UNI-T

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User's Manual

UDP4303S Programmable Linear DC Power

V 1.0

06.2024

Safety Information

⚠DANGER/ WARNING: To avoid electric shock and personal injury, please follow the safety precautions.

⚠CAUTION: If handled improperly, it may damage the product or other devices connected to the product.

Disclaimer

Before using the product, the user must read the following safety information carefully. UNI-T shall not be liable for the personal injury and property losses caused by the user's failure to comply with these terms.

Instrument Grounding	Please use the cable provided by the manufacturer to connect the device. Please ensure the power ground wire is properly connected.
Operating voltage	Please ensure that the operating voltage is within 10% of the rated range to avoid damaging the instrument.
Input voltage	Please use an AC 110V-230V 50/60 Hz power supply, a nationally approved power cord, and ensure the insulating layer is in good condition.
Inspecting the wire of the instrument	Check the condition of the cable's insulating layer to see if it is broken, bare, or functional. If the cable is damaged, please replace it before connecting it to the instrument.
Fuse wire	Only the specified fuse wire is allowed to be used.
Over-voltage protection	Please ensure the instrument is not subjected to over-voltage (such as voltage caused by lightning) to protect operating personnel from electric shock.
Do not open the case while operating	Please do not operating the instrument if the outer shell is opened and do not alter the internal circuit.
Do not touch live parts	When the instrument is operating, do not touch bare wires, spare input terminals, or the circuit being tested. Be extremely careful when measuring voltages higher than 60V DC or 30V AC to prevent electric shock.
Do Not use the instrument in an explosive atmosphere	Do not use the instrument in flammable or explosive gas, steam, or dusty environments. The use of any electronic equipment in such environments poses a risk to personal safety.

Safety Sign

	Grounding		ON (Power)
	Protective Grounding		OFF(Power)
	Signal Ground		Connect to the chassis or case
	Danger		

Environment-friendly Use Period

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.

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

Must not be discarded in the trash can.

Operation Environment

UDP4303S programmable linear DC power can only be used under the normal temperature and non-condensing conditions, Refer to the following table for the general environmental requirements.

Operation Environment	Requirements
Operating temperature	0 ℃-40 ℃
Operating humidity	20%-80% (Non-condensing)
Storage temperature	-10 ℃-60 ℃
Altitude	≤ 2000 meters
Pullation degree	Class 2

Cleaning

To prevent electric shock, unplug the power cord before cleaning. Use a clean cloth slightly dampened with water to wipe the outer shell and panel, and keep them dry. Avoid letting water enter the instrument. Do not clean the inside of the instrument.

Caution：Do not use solvents (such as alcohol or gasoline) to clean instrument.

Chapter 1 Inspection and Installation

1.1 Packing List

Before using the instrument:

1. Check whether the appearance of the product is damaged, scratched or has other defects;

2. Check whether accessories are complete according to the packing list.

If it is damaged or the accessories are missing, please contact Uni-Trend Instrument Sales Department or the distributor immediately.

Table 1-1 Packing List

Accessories	Quantity	Remarks
UDP4303 Programmable Linear DC Power	1	
Power Cord	1	
Factory Calibration Report	1	
USB Cable	1	
WJ2EDGKM-5.08-8P-1Y-00A	2	
WJ2EDGKM-5.08-5P-1Y-00A	1	

Note

Once the packing list is confirmed, suggest to keep the packing materials for possible future storage or shipment.

1.2 Power-on Inspection

When the instrument is rebooted, ensure that the time interval between the two startups is greater than 5 seconds.

Connecting to power

(1) UDP4303S power supply supports various AC power supply inputs. The AC selector setting on the rear panel varies depending on the input power connected, as shown in the table below.

Table 1-2 AC Input Power Specifications and Voltage Selector Settings

AC Input Power	AC Selector
100 V_{ac} ± 10%, 50 Hz-60 Hz	100 V_{ac}
120 V_{ac} ± 10%, 50 Hz-60 Hz	120 V_{ac}
220 V_{ac} ± 10%, 50 Hz-60 Hz	220 V_{ac}
230 V_{ac} ± 10% (Maximum 250 V_{ac}), 50 Hz-60 Hz	230 V_{ac}

Please connect the AC power to the instrument according to Table 1-2.

(2) Check the voltage selector on the rear panel

Ensure that the voltage selector (100 V, 120 V, 220 V or 230 V) on the rear panel of the instrument matches the actual input voltage.

If the input AC voltage selector needs to be changed, please use the two AC selector switches on the rear panel, as shown in the following figure.

Set the input voltage selector according to the figure above. For example, to use 120 V_{ac} AC power, slide both switches to the right; to use 220 V_{ac} AC power, slide both switches to the left.

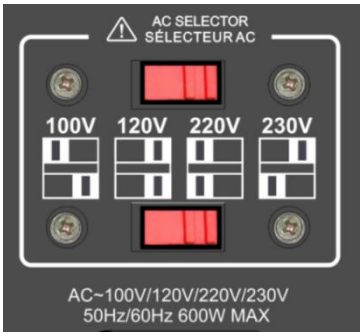


Figure 1-1 AC Selector Switch

(3) Check the fuse

Select the fuse according to the actual input voltage. Refer to the table below.

Table 1-3 Fuse Specification

AC Input Voltage	Fuse
100 V_{ac} ± 10%, 50 Hz-60 Hz	T8A/250 V_{ac}
120 V_{ac} ± 10%, 50 Hz-60 Hz	T8A/250 V_{ac}
220 V_{ac} ± 10%, 5 0Hz-60 Hz	T4A/250 V_{ac}
230 V_{ac} ± 10% (Maximum 250 V_{ac}), 50 Hz-60 Hz	T4A/250 V_{ac}

Replace the Fuse

Follow these steps to replace the fuse:

(1) Turn off the instrument and disconnect the power cable.

(2) Insert a straight screwdriver into the groove of the power slot and gently pry out the fuse socket.

(3) Remove the fuse and replace it with a specified one. Refer to Figure 1-2.

(4) Reinstall the fuse socket to the power socket, ensuring the correct orientation.

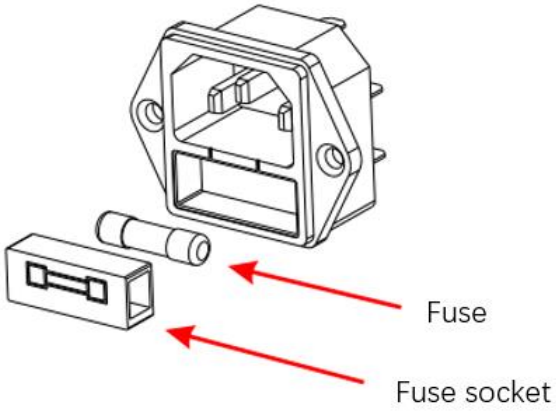


Figure 1-2 Exploded View of Power Socket

⚠WARNING

- To avoid electric shock, the instrument should be properly grounded.
- To avoid personal injury, disconnect the power before replacing the fuse.
- To avoid electric shock or fire, ensure that the power supply matches to the actual input voltage and replace the fuse with the specified one.

Chapter 2 Quick Guide

This chapter provides a brief introduction to the front panel, rear panel, keyboard, and LCD functions of the UDP4303S, ensuring the user can quickly become familiar with the instrument's operation.

2.1 Main Features

- UDP4303S: 32 V/3A, 32 V/3 A, 15 V/3 A, 6 V/10 A
- Electric isolation between 4 channels, independent output, with a maximum output power of 297 W
- 4.3 inch TFT-LCD
- Supports internal series and parallel connections for CH1 and CH2
- Hi resolution of 1 μA for current measurement
- Capability to measure and display dynamic ranges of current
- Outstanding programming and readback accuracy
- Fast transient response time: < 50 μs
- Front and rear panel output terminals
- Supports 2-wire and 4-wire for remote sensing
- Supports a maximum of 512 group serial outputs, with a minimum dwell time of 1 ms, and includes various built-in fundamental waveforms
- Low output ripple and noise: < 350 μV_{rms} /2 mV_{pp} μV_{rms}/2 mV_{pp}
- Command processing time: < 10 ms

- Automatic switchover low and high range measurement
- Supports timing output, energy consumption analysis (IoT), data recording and analysis
- Supports a minimum of 1 ms pulse current waveform
- Supports standard three rack-units (3U), 1/2-rack form factor
- Supports upper computer control
- Multiple protection: OVP/OCP/OTP/Sense; OCP time can be set to 0 ms-1000 ms
- High and low current measurements supports high-speed sampling at 8 kSa/s in full channel mode
- Various standard interfaces: USB Host, USB Device, RS-232, Sense, LAN, and Digital I/O based on SCPI (Standard Commands for Programmable Instruments)

2.2 Appearance and Dimensions

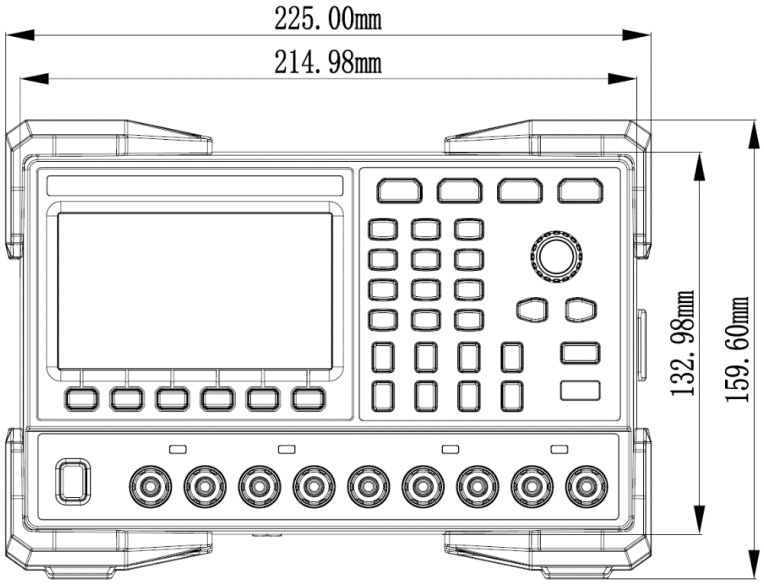


Figure 2-1 Front View

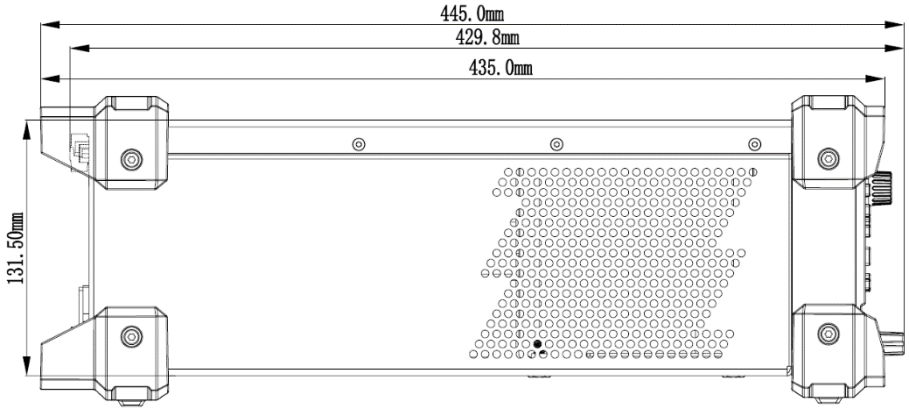


Figure 2-2 Side View

2.3 Front Panel

Figure 2-3 UDP4303S Front Panel

1. 4.3 inch TFT-LCD
2. Functional keys
3. Parameter setting area
4. Channel selection and Output ON/OFF keys
5. All channel selection and Output ON/OFF keys
6. Output terminals
7. CC/CV indicator
8. Power switch
9. Function menu/F1-F6 keys (named by the specified function, standard names are F1-F6 from left to right)
10. USB 2.0 Host port

2.4 Keypad

Figure 2-4 UDP4303S Keypad

Table 2-1 UDP4303S Keypad Description

Key	Description
Home	Short press to enable the main menu Long press to screenshot
Menu	enter the menu
Wave	Press to display waveform
Lock	Short press to lock the key Long press to unlock the key
Numeric keypad	To input the numerical value for the parameter
Arrow keys ← , →	To select the digit place for editing the parameter
Encoder rotary knob	Edit and select the numeric value Short press to confirm the selection (equivalent to "Enter" key)
Esc	Return to previous level Exit data editing
CH1-4	Channel selection keys
On Off	Channel ON/OFF keys
All On Off	All channel ON/OFF keys

