Hantek

HAP11L500/
HAP11L1000

AC Power Supply

User Manual

2025.05

Warranties and Representations

Copyright

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Product certification

Hantek certifies HAP11L500/HAP11L1000 series DC regulated power supply to meet China national industry standards.

Contact us

If you encounter any problems in the process of using the products of Qingdao Hantek Electronics Co., LTD., you can obtain services and support through the following ways:
Email: service@hantek.com, support@hantek.com
Website: http://www.hantek.com

Catalog

1 Safety requirements

1.1 Summary of general security issues

Carefully read the following safety precautions to avoid injury and to prevent damage to this product or products connected to it. To avoid possible dangers, please be sure to use this product in accordance with the regulations.

- **Only professionally authorized personnel can perform repairs.**
- **Use the right power cable.**

  Use only the power cable approved by your country.
- **Ground the product.**

  To avoid electric shock, the product is grounded through the grounding conductor of the power cable. The grounding conductor must be connected to the ground before connecting the input or output end of the product. Ensure that the product is properly grounded.
- **Check all terminal ratings.**

  To avoid fire or excessive current, check all rated values and marking instructions on the product. Please consult the product manual for details before connecting the product.
- **Do not open the cover.**

  Do not run the product when the outer cover or panel is open.
- **Avoid circuit exposure.**

  Do not touch exposed wire terminals and electronic components after the power supply is switched on.
- **Do not perform operations when you suspect that the product is faulty.**

  If you suspect that the product has been damaged, have it inspected by a qualified maintenance person.
- **Maintain proper ventilation.**
- **Do not operate in a damp environment.**
- **Do not operate in inflammable and explosive environment.**
- **Please keep the product surface clean and dry.**

1.2 Security terms and symbols

Safety terms in the manual:

Warning:

Indicates that this operation may not cause immediate damage to you.

Note:

Indicates that you may damage the product or other property if you do so.

Safety terms on the product:

RATING:

Indicates that if you do not perform this operation, potential harm may be caused.

Safety symbols on the product:

warning

Test ground

1.3 Ventilation requirements

The instrument is forced cooled by a fan. Ensure that the intake and exhaust areas are unblocked, and free flowing air is available. In order to ensure adequate ventilation, when using the instrument in the workbench or rack, please make sure that the two sides, above and behind should leave a gap of at least 10 cm.

Note:

Poor ventilation will cause the temperature of the instrument to rise, which will damage the instrument. Good ventilation should be maintained when using. Ventilation vents and fans should be checked regularly.

1.4 Work environment

Working conditions:

Temperature -10 ° C to 40 ° C, relative humidity ≤80%

Storage conditions:

Temperature -20 ° C to 60 ° C, relative humidity ≤80%

Warning:

To avoid short circuit or electric shock, do not operate the instrument in a damp environment.

Warning:

Ensure that no overvoltage (e.g. lightning) reaches the product. Otherwise, the operator may be in danger of suffering from electric shock.

1.5 Maintenance and cleaning

Maintenance:

Do not expose the instrument to direct sunlight for a long time when storing or placing the instrument.

Note:

To avoid damaging the instrument or accessories, do not place it in fog, liquid or solvent.

Cleaning:

Check the instrument and accessories frequently as required by the operating conditions. Clean the outer surface of the instrument according to the following steps:
1) Use lint-free cloth to remove floating dust outside the instrument and accessories. Please be careful to avoid scratching the smooth display.
2) Clean the instrument with a soft cloth soaked in water. For a more thorough cleaning, use a aqueous solution of 75% isopropyl alcohol.

Note:

To avoid damaging the surface of the instrument and accessories, do not use any corrosive reagent or chemical cleaning reagent.

Warning:

Before powering on the instrument again, ensure that the instrument is dry enough to avoid electrical short circuit or even personal injury.

1.6 Environmental considerations

The following symbols indicate that the product complies with the requirements of WEEE Directive 2002/96/EC.

Equipment recycling:

Producing this product requires the extraction and use of natural resources. Some substances contained in the equipment may be harmful to the environment or human health if the product is not disposed of properly. To avoid the release of harmful substances and reduce the cost of natural resources, it is recommended that appropriate methods be used to recycle this product to ensure most of the materials can be properly reused.

