

# **RIGOL**

## **Quick Guide**

English

中文

# **DL3000 Programmable DC Electronic Load**

**Feb. 2017  
RIGOL TECHNOLOGIES, INC.**



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# Guaranty and Declaration

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## Product Certification

**RIGOL** guarantees that this product conforms to the national and industrial standards in China as well as the ISO9001:2008 standard and the ISO14001:2004 standard. Other international standard conformance certifications are in progress.

## Contact Us

If you have any problem or requirement when using our products or this manual, please contact **RIGOL**.

E-mail: [service@rigol.com](mailto:service@rigol.com)

Website: [www.rigol.com](http://www.rigol.com)

## General Safety Summary

1. Only the exclusive power cord designed for the instrument and authorized for use within the local country could be used.
2. Ensure that the instrument is safely grounded.
3. Observe all terminal ratings.
4. Use proper overvoltage protection.
5. Do not operate without covers.
6. Do not insert objects into the air outlet.
7. Use the proper fuse.
8. Avoid circuit or wire exposure.
9. Do not operate the instrument with suspected failures.
10. Provide adequate ventilation.
11. Do not operate in wet conditions.
12. Do not operate in an explosive atmosphere.
13. Keep instrument surfaces clean and dry.
14. Prevent electrostatic impact.
15. Handle with caution.

## Safety Notices and Symbols

### Safety Notices in this Manual:



#### **WARNING**

Indicates a potentially hazardous situation or practice which, if not avoided, will result in serious injury or death.



#### **CAUTION**

Indicates a potentially hazardous situation or practice which, if not avoided, could result in damage to the product or loss of important data.

### Safety Terms on the Product:

**DANGER** It calls attention to an operation, if not correctly performed, could result in injury or hazard immediately.

**WARNING** It calls attention to an operation, if not correctly performed, could result in potential injury or hazard.

**CAUTION** It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

**Safety Symbols on the Product:**

English

Hazardous  
VoltageSafety  
WarningProtective Earth  
Terminal

Chassis Ground



Test Ground

## Care and Cleaning

### Care

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

### Cleaning

Clean the instrument regularly according to its operating conditions.

1. Disconnect the instrument from all power sources.
2. Clean the external surfaces of the instrument with a soft cloth dampened with mild detergent or water. When cleaning the LCD, take care to avoid scarifying it.



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**CAUTION**

To avoid damage to the instrument, do not expose it to caustic liquids.

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**WARNING**

To avoid short-circuit resulting from moisture or personal injuries, ensure that the instrument is completely dry before connecting it to the power supply.

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# Document Overview

This manual introduces some basic information that you should know when you use DL3000 for the first time. It contains the following contents: out-of-box inspection method, product overview, turn-on checkout, and remote control overview.

## Tip

For the latest version of this manual, download it from **RIGOL** official website ([www.rigol.com](http://www.rigol.com)).

## Format Conventions in this Manual

- (1) The key on the front panel is denoted by the format of "Key Name (Bold) + Text Box" in the manual. For example, **ON/OFF** denotes the "ON/OFF" key.
- (2) Use the screen shot to indicate the key. For example,  denotes the Power key.

## Content Conventions in this Manual

The number of channels and the rated values of input parameters for DL3000 are listed in the following table. Unless otherwise specified, this manual takes DL3031A as an example to illustrate the functions and operation methods of the DL3000 series.

Model	No. of Channels	Voltage	Current	Power
DL3021/ DL3021A	1	150 V	40 A	200 W
DL3031/ DL3031A	1	150 V	60 A	350 W

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## General Inspection

### 1. **Inspect the packaging**

If the packaging has been damaged, do not dispose the damaged packaging or cushioning materials until the shipment has been checked for completeness and has passed both electrical and mechanical tests.

The consigner or carrier shall be liable for the damage to the instrument resulting from shipment. **RIGOL** would not be responsible for free maintenance/rework or replacement of the instrument.

### 2. **Inspect the instrument**

In case of any mechanical damage, missing parts, or failure in passing the electrical and mechanical tests, contact your **RIGOL** sales representative.

### 3. **Check the accessories**

Please check the accessories according to the packing lists. If the accessories are damaged or incomplete, please contact your **RIGOL** sales representative.



## Product Overview

DL3000 is a cost-effective programmable DC electronic load with high performance. With a user-friendly interface and superb performance specifications, DL3000 provides various interfaces for remote communication to meet your diversified test requirements. It can be widely used in various industries, such as automotive electronics, aerospace, and fuel cells.

For descriptions of the front panel, refer to Figure 1; for descriptions of the rear panel, refer to Figure 2; and for descriptions of the main interface (display screen), refer to Figure 3.