2.5 Rear Panel

Figure 2-5 UDP4303S Rear Panel

Table 2-2 UDP4303S Rear Panel Description

No.	Name	Description
1	CH3 and CH4	Remote sensing output port for CH3 and CH4
2	USB DEVICE	Connect the instrument as "Slave" device to external USB device (such as PC)
3	Digital I/O	Digital I/O port
4	RS232 port	Serial communication interface
5	LAN port	Connected to the LAN network via RJ45 interface
6	AC voltage selector	To select the specification of the input voltage (100 V_{ac}, 120 V_{ac}, 220 V_{ac} or 230 V_{ac}, refer to *Connecting to power*)
7	AC power inlet socket	AC inlet power connector
8	Fuse	The fuse rating is related to the actual input voltage of the instrument model (refer to *Replacing the fuse*)
9	Ground terminal	-
10	Fan ventilation hole	-
11	CH1 and CH2	Remote sensing output port for CH1 and CH2

2.6 Icon and Character Descriptions on LCD

Figure 2-6 UDP4303S User Interface

Table 2-3 User Interface

No.	Description
1	Interface function name
2	Channel identifier
3	Remote sense state (S indicates remote sense ON; if no display indicates remote sense OFF.)
4	Channel output state OFF: Disable the output CV: Constant voltage output CC: Constant current output
5	Actual output voltage
6	Actual output current
7	Actual output power
8	Voltage and current setting value (constant)
9	Over-voltage and over-current protection values (highlight indicates over-voltage and over-current protection are enabled and can be enabled separately; no highlight indicates these function are disabled.)
10	Function keys
11	Status bar: The following icons indicate the system status. : The screen is locked. : A USB flash drive is detected. : Network connected : The beeper is enabled. : The beeper is disabled. OTP: OTP is enabled. (1): The list output mode is enabled, "(1)" indicates CH1 is operating in list output mode. (1): The delay timer mode is enabled, "(1)" indicates CH1 is operating in delay timer mode. (1): The monitor function is enabled, "(1)" indicates CH1 is operating in monitor mode. : The trigger is enabled. : The recorder is enabled.

2.7 Connecting the Outputs

This series power is equipped with front and rear output terminals. This section describes how to make front and rear connections.

Front Terminal

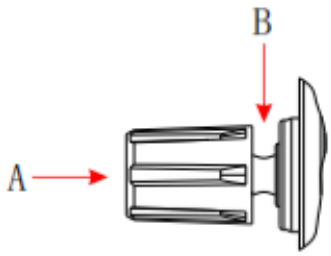


Figure 2-7 Front Outputs Connections

Method 1: Connect wires to the front of the terminals at location A, as shown in the figure above.

Method 2: Rotate the terminal block screws counter-clockwise and connect wires to the terminals in location B, as shown above in the figure. Then, rotate the screws clockwise to tighten the wires. This method helps reduce errors caused by the terminal resistance.

Caution

Disconnect the AC power before making front panel connections. Ensure all wires and lug plates are properly connected to prevent currents from damaging the loads.

Rear Terminal

Insert the connector plug into the rear terminal and secure it by tightening the locking screws.

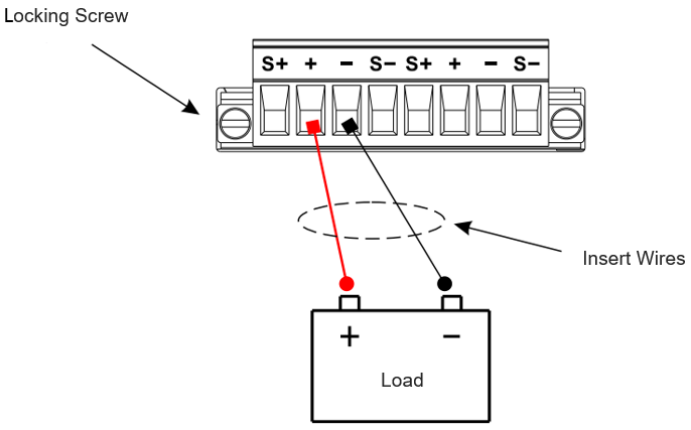


Figure 2-8 Rear Outputs Connections

⚠CAUTION

Disconnect the AC power before making front panel connections. Ensure all wires and lug plates are properly connected to prevent currents from damaging the loads.

Do not use both front and rear panel output terminals concurrently. Only one set of terminals can be selected at a time.

Chapter 3 Protection Function

Each channel output has independent OVP (Over-voltage protection) and OCP (Over-current protection) functions. The "OVP/OCP" status indicator lights up when a protection function is enabled.

3.1 Over-voltage Protection (OVP)

When the output voltage exceeds the user-set threshold, the OVP function will shut down the corresponding channel's output.

Steps to set the OVP limit value (Limit indicates the limit voltage and current):

(1) Tap the **Home** key to enter the user interface, as shown in Figure 2-6.

(2) Press the **function key** below OVP character on the screen to set the OVP limit value.

(3) Press the function key again to highlight the corresponding setting value on the screen, indicating that OVP is enabled. (To disable OVP, press the function key again; the setting value will no longer be highlighted, indicating that OVP is disabled.)

3.2 Over-current Protection (OCP)

When the output current exceeds the user-set threshold, the OCP function will shut down the corresponding channel's output.

Steps to set the OCP limit value (Limit indicates the limit voltage and current):

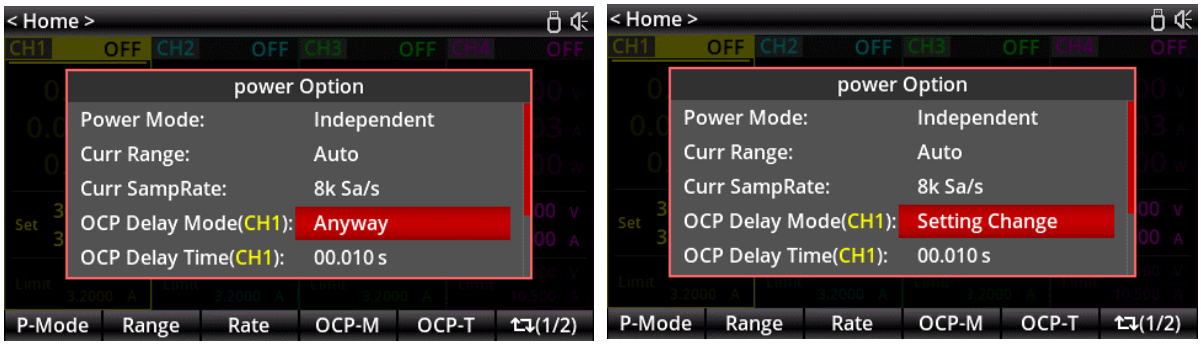
(1) Tap the **Home** key to enter the user interface, as shown in Figure 2-6.

(2) Press the **function key** below OCP character on the screen to set the OCP limit value.

(3) Press the function key again to highlight the corresponding setting value on the screen, indicating that OCP is enabled. (To disable OCP, press the function key again; the setting value will no longer be highlighted, indicating that OCP is disabled.)

3.3 OCP Delay

The OCP delay has two modes, constant and change. The delay time for both modes can be set, as shown in the following figure.



a. Constant Mode b. Change Mode

Figure 3-1 OCP Function

Mode selection: On the Home page, select the OCP delay as shown in the figure above. Tap the OCP delay option and allow the cursor to stay at its current position, then use the encoder rotary knob to switch between Anyway and Setting Change.

Anyway: When anyway is selected, the delay time indicates that each time the actual current reaches the OCP threshold, the output will be disabled. The OCP will not be enabled if the OCP delay time has not reach to the set delay time.

Setting Change: When Setting Change is selected, the delay time indicates that the channel output will not have OCP for the specified duration. Once the channel output is enabled and the output time exceeds the set delay time, if an over-current occurs, the instrument will turn off the channel output as soon as possible, improving the OCP.

OCP delay time: Tap the OCP delay option and allow the cursor to stay at its current position, then use the numeric keypad and encoder rotary knob to input the parameter, the setting range is 0-10 seconds.

Chapter 4 Power Output

UDP4303S provides two output modes: constant voltage (CV) and constant current (CC).

In CV mode, the output voltage equals the set voltage value, and the output current is determined by the load.

In CC mode, the output current equals the set current value, and the output voltage is determined by the load.

⚠CAUTION

While making connections, pay attention to the polarity to avoid damaging the instrument or the devices connected to it.

4.1 Voltage and Current Output Setting

Press the power switch to turn on the instrument, and enter the main menu (user interface).

1. Set the voltage

First, press the function key below Voltage character on the screen. A cursor will appear in the voltage parameter field (the cursor will default to the last set position). Then, set the voltage using one of the two methods below. (Refer to *Chapter 3* for using OVP.)

Method 1: Use the arrow keys ◄ ► to select the voltage setting position that needs modification, then rotate the encoder rotary knob to adjust the value. Finally, press the encoder rotary knob to confirm the set value.

Method 2: Use the numeric keypad to input the desired voltage value, then press the function key below **V** or **mV** displayed on the screen to confirm. Or press the encoder rotary knob to confirm. The default unit is **V** when confirming with the encoder rotary knob. The numeric input interface is shown below.

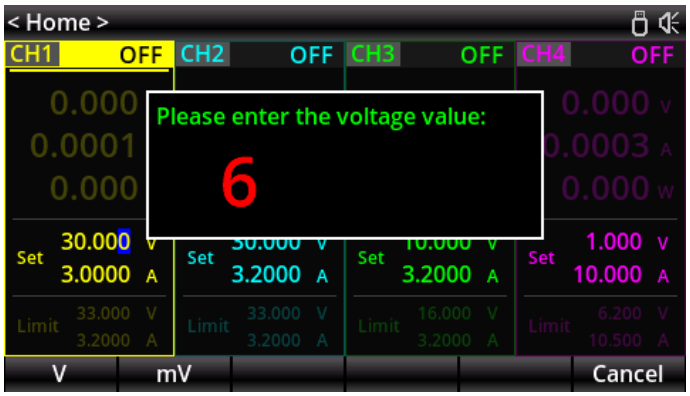


Figure 4-1 Keypad Editing for Voltage

2. Set the current

First, press the function key below Current character on the screen. A cursor will appear in the current parameter field (the cursor will default to the last set position). Then, set the current using one of the two methods below.

Method 1: Use the arrow keys ◄ ► to select the voltage setting position that needs modification, then rotate the encoder rotary knob to adjust the value. Finally, press the encoder rotary knob to confirm the set value.

Method 2: Use the numeric keypad to input the desired current value, then press the function key below **A** or **mA** displayed on the screen to confirm. Alternatively, press the encoder rotary knob to confirm. The default unit is **A** when confirming with the encoder rotary knob. The numeric input interface is shown below.

Figure 4-2 Keypad Editing for Current

4.2 Constant Voltage/Current Output

Press the All On/Off key to enable all channel outputs. When the output is enabled, the corresponding switch indicator will light up. When the output is disabled, the corresponding switch indicator will turn off.

⚠WARNING

To avoid electric shock, please correctly connect the output terminals before turning on the output switch.

Constant Voltage Output

The output mode displays "CV" in constant voltage mode. If the output mode displays "CC", you can increase the current setting value, and the power supply will automatically switch to CV mode.

Note

In CV output mode, when the load current exceeds the set current value, the power supply will automatically switch to CC mode. At this time, the output current equals the set current, and the output voltage equals the current multiplied by the load impedance.

Constant Current Output

The output mode displays "CC" in constant current mode. If the output mode displays "CV", you can increase the voltage setting value, and the power supply will automatically switch to CC mode.

Note

In CC output mode, when the load voltage exceeds the set voltage value, the power supply will automatically switch to CV mode. At this time, the output voltage equals the set voltage, and the output current equals the voltage divided by the load impedance.

Chapter 5 Series/Parallel Connections

Connecting two or more isolated channels in series provides a greater voltage capability, while connecting two or more isolated channels in parallel provides a greater current capability. UDP4303S offers both internal and external series and parallel connections.

(1) The four channels of the power supply are electrically isolated with independent outputs. For a single power supply, any two of the four channels can be externally connected in series or parallel.

(2) Isolated channels from different power supplies can also be connected externally in series or parallel.

