User Manual

Dp11 (12) series HP DC power supply

(version : v1.03)

Hangzhou Zhongan Electronics Co., Ltd.
Hangzhou Dipai Power Supply Technology Co.,Ltd.
Tel: 0571-85123400
Fax: 0571-85122978
Address: Rm323, Bldg A, Western Technology Park, Zhongxin Rd., Yuhan St., Yuhang Dist., Hangzhou City, Zhejiang, China Zip code: 311121

Dp11 (12) series high power DC power supply

Safety

Do not install replacement parts on the instrument yourself or modify it without permission.If there is any quality problem, please send the PS back to the company's maintenance department for repair to ensure its safety features.

Please refer to the specific warnings or precautions in manual to avoid injury and power damage.

There are no operator-serviceable parts inside the power supply. For repair service, please contact trained service personnel.

Safety rules

In order to prevent electric shock, it is not authorized by the company to disassemble the machine.

We are not responsible for any direct or indirect property damage that may occur while using this product.

Safety signs

High voltage danger!

It reminds the user to pay attention to certain operating procedures, methods, conditions, etc. that may cause

Note!

It alerts the user about the operating procedures, methods, conditions, etc. that may result in power loss or permanent data loss.

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Quick Start

Dp11 (12) series (high voltage DC PSU) are the continuously adjustable PSUs with 1200W(2400W) power output and function of constant voltage&current output.This series shows excellent performance of its kind. The series PSU both support remote control&detection, as well as local operation, which greatly improves the flexibility and application of the power supply.This series of power supplies can be widely used in various electronic components burn-in systems, various test instruments and electronic application laboratories.

The main features and advantages are as follows:

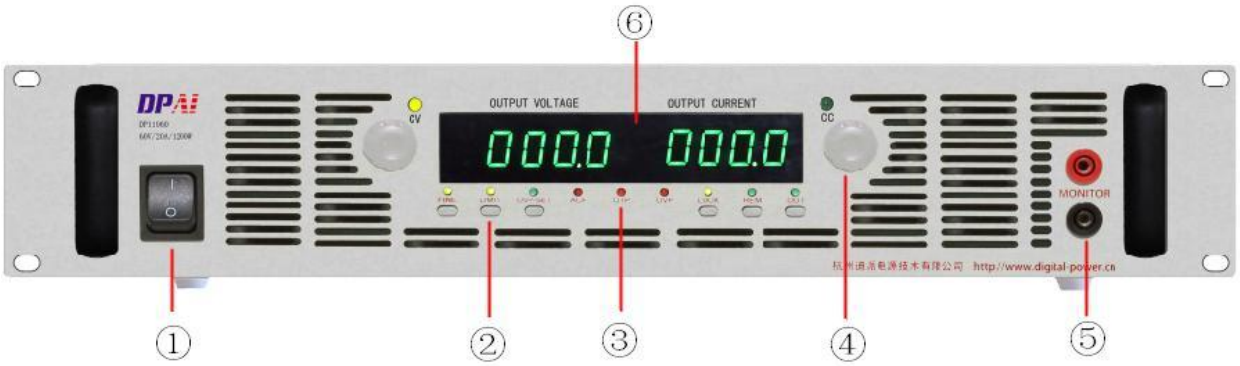
- 19 inch 2U standard case, desktop or rack type are optional
- With function of constant voltage&current output
- Low ripple, high stability
- Output voltage and current are continuously adjustable
- Encoder digital adjustment makes a more precise adjustment
- Adopt PSFB - ZVS switch mode with high conversion efficiency
- Over voltage, over heating and utility power input over&under voltage protection
- LAN and RS485/RS422 communication interface
- MODBUS-RTU standard communication protocol
- Monitored by computer software
- Parameter can be calibrated thru software
- Support both Local&programmable operation mode
- Rated output power 1200w or 2400w
- Rated voltage 6v~600v, rated current 2A-200A; various models are available

Chapter 1 Introduction

This chapter will help you learn some common features of the front panel and rear panel..

1.1 Front panel and rear panel

1.1.1 Front panel layout



1 power switch　2 function button　3 status indication

4 adjustment knob　5 output detection　6 digital display

Figure 1 front panel

1. Power on/off switch.

2　Function button

FINE - The conversion button of coarse adjustment and fine adjustment.(voltage&current)

LIMIT - Voltage&current Presetting button;

OVP-SET - Over voltage protection value setting button;

LOCK - Panel lock button;

REM- Press:disconnect programmable control ; Long press: address setting;

OUT - Power output control button;

3. Status indication :

FINE -　Indicator light up :fine adjustment;

LIMIT -　Indicator light up：show the presetting value;

OVP-SET - Indicator light up :show the over voltage protection value;

ACF——Input over/under voltage indicator, light up: input over/under voltage;

