

# **RIGOL**

## **User's Guide**

### **DP1308A Programmable Linear DC Power Supply**

**Aug. 2009**

**RIGOL Technologies, Inc.**



## **Guaranty and Declaration**

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**RIGOL** guarantees this product conforms to the standards of national and industrial. Meanwhile, the related standards conform to other ISO will get further. At present, DP1308A has passed CE, cTUVus and LXI certification.

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If you have any problem or requirement when using our products, please contact **RIGOL** Technologies, Inc. or your local distributors, or visit: [www.rigol.com](http://www.rigol.com)

## Safety Notices

Review the following safety precautions carefully before operating the instrument to avoid any personal injuries or damages to the instrument and any product connected to it. To prevent potential hazards, do use the instrument specified by this user's guide only.

### **Use Proper Power Cord.**

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

### **Ground the Instrument.**

The instrument is grounded through the grounding conductor of the power cord. To avoid electric shock, the instrument grounding conductor(s) must be grounded properly before connecting the input or output terminals.

### **Connect Output Wire Correctly.**

Please connect the output wire in strict accordance with operation methods in this guide.

### **Observe all Terminal Ratings.**

To avoid fire or shock hazard, observe all ratings and marks on the instrument. Consult your manual for more information about ratings before connecting.

### **Do Not Operate Without Covers.**

Do not operate the instrument with

covers or panels removed.

### **Use Proper Fuse.**

Please use the fuse with specified voltage and current rating.

### **Avoid Circuit or Wire Exposure.**

Do not touch exposed connections and components when power-on.

### **Do not Operate with Suspected Failures.**

If suspected damage occurs to the instrument, have it inspected by qualified service personnel before further operations.

### **Keep Well Ventilation.**

Inadequately ventilated will cause the temperature rises or damages to the device. Please keep well ventilation and inspect the intake and fan regularly.

### **Do not Operate in Wet/Damp Conditions.**

In order to avoid short circuit to the interior of the device or electric shock, please do not operate in a humid environment.

### **Do not Operate in an Explosive atmosphere.**

In order to avoid damages to the device or personal injury, please operate far away from an explosive atmosphere.

**Keep Product Surfaces Clean and Dry.**

In order to prevent the performance of the device from influencing by dust or water in air, please keep the surface of device clean and dry.

**Handling Safety**

Please handle with care during transporting to avoid damages to buttons, and knobs or interfaces as well as other parts on the panel resulting from the falling from your hand.

## Safety Terms and Symbols

**Terms in this Guide.** These terms may appear in this manual:



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**WARNING**

Warning statements indicate the conditions or practices that could result in injury or loss of life.

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**CAUTION**

Caution statements indicate the conditions or practices that could result in damage to this product or other property.

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**Terms on the Product.** These terms may appear on the product:

**DANGER** indicates an injury or hazard that may immediately happen.

**WARNING** indicates a potential injury or hazard that may happen.

**CAUTION** indicates that a potential damage to the instrument or other property might occur.

**Symbols on the Product.** These symbols may appear on the product:



**Hazardous Voltage**



**Refer to Instructions**



**Protective Earth Terminal**



**Chassis Ground**



**Test Ground**

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## DP1308A Overview

DP1308A programmable linear DC power supply is designed with high performance and 80W triple-output. It has clear user interface, excellent specifications and multiple standard interfaces, which can meet diversified testing demands.

### Main Features:

- 4.3 inch, 16M true color TFT LCD;
- Individual and controllable triple-channel enables to output power up to 80W in total;
- Low ripples noise, the output noise and ripples $<350\mu\text{Vrms}/2\text{mVpp}$ ;
- Excellent load regulation rate and linear regulation rate:  $<0.01\%+2\text{mV}$  (voltage),  $<0.01\%+250\mu\text{A}$  (current);
- To implement effective protection for loads through setting up the corresponding parameters based on overvoltage/overcurrent protection function;
- Two-level over-temperature protection;
- Store and recall system parameters;
- Timing output;
- Waveform display: enable to display voltage/current waveform in real time and make the state of instrument understand fully at one glance coordinating with digital voltage, current and power value;
- Standard interfaces: USB Device, USB Host, LAN and GPIB;
- Support U disk store;
- Support remote control via Web;
- Support remote control via commands;
- Conform to LXI-C class instrument standard;
- One button help function;
- Support Chinese & English interface, input method.

# Structure of This Document

## Chapter 1 Quick Start

This chapter introduces you the panels and display interface of DP1308A as well as some considerations when first use.

## Chapter 2 Front Panel Operations

This chapter gives detailed information on function and operating methods about each button of the front panel.

## Chapter 3 Remote Control

This chapter shows more details about remote control of DP1308A.

## Chapter 4 Troubleshooting

This chapter offers some methods to help you solve the problems during operations.

## Chapter 5 Specifications

This chapter lists the specifications of DP1308A power supply.

## Chapter 6 Appendix

Information about accessories, warranties, services and supports and the like.

**Hint:**

For the newest edition of this manual please go to <http://www.rigol.com> to download.

### Conventions about how to denote the buttons and menu softkeys from front panel in this document:

**Buttons:** button characters + textbox, for example: **+6V** denotes the selection button of + 6V channel.

**Menu softkeys:** Menu character+ character shading, for example: **Volt** denotes the voltage option in Channel settings.



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# Chapter 1 Quick Start

This chapter introduces you the panels and display interface of DP1308A as well as some considerations when first use. From this part, you can learn how to use this instrument quickly and correctly.

Following topics are mainly throughout this chapter:

- General Inspection
- Front/Rear Panels and User Interface
  - Front Panel*
  - Rear Panel*
  - User Interface*
- First Use DP1308A
  - Power Requirement*
  - Power-On Inspection*
  - Output Inspection*
- Display Modes

## General Inspection

Please inspect your new DP1308A programmable linear DC power supply according to the following steps:

**1. Inspect the shipping container for damage.**

Keep the damaged shipping container or cushioning material until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically.

If the shipping container is damaged, or the protective material shows signs of stress, notify the carrier as well as your **RIGOL** sales representative. Keep the shipping materials for the carrier's inspection.

**2. Inspect the instrument.**

In case of any damage, or defect, or failure, notify the **RIGOL** sales representative.

**RIGOL** offices will arrange reparation or replacement at **RIGOL's** option without waiting for claim settlement.

**3. Check the accessories.**

Accessories supplied with the instrument are listed in "**Appendix A: DP1308A Accessories**" at of this guide.

If the contents are incomplete or damaged, please notify the **RIGOL** sales representative.

# Front/Rear Panels and User Interface

## Front Panel

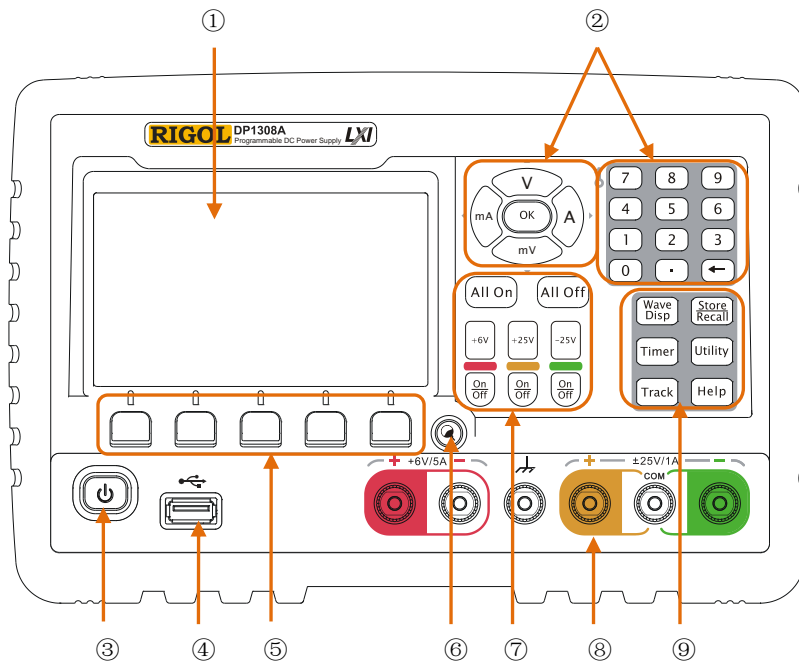



Figure 1-1 Front panel overview

①	LCD	Display user interface
②	Parameters input area	Include digital keyboard, unit key (direction key) and enter key
③	Power button	Turn on (or off) the instrument
④	USB Host port	Connect with external USB device as a "main equipment"
⑤	Menu softkey	With different functions in different menus.
⑥	Display modes switching button	Switch display modes between General and Focus
⑦	Channel setting button	Switch channels, enable/disable channel output
⑧	Output terminal	Channel output connector

⑨	Advanced function area	<ul style="list-style-type: none"> <li>● <b>Wave Disp</b>: Set up whether to display the signal through waveform</li> <li>● <b>Store/Recall</b>: Store and recall the settings of instrument and files</li> <li>● <b>Timer</b>: Enable timing output</li> <li>● <b>Utility</b>: Set up system configuration</li> <li>● <b>Track</b>: Enable track function</li> <li>● <b>Help</b>: System online help</li> </ul>
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### 1. Button Indicator

 The indicator lights when press the button to start-up the instrument.

