

SPS6000X Series

Wide Range Programmable

Switching DC Power Supply



Quick Start

EN01B



SIGLENT TECHNOLOGIES CO.,LTD

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Notice

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- The company reserves the right to change specifications and prices without notice.
- The information provided in this manual replaces all previously published materials.
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Product certification

SIGLENT certified that this product meets China's national product standards and industry product standards, and further certified that this product meets the relevant standards of other international standards organization members.

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General Safety Summary

Understand the following safety precautions to avoid personal injury and prevent damage to this product or any other products connected to it. In order to avoid possible dangers, please use this product in accordance with regulations.

Only qualified technicians can perform maintenance procedures to prevent fire or personal injury.

Use proper power cord

Only use the power cord for this product approved by your country.

Ground the product

This product is grounded through the grounding conductor of the power cord. In order to prevent electric shock, the grounding conductor must be connected to the earth. Before connecting to the input or output terminal of this product, be sure to properly ground the product.

Connect the output cable correctly

Do not connect the ground wire to high voltage. During the test, do not touch the exposed contacts and components.

View the ratings of all terminals

To prevent the risk of fire or electric shock, please check all ratings and marking instructions for this product. Before connecting the product, please read this product manual for further information about the ratings.

Do not operate when you suspect that the product is malfunctioning

If you suspect that this product is damaged, please have it inspected by qualified maintenance personnel.

Avoid exposed circuits

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

Do not operate in a humid environment.

Do not operate in a flammable and explosive environment.

Keep the product surface clean and dry.

Safety Terms and Symbols

DANGER Indicates that there is a direct risk of injury near the mark.

WARNING Indicates that there is a potential risk of injury near the mark.

CAUTION Indicates potential danger to this product and other properties.



DANGER
High Voltage



CAUTION



Protective
terminal



Grounded

Allgemeine Sicherheitshinweise

Bitte lesen Sie die folgenden Sicherheitshinweise sorgfältig durch, um Verletzungen oder Schäden an diesem Produkt oder an einem damit verbundenen Produkt zu vermeiden. Um mögliche Gefahren zu vermeiden, verwenden Sie das Gerät bitte wie angegeben.

Verwenden Sie ein geeignetes Netzkabel.

Es darf nur das für das Gerät vorgesehene und vom jeweiligen Land zugelassene Netzkabel verwendet werden.

Stromversorgung

AC-Eingangsspannungen: 100 V ~ 240 V ± 10 %, 50 ~ 60 Hz ± 5 % .

Verwenden Sie eine geeignete Sicherung.

Sicherungstypen: T30 A / 250 V;

Verwenden Sie unbedingt den richtigen Sicherungstyp, bevor Sie das Gerät einschalten.

Schließen Sie das Netzkabel erst an, wenn Sie die Sicherung ausgetauscht haben.

Finden Sie heraus, warum die Sicherung durchgebrannt ist, bevor Sie sie austauschen.

Erden Sie das Gerät

Das Gerät ist über den Erdungsleiter des Netzkabels geerdet. Um einen elektrischen Schlag zu vermeiden, muss der Erdungsleiter mit der Erde verbunden sein. Stellen Sie sicher, dass das Gerät vor allen Ein- und Ausgängen ordnungsgemäß geerdet ist.

Beachten Sie alle Anschlusswerte

Um Feuer oder einen elektrischen Schlag zu vermeiden, beachten Sie bitte alle Werte und Symbole auf dem Gerät. Lesen Sie diese Anleitung sorgfältig durch,

um vor dem Anschluss weitere Einzelheiten zu den Werten zu erfahren.

Sorgen Sie für ausreichende Belüftung

Unzureichende Belüftung kann zu einem Temperaturanstieg führen, der weitere Schäden zur Folge hat. Bitte sorgen Sie für ausreichende Belüftung und überprüfen Sie den Lüfter und die Lüftungsschlitze regelmäßig, wenn Sie das Gerät verwenden.

Betriebsbedingungen

Standort: Innenbereich, kein starkes Licht, wenig Verschmutzung;

Relative Luftfeuchtigkeit: < 80 %

Höhe: < 2000 m

Temperatur: 0 °C bis 40 °C

Nicht in explosiver Atmosphäre betreiben

Um Verletzungen oder Schäden am Gerät zu vermeiden, betreiben Sie das Gerät nicht in explosiver Atmosphäre.

Oberfläche des Produkts sauber und trocken halten

Um zu vermeiden, dass Staub oder Feuchtigkeit in der Luft die Leistung des Geräts beeinträchtigen, halten Sie die Oberfläche des Produkts sauber und trocken.

