



**ODP3031 Linear Programmable
DC Power Supply
User Manual**

WWW.OWON.COM.HK

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Headquarter: Fujian Lilliput Optoelectronics Technology Co.,Ltd.: The mansion of optoelectronics, 19 Heming Road, Lantian industrial zone, Zhangzhou, Fujian, China

Tel:+86-596-2130430

Fax:+86-596-2109272

Web: www.owon.com.hk

Mail: Business Consulting: info@owon.com.hk

Sale service: service@owon.com.hk

Branch: Xiamen Lilliput Technology Co.,Ltd.: the 5th floor, B Area, Chuangxin Mansion, Software Park, ZhenZhuWan, Huandao RD, Xiamen, Fujian, China

Tel:+86-592-2575666

Fax:+86-592-2575669

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For better after-sales service, please visit www.owon.com.hk and register the purchased product online.

Excepting the after-sales services provided in this summary or the applicable warranty statements, Lilliput will not offer any guarantee for maintenance definitely declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. Lilliput should not take any responsibilities for any indirect, special or consequent damages.

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1. General Safety Requirements

Before any operations, please read the following safety precautions to avoid any possible bodily injury and prevent this product or any other products connected from damage. In order to avoid any contingent danger, this product is only used within the range specified.

Check AC power input setting according to the standards in your own country (see Page 10, "AC Power Input Setting").

Only the qualified technicians can implement the maintenance.

To avoid Fire or Personal Injury:

- **Use Proper Power Cord.** Use only the power cord supplied with the product and certified to use in your country.
- **Product Grounded.** This instrument is grounded through the power cord grounding conductor. To avoid electric shock, the grounding conductor must be grounded. The product must be grounded properly before any connection with its input or output terminal.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markers of this product. Refer to the user's manual for more information about ratings before connecting to the instrument.
- **Do not operate without covers.** Do not operate the instrument with covers or panels removed.
- **Use Proper Fuse.** Use only the specified type and rating fuse for this instrument.
- **Avoid exposed circuit.** Do not touch exposed junctions and components when the instrument is powered.
- **Do not operate if in any doubt.** If you suspect damage occurs to the instrument, have it inspected by qualified service personnel before further operations.
- **Use your instrument in a well-ventilated area.** Please keep well ventilated and inspect the intake and fan regularly.
- **Do not operate in wet conditions.** In order to avoid short circuiting 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 injuries, it is important to operate the device away from an explosive atmosphere.
- **Keep product surfaces clean and dry.** To avoid the influence of dust or moisture in air, please keep the surface of device clean and dry.

2. Safety Terms and Symbols

Safety Terms

Terms in this Manual. The following terms may appear in this manual:



Warning: Warning indicates the conditions or practices that could result in injury or loss of life.



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

Terms on the Product. The following terms may appear on this product:

Danger: It indicates an injury or hazard may immediately happen.

Warning: It indicates an injury or hazard may be accessible potentially.

Caution: It indicates a potential damage to the instrument or other property might occur.

Safety Symbols

Symbols on the Product. The following symbol may appear on the product:



Hazardous Voltage



Refer to Manual



Protective Earth Terminal



Chassis Ground



Public Ground

3. General Characteristics

OWON ODP3031 products are new high-performance programmable linear DC power supplies. The excellent features of this series include up to 100 output groups with configurable timer, high-resolution LCD display, extremely clean ripple and noise, comprehensive over-voltage over-current over-temperature protection, user friendly interface and panel layout, and variety standard interfaces to meet diverse test requirements.

Features and benefits:

- ◆ Outstanding line regulation rate: $\leq 0.01\% + 3\text{mV}(\text{voltage})$, $\leq 0.1\% + 3\text{mA}(\text{current})$;
- ◆ Outstanding load regulation rate: $\leq 0.01\% + 3\text{mV}(\text{voltage})$, $\leq 0.2\% + 3\text{mA}(\text{current})$;
- ◆ Low ripples noise: $\leq 300 \mu\text{V}_{\text{rms}} / 2 \text{mV}_{\text{pp}}$;
- ◆ Up to 100 groups time settings;
- ◆ High-precious resolution output;
- ◆ 3.9 inch high resolution (480*320 pixels) TFT LCD display;
- ◆ Interface: USB2.0, RS232.