OTP——Temperature protection indicator; light up: PS under temperature protection

OVP - Over voltage indicator; light up: output over voltage;

LOCK- Power lock indicator; light up: the power is locked;

REM——Program control indicator; light up: the power supply is programmable controlled;

OUT - Output status indicator; light up: power switch on;

CV——Constant voltage indicator; light up: the power supply is in constant voltage state;

CC——Constant current indicator;　light up: the power supply is in constant current state;

4. Adjustment knob:

V-set - Output voltage adjustment knob;

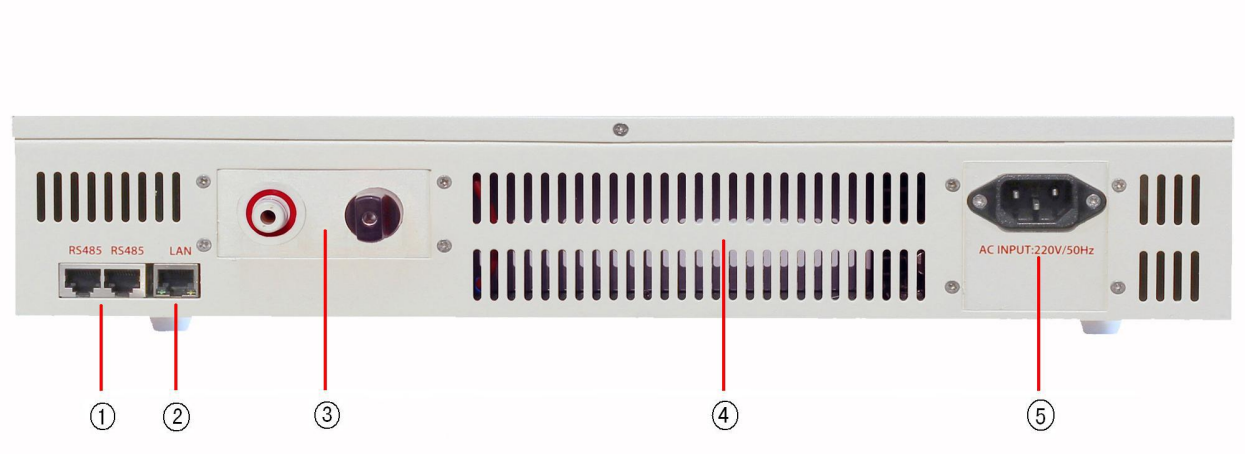
I-set - Output current adjustment knob.

5. Output voltage measured terminal: red - output positive voltage; black - output negative voltage.(no permission of load)

6. Digital display :

It includes voltage display and current display.

1.1.2 Rear panel layout



1, RS-485/RS-422 communication interface 2, LAN communication interface
3. Output interface 4. Heat dissipation window 5. Utility power input port

Figure 2 Power rear panel

1.2 preliminary inspection

The following instructions will help you check if your power supply is working properly.

1.2.1 The supply list check

When you receive the PSU, please check if the following accessories are complete.If there is a missing, please contact your supplier.

a) Power cord:1 unit

b) User Manual:1 unit ;

c) Certificate:1 unit;

1.2.2 Power Status Check

Switch on, the power supply is in working state.

The power supply fan will not turn on without voltage output.

The display area will light up, and the buttons and potentiometer on the panel can be used normally.

Have an overall check and make sure all parts are perfect.

1.2.3 Output check

Make sure your power supply can be up to its maximum rated output and the front panel operation can be performed correctly.

▲ Output voltage check

The following steps are to verify the basic function of the voltage in the case of a null-load power supply.

a) Turn on the power, the CV status indicator lights up, and the others are not ;

b) Press the OVP-SET button to light up the OVP-SET. the screen shows the presetting overvoltage protection value. Adjust the V-SET knob till the maximum value,then press the OVP-SET button to make the OVP-SET. indicator light goes out.

c) Press the OUT button to start the output. OUT indicator lights up.

d) Adjust the V-SET knob to check if the output voltage can reach the rated maximum voltage value, and whether the current display shows 0A;

▲ Output power check

The following steps are to check the basic function of the current in the case of loading condition of power supply.

a) Turn on the power switch, the CV status indicator lights up, and the others are not;

b) Press the LIMIT button to display the presetting constant current value,then adjust the I-SET knob to reach the rated output current value, and press LIMIT again to exit;

c) Adjust the V-SET knob to reach rated output voltage;

d) Changing the load to output current to the rated value, then detecting whether the output power can meet the requirement;

▲ Output short circuit check

a) Select the correct short-circuit line to connect the positive and negative ends of the output, and ensure good contact;

b) Turn on the power, adjust the output voltage till the CC indicator lights up, and the power supply enters the short-circuit protection state;

c) Turn off the power and adjust the V-SET knob to any value.

d) Turn on the power and check if the power supply enters in the short-circuit protection state.

e) Remove the short circuit line;

f) Turn on the power and check if the power is working properly.

