICE! If the measured current is greater than 10A, it will burn out the fuse.
Lease preliminarily evaluate the current before measuring.



Low current measurement:
Red test pen connected to mA, black test pen connected to COM, automatically identifying AC and DC currents.

NOTICE! If the measured current is greater than 1A, it will burn the fuse.
Before measuring, please preliminarily evaluate the current. If unsure, please use a high current gear for measurement first.



Automatic, voltage, resistance, capacitance, temperature, diode / Continuity test measurement:
Red test pen connect to , black test pen connect to COM, please switch to the corresponding functional gear according to the required measurement parameters during measurement.



Voltage range: Automatically recognize AC/DC voltage.

Diode Continuity test gear: When measuring continuity test, when the resistance value is less than 50 Ω, the buzzer will ringing and the screen will display positive bias voltage when measuring the diode. If the polarity of the test wire is opposite to that of the diode, or the diode is damaged, the screen will display „OL“.

LIVE (live wire detection): Red test pen connect to , short press TRIGGER to switch to the LIVE gear, and use a red test pen to detect a live wire when encountering a live wire. The screen displays as shown in the figure below.



Digital Multimeter - Parameters

Function	Range	Accuracy
DC Voltage	9.999V/99.99V/999.9V	±(0.5%+3)
AC voltage	9.999V/99.99V/750.0V	±(1%+3)
DC current	9999uA/99.99mA/999.9mA/9.999A	±(1.2%+3)
AC current	9999uA/99.99mA/999.9mA/9.999A	±(1.5%+3)
Resistance	9.999MΩ/999.9KΩ/99.99KΩ/9.999KΩ/999.9Ω	±(0.5%+3)
	99.99MΩ	±(1.5%+3)
Capacitance	999.9uF/99.99uF/9.999uF/999.9nF/99.99nF/9.999nF	±(2.0%+5)
	9.999mF/99.99mF	±(5.0%+20)
Temperature	(-55 ... 1300°C) / (-67 ... 2372°F)	±(2.5%+5)
Diode	✓	
Continuity test	✓	
Live line detection	✓	

SETTING

Set single item selection: Language / Volume / Automatic Shutdown / Screen Brightness / Startup / Theme / Factory Settings

Specific setting details:

- Language: English / Russian / Portuguese / German / Japanese
- Volume: Button prompt tone
- Automatic shutdown: Off / 15 minutes / 30 minutes / 1 hour
- Screen brightness: 1 ... 100%
- Start up: Turn off, oscilloscope, signal generator, and multimeter. This setting is used to set which functional block to start automatically when starting up
- About: Brand information and version number
- Restore factory settings

First press the direction keys to select the corresponding settings, and then press the direction keys to enter the parameters for individual settings (complete the settings by adjusting the direction keys)

UPGRADE

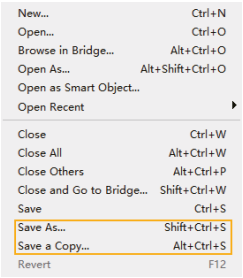
- Obtain the latest firmware from the official website and unzip it to download to the desktop.
- Connect the device to the computer using the USBA to Type-C data cable, press and hold the MENU button, and then press the POWER button to enter firmware upgrade mode, and the computer will pop up the USB flash drive;
- Copy the firmware to the USB drive, and after successful replication, the device will automatically upgrade the firmware.
- Observe the upgrade percentage. After the upgrade is completed, the device will restart. If the upgrade fails, please contact official customer service for help.

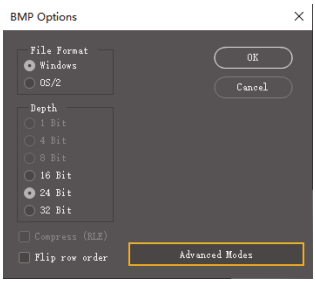
CUSTOMIZE STARTUP LOGO

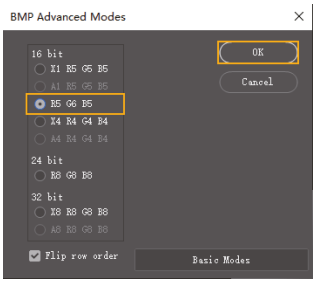
- Prepare the startup interface image to be replaced and import it into the Photoshop software

Specific export operations

- Firstly, please prepare a picture of the startup interface. The picture size must be 320x240 pixels, the format must be [. bmp], and the file name must be [logo2c23. bmp].
- Select [Menu]>[Store As] or [Store Copy].
- Enter Advanced Mode.
- Select [16 bits] [R5 G6 B5] and check the flip row sequence. And click [OK].







