SPD1000X Programmable Linear DC Power Supply

Quick Start

EN03B

SIGLENT TECHNOLOGIES CO.,LTD

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Contents

General Safety Summary

Please review the following safety precautions carefully to avoid personal injury or damage to this product or any product connected to it. To prevent potential danger, please use the instrument as specified.

Use the Proper Power Cord

Only the power cord designed for the instrument and authorized by local country could be used.

Power supply

AC Input Voltages: 100V/ 120V/ 220V/ 230V ±10%, 50/60Hz.

Use the proper fuse

The fuse types: 100V/ 120V (T6.3A/250V); 220V/ 230V (T3.15A/250V);

Make sure to use the correct type of fuse before turning on the instrument.

Find the cause of the fuse failure before replacing the fuse and connecting the power cord

Ground the Instrument

The instrument is grounded through the protective terra conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to the earth. Make sure that the instrument is properly grounded before any inputs or outputs.

Examine all the terminal ratings

To avoid fire or electric shock, please examine all ratings and symbols on the instrument. Read this guide carefully to know more details about the ratings before connection.

Keep proper ventilation

Inadequate ventilation may cause an increase of temperature, which will lead to further damage. Please keep proper ventilation and check the fan and air-vents regularly when using the instrument.

Operate condition

Location: indoor, no strong light, almost no Interfering pollution;

Comparative humidity: < 80%

Altitude: < 2000m

Temperature: 0℃ to 40℃

Electrostatic Prevention

Operate in an electrostatic discharge protective area environment to avoid damages induced by static discharges. Always ground both the internal and external conductors of the cable to release static before connecting.

Do not operate in an explosive atmosphere

To avoid personal injury or damage to instrument, please do not operate in an explosive atmosphere.

Keep surface of the product clean and dry

To avoid dust or moisture in the air influence the performance of the instrument, please keep surface of the product clean and dry.

Safety Terms and Symbols

Terms used in this product. These terms may appear in the product:

DANGER	Indicates direct injury or hazards that may happen.
WARNING	Indicates potential injury or hazards that may happen.
CAUTION	Indicates potential damage to the instrument or other property that may happen.

Symbols used in this product. These symbols may appear on the product:

Hazardous Voltage

Warning

Protective Earth Ground

Earth Ground

Power Switch

Allgemeine Sicherheitsübersicht

Lesen Sie die folgenden Sicherheitshinweise sorgfältig durch, um Verletzungen oder Schäden am Gerät und an den daran angeschlossenen Produkten zu vermeiden. Um mögliche Gefahren zu vermeiden, verwenden Sie das Gerät bitte wie angegeben.

Verwenden Sie ein geeignetes Netzkabel

Verwenden Sie nur das für das Gerät vorgesehene und im jeweiligen Land zugelassene Netzkabel.

Erden Sie das Gerät

Das Gerät ist über den Schutzleiter der Netzleitung geerdet. Um einen elektrischen Schlag zu vermeiden, vergewissern Sie sich bitte, dass das Gerät korrekt geerdet ist, bevor Sie die Eingangs- oder Ausgangsklemmen des Geräts anschließen.

Schließen Sie das Messkabel richtig an

Die Kabelschirmung (Masse) des Messkabels ist gleich dem Potential der Erde, schließen Sie das Messkabel also nicht an eine hohe Spannung an.

Überprüfen Sie die Nennwerte aller Klemmen

Um Feuer oder einen elektrischen Schlag zu vermeiden, beachten Sie bitte alle Angaben und Hinweise auf dem Gerät. Bevor Sie das Gerät anschließen, lesen Sie bitte das Handbuch sorgfältig durch, um weitere Informationen über die Nennwerte zu erhalten.

Verwenden Sie einen ordnungsgemäßen Überspannungsschutz

Stellen Sie sicher, dass keine Überspannung (z. B. durch ein Gewitter) an das Gerät gelangen kann, da sonst die Gefahr eines elektrischen Schlages besteht.