1.2.4 If the power supply can not start up the output check

Please check the following items separately.

a) First, check if the power cord is connected properly; If the power supply works well; If the power switch is turned on.

b) If the constant current value is zero, if it is , adjust the I-SET knob clockwise;

c) If the over voltage protection value is zero, if it is , raise the OVP value.

Chapter II Technical Specifications

2.1 DP11 series technical parameters

Please refer to Table 1, Table 2 and Table 3 for detailed technical parameters of the power supply.

Table 1

Parameter \ Model		DP11006	DP11015	DP11020	DP11030
Rated value	Voltage (null load)	0~6V	0~15V	0~20V	0~30V
	Current	0~200A	0~80A	0~60A	0~40A
	Over voltage protection	0~6.6V	0~16.5V	0~22V	0~33V
Setting resolution	Over voltage	0.001V	0.001V	0.001V	0.01V
	Voltage	0.001V	0.001V	0.001V	0.01V
	Current	0.01A	0.01A	0.01A	0.01A
Display resolution	Voltage	0.001V	0.001V	0.001V	0.01V
	Current	0.01A	0.01A	0.01A	0.01A
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB
	Current	≤0.3%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB
Load regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Ripple (RMS)	Voltage	≤50mV	≤30mV	≤30mV	≤30mV
size		520mm (length) × 482mm (width) × 88mm (height)			

Table 2

parameter \ model		DP11040	DP11060	DP11100	DP11150
Rated value	Voltage (null load)	0~40V	0~60V	0~100V	0~150V
	Current	0~30A	0~20A	0~12A	0~8A
	Over voltage	0~44V	0~66V	0~110V	0~165V

	protection				
Setting resolution	Over voltage	0.01V	0.01V	0.01V	0.01V
	Voltage	0.01V	0.01V	0.01V	0.01V
	Current	0.01A	0.001A	0.001A	0.001A
Display resolution	Voltage	0.01V	0.01V	0.01V	0.01V
	Current	0.01A	0.001A	0.001A	0.001A
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB
	Current	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB
Load regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Ripple (RMS)	Voltage	≤30mV	≤30mV	≤30mV	≤30mV
size		520mm (length) × 482mm (width) × 88mm (height)			

table 3

parameter \ model		DP11200	DP11300	DP11400	DP11600
Rated value	Voltage (null load)	0~200V	0~300V	0~400V	0~600V
	Current	0~6A	0~4A	0~3A	0~2A
	Over voltage protection	0~220V	0~330V	0~440V	0~660V
Setting resolution	Over voltage	0.01V	0.1V	0.1V	0.1V
	Voltage	0.01V	0.1V	0.1V	0.1V
	Current	0.001A	0.001A	0.001A	0.001A
Display resolution	Voltage	0.01V	0.1V	0.1V	0.1V
	Current	0.001A	0.001A	0.001A	0.001A
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB	≤ 0.1Unom%+2LSB
	Current	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB
Load regulation	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB

rate					
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Ripple (RMS)	Voltage	≤50mV	≤50mV	≤50mV	≤100mV
size		520mm (length) × 482mm (width) × 88mm (height)			

2.2 DP12 series technical parameters

For detailed technical parameters of the power supply, please refer to Table 4, Table 5 and Table 6 below.

Table 4

parameter \ model		DP12012	DP12024	DP12030	DP12040
Rated value	Voltage (null load)	0~12V	0~24V	0~30V	0~40V
	Current	0~200A	0~100A	0~80A	0~60A
	Over voltage protection	0~13.2V	0~26.4V	0~33V	0~44V
Setting resolution	Over voltage	0.001V	0.01V	0.01V	0.01V
	Voltage	0.001V	0.01V	0.01V	0.01V
	Current	0.01A	0.01A	0.01A	0.01A
Display resolution	Voltage	0.001V	0.01V	0.01V	0.0V
	Current	0.01A	0.01A	0.01A	0.0A
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB
	Current	≤0.3%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB
Load regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Ripple (RMS)	Voltage	≤100mV	≤100mV	≤50mV	≤50mV
size		520mm (length) × 482mm (width) × 88mm (height)			

table 5

parameter \ model		DP12060	DP12100	DP12150	DP12200
Rated value	Voltage (null load)	0~60V	0~100V	0~150V	0~200V
	Current	0~40A	0~24A	0~16A	0~12A
	Over voltage protection	0~66V	0~110V	0~165V	0~220V
Setting resolution	Over voltage	0.01V	0.01V	0.01V	0.01V
	Voltage	0.01V	0.01V	0.01V	0.01V
	Current	0.01A	0.01A	0.001A	0.001A
Display resolution	Voltage	0.01V	0.01V	0.01V	0.01V
	Current	0.01A	0.01A	0.001A	0.001A
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB	≤0.1%+2LSB
	Current	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB
Load regulation rate	Voltage	≤0.1%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB
Ripple (RMS)	Voltage	≤50mV	≤50mV	≤50mV	≤50mV
size		520mm (length) × 482mm (width) × 88mm (height)			

