Hantek®

Quick Guide

Programmable DC Power Supply

HDP43XX/44XX Series

V 1.1

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A: Please contact the local dealer of Qingdao Hantek Electronic Co., Ltd.;

B: Please contact the local office directly under Qingdao Hantek Electronic Co., Ltd;

C: Please contact the headquarters of Qingdao Hantek Electronic Co., Ltd.

Contact Method of our company:

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Summary of general safety matters

General Safety Summary

Read the following safety precautions carefully to avoid injury and prevent damage to this product or any product connected to this product. To avoid possible danger, be sure to use this product as specified.

Avoid fire and personal injury.

Only professionally authorized personnel should perform repairs.

Use the correct power cord.

Use only the power cord specified for this product in your country.

Connect and disconnect properly.

Select the correct AC power input gear and input the AC voltage within its allowable range. Please turn off the power before connecting to the output terminal. Before powering off the instrument, disconnect the load it carries and then power off.

Ground the product.

To avoid electric shock, the product is grounded through the grounding conductor of the power cord. The grounding conductor must be connected to ground. Before connecting the input or output of the product, be sure to ground the product properly.

View all terminal ratings.

To avoid fire or the impact of excessive current, check all ratings and markings on the product. Please consult the product manual for details on ratings before connecting the product.

Use proper overvoltage protection.

Make sure that no over voltages (such as those caused by lightning) reach the product. Otherwise, the operator may be exposed to electric shock.

Do not open the cover.

Do not operate the product with the cover or panel open.

Maintain proper ventilation.

Poor ventilation will increase the temperature of the instrument and cause damage to the instrument. Good ventilation should be maintained during use, and the vents and fans should be checked regularly.

Use a suitable fuse.

Only use fuses specified for this product.

Avoid exposed circuits.

Do not touch exposed connectors and components after power is turned on.

Do not operate the product if you suspect it is malfunctioning.

If the user suspects that this product has been damaged, have it inspected by qualified service personnel.

Do not operate in a humid environment.

To avoid the danger of short circuit or electric shock inside the instrument, do not operate the instrument in a humid environment.

Do not operate in a flammable or explosive environment.

To avoid damage to the instrument or personal injury, do not operate the instrument in a flammable or explosive environment.

Keep the surface of the product clean and dry.

To prevent dust or moisture in the air from affecting the performance of the instrument, keep the product surface clean and dry.

Anti-static protection.

Static electricity can cause damage to the instrument. Test in an anti-static area whenever possible. Before connecting the cable to the instrument, ground its inner and outer conductors briefly to discharge static electricity.

Pay attention to handling safety.

In order to avoid the instrument falling down during transportation, which may cause damage to the buttons, knobs, or interfaces on the instrument panel, please pay attention to transportation safety.

Safety terms and symbols

Product terminology. The following terms may appear on the product:

DANGER

It indicates that if you do this, you may cause immediate damage to the user.

WARNING

It indicates that the user may not immediately harm the user if they do this.

CAUTION

It indicates that the user may cause damage to this product or other property if this operation is performed.

Product symbol. The following symbols may appear on the product:

Safety Warning   Protective Test   Ground Shell   Earth Terminal

Ventilation requirements

Make sure that the exhaust area is not blocked and has free flowing air. To ensure adequate ventilation, when using the power supply in a workbench or rack, make sure that there should be a gap of at least 10 cm on both sides, above, and behind it.

WARNING

Poor ventilation will increase the temperature of the instrument and cause damage to the instrument. Good ventilation should be maintained during use. Regularly check the vents and fans.

Working environment

Temperature

During operation: 0℃ to 50℃

Non-operating: -40℃ to 70℃

Humidity

0℃ to 30℃: 95% relative humidity.

30℃ to 40℃: 75% relative humidity.

40℃ to 50℃: 45% relative humidity.

WARNING

To avoid the danger of short circuit or electric shock inside the instrument, do not operate the instrument in a humid environment.

