RIGOL

快速指南

DSG3000 系列射频信号源

2015 年 5 月
RIGOL Technologies, Inc.

保证和声明

版权

商标信息

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文档编号

QGG01004-1110

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联系我们

如您在使用此产品或本手册的过程中有任何问题或需求，可与 **RIGOL** 联系：

电子邮箱：service@rigol.com

网址：www.rigol.com

安全要求

一般安全概要

了解下列安全性预防措施，以避免受伤，并防止损坏本产品或与本产品连接的任何产品。为避免可能的危险，请务必按照规定使用本产品。

使用正确的电源线。
只允许使用所在国家认可的本产品专用电源线。

将产品接地。
本产品通过电源电缆的保护接地线接地。为避免电击，在连接本产品的任何输入或输出端子之前，请确保本产品电源电缆的接地端子与保护接地端可靠连接。

正确连接探头。
如果使用探头，探头地线与地电势相同，请勿将地线连接至高电压。

查看所有终端额定值。
为避免起火和过大电流的冲击，请查看产品上所有的额定值和标记说明，请在连接产品前查阅产品手册以了解额定值的详细信息。

使用合适的过压保护。
确保没有过电压（如由雷电造成的电压）到达该产品。否则操作人员可能有遭受电击的危险。

请勿开盖操作。
请勿在仪器机箱打开时运行本产品。

请勿将异物插入风扇的排风口。
请勿将异物插入风扇的排风口以免损坏仪器。

使用合适的保险丝。
只允许使用本产品指定规格的保险丝。

避免电路外露。
电源接通后，请勿接触外露的接头和元件。

怀疑产品出故障时，请勿进行操作。
如果您怀疑本产品出现故障，请联络**RIGOL**授权的维修人员进行检测。任何维护、调整或零件更换必须由**RIGOL**授权的维修人员执行。

保持适当的通风。

通风不良会引起仪器温度升高，进而引起仪器损坏。使用时应保持良好的通风，定期检查通风口和风扇。

请勿在潮湿环境下操作。

为避免仪器内部电路短路或发生电击的危险，请勿在潮湿环境下操作仪器。

请勿在易燃易爆的环境下操作。

为避免仪器损坏或人身伤害，请勿在易燃易爆的环境下操作仪器。

请保持产品表面的清洁和干燥。

为避免灰尘或空气中的水分影响仪器性能，请保持产品表面的清洁和干燥。

防静电保护。

静电会造成仪器损坏，应尽可能在防静电区进行测试。在连接电缆到仪器前，应将其内外导体短暂接地以释放静电。

正确使用电池。

如果仪器提供电池，严禁将电池暴露于高温或火中。要让儿童远离电池。不正确地更换电池可能造成爆炸（警告：锂离子电池）。必须使用 **RIGOL** 指定的电池。

注意搬运安全。

为避免仪器在搬运过程中滑落，造成仪器面板上的按键、旋钮或接口等部件损坏，请注意搬运安全。

安全术语和符号

本手册中的术语。以下术语可能出现在本手册中：

警告
警告性声明指出可能会危害操作人员生命安全的条件和行为。

注意
注意性声明指出可能导致本产品损坏或数据丢失的条件和行为。

产品上的术语。以下术语可能出现在产品上：

DANGER	表示您如果不进行此操作，可能会立即对您造成危害。
WARNING	表示您如果不进行此操作，可能会对您造成潜在的危害。
CAUTION	表示您如果不进行此操作，可能会对本产品或连接到本产品的其他设备造成损坏。

产品上的符号。以下符号可能出现在产品上：


高电压


安全警告


保护性接地端


壳体接地端


测量接地端

保养与清洁

保养

请勿将仪器放置在长时间受到日照的地方。

清洁

请根据使用情况经常对仪器进行清洁。方法如下：

1. 断开电源。
2. 用潮湿但不滴水的软布（可使用柔和的清洁剂或清水）擦拭仪器外部的浮尘。清洁带有液晶显示屏的仪器时，请注意不要划伤 LCD 显示屏。

注意

请勿使任何腐蚀性的液体沾到仪器上，以免损坏仪器。

警告

重新通电之前，请确认仪器已经干透，避免因水分造成电气短路甚至人身伤害。

环境注意事项

以下符号表明本产品符合 WEEE Directive 2002/96/EC 所制定的要求。

设备回收

本产品中包含的某些物质可能会对环境或人体健康有害，为避免将有害物质释放到环境中或危害人体健康，建议采用适当的方法回收本产品，以确保大部分材料可正确地重复使用或回收。有关处理或回收的信息，请与当地权威机构联系。

文档概述

文档中的格式约定

1. **按键：**
   本手册中通常用“文本框+文字（加粗）”表示前面板上的一个按键，如 **FREQ** 表示 **FREQ** 键。

2. **菜单：**
   本手册通常用“字符底纹+文字（加粗）”表示一个菜单，如 **频率** 表示 **FREQ** 功能键的频率菜单项。

3. **连接器：**
   本手册中通常用“方括号+文字（加粗）”表示前面板或后面板上的一个连接器。例如：**[RF OUTPUT 50Ω]**。

4. **操作步骤：**
   本手册中通常用一个箭头“→”表示下一步操作。例如：**FREQ** → **频率** 表示按下前面板上的 **FREQ** 功能键后再按 **频率** 菜单软键。