Table 6

parameter \ model		DP12300	DP12400	DP12600	
Rated value	Voltage (null load)	0~300V	0~400V	0~600V	
	Current	0~8A	0~6A	0~4A	
	Over voltage protection	0~330V	0~440V	0~660V	
Setting resolution	Over voltage	0.1V	0.1V	0.1V	
	Voltage	0.1V	0.1V	0.1V	
	Current	0.001A	0.001A	0.001A	
Display	Voltage	0.1V	0.1V	0.1V	

resolution	Current	0.001A	0.001A	0.001A	
Display value accuracy	Voltage	≤0.1%+2LSB	≤0.1%+2LSB	≤ 0.1%Unom+2LSB	
	Current	≤0.2%+2LSB	≤0.2%+2LSB	≤0.2%+2LSB	
Load regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	
Power regulation rate	Voltage	≤0.5%+2LSB	≤0.5%+2LSB	≤0.5%+2LSB	
	Current	≤1%+2LSB	≤1%+2LSB	≤1%+2LSB	
Ripple (RMS)	Voltage	≤100mV	≤100mV	≤200mV	
size		520mm (length) × 482mm (width) × 88mm (height)			

Note:All models of PSUs have a starting point, and the starting voltage is 1% of the full scale

2.3 Environmental parameters

a) AC input: 220VAC ± 10% 47Hz~63Hz;
b) Heat dissipation method: forced cooling through the fan;
c) Operating environment temperature: 0~40 °C;
d) Storage environment temperature: -20~70 °C.
e) Maximum environmental humidity for indoor use : 95%.

Chapter III PSU Operation

Before the beginning of this chapter, you have learned how to install the PSU and some simple operations. Next, you will be introduced in detail about the front panel button&knobs and how to use these them to complete the power supply related operations.

3.1 Front panel function introduction

Before you operate the PSU, the next sections will describe the meaning of the buttons and indicators on the front panel.

▲ After the power switch is turned on, the PS automatically enters the standby mode. In the panel operation mode, all buttons can be used.

▲ Panel operation mode and remote operation mode can be controlled by panel buttons or PC. If the power supply is in the remote operation mode, the panel voltage and current adjustment knobs are locked and the operation is invalid. All buttons except the LOCK and REM buttons are invalid.

▲ You can control the output of the power supply by pressing the OUT button on the front panel.

▲ The front panel buttons and programmer operating functions are detailed in Table 8.

Table 8

Serial number	Button and potentiometer	status	Description
1	**FINE**	Press	Enter/exit voltage and current fine adjustment
2	**LIMIT**	Press	Enter/ exit voltage and current setting value display status
3	**OVP-SET**	Press	Enter /exit the over voltage setting state
4	**LOCK**	Press	Lock/unlock the power supply
5	**REM**	Press	Exit programmable control long press: to enter address setting status
6	**OUT**	Press	Turn on / off the power output
7	**V-SET**	clockwise rotation	Raise the voltage value
8	**I-SET**	clockwise rotation	Raise the constant current value

▲ The front panel indicator can show some operating status and error information of the power supply. See Table 9 for details.

Table 9

Serial number	Indicator light	status	Description
1	**FINE**	Bright/dark	Coarse/fine adjustment
2	**LIMIT**	Bright/dark	Voltage and current setting status
3	**OVP-SET**	Bright/dark	Over voltage setting status
4	**ACF**	Bright/dark	Input over/under voltage protection
5	**OTP**	Bright/dark	PS internal temperature protection

6	**OVP**	Bright/dark	PS over voltage protection
7	**LOCK**	Bright/dark	PS lock status
8	**REM**	Bright/dark	PS programmable control status
9	**OUT**	Bright/dark	PS output status
10	**CV**	Bright/dark	PS constant voltage state
11	**CC**	Bright/dark	PS constant current state

3.2 Front panel operation introduction

3.2.1 PS Function Operation

▲ Coarse /fine adjustment operation

It's Coarsely adjustment by default as the PS start-up. For the different models in the coarse adjustment mode, from 0 to the rated maximum value, knob 3-6 circle are accordingly needed ; when the user needs fine adjustment, press **FINE** button, enter the fine adjustment mode, which will be adjusted with the minimum resolution in fine adjustment mode.

▲Over voltage operation

Turn on the power switch and the power goes into standby mode.Press the **OVP-SET** button to display the over voltage presetting value.The user can adjust the v-set potentiometer to set the over voltage value slightly larger than the actual maximum voltage value, which to cause protection when the actual output voltage exceeds the over voltage presetting value during use, or inadvertently adjust the output voltage excessively.