Sicherheitsbegriffe und Symbole

Folgende Begriffe können im Produkt vorkommen:

- GEFAHR** Weist auf eine direkte Verletzung oder Gefahr hin, die eintreten kann.
- WARNUNG** Weist auf eine mögliche Verletzung oder Gefahr hin, die eintreten kann.
- VORSICHT** Weist auf eine mögliche Beschädigung des Geräts oder anderer Gegenstände hin, die eintreten kann.

Folgende Symbole können auf dem Produkt vorkommen:



Gefährliche



Schutz



Warnung



Erdungsmasse

Preparation Before Use

When you get a new power supply, it is recommended that you check it step by step as follows.

Check if there is any damage caused by transportation problems.

If you find that the packing box or the foam protective pad is seriously damaged, please keep it until the whole machine and accessories pass the electrical and mechanical tests.

Check the whole machine

If the external damage of the instrument is found and the corresponding test fails, please contact the **SIGLENT** distributor or local office responsible for your region. **SIGLENT** will arrange for repair or replacement of the new machine.

Check the attachment

Regarding the details of the accessories provided, there are detailed instructions in the "packing list", you can refer to this to check whether the accessories are complete. If you find any accessories are missing or damaged, please contact the **SIGLENT** distributor or local office responsible for your region

Connect AC power

According to the machine you get, please use the power cord provided in the accessories to connect to the power source as follows.

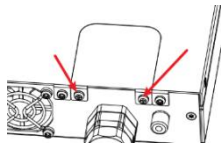


Figure 1 Protective cover



Figure 2 Power port

Connection method

Port / 16 A: applicable models 1500 W

The specification of the equipment that can input AC power is: 100 ~ 240 V, 47 ~ 63 Hz. The power cord connection method provided by the accessories: First, remove the two screws, open them and connect the input wire according to the following instructions.

Black / Brown : live wire, connect to L port

White / Blue : neutral line, connected to port N

Green / Green-yellow : ground wire, connected to GND port



American Standard



European standard

Figure 3 Wiring diagram

Note:

After connecting the input line, lock the safety cover.

Quick Start

Technical specifications

For detailed technical specifications, please refer to the data sheet of SIGLENT's official website (www.siglent.com)

Product model	SPS6225X	SPS6150X
Rated Voltage	200 V	100 V
Rated Current	25 A	50 A
Rated power	1500 W	
Power ratio	3.33	3.33

Standard accessories

Standard Accessories	Quantity
USB Cable	1
Quick Start	1
Calibration Certificate	1
Power Cord	1
Output guard	1

Product Model Introduction

The two models of the SPS6000X series have the same product interface, which is described as follows.

Front Panel



A Screen

C Direction knob







B Button

D Power Switch

A Screen

All SPS supplies include a 3.12-inch OLED display for displaying system output status, system parameter settings, menu options, and promotion information.

B Button

	Used to view system information and configure power parameters.
	(V/I) In the main interface, press this key to select and set the output voltage value or output current value.
	Press Menu to enter the menu list, press this key to return to the previous menu. When the power supply enters the protection state, long press the key to release the protection mode
	Press this key to enter the List mode, you can set each group of output current, output voltage and running time, etc. Press this key again to exit the List interface
	Press this key to turn on the keyboard lock function, long press to release the key lock.
	Power output button used to turn the output on or off.



The left and right direction buttons are used to switch the digits of the value where the cursor is selected, and to move the cursor position or switch options.



The up and down direction buttons are used to select a menu item in the menu operation, and increase (decrease) the output voltage or current value

C Direction knob

When setting parameters, turn the knob to increase or decrease the value at the cursor.

When setting objects (voltage or current, operation mode, internal resistance configuration, etc.), rotate the knob to quickly move the cursor position or switch options, press the knob to set the current parameters, rotate the knob to increase or decrease the value at the cursor, and press again to make the current setting effective.

D Power Switch

Used to turn the power on or off.

Back Panel



- | | |
|--------------------------------|-----------------------------|
| A Output port | E USB Device port |
| B Parallel interface | F USB Host port |
| C Analog connector port | G Fan port |
| D LAN port | H AC power interface |

A Output port (positive (+), negative (-))

One set of positive (+) and negative (-) output terminals are used to output current and voltage.

One set of Sense terminals are used to detect the actual voltage at the load side.

B Parallel interface

C Analog connector port

Output for the monitor signals of voltage and current output. Also used for analog control of the current and voltage outputs.

D LAN port

Supplies a connection between the power supply and a LAN. SPS6000X conforms to the VXI-11 instrument standard and supports Socket-based and

remote commands, and remote control. It can quickly build a test system with other standard equipment and easily achieve system integration.