文档中的内容约定

DSG3000 系列射频信号源包含 DSG3030 和 DSG3060 两个型号。本手册以 DSG3060 为例，介绍其基本操作。有关更多详细信息，请参考《DSG3000 系列射频信号源用户手册》。

本产品用户文档

本产品的主要用户文档包括快速指南、用户手册、编程手册、数据手册等。用户可以登录www.rigol.com下载所需文档的最新版本。

目录

快速入门

一般性检查

1. 检查运输包装

如运输包装已损坏，请保留被损坏的包装或防震材料，直到货物经过完全检查且仪器通过电性和机械测试。

因运输造成仪器损坏，由发货方和承运方联系赔偿事宜。**RIGOL**公司恕不进行免费维修或更换。

2. 检查整机

若存在机械损坏或缺失，或者仪器未通过电性和机械测试，请联系您的 **RIGOL** 经销商。

3. 检查随机附件

请根据装箱单检查随机附件，如有损坏或缺失，请联系您的**RIGOL**经销商。

前面板概述

DSG3000 系列射频信号源前面板如下图所示。

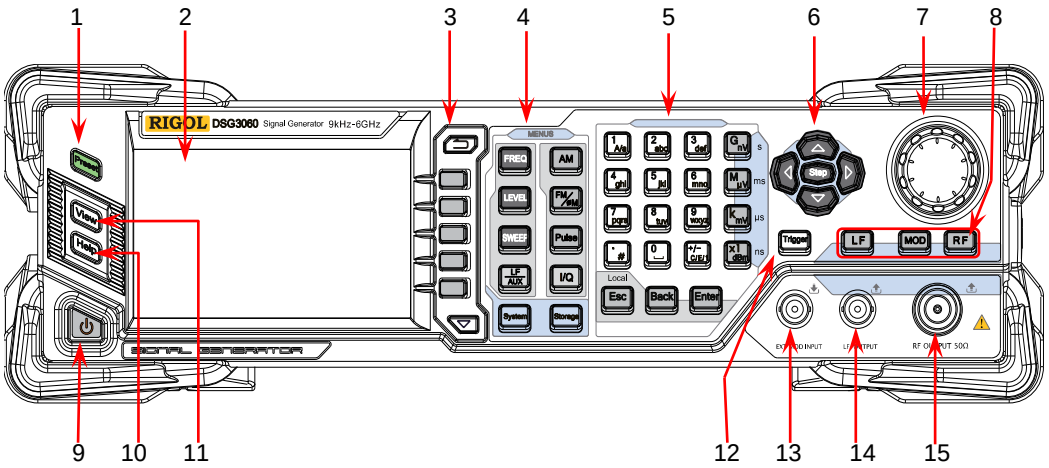


图 1 前面板

1. 恢复预设设置键

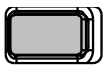
将仪器恢复至预设的状态（出厂默认状态或用户保存的状态）。

2. LCD 显示屏

4.3 英寸 TFT 高清（480×272）彩色液晶显示屏，清晰显示仪器当前的主要设置和状态，详细信息请参考“**用户界面**”一节。

3. 菜单控制键

退出当前菜单，并返回上一级菜单。



菜单软键，与其左侧显示的菜单一一对应，按下该软键激活相应的菜单。

菜单翻页键。

4. 功能键

设置 RF 输出信号的频率、频率偏移以及相位等参数。

设置 RF 输出信号的幅度、衰减等参数，并提供平坦度校正功能。

设置扫描方式、扫描类型、扫描模式等参数。

设置幅度调制（Amplitude Modulation，AM）相关的参数。

设置频率调制（Frequency Modulation，FM）和相位调制（Phase Modulation，ØM）相关的参数。

设置脉冲调制（Pulse Modulation）相关的参数。

设置 I/Q 调制相关的参数。

设置 LF 输出、仪器选件以及其他扩展功能的相关参数。

存储和调用仪器状态、平坦度校正数据、扫描列表等。

设置系统相关的参数。

5. 数字键盘

数字键盘支持中文字符、英文大/小写字符、数字和常用符号（包括小数点、#、空格和正负号+/-）的输入。主要用于编辑文件或文件夹的名称、设置参数。

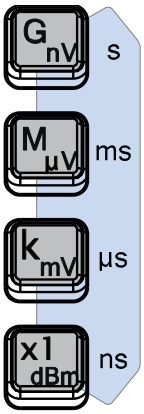
数字与字母复用的按键用于直接输入所需的数字或字母。

用于切换输入模式为中文、英文或数字。
设置参数时，输入模式固定为数字，该键用于输入数值的符号（“+”或“-”）。

数字输入模式下，按下该键输入 1。
英文输入模式下，用于切换字母的大小写状态。

0 与空格的复用：
数字输入模式下，按下该键输入 0。
中文或英文输入模式下，按下该键输入空格。

数字输入模式下，按下该键，当前光标处插入一个小数点。
英文输入模式下，该键用于输入“#”。
中文输入模式下，该键无效。



用于设置参数的单位。
设置参数时，使用数字键盘输入数字后，按下该按键其中之一即可选择相应的单位。选择的单位与设置的参数类型有关。

参数类型	GnV	MµV	kmV	X1dBm
频率	GHz	MHz	kHz	Hz
幅度	nV	µV	mV	dBm
周期	s	ms	µs	ns

设置参数时，用于清除活动功能区的数字，同时退出参数输入状态。
编辑文件名时，用于清除输入栏的字符。
在键盘测试状态，用于退出当前测试状态。
仪器工作在远程模式时，用于返回本地模式。