Altitude

When operating: below 3000 meters.

Non-operating: below 15000 meters.

Daily maintenance and cleaning

Daily maintenance

When storing or placing the oscilloscope, do not expose the LCD monitor to direct sunlight for a long time.

CAUTION

To avoid damaging the oscilloscope or probe, do not place it in mist, liquid or solvent.

Clean

According to the requirements of operating conditions, check the oscilloscope and probe frequently. Please clean the outer surface of the instrument according to the following steps:

Use a lint-free cloth to remove dust from the outside of the oscilloscope and probe. Be careful not to scratch the smooth display filter.

Clean the oscilloscope with a soft cloth dampened with water. For more thorough cleaning, use 75% isopropyl alcohol in water.

⚠ CAUTION

To avoid damaging the surface of the oscilloscope or probe, do not use any corrosive or chemical cleaning agents.

Equipment recycling

Production of this equipment requires the extraction and use of natural resources. If this product is not disposed of properly, some of the substances contained in the device may be harmful to the environment or human health. To avoid release of harmful substances into the environment and reduce the use of natural resources, it is recommended that this product be recycled by appropriate methods to ensure that most materials can be reused correctly.

Contents

Introduction

HDP43XX/44XX is a programmable DC power supply. It has a user-friendly interface design, excellent performance indicators, a variety of communication interfaces to meet the different needs of users, and a variety of analysis functions to meet the diverse needs of users.

Main Feature:

- 4.3-inch TFT display
- Series and parallel output
- High performance: accuracy, transient response and linear adjustment rate
- Built-in Chinese and English help system
- Digital IO interface, support trigger input/output function
- Support SCPI programmable command control
- Waveform display function, real-time dynamic display of output voltage/current waveform, with the digital display of voltage, current and power values, so that users can see the output status and trend of the instrument at a glance
- OV/OC/OT protection function
- Keyboard lock function to prevent misoperation
- Voltage tracking function
- Delay switch function
- One-key restore preset state function
- Support store and recall
- A variety of interface configurations to meet the needs of users
- Support U disk storage

Chapter 1 Quick Start

Taking the three-channel power supply as an example, this chapter will briefly describe and introduce the front panel, rear panel, user interface, help system, and precautions when using the instrument for the first time. In this way, users can become familiar with this series of power supplies in the shortest possible time.

1. Check before use

1.1 Check the shipping package

If you find that the packaging carton or foam protection pad is severely damaged, please keep it until the whole machine and accessories pass the electrical and mechanical tests.

1.2 Check the whole machine

If you find that the appearance of the instrument is damaged, the instrument is not working properly, or the performance test fails, please contact the dealer responsible for this business.

1.3 Check the accessories

Please check the accessories according to the product packing list. If you find the accessories are missing or damaged, please contact the dealer responsible for this business.

2. Front Panel Introduction

1. LCD Display screen

2. Restore default settings

3. Help

Used to quickly get relevant help on the use of the instrument.

4. USB Host

Used for firmware upgrade or external file saving.

5. Auxiliary function soft keys

Operate according to the screen display.

6. Channel Button

Press to select the current channel. Then you can directly set the voltage and current of the current channel.

7. Power button

8. Common ground terminal

9. Output terminal

10. Output control keys

Turn the output on or off.

11. ALL ON/OFF key

Turn on all or turn off all output channels.

12. Voltage/current adjustment knob

Finely adjust the voltage/current, and the adjustment accuracy is 1mV/1mA.

13. Arrow keys

Use the arrow keys to move the cursor position up, down, left, and right.

14. Numeric keypad

Enter the value directly, press the "Enter" key to confirm, and press the "×" key to delete.

15. Function keys

Meter View: Display the Meter View of the selected channel.

Tracking: Turn on or off the tracking mode of channel 1 and channel 2.

Store/Recall: Open the store/recall menu.