COMMON IN-CIRCUIT TESTING METHODS

Battery or DC voltage measurement

Gear selection

The battery voltage is generally below 80V, and other DC voltages are uncertain. It is necessary to adjust the gear according to the actual situation, if it is below 80V, use 1X gear, and if it is above 80V, use 10 gear × Gear position. (Both the probe and oscilloscope are set to the same gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (DC voltage belongs to periodic signals)
- Set the oscilloscope to the corresponding gear (default to 1X gear after startup)
- Set the oscilloscope to DC coupling mode
- Insert the probe and pull the switch on the probe handle to the corresponding gear position
- Ensure that the battery has power or DC voltage output
- Connect the probe clamp to the negative pole of the battery or DC negative pole, and connect the probe to the battery or DC negative pole
- Positive electrode
  Press the [AUTO] button once, and the DC electrical signal will be displayed. Note that battery voltage or other DC voltages belong to DC signals, which have no curve or waveform, only a straight line with up and down offset, and the peak to peak VPP and frequency F of this signal are both 0.

Crystal oscillator measurement

Gear selection

When the crystal oscillator encounters capacitance, it is easy to stop oscillation. The input capacitance of the 1X probe is as high as 100-300pF, and the 10X gear is around 10-30pF, it is easy to stop oscillation in the 1X gear, so it needs to be set to the 10X gear, that is, both the probe and oscilloscope should be switched to the 10X gear (both the probe and oscilloscope should be set to the 10X gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (crystal oscillator resonance sine signals belong to periodic signals).
- Set the oscilloscope to 10X gear (default to 1X gear after startup).
- Oscilloscope setting AC coupling mode.
- Insert the probe and pull the switch on the probe handle to the 10X position.
- Ensure that the crystal oscillator motherboard is powered on and running.
- Connect the probe clamp to the ground wire of the crystal oscillator motherboard (negative pole of the power supply), pull out the probe cap, which is the needle tip inside, and make the needle tip contact one of the pins of the crystal oscillator.
- Press the AUTO button once, and the waveform of the tested crystal oscillator will be displayed. If the waveform after AUTO adjustment is too small or too large, you can manually adjust the waveform size in zoom mode.

PWM signal measurement of MOS transistor or IGBT

Gear selection
The PWM signal voltage for directly driving MOS tubes or IGBTs is generally within 10V~20V, and the PWM front-end control signal is also generally within 3-20V. The maximum test voltage for 1X gear is 80V, so using 1X gear for testing PWM signals is sufficient (both the probe and oscilloscope are set to 1X gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (PWM belongs to periodic signals).
- Set the oscilloscope to 1X gear (default to 1X gear after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and move the switch on the probe handle to the 1X position
- Ensure that the PWM motherboard has PWM signal output at this time.
- Connect the probe clamp to the S pole of the MOS tube and the probe to the G pole of the MOS tube.
- Press the AUTO button once, and the measured PWM waveform will be displayed. If the waveform after AUTO adjustment is too small or too large, you can manually adjust the waveform size in zoom mode.

Signal generator output measurement

Gear selection
The output voltage of the signal generator is within 30V, and the maximum test voltage for 1X gear is 80V. Therefore, using 1X gear for testing the signal generator output is sufficient (both the probe and oscilloscope are set to 1X gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (the signal output by the signal generator belongs to periodic signals).
- Set the oscilloscope to 1X gear (default to 1X gear after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and move the switch on the probe handle to the 1X position.
- Ensure that the signal generator is turned on and working and outputting signals.
- Connect the probe clamp to the black clamp on the output line of the signal generator, and connect the probe to the red output line of the signal generator.
- Press the AUTO button once, and the waveform output by the generator will be displayed. If the waveform after AUTO adjustment is too small or too large, you can manually adjust the waveform size in zoom mode.