Schutz vor Elektrostatik

Betreiben Sie das Gerät in einer Umgebung, die vor elektrostatischer Entladung geschützt ist, um Schäden durch statische Entladung zu vermeiden. Erden Sie vor dem Anschließen immer sowohl den Innen- als auch den Außenleiter des Kabels, um statische Aufladung abzubauen.

Für gute Belüftung sorgen

Eine unzureichende Belüftung kann zu einem Temperaturanstieg führen, der schließlich das Gerät beschädigt. Sorgen Sie daher für eine gute Belüftung und überprüfen Sie regelmäßig die Ansaugung und den Lüfter.

Vermeiden Sie freiliegende Schaltkreise oder Komponenten

Berühren Sie keine freiliegenden Kontakte oder Bauteile, wenn das Gerät eingeschaltet ist.

Richtige Sicherung verwenden

Verwenden Sie nur die angegebene Sicherung.

Betreiben Sie das Gerät nicht ohne Abdeckungen

Betreiben Sie das Gerät nicht, wenn Abdeckungen oder Verkleidungen entfernt sind.

Betreiben Sie das Gerät nicht bei vermuteten Defekten

Wenn Sie vermuten, dass das Gerät beschädigt ist, lassen Sie es vor dem weiteren Betrieb von qualifiziertem Servicepersonal überprüfen. Jegliche Wartung, Einstellung oder Austausch, insbesondere von Schaltkreisen oder Zubehör, muss von SIGLENT autorisiertem Personal durchgeführt werden.

Nicht in feuchter Umgebung betreiben

Um einen Kurzschluss im Geräteinneren oder einen elektrischen Schlag zu vermeiden, betreiben Sie das Gerät nicht in feuchter Umgebung.

Betreiben Sie das Gerät nicht in explosionsgefährdeten Umgebungen

Um Schäden am Gerät oder Personenschäden zu vermeiden, ist es wichtig, das Gerät nicht in explosionsgefährdeter Umgebung zu betreiben.

Halten Sie die Produktoberflächen sauber und trocken

Um den Einfluss von Staub und/oder Feuchtigkeit in der Luft zu vermeiden, halten Sie die Oberfläche des Geräts bitte sauber und trocken.

Sicherheit bei der Handhabung

Bitte behandeln Sie das Gerät während des Transports vorsichtig, um Schäden an Tasten, Drehknopfschnittstellen und anderen Teilen auf den Bedienfeldern zu vermeiden.

Es dürfen nur Tastköpfe verwendet werden, die den Spezifikationen des Herstellers entsprechen

Bei Verwendung von 2X/.../10000X-Sondenbaugruppen müssen die Sondenbaugruppen durch eine doppelte oder verstärkte Isolierung von den gemessenen Stromkreisen isoliert sein.

Alle Sondenbaugruppen sollten die Anforderungen von UL 61010-031 und CAN/CSA-C22.2 Nr. 61010-031-07 erfüllen.

Das Gerät darf nicht so positioniert werden, dass es schwierig ist, die Trennvorrichtung (abnehmbarer Stecker) zu bedienen.

Wenn das Gerät auf eine Weise verwendet wird, die nicht vom Hersteller angegeben ist, kann der Schutz, den das Gerät bietet, beeinträchtigt warden.

Sicherheitsbegriffe und symbole

Begriffe in diesem Handbuch. Diese Begriffe können in diesem Handbuch vorkommen:

WARNUNG

Warnhinweise weisen auf Bedingungen oder Praktiken hin, die zu Verletzungen oder zum Verlust des Lebens führen können.

VORSICHT

Vorsichtshinweise weisen auf Bedingungen oder Praktiken hin, die zu Schäden an diesem Produkt oder anderen Gegenständen führen können.

Begriffe auf dem Produkt. Diese Begriffe können auf dem Produkt erscheinen:

GEFAHR	Weist auf direkte Verletzungen oder Gefahren hin, die auftreten können.
WARNUNG	Weist auf mögliche Verletzungen oder Gefährdungen hin, die auftreten können.
VORSICHT	Weist auf mögliche Schäden am Gerät oder an anderen Gegenständen hin, die eintreten können.