2 Summary

2.1 Product Introduction

AC variable frequency power supply can provide power supply voltage for power grids in various countries around the world, suitable for export electrical manufacturers, laboratories, national defense and military industries. The power supply adopts digital technology and IPM/IGBT intelligent output, with good dynamic characteristics, strong load adaptability, high efficiency, and simple operation. It is currently an excellent product in terms of technical performance.

2.2 Product Features

2.2.1 Essential performance

1. Output frequency preset
The output frequency is pre-set between 45~400Hz, which can provide the output frequency for frequency doubling testing of winding products.
2. Output voltage preset and adjustment
The preset range of output voltage is 1-300V.

3 Product Selection

3.1 Relationship between output voltage and current

The output current at the two center voltages of 110V and 220V is shown in Figure 3-1.

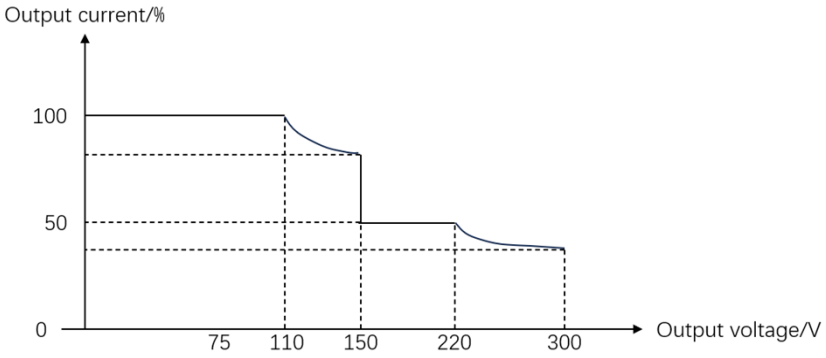


Figure 3-1 The relationship between output voltage and current

3.2 The Influence of Load Power Factor on Output Power

When the load supplied by the AC variable frequency power supply is inductive or capacitive, the active power varies diagonally due to the influence of reactive power.

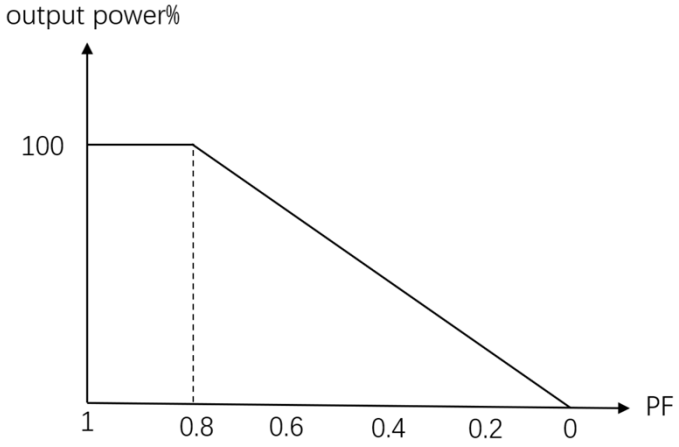


Figure3-2 The Influence of Load Power Factor on Output Power

3.3 Unsealing inspection

Open the cardboard box and remove the power supply;
During the disassembly process, it is prohibited to tilt the chassis more than 45 degrees;
Firstly, check the product nameplate to confirm that the model matches the order, inspect the accessories inside the packaging box to confirm that they match the packing list, inspect for any transportation damage, fasteners for detachment, or other abnormal phenomena. If you have any questions, please contact the company in a timely manner.

3.4 Installation environment

Ensure that the actual input voltage matches the power input voltage specifications.
It is strictly prohibited to install in environments containing flammable, explosive gases or corrosive substances.
The distance between the heat dissipation hole and the wall or obstruction should be at least 20cm, and the variable frequency power supply should be avoided from being placed in direct sunlight and humid areas. Water immersion is strictly prohibited.
Please stay away from sources of fire and high temperatures to prevent the machine from overheating.

3.5 Power on inspection

Recheck the incoming and outgoing lines of the variable frequency power supply, confirm that the connection is correct, close the incoming switch, and after about 9 seconds of preheating, the display panel will show standby mode. Check if the display window is displaying normally and if the button functions are functioning properly.
If there is an alarm sound, it indicates a fault, and the variable frequency power supply will automatically enter the protection state and display the alarm information in the power window.