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3. Rear Panel Introduction

1. Digital IO interface

2. USB interface

3. LAN interface

4. AC selector

5. Power jack

6. Fuse holder

7. Exhaust fan

8. Ground reference point

9. Safety lock

10. GPIB interface

11. RS-232/485 interface

Chapter 2 Getting Started

1. Check the AC voltage range

This series of programmable DC power supplies support various specifications of AC power input, and users can choose the appropriate input gear according to actual needs. The user must check the gear position of the AC voltage selector on the rear panel of the power supply before using it, and the input voltage must be within the allowable range (±10%) of the gear position. The corresponding relationship between the voltage selector on the rear panel of the power supply and the allowable input voltage is as follows:
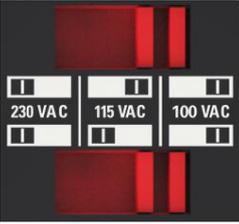
2. Check the fuse

The instrument has been installed with the specified fuse at the factory. Before use, please check whether the fuse type matches the AC voltage range. If it does not match or the fuse is blown, replace the fuse according to the specifications.

Steps to replace the fuse:

1. Turn off the power and unplug the power cord;
2. Lift out the fuse holder;

3. Remove the broken fuse and install a new one;
4. Put the fuse holder back into the slot.

Chapter 3 Function Introduction

1. Output voltage and current

The output voltage and current can be directly input in the main interface, or set in "Source Settings" and "Meter View".

Setting steps:

1. Select the output channel

Press the digital channel button on the front panel, or continuously press the left "◁" and right "▷" arrows to select the output channel to be set.

2. Set voltage/current:

Press the arrow keys to select voltage or current, use the numeric keyboard or knob to set the value, press "×" to delete, and press "Enter" to confirm and exit editing.

3. Turn on the output

Press the "On/Off" key to turn on the output.

2. Series output

Press Output Settings->Operation Mode to select Series, which can be set as serial output.

In series mode, the channels are internally connected in series to form a single output. The channel 2 window of the main interface displays "SERIES with CH1". Channel 1 is the master and channel 2 is the slave. The "+" terminal of channel 1 and the "-" terminal of channel 2 are the two output terminals of the series circuit. The output voltage is twice the set voltage of channel 1, and the output current is the set current of channel 1. The external wiring method of series mode is as follows:

3. Parallel output

Press Output Settings->Operation Mode to select Parallel, which can be set as parallel output.

In parallel mode, the channels are internally connected in parallel to form a single output. The channel 2 window of the main interface displays "PARALLEL with CH1". Channel 1 is the master and channel 2 is the slave. The "+" and "-" binding posts of channel 1 are the two output terminals of the parallel circuit. The output current is twice the set current of channel 1, and the output voltage is the set voltage of channel 1. The external wiring method of parallel mode is as follows:

4. Remote control

4.1 USB remote control

Use the USB cable to connect the USB port on the back of the computer to the USB port on the rear panel of the power supply. At this time, the USB connected logo is displayed on the upper right corner of the main interface of the power supply.

Download and install the IO software from the following address:
https://www.keysight.com/main/software.jspx?id=2175637&nid=-11143.0.00&pageMode=CV&lc=eng&cc=CA

Open the IO software, find the device, and send an instruction to see if the communication is normal. After normal communication is obtained, SCPI commands can be used to control the power output.

E.g:

OUTP On, (@1)   Set the channel 1 output on.
Volt 5, (@1)   Set the voltage of channel 1 to 5V.
Meas:volt? (@1)   View the output voltage value of channel 1.
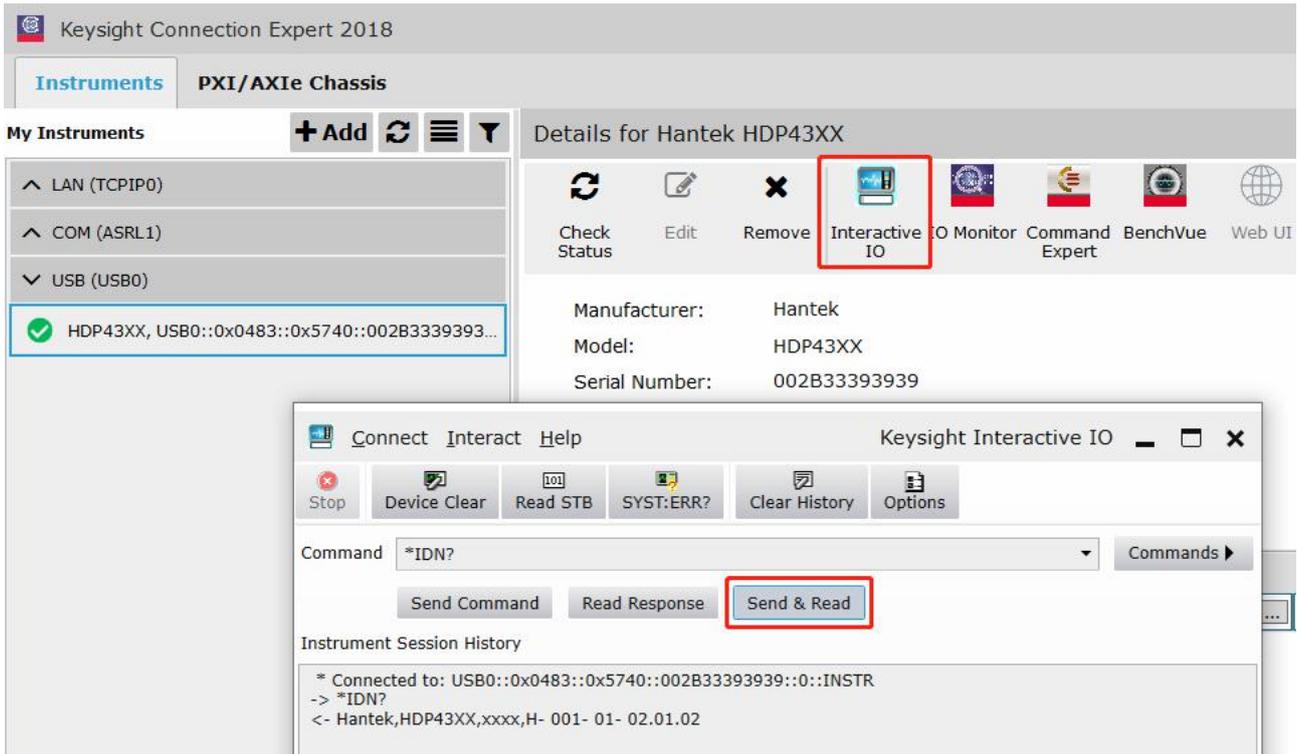
4.2 LAN remote control

Connect the back-end network port of the computer to the network port on the rear panel of the power supply with a LAN network cable.

Utility→I/O Config→LAN Settings to set the power supply LAN parameter.

Press Load menu to load settings, as shown in the figure below:

Please configuration of computer IP and other information manually. Set computer Ethernet properties:
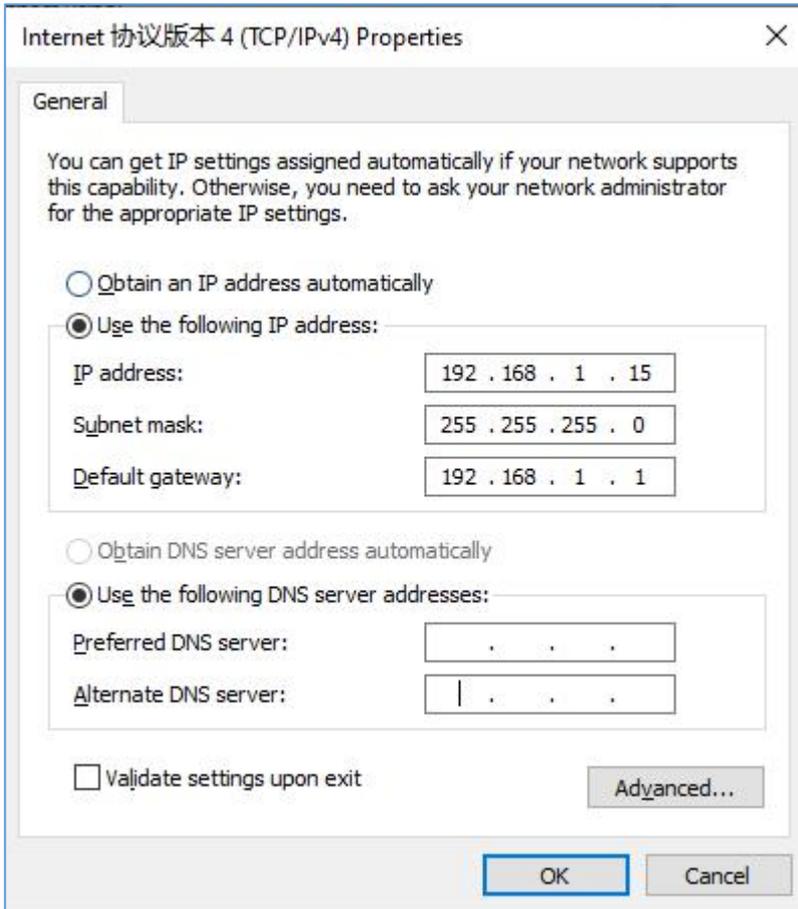
After the connection is successful, open the IO software and the device will appear in the LAN list. If the device does not appear, you can manually add the device, enter the device's IP address and protocol, test the VISA address, and click OK to add a new device.
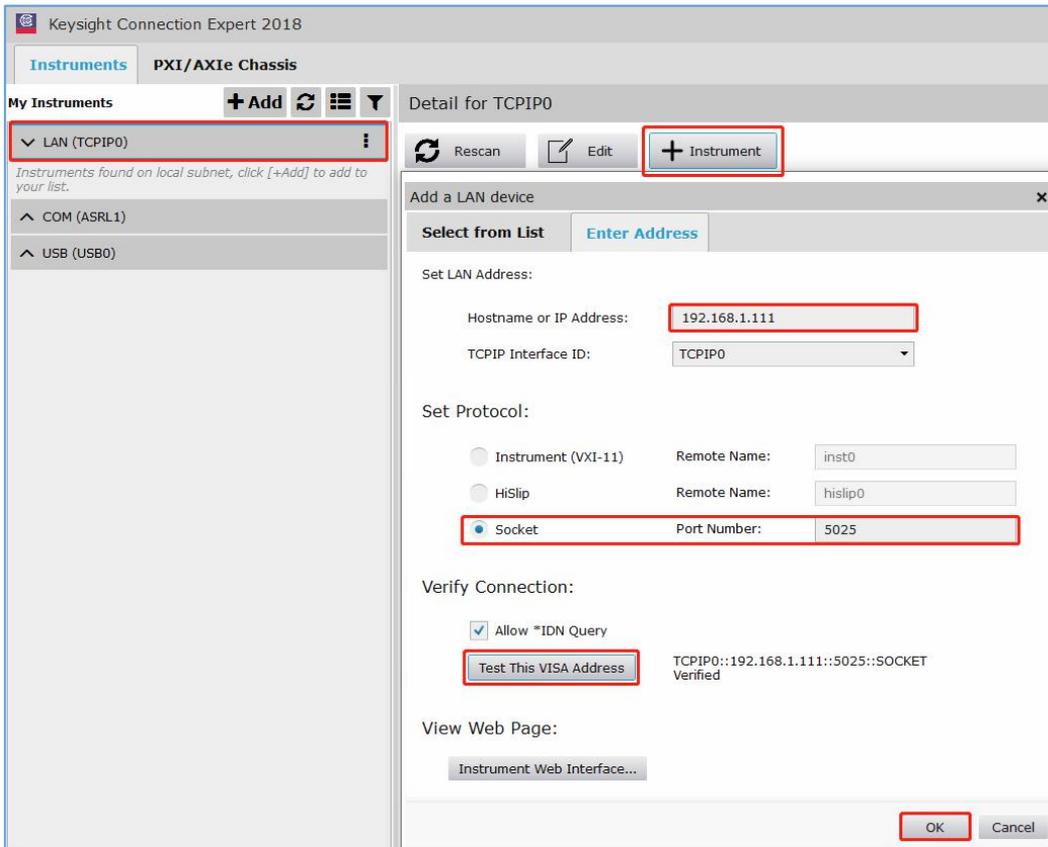
After a successful connection, the network port icon in the upper right corner of the main interface is displayed as follows:

As with USB remote control, after obtaining normal communication, you can use SCPI commands to control the power output.

If there is a DHCP server in the LAN, you can open the DHCP function, and the instrument will automatically obtain IP and other information from the DHCP server without manual setup.

Note: If there is no DHCP server on the LAN, you must configure IP and other information manually.

4.3 RS232/485 remote control

Each parameter is unchanged by default.

Pay attention to the wiring:

Pin2 is RS232_TX, Pin3 is RS232_RX, Pin4 is RS485_A, Pin9 is RS485_B.
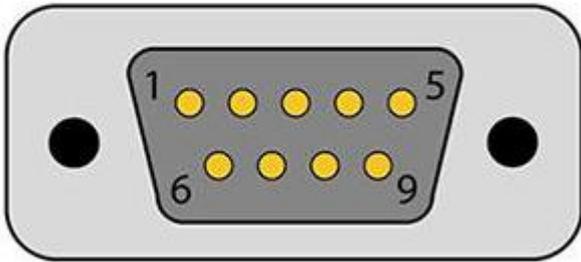
Pin#	Signal
1	NC
2	RS232_TX
3	RS232_RX
4	RS485_A
5	GND
6	NC
7	NC
8	NC
9	RS485_B

Open the IO software, select to add a device, set the corresponding baud rate, test the VISA address, and click OK to add a new device.

As with USB remote control, after obtaining normal communication, you can use SCPI commands to control the power output.
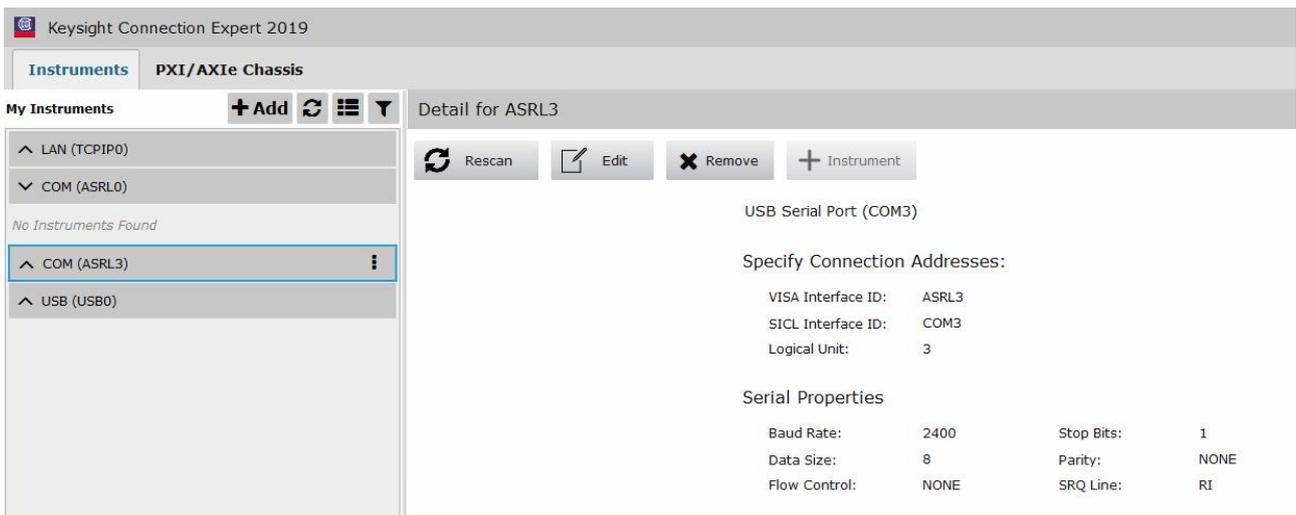
4.4 GPIB remote control