Symbole auf dem Produkt. Diese Symbole können auf dem Produkt erscheinen:

Hazardous Voltage

Protective Earth Ground

Warning

Terminal Ground

Power Switch

Wenn Sie solche Symbole auf dem Produkt finden, ziehen Sie das Handbuch zu Rate, um die Art der potenziellen Gefahr und die zu ergreifenden Maßnahmen zu erfahren

General Care and Cleaning

Care:

Do not store or leave the instrument in direct sunshine for extended periods.

To avoid damage to the instrument or probes, please do not expose them to fog, liquid, or solvents.

Cleaning:

Please perform the following steps to clean the instrument and probes.

1. Disconnect the instrument from all power sources and then clean it with a soft damp cloth.
2. Clean the loose dust on the outside of the instrument and probe with a soft cloth.

To avoid damage to the surface of the instrument and probe, please do not use any corrosive liquid or chemical cleansers.

Make sure that the instrument is completely dry before restarting it to avoid potential short circuits or personal injury.

General Inspection

- **Inspect the shipping container**

Keep the original shipping container and cushioning material until the contents of the shipment have been completely checked and the instrument has passed both electrical and mechanical tests.

The consigner or carrier will be responsible for damages to the instrument resulting from shipment.

SIGLENT will not provide free maintenance or replacement if the instrument has been damaged in shipment.

- **Inspect the instrument**

If there are instruments found damaged, defective, or have failed any electrical and / or mechanical tests, please contact SIGLENT.

- **Check the accessories**

Please check the accessories according to the packing list. If the accessories are incomplete or damaged, please contact your SIGLENT sales representative.

SPD1000X Brief Introduction

Siglent's SPD1000X Programmable DC Power Supply has a 2.8 inch TFT-LCD screen, programmable output, and real time measurement graphing. The SPD1168X has a maximum output values of 16 V/8 A, while the SPD1305X has a maximum output values of 30 V/5 A. Both models have remote sense capability, output short circuit and overload protection.

SPD1168X

SPD1305X

Figure 1: Side view

Main Features

- Single high-precision programmable output:
  SPD1168X : 16 V/8 A, total power is 128 W
  SPD1305X : 30 V/5 A, total power is 150 W
- Compact, easy to use, powerful, ideal for bench power supply applications
- Stable, Reliable and Low Noise: ≤ 350 uVrms/3 mVpp
- Fast Transient Response Time: < 50μs
- Maximum resolution of 1mV/ 1mA with 5-bit voltage and 4-bit current display
- Timer function sequences pre-set output values
- High resolution 2.8 inch TFT LCD (240*320 pixels)
- Two output modes: two-wire output and remote sense compensation function (maximum compensation up to 1V)
- Four varieties of input-line voltage values include 100V, 120V, 220V and 230V to satisfy user requirements
- Intelligent temperature-controlled fan, effectively reduces noise
- Clear graphical interface, with waveform display
- 5 internal system parameters save / recall, support for data storage space expansion
- Uses EasyPower PC software, real-time control via USB, LAN, support SCPI command set and LabView driver package to meet the remote control and communication requirements

Panel Introduction

Front Panel

Figure 2: The front panel of the SPD1000X

1. LCD

2.8 inch TFT display. It is used to display system parameter settings, system output state, menu options, prompt messages, etc.

2. Knob

When setting parameters, rotate the knob to increase or decrease the value of the digit at the cursor.

3. Function button and power key

When setting parameters, press the Fine button to move the cursor to select the position of digit to be modified.

The right and left direction buttons move the cursor to select the parameter to be modified.

Press the button briefly to enter the system message interface.
Press the button for 1 second or longer to activate the lock function.

Press the button briefly to enter the timer interface. Press the left button to move the cursor from left to right , press the right button to move the cursor in the opposite direction. In the timer interface or main interface , press the On/Off button briefly to turn on/off the timer.
Press the button for 1 second or longer to enter the waveform display mode.