4 Operation method

4.1 Front panel description

4.1.1 Front panel schematic diagram

The schematic diagram of the front panel of the power supply is shown in Figure 5-1.

Figure 5-1 Front panel

1.On/Off button

Turn on or off the output. When the output is turned on, the button indicator light turns green.

2. High and low gear conversion keys

Low：1~150V
High：150.1~300V

3.Restore default settings

4.Help

Quickly obtain relevant assistance on instrument usage.

5.USB

Used for firmware upgrade or external file saving

6.LCD display screen

7.Auxiliary function soft key

Operate according to the screen display.

8. Power button

9. Output

10. Multi functional adjustment knob

11. Function keys

12. Numerical keypad

Enter the numerical value directly, press the 【**Enter**】 key to confirm, and press the 【×】 key to delete.
M0- M9 shortcut keys. Long press to save the current state, short press to bring up the current state.

13. Direction keys

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

4.1.2 Rear panel

Figure 5-2 Rear panel

4.1.3 Front screen

The schematic diagram of the front screen of the power supply is shown in Figure 5-3.

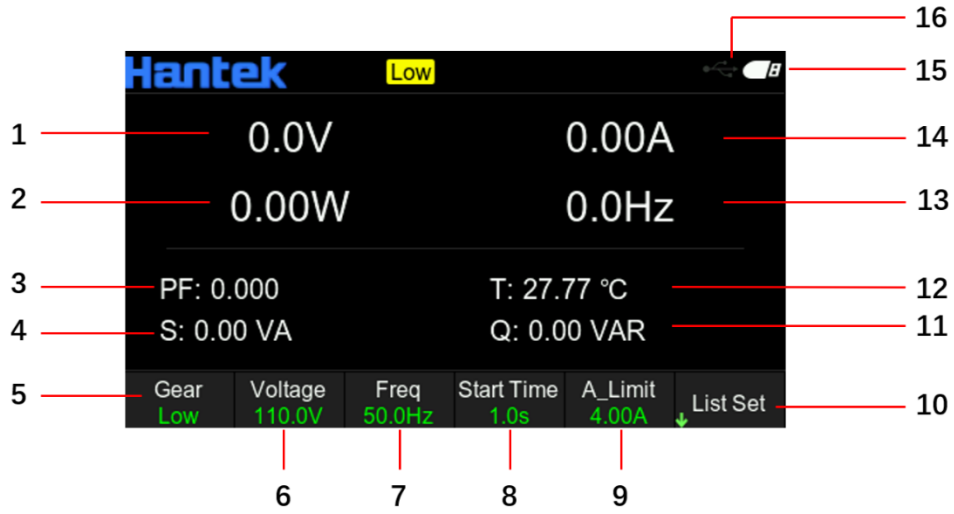


Figure 5-3 Front Screen

1. Read back voltage

2. Read back power

3. Power factor

4. Active power

5. High and low gears

6. Set voltage

Short press to select 110V/220V, long press to set voltage through digital buttons.

Low : 0-150V

High : 150.1-300V

7.Set frequency

8. Soft start time

The range is 1-300S

9. Protection current

10. List Settings

11. Reactive power

12. Temperature

13. Frequency

14. Read back current

15. USB flash drive

Insert the USB flash drive and this indicator will light up. This flag is dark if the USB drive is not inserted.

16. Network icon display

4.2 List Settings

Output list can make the output output according to the conditions set by the list. The output conditions include output voltage, output duration, output cycle times, etc.

List setting steps:

1. Create a list

Add/Remove Steps

Press the【Add】soft key and insert a new step below. The maximum length of the list is 10.

Press the【Delete】soft key to delete the current step.

2. Set list output

Use the directional keys to move the cursor for positioning, and use the numeric keypad to set the output voltage, running time, and holding time. Press [x] to delete, press【Enter】to confirm and exit editing.

3. Choose the number of repetitions

If 'Continue' is selected as **On** , the list will continue to run in sequence without stopping. At this point, the**【Repeat】** setting is invalid.