**On/Off** The corresponding button light will go on if turn on a channel.

**Wave Disp** The button light will go on if enable waveform display.

**Timer** The button light will go on if enable timing output function.

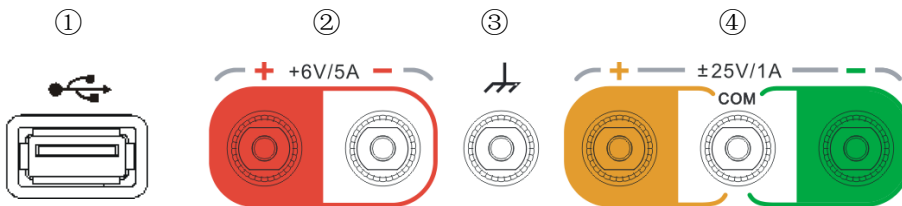
**Track** The button light will go on if enable track function.

**Store/Recall** The button light will go on if enter into store/recall menu.

**Utility** The button light will go on if enter into system settings.

**Help** The button light will go on if enter into online help.

### 2. Front panel connector



①	USB Host: Connect as a "main equipment" with an external USB device such as U disc.
②	Output terminals of +6V channel
③	This terminal is connected with the chassis and ground wire when power on, which could act as an additional ground terminal for the devices connected to.
④*	Output terminals of ±25V channels

**NOTE\***: COM is a public port.

## Rear Panel

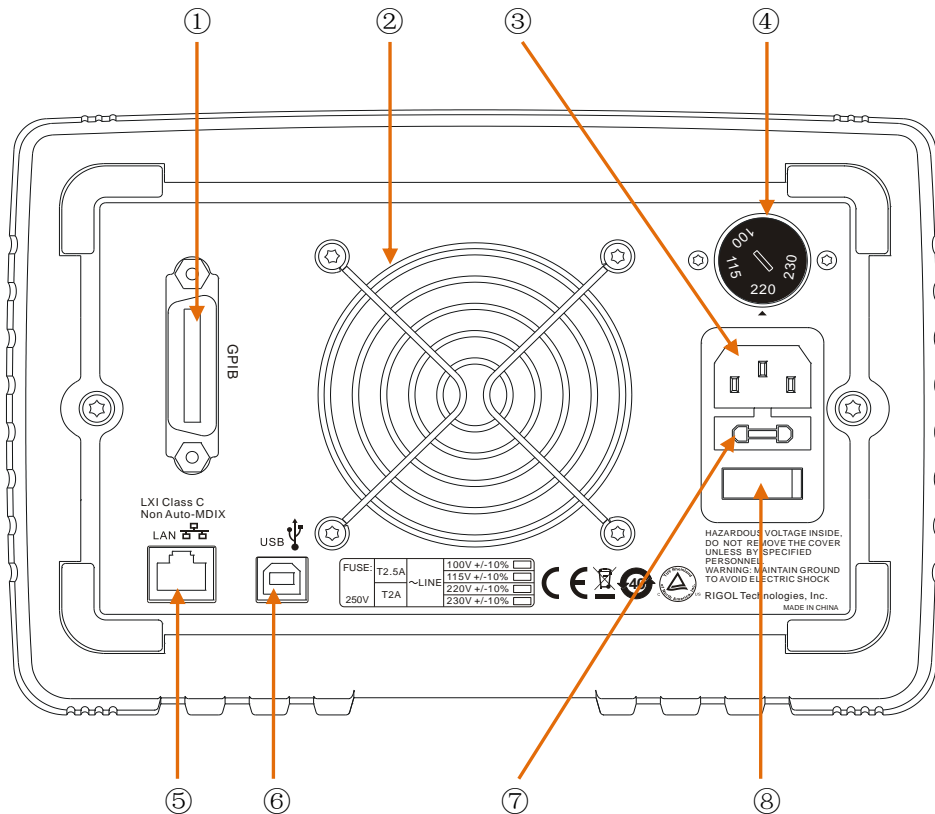


Figure 1-2 Rear panel overview

①	GPIB Port	Conform to IEEE 488.2 protocol
②	Fan	Air outlet of the fan
③	Supply Hub	AC input interface
④	Power Voltage Selector	Select the proper level according to the input power supply
⑤	LAN Port	Access LAN via RJ45 port
⑥	USB Device Port	Connect as a "slave unit" with an external USB device.
⑦	Fuse	Offer two types of specifications: 250V, T3A and 250V, T2A
⑧	Power Switch	Power-on/off the power

## User Interface



Figure 1-3 User interface of DP1308A

①	Channel output state	⑬	Output voltage
②	Channel mark	⑭	Output current
③	Selected channel*	⑮	Output power
④	Constant voltage output	⑯	O.V.P input box
⑤	LAN connecting	⑰	O.C.P input box
⑥	Keylock	⑱	Operation menu
⑦	Self-test failed	⑲	Timing output mark
⑧	O.T.P mark	⑳	Time for timing output
⑨	Remote control connecting	㉑	Voltage input box
⑩	U disk detected	㉒	Current input box
⑪	Help system mark	㉓	Track mark
⑫	The beeper is enabled	㉔	O.V.P/O.C.P state

NOTE\*: The channel is highlighted on the screen (in breath state).



## First Use DP1308A

Before operating, please do perform necessary inspections to ensure the instrument is in a good position to work normally.

### Power Requirement

Four types of AC power within 50Hz-60Hz of frequency are provided by DP1308A: 100V, 115V, 220V, 230V. You can choose an appropriate input power as required through switching the “**Power Voltage Selector**” on the rear panel.



#### **WARNING**

Before switching the “Power Voltage Selector”, make sure that the power supply has been cut off and the instrument has installed specified fuse.

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### Power-On Inspection

Please use the power cord listed in accessories to connect the instrument with AC supply, and then perform the following instructions:

#### **1. Turn on the instrument**

Turn on the power switch on the rear panel. (At present, the instrument has connected to AC supply.)




#### **WARNING**

To avoid electric shock, make sure that the instrument has properly grounded.

---

#### **2. Turn on the power button**

Press down the power button  on the front panel to enable the self-test. If pass test, the user interface will appear on screen, or else a clue “System power-on self-test has a mistake, view the error or not?” will pop up, press **OK** to get more information about fail, or press **Cancel** to exit clue.

## Output Inspection

In virtue of this function, the instrument enables to respond to front panel correctly and output rated value. The inspections are mainly centered on the voltage output on the occasion of no loads for each channel and the current output when short circuit.

### 1. Channel selection and output switch

Choose an appropriate output channel using selection buttons. The selected channel will be highlighted on screen.

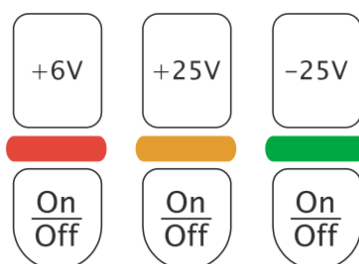



Figure 1-4 Output channel selection

Turn on/off the output by pressing **On/Off** button under the selection button of each channel. After you enable the output of a channel, the corresponding button will light until you disable the output regardless of whether it is the current channel or not.