(3) CH1 and CH2 can be internally connected in series or parallel.

(4) In internal series mode, CH1 and CH2 cannot be externally connected in parallel.

In internal parallel mode, CH1 and CH2 cannot be externally connected in series.

(5) The parameter settings for series and parallel connections must comply with safety requirements.

5.1 Series

Connecting power supplies in series provides a higher voltage, with the output voltage being the sum of all channel's output voltages. When connecting power supplies in series, set the same current setting value for each channel.

⚠WARNING

To avoid electric shock, do not touch the output terminals when the output voltage exceeds 60 V.

UDP4303S supports internal series connection for CH1 and CH2. In internal series connection mode, the output voltage of terminal is the set voltage (up to 66 V). The output voltage and current are shown in the following figure.

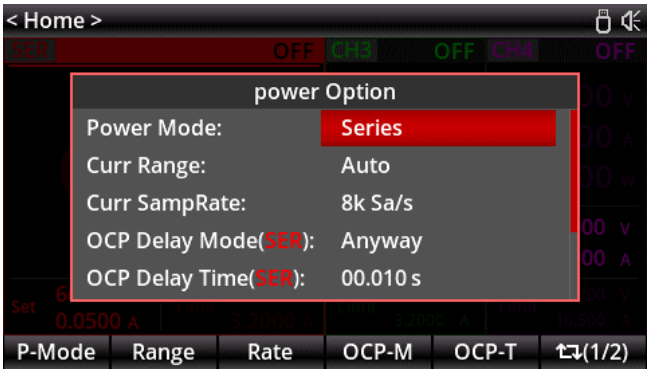


Figure 5-1 Power Option

Figure 5-2 Series Connection

Steps to Enter Series Connection Mode:

(1) On Home page, tap Option Mode to enter the power option interface.

(2) Use the arrow keys ◄ ► or use the function key at the bottom of the screen to select the parameter filed to be set.

(3) Rotate the encoder rotary knob to select the series connection mode.

(4) Press Esc or Home key to return to the main page. The series connection is shown in Figure 5-2

The steps for setting series connection voltage, current, and protection are the same as in independent mode. Refer to *Chapter 3 and Chapter 4* for detailed instructions.

The external wiring diagram on the front panel under internal series connection mode is shown in Figure 5-3.

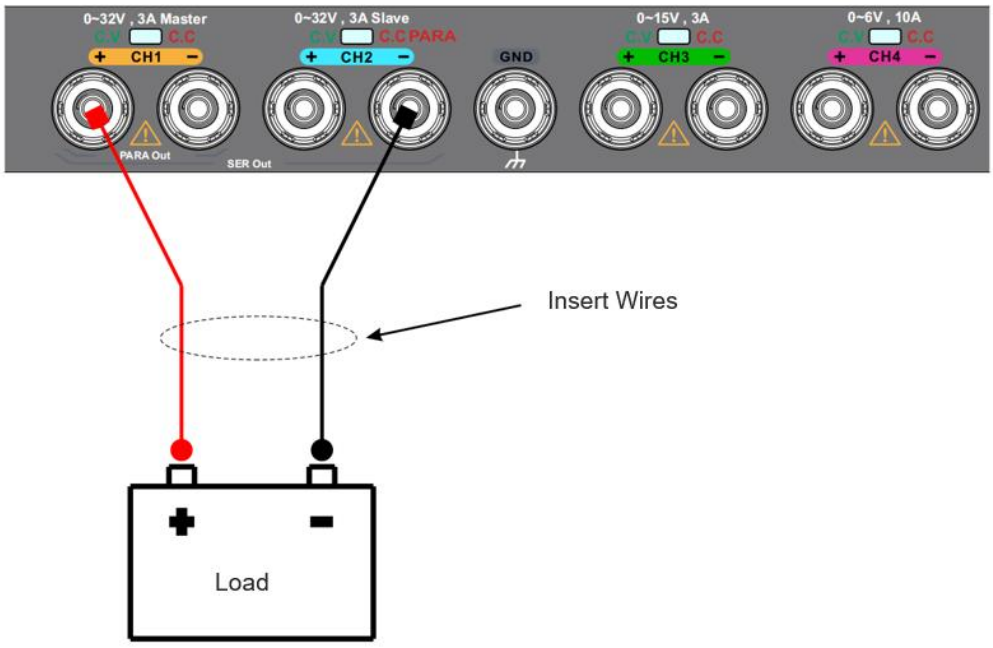


Figure 5-3 External Wiring Diagram of Internal Series Connection Mode on Front Panel

The external wiring diagram on the rear panel under external series connection mode is shown in Figure 5-4.

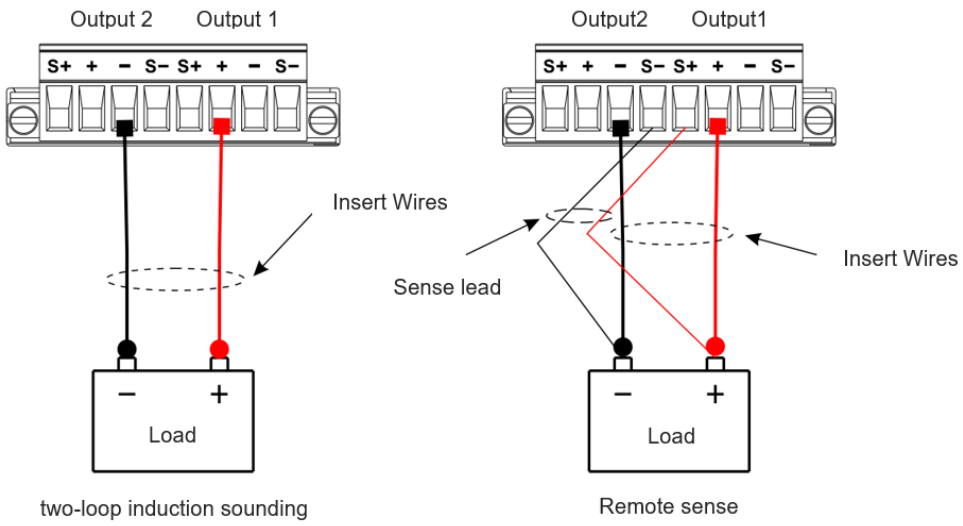


Figure 5-4 External Wiring Diagram of Internal Series Connection on Rear Panel

Note

When the series connection needs to provide positive and negative voltage, the voltage conductor in the middle should be connected to the negative terminal of CH1.

5.2 Internal Parallel Connection

Connecting power supplies in parallel provides a higher current, with the output current being the sum of a single channel's output current. When connecting power supplies in parallel, the voltage and OVP values for each channel should be the same.

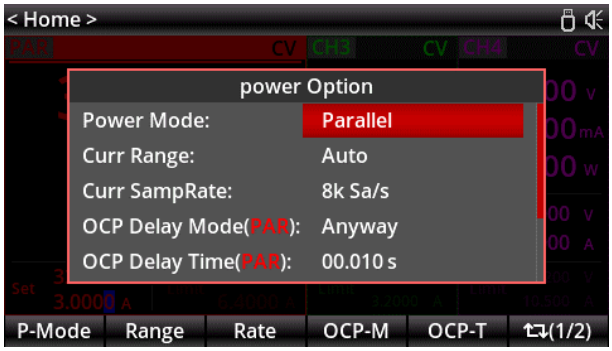


Figure 5-5 Power Option

Figure 5-6 Parallel Connection

Steps to Enter Parallel Connection Mode:

(1) On Home page, tap Ootion Mode to enter the power option interface.

(2) Use the arrow keys  or use the function key at the bottom of the screen to select the parameter filed to be set.

(3) Rotate the encoder rotary knob to select the parallel connection mode.

(4) Press Esc or Home key to return to the main page. The parallel connection is shown in Figure 5-

The steps for setting parallel connection voltage, current, and protection are the same as in independent mode. Refer to *Chapter 3 and Chapter 4* for detailed instructions.

The external wiring diagram on the front panel under internal parallel connection mode is shown in Figure 5-7.

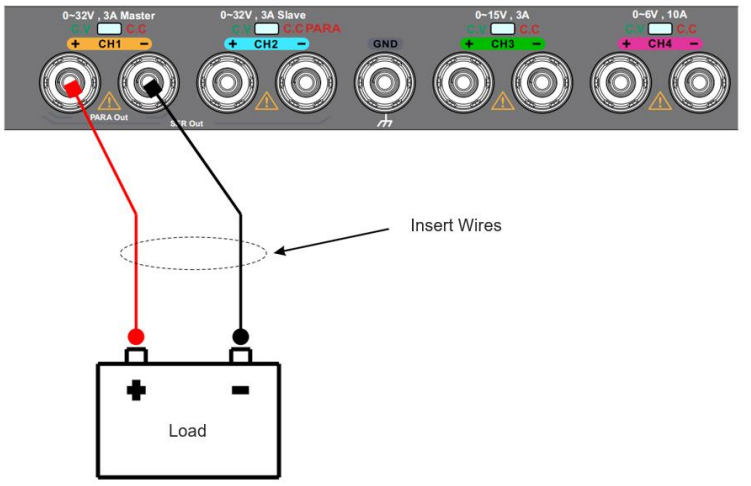


Figure 5-7 External Wiring Diagram of Internal Parallel Connection on Front Panel

The external wiring diagram on the rear panel under internal parallel connection mode is shown in Figure 5-7.

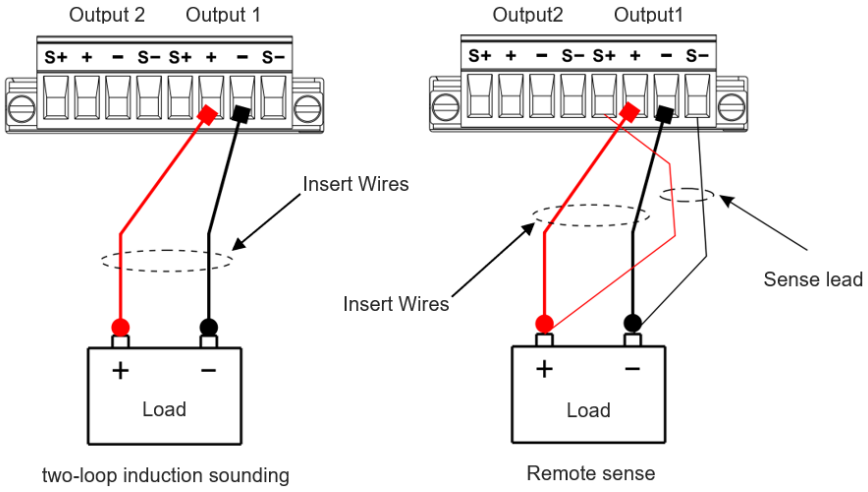
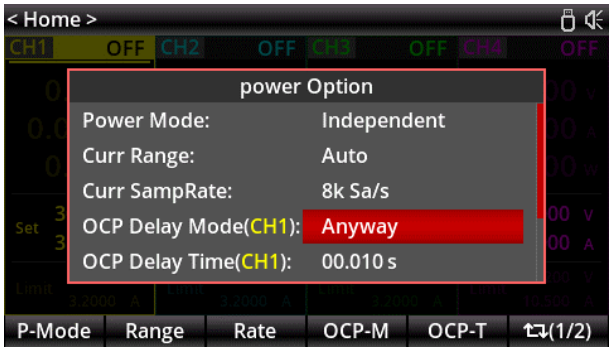


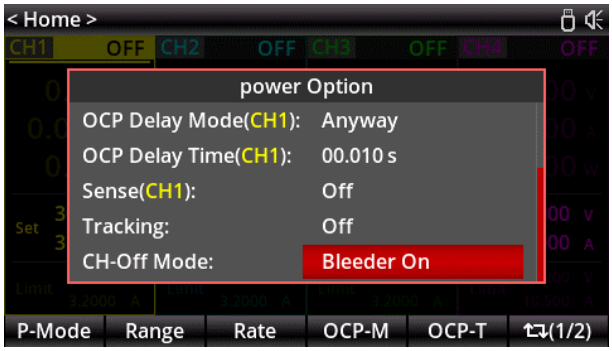
Figure 5-8 External Wiring Diagram of Internal Parallel Connection on Rear Panel

Chapter 6 Function Keys on Main Menu

The function keys on the main page include Power Mode, Current Range, Current Sampling Rate, OCP Delay Mode, OCP Delay Time, Sense, Trace, and Channel OFF Mode, as shown in the following figure.



a. Power Option Page 1



b. Power Option Page 2

Figure 6-1 Power Option Interface

1. Power mode: Used to switch the independent, series or parallel mode for CH1 and CH2. Press the **Power Mode** key and allow the cursor stay at its current position. Then, rotate the encoder rotary knob to switch modes.
2. Current range: Displays the current state of actual output current position and unit on the main page, including three modes: Auto, Large current, and Low current.