E USB Device port

The interface can be connected to a PC for remote communication via USB using the USBTMC protocol. Provides remote computer control of the supply by sending commands through computer software.

F USB Host port

Used to insert peripheral USB devices for file transfer and system upgrades.

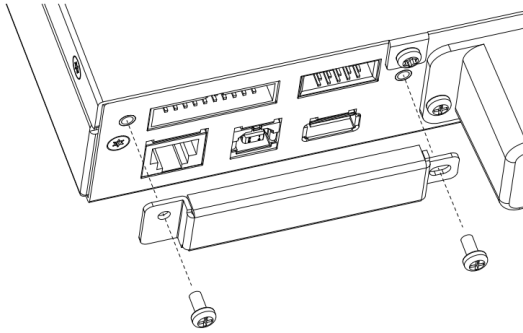
G Fan port

The temperature-controlled fan effectively dissipates the heat of the power supply line over all operating conditions.

H AC power interface

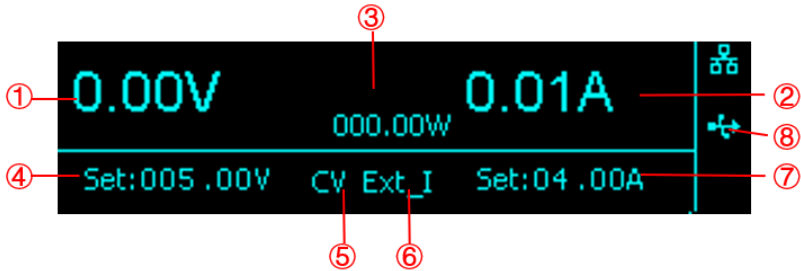
The AC power supply supports 100 ~ 240 V, 47 Hz ~ 63 Hz. Please use the provided power cord to connect to MAINS. For different types of power interface connections, please refer to [7.1].

PS: B. Parallel interface and C. Analog control interface are protected by protective cover. As shown in the figure, the protective cover can be removed by removing the two screws fixing the protective cover; The ground installation of the protective cover is completed by securing the protective cover to the two holes shown on the bottom shell with two M3 screws.



User Interface

User interfaces of the SPS6000X series:



- ① For Output voltage value, take the average voltage.
- ② Output current value, take the average value of current.
- ③ Output power value.
- ④ Voltage setting value, you can set the size of the output voltage value.

Method: Press the **[V/I]** key to switch the cursor position, press the left and right direction keys to switch the cursor to the number of digits, press the up and down direction keys or turn the knob to increase or decrease the value, press the knob or **[SEL]** key to confirm, and the setting is complete.

- ⑤ Display the current status of the power supplies. The symbol display and meaning of the power supply are as follows:

Symbol	Representation
CV	CV mode
CC	CC mode
Alt	Critical mode

- ⑥ Display the current mode of the power supply, The symbol display and meaning of the power supply are as follows:

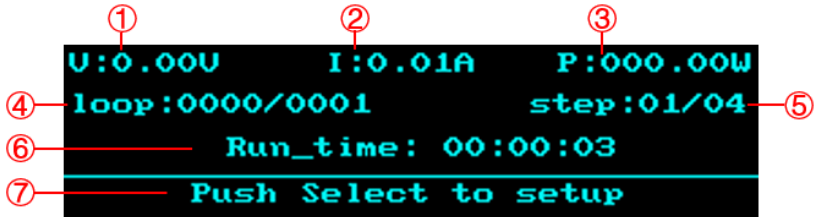
Symbol	Representation
P	Parallel mode
S	Slave mode
P_Limit	Power limiting mode
Ext	External control mode
Ext_V, Ext_I, Ext_VI	Voltage and current programming mode

- ⑦ Current setting value, you can set the size of the output current value.

Method: Press the **[V/I]** key to switch the cursor position, press the left and right direction keys to switch the cursor to the number of digits, press the up and down direction keys or turn the knob to increase or decrease the value. After setting, press the knob or **[SEL]** key to confirm, and the setting is complete.

- ⑧ Display the status of LAN network port or peripheral USB access. When the network cable is connected or the USB drive is inserted, this place is highlighted. **[E]** means that a USB drive has been read, and **[LAN]** means that the LAN cable is connected.

List interface:



- ① Voltage: Displays the real-time voltage at the output of the list.
- ② Current: Displays the real-time current at the output of the list.
- ③ Power: Displays the real-time power at the output of the list.
- ④ Display of the number of cycles: It is expressed in the form of the number of local cycles/total cycle times.
- ⑤ Display of running steps: It is expressed in the form of current running steps / total steps.
- ⑥ Running time: displays the remaining time of the current steps. The time countdown is performed in the form of hour: minute: second when the output is enabled.
- ⑦ Operation prompt: Press the knob in this interface to enter the list parameter configuration interface.

