

# RIGOL

## Selection Guide

# DP800 Series Programmable Linear DC Power Supply

This manual is used to help users to quickly get familiar with the main features and key specifications of each model of DP800 series so as to select the desired model and options according to the actual need.

For the detailed specifications, please refer to *DP800 Data Sheet*; for an overview of the products, please refer to *DP800A Quick Guide* and *DP800 Quick Guide*.



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## DP800 Series Overview

DP800 series is high-performance programmable linear DC power supply. It is designed with clear user interface, superb performance specifications, various analysis functions and various communication interfaces. DP800 series can fulfill versatile test requirements.

### Main Features

- Three-channel/dual-channel/single-channel models available, up to 200W total output power
- Low ripples and noise:  
DP832A/DP832/DP831A/DP831/DP822A/DP822/DP821A/DP821: <350uVrms/2mVpp  
DP813A/DP813/DP811A/DP811: <350uVrms/3mVpp
- Excellent load regulation rate and linear regulation rate
- Fast transient response time: <50μs
- Some channels are isolated
- Provide overvoltage/overcurrent/overtemperature protection function
- Independent control for each channel
- Support serial and parallel output functions
- Some channels support the track function to track the channel voltage setting value and output on/off status
- Provide the Sense function to automatically compensate for the voltage drop caused by the load lead in high current output
- Provide timing output and delay output functions
- Provide built-in recorder to sample and record the channel output according to the specified record period
- Provide analyzer to analyze the recorded files and provide the analysis results of the channel voltage, current and power
- Support monitor to monitor the output status of the instrument and the instrument will execute the corresponding operation according to the current setting when the specified monitor condition is met
- Provide trigger and support trigger input and trigger output
- Built-in V,A,W measurements and waveform display
- 3.5-inch TFT display
- Various interfaces: USB Host&Device, LAN, RS232, USB-GPIB (option), digital IO, rear panel output interface (for DP813A/DP813/DP811A/DP811)

### Applications

- R&D lab general purpose test
- Quality control and assessment
- Provide pure power for RF/MW circuits or components
- Provide power for automobile electronic circuit test
- Production automation test
- Device or circuit characteristic verification and troubleshooting
- Educational experiment

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## Selecting Procedures

You can select the desired model of power supply and options according to the actual need. The procedures are as follows.

### 1. Select the proper model

#### Three-channel models

| Model/Order No.                              |                        | DP832A  | DP832          | DP831A  | DP831         |
|--|------------------------|---|----------------|---|---------------|
| Channel Output                               |                        | CH1: 0 to 30V/0 to 3A<br>CH2: 0 to 30V/0 to 3A<br>CH3: 0 to 5V/0 to 3A  |                | CH1: 0 to 8V/0 to 5A<br>CH2: 0 to 30V/0 to 2A<br>CH3: 0 to -30V/0 to 2A |               |
| Isolation between Channels                   |                        | CH1  CH2,CH3  |                | CH1  CH2,CH3  |               |
| Max. Total Power                             |                        | 195W  |                | 160W  |               |
| Ripples and Noise (20Hz to 20MHz)            | Normal Mode Voltage    | <350 $\mu$ Vrms/2mVpp   |                |   |               |
|  | Normal Mode Current    | <2mArms   |                |   |               |
| Load Regulation Rate                         | Voltage                | <0.01%+2mV  |                |   |               |
|  | Current                | <0.01%+250 $\mu$ A  |                |   |               |
| Linear Regulation Rate                       | Voltage                | <0.01%+2mV  |                |   |               |
|  | Current                | <0.01%+250 $\mu$ A  |                |   |               |
| Programming Annual Accuracy (25°C $\pm$ 5°C) | Voltage <sup>[1]</sup> | 0.05%+20mV/0.05%+20mV/0.1%+5mV  |                | 0.1%+5mV/0.05%+20mV/0.05%+20mV  |               |
|  | Current <sup>[1]</sup> | 0.2%+5mA/0.2%+5mA/0.2%+5mA  |                | 0.2%+10mA/0.2%+5mA/0.2%+5mA   |               |
| Readback Annual Accuracy (25°C $\pm$ 5°C)    | Voltage <sup>[1]</sup> | 0.05%+10mV/0.05%+10mV/0.1%+5mV  |                | 0.1%+5mV/0.05%+10mV/0.05%+10mV  |               |
|  | Current <sup>[1]</sup> | 0.15%+5mA/0.15%+5mA/0.15%+5mA   |                | 0.2%+10mA/0.1%+5mA/0.1%+5mA   |               |
| Programming Resolution                       | Voltage <sup>[1]</sup> | 1mV/1mV/1mV   | 10mV/10mV/10mV | 1mV/1mV/1mV   | 1mV/10mV/10mV |
|  | Current <sup>[1]</sup> | 1mA/1mA/1mA   | 1mA/1mA/1mA    | 0.3mA/0.1mA/0.1mA   | 1mA/1mA/1mA   |
| Transient Response Time                      |                        | Less than 50 $\mu$ s for output voltage to recover to within 15mV following a change in output current from full load to half load or vice versa. |                |   |               |