   Press the **Range** key and allow the cursor stay at its current position. Then, rotate the encoder rotary knob to switch modes.

   a) Auto: The current output display position can automatically switch display units (mA or A) according to the actual output size.

   b) Large current: The current output display position unit is A, and it cannot be changed automatically.

   c) Low current: The current output display position unit is mA, and it cannot be changed automatically. If the current output exceeds the range, "—. ----" will appear.
3. Current sampling rate: Press the Sampling key and allow the cursor stay at its current position. Then, rotate the encoder rotary knob to switch 8 kSa/s, 4 kSa/s, and 62Sa/s. 8 kSa/s, 4 kSa/s, and 62Sa/s is corresponding RL:6S, RL:12S and RL300S on the waveform page, indicating waveform recoding time of 6 seconds, 12 seconds, and 300 seconds, respectively.
4. OCP delay mode and OCP delay time: Refer to the section *3.3 OCP Delay*, for details.
5. Sense: When the power supply outputs high current, the voltage drop across the load leads can become significant. To ensure that the load receives an accurate voltage, the output terminals on the rear panel of this power supply provide the Sense (remote compensation) mode of operation.

In this mode, the voltage at the load terminal is detected instead of the voltage at the power supply output. This enables the instrument to automatically compensate for the voltage drop across the load leads, ensuring that the user-set power supply output value matches the voltage obtained by the load. The figure

below depicts the load connection using two-wire sensing and remote sensing, respectively.

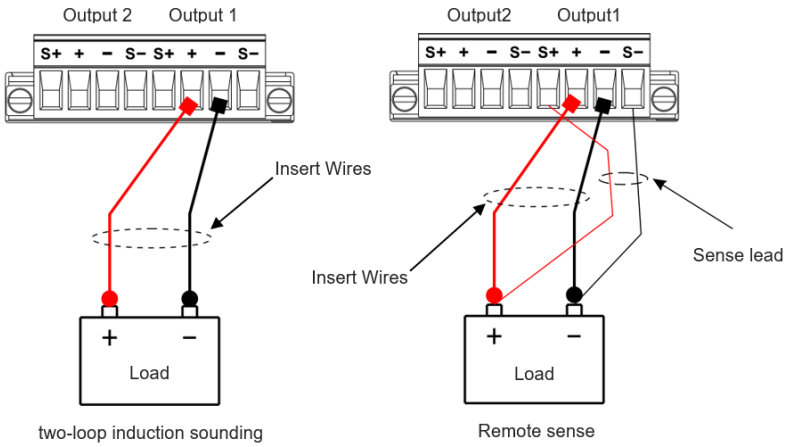


Figure 6-2 Load Wiring on Rear Panel

6. Trace: The trace function on the main page is shown in Figure 6-3. For the two channels that support tracing (CH1 and CH2), changing the settings of either channel (voltage and current settings, OVP and OCP settings, and OVP and OCP switch status) will also change the settings of the other channel. When the trace function is turned off, changing the settings of one channel does not affect the settings of the other channel.

Figure 6-3 Trace Mode

7. Channel OFF: Includes turning the leakage circuit on or off.

   When the leakage circuit is enabled, it is used for measuring DUTs that are not batteries. When the test is finished and the output is turned off, the voltage can decrease quickly (enabling the internal fake load of the power supply).

   When the leakage circuit is disabled, it is used for measuring DUTs that are batteries. When the test is finished, it prevents discharging the battery of the DUT (disabling the internal fake load of the power supply).

Chapter 7 Output Waveform Display

UDP4303S provides an output waveform display function for observing the voltage and current output states.

Press the Wave key to enter the waveform display page, as shown in Figure 7-1.

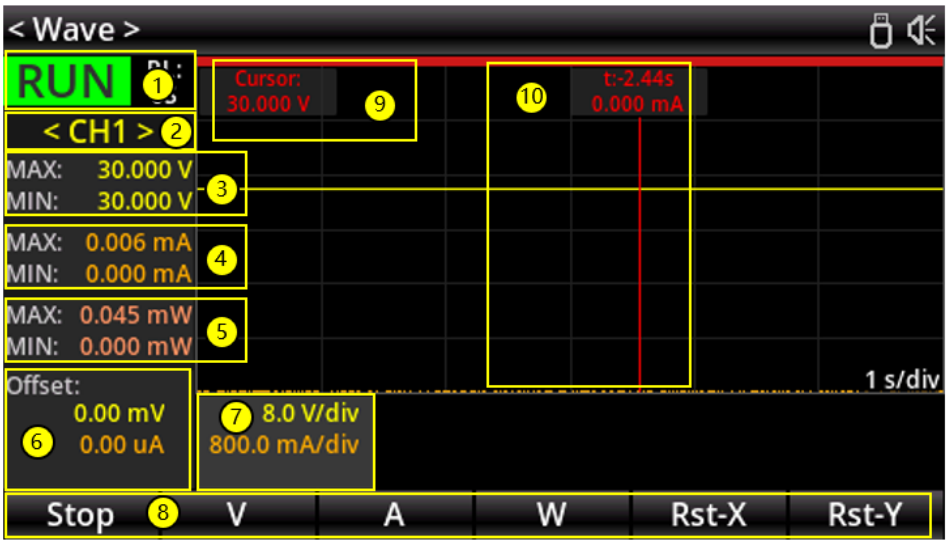


Figure 7-1 Waveform Display Page

Table 7-1 Waveform Display Description

No.	Description
1	Operation state: The stop key F1 controls the start and stop waveform display. Waveform recording time: This is related to the sampling rate.
2	Channel identifier: Displays the channel parameter and its waveform for CH1-CH4.
3	Displays the maximum and minimum of voltage waveforms for the specified channel within the display range.
4	Displays the maximum and minimum of current waveforms for the specified channel within the display range.
5	Displays the maximum and minimum of power waveforms for the specified channel within the display range.
6	Indicates the voltage, current, and power waveform offset for the specified channel. The offset can be edited using the numeric keypad and encoder rotary knob.
7	Indicates the voltage, current, and power vertical coordinate size for the specified channel. These parameters can be edited using the numeric keypad and encoder rotary knob.
8	Function keys on the waveform display page V: Short press to switch between the voltage offset and the vertical coordinate size. Long press to hide or display the voltage waveform. A: Short press to switch between the current offset and the vertical coordinate size. Long press to hide or display the current waveform. W: Short press to switch between the power offset and the vertical coordinate size. Long press to hide or display the power waveform. Reset-X: Restore the horizontal axis to the default setting.

	Reset -Y: Restore the vertical axis to the default setting.
9	Displays the waveform parameter: voltage, current, and power on the time axis for the specified channel. If only display two parameters of 10, press the Wave key to switch different parameter.
10	Displays the time and one of the parameters (voltage, current, or power) on the time axis。 If nothing is displayed on the screen, press the encoder rotary knob to display. Rotate the knob to change the time axis position. If the function is not displayed on the screen, press the encoder rotary knob again and rotate it to zoom-in or zoom-out the waveform (to change the time axis size).

Remarks: The waveform is displayed correctly when the output voltage is stable. The waveform displayed under other conditions is for reference only.

Chapter 8 List Output

UDP4303S provides a list output function for generating arbitrary waveforms and freely editing programmable waveforms. These waveforms can be reproduced within the limit settings for voltage and current. Users can set the repetition cycle for the arbitrary waveforms, as well as the output voltage, current, and time for each group of data. Additionally, the instrument offers various output templates for selecting and editing arbitrary waveforms. The instrument will output the parameter based on the current settings. All channels, as well as series and parallel connections, support this function.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "List Output" on the menu, and short press the **Enter** key or encoder rotary knob to enter the list output function page.

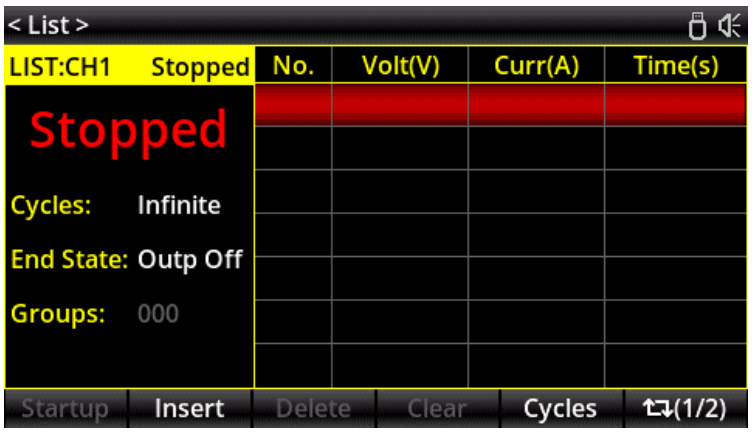


Figure 8-1 List Mode

8.1 Arbitrary Wave Setting

The arbitrary wave output has two pages (1/2), as shown in Figure 8-2.

a. List Function Page 1 b. List Function Page 2

Figure 8-2 List Function Page

Insert or edit the arbitrary waveform parameters on the above page, or recall the built-in waveform template to edit the arbitrary waveform. The setting steps are as follows.

(1) Use the insert key to input the group for the waveform design. The inserted parameters are all default values and should be changed using the following steps. Use the Delete key to clear all data for redesigning waveform. Extra lines can be deleted using the Delete key to remove the selected line.

(2) When a group is inserted, rotate the encoder rotary knob to select the parameter line that needs to be changed. Press the rotary knob to enter the parameter setting. The output group number displayed on the page indicates how many data lines have been inserted.

(3) Press the encoder rotary knob to move the cursor to Voltage→Current→Time→Voltage in sequence. The parameters can be edited at the cursor position. There are two ways to edit the parameter.

Method 1: Use the arrow keys ◄ ► to move the digit of the parameter, then rotate the encoder rotary knob to adjust the parameter.

Method 2: Use the numeric keypad to input the parameter, then press the encoder rotary knob to confirm the setting.

(4) Press the Esc key to confirm and exit the parameter editing for that line, then rotate the encoder rotary knob to set parameters for other lines.

(5) Press the Repetition Cycle key on page 1, rotate the encoder rotary knob or use the numeric keypad to set the cycle number (1-99999 or infinity). Press the encoder rotary knob or Esc key to exit the setting.

(6) Press the Stop key on page 2, each time you press this key, the last group data will be run, and then the state of the last group data will be maintained or the output will be turned off directly. When the cycle number is set to infinity, the end status setting is invalid.

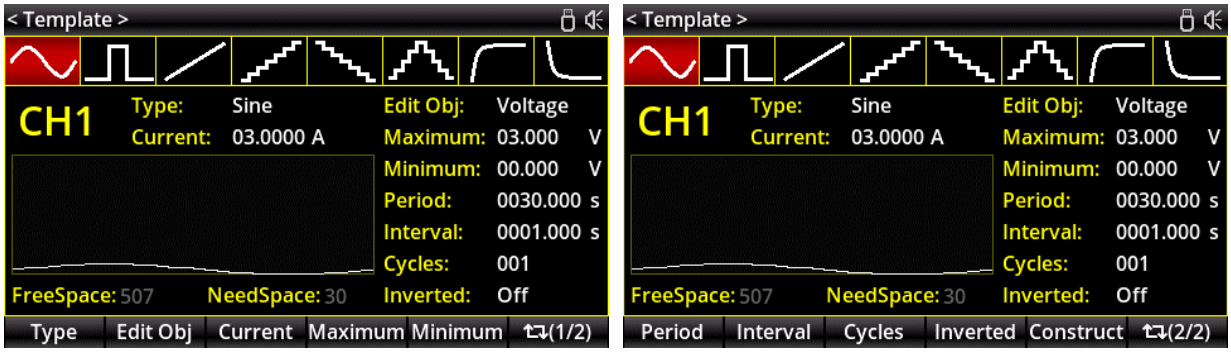
(7) After setting the waveform parameters, press the Start key on page 1 to activate the set data. Press the corresponding channel key On/Off (indicator lights up) to output the waveform based on the set parameters (the output waveform can be checked on waveform display page, refer to *Chapter 7* for more details). Press the channel key On/Off (indicator lights off) again to stop the output, the pause position is at the current running line, but the state is stopped. Press this key again to resume the output. To run

the first group data, press the Stop key, then press the Start key, and then press the channel key to resume the output. The Start and Stop keys are named differently but function as the same key (F1) for different operating states in list mode.