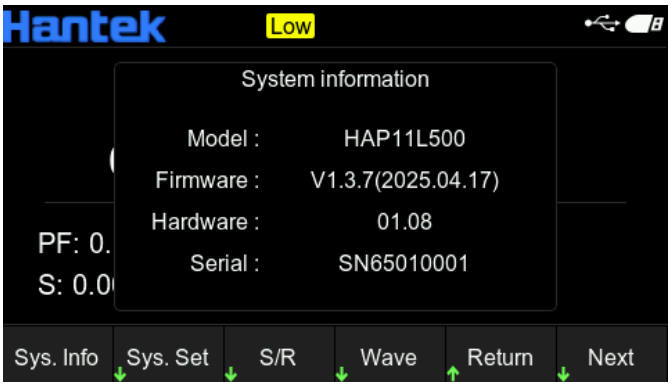
If 'Continue' is set to **Off** and **【Repeat】** is set to 2, the list will run twice in sequence and automatically stop.

4. Run/Stop

Set the output list to run or stop. During operation, the main interface displays the output value in the corresponding channel.

When using list output, the channel output should be turned on first, and then press 【Run/Stop】, otherwise the complete list cannot be output.

4.3 System information

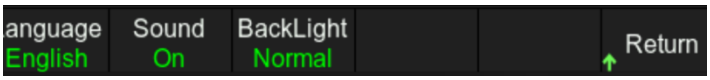


Click on【**Utilities**】>【**Sys.Info**】to view system information.

The system information includes model, software version, hardware version, and serial number.

4.4 System Settings

Click on【**Utilities**】>【**Sys.Set**】 to enter the system settings interface.



The system settings include: system language, system time, and backlight brightness.

1. Language

Click on the corresponding multifunction key below, move the cursor to locate it, and confirm with【**Enter**】.

Users can choose the language to be Chinese or English, and the system language defaults to English.

2. Sound

Click on the corresponding multifunction key below, move the cursor to locate it, and confirm with【**Enter**】.

Users can choose whether the sound is on or off, and the system sound defaults to on.

3. Backlight brightness

Click on the corresponding multifunction key below, move the cursor to locate it, and confirm with【**Enter**】.

Users can choose whether the backlight brightness is dim, normal, or high, and the default backlight brightness is normal.

4.5 Function settings

Click on【**Utilities**】>【**Func.Set**】 to enter the function settings interface.

The content of the function setting is current limitation.

1. Current limitation

When the read back current exceeds the set limit current, the power supply stops outputting.

Taking HAP11L500 as an example,

When in high gear, the maximum current limit can be set to 2.3A;

When in low gear, the maximum current limit can be set to 4.6A.

4.6 Remote control

4.6.1 USB remote control

Use a USB cable to connect the computer's backend USB port to the USB interface on the power supply's back panel. At this point, the USB connected icon will be displayed in the upper right corner of the power supply's main interface.

Download and install IO software from the following address:

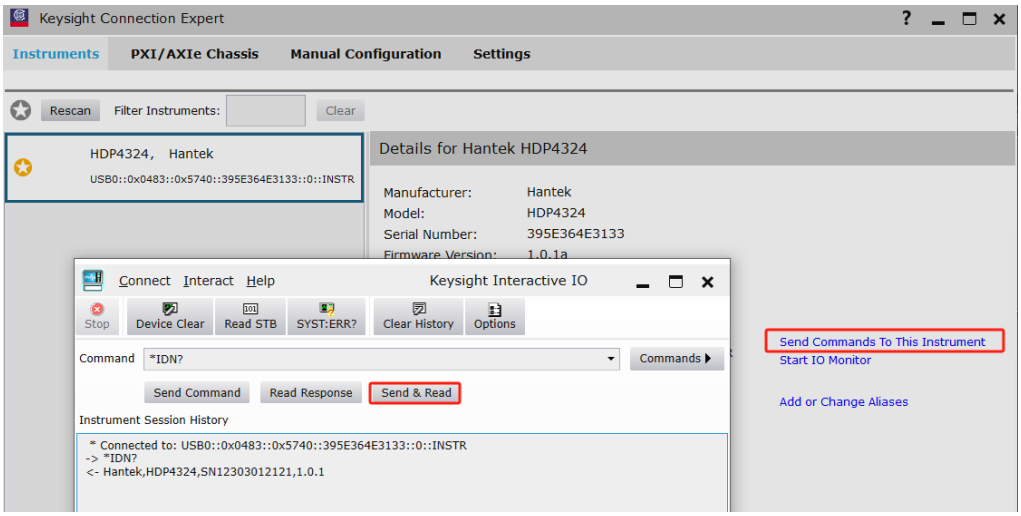
https://www.keysight.com/main/software.jspx?ckey=2175637&lc=chi&cc=CN&nid=-11143.0.00&id=2175637

Open the IO software, locate the device, and send a command to check if communication is normal. After obtaining normal communication, SCPI commands can be used to control power output.

