

# RIGOL

## Selection Guide

# DG800 Series Function/Arbitrary Waveform Generator

This manual is used to help users to quickly get familiar with the main features and key specifications of each model of DG800 series so as to select the desired model and options according to the actual need.

For the detailed specifications, please refer to *DG800 Series Data Sheet*; for an overview of the products, please refer to *DG800 Series Quick Guide*.



**RIGOL (SUZHOU) TECHNOLOGIES INC.**

# DG800 Series Overview

As a multi-functional signal generator, DG800 series function/arbitrary waveform generator integrates many instruments into 1, such as function generator, arbitrary waveform generator, noise generator, pulse generator, harmonic generator, analog/digital modulator, and frequency counter. As a multi-functional and portable instrument, it offers you a new choice in education, R&D, production, measurement, and other industries with its user-friendly touch screen and high performance at an unprecedented price point.

## Main Features

- Unique SiFi II (Signal Fidelity II) technology: generate the arbitrary waveforms point by point; recover the signal without distortion; sample rate accurate and adjustable; jitter of all the output waveforms (including Sine, Pulse, etc.) as low as 200 ps
- 2 Mpts memory depth (standard), 8 Mpts memory depth (optional) per channel for arbitrary waveforms
- Optional dual-channel with the same performance, equivalent to two independent signal sources
- High frequency stability:  $\pm 1$  ppm; low phase noise: -105 dBc/Hz
- Built-in high-order harmonic generator (at most 8-order harmonics)
- Built-in 7 digits/s, 240 MHz bandwidth full featured frequency counter
- Up to 160 built-in arbitrary waveforms, covering the common signals in engineering application, medical electronics, auto electronics, math processing, and other various fields
- Sample rate up to 125 MSa/s, vertical resolution 16 bits
- Arbitrary waveform sequence editing function available; arbitrary waveforms also can be generated through the PC software
- Various analog and digital modulation functions: AM, FM, PM, ASK, FSK, PSK, and PWM.
- Standard waveform combine function, capable of outputting specified waveforms combined with the basic waveforms
- Standard channel tracking function, when enabled, all the parameters of both channels are updated based on users' configurations
- USB HOST&DEVICE interface (standard); USB-GPIB function supported
- 4.3" TFT color touch screen
- RS232, PRBS, and Dualtone outputs supported

## Selecting Procedures

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

### 1. Select the proper model

| Model                            | DG812  | DG811 | DG822                | DG821 | DG832                | DG831 |
|----------------------------------|--|-------|----------------------|-------|----------------------|-------|
| Channel                          | 2  | 1     | 2                    | 1     | 2                    | 1     |
| Max. Frequency                   | 10 MHz   |       | 25 MHz               |       | 35 MHz               |       |
| Sample Rate                      | 125 MSa/s  |       |                      |       |                      |       |
| <b>Waveform</b>                  |  |       |                      |       |                      |       |
| Basic Waveforms                  | Sine, Square, Ramp, Pulse, Noise, DC, Dual-tone  |       |                      |       |                      |       |
| Advanced Waveforms               | PRBS, RS232, Sequence  |       |                      |       |                      |       |
| Built-in Arbitrary Waveforms     | 160 types of waveforms, including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, etc. |       |                      |       |                      |       |
| <b>Frequency Characteristics</b> |  |       |                      |       |                      |       |
| Sine                             | 1 $\mu$ Hz to 10 MHz   |       | 1 $\mu$ Hz to 25 MHz |       | 1 $\mu$ Hz to 35 MHz |       |
| Square                           | 1 $\mu$ Hz to 5 MHz  |       | 1 $\mu$ Hz to 10 MHz |       | 1 $\mu$ Hz to 10 MHz |       |