Basic Operation

View system information

Users can view the system information through **Menu** -> **System** -> **Version** , and the contents to be viewed include:

- Boot times
- Supplier name
- Product model
- Specifications
- Serial number
- Software version
- Hardware version

Upgrade

Please follow the steps below to upgrade:

1. Download the upgrade package from the official website.
2. Copy the .ADS file in the upgrade package to the root directory of the USB drive.
3. Insert the USB drive into the USB port, press **Menu** → **System** → **Upgrade** and select the upgrade file;
4. Press the button to confirm and the upgrade progress bar will pop up. After the upgrade is successful, it will restart, and if it fails, a prompt box will pop up.

Any operation that interrupts the upgrade process may cause the upgrade to fail or even the machine cannot start. Please keep the USB drive in a stable state and the machine's power supply status during the upgrade process.

Voltage and current setting

By pressing the **V/I** key, the cursor appears at the voltage setting. Press the **V/I** key again to switch the cursor to the current setting. Press the left and right direction key to switch the position of the cursor, press the up and down direction keys or turn the knob to increase or decrease the value, press the knob or **SEL** key to confirm, and the setting is complete.

List setting

Press the **List** key on the panel to enter the List setting interface, press the knob or the **SEL** key to enter the list parameter configuration interface, rotate the knob or use the up and down direction keys to select parameters. Press the knob or **SEL** key at the point where the * sign points to set this parameter, press the left and right direction key to switch the position of the cursor, press the up and down direction keys or turn the knob to increase or decrease the value, press the knob or **SEL** key again to confirm the setting.

Other configuration setting

Users can configure the system function through **Menu** → **Configure** :

1. Protect

Set the overvoltage protection (OVP) value and overcurrent protection value (OCP), and the ON/OFF of OCP.

2. Operating mode

You can set the power mode to CC or CV mode, and set the priority mode to high speed priority or slope priority. When it is set to slope priority, you can also set the slope value.

3. Output delay

On_dly: output delay when output is turned on; Off_dly: turn off delay when turning off the output.

4. Measure average

Set the average number of readback parameters, three modes of Low, Mid, and High can be set.

5. Voltage control

The parameters Local, Ext_V (external voltage 0-10V control) can be set.

6. Current control

The parameters Local, Ext_V (external voltage 0-10V control) can be set.

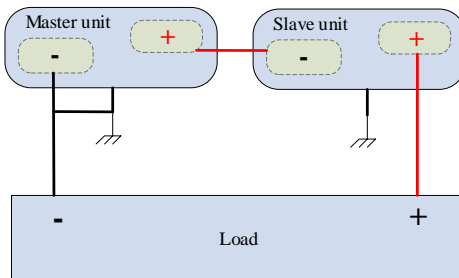
7. Ext Control

Set the external control switch. When it is set to Ext_ctrl_enable, the output is controlled by the high level of the rear analog interface pin19, and the output button on the front panel is invalid

When it is set to Ext_trigger, the signal will trigger when using 5V high level and keep the current output.

8. Series connection mode

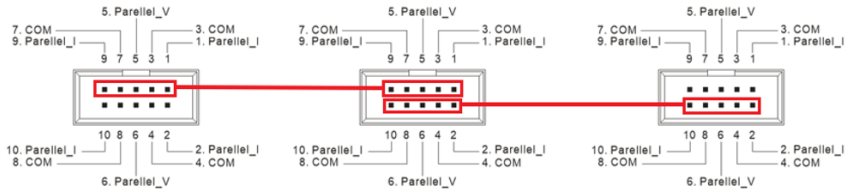
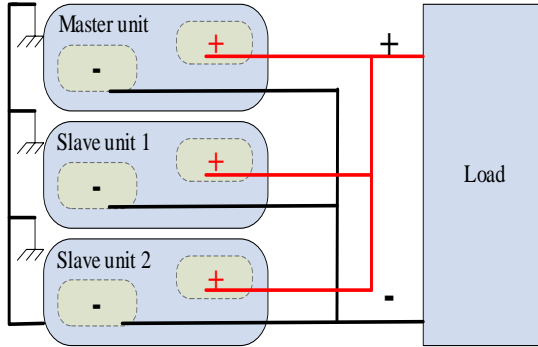
One in series: Schematic diagram of analog interface wiring.



