UNI-T

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QuickStart Guide

UDP5000 Series Programmable DC Power Supplies

REV 2

January 2025

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 a 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.

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1. Production Overview

Rated Output Voltage: 40 V, 80 V, 160 V, 250 V

Total Models: 16

UDP5000 series power supplies feature a compact design, high performance, versatile functionality, a wide output range, user-friendly operation, and flexible usage. The series includes four rated output voltages (40 V, 80 V, 160 V, 250 V) and four rated output power levels (400 W, 800 W, 1200 W, 2000 W), forming a total of 16 models.

Each model is equipped with:

- USB and LAN communication interfaces
- Output terminals on both the front and rear panels (maximum front panel output current: 10 A)
- Internal variable resistance function
- Discharge circuit control function
- CC/CV mode
- Various protection functions

Product Specifications

Model	Voltage Output	Current Output	Output Power
40 V			
UDP5040-40	0-40 V	0-40 A	400 W
UDP5040-80		0-80 A	800 W
UDP5040-120		0-120 A	1200 W
UDP5040-200		0-200 A	2000 W
80 V			
UDP5080-20	0-80 V	0-20 A	400 W
UDP5080-40		0-40 A	800 W
UDP5080-60		0-60 A	1200 W
UDP5080-100		0-100 A	2000 W
160 V			
UDP5160-8	0-160 V	0-8 A	400 W
UDP5160-16		0-16 A	800 W
UDP5160-24		0-24 A	1200 W
UDP5160-40		0-40 A	2000 W
250 V			
UDP5250-6	0-160 V	0-6 A	400 W
UDP5250-12		0-12 A	800 W
UDP5250-18		0-18 A	1200 W
UDP5250-30		0-30 A	2000 W

1.1 Product Introduction

UDP5000 series is a single-output programmable switched DC power supply, available in 16 models, featuring four rated voltage models 40 V, 80 V, 160 V, and 250 V; four power models 400 W, 800 W, 1200 W, and 2000 W. This series allows flexible voltage and current output combinations under fixed power conditions. A single unit can accommodate both high-voltage, low-current and high-current, low-voltage outputs, optimizing costs and space. For example, UDP5040-40 (40 V/40 A/400 W) supports multiple output configurations, such as 10 V/40 A/400 W, 20 V/20 A/400 W, 40 V/10 A/400 W.

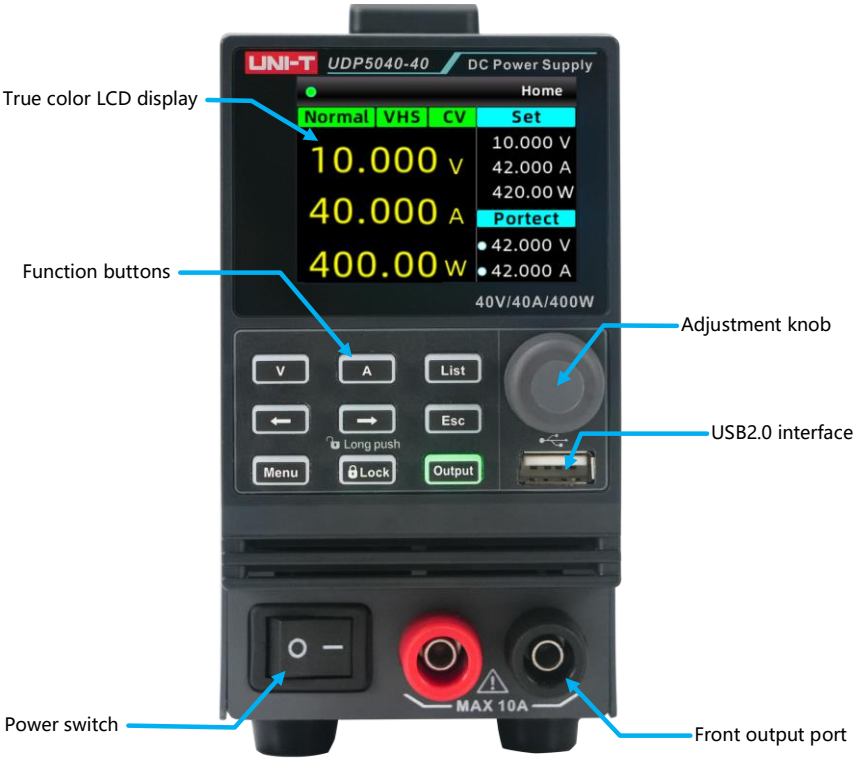
UDP5000 series is equipped with USB and LAN interfaces, supports the SCPI protocol, and enables remote control, industrial PLC integration, and intelligent test platform setups. It is widely used in DC-DC power module testing, battery charging, and sensor applications.

Main Features

1. **TFT-LCD Display**: Simultaneously shows set voltage, current, output voltage, and output current.
2. **Series and Parallel Connections**: Supports series and parallel connections of the same model, with up to 3 units in parallel and 2 units in series.
3. **LAN Port**: Enables remote control via Web and VXI bus using a browser.
4. **Global Voltage Compatibility**: Supports free voltage switching, eliminating the need to manually adjust the input voltage range.
5. **Extension Ports**: Built-in USB, LAN, and analog control ports for future expansion.
6. **SCPI**: Compatible with the SCPI protocol, facilitating remote control, industrial PLC integration, and intelligent test platform setups.
7. **High Power Quality**: Features high power factor, low THD, low ripple, and low noise, ensuring minimal harmonic interference, ideal for applications requiring superior power quality.
8. **Multiple CC/CV Slope Modes**: Provides enhanced load protection.
9. **External Analog Control**: Supports external analog voltage/resistance control, as well as voltage and current monitoring output.
10. **High Power Outputs**: Enables high-power output from both the front and rear panels.
11. **Remote Sense Compensation Function**: Compensates for voltage drops in wiring, ensuring accurate testing results.
12. **Protection Modes**: OVP (Over Voltage Protection), OCP (Over Current Protection), OTP (Over Temperature Protection), and OPP (Over Power Protection) functions.
13. **Discharge Load Control**: After shutdown, the output capacitor's current is discharged to a safe voltage level.
14. **Wide Operating Temperature Range**: Designed for reliable operation in environments up to 50°C.

2.Basic Configuration

2.1 Front Panel



400 W Model Front Panel

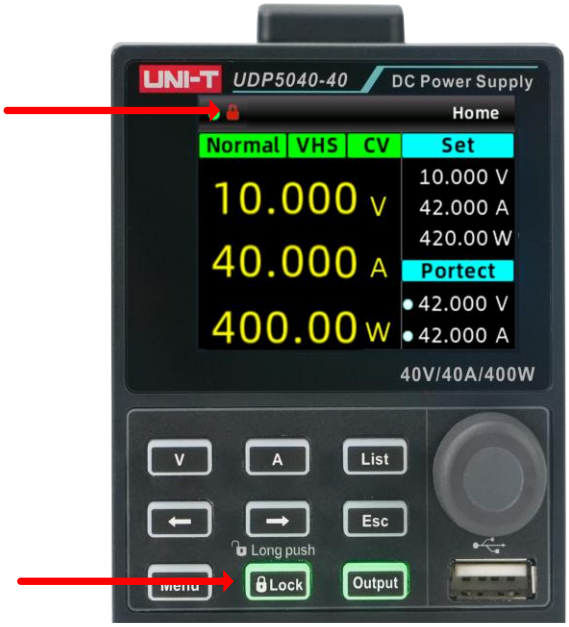
2.2 Rear Panel

Taking the 400 W model (UDP5040-40) as an example, the rear panel may vary for different models.