For example:

OUT ON	Open output
OUT:VOLG LOW	Set the power output to low gear
OUT:VOLT 20	Set the voltage of the power supply to 20V

MEAS:VOL? View the output voltage value

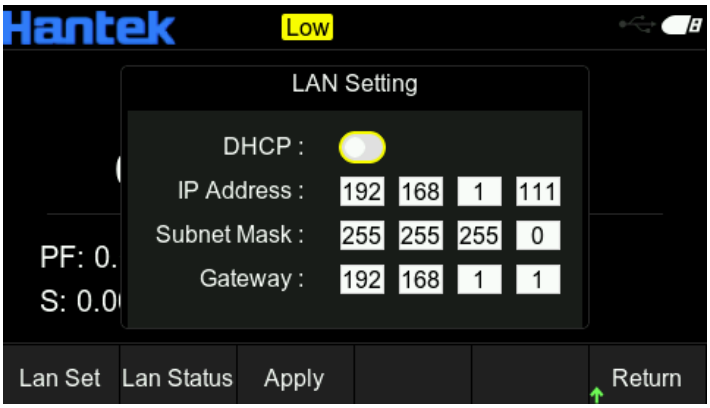


4.6.2 LAN remote control

Connect the computer backend network port to the power back panel network port using a LAN cable.

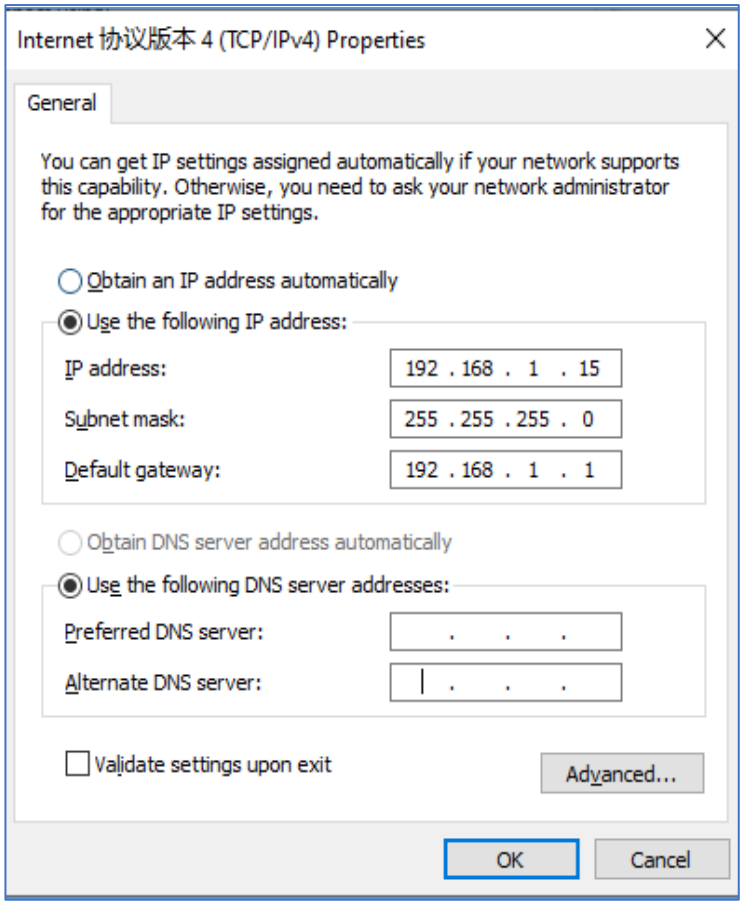
【Utilities】>**【I/O Set】**>**【LAN】** Set the power LAN parameters.