8.2 Waveform Template Setting

UDP4303S provides various built-in waveform output templates. Users can select a template to create a waveform.

In list mode, press the page switch key to enter page 2, and press the **Wave** key to enter the waveform template setting page, as shown in Figure 8-3.



a. Template Page 1

b. Template Page 2

Figure 8-3 List Mode

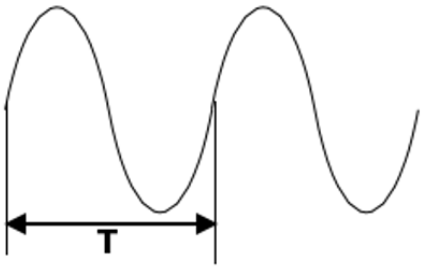
1. Select waveform template

Press the **Wave** key to select a waveform template.

Waveform template types: Sine, Pulse (Square), Ramp, Stair Up, Stair Down, Stair Up and Down, Exponential Rise, and Exponential Fall.

(1) Sine Wave

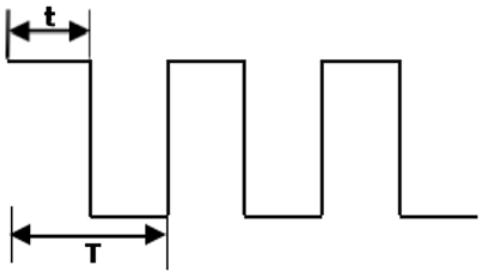
The sine waveform is shown in the figure below. The instrument determines the amplitude of the sine wave using the current setting of the maximum and minimum values, and determines the points of waveform in a period using the current setting of the period time and interval time, thus forming a sine waveform. When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Period x Period Count/Interval.



Sine Wave

(2) Pulse (Square) Wave

The square waveform is shown in the figure below. The instrument determines the amplitude of the square wave using the current setting of the maximum and minimum values, and determines the high level duration using the current setting of the pulse width. Low level duration = Period Time – Pulse Width Time, thus, forming a square waveform. When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Period x Pulse Count x 2.



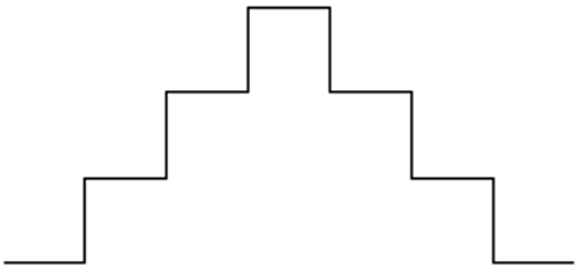
Pulse Wave

(3) Stair Up and Down

The stair up and down waveform is shown in the figure below. The instrument determines the stair up and down waveform using the current settings of the maximum, minimum, period time, and stair steps.

- When the stair step is 1, the waveform displays the minimum.
- When the stair step in even, the waveform starts from the minimum and increase to the maximum in steps of (Maximum-Minimum)/(Stair Step-1)/2, and decreases back to the minimum in the same manner.
- When the stair step is odd, the waveform starts from the minimum and increase to the maximum in steps of (Maximum-Minimum)/(Stair Step-2)/1, and decreases back to the minimum in steps of (Maximum-Minimum)/(Stair Step/2).

Interval time = Period Time/Stair Step. When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Stair Step.



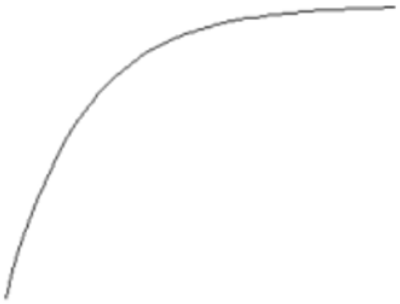
Stair Up and Down

(4) Exponential Rise

The exponential rise waveform is shown in the figure below. The instrument determines the exponential rise waveform using the current settings of the maximum, minimum, inserted groups, interval time, and

exponential.

The waveform function is ((Maximum-Minimum) x (1-$e^{-i*Exponential/InsertedGroups}$), where "I" is the independent variable, ranging from 0 to (number of groups inserted -1). When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Inserted Groups.

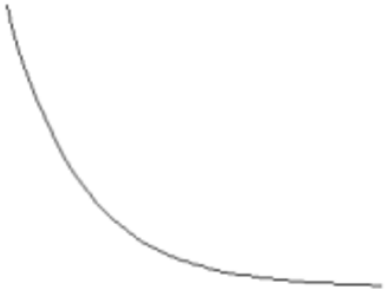


Exponential Rise

(5) Exponential Fall

The exponential fall waveform is shown in the figure below. The instrument determines the exponential rise waveform using the current settings of the maximum, minimum, inserted groups, interval time, and exponential.

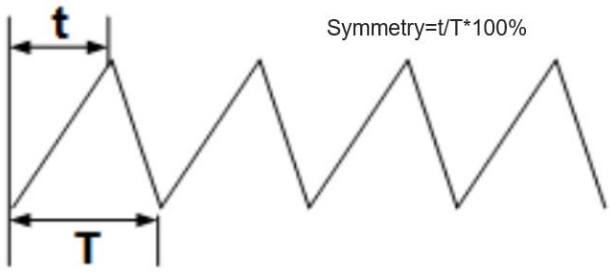
The waveform function is (Maximum-Minimum) x (1-$e^{-i*Exponential/InsertedGroups}$), where "I" is the independent variable, ranging from 0 to (number of groups inserted -1). When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Inserted Groups.



Exponential Fall

(6) Ramp

The ramp waveform is shown in the figure below. The instrument determines the amplitude of the square wave using the current setting of the maximum and minimum values, and determines the points of waveform in a period using the current setting of the period time and interval time. A ramp wave can be formed according to the current settings of symmetry (Waveform Rising Edge Time= Period Time/Interval Time x Symmetry, Waveform Falling Edge Time= Period Time- Period Time /Interval Time x Symmetry). When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Period Time/Interval Time.

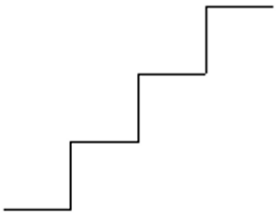


Ramp

(7) Stair Up

The stair up waveform is shown in the figure below. The instrument determines the stair up waveform using the current settings of the maximum, minimum, period time, and stair steps.

When the stair step is 1, the waveform displays the minimum. Waveform Step = (Maximum-Minimum)/(N -1), Interval Time = Period Time-Stair Step. When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Stair Step.

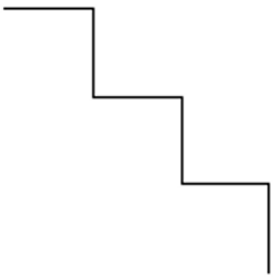


Stair Up

(8) Stair Down

The stair down waveform is shown in the figure below. The instrument determines the stair down waveform using the current settings of the maximum, minimum, period time, and stair steps.

When the stair step is 1, the waveform displays the maximum. Waveform Step = (Maximum-Minimum)/(N-1), Interval Time = Period Time-Stair Step. When editing the parameters, the instrument will insert the groups (maximum 512 groups) according to the set parameters, where the number of groups = Stair Step.



Stair Down

2. Editing parameters

Press the Parameter key on page 1 to switch the editing parameter between "Voltage" or "Current".

(1) Voltage: When the voltage is selected, you can set a fixed current for all groups' output. Press the

Current key, then use the numeric keypad or rotate the encoder rotary knob to set the current values.

(2) Current: When the current is selected, you can set a fixed voltage for all groups' output. Press the Voltage key, then use the numeric keypad or rotate the encoder rotary knob to set the voltage values.

3. Editing arbitrary waveform parameters

Different waveform templates require different parameters to be set. Refer to the table below for details.

Table 8-1 Waveform Template Parameters

Waveform Template Type	Parameter
Sine	Maximum Value, Minimum Value, Period, Interval, Period Count, and Inversed Phase
Pulse (Square)	Maximum Value, Minimum Value, Period, Pulse Width, Pulse Count, and Inversed Phase
Ramp	Maximum Value, Minimum Value, Period, Interval, Symmetry, and Inversed Phase
Stair Up	Maximum Value, Minimum Value, Period, and Stair Step
Stair Down	Maximum Value, Minimum Value, Period, and Stair Step
Stair Up and Down	Maximum Value, Minimum Value, Period, and Stair Step
Exponential Rise	Maximum Value, Minimum Value, Inserted Group, Interval, and Exponential
Exponential Fall	Maximum Value, Minimum Value, Inserted Group, Interval, and Exponential

(1) Maximum Value: Set the maximum voltage and current value for the currently selected template, the range is determined by the current channel, and it should be greater than or equal to the current minimum.

(2) Minimum Value: Set the minimum voltage and current value for the currently selected template, the range is determined by the current channel, and it should be less than or equal to the current maximum.

(3) Period: Set the duration for the currently selected template in a period. The maximum period is 3600 seconds.

(4) Interval: Set the interval time of each point for the currently selected template (set the duration output time of arbitrary waveform parameter for each group. The maximum interval time is 3600 seconds.

(5) Period Count: Set the period count for the waveform output. The range can be set from 1 to 512.

(6) Inversed Phase: If the selected template is sine, pulse, or ramp wave, press the Inverse key, the power supply will invert the waveform and form the output waveform.

(7) Pulse Width: If the selected template is pulse wave, the positive pulse width (high-level duration within a period) can be set up to 3600 seconds. The setting range of positive pulse width is determined by the current period.

(8) Pulse Count: Equivalent to period count.

(9) Symmetry: If the selected template is ramp wave, set the symmetry the ramp wave (the ratio of rising edge duration to the entire period within a period) and the range can be set from 0% to 100%.

(10) Stair Step: If the selected template is stair up, stair down, or stair up and stair down wave, press the Stair step key to set the total points of waveform within the entire period. The range can be set from 1 to 512.

(11) Inserted Group: If the selected template is exponential rise or exponential fall, press the Insert key on page 2 to set the total points of waveform within the entire period. The range can be set from 1 to 512.

(12) Exponential: If the selected template is exponential rise, set the rise index. The range can be set from 0 to 10. If the selected template is exponential fall, set the fall index. The range can be set from 0 to 10.

4. Apply setting

After editing the arbitrary waveform parameters, press the Apply key to form the output waveform. The corresponding parameters will be displayed in the list mode diagram as shown in Figure 7.2.

8.3 Delete

In the parameter editing interface of the list mode on page 2 (Figure 7-2), press the delete key to delete a set of parameters in the line where the cursor is located. If there is no data in the currently selected line, the delete key will be dimmed. Press the delete key will clear all data. If there is no data, some keys will be dimmed and thus be invalid.

8.4 Read and Save

Users can save the edited arbitrary waveform parameters to internal or external storage for later use.

Save:

(1) After setting the arbitrary waveform parameters, press the **Save** key in the list mode to enter the save and recall settings page.

(2) Select the file path and press the **Save** key to save.

(3) Input the filename in pop-up window and press the **Enter** key to confirm. The file type is fixed to ".csv".

Read:

(1) Press the **Save** key to enter the save and recall settings page.

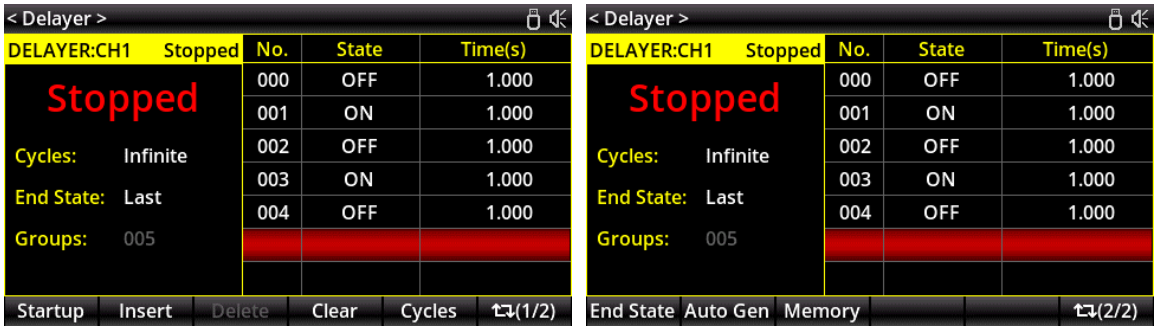
(2) Move the **Cursor** to the waveform file to be loaded.