2.3 Key Functions

Button	Functional Description
V	Voltage setting button: Long press to enter the OVP (Over Voltage Protection) setting.
A	Current setting button: Long press to enter the OCP (Over Current Protection) setting.
List	List mode and delay function switching button. When a USB flash drive is connected, long press to save a screenshot to the USB.
← →	Arrow keys: Used to switch the step value.
Esc	Return to the previous level or exit data editing
Menu	Enter the menu page to view and set the power supply information, including output settings, system settings, network settings, and viewing local machine information. Long press to enter the preset value page.
Lock	Short press to lock, long press to unlock.
Output	Turn the power supply on or off.
Rotary Knob	Used for numerical editing and selection. Scroll to set the data. Short press to confirm the setting, equivalent to the Enter key.
USB 2.0	Connect to a USB flash drive for saving screenshots, accessing and storing information, reading/saving files, and upgrading the firmware.

2.4 Key/Panel Lock



Key Lock Function

This function prevents accidental changes to the set voltage/current due to unintentional operations.

Panel Lock Function

- Short press the Lock button. The lock icon changes to , and a red lock icon appears in the status bar of the power supply display.
- All operations are disabled when the panel is locked .
- Modifying the output voltage/current setting requires unlocking the panel.

Panel Unlock Function

- Long press the lock button to unlock the panel, the lock icon changes to , and the red lock icon disappears from the status bar of the power supply display, indicating that the panel is unlocked.
- All operations are enabled when the panel is unlocked.

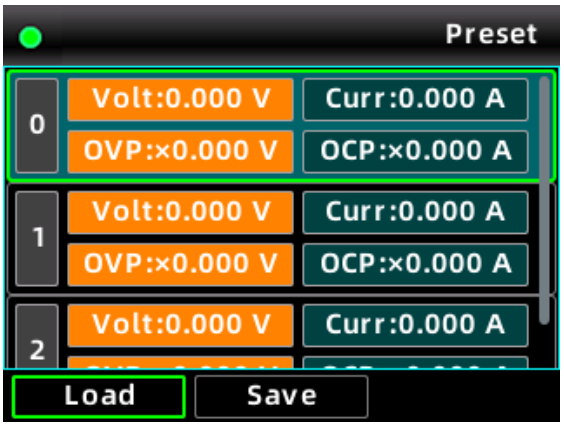
2.5 Screenshot

When a USB flash drive is connected, long press the List button to save the current page to the USB. Remove the USB after the screenshot process is complete.

Note: The USB flash drive must be formatted in FAT32.

2.6 Preset Value

UDP5000 series is equipped with preset value settings for quickly saving and loading voltage or current preset values.



Long press the Menu button Menu in any page to load the user-defined group preset values.
Use the arrow keys ← , → and the rotary knob to load and save the preset values.
One user-defined group can save and load three data sets.

Short press the Menu Menu button to access the menu and navigate to the user-defined group settings.
User-defined groups: 0-31 groups

2.7 Remote Sensing

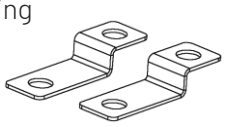
The remote sense compensation function improves the output accuracy and stability of the power supply by compensating for voltage drops caused by the resistance of cables or connectors, ensuring the load receives the correct voltage.

	400 W Model	800 W Model	1200 W Model	2000 W Model
Compensating Voltage (Max)	1.5 V	4 V	5 V	5 V

Note

The product is shipped with a voltage sampling spring piece installed between the sampling and output terminals.

If the voltage sampling spring piece is damaged or lost, please contact UNI-T distributor for assistance.



⚠ Warning: Risk of electric shock and internal circuit damage.

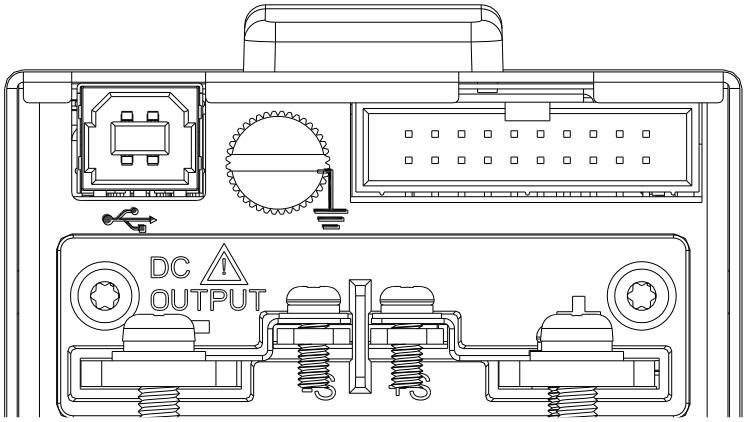
- Never perform wiring on the voltage sampling terminals while the power supply is powered on.
- Use wires with a rated voltage higher than the power supply's insulation voltage for sampling lines. For exposed shielded parts, use a voltage-resistant insulation sleeve with a rating higher than the insulation voltage of this product for protection.

- When the discharge load is disabled, residual voltage may remain on the output terminals for a short period after the output is turned off. Always enable the discharge load before touching the voltage sampling terminals.
- Always install the output protection cover when the power supply is switched on.

Remote Sensing Operation Procedure

Warning: May damage the power supply and load.

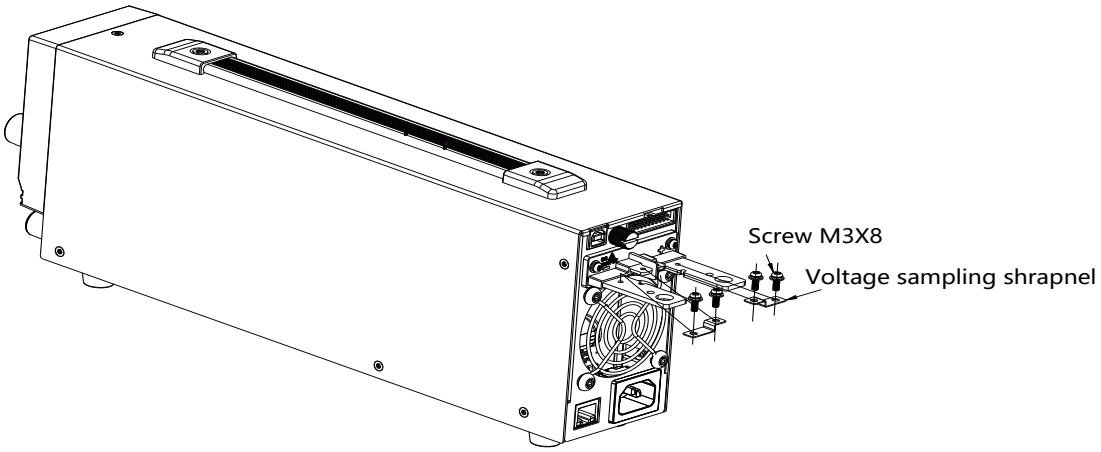
- Correctly connect the positive and negative terminals of the power supply and load.
- Use output wires with sufficient current capacity and a flame-resistant, durable outer sheath.
- Ensure that the voltage at the sampling point does not exceed the rated output voltage to prevent damage to the load device.



Rear Panel Structure

Operation Steps

1. Turn off the power supply.
2. Use M3 head screwdriver to remove the voltage sampling spring piece that connects the voltage sampling terminal and the output terminal.