### 2. Voltage output inspection

- (1) When the instrument has no load: Press power button  and make sure that the setting value of current in each channel is not 0;
- (2) Inspect "all on" and "all off" function of channels;
  - Press **All On** button, then a clue about whether to open output of all channels will appear on, if click **ok**, all the channel buttons light will go on that denotes they are ready to output; on the contrary, the instrument backs to the state before.
  - Press **All Off** buttons to disable the output of all channels. Meanwhile, the corresponding **On/Off** button is black out.

- (3) Inspect the voltage function of +6V channel;

Press **+6V** button and the corresponding **On/Off** button, the channel will be in constant voltage output state after **On/Off** button light goes on, then check whether the "voltage" can be adjusted from 0 to the maximum rated value(6.3V). See the "**Parameter Input**" section in chapter 2.


- (4) Inspect the voltage function of +25V channel;

Press **+25V** button and the corresponding **On/Off** button, the channel will be in constant voltage output state after **On/Off** button light goes on, then check whether the "voltage" can be adjusted from 0 to the maximum rated value(26.25V).

- (5) Inspect the voltage function of -25V channel;

Press **-25V** button and the corresponding **On/Off** button, the channel will be in constant voltage output state after **On/Off** button light goes on, then check whether the voltage can be adjusted from 0 to the minimum rated value(-26.25V).

### 3. Current output inspection

- (1) Press the power button .

- (2) Press **All Off** button to disable the output of all channels.

- (3) Inspect the current function of +6V channel.

- Short the terminal (+) and (-) of +6V channel using an insulating output lead;
- Press **+6V** button;
- Set the voltage as 6V;
- Press the corresponding **On/Off** button of +6V channel;
- After **On/Off** button light goes on, check whether the "current" can be adjusted from 0 to the maximum rated value (5.25A).

- (4) Inspect the current function of +25V channel.

- Short the terminal (+) and (COM) of +25V channel using an insulating testing lead;
- Press **+25V** button;
- Set the voltage value as 25V;

- Press the corresponding **On/Off** button of +25V channel;
- After **On/Off** button light goes on, check whether the “current” can be adjusted from 0 to the maximum rated value (1.05A).

(5) Inspect the current function of -25V channel.

- Short the terminal (-) and (COM) of -25V channel using an insulating testing lead;
- Press **-25V** button; set the voltage value as -25V;
- Press the corresponding **On/Off** button of -25V channel;
- After **On/Off** button light goes on, check whether the current can be adjusted from 0 to the maximum rated value (1.05A).

## Display Modes

DP1308A provides four display modes: **general display mode**, **focus display mode**, **general waveform display mode** and **focus waveform display mode**.

The output current and voltage can be displayed in waveforms by DP1308A, for the details , please see general waveform display mode (Figure 1-7) and focus waveform display mode (Figure 1-8). The **Wave Disp** button light will go on regardless of which waveform display mode is active until this function is disabled.

### 1. General display mode

In the following figure, the three channel outputs are shown on screen abreast, and the selected channel is highlighted and stay in breath state.



Figure 1-5 General display mode

### 2. Focus display mode



Press  to enter into focus display mode from general display mode; to exit, press the button again. In this mode, the parameters and output state of selected channel are displayed clearly.



Figure 1-6 Focus display mode

### 3. General waveform display mode

Press **Wave Disp** button in general display mode or press  in focus waveform display mode to enter into general waveform display mode. The state of **Wave Disp** button light varies with waveform display mode. The waveforms from all three channels could be displayed simultaneously in this mode.

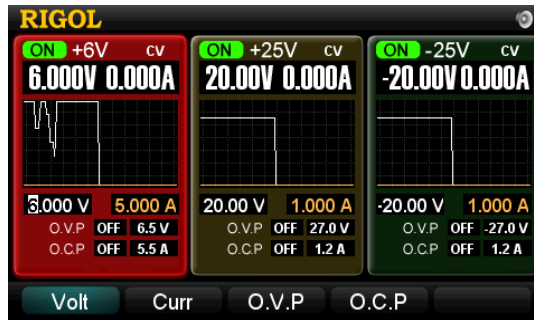


Figure 1-7 General waveform display mode

### 4. Focus waveform display mode


Press  in general waveform display mode or press **Wave Disp** button in focus display mode to enter into focus waveform display mode. In this mode, the waveform and channel output state are displayed clearly.



Figure 1-8 Focus waveform display mode

## Chapter 2 Front Panel Operations

This chapter gives detailed information on function and operating methods about each button on the front panel, among them, you will learn more about DP1308A and make primary work.

Following topics are mainly throughout this chapter:

- Parameter Input
- Constant Voltage Output
- Constant Current Output
- Timing Output
- Multiplexed Output
- Tracking Output
- Save and Recall
- Set up the Utility
  - I/O Setting*
  - System Setting*
  - Calibrate*
  - Timer Setting*
- Online Help System
- Key Lock

## Parameter Input

DP1308A has two methods to input parameters: **dialog box input** and **direct input (modify)**. Parameters can be inputted by the digital keyboard and unit key (direction key).

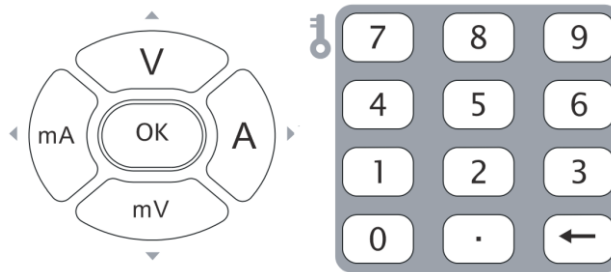


Figure 2-1 Digital keyboard and unit key (direction key)

### 1. Dialog box input

When the selected menu is **Volt** or **Curr**, input desired numerical value using the digital keyboard and then press "V", "mV", "A" or "mA" on the panel or in the menu, the instrument will automatically set the voltage or current according to the value and unit you have selected. When the selected menu is **O.C.P** or **O.V.P**, use the same way to set O.C.P or O.V.P.

For either "**Calibrate**" or "**Timer Setting**" mode, the unit must be defined based on practical needs after inputting numerical value, for instance, when input a voltage value, only "mV" and "V" can be chosen as its unit.

### 2. Direct input(modify)

When the cursor is in the input box of voltage or current, press the "up (V)" direction key to increase the value or press the "down (mV)" direction key to decrease. To move the position of the cursor, press the "left (mA)" or "right (A)" direction key.

For "**I/O Setting**", respectively use the numeral key and direction key to input numerical value and move the cursor; to backspace, press "←".



**NOTE**

- A long press on up or down direction key may change the setting value of current or voltage quickly and linearly; if on left or right direction, the position of the cursor could be moved quickly.
- While inputting the file name, the position of the cursor can be moved quickly If press direction keys for long time.

# Constant Voltage Output

DP1308A provides two kinds of output mode for each channel including Constant Voltage Output (CV) and Constant Current Output (CC), which is depends on the specified voltage and current as well as the loads carried by the instrument. The instrument will not output voltage or current beyond setting value. In CV mode, the output voltage equals to the specified value and the output current equals to the specified value in CC mode.

### For example:

Choose the +6V channel; set the voltage to 6V, the current to 5A and the load to 5Ω separately.

Because  $5\Omega \times 5A = 25V > 6V$  and  $6V / 5\Omega = 1.2A < 5A$ , so the Constant Voltage Output of the channel is 6V, 1.2A.

### Operation Steps:

#### 1. Power on

Press  to start-up the instrument.

#### 2. Choose the channel

Press **+6V** to enable +6V channel, at present, the channel is highlighted on the screen (in breath state).

#### 3. Set the voltage

Press **Volt** and set the voltage to 6 V.

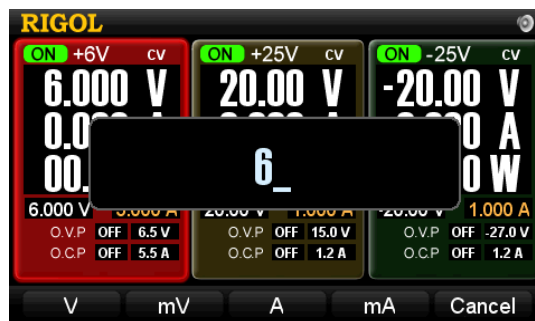


Figure 2-2 Set the voltage

#### 4. Set the current

Press **Curr** and set the current to 5 A.