Utility->I/O Config->GPIB to open GPIB window. Use the numeric keypad to set the address of GPIB and press ENTER to confirm.

GPIB Set

gpib address   1

* The range of gpib address is 1 - 30!

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5. Utilities

Store / Recall	I/O Config	Setup	Error	Capture	Back

5.1 Store/recall

Store Setting	Recall Setting	Power On Setting		Set to Default	Back

Store/Recall can store and recall settings as volatile settings, such as: voltage and current values, OVP, OCP, output coupling, output status, operation mode, list output, trigger settings, data recording, key tone, Help language etc.

5.1.1 Store Setting

Store Settings: Used to select internal storage or external storage.

Select **Internal**, the settings will be saved in the power memory. Up to 10 states can be stored as State 0-State 9. You can choose whether to set it to "Power-on State". Press "Store" to save this setting.

Select **External**, the settings will be saved to the external storage device. First insert the USB storage device into the USB port on the front panel, press "Enter" under "File" to edit the file name, press "Done" to save and exit, and press "Store" to execute the save. The file will be saved in the .csv format to the root directory of the external storage device.

5.1.2 Recall setting

Used to select to recall from internal or from external. Same as store settings: select the location, state name or external .csv setting file of the file to be recalled, press "Enter" to confirm, and press "Recall" to execute recall.

5.1.3 Power-on setting

Press "Power On Setting" to select a state to be automatically recalled after power-on. You can choose the default settings or user-specified settings. Press "SetPwrOn" to save the settings. Users can also check "☐Set this as power-on state." in "Store Settings" to set.

5.1.4 Restore default settings

Press "Set to Defaults" to restore the default settings.

5.2 Setup

5.2.1 Help language

The default is English, press "Enter" to switch to Chinese.

5.2.2 Sound switch

Press "Enter" to switch the key tone on or off.

5.2.3 Firmware upgrade

Select the channel to be upgraded and press "Start" to start the upgrade.

5.2.4 Calibration

The instrument has been calibrated before leaving the factory, and the user does not need to calibrate again. If you really need to calibrate, you can use SCPI commands to recall the calibration program.

5.3 Error message

Error displays the error information of the instrument. The error information list is arranged in the order in which it was generated, that is, the most recent error is displayed at the top. Press "Next" to view the next page.

5.4 Capture

Capture can set the properties of the screenshot file, including the save path and file name. The default picture format is .bmp.

Long press the "Meter View" button for 3 seconds to perform the screenshot operation, and the screenshot file is automatically saved to the external storage device.

Capture Display

Save File Path   0:

Save File Name   Screenshot.bmp

*Long press the [Meter View] key to capture current screen.

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6. Lock/Unlock

Long press the "Lock/Unlock" key to lock the front panel, short press this key to cancel the lock.

When the front panel is locked, the lock icon will be displayed on the top of the main screen, and the icon will disappear after unlocking.

Chapter 4 Troubleshooting

The following faults may occur during the use of this series of programmable DC power supplies. Users can refer to the following methods to deal with. If the fault still exists, please contact Hantek and provide the equipment information of the instrument (How to obtain: ? ->About).