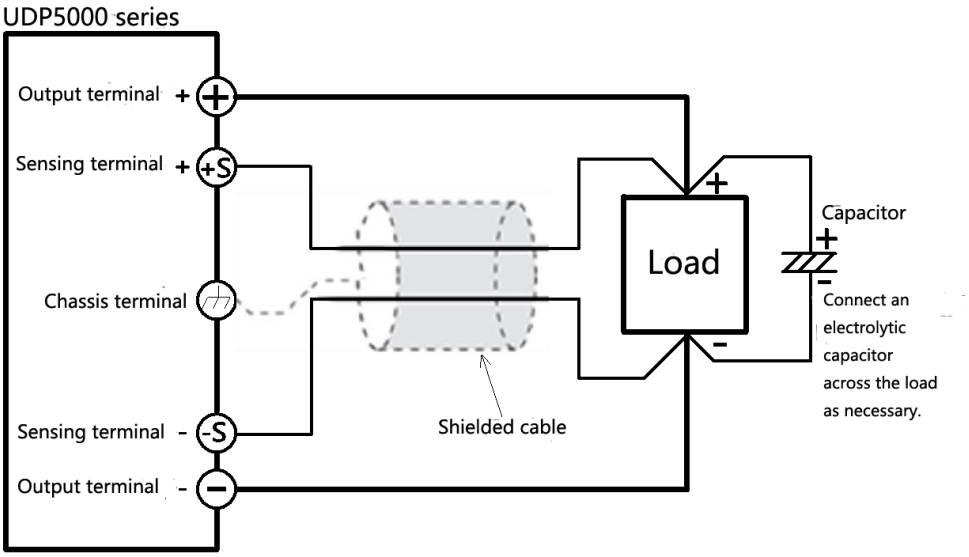


3. Connect the wires to the power supply and the load.
   - Select a pair of wires to measure the actual voltage at the load terminal. Based on the current magnitude, select an appropriate pair of output wires to transmit the power supply current.

- Use the output wires to connect the positive output terminal of the power supply to the positive input terminal of the load device, and the negative output terminal of the power supply to the negative input terminal of the load device. Install crimp terminals compatible with M4×12 screws to secure the wires.
- Connect the S+ measuring terminal of the power supply to the positive input terminal of the load device. Connect the S- measuring terminal of the power supply to the negative input terminal of the load device. Install crimp terminals compatible with M3×6 screws to secure the wires.

Note: If shield wires cannot be used, coil the measuring wires together in a spiral shape.

If the sampling wires become disconnected, the output voltage may increase by several volts. To prevent the output voltage from exceeding the set voltage, set an appropriate overvoltage protection (OVP) value.



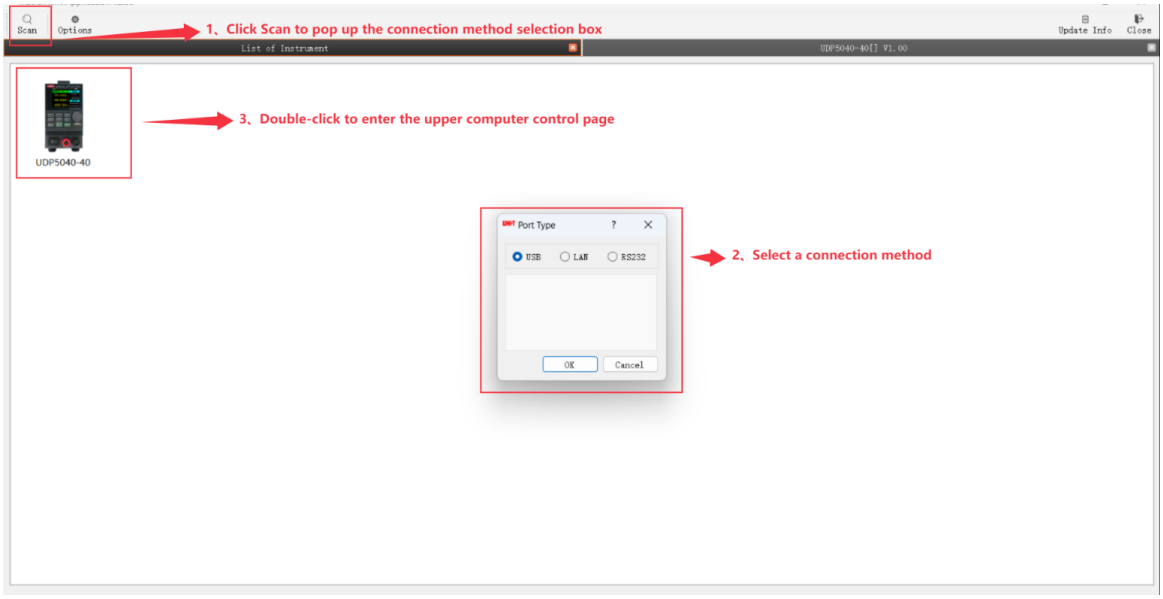
4. Install an electrolytic capacitor at the input terminal of the load device.
   - Connect the positive terminal of the electrolytic capacitor to the positive terminal of the measuring wire of the load device.
   - Connect the negative terminal of the electrolytic capacitor to the negative terminal of the measuring wire of the load device.
5. Check the connections.
   - Ensure that all connections are secure and that there are no loose wires or short circuits.
   - Confirm that the current-carrying wires and measuring wires are connected correctly.
6. Configure power output
   - Set the output voltage and current values of the power supply according to the load requirements.
   - Start the power supply and observe the output voltage and current to ensure they are within the expected range.

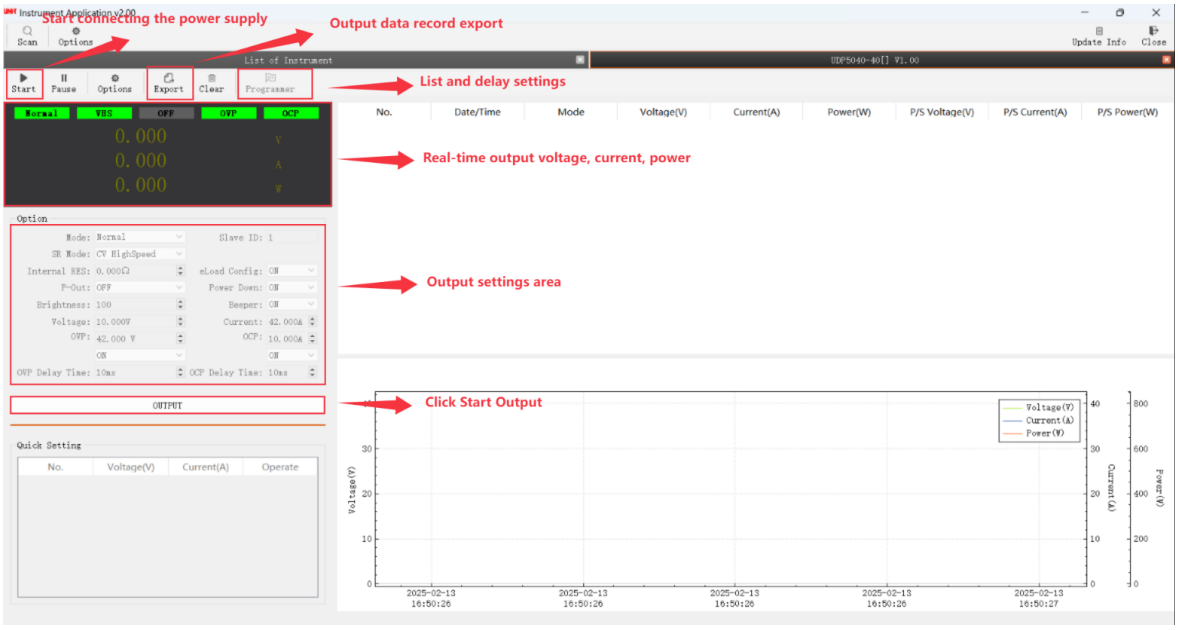
2.8 Upper Computer Control

1. Download the Instrument Application installation file from the UNI-T official website www.uni-trend.com.
2. Power on the power supply.
3. Connect the PC to UDP5000 series via a USB or LAN control cable.
4. Launch the remote control application.