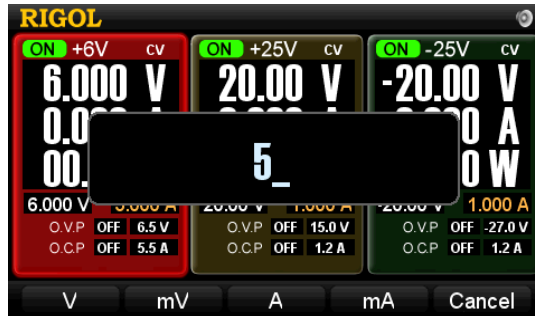


Figure 2-3 Set the current

#### 5. Connect the output lead

Connect the output terminal of +6V as the following figure:

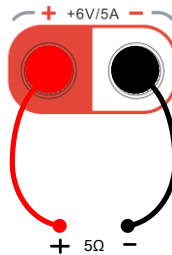


Figure 2-4 Connect the terminal of +6V

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#### CAUTION



Wrong connection may lead damages to the instrument or the equipment connected to.

---

#### 6. Turn on the output

Press the **On/Off** button below +6V button, and which will be lightened during the output until you press again.

**NOTE**

In CV state, the instrument will switch to the CC state in terms of the preset setting value of the current automatically if the output current exceeds the setting value resulting from the decrease of load, meanwhile, the output voltage will decrease pro rata. To resume CV state, increase the load or the current setting value.

**7. O.V.P\***

In channel output mode, press **O.V.P** to enter into the setting menu, you can input needed value using number keyboard and then press **O.V.P** to enable (or disable) O.V.P protection. If the parameters of O.V.P have already been set, press **O.V.P** to directly enable (or disable) O.V.P protection.

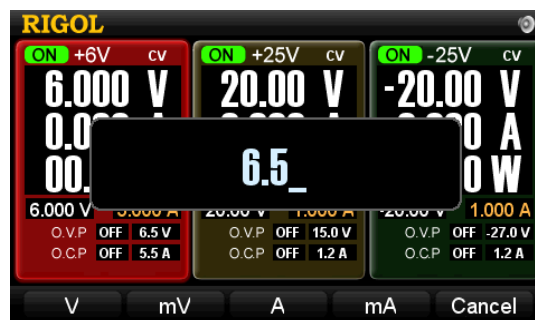


Figure 2-5 Set O.V.P

**NOTE**

- If channel output is disabled, the O.V.P function can not be enabled but only for inputting value.
- If the output voltage beyond the value of overvoltage protection, the output will be disabled automatically.
- \*: Please use O.V.P function as required.

## 8. O.C.P\*

In channel output mode, press **O.C.P** to enter into the setting state, you can input needed current value using number keyboard and then press **O.C.P** to enable (or disable) O.C.P protection. If the parameters of O.C.P have already been set, press **O.C.P** to directly enable (or disable) O.C.P protection.

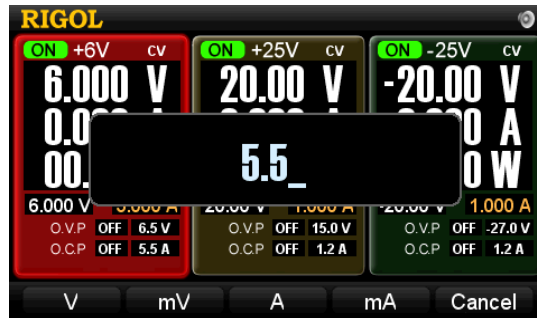


Figure 2-6 Set O.C.P

### NOTE

- If channel output is disabled, the O.C.P function can not be enabled but only for inputting value.
- If the output current beyond the value of over current protection, the output will be disabled automatically.
- \*: Please use O.C.P function as required.

## Constant Current Output

### For example:

Choose the +6V channel; set the voltage to 6V, the current to 5A and the load to 1 $\Omega$  separately.

Because  $6V/1\Omega=6A>5A$  and  $5A\times 1\Omega=5V<6V$ , so the Constant Current Output of the channel is 5A, 5V.

### Operation Steps:

#### 1. Power on

Press  to start-up the instrument.

#### 2. Choose the Channel

Press **+6V** to enable +6V channel, at present, the channel is highlighted on the screen (in breath state).

#### 3. Set the voltage

Press **Volt** and set the voltage to 6 V.

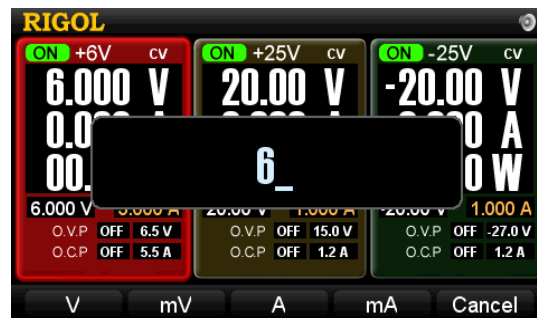


Figure 2-7 Set the voltage

#### 4. Set the current

Press **Curr** and set the current to 5 A.

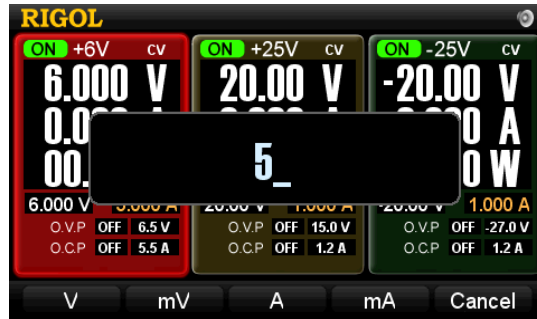


Figure 2-8 Set the current

## 5. Connect the output lead

Connect the output terminal of +6V as the following figure:

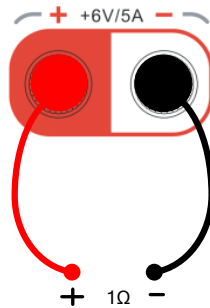


Figure 2-9 Connect the terminal of +6V



### CAUTION

Wrong connection may lead damages to the instrument or the equipment connected to.

## 6. Turn on the output

Press the **On/Off** button below +6V button and which will be lightened during the output until you press again.

**NOTE**

In CC state, the instrument will switch to the CV state in terms of the preset setting value of the voltage automatically if the output voltage exceeds the setting value resulting from the increase of load, meanwhile, the output current will decrease pro rata. To resume CC state, decrease the load or increase the voltage setting value.

**7. O.V.P\***

In channel output mode, press **O.V.P** to enter into the setting state, you can input needed value using number keyboard and then press **O.V.P** to enable (or disable) O.V.P protection. If the parameters of O.V.P have already been set, press **O.V.P** to directly enable (or disable) O.V.P protection.

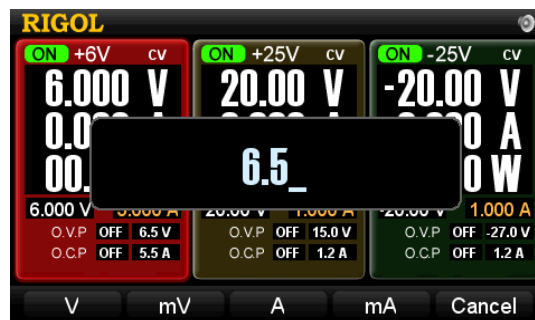


Figure 2-10 Set the O.V.P

**NOTE**

- If channel output is disabled, the O.V.P function can not be enabled but only for inputting value.
- If the output voltage beyond the value of overvoltage protection, the output will be disabled automatically.
- \*: Please use O.V.P function as required.



## 8. O.C.P\*

In channel output mode, press **O.C.P** to enter into the setting state, you can input needed current value using number keyboard and then press **O.C.P** to enable (or disable) O.C.P protection. If the parameters of O.C.P has already been set, press **O.C.P** to directly enable (or disable) O.C.P protection.

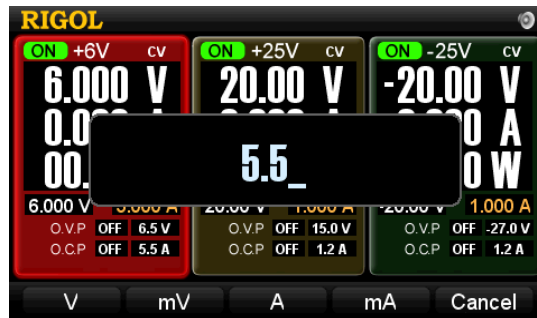


Figure 2-11 Set O.C.P

### NOTE

- If channel output is disabled, the O.C.P function cannot be enabled but only for inputting value.
- If the output current beyond the value of overcurrent protection, the output will be disabled automatically.
- \*: Please use O.C.P function as required.