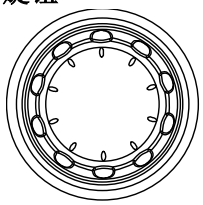
设置参数时，用于删除光标左边的数字。
编辑文件名时，用于删除光标左边的字符。
存储功能中，用于收起当前选中目录。

设置参数时，用于结束参数输入，并为参数添加默认的单位。
编辑文件名时，用于输入当前光标选中的字符。
存储功能中，用于展开当前选中目录。

6. 方向键/Step 键

设置参数时，**Step** 键用于设置当前选中参数的步进。
左右方向键用于进入参数编辑状态并移动光标至指定位。
上下方向键用于修改光标处的数值或以当前步进修改参数值。
存储功能中，左右方向键用于展开或收起当前选中目录。
上下方向键用于选择当前目录或文件。
文件名编辑时，用于选择所需的字符。

7. 旋钮



参数设置时，用于修改光标处的数值或以当前步进修改参数值。
文件名编辑时，用于选择所需的字符。
存储功能中，用于选择当前的路径或文件。

8. 输出控制键

用于打开或关闭 LF 输出。

— 按下该按键，背灯点亮，用户界面状态栏显示 LF 标志。打开 LF 输出。此时，**[LF OUTPUT]** 连接器以当前配置输出 LF 信号。
— 再次按下该按键，背灯熄灭，此时，关闭 LF 输出。

用于打开或关闭 RF 输出。

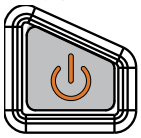
— 按下该按键，背灯点亮，用户界面状态栏显示 RF 标志。打开 RF 输出。此时，**[RF OUTPUT 50Ω]** 连接器以当前配置输出 RF 信号。
— 再次按下该按键，背灯熄灭，此时，关闭 RF 输出。

用于打开或关闭 RF 调制输出。

— 按下该按键，背灯点亮，用户界面状态栏显示 MOD 标志。打开 RF 调制输出。此时，**[RF OUTPUT 50Ω]** 连接器以当前配置输出已调制的 RF 信号（**RF** 按键背灯必须点亮）。

— 再次按下该按键，背灯熄灭，此时，关闭 RF 调制输出。

9. 电源键



用于打开或关闭信号源。该键关闭时，信号源处于待机模式，只有关闭后面板电源开关并拔掉电源线，信号源才会处于断电模式。

按 **System** → **电源状态** 选择“常开”或“缺省”。选择“缺省”时，仪器上电，打开后面板电源开关后，您需要按下该按键启动仪器。选择“常开”时，仪器上电，打开后面板电源开关，仪器自动启动。

10. 内置帮助系统

要获得任何前面板按键或菜单软键的帮助信息，按下该键，再按下你所需要获得帮助的按键即可。

11. 视图切换键

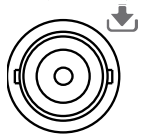
用于切换界面的显示模式为普通显示模式或参数放大模式。

12. 触发控制键

当 **Sweep** 的触发类型为“按键触发”时，按一次该键，触发一次扫描。

当 **Pulse** 的触发模式为“按键触发”时，按一次该键，启动一次脉冲调制。

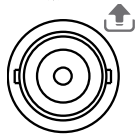
13. 外部调制输入连接器



EXT MOD INPUT

当 AM、FM 和 ΦM 的调制源为外部时，该连接器用于输入外部调制信号。

14. LF 输出连接器



LF OUTPUT

当 **LF** 按键背灯点亮时，该连接器用于输出 LF 信号。

15. RF 输出连接器

RF OUTPUT 50Ω

当 **RF** 按键背灯点亮时，该连接器用于输出 RF 信号和 RF 扫描信号。

当 **RF** 和 **MOD** 按键背灯点亮时，该连接器用于输出 RF 已调制信号。

注意

为了避免损坏仪器，RF 输出连接器上的反向直流电压不得超过 50 V；9 kHz~1 MHz 频段，反向功率不得超过+10 dBm；1 MHz~6 GHz 频段，反向功率不得超过+30 dBm。