5. Example: UD5040-40

- Click Instrument Application to select the connection method
- Double click UDP5040-40 icon to enter the remote communication interface, as shown in the following figure.



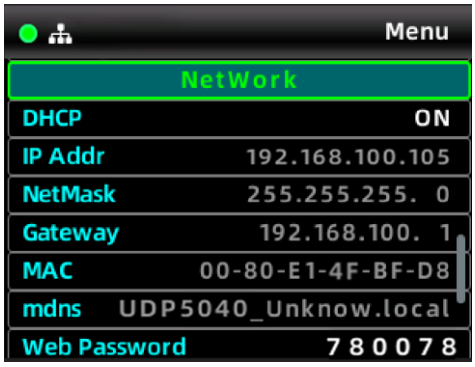


2.9 Web Remote Control

UDP5000 series also supports Web remote control.

1. Connect the PC and UDP5000 series power supply's LAN port to the same router and network. The power supply's status bar will display to confirm a successful LAN connection.
2. Press the menu Menu button on UDP5000 series power supply to access network settings. Manually configure the IP address and other parameters. Enable DHCP service for automatic IP address assignment.

   Note: DHCP requires router support. After enabling DHCP, the power supply will automatically fetch and update IP parameters, as shown in the following figure.



3. Open a browser on the PC and enter the power supply's IP address 192.168.100.105, as shown in the figure above.

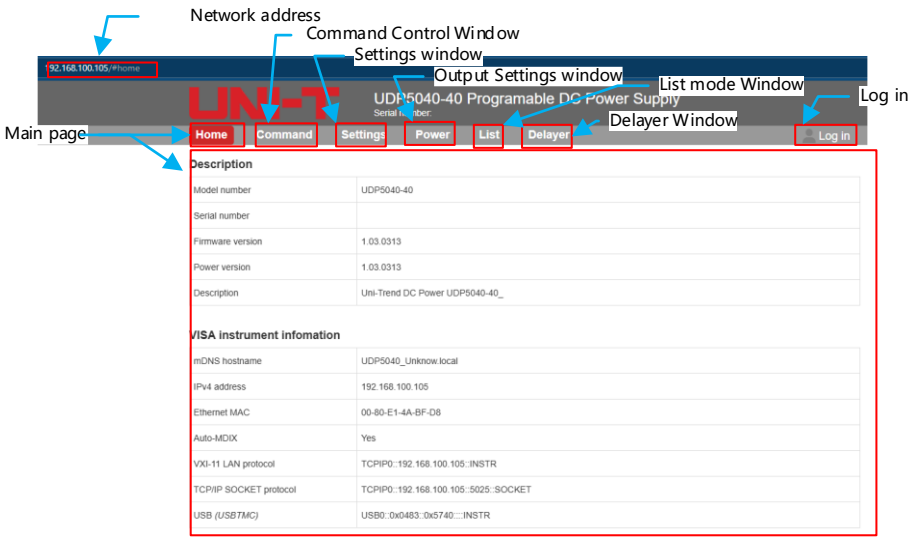
   Note: Communication can only be established when the PC and the power supply are on the same network.

4. Enter the control interface.

   IP address: Enter the power supply's IP address 192.168.100.105

   Login: Enter the Web password of the power supply

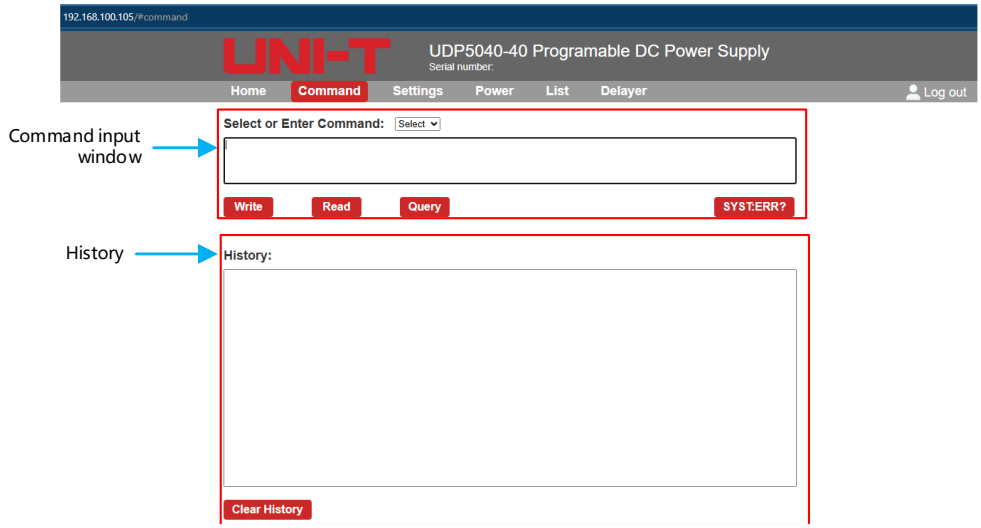
   Main page



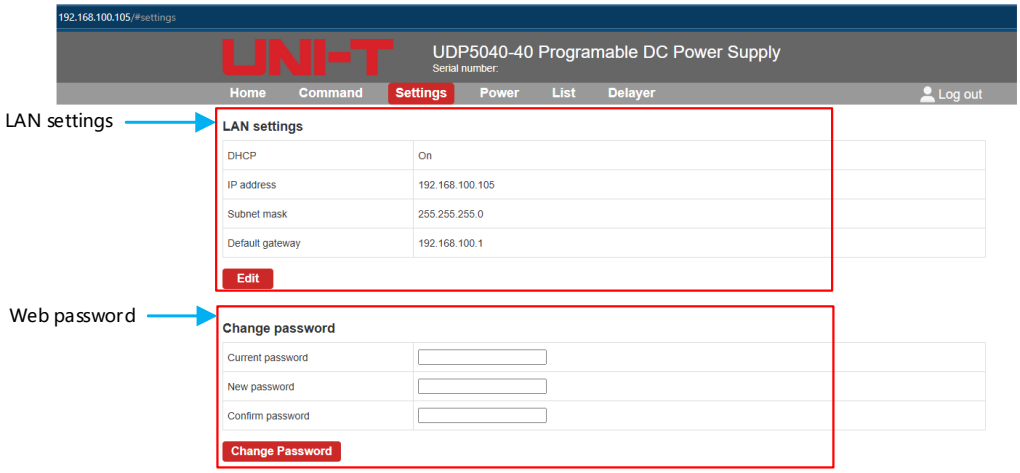
Command control window

For control commands, refer to the *UDP5000 Series Programmable DC Power Supplies-Programming*

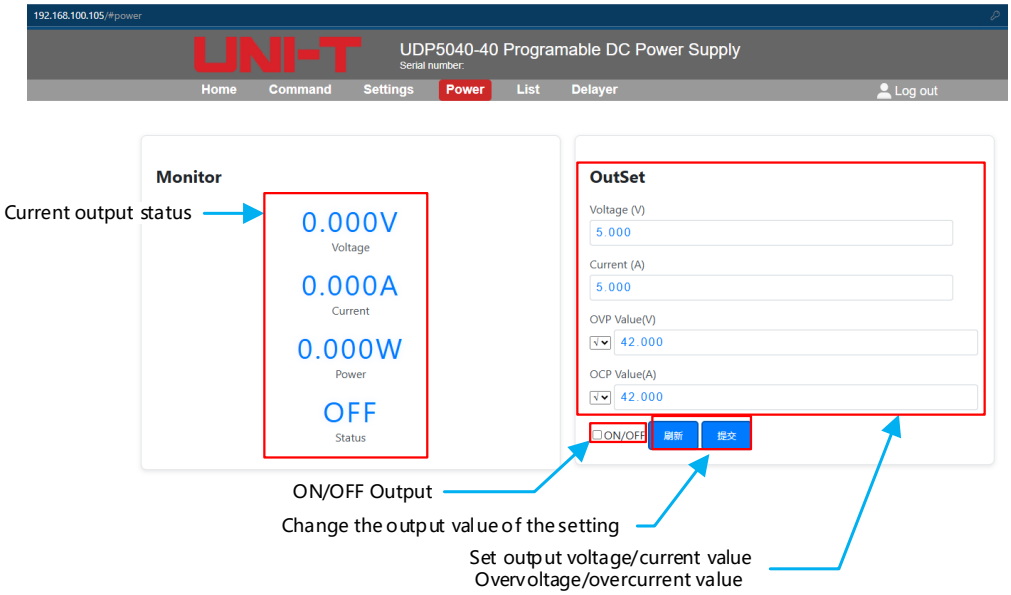
Manual.