|                    |   |                       |                      |
|--------------------|---|-----------------------|----------------------|
| Ramp               | 1 $\mu$ Hz to 200 kHz   | 1 $\mu$ Hz to 500 kHz | 1 $\mu$ Hz to 1 MHz  |
| Pulse              | 1 $\mu$ Hz to 5 MHz   | 1 $\mu$ Hz to 10 MHz  | 1 $\mu$ Hz to 10 MHz |
| Harmonic           | 1 $\mu$ Hz to 5 MHz   | 1 $\mu$ Hz to 10 MHz  | 1 $\mu$ Hz to 15 MHz |
| PRBS               | 2 kbps to 10 Mbps   | 2 kbps to 20 Mbps     | 2 kbps to 30 Mbps    |
| Dual-tone          | 1 $\mu$ Hz to 10 MHz  | 1 $\mu$ Hz to 20 MHz  | 1 $\mu$ Hz to 20 MHz |
| RS232              | baud rate range: 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400 |                       |                      |
| Sequence           | 2 k to 30 MSa/s   |                       |                      |
| Noise (-3 dB)      | 100 MHz bandwidth   |                       |                      |
| Arbitrary Waveform | 1 $\mu$ Hz to 5 MHz   | 1 $\mu$ Hz to 10 MHz  | 1 $\mu$ Hz to 10 MHz |
| Resolution         | 1 $\mu$ Hz  |                       |                      |
| Accuracy           | $\pm$ (1 ppm of the setting value + 10 pHz), 18°C to 28°C                 |                       |                      |

## 2. Select and order the options

### DG832/DG822/DG812

For these models, the single-dual channel upgrade option is standard function. You can select and order the following option according to your need.

| Option                       | Function Description   | Order NO.   |
|------------------------------|--|-------------|
| Memory Depth Upgrade Option  | When this option is installed, DG800 can extend the memory depth for arbitrary waveforms to 8Mpts.   | DG800-ARB8M |
| USB-GPIB Interface Converter | You can extend a GPIB interface via the USB HOST interface on 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    |
| 40 dB Attenuator             | Connect the attenuator to the signal output connector to adjust the output signal voltage.   | RA5040K     |

### DG831/DG821/DG811

For these models, the single-dual channel upgrade option and memory depth upgrade option is optional function. You can select and order the following options according to your need.

| Option                        | Function Description   | Order NO.   |
|-------------------------------|--|-------------|
| Single-dual CH Upgrade Option | When this option is installed, DG831, DG821 and DG811 can be extended into two signal output channels.   | DG800-DCH   |
| Memory Depth Upgrade Option   | When this option is installed, DG800 can extend the memory depth for arbitrary waveforms to 8Mpts.   | DG800-ARB8M |
| USB-GPIB Interface Converter  | You can extend a GPIB interface via the USB HOST interface on 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    |
| 40 dB Attenuator              | Connect the attenuator to the signal output connector to adjust the output signal voltage.   | RA5040K     |

**Note:** To install the single-dual channel upgrade option and memory depth upgrade option, you need to get the corresponding option license. Please acquire the option license according to the following procedures (first, order the desired option and the option key is provided; then, log in **RIGOL** website ([www.rigol.com](http://www.rigol.com)), click "License Activation" at the bottom of the webpage to enter the "Registered product license code" interface; finally, input the option key, instrument serial number (refer to the User's Guide to acquire the serial number) and verification code as well as click "Generate" to acquire the corresponding option license). Then, build the communication between the signal generator and PC and send the :LICense:SET <license> or :LICense:INSTall <license> command to install the option. Besides, installing the option by

reading the option installation file from the USB storage device is also available. For detailed procedures, refer to relevant instructions in User's Guide.

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>Model</b>                | DG812 (10 MHz, Dual-channel)                                       | DG812             |
|                             | DG822 (25MHz, Dual-channel)  | DG822             |
|                             | DG832 (35MHz, Dual-channel)  | DG832             |
|                             | DG811 (10MHz, Single-channel)                                      | DG811             |
|                             | DG821 (25MHz, Single-channel)                                      | DG821             |
|                             | DG831 (35MHz, Single-channel)                                      | DG831             |
| <b>Standard Accessories</b> | 1 Power Cord conforming to the standard of the destination country | -                 |
|                             | 1 BNC Cable (only provided by DG832/DG831/DG822/DG821)             | CB-BNC-BNC-MM-100 |
|                             | 1 Quick Guide  | -                 |
|                             | 1 Product Warranty Card  | -                 |
| <b>Option</b>               | Single-dual CH Upgrade Option (only for DG831/DG821/DG811)         | DG800-DCH         |
|                             | Memory Depth Upgrade Option  | DG800-ARB8M       |
| <b>Optional Accessories</b> | 40 dB Attenuator   | RA5040K           |
|                             | USB-GPIB Interface Converter                                       | USB-GPIB-L        |