(3) Press the **Read** key to load the waveform parameters.

Chapter 9 Delayer

9.1 Arbitrary Delayer Setting

UDP4303S provides a delayer function that supports all channels, series, and parallel connections. This function is used to control the output state of the selected channel ON or OFF, as shown in Figure 9-1.



a. Delayer Function Page 1 b. Delayer Function Page 2

Figure 9-1 Delayer Function

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Delayer" on the menu, and short press the **Enter** key or encoder rotary knob to enter the delay function page.

Insert or edit the switch state and duration for the selected channel on the above page, or recall the built-in automatic template to edit. The setting steps are as follows.

(1) Use the insert key to input the group for the switch state. The inserted parameters are all default values and should be changed using the following steps. Use the Delete key to clear all data for redesigning. Extra lines can be deleted using the Delete key to remove the selected line.

(2) When a group is inserted, rotate the encoder rotary knob to select the parameter line that needs to be changed. Press the rotary knob to enter the parameter setting. The output group number displayed on the page indicates how many data lines have been inserted.

(3) Press the encoder rotary knob to move the cursor to State→Actual Duration→Switch state position in sequence, and edit these parameters separately. The maximum time is 3600 seconds. There are two ways to edit the parameter.

Method 1: Use the arrow keys  to move the digit of the parameter, then rotate the encoder rotary knob to adjust the parameter.

Method 2: Use the numeric keypad to input the parameter, then press the encoder rotary knob to confirm the setting.

(4) Press the Esc key to confirm and exit parameter editing for that line, then press the encoder rotary

knob to set parameters for other lines.

(5) Press the Repetition Cycle key on page 1, rotate the encoder rotary knob or use the numeric keypad to set the cycle number (1-99999 or infinity). Press the encoder rotary knob or Esc key to exit the setting.

(6) Press the Stop key on page 2, each time you press this key, the last group data will be run, and then the state of the last group data will be maintained or the output will be turned off directly. When the cycle number is set to infinity, the end status setting is invalid.

(7) After the switch state and duration parameters are set, press the Start key on page 1 to activate the set data. Press the corresponding channel key  (indicator lights up) to output the waveform based on the set parameters. The output waveform can be checked on waveform display page, refer to *Chapter 7* for more details. Press the channel key  (indicator lights off) again to stop the output. Every time it restarts, it works from the first line state.

Note: The start and stop keys are named for different functions of the same key (F1) for different operating states in the list mode.

(8) The save function on page 2 is the same as the operation in list mode; refer to the section *8.1 Arbitrary Wave Setting for more details.*

9.2 Automatic Template Setting

The automatic template includes three switch state duration changes: fixed time, monotonically increasing time, and monotonically decreasing time. The setting steps are as follows.

Press the **Wave** key to select the template.

- Fixed time template indicates that the duration of each switch state is the same.
- Monotonically increasing time indicates that next state duration is greater than the current state duration.
- Monotonically decreasing time indicates that next state duration is less than the current state duration. The decreased time is determined by the step value.

The three templates are shown in Figure 9-2.

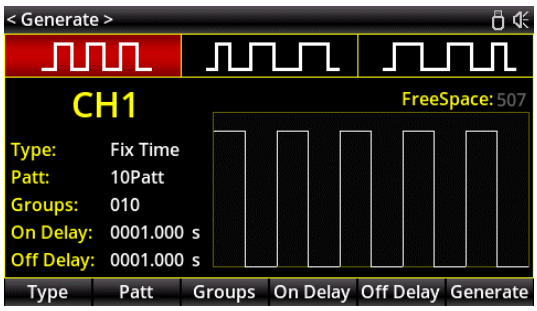


Figure 9-2 Fixed Time Template

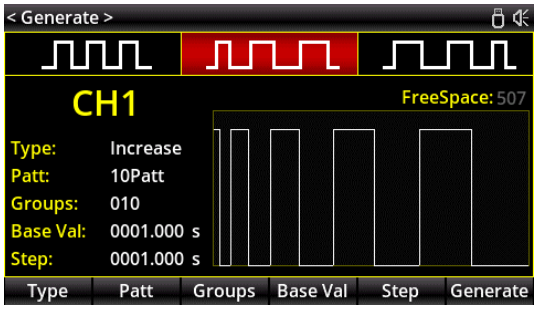


Figure 9-3 Monotonically Increasing Time Template

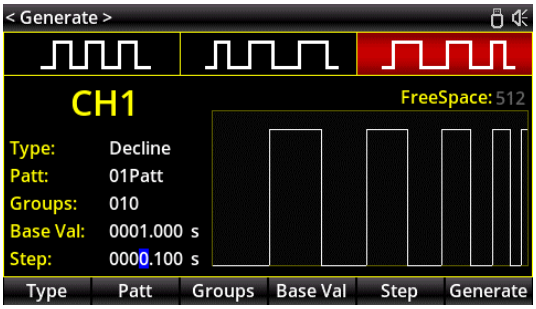


Figure 9-4 Monotonically Decreasing Time Template

(1) Template type: Used to switch the template type.

(2) Mode: Used to change the initial state.

01 code indicates that the initial state is "Output OFF". The state sequence will be OFF → ON → OFF for the specified groups.

10 code indicates that the initial state is "Output ON". The state sequence will be ON → OFF → ON for the specified groups.

(3) Inserted group: Set the group for output state (high-level count + low-level count), with a range of 1 to 512.

(4) Enable output time: A parameter in fixed time mode that indicates the output time is enabled. Press the Time key to change the value (maximum 3600 seconds).

(5) Disable output time: A parameter in the fixed time mode that indicates the output time is disabled. Press the Time key to change the value (maximum 3600 seconds).

(6) Time base value: A parameter in the monotonically increasing time and monotonically decreasing time modes, indicating the duration of the first state. Press the Time Base key to change the value (maximum 3600 seconds).

(7) Step value: In monotonically increasing time mode, this parameter indicates the increased duration of the next state. After setting, the duration of the last state cannot exceed 3600 seconds.

In monotonically decreasing time mode, this parameter indicates the decreased duration of the next state. The step value should less than the time base value in the single falling mode, and the duration of the last state should not less than 0.001 seconds. Press the Step key to change the value.

(8) Generate: After setting the template, press the Generate key to active the switch state parameters. The parameter displayed in Figure 9-1 Delayer Mode.

Chapter 10 Monitor

UDP4303S provides a monitor function that supports all channels, series, and parallel connections. The monitor function informs the user whether the voltage, current, or power of the channel meets the set condition by configuring the monitor condition and selecting a response mode. When the condition is met, an alert is triggered according to the selected response mode.

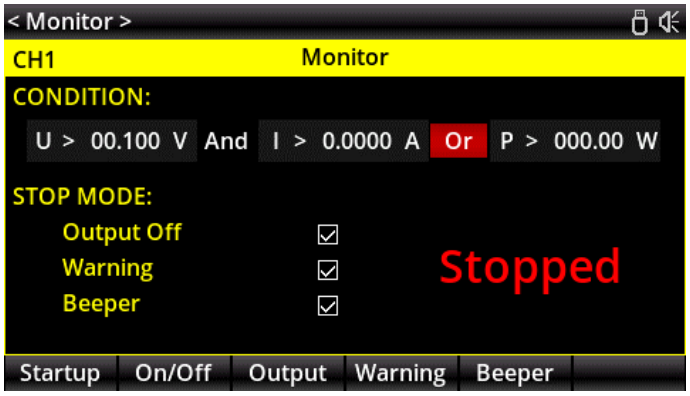


Figure 10-1 Monitor Function

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Monitor" on the menu, and short press the **Enter** key or encoder rotary knob to enter the monitor function page.

(1) Start: Press the **Start** key to enable the monitor function, press the **Stop** key to disable the monitor function. The red character in the figure above indicate the monitor operating state: Running (in green), Stopped (in red).

Note: The start and stop keys are named for different functions of the same key (F1) for different operating states in the list mode.

(2) ON/OFF: When the red cursor positioned at any one of the three judgment conditions, press the ON/OFF key to enable or disable the judgment condition at the current cursor position. Enable will be highlighted, while Disable will be dimmed.

1. Monitor Condition

The monitor condition can set three judgment conditions. When only the red cursor appears on the screen, use the arrow keys ◄ ► to select the field to be edited, and rotate the encoder rotary knob to change the condition. When the cursor is at the numeric parameter, a blue cursor will appear within the red cursor. Use the encoder rotary knob or press the numeric keypad to change the value. At this time, use the arrow keys ◄ ► to change the digit in the red cursor. To change other condition, press the encoder rotary knob or Esc key to make the blue cursor disappear, then use the arrow keys ◄ ► to select other judgment condition.

(1) U: When the red cursor is positioned at, rotate the encoder rotary knob to set whether the condition is U (Voltage), A (Current), or P (Power).

(2) >: When the red cursor is positioned at >, rotate the encoder rotary knob to change the condition to Greater than or Less than.

(3) 01.000: When the red cursor is positioned at 01.000, rotate the encoder rotary knob or use the numeric keypad to change the threshold.

(4) And: When the red cursor position at And , rotate the encoder rotary knob to change the condition to "U > 01.000 V", "P < 000.00 W", or "I > 0.0000 A".

2. Response Mode

Output OFF: Press this key to enable/disable the output function. A tick will appear in the box if the output is enabled. The channel output will automatically turn off when it reaches to the monitor condition. The box is empty if the output is disabled.

Result: Press this key to enable/disable the display result of the monitor. A tick will appear in the box if the display is enabled. The channel output will automatically display the monitor event when it reaches to the monitor condition. The box is empty if the display is disabled.

Beeper: Press this key to enable/disable the beeper function. A tick will appear in the box if the beeper is enabled. A beeper will sound when the channel output reaches to the monitor condition. The box is empty if the beeper is disabled.

Chapter 11 Trigger

UDP4303S provides a digital I/O port on the rear panel, supporting trigger input and trigger output.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Trigger" on the menu, and short press the **Enter** key or encoder rotary knob to enter the trigger function page.

Trigger input: The digital I/O port can receive a trigger signal form an external source. When the preset trigger condition is met, the controlled source (output channel) will be enabled to turn on/off the output, or the inverse output state.

Trigger output: When the output of the controlled source (output channel) is enabled, the digital I/O port will output a high or low-level signal.

The digital I/O port has four independent data cables. Each can be used for trigger input or trigger output separately. The trigger wiring is shown in Figure 11-1.

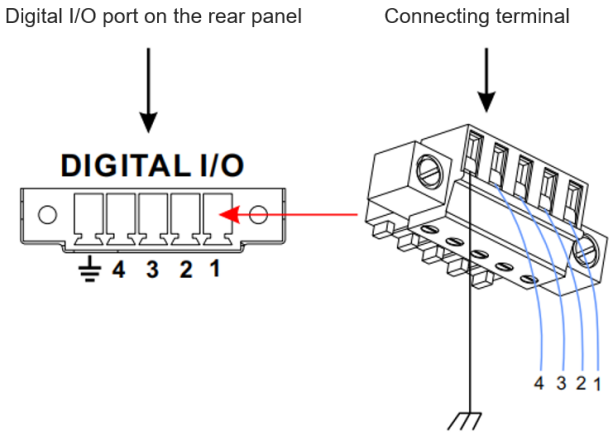


Figure 11-1 Trigger Wiring

Connecting steps:

(1) Connect the wire to the terminal connector as shown in the figure above. Please note the corresponding relationship.

(2) Insert the terminal connector into the digital I/O port on the rear panel. Please note the corresponding relationship.

11.1 Trigger Input

When the specified data line receives an input signal that meets the current trigger type, the specified controlled source will turn on/ the output, or the inverse output state according to the output response settings, as shown in Figure 11-2.