▲ Constant current operation

Turn on the power switch and the power goes into standby mode.Press the **LIMIT** button to show the presetting voltage value and the presetting constant current value.The user can adjust the I-SET knob to set the constant current value to be slightly larger than the actual current value.When the actual output current exceeds the presetting constant current, the power supply enters the constant current working mode. Reasonable adjustment of the presetting constant current value to protect the equipment from damage causing by inadvertently over-current .

▲Shutdown, on and reset

In the process of use, if the user wants to temporarily turn off the output, press OUT button to perform output shutdown, and press OUT to re-open, which is user-friendly.

Reset: During operation, Inadvertently generate an overshoot when adjust the V-SET voltage knob, causing the actual output voltage exceed the presetting over voltage value, and the OVP indicator lights up (over voltage protection).At this point, the user only needs to adjust the V-SET knob half turn counterclockwise, and then press the OUT button to resume the output.If the PS still in the over voltage protection state, just adjust the v-set knob counterclockwise again.

▲ Local control and remote control switching and address setting

The REM button allows the user to switch to local control under remote control condition.In the remote control state, press the REM button to enter the local control mode. Then can you set output parameters through the knob on the panel.

Address setting: long press REM button (2 seconds or more), to enter the address setting interface. Firstly enter the RS485 or LAN selection interface, select the needed communication mode through the V-SET knob, then press Rem, enter the next level. Adjust to the address of RS485 that you need by V-SET knob, then press REM to exit.The LAN address setting refers to 3.2.4.

3.2.2 Power Potentiometer Operation

▲ **Output voltage adjustment**

Adjust the V-SET knob to adjust the output voltage.Value rises clockwise and decreases counterclockwise. Adjustment range: from 0v to the rated output voltage.

▲ **Over voltage adjustment**

Press the OVP-SET button, the OVP-SET indicator lights up, and the display area shows the setting over voltage value. Adjust the V-SET knob to set the over voltage value range: from 0v to the rated output over voltage value. Press again to return the voltage and current display interface.

▲ **Constant current value adjustment**

Press the LIMIT button, the LIMIT indicator lights up, the display area shows the setting value of constant current and voltage. Adjust the I-set knob to set the constant current value range: 0A to the rated output current value, and then press it again to back to the voltage&current display interface.You can also directly adjust the constant current value with the I-SET knob.

3.2.3 Power Supply Operation Process

Example: DP16010

This model is a 600W high-power DC power supply with an output voltage of 1000V and an output current of 600mA.

The specific operation process is as follows:

Step 1: connect the utility AC power;

Step 2: Turn on the power switch, the power is turned on, the display area shows 0000.0V; 0000.0mA, the status indicator CV lights up, and the other indicators are off. Boot properly.

Step 3: Press the **OUT** button, the power output is turned on. adjust the **V-SET** to the voltage value required by the user;

Or press the **LIMIT** button to enter the voltage and current setting display interface, adjust the **V-SET** knob and the **I-SET** knob to the value required by the user. Press the **LIMIT** button to exit the setting display interface, and then press **OUT** to turn on the power output.

Step 4: Set the overvoltage and constant current values according to the actual needs of the user.

Note: All knobs on the panel are forbidden to squeeze inward.

3.2.4 Network Address Settings

1: Press and hold the **REM** key to enter the address setting interface (the **REM** indicator will not light UP).Rotate the voltage knob, left-hand **485**, right-hand **LAN**.

Press the **REM** key on the Lan interface to enter the network address setting interface (the network address setting is performed on this interface), and then press the **REM** key to save and exit, then return to the voltage and current display.

2: Network address setting, a total of 13 parameters can be set. Seen as the following arrangement (voltage knob pressed to switch left and right, current knob pressed to switch up and down)

Ip address xxx(11).xxx(12).xxx(13).xxx(14) Such as: 192.168.0 .30

Sub net mask xxx(21).xxx(22).xxx(23).xxx(24) Such as: 255.255.255.0

Gateway xxx(31).xxx(32).xxx(33).xxx(34) Such as: 192.168.0 .2

Port xxxxx(41) Such as: 08088

When entering, the interface displays xxx 1 1. The left 1 indicates the IP address, and the right 1 indicates the first address of the IP address (192). xxx indicates the value.Press the “Voltage Knob” again to change to xxx 1 2, indicating the second address of the ip address (168). Press again to cycle the ip address setting.