1) Press**【Lan Set】**to load the settings. As shown in the picture:

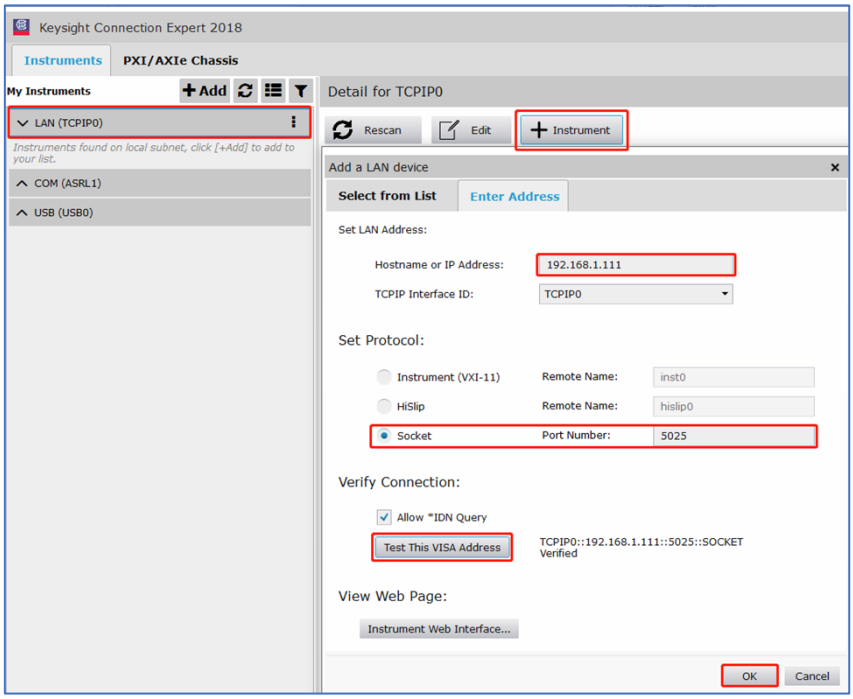


2) Manually configure the IP and other information of the computer, set the Ethernet properties of the computer:

3) After successful connection, 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



the new device.



After successful connection, the network port icon in the upper right corner of the main interface is displayed as follows:

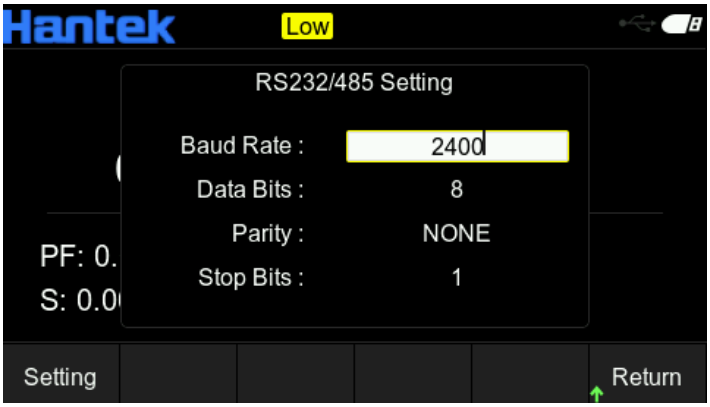
Like USB remote control, after obtaining normal communication, SCPI commands can be used to control power output.

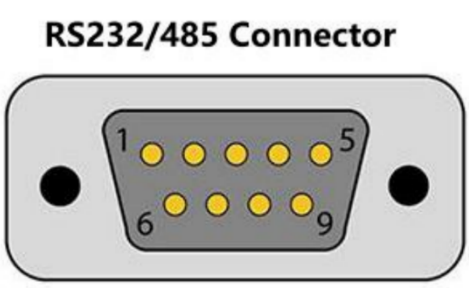
If there is a DHCP server in the local area network, the DHCP function can be turned on, and the instrument will automatically obtain IP and other information from the DHCP server without the need for manual settings.

Attention: If there is no DHCP server in the local area network, IP and other information must be manually configured.