4. Quick Start

This chapter will deal with the following topics mainly:

- **Front/Rear Panel Overview**
- **User Interface Overview**
- **How to Implement General Inspection**
- **How to Implement Power-On Check**
- **How to Implement Output Inspection**
- **Instruction of the System Menu Operation**

4.1 Front/Rear Panel and User Interface

4.1.1 Front Panel

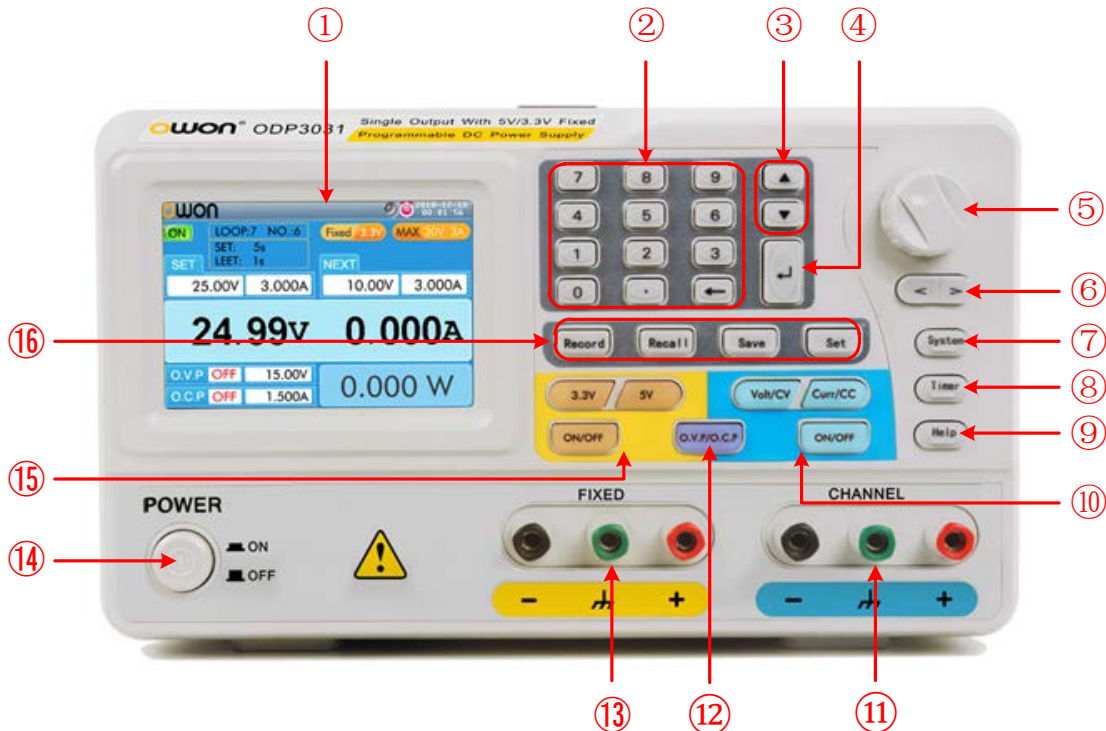


Figure 4-1 Front panel overview

① LCD	Display the user interface
② Numeric keys area	Parameter input, include the numeric keys, decimal point and backspace key.
③ Up and down direction key	Select menu or change the parameter
④ Enter key	Enter menu or confirm the parameter entered
⑤ Knob	Select menu or change the parameter, pressing it has the same effect as pressing the enter key
⑥ Left and right direction key	Select menu or move the cursor
⑦ System key	Enter the system menu
⑧ Timer key	Enter/exit timer status
⑨ Help key	View the built-in help
⑩ Channel control area	Volt/CV key: Set the output voltage of Channel Curr/CC key: Set the output current of Channel Blue ON/OFF key: Enable/disable the output of Channel

⑪	Output terminals of Channel	Channel output connectors
⑫	O.V.P/O.C.P key	Set O.V.P/O.C.P (or Timer range)
⑬	Fixed output terminals	Output fixed 3.3V/5V , max output current is 3A
⑭	Power button	Turn on/off the instrument
⑮	Fixed output control area	3.3V key: Fixed output voltage is set to 3.3V 5V key: Fixed output voltage is set to 5V Orange ON/OFF key: Enable/disable the fixed output
⑯	Function keys	Record key: Record the current output data as a txt file and save to USB disk Recall key: Recall the stored settings file Save key: Save the current setting parameters Set key: Enter/exit the setting interface of timing output

Instructions for panel key indicator

ON/OFF key: The indicator will be lighted after you turn on the channel or fixed output.

3.3V key: Fixed output voltage is set to 3.3V

5V key: Fixed output voltage is set to 5V

Volt/CV key: The indicator will be lighted when the channel is in Constant Voltage output mode; blinking indicates you are setting the output voltage through the input box.

Curr/CC key: The indicator will be lighted when the channel is in Constant Current output mode; blinking indicates you are setting the output current through the input box.