后面板概述

DSG3000 系列射频信号源后面板如下图所示。

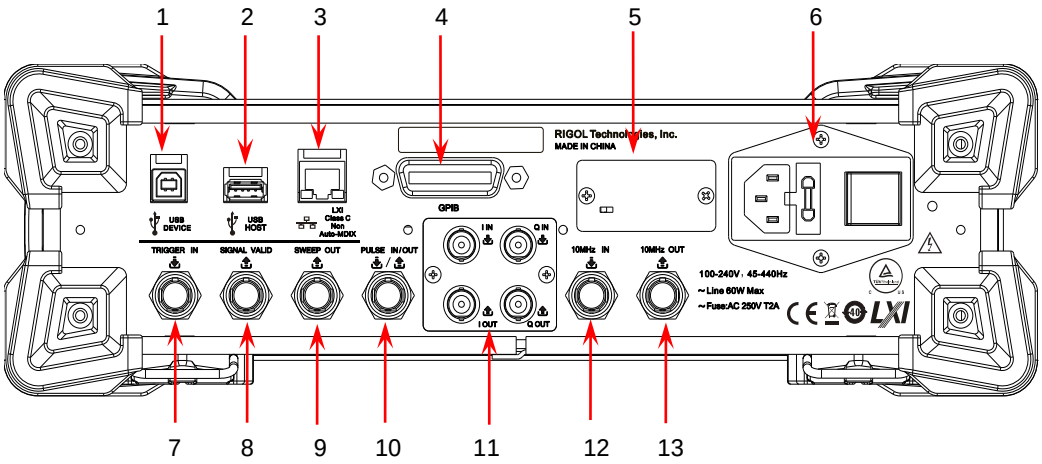
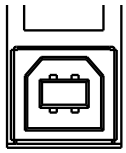


图 2 后面板

1. USB Device

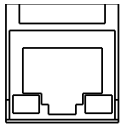


用于与计算机相连，从而实现远程控制。

2. USB Host

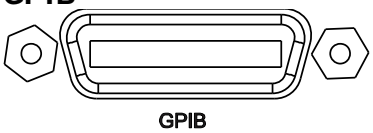
用于连接 U 盘升级系统或存储系统状态、扫描列表等，还可连接 USB 功率传感器以及 RX1000 等设备。

3. LAN



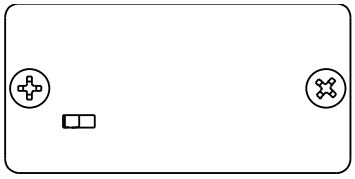
用于连接至计算机或网络，从而实现远程控制。

4. GPIB



用于连接计算机，从而实现远程控制。

5. OCXO（选件）

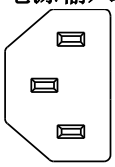


OCXO 为恒温晶体振荡器（Oven Controlled Crystal Oscillator），可提供更高温度稳定度的频率参考源。

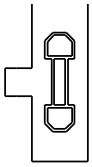
注意：OCXO 在达到其标称频率前需要 40 分钟的预热时间。

有关该选件的订货信息，请参考本产品的数据手册。

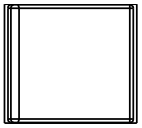
6. 电源输入连接器、保险丝和开关



电源输入连接器。
本信号源支持 100-240 V，45-440 Hz 规格的交流电源。仪器最大输入功率不超过 60 W。当通过该连接器将信号源连接到交流电源时，仪器自动调节至正确的电压范围，无需手动选择电压范围。

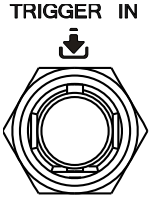


保险丝。
本信号源支持的保险丝规格为：AC 250 V，T2A。如需更换，请参考“**更换保险丝**”一节。



电源开关。
用于打开或关闭信号源。

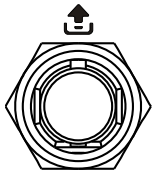
7. 外部触发输入连接器



当 **Sweep** 或 LF 输出“扫正弦”的触发方式为“外触发”时，该连接器用于输入外部触发信号。

8. 信号有效输出连接器

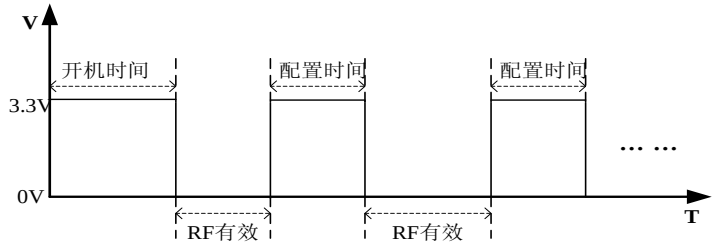
SIGNAL VALID



修改 RF 输出频率或幅度时，仪器内部电路经过一定的响应和处理时间后，前面板 RF 输出连接器以指定的频率和幅度输出 RF 信号。在此过程中，**[SIGNAL VALID]** 连接器输出一个脉冲同步信号指示 RF 输出信号的有效性：