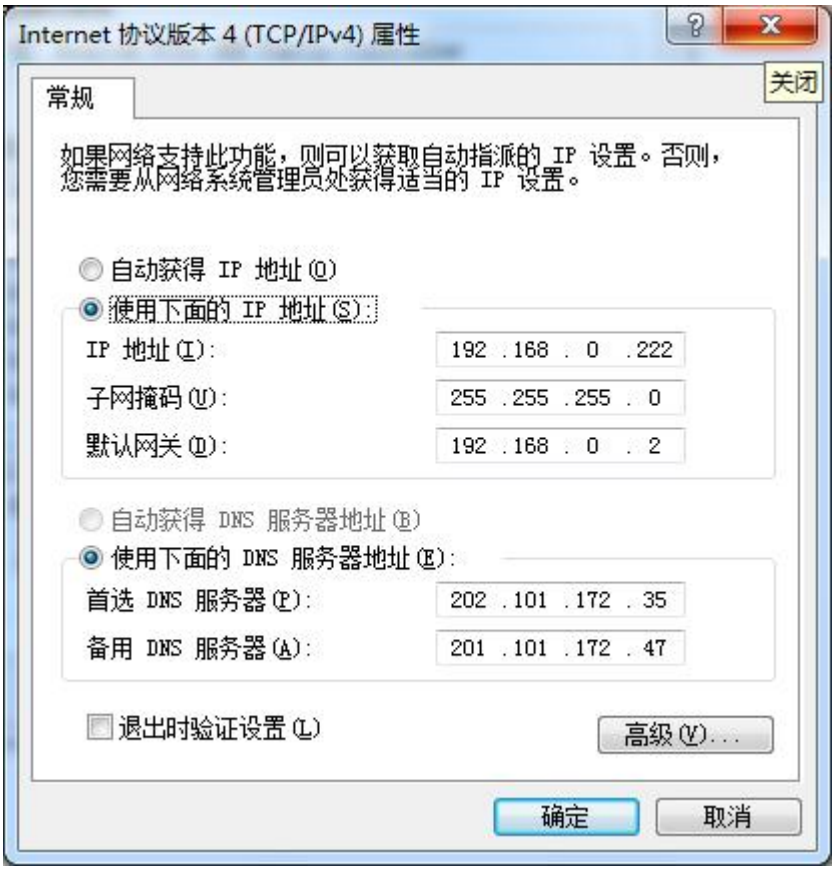
Press the “Current Setting” knob to switch from the ip address to the sub net mask setting, and the interface displays xxx21.

Press again to switch to the gateway settings.

Press again to set Gateway , interface xxx 31.

Press again to set port , interface xxxxx 41.

Computer IP address setting



Open the TCP/IPv4 on computer, setting the sub net mask and gateway of the power supply as above shows, and the last 222 of the IP address can also be replaced by other addresses. For example, 190 can also set the power address according to the IP of the computer.(Computer and MCU addresses cannot be repeated)

ChapterⅣ Power and pc communication

4.1 Overview

DP11/12 series high-power DC power supply, with RS-485 or RS-422 communication interface and LAN interface, supports Modbus application protocol, and is equipped with corresponding computer user software.

4.2 Communication Module Introduction

The RS-485, RS-422 or LAN communication interface on the rear panel of power supply can be connected to the corresponding interface of the computer via communication cable This protocol applies to the following communication cables.

▲ **RS-485** communication cable of **DP-E835** type

You can directly connect the **RS-485** (**RS**-422) interface of the power supply to other **RS-485** (**RS**-422) interface devices or computers through a **RS-485** communication cable of **DP-E835** type.

▲ Communication adapter(RS-232 to RS-485) of DP-E837 type

You can convert the **RS**-232 interface of the computer into the **RS**-485 interface through the accessory **DP**-E837 communication adapter, and then connect to the **RS-485** interface of the power supply through the **RS-485** communication cable.

▲ Communication adapter(RS-232 to RS-422) of DP-E838 type

You can convert the **RS**-232 interface of the computer into the **RS**-422 interface through the accessory **DP**-E838 communication adapter, and then connect to the **RS**-422 interface of the power supply through the **RS**-485 communication cable.

The following table shows the connection methods and performance comparison of each communication mode:

Communication mode	Connection method	communication method	Communication distance	Multi-machine communication
RS-485	Communication adapter(RS-232 to RS-485) of DP-E837 type + **RS-485** communication cable of **DP-E835** type	Half duplex	Long distance are supported	supported
RS-422	Communication adapter(RS-232 to RS-422) of DP-E837 type + **RS-485** communication cable of **DP-E835** type	Full duplex	Long distance are supported	supported

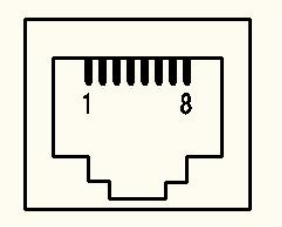
4.3 communication address setting

Press and hold REM button to enter the address menu to set the address..The specific operation process seen in 3.2.1 power function operation.