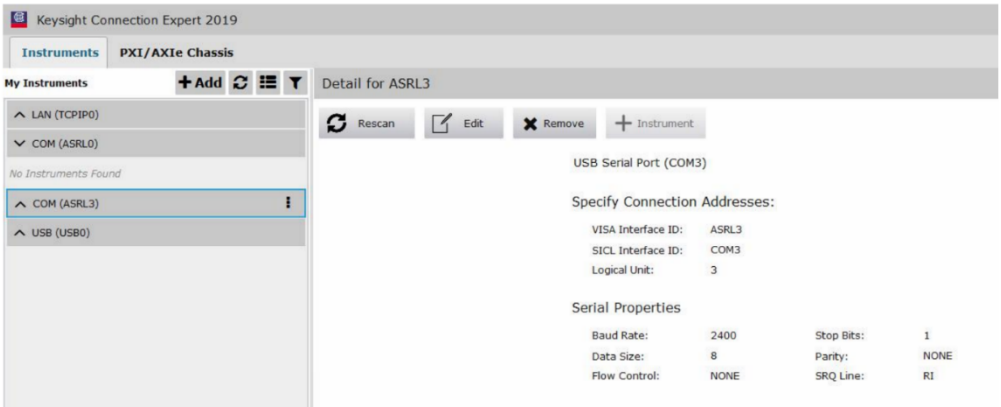
4.6.3 RS232/485 Remote control

All parameters are unchanged by default. The baud rate supports 2400，4800，9600，19200，38400，57600，115200，230400。





Pin#	Signal
1	NC
2	RS232_TX
3	RS232_RX
4	RS485_A
5	GND
6	NC
7	NC
8	NC
9	RS485_B



Pay attention to wiring:

Pin2 is RS232_TX, Pin3 is RS232_RX, Pin4 is RS485_A, and Pin9 is RS485_B.

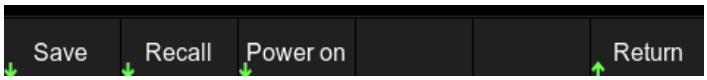
Open the IO software, select Add Device, set the corresponding baud rate, test the VISA address, and click OK to add a new device.

Like USB remote control, after obtaining normal communication, SCPI commands can be used to control power output.

Attention: When using RS232, please use a straight through cable connection.

4.7 Save/Recall

The S/R can save and retrieve volatile settings, such as voltage and current values OVP、OCP、 List output, data recording, key tone, language, etc.



11.1.1 Save Settings

【Save】 You can choose to save the settings internally.

Can be saved in up to 10 states from M0 to M9. You can choose whether to set it to the power on state. Press **【Save】** to save this setting.

11.1.2 Retrieve Settings

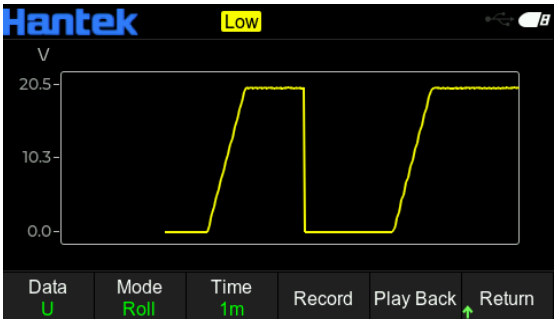
The Recall call out setting can be selected to call out from within. Same as saving settings: Select the location where you want to retrieve the file, press**【Enter】**to confirm, and press**【Recall】**to retrieve it.

11.1.3 Power on Settings

Press**【Power On】**to select a state for automatic boot up. You can choose default settings or user specified settings. Press **【Set PwrOn】** to save the settings. Users can also select **【SetPwrOn】** as **Yes** in **【Save】** to set it.

4.8 Waveform display

Click on【**Utilities**】>【**Wave**】 to enter the waveform display interface, where you can view real-time waveform records and historical waveform records.



Date: Data type. The waveform display of current or voltage can be viewed separately.

Mode: Mode selection. In **Roll** mode, scrolling displays real-time waveforms; In **Fast** mode, waveform details can be viewed.

Time: The time required to collect a point in real-time interface mode. When selecting 1m, it indicates that one point is collected in 1ms.

Record: Save data. After inserting the USB drive, click this button to save the data.

Play Back: Export data. After inserting the USB drive, select File Open to view the previously saved data.

4.9 Fault conditions

When a fault occurs, the automatic protection function is activated and enters the fault state. At this time, the output stops and the screen displays the fault information. After troubleshooting, it can be restarted.

View historical fault and alarm information through 【**Utilities**】> 【**Warninfo**】.

The fault description is shown in Table 5-1.