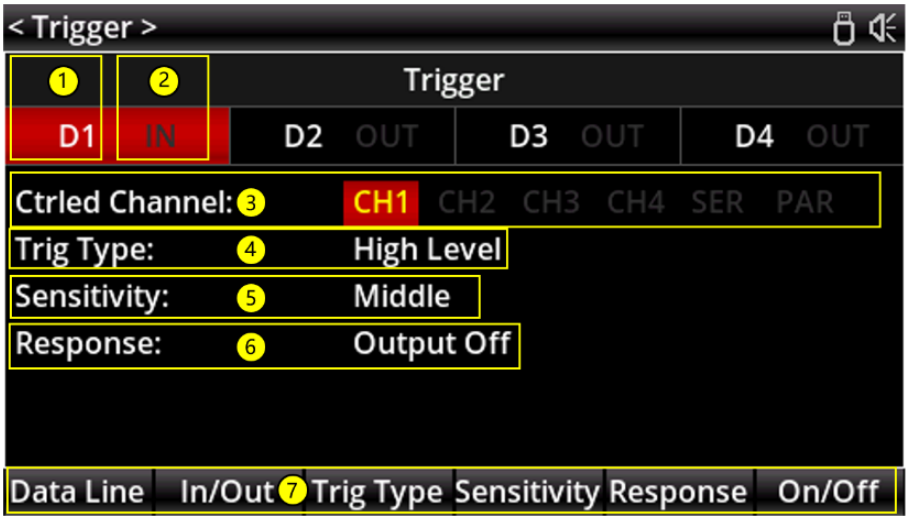


Figure 11-2 Trigger Input

Table 11-1 Trigger Input Description

No.	Description
1	Port number on the rear number.
2	Trigger input identifier: A character in green indicates that the input is enabled. A character in dark indicates that the input is disabled.
3	The specified channel under control: If the channel is lit, it indicates that the channel accepts the trigger. If the channel is light off, it indicates that the channel does not accept the trigger. Use the arrow keys ◄ ► to select a channel, and press the encoder rotary knob to control whether the selected channel responds to the trigger.
4	Trigger type: Indicates the trigger condition. When the input meets the preset condition, the specified channel will respond according to the output response mode.
5	Sensitivity: Indicates the trigger response speed.
6	Output Response
7	Function keys Data line: Switch between the selected port in sequence: D1→D2→D3→D4→D1 Input/Output: Switch between trigger input and trigger output. Trigger type: Switch between the trigger conditions in sequence: High-level→Low-level→Rising Edge→Falling Edge→High-level. Sensitivity: Switch between the trigger response speeds in sequence: Slow→Middle→Fast→Slow. Output Response: Switch between the output responses in sequence: Output ON→Output OFF→Inverse Output→Output ON. ON/OFF: Enable/Disable the trigger function.

11.2 Trigger Output

When the output of the specified controlled source is enabled, the specified data cable will output the high-level or low-level signal according to the settings, as shown in Figure 11-2.

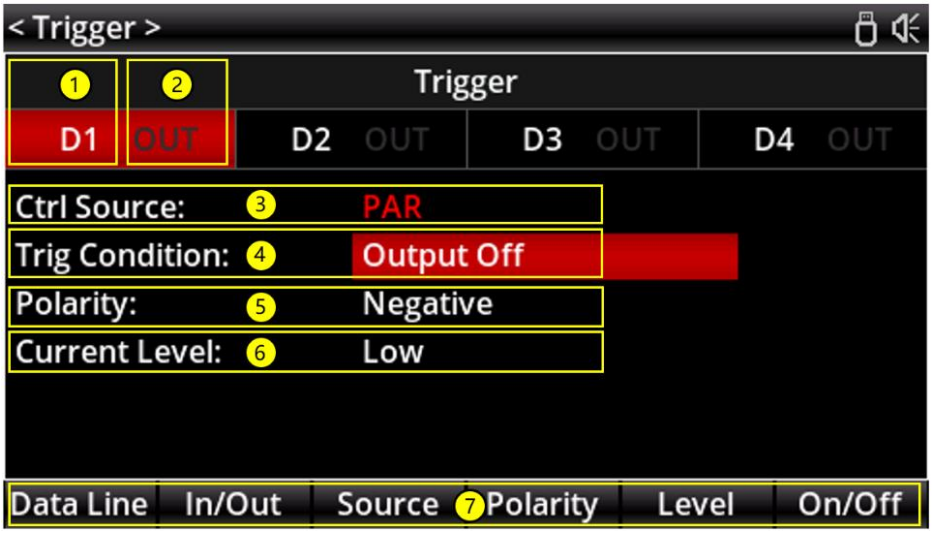


Figure 11-2 Trigger Output

Table 11-2 Trigger Output Description

No.	Description
1	Port number on the rear number.
2	Trigger input identifier: A character in green indicates that the input is enabled. A character in dark indicates that the input is disabled.
3	The specified channel under control
4	Trigger type: Indicates the trigger condition. When the output of the specified controlled source is enabled, the specified data line will output the high-level or low-level signal according to the settings
5	Polarity: If the polarity is set to positive, the digital I/O port outputs high-level signal. If the polarity is set to negative, the digital I/O port outputs low-level signal.
6	Output Response
7	Function keys Data line: Switch between the selected ports in sequence: D1→D2→D3→D4→D1 Input/Output: Switch between trigger input and trigger output. Control source: Switch between the controlled channels in sequence: CH1→CH2→CH3→CH4→SER→PAR→CH1 Trigger condition: Switch between the trigger conditions in sequence: Auto → Output ON → Output OFF → Voltage Threshold → Current Threshold → Power Threshold, rotate the encoder rotary knob to control. Auto: the trigger event will immediately occurs when the trigger function is enabled. Polarity: Switch between positive and negative. Positive: High-level. Negative: low-level. Level: Set the level for the specified port to high-level or low-level. ON/OFF: Enable/Disable the trigger function.

Chapter 12 Recorder

UDP4303S provides a recorder function that supports all channels, series, and parallel connections. This function allows users to save voltage, current, and power data for all channels to a USB flash drive. The recorded data is saved in a list format on the USB flash drive, as shown in Figure 12-1.

Figure 12-1 Recorder Function

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Recorder" on the menu, and short press the **Enter** key or encoder rotary knob to enter the recorder page.

Recorder Settings

(1) Stopped/Running: Press the "Running" key to enable the recorder. Press the "Stopped" key to disable the recorder.

Note: The start and stop keys are named for different functions of the same key (F1) for different operating states in the list mode.

(2) Save path: Press the Save Path key to enter the file selection menu. Only files on the USB flash drive can be selected, which is displayed as D disk on the save page. Refer to the section *Storage* for more details.

(3) Channel recording: Press the Channel Recording key to edit. Use the arrow keys  to select the specified channel to be recorded.

Press the encoder rotary knob to select the specified channel: If the channel is lit, it indicates that the recorder will be enabled for that channel's settings and channel outputs. If the channel is dimmed, the recorder function is disabled for that channel.

(4) Parameter recording: Press the Parameter Recording, use the arrow keys  to select the parameter to be recorded.

Press the encoder rotary knob to select the specified parameter: If the parameter is lit, it indicates that the recorder will be enabled for recording the parameter. If the parameter is dimmed, the recorder function is disabled for recording.

(5) Recording interval: Press the Recording Interval key to edit. Use the numeric keypad or encoder rotary knob to set the parameter, the range can be set from 0.2 to 9999.9 seconds.

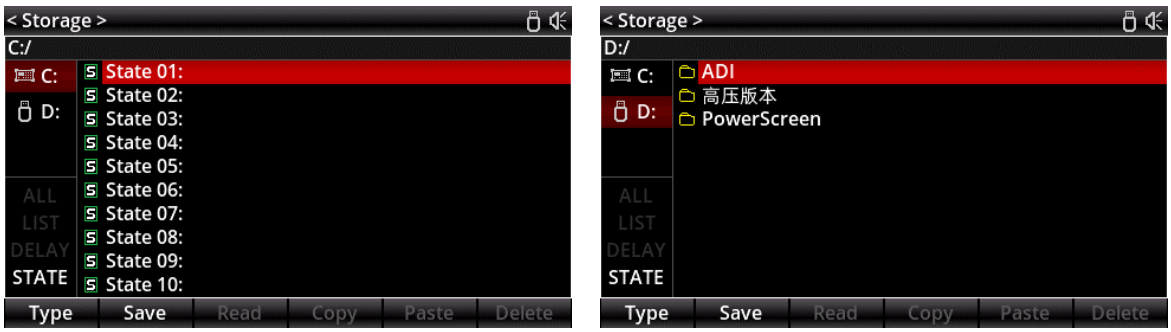
(6) Recorded count: Indicates the number of times it has been recorded.

(7) Recorded time: Indicates the total duration of the recorded operation.

Chapter 13 Storage

UDP4303S provides a storage function that supports for list output, delayer, monitor, and recorder. UDP4303S offers 10 groups of storage locations for list output, delayer, and monitor, and it also supports saving to external storage. The recorder is only available for external storage. The file suffix of all the storage files is .csv.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Storage" on the menu, and short press the **Enter** key or encoder rotary knob to enter the storage page, as shown in Figure 13-1.



a. Internal Storage Page b. External Storage Page

Figure 13-1 Storage Function

(1) Use the encoder rotary knob, the arrow keys ◄ ► and Esc key (return to the previous level) to select or load the saved file.

(2) Function keys:

ALL: Indicates all types of file.

LIST: Indicates the save data of list mode.

DELAY: Indicates the save data of delayer.

STATE: Indicates the save data of monitor.

(3) Save: Press the Save key to save the data to the specified location. Filename setting as shown in Figure 13-2.

Input filename: Rotate the encoder rotary knob to select a letter, number, or symbol position, then rotate it again to input the selected letter, number, or symbol. Alternatively, use the numeric keypad to input the specified number, and use the arrow keys ◄ ► to select the filename position.

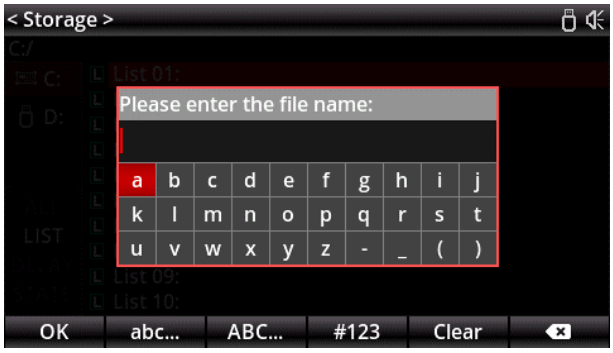


Figure 13-2 Filename Editing Page

(4) Enter: Confirm the filename editing.

(5) Clear: Indicates the filename is cleared.

(6) Other: Switch the keypad displayed on the screen.

(7) Read: Load the selected file to the specified function.

(8) Copy, paste, and delete key: Indicates copy, paste, or delete the selected file.

Chapter 14 Preset Setting

UDP4303S provides 5 groups of output preset function that can be edited and stored freely. Users can preset the voltage, current, voltage limit, and current limit parameters of each channel and series-parallel channel according to their needs. These parameters can be read and applied when needed, eliminating the need for repeated parameter settings.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Preset" on the menu, and short press the **Enter** key or encoder rotary knob to enter the preset page, as shown in Figure 14-1.

Figure 14-1 Preset Function

Use the arrow keys  on encoder rotary knob to set the 5 groups data in preset function, as shown on page above.

(1) Edit: Press the Edit key to enter the preset function page, rotate the encoder rotary knob to select the specified channel to be changed, and press the function keys voltage, current, OVP, or OCP at the bottom of the screen to edit. Alternatively, use the encoder rotary knob or numeric keypad for editing. To change other channel settings, press the Esc key first, then rotate the encoder rotary knob to select the channel to be edited. After configuring the settings, press the Esc key to return to the page displayed in Figure 14-1. Press the Read key to load the selected group data.

Figure 14-1 Preset Editing Page

(2) Overlay: Press the Overlay key to overwrite the selected group data with the settings on main page.

Chapter 15 Setup and Language

15.1 Setup

UDP4303S has a system setup function.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Setup" on the menu, and short press the **Enter** key or encoder rotary knob to enter the setup page, as shown in Figure 15-1.