# Timing Output

Press **Timer** to enable the timing output of current channel, at this moment, a hint "Timing will change the output of channel possibly, do you go on?" will pop up, then click **OK**, the button light will go on and a "Clock" icon and the corresponding timing parameters are shown on the screen. See the figure below. The instrument will start output after you turn on the current channel until finishing all timing outputs (at the same time, the light of **Timer** button goes out.).

If no timing parameters have been set before enabling the timer, the system will enter "Timer Setting" Interface automatically after you press **Timer** (the light of **Utility** goes on). In timing mode, if you turn off the channel under timing, the timer will stop until it is enabled again. However, the timer would be disabled once you press **Timer** during timing.



Figure 2-12 Timing output (in focus display mode)

In focus display mode, the character "Set" on the screen denotes the current output voltage and current setting value while "Next" denotes the next output voltage and current setting value. The next output value does not displayed in normal display mode, see the figure below.



Figure 2-13 Timing output (normal display mode)

To change the voltage, current or the time that has been set, press **Utility** to enter the “**TimerSet**” menu.

**NOTE**

- If the timing output is enabled on a channel, of which **Volt** and **Curr** values can't be set.
- Timing Output can not be used if tracking function of +25V (-25V) channel is active.

# Multiplexed Output

Typically, all three channels of DP1308A enable to output synchronously, and each of them could be controlled independently.

## Operation Steps:

### 1. Power on

Press  to start-up the instrument.

### 2. Choose and set channels

Press the channel selection button to choose the channel required to output, then separately set the voltage and current for each of them.

### 3. Connect the output lead

The connection method of output terminals are given as follow, you can use a cable with banana plug or a common cable to connect them with customers.

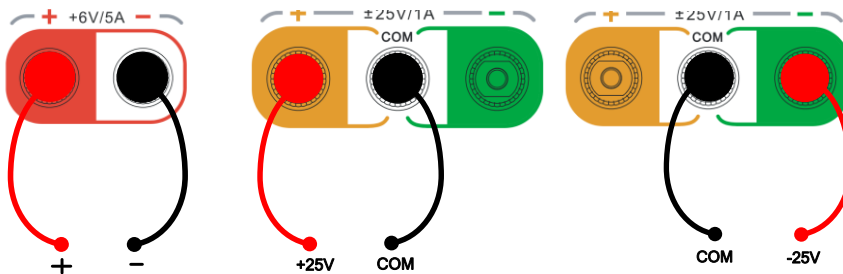


Figure 2-14 Connect the multiplexed terminals

### 4. Turn on the output

Press **All On**, and the system will prompt whether to turn on the output of all channels. If you select "ok", the **On/Off** button of the corresponding channel will be light, which indicates that all channel outputs are enabled; conversely the instrument returns the state before.

### 5. Set O.V.P and O.C.P

In output state, you can set O.V.P and O.C.P parameters for each channel if necessary.

## 6. How to output 0V~50V power\*

DP1308A can output 0V~50V power by connecting +25V channel in series with -25V channel, see the figure below.

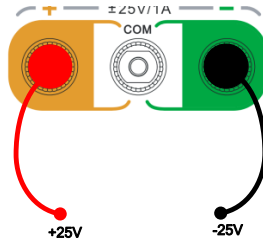



Figure 2-15 Connect +25V and -25V channel in series

### **NOTE\***

When +25V channel is connecting with -25V channel in series, the output voltage is the sum of the two channels' output voltage, while the output current may be one of the two channels' output current.

## Tracking Output

The  $\pm 25V$  channel provides tracking output function, which denotes that the voltage of a channel can vary with the one of another channel.

Select a channel such as +25V, and then press **Track**, at present, a hint "Track will change the output of channel possibly, do you go on?", then click **OK**, the button will light and a track icon  appears at the lower left of +25V that denotes +25V is in tracking mode.

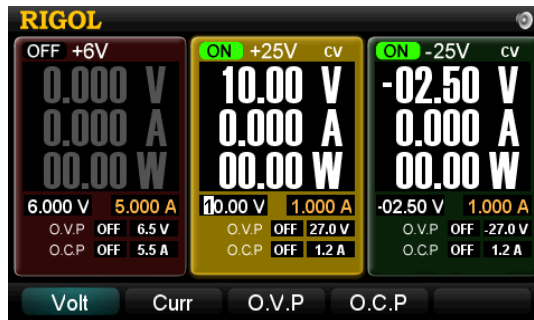


Figure 2-16 Tracking output (before tracking)

Next, change the voltage of -25V channel, and then the voltage of +25V channel changes along with it\*. For example: Change the voltage of -25V channel to 2.5V, the voltage of +25V channel is also changed to 2.5V, please see the figure below.



Figure 2-17 Tracking output (after tracking)

Press **Track** again to disable track function and the light is out.

**NOTE**

- \*: Track function is only available for the voltage setting value but has nothing to do with the output value. The voltage of channel under tracking varies with the value of channel to be tracked only when both channels are in CV state.
- Track function is forbidden when "Timing Output" of +25V (-25V) channel is active.
- The voltage of channel under tracking can not be set manually when track function is enabled.

## Save and Recall

DP1308A supports two types of document storage ways: U disc storage and local storage. Among the internal memory, 4 groups of settings could be saved or recalled and more settings are available for USB device.

Press **Store/Recall** to enter the Save and Recall interface (the button is light). To exist, press this button again. See as figure 2-18.



Figure 2-18 Save and recall interface

Table 2-1 Explanations of save and recall menus

Menu	Explanations
<b>Browser</b>	Shift cursor between directory and file window
<b>Store</b>	Enter the Save interface
<b>Recall</b>	Recall the selected system configuration file
<b>Delete</b>	Delete the selected file
➡	Enter next page
⬅	Back to previous page
<b>Update</b>	Select the desired file and update
<b>Exit</b>	Exit the save and recall interface


Press **Store** to enter the interface below, press **InType** to switch the input method.





Figure 2-19 Input interface of the file name

Table 2-2 Explanations of file name input menu

Menu	Explanations
<b>InType</b>	Chinese or English
<b>Focus</b>	Shift cursor among the input box of file name, virtual keyboard and Chinese show box
<b>ABC(abc)</b>	Switch capital and lower case. If display "ABC", lowercase letter and pinyin could be inputted. If display "abc", capital letter could be inputted.
<b>Save</b>	Save system configuration file
	Back to save and recall interface

## 1. Chinese Input

Press **InType** and select "Ch" to enter the Chinese input interface as the figure above. Take file name "北京普源" as an example:

### (1) Input "北京普源"

- Select character "b" in soft keyboard using direction keys and press **OK** to input, then, input "bei" in the same way.
- Press **Focus** and switch cursor to Chinese input box, then press direction keys up or down to shift characters until the character "北" appears. After that, input the whole name file "北京普源" in the same way.

### (2) Delete the wrong characters you input

In the process of editing, if press "←", the characters in display box will be deleted at first.

(3) Save the file

Press **Save** to save the file as the specified name and finish editing.

## 2. English Input

Press **InType** and select "En" to enter the English input interface as the figure below. Take file name "newfile" as an example:



Figure 2-20 English Input

(1) Input "newfile"

Select character "n" in soft keyboard using direction keys and press **OK** to input, then, input "newfile" in the same way.

(2) Delete the wrong letters you input

Shift the focus cursor to the input box, then select the letter to be deleted using left/right direction key and press "←" to delete.

(3) Save the file

Press **Save** to save the file as the specified name and finish editing.

### NOTE

The length of Chinese file name must be less than 6 characters and the English name must be less than 12 letters (including number).

## Set up the Utility

Press **Utility** (the light is on) to enter the utility interface as the figure below.