Setting window

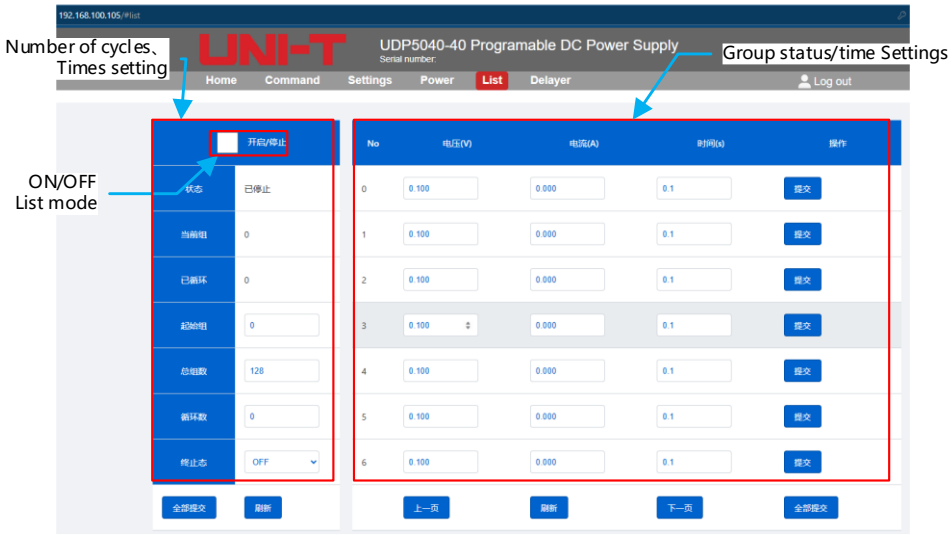


Output setting window



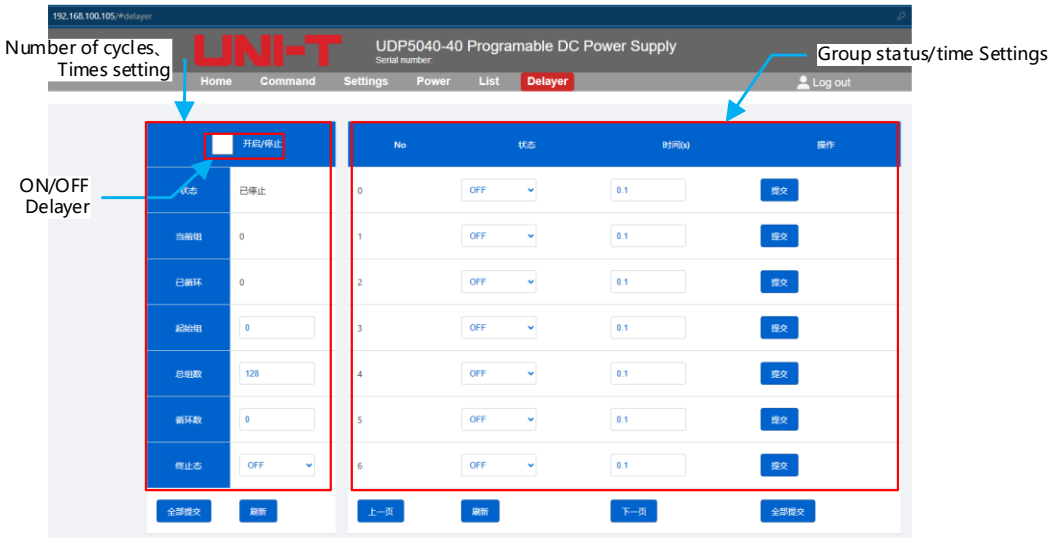
Note: After changing the voltage/current value in the Outset area, you need to click "提交", and the power supply will output according to the current setting value.

List mode window



Note: After setting the group voltage/current/time area, you need to click "全部提交" to import the current Settings into the power supply.

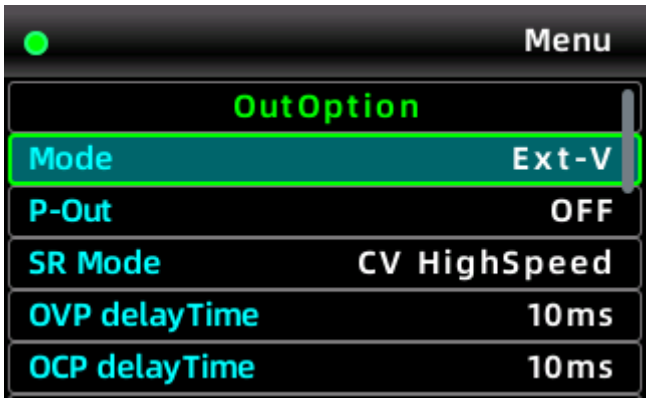
Delayer mode window



Note: After setting the group status/time area, you need to click "全部提交" to import the current Settings into the power supply.

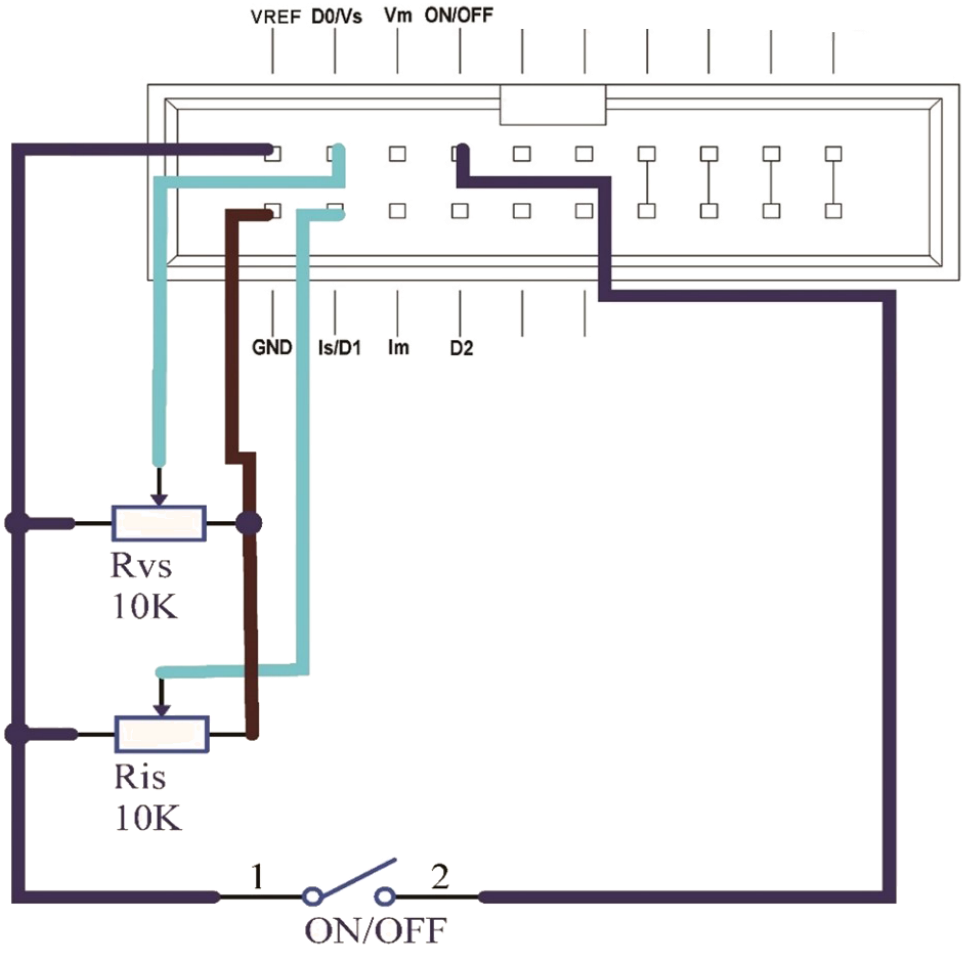
2.10 External Voltage Control

Setting Steps



Press the men Menu button to access the menu settings, rotate the rotary knob to set the operation mode to external voltage control.