4.1.2 Rear Panel

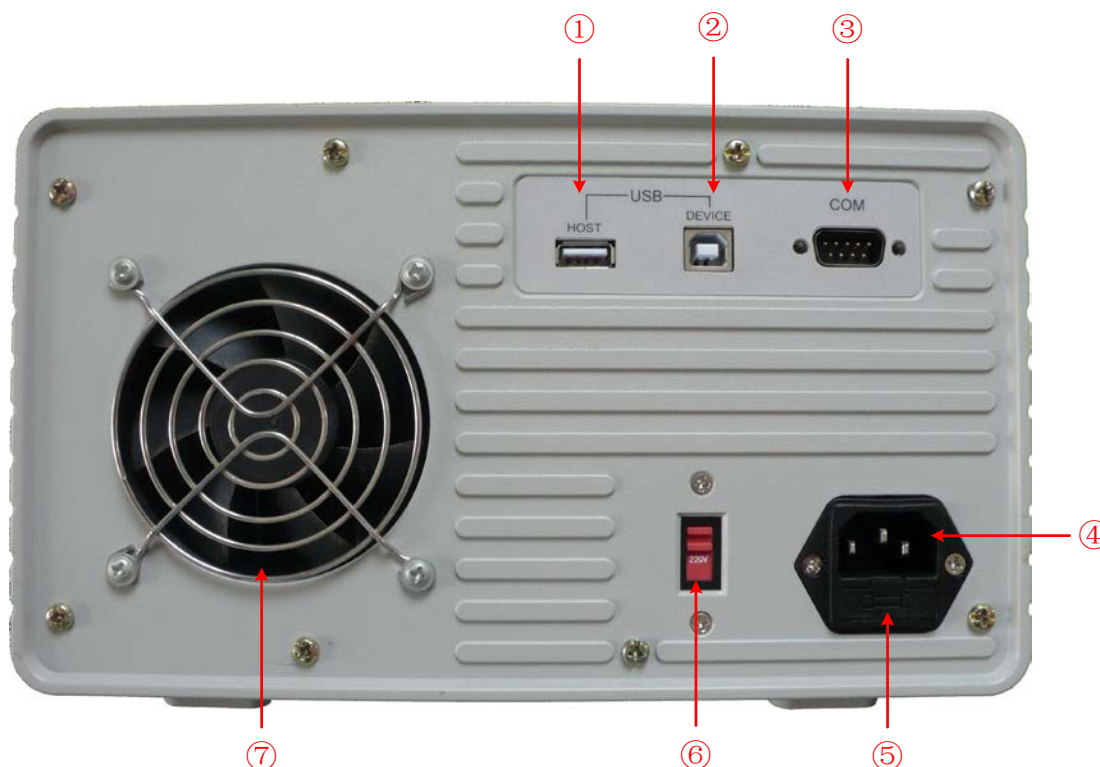


Figure 4-2 Rear panel overview

① USB Host port	Connect as a "host device" with an external USB device, such as connect a USB disk to the instrument.
② USB Device port	Connect as a "slave device" with an external USB device, such as connect the instrument to a PC.
③ COM port	Connect the instrument with external equipment as serial port
④ Power socket	AC input connector
⑤ Fuse	Use the specified fuse according to the voltage scale
⑥ Power switch	Switch between 110V and 220V
⑦ Fan	Fan inlet