1. The instrument cannot be turned on.

(1) Check whether the power cord is properly connected.
(2) Check whether the power switch on the front panel is turned on.
(3) Unplug the power cord, check whether the AC selector is in the correct position, whether the specifications of the fuse are correct and whether it is intact. If you need to replace the fuse, please refer to the "Steps to replace the fuse".
(4) If the problem persists, please contact Hantek.

2. The constant voltage output is abnormal.

(1) Check whether the maximum output power of the selected gear meets the load requirements.
(2) Whether the cables connecting the load and the power supply are short-circuited, and whether they are in good contact.
(3) Check whether there is a problem with the load.
(4) Check whether the current setting value of this gear is appropriate. If it is too low, you can increase the current setting value appropriately.
(5) If the problem still cannot be solved, please contact Hantek.

3. The constant current output is abnormal.

(1) Check whether the maximum output power of the selected gear meets the load requirements.
(2) Whether the cables connecting the load and the power supply are disconnected and whether they are in good contact.
(3) Check whether there is a problem with the load.
(4) Check whether the voltage setting value of this gear is appropriate. If it is too low, you can increase the voltage setting value appropriately.
(5) If the problem still cannot be solved, please contact Hantek.

4. The U disk cannot be recognized correctly.

(1) Check whether the U disk can work normally.
(2) Make sure that the USB flash drive is used. This instrument does not support hard drive USB flash drives.
(3) After restarting the instrument, insert the U disk to check.
(4) If the USB flash drive still cannot be used normally, please contact Hantek.

Chapter 5 Performance Index

DC output (0℃~40℃)		Voltage	Current
Channel		Voltage	Current
HDP43XX	CH1	32V	3.2A
	CH2	32V	3.2A
	CH3	8V	5A
HDP44XX	CH1	32V	3.2A
	CH2	32V	3.2A
	CH3	8V	2A
	CH4	16V	1.5A

Series and parallel output		Series	Parallel
Channel		Series	Parallel
HDP43XX	CH1	64V,3.2A	32V,6.4A
	CH2		
	CH3	—	—
HDP44XX	CH1	64V,3.2A	32V,6.4A
	CH2		
	CH3	—	—
	CH4	—	—

Load Regulation ±(% of output + offset)	
Voltage	<0.01%+2mV
Current	<0.01%+250μA

Line Regulation ±(% of output + offset)	
Voltage	<0.01%+2mV
Current	<0.01%+250μA

Ripple and noise (20Hz to 20MHz)	
Normal mode voltage	<350μVrms /2mVpp

Accuracy(25℃±5℃) ±(% of output + offset)		Programming		Readback	
Channel		Voltage	Current	Voltage	Current
HDP43XX	CH1	0.05%+10mV	0.2%+5mA	0.05%+10mV	0.2%+5mA
	CH2				
	CH3	0.1%+5mV	0.1%+10mA	0.1%+5mV	0.1%+10mA

	CH1	0.05%+10mV	0.2%+5mA	0.05%+10mV	0.2%+5mA
HDP44XX	CH2				
	CH3	0.1%+5mV	0.1%+10mA	0.1%+5mV	0.1%+10mA
	CH4				

Transient response time
The output current from full load to half load, or from half load to full load, the time for the output voltage to recover to within 15mV is less than 50μs.

Mechanical		
Size	232*153*392mm	
Weight	HDP43XX	9.15Kg
	HDP44XX	9.45Kg

Power supply	
AC input (50Hz～60Hz)	100Vac±10%，115Vac±10%，230Vac±10%(Maximum 250Vac)
Maximum input power	600VA

Interface	
USB Device	1 piece
USB Host	1 piece
LAN	1 piece
Digital IO	1 piece
RS-232/485	1 piece (Option)
GPIB	1 piece (Option)

Surroundings	
Cooling method	Air-cooled
Operating temperature	0℃～50℃
Storage temperature	-40℃～70℃
Humidity	0℃～30℃: ≤95% relative humidity
	30℃～40℃: ≤75% relative humidity
	40℃～50℃: ≤45% relative humidity
Altitude	Below 3000 meters