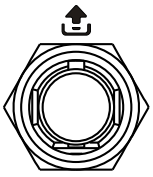
— 高电平（3.3 V）：表示 RF 信号正在配置；

— 低电平（0 V）：表示 RF 信号已经稳定（即有效）。



9. 扫描输出连接器

SWEEP OUT



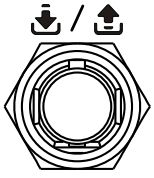
启动 RF 扫描功能，前面板 RF 输出连接器以当前设置值输出扫描信号的同时，**[SWEEP OUT]**连接器输出一个 0 V~+10 V 的信号。每启动一次扫描则对应一个周期输出。

— 步进扫描时，该输出信号与“扫描形状”的选择有关，可设置为“三角波”或“锯齿波”。

— 列表扫描时，该输出信号默认为锯齿波。

10. 脉冲信号输入/输出连接器

PULSE IN/OUT



该连接器的功能由脉冲调制当前的工作模式决定。

PULSE IN：

— 当 **Pulse** 的调制源为“外部”时，用于输入外部脉冲信号。

— 当 **Pulse** 的调制源为“内部”且触发模式为“外部触发”时，用于输入外部触发信号。

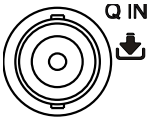
— 当 **Pulse** 的调制源为“内部”且触发模式为“外部门控”时，用于输入外部门控信号。

PULSE OUT：

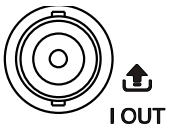
当 **Pulse** 的调制源为“内部”且脉冲输出开关打开时，用于输出内部发生器产生的脉冲信号。该输出信号与“脉冲类型”的选择有关，可设置为“单脉冲”、“双脉冲”或“多脉冲”。

11. I/Q 调制信号输入/输出连接器（选件）

当 I/Q 调制类型为外部时，用于输入 I/Q 调制的同相（I：In-Phase）基带信号。



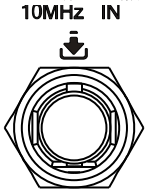
当 I/Q 调制类型为外部时，用于输入 I/Q 调制的正交相位（Q：Quadrature Phase）基带信号。



用于输出内置基带发生器 I/Q 调制的同相（I：In-Phase）成分。

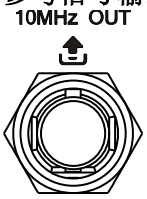
用于输出内置基带发生器 I/Q 调制的正交相位（Q：Quadrature Phase）成分。

12. 参考信号输入连接器



用于输入外部 10 MHz 参考时钟信号，常用于与其它仪器的同步。如需了解该连接器对外部时钟信号的规格要求，请参考本产品的数据手册。

13. 参考信号输出连接器



用于输出由仪器内部晶振产生 10 MHz 参考时钟信号，常用于与其它仪器的同步。如需了解该连接器输出时钟信号的规格，请参考本产品的数据手册。

首次使用 DSG3000

连接电源

请使用附件提供的电源线将信号源连接至 AC 电源中，如下图所示。本信号源支持 100-240 V，45-440 Hz 规格的交流电源。仪器最大输入功率不超过 60 W。当通过该连接器将信号源连接到交流电源时，仪器自动调节至正确的电压范围，无需手动选择。