4.1.3 User Interface

- **User interface in Normal status**

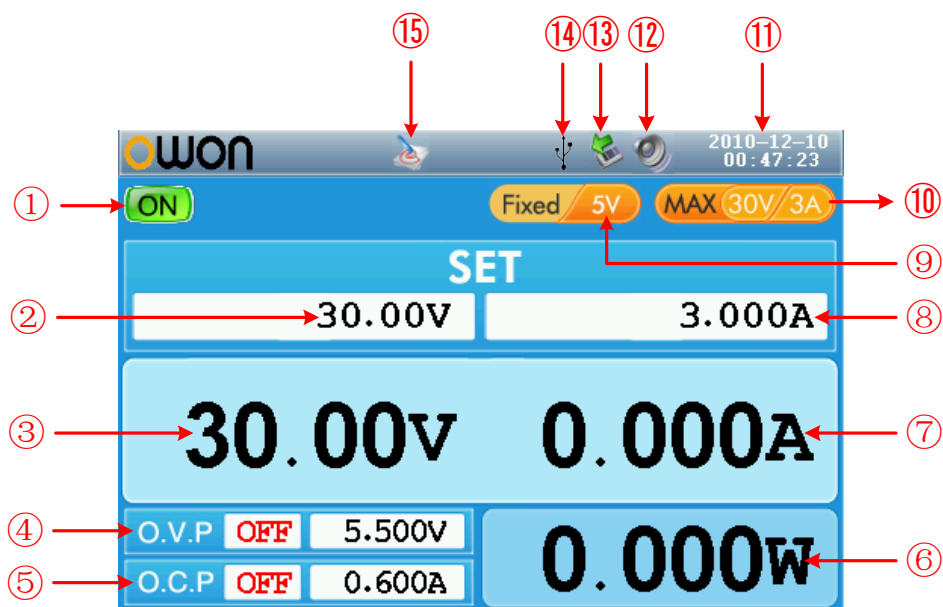



Figure 4-3 User interface in Normal status

- | | |
|---|---|
| ① | Output status of Channel |
| ② | Set values of voltage for Channel |
| ③ | Actual output value of voltage |
| ④ | Status and set values of O.V.P in current status |
| ⑤ | Status and set values of O.C.P in current status |
| ⑥ | Actual output value of power |
| ⑦ | Actual output values of current |
| ⑧ | Set values of current for Channel |
| ⑨ | The set voltage of fixed output |
| ⑩ | Maximum ratings of voltage and current |
| ⑪ | System date and time |
| ⑫ | The buzzer is on,  indicates off |
| ⑬ | A USB device is detected |
| ⑭ | Connect as a slave device with PC |
| ⑮ | Recording the current output |

● User interface in Timer status

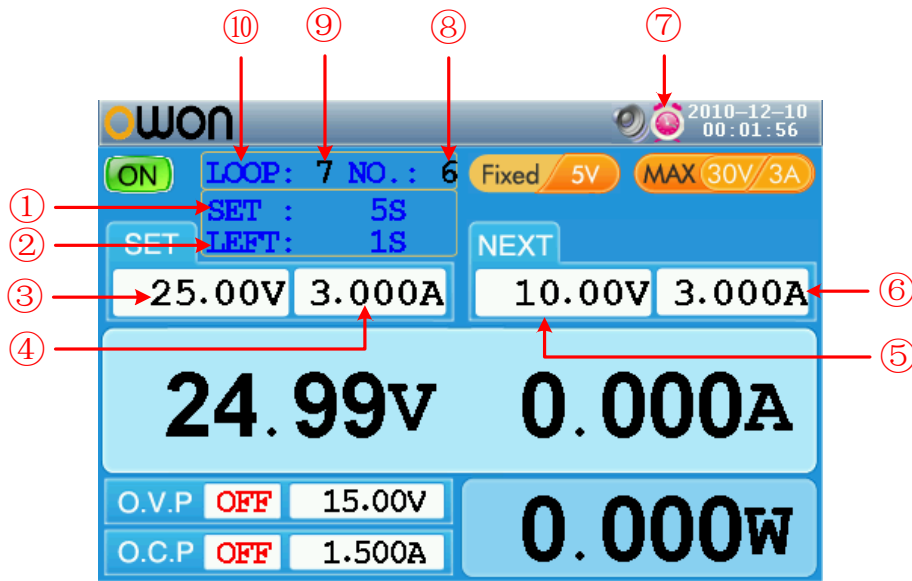


Figure 4-4 User interface in Timer status

- | | |
|---|---|
| ① | Set time of current output |
| ② | Left time of current output |
| ③ | Set values of voltage for Channel |
| ④ | Set values of current for Channel |
| ⑤ | Set values of voltage that will be output at the next fixed times |
| ⑥ | Set values of current that will be output at the next fixed times |
| ⑦ | Timer Status icon |
| ⑧ | The parameter number of the current output |
| ⑨ | Timer range |
| ⑩ | Output mode of timing output (Sequence / Loop) |

4.2 General Inspection

After you get a new ODP3031 power supply, it is recommended that you should make a check on the instrument according to the following steps:

1. Check whether there is any damage caused by transportation.

If it is found that the packaging carton or the foamed plastic protection cushion has suffered serious damage, do not throw it away first till the complete device and its accessories succeed in the electrical and mechanical property tests.

2. Check the Accessories

The supplied accessories have been already described in the "Appendix A: Enclosure" of this Manual. You can check whether there is any loss of accessories with reference to this description. If it is found that there is any accessory lost or damaged, please get in touch with the distributor of Lilliput responsible for this service or the Lilliput's local offices.

3. Check the Complete Instrument

If it is found that there is damage to the appearance of the instrument, or the instrument cannot work normally, or fails in the performance test, please get in touch with the Lilliput's distributor responsible for this business or the Lilliput's local offices. If there is damage to the instrument caused by the transportation, please keep the package. With the transportation department or the Lilliput's distributor responsible for this business informed about it, a repairing or replacement of the instrument will be arranged by the Lilliput.