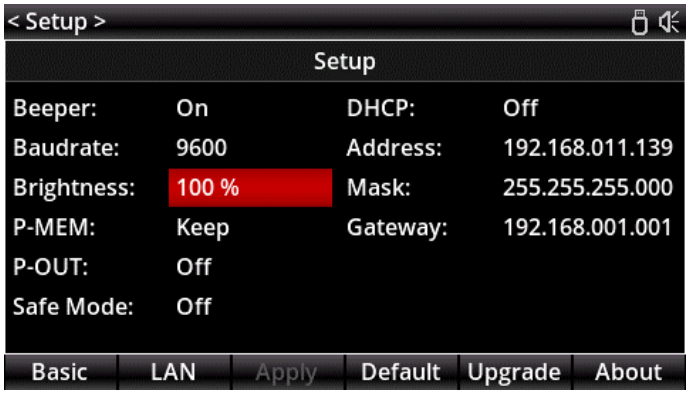


Figure 15-1 Setup

System setup can check system parameters such as the IP address, baud rate of the serial port 232, and current screen brightness. Users can also set the system settings according to their needs, such as changing the IP address, the screen brightness, baud rate, beeper switch, power-up parameters, and power output. Additionally, use the function key at bottom of the screen to upgrade the software, restore factory settings, and view the system version. The system version can be displayed using the **About** key as shown in Figure 15-2.

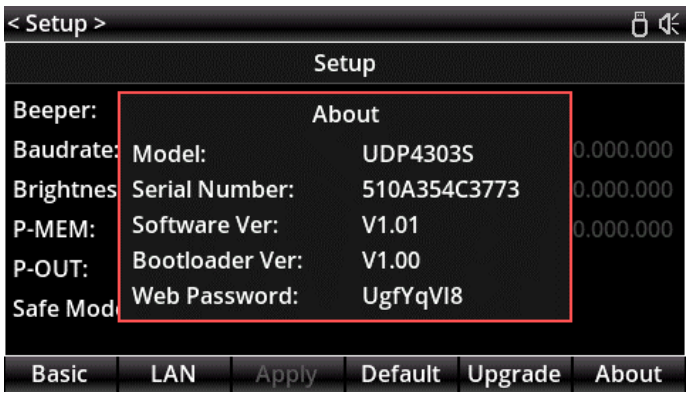


Figure 15-2 About Page

15.2 Language

UDP4303S offers two languages, Simplified Chinese and English.

Short press the **Menu** key to enter the menu function page. If the current page is not Menu, short press the **Menu** key again to return to the menu function page. Rotate the encoder rotary knob to select "Language" on the menu, and short press the **Enter** key or encoder rotary knob to enter the language page, as shown in Figure15-3.

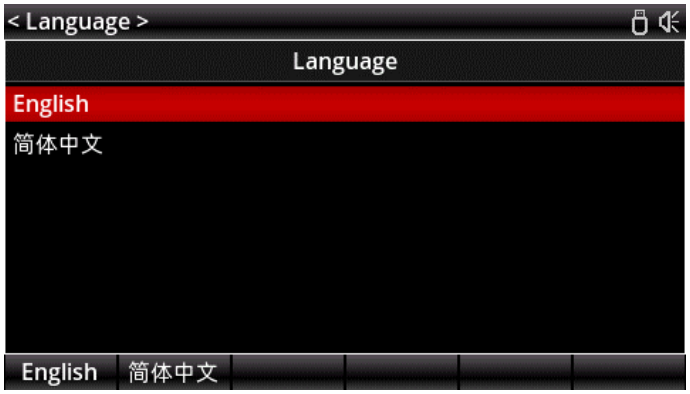


Figure15-3 Language Selection

Chapter 16 Remote Control

16.1 Remote Control Method

UDP4303S has two methods for remote control.

1. Custom Programming
   The user can perform the programming control on the oscilloscope through SCPI (Standard Commands for Programmable Instruments). For detailed descriptions on command and programming, please refer to UDP4303S Programmable Linear DC Power-Programming Manual.
2. PC Software Control (Instrument manager)
   Users can remotely control the instrument by sending commands using PC software. It is recommended to use the Instrument Application software provided by UNI-T. The software can be downloaded through

the UNI-T official WeChat account or UNI-T official website (https://www.uni-trend.com).

Operating steps:

- Setup the communication between the instrument and a PC
- Open the Instrument Application software and search the instrument source
- Open the remote-control panel and send the command

This device supports communication with a computer via USB, LAN, and RS232 interfaces to achieve remote control. Remote control is implemented based on the SCPI command set.

Note: Before connecting the communication cable, please power off the instrument to avoid damaging the communication interface.

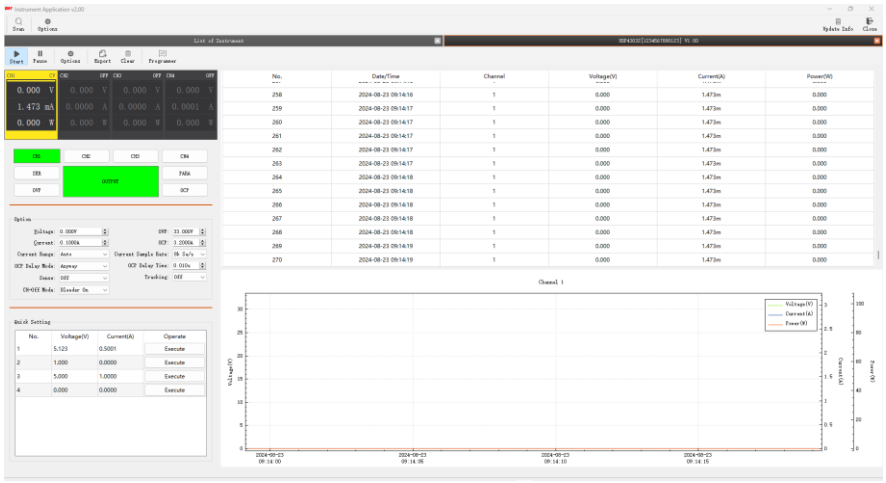
16.2 Instrument Application for Remote Control

1. Connecting device

   Connect the instrument to a computer using a USB data cable, Ethernet cable, or RS232 cable.

2. Search instrument source

   Open the Instrument Application software. Depending on the connection type, click on USB, LAN, or RS232 to search for the corresponding device. Then, click on the displayed device to access the control interface, as shown in the figure below.



Control Interface on Instrument Application

Use the Instrument Application control interface to send commands and read data to remotely control the devic

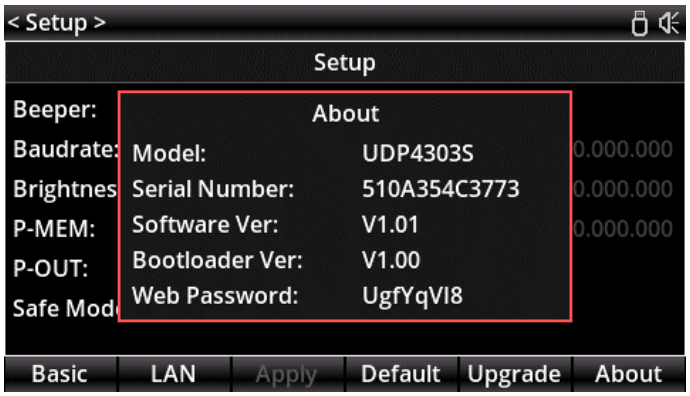
Chapter 17 WEB Server

UDP4303S has a built-in web server. After opening the instrument's web page in a browser, users can view some basic information and control the instrument (log in with a password before controlling the instrument).

Web Server Login Password:

(1) The login password for the web page is displayed in the "About" page of the instrument (MENU -> Setup -> About).

(2) The default password is a randomly generated 8-digit password. A new password will be generated and displayed in the "About" screen every time the factory settings are restored.



When the user has changed the password in the web server, the "About" page will hide the password display (showing "******" instead of the password). If the user forgets their password, they can restore the factory settings to generate a new default password.

Chapter 18 Technical Index

Model		UDP4303S
Rated Output Value	Voltage	CH1 and CH2: 0-32 V×2 CH3: 0-15 V CH4: 0-6 V
	Current	CH1 and CH2: 0-3 A×2 CH3: 0-3 A×1 CH4: 0-10 A
	Power	297 W
Constant Voltage	Regulation Rate	Power regulation rate: < 0.01%+2 mV
		Load regulation rate: < 0.01%+2 mV
	Ripple and Noise	< 350 μV_{rms}/2 mV_{pp}(20 Hz-20 MHz)
	Transient Response Time	< 50 μs (Less than 50 μs of time is required to recover within the ±15 mV settling range following a load change from 50% to 100% of full load. The output voltage error recovers to the stable output value of ±15 mV.)
	Command Processing Time	< 10 ms Continuously adjustable from 0 to rated voltage.
	Output Range	Continuously adjustable from 0 to rated voltage.
Constant Current	Regulation Rate	Power regulation rate: < 0.01%+250 μA
		Load regulation rate: < 0.01%+250 μA
	Ripple Current	< 2 mArms
	Output Range	Continuously adjustable from 0 to rated voltage.
Measurement	Display	Voltage full scale: 5 digit; LCD
		Current full scale: 5 digit; LCD Low current: 5 digit (CH4 outputs 10 A with 6-digit display)
	Programming Resolution	Voltage: 1 mV
		Current: 0.1 mA
	Readback Resolution	Voltage: 1 mV
		Current: 0.1 mA (low current: 1 μA), sampling rate: 8 kSa/s
	One-year Accuracy for Programming (25±5℃)	Voltage: CH1-CH3: ±(0.03%+8 mV)/ CH4: ±(0.04%+4 mV)
		Current: CH1-CH3:±(0.15%+5 mA)/CH4: ±(0.15%+10 mA)
	One-year Accuracy for Readback (25±5℃)	Voltage: CH1-CH3: ±(0.03%+8 mV)/ CH4: ±(0.08%+3 mV)
		Current: CH1-CH3: ±(0.15%+5 mA)/CH4: ±(0.15%+10 mA) 0.25%+28 μA (low current measured at constant conditions)

Voltage Programming Response Time (1% of the total variation)	CH1-CH3	Rise: Full load < 50 ms; Empty load <30 ms
		Fall: Full load < 50 ms; Empty load < 400 ms
	CH4	Rise: Full load <15 ms; Empty load < 14 ms
		Fall: Full load <20 ms; Empty load < 100 ms
Temperature Coefficient per℃ (% of output+offset)	CH1	Voltage: 0.01%+4 mV; Current: 0.01%+2 mA
	CH2	Voltage: 0.01%+4 mV; Current: 0.01%+2 mA
	CH3	Voltage: 0.01%+4 mV; Current: 0.01%+2 mA
	CH4	Voltage: 0.01%+4 mV; Current: 0.01%+3 mA
Lock Key		√
Output waveform Display		√
Timer		√
Delayer		√
Recorder, Analyzer, Monitor		√
Interface		USB Host, USB Device, LAN, and Digital I/O
Storage Loading		Not less than 10 groups
Screen		4.3-inch TFT LCD, WVGA (480*272)
Input Voltage		AC 100 V/120 V/220 V/230 V ±10%, 50/60 Hz
Operating Temperature		0℃ to + 40℃
Storage Temperature		-10℃ to +60℃
Humidity		20% to 80% RH.
Altitude		Below 2000 meters
General Specification		
Color		Black
Weight		10.5 kg
Dimension (W×H×D)		225.00 mm × 159.60 mm × 445.00 mm
Packing Quantity		1 set/piece

Preface

Thank you for choosing Uni-T brand new product. To safely operate this equipment, please review this manual thoroughly, pay close attention to the safety notes.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Copyright Information

Options ordering and installation

1. **Purchase options:** Based on your requirements, please purchase the specified function options from Uni-t Sales Personnel and provide the serial number of the instrument that needs the option installed.
2. **Receive certificate:** You will receive the license certificate based on the address provided in the order.
3. **Register and obtain license:** Visit the Uni-t official website license activation session for registration. Use the license key and instrument serial number provided in the certificate to obtain the option license code and license file.
4. **Install the option:** Download the option license file to the root directory of a USB storage device, and connect the USB storage device to the instrument. Once the USB storage device is recognized, the Option Install menu will be activated. Press this menu key to begin installing the option.

Limited Warranty and Liability

Uni-T guarantees that the Instrument product is free from any defect in material and workmanship within three years from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. If you need warranty service within the warranty period, please contact your seller directly. Uni-T will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device. For the probes

and accessories, the warranty period is one year. Visit instrument.uni-trend.com for full warranty information.

Learn more at: www.uni-trend.com

Register your product to confirm your ownership. You will also get product notifications, update alerts, exclusive offers and all the latest information you need to know.

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