Press the button briefly to configure the network connection information. Then press the left button to move the cursor from right to left , press the right button to move the cursor from left to right. Choose the DHCP window , press the On/Off button for a short period to turn On/Off the DHCP function
Press the button for a longer period to enter the storage function system. Press the Fine button for a short period to choose the subproject , press the Fine button for a longer period to determine the choice.

Press the button to enable/disable the remote sense function.

Press the button to enable/disable the channel output.

4. Output Terminal

Physical output connections to the external circuit.

5. Ground Terminal

This terminal is connected to the instrument chassis and ground wire and is in grounded state.

6. Sense terminal

Used to sense the actual voltage at the load. This allows the source to compensate the voltage drop caused by the leads between the power supply and the load and increases the accuracy of the voltage delivered to the load.

7. Power key

Turn on or off the instrument.

Rear Panel

Figure 3: The rear panel of the SPD1000X

1. **Warning message**

   To note to ground the instrument and non-professional personnel should not disassemble the instrument and so on.

2. **AC input voltage description**

   The frequency voltage and the specified fuse have to match with AC input.

3. **AC power socket**

   The socket of AC input power.

4. **Fuse**

   The needed specified fuse relate to the input voltage (Please refer to the “AC input voltage description“)

5. **AC line power selection switch**

   AC Input Voltages: 100/120/220/230 V

6. **LAN interface**

   Connect the local network by RJ45 interface.

7. **USB device**

   Connect the instrument (as “slave” device) to external USB device (such as, USB storage device) computer.

8. **Fan**

Connect power

The power supply supports a variety of AC line power input values. For each line voltage, the rear panel voltage selector settings are different, as shown in table 1 below.

Table 1: AC input line power specifications

AC power input	Voltage selector configure
100Vac±10% , 50Hz / 60Hz	
120Vac±10% , 50Hz / 60Hz	
220Vac±10% , 50Hz / 60Hz	
230Vac±10% , 50Hz / 60Hz	

Please connect the power carefully follow the steps below:

1. **Check the input power**
   Make certain that the AC line power to be connect to the instrument meets the requirements in Table 1.

2. **Check the voltage selector at the rear panel**
   Make certain that the voltage selector setting at the rear panel of the instrument matches the actual input voltage.

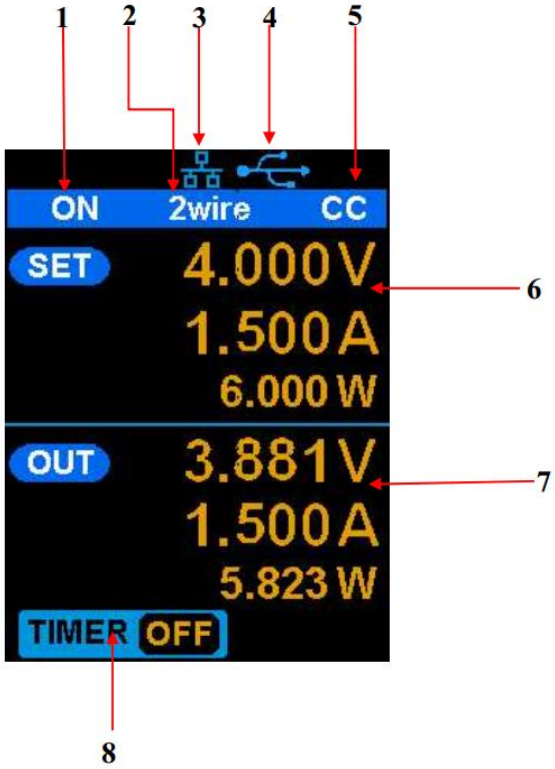
3. **Check the fuse**
   When the instrument leaves factory, the specified fuse is installed.
   Please check whether the fuse matches the actual input voltage according to the "Input Power Requirements" at the rear panel of the instrument.

4. **Connect the power**
   Connect the instrument to AC power supply using the power cord provided in the accessories. Then press the button  to turn on the power.