4.3 Power-On Check

4.3.1 AC Power Input Setting

ODP3031 adopt 110V/220V AC power source. Users should regulate the voltage scale of the **Power Switch** according to the standards in their own country (see *Figure 4-2*) at the rear panel and use an appropriate fuse.

Voltage	ODP3032
AC110V	125 V, F5 A
AC220V	250 V, F3 A

To change the input voltage scale of the instrument, do the following steps:

- (1) Turn off the power button at the front panel and remove the power cord.
- (2) Check if the fuse installed before leaving factory (250 V, F3 A) can match with the selected voltage scale; if not, pry the cover open using a straight screwdriver (see ⑤ in *Figure 4-2*), change the fuse.
- (3) Regulate the **Power Switch** to the right voltage scale.

4.3.2 Power On

- (1) Connect the instrument to the AC supply using the supplied power cord.



Warning:

To avoid electric shock, the instrument must be grounded properly.

- (2) Press down the **power button** at the front panel, the orange and blue key is lighted; the screen shows the boot screen.
- (3) Press any key to enter.

4.4 Output Inspection

Output inspection is to ensure that the instrument can achieve its rated outputs and properly respond to operation from the front panel. For the procedures below, it is suggested that you read *"Turn On/Off the Output"* on P14 and *"Set the Output Voltage/Current"* on P14.

4.4.1 Voltage Output Inspection

The following steps verify basic voltage functions without load:

- (1) When the instrument is under no load, power on it; make sure that the output current setting value is none-zero.
- (2) Turn on the channel output. The **ON/OFF** and **Volt/CV** key is lighted, which indicates the channel you opened is in Constant Voltage output mode.
- (3) Set some different voltage values; check if the actual voltage value displayed is close to the set voltage value, and to check if the actual current value displayed is nearly zero.
- (4) Check that if the output voltage can be adjusted from zero to the maximum rating 30V.

4.4.2 Current Output Inspection

The following steps check basic current functions with a short across the power supply's output:

- (1) Power on the instrument.
- (2) Connect a short across (+) and (-) output terminals with an insulated test lead. Use a wire size sufficient to handle the maximum current 3A.
- (3) Set the output voltage to the maximum rating 30V.
- (4) Turn on the channel output. The **ON/OFF** and **Curr/CC** key is lighted, which indicates the channel you opened is in Constant Current output mode.
- (5) Set some different current values; check if the actual current value displayed is close to the set current value, and to check if the actual voltage value displayed is nearly zero.
- (6) Check that if the output current can be adjusted from zero to the maximum rating 3A.
- (7) Turn off the channel output and remove the short wire from the output terminals.



4.5 System Menu Operation

(1) Display the menu


Press **System** key, the System menu is shown on the screen.

(2) Choose the menu

- Press **▲** / **▼** direction key or turn the **knob** to move around the menu items.
- Press any one of the **<** direction key, the **↵** key or the **knob** to enter the submenu; to return to main menu, press the **>** direction key.

- In the submenu, press  /  direction key or turn the **knob** to move around the submenu items.

(3) Enter the menu

Press the  key or the **knob** to enter the selected menu item.

(4) Exit the menu

Press **System** key to close the menu or the pop-up box.

Note:

In this document, [**Pro Set** → **O.V.P**] means:

Enter the **Pro Set** item in **System** menu, and then choose the **O.V.P** submenu.

5. Front Panel Operation

This chapter will deal with the following topics mainly:

- **How to Turn On/Off the Output**
- **Set the Output Voltage/Current**
- **Over Voltage/Current Protection**
- **Timing Output**
- **Save/Recall/ Record Functions**
- **System Settings**
- **How to Use Built-in Help**

5.1 Turn On/Off the Output

Press the **orange ON/OFF** key to turn on/off the Fixed output.

Press the **blue ON/OFF** key to turn on/off the Channel output.

The **ON/OFF** key is lighted when the channel is on.

Note:

When the channel output is short-circuited, the instrument will sound an alarm.

5.2 Set the Output Voltage/Current

5.2.1 Set the Fixed Output Voltage







Press the **3.3V** key or **5V** key to switch the fixed output voltage between 3.3V/5V.

5.2.2 Set the Output Voltage/Current of Channel

You can set the output voltage/current through input box. The range of voltage rating is 0~30V; the range of current rating is 0.02~3A.

Note: The output voltage/current cannot be set in Timer status. If you want to set it, you should exit the Timer status first.

- (1) Press the **Volt/CV** or **Curr/CC** key, the input box of **Channel** output voltage/current will pop up.
- (2) The key light will start blinking, indicating to input, there are two methods to change the value.