4.4 Communication Interface Definition

4.4.1RS-485/RS-422 Communication Interface Definition

Users can customize the RS-485 or RS-422 (RS485 four-wire) communication interface.The following diagram shows the definition of two interface pins definition:



Interface schematic

Pin position	RS-422 pin definition	RS-485 pin definition
1	GND	GND
2	GND	GND
3	T+	A(D+)
4	T-	B(D-)
5	R+	NC
6	R-	NC
7	NC	NC
8	NC	NC

4.5 Data

Its data frame structure consists of 4 parts

Additional address	function code	data	Error check

In order to ensure the reliability of communication, it should be ensured that the data interval of each frame should be greater than 3.5 times of the single-byte character transmission time. If the baud rate is 9600, the time interval between frames must be greater than 11*3.5/9600=0.004. second.

The power supply adopts two-way asynchronous communication, fixed 1 start bit, 8 data bits, 1 stop bit, and supports four baud rates such as 9600, 19200, 38400, 57600.

In some command frames, the data is fixed length, but in other parts of the frame, the data is indefinite. Following the Modbus protocol, the hexadecimal data in the data field, as well as the floating point number, are both high byte first and low byte last.In addition, in the output value of the write coil, the data must be 0x0000 and 0xFF00, where 0x0000 means position zero and 0xFF00 means position 1.

4.6 Function code

The function code is single-byte hexadecimal data. Currently, only the following four functional modes are open.

function code	Description
0x01	Read coil, read data by bit addressing
0x05	Write coil, write data by bit addressing
0x03	Read register, read data by word addressing
0x10	Write register, write data by word addressing

4.7 Error check

The power supply uses a cyclic redundancy check (CRC), and the result of CRC is a single word with the low byte first and the high byte later.The law of its formation is as follows:

a) Set a 16-bit CRC register and assign it the initial value of 0xFFFF.

b) The first byte in the data frame, that is, the additional address, bitwise XOR with the lower 8 bits of the CRC register and stored in the CRC register.

c) Shift the CRC register to the right by 1 bit and check if the least bit shifted out is 1. If yes, XOR the CRC register with the fixed number 0xA001.

d) Repeat step c for 8 times.

e) Repeat steps b, c, and d for the next byte of the data frame till the last data in the data field.

f) The contents of the last CRC register, which is the last check value, is appended to the last data of the data frame, with the lower 8 bits first and the upper 8 bits followed.

If a data check error occurs when the power supply receives data, the power return address + error code + check code.

4.8 Complete command frame resolution

▲ reading coil

Request frame	Byte length	value
Additional address	1	1~64
function code	1	0x01
initial address	2	0~0xFFFF
Number of coils	2	1-16
Check code	2	
Reply frame	Byte length	value
Additional address	1	1-64
function code	1	0x01
Number of bytes	1	1-2
Coil state	n	
Check code	2	
Exception frame	Byte length	value
Additional address	1	1~64
function code	1	0x81
Exception code	1	1~8
Check code	2	

Example: The power communication address is 1, read the remote control status of the power

supply.

Check the table 10 to know the address of the PC is 0x0500

Then send the request: 01 01 05 00 00 01 fd 06

Get reply: 01 01 01 ff 90 48

Where FF is the data read back, If the lowest bit is 1, indicating that the power remote control status is ON.

▲ write coil

Request frame	Byte length	value
Additional address	1	1~64
function code	1	0x05
initial address	2	0~0xFFFF
output value	2	0x0000 or 0xFF00
Check code	2	
Reply frame	Byte length	value
Additional address	1	1-64
function code	1	0x01
initial address	2	0~0xFFFF
output value	2	0x0000 or 0xFF00
Check code	2	
Exception frame	Byte length	value
Additional address	1	1~64
function code	1	0x85
Exception code	1	1~8
Check code	2	

Example: The power communication address is 1, and the control power mode is remote control.

Check the table 10 to know the address of the PC is 0x0500

Then send the request: 01 05 05 00 ff 00 8c f6

Get reply: 01 05 05 00 ff 00 8c f6

▲ read register

Request frame	Byte length	value
Additional address	1	1~64
function code	1	0x03
initial address	2	0~0xFFFF
Number of registers	2	n=1-32
Check code	2	
Reply frame	Byte length	value
Additional address	1	1-64
function code	1	0x03
Number of bytes	1	2*n
Register value	2*n	
Check code	2	
Exception frame	Byte length	value
Additional address	1	1~64

function code	1	0x83
Exception code	1	1~8
Check code	2	

Example: The power communication address is 1, reading the current voltage value vs.

Check the table 11 to know that the address of VS is 0x0B00

Then send the request: 01 03 0b 00 00 02 c6 2f

Get reply: 01 03 04 40 ab 28 46 01 e1

40 ab 28 46 is the voltage value read back, indicating a floating point number of 5.35v.(only 2 decimal places are kept here)

▲ write register

Request frame	Byte length	value
Additional address	1	1~64
function code	1	0x10
initial address	2	0~0xFFFF
Number of registers	2	n=1-32
Byte count	1	2*n
Register value	2*n	
Check code	2	
Reply frame	Byte length	value
Additional address	1	1-64
function code	1	0x010
initial address	2	0~0xFFFF
Number of registers	2	n
Check code	2	
Exception frame	Byte length	value
Additional address	1	1~64
function code	1	0x90
Exception code	1	1~8
Check code	2	

Example: The power communication address is 1, and the setting voltage is 10v.