Fault	Reason
Software overvoltage protection	The output voltage exceeds the set protection voltage. Adjustable low voltage output or increased protection voltage
Software overcurrent protection	The current flowing through the circuit exceeds the set protection current value. Can reduce the circuit current or increase the protection current
Software over power protection	Output voltage * circuit current>protection power. Can reduce output voltage, decrease circuit current, or increase protection power

Table 5-1 Fault description

4.10 Precautions for operation

1. Before closing the input switch, ensure that the wiring is correct.

2. Before closing the output switch, check if the power setting parameters are correct to avoid burning out the load.

4. The power screen displays the measured active power of the load.

6. Before disconnecting the input switch, please click【**On/Off**】 to stop the output.

4.11 System upgrade

Insert a USB flash drive and click on 【**Utilities**】>【**Update**】 to upgrade the system.

Note: There can only be one upgrade file on the USB drive.

5 Common faults and maintenance

In order to ensure long-term stable operation of the power supply, good usage methods are very beneficial:

When the power supply is working, maintain smooth heat dissipation, air circulation, and good heat dissipation.

2. Pay attention not to exceed the maximum output current or operate under overload.

Before shutting down, press the【**On/Off**】 key to stop the output.

6 Warranty Summary

Qingdao Hantek Electronics Co., LTD. (hereinafter referred to as Hantek) undertakes that main body and accessories of its instruments shall be free from any material and process defects during the warranty period.
During the warranty period, if the product is proved to be defective, Hantek will repair or replace the product free of charge. Please refer to Hantek's official website or product warranty card for details. For full repair service or warranty instructions, please contact Hantek Repair Center or local agencies.
Hantek disclaims all warranties, express or implied, other than those provided in this summary or any other applicable warranty card, including, but not limited to, any implied warranties of merchantability and applicability for special purpose. In no instance shall Hantek be liable for indirect, special or consequential loss.

7 Model List

Model		HAP11L500	HAP11L1000
Input/Output		Single-phase input, single-phase output	
Rated current	Low	4.6A	9.0A
	High	2.3A	4.5A
Output power		500VA	1KVA
Interface		Standard configuration: USB,	RS232/485 interfaces

8 performance parameter

Parameter		HAP11L500	HAP11L1000
Output function		Analog voltage per country	
Isolation function		Built-in isolation transformer	
Wiring method		Input: single-phase two-wire Output: single-phase two-wire	
Number of output phases		Single-phase two-wire + PE	
Output mode		Single-phase standard sine wave output	
Output voltage		Low gear: 1-150.0V Rated voltage: 110.0V;	
		High gear: 150.0-300.0V Rated voltage: 220.0V;	
		List output: 1-300.0V Rated Voltage: 220.0V	
Voltage setting accuracy		Accuracy: ≤1% Resolution: 0.1V	
Rated current	Low gear	4.6A	9.0A
	High gear	2.3A	4.5A
Output power		500VA	1KVA
Output frequency		45-400 Hz	
Frequency setting accuracy		Accuracy: ≤0.05% Resolution: 0.1	
Frequency stability		≤0.05%	
Voltage distortion		<2% (linear load)	
Response time (technology)		≤2ms	

Voltage sudden change response time	≤20ms
Crest factor	1.41±0.1
Source voltage effect	≤1%
Load effect	≤1%
Efficiency	＞85%
Display mode	4.3" LCD display (480 x 272)
Voltage measurement accuracy	Accuracy: 0.2% FS + 0.3% display value Resolution: 0.1V
Frequency measurement accuracy	Accuracy: 0.05% Resolution: 0.1Hz
Current measurement accuracy	Accuracy: 0.3% FS + 0.5% display value Resolution: 0.1A/1A
Automatic memory function	Setting parameters are automatically memorized and automatically recalled on power-up
Shortcut group recall	10 sets of quick-operation parameter groups for fast switching
Real-time adjustment function	Real-time adjustment of the output voltage setting in the start-up state
Overload capacity	Immediate output cutoff for overload
Protection device	Output overcurrent, overload protection, output short circuit protection, overheating protection

Communication interface	Standard: USB, RS232/485 interface	
Input phases	Single-phase two-wire + PE	
Input voltage range	220V±10%	
Input frequency range	45-65 Hz	
Operating temperature	0~40℃	
Operating humidity	20~90%RH (non-condensing)	
Size L×W×H (mm)	344 x 208.5 x 125 (without protective cover) 10.7kg (net weight)	455 x 208.5 x 125 (without protective cover) 16.6kg (net weight)

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