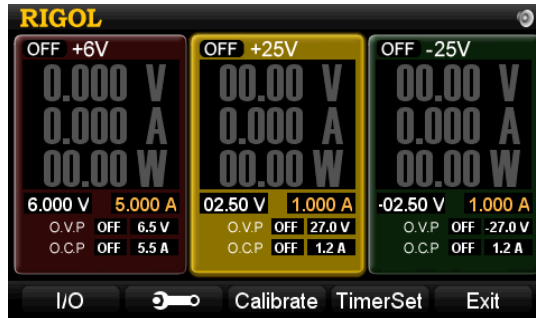



Figure 2-21 Utility Setting interface

Table 2-3 Explanations of utility setting menu

Menu	Explanation
<b>I/O</b>	Set the LAN parameters and GPIB address and view the ID of USB device
	Set system parameters
<b>Calibrate</b>	Enter the calibration interface
<b>TimerSet</b>	Set the timing parameters for each channel
<b>Exit</b>	Exit utility menu

# I/O Setting

DP1308A provides LAN, USB and GPIB three interfaces for communication; you can set and review the related parameters through setting interface.

## 1. LAN

Press **I/O** → **LAN**, enter the following interface.

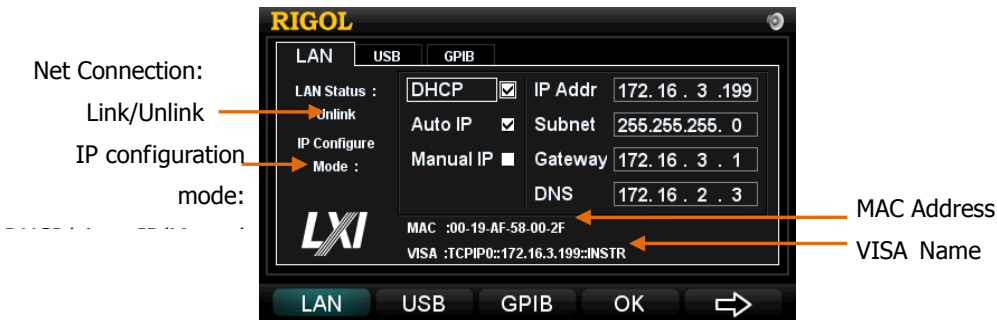


Figure 2-22 Set the LAN

### General condensed summaries:

- If "DHCP" is selected, the instrument will automatically assign "IP Address", "Subnet", "Gateway" and "DNS Server".
- If "Auto IP" is selected, the instrument will automatically assign "IP Address" and "Mask".
- If "Manual IP" is selected, "IP Address", "Mask", "Gateway" and "DNS Server" has to be set manually.
- If both "DHCP", "Auto IP" and "Manual IP" are selected, the priority is from high to low: "DHCP", "Auto IP" and "Manual IP".

### Default settings:

In the second page of **I/O** menu, press **Default** → **OK** to recall the default setting of LAN. See the following figure.

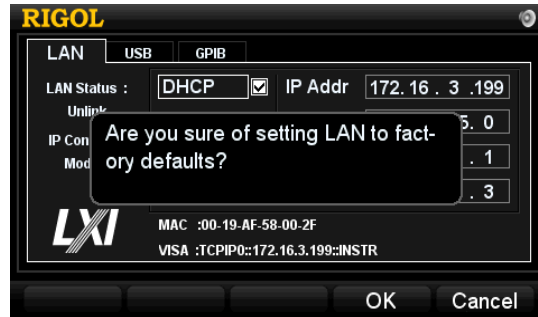


Figure 2-23 Recall the default setting of LAN

## 2. USB

Press **I/O** → **USB**, enter the following interface. This option shows the ID information about USB device with setup-free.



Figure 2-24 USB ID information

## 3. GPIB

Press **I/O** → **GPIB**, enter the following interface. The range of GPIB address is 1~30. See the figure below, directly input the desired address by number keyboard and then press **OK** to save. Press “←” or the left direction key to delete the number before the cursor.

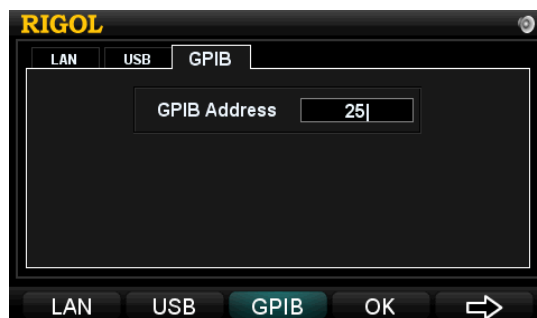



Figure 2-25 Set the GPIB address

## System Setting

Press  to enter the system setting menu, which including language, power-on and brightness, over-temperature protection, beeper, self-test and system information.

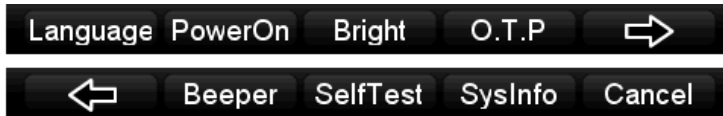


Figure 2-26 System settings

### 1. Language Setting

Press **Language** to enter the setting interface of system language. The optional languages are "Chinese" and "English".

### 2. PowerOn Setting

Press **PowerOn** to enter the setting interface. The optional settings are "Default" and "Last".

- "Default": Factory settings will be recalled when reset the instrument.
- "Last": Settings before last power-off will be recalled when reset the instrument.

### 3. Brightness Setting

Press **Bright** to enter the brightness setting interface. The brightness of display screen could be regulated by pressing "+"/ "-" key (in menu) or left/right direction key.



Figure 2-27 Brightness setting

#### 4. Over-temperature Protection Setting

Press **O.T.P** to enter the over-temperature protection setting interface. The over-temperature protection includes two grades. Users can turn ON or OFF the first-grade protection. A mark **O.T.P** will appear at the Status Bar when the protection is turned on, see as follow:



Figure 2-28 Over-temperature Protection Settings

The second-grade protection is a mandatory protection which is always on.

#### 5. Beeper Setting


Press **Beeper** to enter into setting interface. A sign  would shown at Status Bar once you turn on beeper, which indicates that the instrument may buzzed once pop up a hint message or some button is pressed down.



Figure 2-29 Beeper settings

## 6. SelfTest

Press **SelfTest** to enter the following interface. Users can perform self-test and view its result. If do not carry out self-test, the display is the results when power on.



Figure 2-30 Self-Test menu

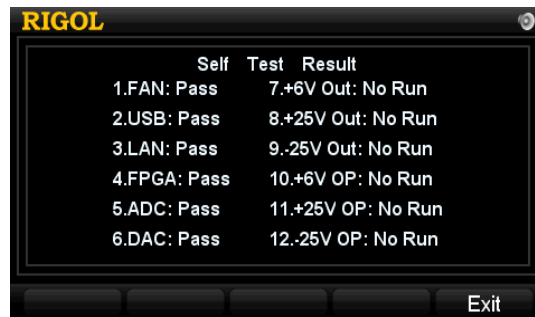


Figure 2-31 View Self-Test Result

## 7. View System Information

Press **Sysinfo** to view the Model, Serial Number, Hardware Version, Logic Version and Software Version of the instrument.

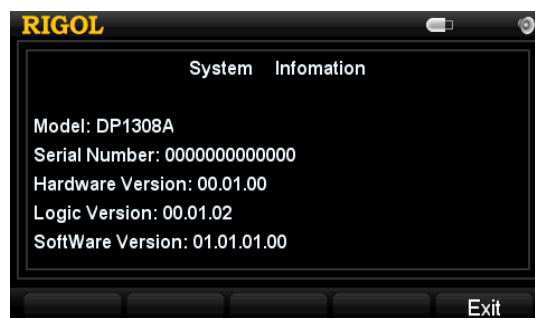


Figure 2-32 System information settings



## Calibrate

Before enter the calibration interface, correct password must be input.

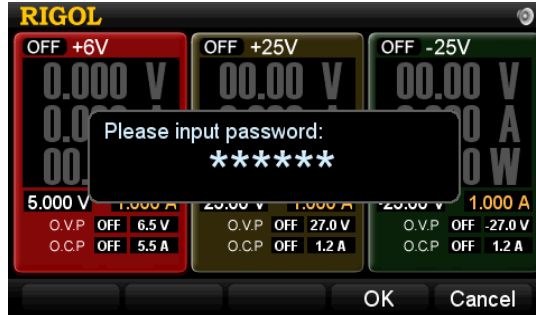


Figure 2-33 Input interface of calibration code

### NOTE

- The instrument has been calibrated before leaving factory. Personal calibration is not recommended. For calibration help, please contact **RIGOL** technical support.