Household electric supply 220V or 110V measurement

Gear selection

Household electricity is generally 180-260V, with a peak to peak voltage of 507-733V. In some countries, household electricity is 110V, with a peak to peak voltage of 310V. The highest measurement for 1X gear is 80V, and the highest measurement for 10X gear is 800V (10X gear can withstand up to 1600 peak to peak). Therefore, it is necessary to set it to 10X gear, which means that both the probe and oscilloscope must be switched to 10X gear.

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (50Hz for household appliances is considered a periodic signal).
- Set the oscilloscope to 10X gear (default to 1X gear after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and move the switch on the probe handle to the 10X position
- Ensure that there is a household electrical output at the tested end.
- Connect the probe clamp and probe to the two wires of the household appliance, without distinguishing between positive and negative poles.
- Press the AUTO button once, and the waveform of the household electricity will be displayed. If the waveform after AUTO adjustment is too small or too large, you can manually adjust the waveform size in zoom mode.

Power ripple measurement

Gear selection

If the power output voltage is below 80V, set it to 1X gear (both the probe and oscilloscope are set to 1X gear). If it is between 80-800V, set it to 10X gear (both the probe and oscilloscope are set to the same gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test cycle signals.
- Set the oscilloscope to the corresponding gear (default to 1X gear after startup).
- Set the oscilloscope to AC coupling mode.
- Insert the probe and move the switch on the probe handle to the corresponding gear position.
- Ensure that the power supply is powered on and there is a voltage output.
- Connect the probe clamp to the negative terminal of the power output, connect the probe to the positive terminal of the power output, and wait for about 10 seconds, when the yellow line and the yellow arrow on the left end of the waiting period.
- Press the AUTO button once, and the power ripple will be displayed.

Inverter output measurement

Gear selection
The output voltage of the inverter is similar to that of household electricity, usually around a few hundred volts, so it needs to be set to the 10X gear (both the probe and oscilloscope are set to the 10X gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup), which is used to test periodic signals (the signals output by the inverter belong to periodic signals).
- Set the oscilloscope to 10X gear (default to 1X gear after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and move the switch on the probe handle to the 10X position.
- Ensure that the inverter is powered on and has voltage output.
- Connect the probe clamp and probe to the output end of the inverter without distinguishing between positive and negative poles.
- Press the AUTO button once, and the waveform output by the inverter will be displayed. If the waveform after AUTO adjustment is too small or too large, the waveform size can be manually adjusted in zoom mode.

Automotive communication signals/bus signals measurement

Gear selection
Communication signals used in automobiles are generally lower than 20V, and the highest test voltage for 1X gear is 80V. Therefore, using 1X gear for testing automotive communication signal signals is sufficient (both the probe and oscilloscope are set to 1X gear)

- Firstly, set the oscilloscope to Normal trigger mode (default to Auto trigger mode after startup). The Norma trigger mode is specifically used to measure non periodic digital signals, and if you use Auto trigger mode, you cannot capture non periodic signals.
- Set the oscilloscope to 1X position (default to 1X position after startup).
- Set the oscilloscope to AC coupling mode.
- Insert the probe and move the switch on the probe handle to the 1X position.
- Connect the probe clamp and probe to two signal wires of the communication line, regardless of positive or negative. If there are multiple signal wires, you need to determine the signal wires in advance or try selecting two of them multiple times to test.
- Ensure that there is a communication signal on the communication line at this time.
- Adjust the vertical sensitivity to the 50mV gear.
- Set the time base to 20uS.
- When there is a communication signal on the communication line, the oscilloscope will capture it and display it on the screen. If it cannot be captured, it is necessary to try adjusting the time base (1mS ... 6nS) and triggering voltage (red arrow) multiple times for debugging

Power amplifier or audio signal measurement

Gear selection

The output voltage of the power amplifier is generally below 40V, and the maximum test voltage for 1X gear is 80V, so using 1X gear is sufficient (both the probe and oscilloscope are set to 1X gear).