Modify: Turn the **knob** or press the  /  direction key to change the value by the unit of cursor position, hold down the  /  direction key to change continuously. Press the  /  key to move the cursor.

Input: Use the numeric keys to enter a desired value, the original value will be cleared, and display the value you entered.

- (3) Press the  key to confirm.

Note: If the input value is out of the rated range, the box prompts "ERROR"; you need to input another value within the rated range.

5.3 Over Voltage/Current Protection

When the Over Voltage Protection (O.V.P) or Over Current Protection (O.C.P) is enabled, once the output voltage/current reaches the set value of O.V.P/O.C.P, the instrument will cut off the output. The value of O.V.P/O.C.P which causes cutting off will turn red and

flashing; the instrument will make a buzzing sound if the buzzer is turned on.




Note:

When the instrument disables the output due to protection, after you make some adjustments, the channel must be restarted to output normally.




This function can keep the power output from exceeding the load rating in order to protect the load. The O.V.P/O.C.P can be set separately for different status (normal, timer). You can enable or disable these functions as required.

The parameters of the O.V.P/O.C.P set in normal status take effect in normal status. The parameters of the O.V.P/O.C.P set in timer status take effect in timer status.

5.3.1 Set O.V.P

- (1) Press the **O.V.P/O.C.P** key repeatedly to switch to "Set O.V.P" setting box; or press the **System** key, in normal status, enter [O.V.P], in timer status, enter [Pro Set → O.V.P].
- (2) Press the  /  key to switch the state of the O.V.P between "ON" or "OFF", the O.V.P in current status is enabled or disabled.
- (3) Use the numeric keys to enter the O.V.P value in current status. The maximum is 31.5V. Press the  key to confirm.

5.3.2 Set O.C.P

- (1) Press the **O.V.P/O.C.P** key repeatedly to switch to "Set O.C.P" setting box; or press the **System** key, in normal status, enter [O.C.P], in timer status, enter [Pro Set → O.C.P].
- (2) Press the  /  key to switch the state of the O.C.P between "ON" or "OFF", the O.C.P in current status is enabled or disabled.
- (3) Use the numeric keys to enter the O.C.P value in current status. The maximum is 3.15A. Press the  key to confirm.

5.4 Timing Output

The timing output function can preset up to 100 groups of timing parameters. When you turn on the timing output, the instrument will output the pre-specified voltage, current in pre-specified time.

You can set special O.V.P/O.C.P for timer status; see "Over Voltage/Current Protection" for more details.

5.4.1 Enter/Exit Timer Status

Press **Timer** to enter/exit timer status.

The  icon identifies the system is in timer status.

5.4.2 Timer Setting

Before turning on the timing output, you should set the timer parameters, including voltage, current and output time. This function allows up to 100 groups of timer parameters.

In timer status, press the **Set** key to enter/exit timer setting interface.

No.	Volt (V)	Curr (A)	Time (S)
0	25.000	1.000	5
1	6.000	2.000	5
2	5.000	3.000	5
3	5.000	3.000	5
4	6.000	0.500	10
5	25.000	3.000	32
6	10.000	3.000	6
7	0.000	0.000	6

Page number: 1

Figure 5-1 Timer Setting Interface

The selected parameter will be highlighted.

Press the **▲** / **▼** key to change the parameter item.

After selecting the parameter, use the numeric keys to enter a desired value, press the **↵** key to confirm.

Press the **◀** / **▶** key to go to the previous or next setting page.

Note:

If the input value exceeds the rating, the system will change it to the maximum rating automatically after pressing the **↵** key to confirm.

5.4.3 Timer Range

Timer range setting denotes that you can set the last number of timer parameter group and output mode. You can find out the **TimerRng** submenu of system menu only in timer status. If turn on the timing output, the system will output the pre-set parameters between 0 and the set number at sequence or loop mode.

- (1) In timer status, Press the **System** key, enter [**TimerRng**].
- (2) The timer range setting box pops up. Use the numeric keys enter a number (0~99), press the **▲** / **▼** key to switch between **Sequence** and **Loop**, press the **↵** key to confirm.


5.4.4 Turn On/Off Timing Output

In timer status, Press **blue ON/OFF** key to turn on/off the timing output of **Channel**.

Note:







In the process of timing output, closing the channel output will reset the timer; turning on the channel again will restart the timing output and the timer.

5.5 Save/Recall/Record










ODP3031 support operations with a USB flash device and local file storage, including: store, recall and delete current setting parameters. The current data of the channel can be recorded into a txt file, which stored in USB disk. You can connect the USB disk to the ① **USB Host interface** in *Figure 4-2*. After connecting the USB disk successfully, an icon  will be shown at the top of the screen.