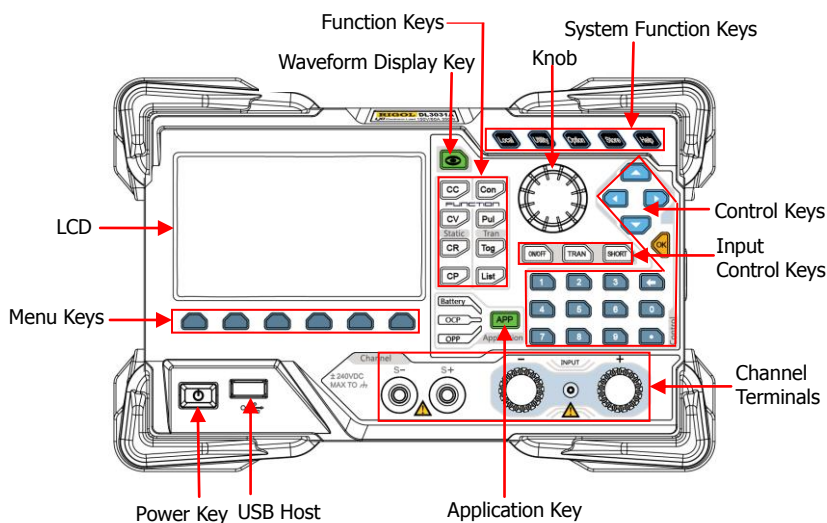


Figure 1 Front Panel

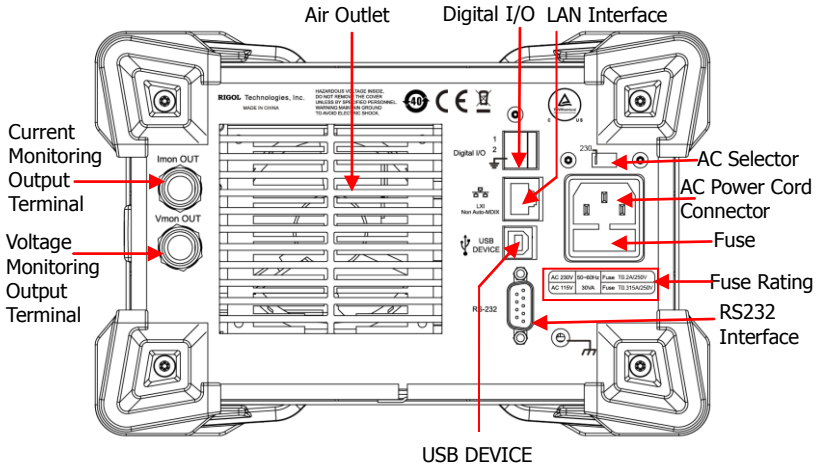


Figure 2 Rear Panel

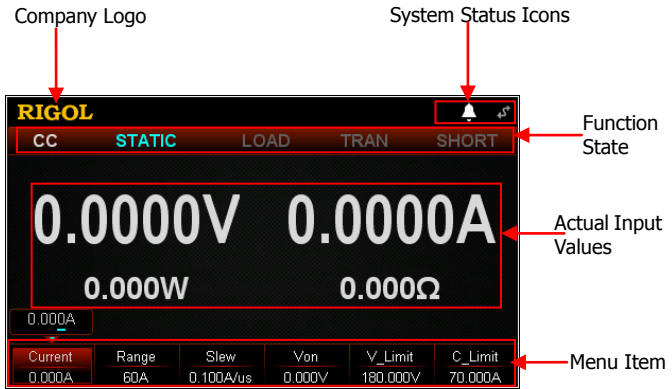


Figure 3 Main Interface

# Turn-on Checkout

## To Connect to Power Supply

Two kinds of AC power inputs are supported by DL3000 series electronic load. When the DL3000 series is connected to different power sources, the AC selector setting on its rear panel is different, as shown in Table 1.

Table 1 AC Input Power Specification and AC Selector Setting

AC Input Power	AC Selector
$\pm(10\%$ of AC input + 115 Vac), 50 Hz to 60 Hz	115
$\pm(10\%$ of AC input + 230 Vac) (max: 250 Vac), 50 Hz to 60 Hz	230

Please strictly follow the steps below to connect the DL3000 electronic load to the power supply.

### 1. Check the input power

Ensure that the AC power to be connected to the load conforms to the AC input power requirement specified in Table 1.

### 2. Check the AC selector

Ensure that the AC selector setting (115 or 230) on the rear panel of the load matches the actual AC input power (For the match relationship, refer to Table 1).

### 3. Check the fuse

When leaving the factory, the load has installed a fuse that conforms to the destination country standard. Please refer to the "fuse rating" on the rear panel of the load to ensure that the fuse matches the actual AC input power.