	**WARNING** Before switching the input power supply voltage, please disconnect the power supply before setting the voltage selector To the appropriate gear.

	**WARNING** To avoid electric shock, make sure that the instrument is correctly grounded.

User Interface



1. **Channel output state**
2. **Remote sense mode**
3. **LAN connection icon**
4. **USB connection icon**
5. **Output mode**
6. **Output programmed values**
7. **Measured output values**
8. **Timer state**

Figure 4: The user interface

Output Inspection

1. Check the output voltage

1) Turn on the power and make sure the channel current setting is not zero when the instrument has no-load.
2) Press on/off button, the supply should be working in constant voltage (CV) mode. You can check the voltage range of SPD1168X by adjusting the voltage setpoint from the minimum (0 V) to the maximum value (16 V) and the voltage range of SPD1305X by adjusting the voltage setpoint from the minimum (0 V) to the maximum value (30 V).

2. Check the output current

1) Turn on the power and make sure the voltage setting is not zero.
2) Connect the output terminals (short) with an insulated wire that can handle 10 A or more (18 AWG single core, for example).
3) Activate the output by pressing the on/off button. The low impedance (shorted) output will cause the instrument to enter current control (CC) mode. You can check the current range of the SPD1168X by adjusting the current setpoint from the minimum (0 A) to the maximum value (8 A) and the current range of the SPD1305X by adjusting the current setpoint from the minimum (0 A) to the maximum value (5 A).

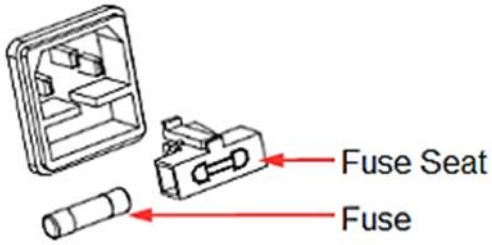
Fuse Replacement

The specifications of the fuse are relative to the actual input line voltage, shown in the table below. You also can refer to the rear panel “input power requirement”.

Input voltage	Fuse specification
100Vac / 120Vac	T6.3A
220Vac / 230Vac	T3.15A

To replace the fuse, please follow the steps below:

1. Turn off the instrument and remove the power cord.
2. Insert a small straight screwdriver into the slot at the power socket and gently pry out the fuse seat.



3. Adjust the power voltage selector manually to select the correct voltage scale.
4. Take out the fuse and replace it with the specified fuse (for the corresponding relations between the input voltage and fuse specification, refer to the “input power requirement” at the rear panel).
5. Re-insert the fuse holder into the power socket (please pay attention to the direction).

⚠	**WARNING** To avoid personal injuries, unplug the power supply before replacing the fuse. To avoid electric shock or fire, select the proper power supply specification and replace only with the proper fuse.

Troubleshooting

Here are some common failures and their solutions. If the problem persists after following the listed steps, please contact **SIGLENT**.

1. The instrument cannot start up.

1) Check whether the power is correctly connected.
2) Check whether the power switch at the front panel is really on.
3) Remove the power cord and check whether the voltage selector is at the proper scale, whether the specification of the fuse is correct and whether the fuse is intact. If the fuse needs to be changed, refer to “To Replace the Fuse”.
4) If the problem remains, please contact **SIGLENT**.

2. The constant voltage output is abnormal.

1) Check whether the maximum output power of the scale currently selected fulfills the load requirement. If yes, go to the next step.
2) Check the cable connecting the load and power supply for short-circuits.
3) Check whether the load is normal.
4) Check whether the current setting value of this scale is proper. If it is too low, increase it.
5) If the problem remains, please contact **SIGLENT**.

3. The constant current output is abnormal.

1) Check whether the maximum output power of the scale currently selected fulfills the load requirement. If yes, go to the next step.
2) Check whether the cable connecting the load and power supply is in good condition.
3) Check whether the load is normal.
4) Check whether the voltage setting value of this scale is proper. If it is too low, increase it.
5) If the problem remains, please contact **SIGLENT**.

Contact SIGLENT

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