**Note**<sup>[1]</sup>: CH1/CH2/CH3.

#### Dual-channel models

| Model/Order No.                              |                        | DP821A   | DP821 | DP822A   | DP822 |
|--|------------------------|--|-------|--|-------|
| Channel Output                               |                        | CH1: 0 to 60V/0 to 1A<br>CH2: 0 to 8V/0 to 10A |       | CH1: 0 to 20V/0 to 5A<br>CH2: 0 to 5V/0 to 16A |       |
| Isolation between Channels                   |                        | CH1  CH2                                       |       |  |       |
| Max. Total Power                             |                        | 140W   |       | 180W   |       |
| Ripples and Noise (20Hz to 20MHz)            | Normal Mode Voltage    | <350 $\mu$ Vrms/2mVpp                          |       |  |       |
|  | Normal Mode Current    | <2mArms  |       |  |       |
| Load Regulation Rate                         | Voltage                | <0.01%+2mV                                     |       |  |       |
|  | Current                | <0.01%+250 $\mu$ A                             |       |  |       |
| Linear Regulation Rate                       | Voltage                | <0.01%+2mV                                     |       |  |       |
|  | Current                | <0.01%+250 $\mu$ A                             |       |  |       |
| Programming Annual Accuracy (25°C $\pm$ 5°C) | Voltage <sup>[2]</sup> | 0.1%+25mV/0.05%+10mV                           |       |  |       |
|  | Current <sup>[2]</sup> | 0.2%+10mA/0.2%+10mA                            |       |  |       |

|                                     |                        |   |           |         |           |
|-------------------------------------|------------------------|---|-----------|---------|-----------|
| Readback Annual Accuracy (25°C±5°C) | Voltage <sup>[2]</sup> | 0.1%+25mV/0.05%+5mV   |           |         |           |
|                                     | Current <sup>[2]</sup> | 0.15%+10mA/0.15%+10mA   |           |         |           |
| Programming Resolution              | Voltage <sup>[2]</sup> | 1mV/1mV   | 10mV/10mV | 1mV/1mV | 10mV/10mV |
|                                     | Current <sup>[2]</sup> | 0.1mA/1mA   | 1mA/10mA  | 1mA/1mA | 10mA/10mA |
| Transient Response Time             |                        | Less than 50µs for output voltage to recover to within 15mV following a change in output current from full load to half load or vice versa. |           |         |           |

Note<sup>[2]</sup>: CH1/CH2.