Check the table 11 to know that the address of VSET is 0x0A05

Then send a request: 01 10 0a 05 00 02 04 41 20 00 00 58 c6

Get reply: 01 10 0a 05 00 02 52 11

Where 41 20 00 00 represents 10v of floating point numbers

Voltage initiation command: 0110 0a00 0001 0200 01cd 90

Get reply: 0110 0a00 0001 0211

4.9 coil and register address assignment

Coil bit definition:

name	address	Bit	Attributes	Description
PC	0x0500	1	W/R	Remote control status bit: When 1, the front button panel is disabled.
ACF	0x0510	1	R	AC input over/under pressure: When 1, it is over-voltage.
OTP	0x0511	1	R	1 is overheated
OVP	0x0512	1	R	1 is an over pressure mark
OFF	0x0513	1	R	Output state is off: When 1 is output off.
CC	0x0514	1	R	Constant voltage constant current status bit: constant current at 1 time, constant voltage at 0

Register ram area definition:

name	address	word	Attributes	Description
CMD	0x0A00	1	W/R	Command register: The lower 8 bits are valid, and the upper 8 bits are meaningless.
VMAX	0x0A01	2	W/R	Voltage maximum register, float type
IMAX	0x0A03	2	W/R	Current maximum register, float type
VSET	0x0A05	2	W/R	Voltage setting register, float type
ISET	0x0A07	2	W/R	Current setting register, float type
TMCVS	0x0A09	2	W/R	Voltage initiated setup time register, float type
VC_BIAS	0x0A0b	2	W/R	Voltage setting parameter offset register, float type
VC_AMP	0x0A0d	2	W/R	Voltage setting parameter amplification register, float type
IC_BIAS	0x0A0f	2	W/R	Current setting parameter offset register, float type
IC_AMP	0x0A11	2	W/R	Current setting parameter amplification register, float type
VS_BIAS	0x0A13	2	W/R	Voltage parameter offset register, float type
VS_AMP	0x0A15	2	W/R	Voltage parameter amplification register, float type
IS_BIAS	0x0A17	2	W/R	Current parameter offset register, float type
IS_AMP	0x0A19	2	W/R	Current parameter amplification register, float type
BAUDRATE	0x0A1b	1	W/R	Baud rate setting register, u16 type 9600; 19200; 38400; 57600.
ADDR	0x0A1c	1	W/R	Power address (485), u16 type
OVPSET	0x0A1d	2	W/R	Over voltage setting, float type
VS	0x0B00	2	R	Voltage register, float type
IS	0x0B02	2	R	Current register, float type
MODEL	0x0B04	1	R	Model register, u16 type
EDITION	0x0B05	1	R	Software version number register, u16 type

4.10 Command Register CMD Definition

Definition	CMD value	Description
Voltage setting	01	Make the set voltage value valid
Current setting	02	Make the set current value effective
Voltage soft start setting	03	Make the set voltage value valid, slowly turn on the voltage value
Baud rate setting	05	Make the set baud rate effective
Over voltage setting	06	Make setting over voltage value effective
485 address setting	07	Make the set address valid
Power off	0E	Power off
Unlock OVP	0F	Unlock OVP light
Reset	10	Reset the micro controller

4.11 Description of common operation functions

▲ Remote control operation:

operating	register	value	Description
Write coil	PC	1	required

▲ Cancel remote control operation:

operating	register	value	Description
Write coil	PC	0	required

▲ Voltage setting operation:

operating	register	value	Description
Write register	VSET	float	Optional
Write register	CMD	1	required

▲ Current setting operation:

operating	register	value	Description
Write register	ISET	float	Optional
Write register	CMD	2	required

▲ Voltage soft start setting operation:

operating	register	value	Description
Write register	VSET	float	Optional
Write register	TMCVS	float	Optional
Write register	CMD	3	required

▲ System check parameter setting operation:

operating	register	value	Description
Write register	VC_BIAS	float	Optional
Write register	VC_AMP	float	Optional
Write register	IC_BIAS	float	Optional
Write register	IC_AMP	float	Optional
Write register	VS_BIAS	float	Optional
Write register	VS_AMP	float	Optional
Write register	IS_BIAS	float	Optional
Write register	IS_AMP	float	Optional
Write register	CMD	4	required

▲ System parameter setting mode:

operating	register	value	Description
Write register	BAUDRATE	u16	Optional
Write register	CMD	5	required