Hardware Connection Diagram for External Voltage Control



External Voltage Control Operation Steps:

1. Connect the wires as shown in the diagram above, and set the power supply mode to external voltage control.
2. Adjust the Rvs or the Ris potentiometer to set the output voltage or current value.
3. Close the external switch to enable power output; disconnect it to turn off the power output.

2.11 Power-on Self-Test

A successful self-inspection process indicates that the power supply meets the factory standards and can be used normally. Before operating the power supply, please make sure you have read and understood the safety instructions.

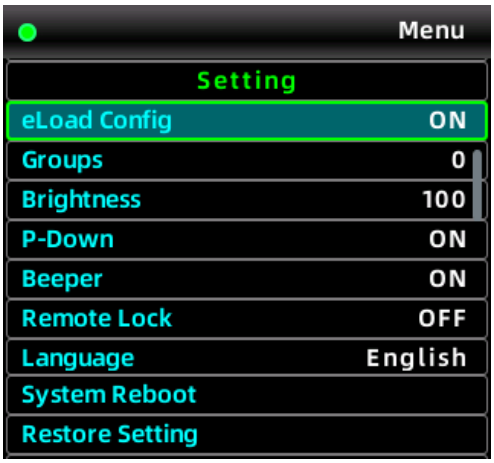
Warning

- Ensure that the grid voltage of the power supply is within the voltage range specified for the product before turning on the power. Otherwise, the power supply may be damaged.
- Connect the main power plug into a power socket with protective grounding. Do not use a power strip without protective grounding. Before operating the power supply, ensure that the power supply is properly grounded.
- Pay attention to the positive and negative pole markings before wiring the power supply. Otherwise, the power supply may be damaged.

Self-Inspection Process

1. Properly connect the power cord, then press the power switch to turn on the power supply. The power supply will automatically perform a self-inspection.
2. Upon completion of self-inspection, the LCD display will show current and voltage information on the home page.

2.12 Factory Default Reset



- Press the Menu button to access the menu settings.
- Rotate the rotary knob to Restore Setting.
- Short press the rotary knob to confirm.
- After confirmation, the power supply will restart. Once restarted, all settings will reset to factory defaults.

3. Single-Control Parallel Operation

Single-control operation enables centralized control of a parallel-connected power supply system via a master unit, while other identical UDP5000-series models function as slaves. This setup increases the total output current capacity, calculated as: Maximum Output Current = Single-unit Rated Current × Number of Parallel-Connected Unit

	400 W Model	800 W Model	1200 W Model	2000 W Model
Maximum Parallel-Connected Units	4	4	4	2

The difference in output voltage and output current between the master unit and the slave unit must be within 1% of the rated value.

Danger: Risk of electric shock.

- Before touching the output terminals, turn off the power switch.
- After assembling the output cables, install the output protection cover.

Note

If parallel operation is not in use, disconnect all parallel connections.

3.1 Parallel Operation Steps

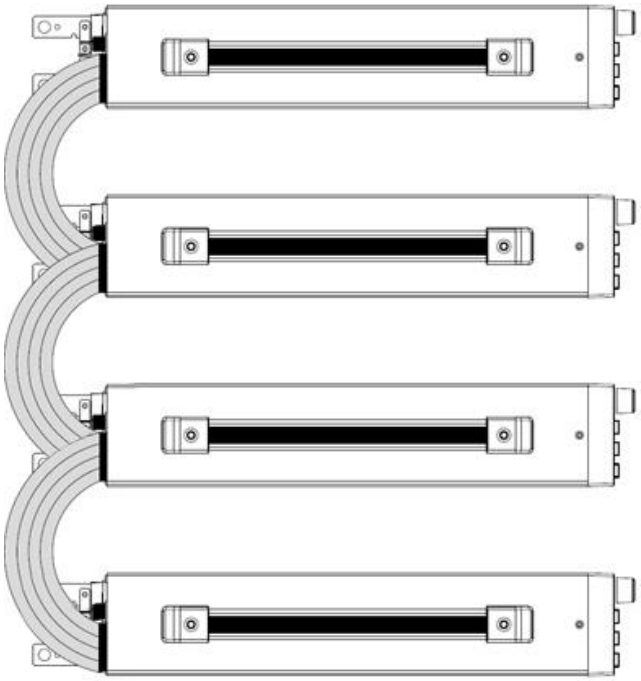
Note

- When grounding the output terminals, connect the same-polarity output terminals (+ or -) of the master and slave units to the chassis terminal. Improper connection may damage the power supply and load.
- For long wires, phase shifts due to wiring inductance and capacitance may cause oscillations. To prevent this, connect an electrolytic capacitor (ranging from hundreds of μF to tens of thousands of μF) at the load end as needed. The capacitor's voltage rating must be at least 120% of the UDP5000 series rated output voltage.
- Twist the + and - wires together and keep them as short as possible when connecting.

Example: Setting Parallel Operation on UDP5040-40

1. Turn off all power switches.
2. Remove the output protection cover.
3. Connect the analog interface.

   Use a double-ended female header cable (dual-row female header 2×10 pins, 2.54mm pitch) to connect the analog interface of the parallel power supplies.



4. Parallel-connect the output terminals of all units to a wire connector using appropriate wires, then connect to the load.

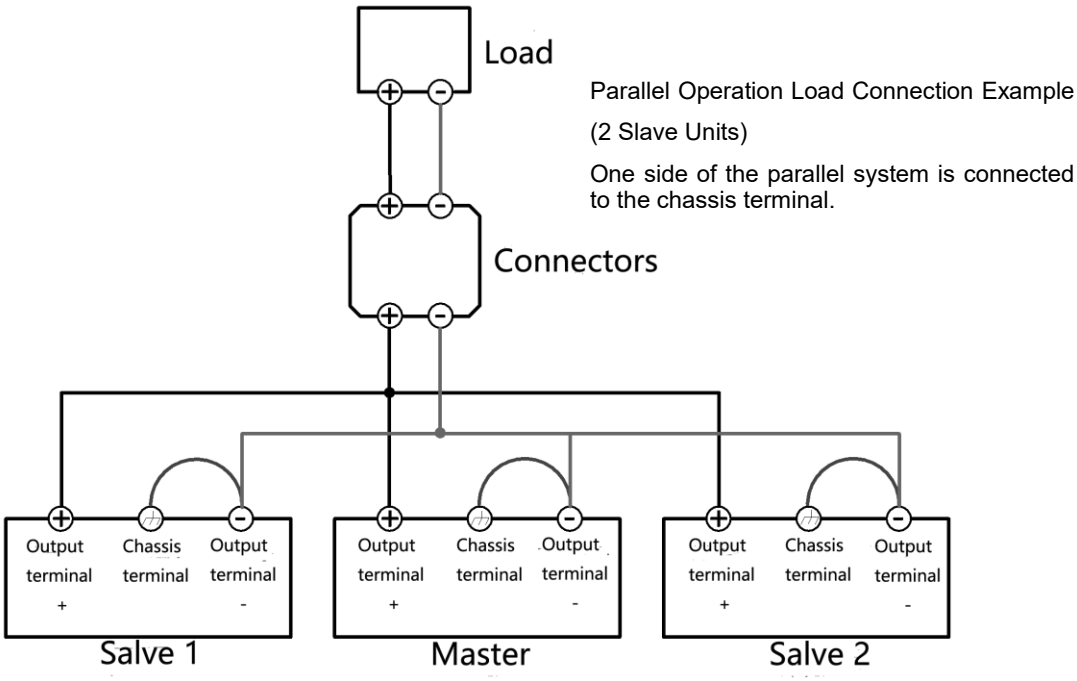
Ground the same-polarity output terminals (+ or -) of the master and slave units.