### Single-channel models

| Model/Order No.                        | DP811A  | DP811   | DP813A  | DP813 |      |
|--|---|---|---|-------|------|
| Channel Output                         | Range1: 0 to 20V/0 to 10A<br>Range2: 0 to 40V/0 to 5A |   | Range1: 0 to 8V/0 to 20A<br>Range2: 0 to 20V/0 to 10A |       |      |
| Max. Total Power                       | 200W  |   |   |       |      |
| Ripples and Noise (20Hz to 20MHz)      | Normal Mode Voltage                                   | <350µVrms/3mVpp   |   |       |      |
|  | Normal Mode Current                                   | <2mArms   |   |       |      |
| Load Regulation Rate                   | Voltage   | <0.01%+2mV  |   |       |      |
|  | Current   | <0.01%+250µA  |   |       |      |
| Linear Regulation Rate                 | Voltage   | <0.01%+2mV  |   |       |      |
|  | Current   | <0.01%+250µA  |   |       |      |
| Programming Annual Accuracy (25°C±5°C) | Voltage   | 0.05%+10mV  |   |       |      |
|  | Current   | 0.1%+10mA   |   |       |      |
| Readback Annual Accuracy (25°C±5°C)    | Voltage   | 0.05%+10mV  |   |       |      |
|  | Current   | 0.1%+10mA   |   |       |      |
| Programming Resolution                 | Voltage   | 1mV   | 10mV  | 1mV   | 10mV |
|  | Current   | 0.5mA   | 10mA  | 1mA   | 10mA |
| Transient Response Time                |   | Less than 50µs for output voltage to recover to within 15mV following a change in output current from full load to half load or vice versa. |   |       |      |

## 2. Select and order the options

### DP832A/DP831A/DP822A/DP821A/DP813A/DP811A

For these models, the high-resolution setting, trigger, monitor, analyzer as well as the RS232 and LAN communication functions are all standard functions. You can select and order the following option according to your need.

| Option                          | Function Description   | Order No. |
|---------------------------------|--|-----------|
| USB to GPIB Interface Converter | You can extend a GPIB interface via the USB HOST interface at the rear panel of the instrument using this module. Then, connect the instrument to the PC using a GPIB cable to realize the communication between the instrument and PC via the GPIB interface. | USB-GPIB  |

### DP832/DP831/DP822/DP821/DP813/DP811

For these models, the high-resolution setting, trigger, monitor, analyzer as well as the RS232 and LAN communication functions are all optional functions. You can select and order the following options according to your need.

**Note:** To install the high-resolution option, digital I/O option, on-line monitor and analysis option as well as the RS232 and LAN communication interfaces option, you need to get the corresponding option license. For the acquisition method of the option license and the installation procedures of the options, refer to the corresponding specific manual (you can download the manual from **RIGOL** official website ([www.rigol.com](http://www.rigol.com))).

| Option  | Function Description   | Order No.       |
|---|--|-----------------|
| High-resolution Option                        | Provide high-resolution setting. When DP832, DP831, DP822, DP821, DP813, and DP811 are installed with this option, their resolution specifications are the same with those of DP832A, DP831A, DP822A, DP821A, DP813A, and DP811A respectively.   | HIRES-DP800     |
| Digital I/O Option                            | When this option is installed, you can use the trigger and the instrument supports trigger input and trigger output. Insert the Digital I/O interface connecting terminal into the Digital I/O interface at the rear panel of the instrument; at this point, the instrument provides 4 trigger input and output channels.<br>Trigger input: the data cable of the Digital I/O interface can receive external trigger signals; the source under control (namely the output channel) will turn on/off the output or invert the output status when the preset trigger condition is met.<br>Trigger output: the data cable of the Digital I/O interface outputs level or square signal when the output of the control source (namely the output channel) meets the preset trigger condition. | DIGITALIO-DP800 |
| On-line Monitor and Analysis Option           | After this option is installed, you can use the monitor and analyzer.<br>Monitor: monitor the output status of the instrument. The instrument will execute the corresponding operation according to the current setting when the user-defined monitor condition is met.<br>Analyzer: analyze the files recorded and provide the analysis results of the channel voltage, current and power (include various statistic parameters, such as the average, VAR and range).   | AFK-DP800       |
| RS232 and LAN Communication Interfaces Option | After this option is installed, you can use the RS232 or LAN interface to control the instrument remotely.<br>RS232: connect the instrument to the PC using a RS232 cable via the RS232 interface at the rear panel of the instrument (namely the instrument can communicate with the PC via the RS232 interface).<br>LAN: connect the instrument to the PC or the local network of the PC using a network cable via the LAN interface at the rear panel of the instrument (namely the instrument can communicate with the PC via the LAN interface).  | INTERFACE-DP800 |
| USB to GPIB Interface Converter               | You can extend a GPIB interface via the USB HOST interface at the rear panel of the instrument using this module. Then, connect the instrument to the PC using a GPIB cable to realize the communication between the instrument and PC via the GPIB interface.   | USB-GPIB        |