## Timer Setting

In timer setting interface, you can set user-defined voltage, current and output time as well as up to five groups timing output for each channel.

See the figure below: the interface is divided into two parts: parameter setting area (right) and waveform display area (left).

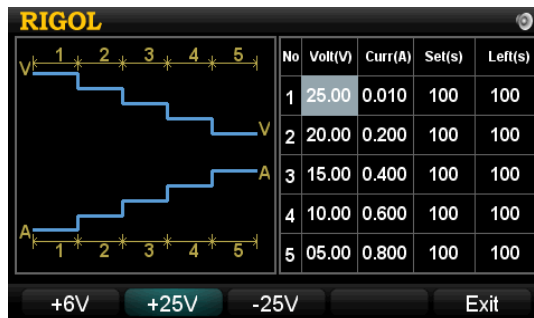


Figure 2-34 Timing Settings

In parameter setting area, three kinds of parameters for each output are available to set: voltage (Volt), current (Curr) and time (Set).

In waveform display area, the system displays waveform based on specified voltage (Volt) and current (Curr) for user to view the output state more clearly and directly.

### General condensed summaries:

- If Timing output is disabled, the parameter "Left(s)" in parameter setting area is equal to "Set(s)".
- If Timing Output is enabled, the instrument starts output with first group of settings after you enable relative channel, and the value of "Left(s)" is on the decrease until to 0, at this moment, the instrument enters next group and so on until finish outputs of all settings.

## Online Help System

Online help system provides the help information about buttons on the front panel (except for numeric keys and direction keys), which make users acquire prompt or help information about each function and the operation methods more conveniently and quickly.

After you press **Help** (the light is on), a letter "HELP" will shown at status bar; then, press desired help button and the related help information will shown on the screen, meanwhile, **Help** light goes out and the letter "HELP" disappears. Press **Exit** to quit help menu.






Figure 2-35 Help information


# Key Lock

This function is widely used in product line of industry to avoid misoperation.

## 1. Local Mode

In Local mode, press and hold "Little Key  (number 7) in digital keyboard to lock all buttons except power button , "Little Key" and **All Off**, at the moment, a sign  appears on the screen. To unlock the keyboard, press "Little Key" again.

## 2. Remote Mode

In Remote mode, all buttons are locked automatically except power button , "Little Key" and **All Off**. To exit remote mode, press "Little Key" again.

## Chapter 3 Remote Control

DP1308A Programmable Linear DC Power Supply confirms to LXI-C standard and supports remote control. Please take the following steps to operate:

### 1. LAN Setting

Make sure DP1308A has been connected to local area network, then press **I/O** → **LAN** to enter LAN parameter setting interface. Set and obtain IP address referring to the introduction of “I/O Setting” in chapter 2.



Figure 3-1 Set the LAN

### 2. Remote Control

- (1) Input IP address obtained from LAN Setting interface in internet explorer, entering to the following welcome interface.



Figure 3-2 Welcome interface

A hint “identification!” will pop up on the screen of the instrument after clicking “Web Identification indicator”. See figure 3-2, this page is available to overview

information about this instrument, as well as offers seven functions, including “Welcome Page”, “Network Status”, “Web Control”, “Help”, “Security” and “LXI”.

- (2) To view TCP/IP and Network Hardware Configuration, please click “Network Status” icon to enter the network status information interface as follows.

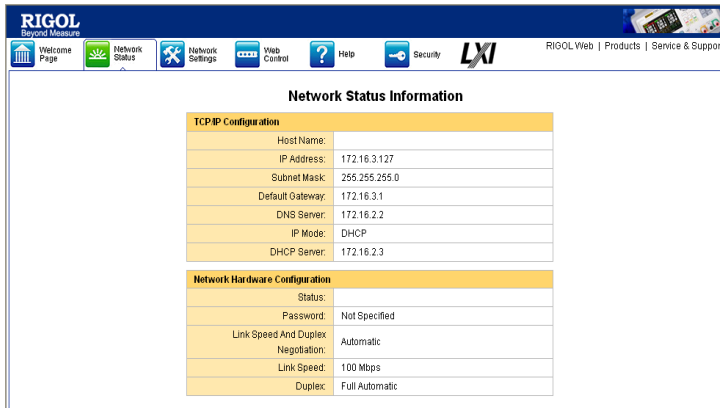


Figure 3-3 Network status information

- (3) Enter IP setting interface by clicking “Network Settings” icon. See figure below.

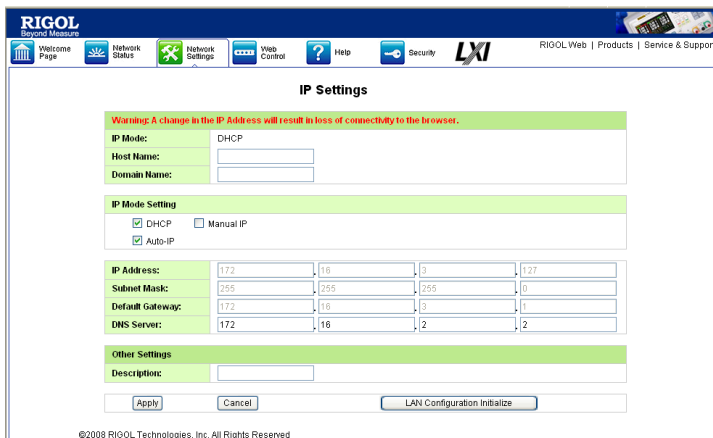


Figure 3-4 IP settings

After IP setting, you can choose “Apply” to validate the modification, or choose “Cancel” to call off, as well as choose “LAN Configuration Initialize” to recover the initial value.

- (4) Click “Web Control” icon to get the following interface, you could change the instrument setting by using the mouse to click corresponding keys\* via virtual panel, so as to achieve remote control of DP1308A.

**NOTE\*:** Several keys or functions cannot be controlled via network, to which an icon “Ⓛ” will appear when the mouse is pointing.



Figure 3-5 Control DP1308A via web

### Explanations:

In condition of instrument password is effective, the system will pop up a dialog as figure below when use “Network Settings” and “Web Control” functions (Note that the default user name and password are both empty, to modify the password, please refer to introduction of (6)).

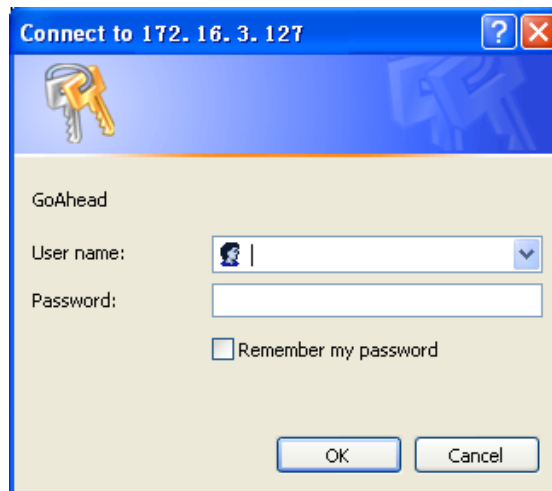


Figure 3-6 Password input dialog

- (5) In order to view more information about all pages of the instrument, please go into the help interface via clicking “Help” icon.

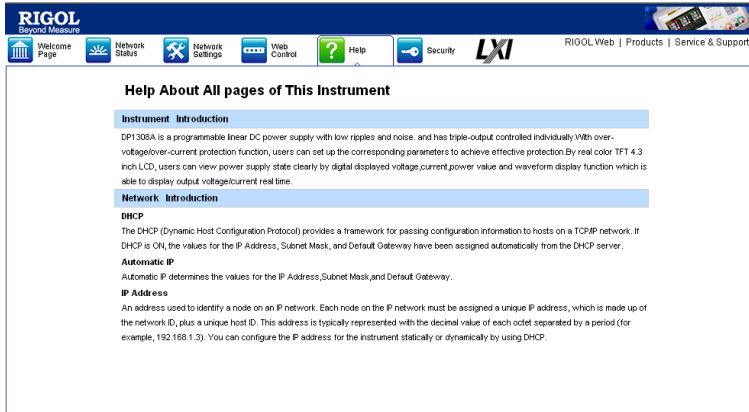


Figure 3-7 Help information interface

- (6) Click “Security” icon to get the security interface, which enable users to modify the password by inputting the old password, new password and confirm password in turns. Finally, click “Apply”, a hint “Note: Your password setting successful” will pop up, indicating that the password for “Network Settings” and “Web control” has been modified successfully.