Use wires with sufficient current capacity for the output connection.

Ensure equal length and cross-sectional area for all wires connecting each UDP5000 series unit to the intermediate terminal block.

Keep wire lengths ≤50 cm to minimize resistance and inductance.

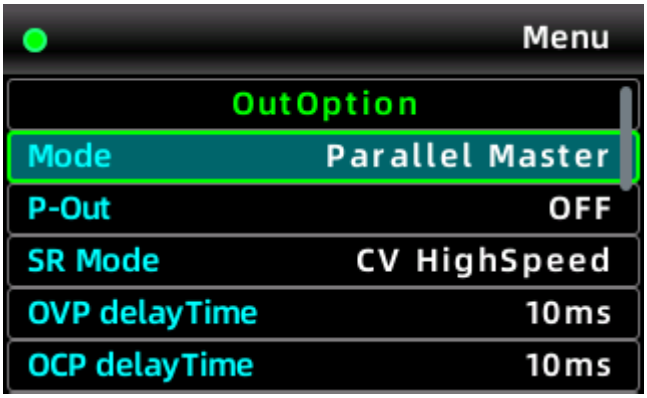
Separate the analog interface wiring from the output wiring as much as possible to reduce interference.



5. Install the output protection cover.

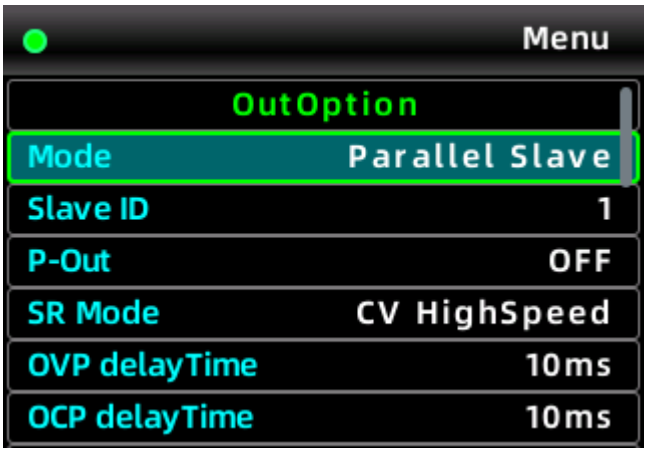
Master/Slave Settings

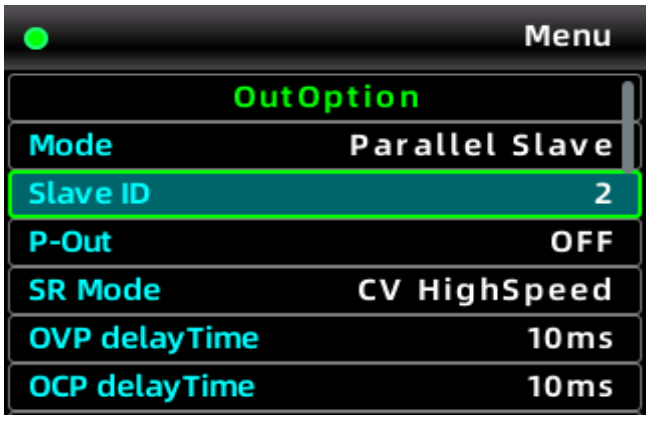
Select one power supply as the master, and other power supply as slaves.



Parallel-connect master setting:

Press the menu Menu button to access the menu settings, rotate the rotary knob to select the mode to Parallel Master.





Parallel-connect slave setting:

Press the menu Menu button to access the menu settings, rotate the rotary knob to select the mode to Parallel Slave.

Set the slave ID for the slave number: 1, 2.

4.Single-Control Series Operation

Single-control operation enables centralized control of a series-connected power supply system via a master unit, while other identical UDP5000-series models function as slaves. This setup increases the output voltage capacity, calculated as: Maximum Output Voltage = Single-unit Rated Voltage × Number of Series-Connected Unit

Maximum Series-Connected Units: 2

	400 W Model	800 W Model	1200 W Model	2000 W Model
Maximum Series-Connected Units	2	2	2	2

Danger: Risk of electric shock.

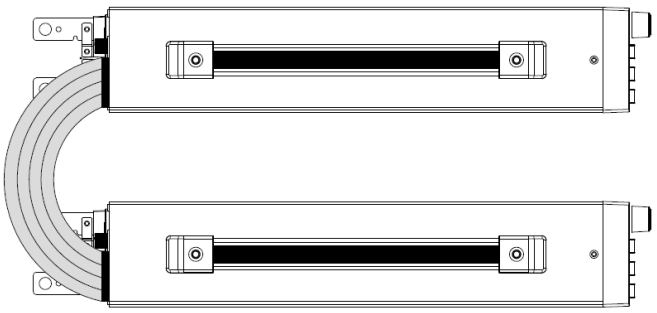
- Before touching the output terminals, turn off the power switch.
- After assembling the output cables, install the output protection cover.

4.1 Series Operation Steps

Example: Setting series operation on UDP5040-40

1. Turn off all power switches.
2. Remove the output protection cover.
3. Remove the output protection cover.

   Use a double-ended female header cable (dual-row female header 2×10 pins, 2.54mm pitch) to connect the analog interface of the series power supplies.



4. Connect the power supplies in series with the load.

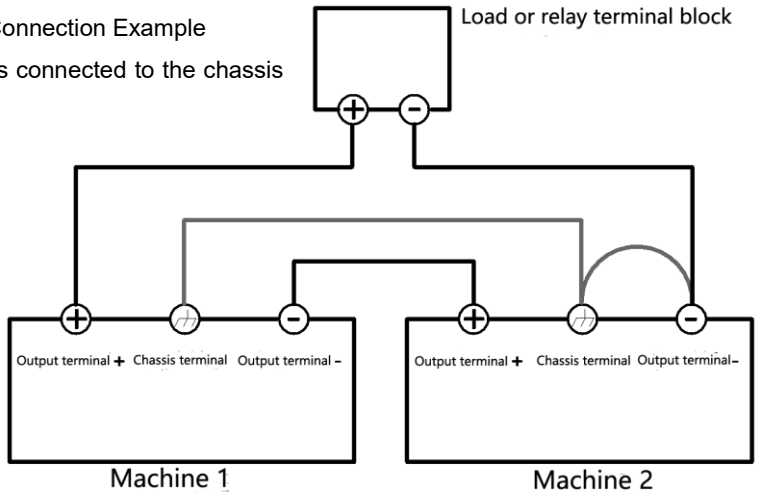
   Use wires with sufficient current capacity for the output connection.

   Keep output wires as short as possible to minimize voltage drop.

   Excessive wire length can increase voltage drop, causing potential differences between power supplies and leading to greater load fluctuations.