### 3. Select and order the rack mount kit

| Option  | Function Description  | Order No.  |
|---|---|------------|
| DP800 Series Rack Mount Kit (Single Instrument) | Install a single instrument into a standard 19-inch machine cabinet.          | RM-1-DP800 |
| DP800 Series Rack Mount Kit (Two Instruments)   | Install two instruments into a standard 19-inch machine cabinet side by side. | RM-2-DP800 |

### 4. Select and order the safety plug

| Option                         | Function Description                            | Order No. |
|--------------------------------|---|-----------|
| DP800 Series Red Safety Plug   | Provide better insulation protection for users. | SPR-DP800 |
| DP800 Series Black Safety Plug |   | SPB-DP800 |
| DP800 Series Green Safety Plug |   | SPG-DP800 |

**Note:** For the detailed information of the optional accessories, please refer to the corresponding specific manual (you can download the manual from **RIGOL** official website ([www.rigol.com](http://www.rigol.com))).

## Ordering Information

|   | Description  | Order No.           |
|---|--|---------------------|
| <b>Models</b>                             | Programmable Linear DC Power Supply (Three-channel)  | DP832A              |
|   | Programmable Linear DC Power Supply (Three-channel)  | DP832               |
|   | Programmable Linear DC Power Supply (Three-channel)  | DP831A              |
|   | Programmable Linear DC Power Supply (Three-channel)  | DP831               |
|   | Programmable Linear DC Power Supply (Dual-channel)   | DP822A              |
|   | Programmable Linear DC Power Supply (Dual-channel)   | DP822               |
|   | Programmable Linear DC Power Supply (Dual-channel)   | DP821A              |
|   | Programmable Linear DC Power Supply (Dual-channel)   | DP821               |
|   | Programmable Linear DC Power Supply (Single-channel)   | DP813A              |
|   | Programmable Linear DC Power Supply (Single-channel)   | DP813               |
|   | Programmable Linear DC Power Supply (Single-channel)   | DP811A              |
|   | Programmable Linear DC Power Supply (Single-channel)   | DP811               |
| <b>Standard Accessories</b>               | Power Cord   | --                  |
|   | USB Cable  | CB-USBA-USBB-FF-150 |
|   | Fuse 50T-032H 250V 3.15A<br>(DP832A/DP832/DP822A/DP822/DP813A/DP813/DP811A/DP811)  | --                  |
|   | Fuse 50T-025H 250V 2.5A (DP831A/DP831/DP821A/DP821)  | --                  |
|   | Short-circuit Equipment<br>(DP822A/DP822/DP821A/DP821/DP813A/DP813/DP811A/DP811)   | --                  |
| Digital I/O Interface Connecting Terminal | Terminal-Digital I/O-DP800   |                     |
| <b>Optional Accessories</b>               | Provide high-resolution setting (for DP832/DP831/DP822/DP821/DP813/DP811; for the other models, this is a standard accessory)                | HIRES-DP800         |
|   | Provide 4 trigger input and output channels (for DP832/DP831/DP822/DP821/DP813/DP811; for the other models, this is a standard accessory)    | DIGITALIO-DP800     |
|   | Provide on-line monitor and analysis functions (for DP832/DP831/DP822/DP821/DP813/DP811; for the other models, this is a standard accessory) | AFK-DP800           |
|   | Provide RS232 and LAN communication interfaces (for DP832/DP831/DP822/DP821/DP813/DP811; for the other models, this is a standard accessory) | INTERFACE-DP800     |
|   | USB to GPIB Interface Converter  | USB-GPIB            |
|   | DP800 Series Rack Mount Kit (Single Instrument)  | RM-1-DP800          |
|   | DP800 Series Rack Mount Kit (Two Instruments)  | RM-2-DP800          |
|   | DP800 Series Red Safety Plug   | SPR-DP800           |
|   | DP800 Series Black Safety Plug   | SPB-DP800           |
|   | DP800 Series Green Safety Plug   | SPG-DP800           |

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