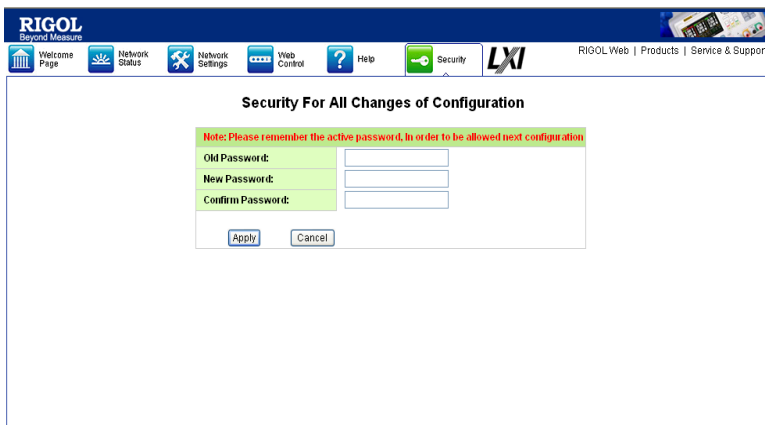


Figure 3-8 Security interface

- (7) Click “LXI” icon to enter LXI website (<http://www.lxistandard.org/>), so as to obtain more information about LXI standard.



## Chapter 4 Troubleshooting

### 1. After the instrument is powered on, the screen still dark (no display):

- (1) Check the power cord connection.
- (2) Ensure the power indicator is lighting and flickering.
- (3) Pull out the power cord from instrument and ensure the voltage selector is in right scale and the fuse is suitable and intact.
- (4) If the problem still remains, please ask **RIGOL** for help.

### 2. Constant voltage output is abnormal:

- (1) Check whether the maximum power from selected channel meets load requirement.
- (2) If meet, please do:
  - Verify whether the current value of this channel is appropriate, if lower, please increase it in moderation.
  - Ensure the cord used for connecting load and power contracts well and no short circuit occurs.
  - Check if the load goes wrong.
- (3) If the problem still remains, please ask **RIGOL** for help.

### 3. Constant current output is abnormal:

- (1) Check whether the maximum power of selected channel meets load requirement.
- (2) If meet, please do:
  - Verify whether the voltage value of channel is appropriate, if lower, please increase it in moderation.
  - Ensure the cord used for connecting load and power contracts well and no short circuit occurs.
  - Check if the load goes wrong.
- (3) If the problem still remains, please ask **RIGOL** for help.

### 4. U disk can't be identified:

- (1) Check whether the U disk works normally.
- (2) Ensure the U disk used now is Flash, as the hard disk can not be supported.
- (3) Restart the instrument and insert U disk again.
- (4) If the problem still remains, please ask **RIGOL** for help.



## Chapter 5 Specifications

DP1308A Programmable Linear DC Power Supply specification and operating characteristics are based on the instrument having been operated continuously for 30 minutes under the specified operating temperature.

### NOTE:

All the specifications below apply to all the three channels output unless where noted.

Model	DP1308A		
Channels	+6V	+25V	-25V
<b>DC output (@ 0°C~40°C)</b>			
Voltage	0~+6V	0~+25V	0~-25V
Current	0~5A	0~1A	0~1A
Overshoot Protection	0.1V~6.5V	0.1V~27V	-0.1V~-27V
Overcurrent Protection	0.1A~5.5A	0.1A~1.2A	0.1A~1.2A
<b>Load Regulation± (output percentage + offset)</b>			
Voltage	<0.01%+2mV		
Current	<0.01%+250μA		
<b>Line Regulation± (output percentage + offset)</b>			
Voltage	<0.01%+2mV		
Current	<0.01%+250μA		
<b>Ripple and Noise (20 Hz~20 MHz)</b>			
Normal Mode Voltage	<350μVrms/2mVpp		
Normal Mode Current	<2mArms	<500μArms	
Common Mode Current	<1.5μArms		
<b>Accuracy 12 Months<sup>[1]</sup> (25°C±5°C)±(output percentage + offset)</b>			
Program ming	Voltage	0.1%+5mV	0.05%+20mV
	Current	0.2%+10mA	0.15%+4mA
Read Back	Voltage	0.1%+5mV	0.05%+10mV
	Current	0.2%+10mA	0.15%+4mA
<b>Resolution</b>			
Programming	0.5mV/0.5mA		1.5mV/0.1mA
Read Back	0.5mV/0.5mA		1.5mV/0.1mA
Meter	1mV/1mA		10mV/1mA

**Transient Response Time**

Less than 50 $\mu$ s is spent on recovering the voltage within 15mV during the output current changes from full load to half load or half to full.

**Command Processing Time<sup>[2]</sup>**

<50ms

**Temperature Coefficient per °C (output percentage + offset)**

Voltage	0.01%+2mV	0.01%+3mV
Current	0.02%+3mA	0.01%+0.5mA

**Stability<sup>[3]</sup>  $\pm$  (output percentage + offset)**

Voltage	0.03%+1mV	0.02%+2mV
Current	0.1%+3mA	0.05%+1mA

**Voltage Programming Speed(to within 1% of total variation range)**

Rising	Full Load	11ms	50ms
	No Load	10ms	45ms
Falling	Full Load	13ms	20ms
	No Load	200ms	400ms

**OVP/OCP**

Accuracy $\pm$ (output percentage + offset)	0.5%+0.5V/0.5%+0.5A
Activation Time	1.5ms (OVP $\geq$ 3V) <10ms (OVP<3V and OCP)

**Machine**

Dimension	235 mm (W) x 155 mm (H) x 384 mm (D)
Weight	8.5 kg

**Power Supply**

AC Output (50Hz-60Hz)	100Vac $\pm$ 10%, 115Vac $\pm$ 10%, 220Vac $\pm$ 10%, 230Vac $\pm$ 10% (250VAC Max)
--------------------------	--

**Environment**

Working Temperature	Full rated value output: 0°C ~40°C At higher temperature: the output current falls into 50% at the maximum temperature 55°C
Cooling Method	Fan cooling

**Remarks:**

- [1] Specifications are for one hour warm-up and at 25°C.
- [2] The maximum time required for regulating corresponding output when received APPLY and SOURce commands.
- [3] The variation of output within 8 hours after warm-up 30 minutes and both the load circuit and

environment temperature are in constant conditions.



## Chapter 6 Appendix

### Appendix A: DP1308A Accessories

#### Standard Accessories:

- A power cord that fits the standard of destination country
- An USB data cable
- A CD (including User's Guide)
- An INSTRUCTION
- Four fuses (two of 250V/T3A and two of 250V/T2A)

**NOTE:** All the accessories are available by contacting your local **RIGOL** office.

## Appendix B: Warranty

**RIGOL** warrants that its products mainframe and accessories will be free from defects in materials and workmanship within the warranty period. During the period, **RIGOL** guarantees the free replacement or repair of products which are approved defective.

To get repair service or obtain a copy of the whole warranty statement, please contact with your nearest **RIGOL** sales and service office.

**RIGOL** does not provide any other warranty items except the one being provided by this summary and the warranty statement. The warranty items include but not being subjected to the hint guarantee items related to tradable characteristic and any particular purpose.

**RIGOL** will not take any responsibility in cases regarding to indirect, particular and ensuing damage.



## Appendix C: General Care and Cleaning

### General Care

Do not store or leave the instrument in where the instrument exposed to direct sunlight for long periods of time.

### Caution

To avoid damages to the instrument, do not expose it to liquids which have causticity.

### Cleaning

Clean the instrument often based on the operating conditions. To clean the exterior surface, perform the following steps:

1. Disconnect the instrument from all power sources.
2. Clean the loose dust on the outside of the instrument with a lint- free cloth (with a mild detergent and water). When clean the LCD, take care to avoid scarifying it.



### **WARNING**

To avoid injury resulting from short circuit, make sure the instrument is completely dry before reconnecting into a power source.

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