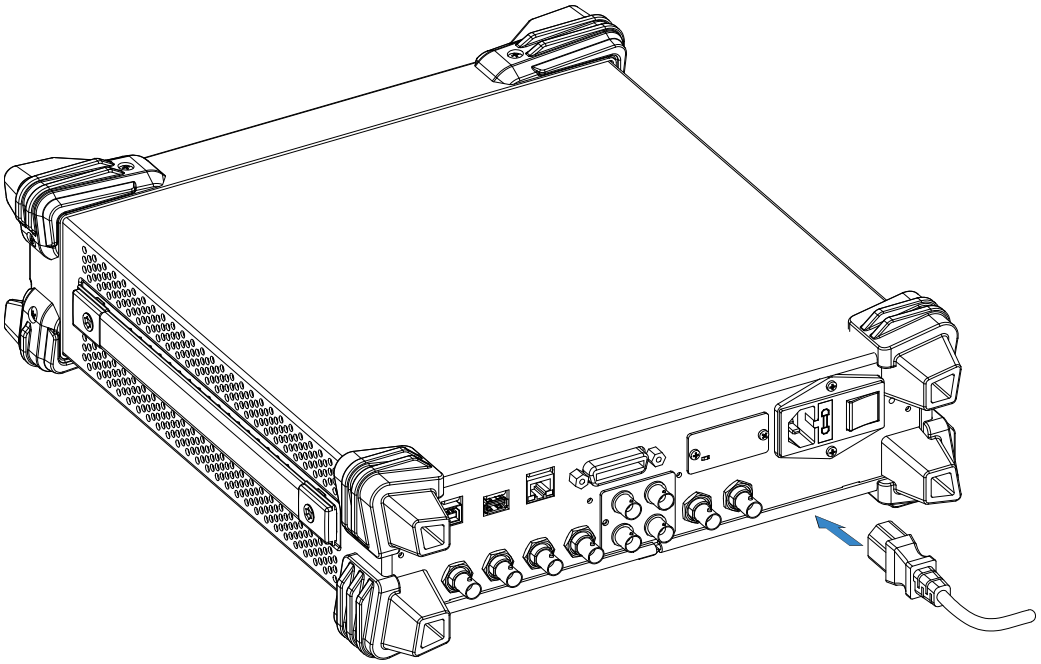


图 3 连接电源

注意

为避免电击，请确保仪器正确接地。

开机检查

正确连接电源后，按下后面板的电源开关和前面板的电源键 打开信号源。开机过程中仪器执行初始化过程和自检过程。结束后，屏幕进入默认界面。

设置系统语言

DSG3000 系列射频信号源支持多种系统语言，您可以按 **System** → **Language** 切换系统语言。

更换保险丝

如需更换保险丝，请使用仪器指定规格的保险丝，按如下步骤更换：

1. 关闭仪器，断开电源，拔去电源线；
2. 使用小一字螺丝刀撬出保险丝座；
3. 取出保险丝；
4. 更换指定规格的保险丝；
5. 重新安装保险丝座。

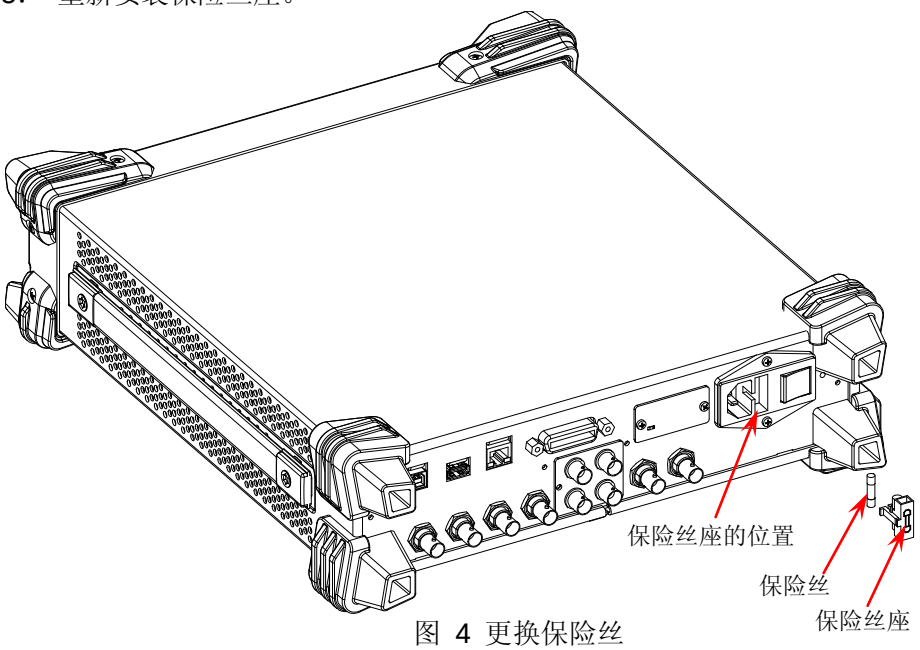


图 4 更换保险丝

警告

为避免电击，更换保险丝之前，请确保仪器已关闭并且已断开与电源的连接，且确保更换的保险丝规格符合要求。

用户界面

DSG3000 系列射频信号源的用户界面包括两种显示模式：普通显示模式和参数放大模式。开机默认进入普通显示模式。本手册仅以 DSG3060 型号的普通显示模式为例，介绍仪器的用户界面。