Parallel connection:

The master power supply is set to Master and the slave power supplies is set to Slave, the analog interface is connected in the following ways. Up to five devices can be supported for parallel connection

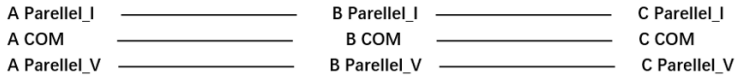
Connect two units in parallel:



A:Master

B:Slave

C:Slave



Remote

Based on the SCPI (Standard Commands for Programmable Instruments) command set, the power supply supports communication with the computer via USB, LAN, and GPIB-USB interfaces to realize remote control.

Press **[Menu]** → **[Communication]** to configure the remote control parameters of the power supply

1. View the USB resource information of the power supply.
2. View and configure GPIB address.
3. LAN parameter settings, you can set the DHCP switch, IP address, gateway address and subnet mask address.

Method:

After entering the LAN interface, press the knob or up and down direction keys to select the parameters. Press **[Menu]** → **[Communication]** → **[LAN]** → **[DHCP]** to enter the DHCP Settings interface, press the knob or **[SEL]** key display the cursor position. Press the up and down direction keys or turn the knob to select On/Off and then press the knob or **[SEL]** key to confirm the setting takes effect.

When is displayed, it means that the selected is On, and the IP is automatically obtained at this time. Turn the knob to switch On/Off, and press the knob to confirm the setting. To manually set the IP, first set DHCP to Off according to the above method, press the knob to select Off, press the knob again and press **[▲▼]** to move the cursor up and down, the key **[◀▶]** can move the cursor left and right, turn the knob to change the value, press the knob to confirm the setting.

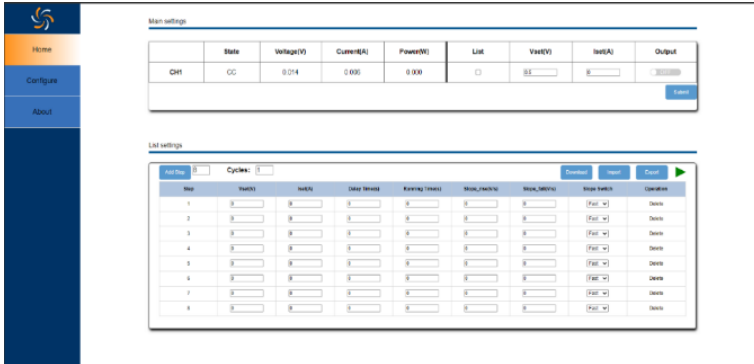
Return to the previous level to display **1. DHCP<ON>** and the IP address is automatically obtained. When **1. DHCP<OFF>** is displayed, you can manually set the IP address.

Press **[Menu]** → **[Communication]** → **[LAN]** → **[MAC]** to enter the interface, you can view the physical address of the MAC network card.

More Information

Web Service

Enter the IP address set on the machine directly into a web browser to enter the web interface to achieve remote control of the power supply.



After setting the parameters, click with the mouse and then the data will be sent to the power supply.

For more information about this product, please refer to the following manual:

(you can log in to the **SIGLENT** website to download [Http://www.siglent.com](http://www.siglent.com))

“SPS6000X User Manual” Provide a detailed description of the functions of this product, as well as a detailed description of the SCPI commands and programming of this product.

“SPS6000X Data Sheet” Provide the main features and technical indicators of this product.

Troubleshooting

The following lists the possible failures and troubleshooting methods during the use of the power supply. When you encounter these faults, please follow the corresponding steps to deal with them. If you cannot deal with them, please contact **SIGLENT** in time.

1. If you press the power button, the power is still black without any display:
 - 1) Check whether the power connector is properly connected
 - 2) After checking, please restart the power.
 - 3) If the power supply still cannot be started normally, please contact SIGLENT.
2. Press Output without voltage output
 - 1) Check whether the voltage and current settings are correct
 - 2) Check whether it is in host mode, whether EXT on/off is in off state, Volt_ctrl and Curr_ctrl are in Local state, and whether the output resistance setting is reasonable. Whether the output delay time is too large or the slope mode setting is too small, which causes the output voltage to rise slowly.
 - 3) Use the default setting to reset the voltage and current output after restoring the factory settings.
 - 4) If the power supply still cannot be used normally, please contact SIGLENT.
3. U disk cannot be recognized
 - 1) Check whether the U disk device can work normally.
 - 2) Check whether the power USB HOST interface is working properly.
 - 3) Make sure that a flash-type USB drive is used. The power supply does not support hard disk-type USB drive devices.
 - 4) Re-plug the USB drive, or restart the power and insert the USB drive again.
 - 5) If you still cannot use the USB drive normally, please contact SIGLENT.

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