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup)
- Set the oscilloscope to 1X gear (default to 1X gear after startup)
- Set the oscilloscope to AC coupling mode
- Insert the probe and move the switch on the probe handle to 1X position
- Ensure that the amplifier is turned on and working, and is outputting an audio signal
- Connect the probe clamp and probe to the two output terminals of the power amplifier, without distinguishing between positive and negative poles
- Press the AUTO button once, and the waveform output by the power amplifier will be displayed. If the waveform after AUTO adjustment is too small or too large, you can manually adjust the waveform size in zoom mode.

Infrared remote control receiver measurement

Gear selection

The infrared remote control signal generally ranges from 3 to 5, with a maximum test voltage of 80V in X gear. Therefore, using 1X gear for testing automotive communication signal signals is sufficient (both the probe and oscilloscope are set to 1X gear)

- Firstly, set the oscilloscope to Normal trigger mode (default to Auto trigger mode after startup). The Normal trigger mode is specifically used to measure non periodic digital signals. If use Auto, the trigger mode cannot capture non periodic signals, and the infrared remote control signal belongs to non periodic digital coding signal.
- Set the oscilloscope to 1X position (default to 1X position after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and move the switch on the probe handle to the 1X position.
- Connect the probe clamp to the ground terminal (negative pole) of the infrared receiver motherboard, and connect the probe to the data pin of the infrared receiver head.
- Set the vertical sensitivity to 1V gear.
- Set the time base to 20uS.
- Adjust the trigger red arrow position to approximately 1 large grid distance above the yellow arrow position on the left.
- At this point, use the remote control to send a signal to the infrared receiver, and a waveform will appear on the oscilloscope.

Amplification circuits with sensors (temperature, humidity, pressure, Hall, etc.) measurement

Gear selection

Sensor signals are generally relatively weak, about a few millivolts, and this small signal cannot be directly detected by an oscilloscope. This type of sensor has a signal amplifier on the motherboard, which can measure the amplified signal. The 1X gear can be used (both the probe and oscilloscope are set to 1X gear)

- Firstly, set the oscilloscope to Auto trigger mode (default to Auto trigger mode after startup).
- Set the oscilloscope to 1X position (default to 1X position after startup).
- Set the oscilloscope to DC coupling mode.
- Insert the probe and pull the switch on the probe handle to the 1X position.
- Connect the probe clamp to the ground terminal (negative pole of the power supply) of the sensor motherboard, locate the output terminal of the amplification section, and connect the probe to this output terminal.
- Adjust the vertical sensitivity to the 50mV gear.
- Switch to keyboard movement mode and move the yellow arrow horizontally to the bottom of the waveform.
- Adjust the time base to 500mS and enter the large time base slow scan mode.
- If the yellow signal line appears at the top, it is necessary to reduce the vertical sensitivity, which is 100mV, 200mV, 500mV, etc. When the updated signal on the right is not at the top (usually in the middle), the signal received by this sensor can be detected at this time.

NOTICE

- When dual channels are used simultaneously, the ground clamps of the two probes must be connected together. It is strictly prohibited to connect the ground clamps of the two probes to different potentials, especially at different potential terminals or 220V of high-power equipment. Otherwise, the oscilloscope motherboard will be burned because the two channels are grounded together, and connecting to different potentials will cause a short circuit in the internal ground wires of the motherboard, as is the case with all oscilloscopes.
- The maximum tolerance for the BNC input of the oscilloscope is 400V, and it is strictly prohibited to input voltage exceeding 400V under the 1X probe switch
- When charging, a separate charging head must be used. It is strictly prohibited to use the power supply or USB of other currently tested devices, otherwise it may cause a short circuit to the motherboard ground wire and burn the motherboard during the testing process.
- Before using the product, please check if the insulation near the shell and interface is damaged
- Please hold your finger behind the protective device of the pen
- When measuring the circuit to be tested, do not touch all input ports
- Please disconnect the test probe and circuit connection before changing the gear position
- When the DC voltage to be tested is higher than 36V and the AC voltage is higher than 25V, users should take precautions to avoid electric shock
- When the battery level is too low, a pop-up prompt will appear, please charge it in a timely manner to avoid affecting the measurement performance

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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