普通显示模式

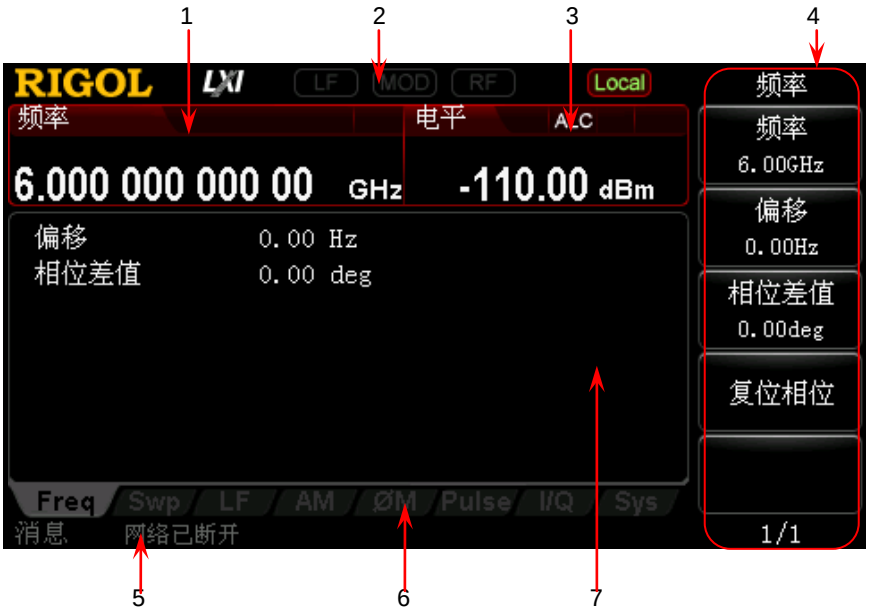


图 5 用户界面（普通显示模式）

1. 频率区

显示当前射频信号源的频率设置。

— Offs ：频率偏移不为 0 时显示。

— ：连续扫描标志。当扫描类型为“频率”或“频率和电平”且扫描模式为“连续”时显示。

— ：单次扫描标志。当扫描类型为“频率”或“频率和电平”且扫描模式为“单次”时显示。

— ：递增扫描标志。当扫描类型为“频率”或“频率和电平”且扫描方向为“递增”时显示。

— ：递减扫描标志。当扫描类型为“频率”或“频率和电平”且扫描方向为“递减”时显示。

— ：频率扫描进度条。当扫描类型为“频率”或“频率和电平”时显示。

2. 状态栏

指示射频信号源部分功能的状态。

— 

：打开 LF 输出时显示。

— 

：打开 RF 调制输出时显示。

— 

：打开 RF 输出时显示。

— 

：射频信号源工作在远程控制模式。

— 

：射频信号源工作在本地操作模式。

3. 幅度区

显示当前射频信号源的电平设置。

— 

：衰减模式为“固定”时显示。

— 

：ALC 状态为“打开”时显示。

— 

：ALC 状态为“自动”时显示。

— 

：平坦度校正开关为“打开”时显示。

— 

：幅度偏移不为 0 时显示。

— 
：连续扫描标志。当扫描类型为“电平”或“频率和电平”且扫描模式为“连续”时显示。

— 
：单次扫描标志。当扫描类型为“电平”或“频率和电平”且扫描模式为“单次”时显示。

— 
：递增扫描标志。当扫描类型为“电平”或“频率和电平”且扫描方向为“递增”时显示。

— 
：递减扫描标志。当扫描类型为“电平”或“频率和电平”且扫描方向为“递减”时显示。

— 
：幅度扫描进度条。当扫描类型为“电平”或“频率和电平”时显示。

4. 菜单显示区

该区域定义了显示屏右边菜单软键的标注。根据选定的功能，菜单软键的标注会发生变化。按下任一软键可激活相应的功能。

5. 错误消息显示区

显示缩写的信息。如果发生多条信息，那么只会保持显示最新的信息。您可通过按 **System** → **信息** → **系统消息** ，查看最近出现的消息。

6. 功能状态区

显示当前各功能的活动状态。每一功能对应最多 4 种状态，如下表所示。

类型	说明	举例
黑底灰字	未选中且未启用该功能。	AM
灰底黑字	选中该功能，即可设置其对应的参数。	AM
灰底白字	选中且已启用该功能。	AM
黑底白字	未选中但已启用该功能。	AM