5.5.1 Save System Parameters

In Normal Status, press the **Save** key to save the parameters about the output voltage/current, the O.V.P/O.C.P. You can name the setting files. This function is not available in Timer Status.

- (1) In Normal Status, press the **Save** key to enter the function interface (press it again to exit). Press the  /  key to choose the storage location as "Local" or "UDisk". Turn the **knob** to change the selected character in "Save name" input box. Press the  key to add the next character. Press the  key to select the previous character. Press the  key to delete the selected character.
- (2) Press the  key to store after editing the file name.



5.5.2 Recall and Delete System Parameters File

- (1) Press the **Recall** key to enter the function interface (press it again to exit). Press the  /  key to choose the storage location. Press the  key to show the list of system parameters files.
- (2) The list displays the file name and stored date. Turn the **knob** or press the  /  key to select a file, and then press the  key.
- (3) Two options appear on the screen: "Load" and "Delete". Turn the **knob** or press the  /  key to switch between the options. Press the  key to confirm.

5.5.3 Record the Output

You have to insert a USB disk before using this function. By pressing the **Record** key, the current data of the channel can be recorded into a txt file, which stored in USB disk.

- (1) Press the **Record** key; press the numeric keys to set the interval.

- (2) Press the  key to start recording. During recording, an icon  is shown on the status bar.
- (3) Press the **Record** key again to stop recording.



5.6 System Settings

You can set the system by operating the System Menu. It is suggested that you should read the "System Menu Operation" on P11 first, so as to be familiar with the menu operation.

5.6.1 Set Language



Press the **System** key and enter [**Language**]; choose the desired language. The supported languages include: Chinese, English and so on.

5.6.2 Set Bright






Press the **System** key and enter [**Display** → **Bright**]. Press the  /  key or turn the knob to adjust the screen brightness (1~10).

5.6.3 Set Screen Saver Time




The screen saver will run automatically if no operation is taken for any key within the set time. Press any key to resume.

Press the **System** key and enter [**Display** → **ScrSaver**]. Press the  /  key or turn the knob to adjust the screen saver time (1~99 minutes). When it is set to "00", the screen saver is disabled.


5.6.4 Set System Time

Press the **System** key and enter [**Sys Set** → **SysTime**]. Press the  /  key or turn the knob to set the selected value. Press the  /  key to move the cursor. Press the  key to confirm.

5.6.5 Buzzer

Press the **System** key and enter [**Sys Set** → **Buzzer**]. Press the  key to turn on/off the buzzer. When the buzzer is on, an icon  will be shown on the status bar. You will hear a key tone once a key is pressed down; when the system prompts the instrument will make a buzzing sound, e.g. cutting off the output due to O.V.P/O.C.P. When the buzzer is off, an icon  will be shown on the status bar.


5.6.6 Short Circuit Protection

Press the **System** key and enter [**Sys Set** → **ShortCurPro**]. Press the  key to check/uncheck it. If you check it, when short circuit occurs, the instrument will cut off the output; uncheck it to still output.

5.6.7 View System Information

Press the **System** key and enter [SysInfo]. You can view the Serial Number, Software Version and Hardware Version.





5.6.8 Set as Default

Press the **System** key and choose [Default], press the  key to use the factory defaults, see table below.

	Voltage	Current	O.V.P value	O.C.P value	O.V.P/O.C.P status
Normal status	5 V	0.5 A	5.5 V	0.6 A	OFF
Timer status			15 V	1.5 A	OFF

Menu Item	Defaults
Brightness	9
Screen Saver	OFF
Buzzer	ON

5.7 Use Built-in Help

- (1) Press **Help** function button, the catalog will display in the screen.
- (2) Press the  /  key or turn the knob to choose help topic.
- (3) Press the  key to view the details about the topic; press the  key to go back to the catalog.
- (4) Press **Help** again to exit the help, or just do other operations.

6. Communication with PC

ODP3031 Power Supply supports communications with a PC through USB or COM interface. You can use the ODP communication software to set the parameters, control the output of the power supply, and synchronously display the actual output values on the Power Supply screen.

(1) **Install the software**

Install the ODP communication software on the supplied CD.

(2) **Connect the instruments**

Use a USB data cable to connect the **USB Device port** in the rear panel of the Power Supply to the USB port of a PC. Or use a data cable to connect the **COM port** in the rear panel of the Power Supply to the COM interface of a PC.

(3) **Install the driver**

When the Power Supply is turned on, a dialog will appear on the PC screen and guide you to install the USB driver. The driver is in the "USBDRV" folder under the directory where the ODP communication software is installed, such as "C:\Program Files\ODP\USBDRV".