### 4. Connect the AC power


Plug the specified power cord available in the accessories into the AC power supply connector of the instrument, and then connect the instrument to the properly grounded AC power.



#### **WARNING**

To avoid electric shock, ensure that the instrument is correctly grounded.

## To Power on the instrument

After the instrument is connected to the power source, press the **Power** key  at the left bottom of the front panel to power on the instrument. When the instrument is turned on, it will undergo a self-test. If the instrument passes the self-test, the welcome interface is displayed; otherwise, self-test failure information will be displayed. At this time, please contact **RIGOL** distributors.

**CAUTION**

Ensure that the AC selector setting on the rear panel of the instrument matches the actual AC input voltage, otherwise, the electronic load will be burned out.

**CAUTION**

Please pay attention to the positive and negative polarities of the electronic load to avoid wrong connection. Otherwise, the load will be burned out.

**Tip**

After powering off the electronic load, please wait for at least 1 s before you power it on again.

## To Use the Built-in Help System

The built-in help system provides help information for any key on the front panel (except parameter input area) and menu keys, which are convenient for you to get the descriptions of the function keys or menus, as shown in Figure 4.

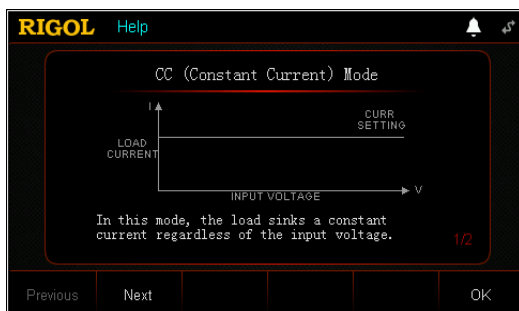




Figure 4 Help Information Interface

1. Get the built-in help information  
Press **Help**, and then "Help" will be displayed at the top of the interface, being highlighted. At this time, press the corresponding function key or menu key to enter the corresponding help information interface.
2. Page up/down operation  
If the help information is displayed in several pages, press **Previous** to go to the previous page or press **Next** to go to the next page. You can also use the arrow keys or the knob to page up/down the help information.
3. Exit the current help information interface  
When the help information is displayed, press **OK** to exit the current help information interface and return to the previous interface.

## Parameter Setting Method

Most parameters can be set by operating the keys on the front panel. The common setting methods are listed below. The setting method for certain parameters is different from the methods below, refer to the relevant chapters of this manual for the further explanation.

### Method 1: Use the numeric keys


1. In the main interface, press the specified menu key to switch the parameter focus; in the guide interface, use the arrow keys to switch the parameter focus.
2. Enter a value by using the numeric key. While entering a name, press  to delete the unwanted character if necessary.
3. When setting resistance, press the specified menu key and select "Ω" or "kΩ" to be the unit.  
When setting period/width, press the specified menu key and select "ms" or "s" to be the unit.  
When setting frequency, press the specified menu key and select "Hz" or "kHz" to be the unit.  
When setting other parameters, press  to confirm the input.

### Method 2: Use the knob or the arrow keys

1. In the main interface, press the specified menu key to switch the parameter focus.
2. Press the Left/Right arrow key to move the cursor to a desired position.
3. Press the Up/Down arrow key or rotate the knob to modify the value.

# Remote Control

DL3000 electronic load can be connected to the PC via the USB, LAN, GPIB, or RS232 interface to build communication and realize remote control. The remote control can be realized by using SCPI (Standard Commands for Programmable Instruments) commands. DL3000 electronic load supports two ways of remote control: user-defined programming and PC software (e.g. **RIGOL** Ultra Sigma).

When the instrument is in remote control, the  icon is displayed on the interface. The keypads on the front panel are locked. At this time, you can press **Local** to exit the remote mode.

## More Product Information

### 1. Obtain the device information

Press **Utility** to enter the system utility function interface, and then press **System Info**. Select the "system information" tab to obtain the device information, including the manufacturer, device model, software and hardware version number, FPGA version number, Boot version number, and the number of boot times, calibration date, and product serial number.

### 2. Check the option installation status

Press **Utility** to enter the system utility function interface. Then, press **Option** to view the installation status of all the options.

For more information about this instrument, refer to the relevant manuals by logging in to the official website of **RIGOL** ([www.rigol.com](http://www.rigol.com)) to download them. *DL3000 User's Guide*: introduces the functions of the instrument and the operation methods, remote control methods, possible failures and solutions in using the instrument, the technical specifications, and order information; *DL3000 Programming Guide*: provides detailed descriptions of SCPI commands and programming instances of the instrument. *DL3000 Datasheet*: provides the main features and technical specifications of the instrument.