Series Operation Load Connection Example

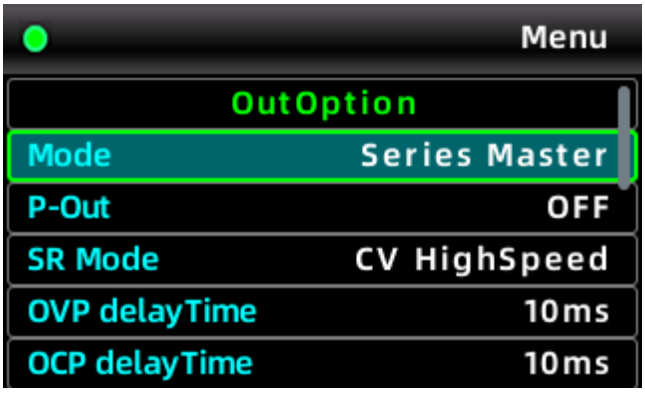
One side of Machine 2 is connected to the chassis terminal.



5. Install the output protection cover.

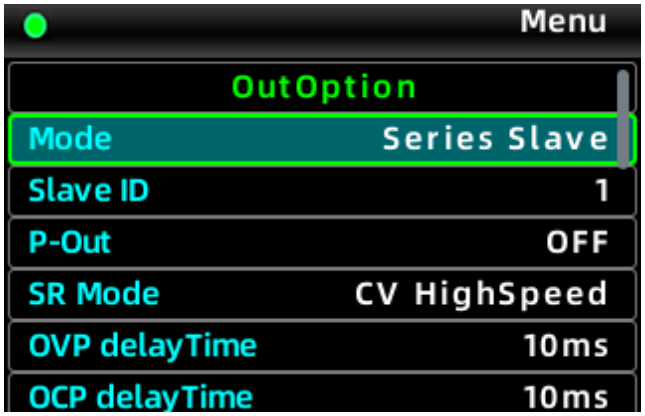
4.2 Master/Slave Settings

Select one power supply as the master, and other power supply as slaves.



Series-connect master setting:

Press the menu Menu key to access the menu settings, rotate the rotary knob to select the mode to Series Master.



Series-connect slave setting:

Press the menu Menu key to access the menu settings, rotate the rotary knob to select the mode to Series Slave.
Set the slave ID for the slave number: 1, 2.

5. Troubleshooting

5.1 Troubleshooting

When abnormalities occur in the power supply, some issues can be resolved using the simple methods described in the following table. If the problem persists, please contact UNI-T distributor for assistance.

Power Switch Fault

Case	Check Item	Solution
The power supply does not respond when the power switch is turned on.	Is the power cord damaged?	Replace the power cord if it is damaged.
	Is the power cord connected correctly?	Reconnect the power cord properly.

Power on but display fault

Case	Check Item	Solution
After turning on the power switch, the display panel does not respond, but the fan rotates at high speed.	Did you press and hold the rotary knob while turning on the power switch?	Turn off the power switch and restart the unit without pressing the rotary knob.

Output Voltage/Current/OCP/OCP Setting Fault

Case	Check Item	Solution
Output voltage cannot be set.	Is the voltage limit function enabled?	• The output voltage setting must not exceed approximately 95% of the OVP setting. • The OVP setting must not be than lower than approximately 105% of the output voltage setting. • Ensure the limit function is disabled and confirm the OVP setting.
Output current cannot be set.	Is the current limit function enabled.	• The output current setting must not exceed approximately 95% of the OCP setting. • The OCP setting must not be than lower than approximately 105% of the output current setting. • Ensure the limit function is disabled and confirm the OCP setting.
Buttons unresponsive during voltage/current setting	Is this instrument operating as a series/parallel slave?	Output settings cannot be adjusted if the instrument is in slave mode.
	Is the keypad lock enabled?	Unlock the keypad to allow adjustments.
	Is the list mode active?	Turn off the list mode.
	Is external voltage control enabled?	Output voltage/current settings are unavailable during external voltage control.
OVP/OCP cannot be set.	Is the keypad lock enabled?	Unlock the keypad to allow adjustments.
	Is this instrument operating as a series/parallel slave?	Output settings cannot be adjusted if the instrument is in slave mode.
	Is the list mode active?	Turn off the list mode.

Output Fault

Case	Check Item	Solution
No output after pressing the output button	Is the output voltage set to 0V or the output current set to 0A?	Rotate the rotary knob to set the output voltage and current to the desired value
	Is external voltage control enabled?	Turn off the external voltage control.

Output automatically turns off immediately after turning.	Is OVP enabled?	Set the OVP value higher than the voltage setting.
	Is OTP enabled?	An abnormal temperature rise may trigger OTP. Check the operating environment, address any overheating causes, and restart the output.
	Is external voltage control enabled?	If the external voltage control is enabled, pressing the output button will only exit external voltage control mode and will not activate output.

Great Output Fluctuation

Case	Check Item	Solution
Output fluctuations occasionally increase.	Is the input voltage outside the specified range?	Ensure the input voltage remains within the rated range.
Relocating the installation site causes greater fluctuations.	Is there a strong magnetic or electric field source nearby?	Move the instrument away from interference sources or mitigate noise by twisting output wires
Significant fluctuations occur during external control	Is the external voltage noise excessive?	Use appropriate filtering or shielding techniques to reduce voltage noise.
Fluctuations worsen after replacing output wires.	Is the sampling wire connected?	If remote sense compensation is disabled, reconnect the voltage sampling spring piece.

Output Unstable

Case	Check Item	Solution
When enabling output, changing the voltage/current value may cause instability.	Is the operation mode switching between CV → CC or CC → CV?	• Set the output voltage or current limit higher than the current setting. • If the current setting is already at the maximum, consider a power supply with a higher output voltage or current capacity.
The output voltage or current fluctuates during operation.	Is the instrument operating in single-controlled parallel mode?	Performance may be lower in parallel operation than when the instrument is used alone.
	Have the sense wires or voltage sampling spring pieces become disconnected?	If remote sense compensation is disabled, reconnect the voltage sampling spring piece.
	Is the operation mode repeatedly switching between CC/CV?	If remote sensing compensation causes oscillations, install a capacitor at the load terminal.
		If circuit damage is suspected, immediately stop using the instrument and arrange for repairs.
	Are there loose connections or breaks in the sampling wires or output wires?	Turn off the power switch and check all wiring connections.
	Are there load current peaks or fluctuations?	If peak currents exceed the set value, increase the current setting or switch to a higher-capacity power supply.
Output voltage deviates when power is applied.	Has the instrument been powered on for at least 30 minutes?	The instrument should warm up for at least 30 minutes before use.
Output voltage does not drop even after turning off the output.	Is the discharge load setting disabled?	If the discharge load is disabled, residual voltage may remain after turning off the output. Set the discharge load to On/Auto to ensure proper voltage dissipation.
Output voltage deviates from the set value.	Has the internal resistance value been configured?	Set the internal resistance value to zero.
	Are the screws securing the voltage sampling spring piece loose?	Secure the voltage sampling spring piece by tightening the screws at the voltage sampling terminals and rear output terminals.

P/N:110401113594X

说明书菲林做货要求：

序号	项目	内容
1	尺寸	285*210mm
2	材质	60g书纸
3	颜色	单色印刷
4	外观要求	完整清晰、版面整洁，无斑墨、残损、毛边、刀线错位等缺陷。
5	装订方式	钉装
6	表面处理	无
7	其它	无
版本		0
修改页码		

DWH 设 计	宣浩	MODEL 机型: UDP5000	Part NO. 物料编号: 110401113594X
CHK 审核		UNI-T® 优利德科技(中国)股份有限公司 UNI-TREND TECHNOLOGY (CHINA) CO., LTD.	
APPRO. 批准			