(4) **Use the software**

Run the ODP software; click the "Menu" button in the top right corner. Choose the "Communications → Ports-Settings" to set the corresponding communication parameters. After connect successfully, the connection information in the bottom right corner of the software will turn green. To learn about how to operate the software, you can choose "Communications → Help → Help" to open the help file.

7. Troubleshooting

1. The instrument is powered on but no Display.

- Check if the power is connected properly.
- Check if the Power Switch is in the proper voltage scale.
- Check if the fuse which is below the AC Power socket is used appropriately and in good condition (the cover can be pried open with a straight screwdriver).
- Restart the instrument after the steps above.
- If the problem still exists, please contact **Lilliput** for our service.

2. The output is abnormal:

- Check if the output voltage is set to 0V. If so, set it to other value.
- Check if the output current is set to 0A. If so, set it to other value.
- When in timer status, check if there is any voltage/current value of timer setting is set to 0. If so, set it to other value.
- If the problem still exists, please contact **Lilliput** for our service.

3. Cannot identify the USB device correctly:

- Check if the USB device is in good condition.
- Check if the used USB device is a flash device, note a hard disk cannot be supported.
- Restart the instrument and insert your USB flash device again.
- If the problem still exists, please contact **Lilliput** for our service.

8. Technical Specifications

The specifications below are based on the instrument having run for at least 30 minutes continuously under the specified operating temperature.

		Channel	Fixed 5V/3.3V
DC Output Ratings	Voltage	0~30V	5V/3.3V
	Current	0~3A	3A
Line Regulation	CV	$\leq 0.01\% + 3\text{mV}$	$\leq 3\text{mV}$
	CC	$\leq 0.1\% + 3\text{mA}$	
Load Regulation	CV	$\leq 0.01\% + 3\text{mV}$	$\leq 0.1\% + 3\text{mV}$
	CC	$\leq 0.2\% + 3\text{mA}$	
Noise and Ripple (20Hz~7MHz)	CV	$\leq 300 \mu\text{Vrms} / 2 \text{ mVpp}$	$\leq 300 \mu\text{Vrms} / 2 \text{ mVpp}$
	CC	$\leq 3\text{mA}_{\text{rms}}$	
Settings Resolution	Voltage	1mV	None
	Current	1mA	None
Settings Accuracy (25°C ± 5°C)	Voltage	$\leq 0.05\% + 3\text{mV}$	None
	Current	$\leq 0.1\% + 3\text{mA}$	None
Read Back Resolution	Voltage	1mV (<10V) 10mV ($\geq 10\text{V}$)	None
	Current	1mA	None
Read Back Accuracy (25°C ± 5°C)	Voltage	$\leq 0.05\% + 3 \text{ digits}$	None
	Current	$\leq 0.1\% + 3 \text{ digits}$	None

Display

Display Type	3.9 inch colored LCD (Liquid Crystal Display)
Display Resolution	480 (Horizontal) × 320 (Vertical) Pixels
Display Colors	65536 colors, TFT screen

Power

Supply	110 Vac ± 10%, 220 Vac ± 10%; AC input 50/60Hz	
Fuse	110V	125 V, F5A
	220V	250 V, F3A

Environment

Temperature	Working temperature: 0°C ~ 40°C Storage temperature: -20°C ~ 60°C
Relative Humidity	≤ 90%
Height	Operating: 3,000 m Non-operating: 15,000 m
Cooling Method	Fan cooling

Mechanical Specifications

Dimension	298mm×202mm×450mm (W*H*D)
Weight	About 7.0 kg

Interval Period of Adjustment:

One year is recommended for the calibration interval period.

9. Appendix

9.1 Appendix A: Enclosure

Standard Accessories:

- A power cord that fits the standard of the destination country
- A USB data cable
- A CD (PC link application software)
- A User Manual

9.2 Appendix B: General Care and Cleaning

General Care

Do not store or leave the instrument where the liquid crystal display will be exposed to direct sunlight for long periods of time.

Caution: To avoid any damage to the instrument, do not exposed it to any sprays, liquids, or solvents.

Cleaning

Inspect the instrument as often as operating conditions require.

To clean the instrument exterior, perform the following steps:

1. Wipe the dust from the instrument surface with a soft cloth. Do not make any scuffing on the transparent LCD protection screen when clean the LCD screen.
2. Disconnect power before cleaning your instrument. Clean the instrument with a wet soft cloth not dripping water. It is recommended to scrub with soft detergent or fresh water. To avoid damage to the instrument, do not use any corrosive chemical cleaning agent.



Warning: Before power on again for operation, it is required to confirm that the instrument has already been dried completely, avoiding any electrical short circuit or bodily injury resulting from the moisture.