功能状态区可能出现的状态图标如下图所示。

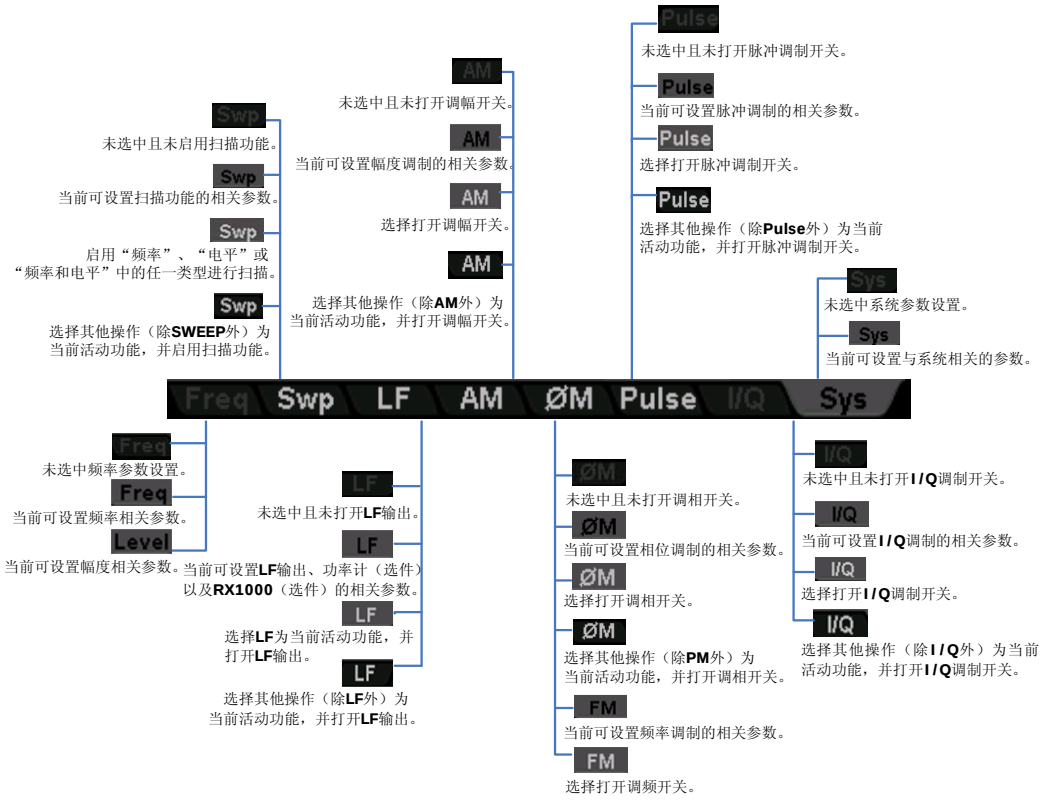


图 6 功能状态区图标

7. 文本显示区

显示射频信号源当前执行功能所对应的参数信息。

参数放大模式

在普通显示模式下，按屏幕左边的显示切换键 **View**，可切换到下图所示的参数放大模式。

图 7 用户界面（参数放大模式）

使用内置帮助系统

DSG3000 内置帮助系统对于前面板上的每个功能按键以及菜单软键，都提供了相关帮助信息。用户可在操作仪器的过程中随时查看任意键的相关帮助。

1. 获取内置帮助的方法

按下 **Help** 键，用户界面文本显示区弹出如何获取帮助的提示，如图 8 所示。然后按下所需要获得帮助的按键，文本显示区将出现该键的帮助信息。

图 8 帮助界面

2. 帮助的翻页操作

当帮助信息为多页显示时，通过方向键或旋钮可获得上一页或下一页的帮助信息。

3. 关闭当前的帮助信息

当文本显示区显示帮助信息时，用户按下前面板上的任意按键（除方向键和旋钮外），将关闭当前显示的帮助信息。

4. 获取菜单软键的帮助信息

按下 **Help** 键，文本显示区将显示帮助信息。按下菜单软键，文本显示区显示菜单键所对应菜单项的帮助信息。

5. 获取任意功能按键的帮助信息

按下 **Help** 键，文本显示区将显示帮助信息。按下任意功能按键，文本显示区显示按键本身的功能帮助信息。

基本操作

输出 RF 信号

从**[RF OUTPUT 50Ω]**连接器输出一个频率为 1 GHz，幅度为-40 dBm 的 RF 信号。

1. 恢复出厂设置

按 **System** → **复位** → **预置类型** → “出厂设置”，然后按 **Preset** 键恢复出厂设置（频率偏移默认为 0 Hz，幅度偏移默认为 0 dB）。

2. 频率设置

按 **FREQ** → **频率** ，使用数字键盘输入频率的数值 1，然后在弹出的单位菜单或单位按键中选择所需的单位 GHz。

- 可选的频率单位有GHz、MHz、kHz和Hz。
- 按 **Enter** 键可以选择默认单位Hz。
- 您还可以按左右方向键进入参数编辑状态并移动光标至指定的位，按上下方向键或旋转旋钮修改数值。
- 频率设置完成后，您可以按上下方向键或旋转旋钮以当前步进值修改频率。
- 按 **FREQ** → **频率** ，再按 **Step** 键可以设置步进值。

3. 幅度设置

按 **LEVEL** → **电平** ，使用数字键盘输入幅度的数值-40，然后在弹出的单位菜单或单位按键中选择所需的单位 dBm。您也可以按 **Enter** 键选择默认单位 dBm。

- 可选的幅度单位有dBm、-dBm、mV、uV和nV。
- 您可以按左右方向键进入参数编辑状态并移动光标至指定的位，按上下方向键或旋转旋钮修改数值。
- 您还可以按上下方向键或旋转旋钮以当前步进值修改幅度。
- 按 **LEVEL** → **电平** ，再按 **Step** 键可以设置步进值。

4. 打开 RF 输出

按下 **RF** 键，背灯点亮，用户界面状态栏显示 RF 标志，打开 RF 输出。此时，**[RF OUTPUT 50Ω]** 连接器以当前配置输出 RF 信号。

图 9 输出 RF 信号参数设置界面

输出 RF 扫描信号

本小节以配置连续的线性步进扫描为例，介绍输出一个 RF 扫描信号：频率范围为 1 GHz~2 GHz，幅度范围为-20 dBm~0 dBm，扫描点数为 10，驻留时间为 500 ms。

1. 恢复出厂设置

按 **System** → **复位** → **预置类型** → “出厂设置”，然后按 **Preset** 键恢复出厂设置（扫描模式默认为连续，扫描方式默认为步进，扫描间隔默认为线性）。

2. 步进扫描参数设置

按 **SWEEP** 键，使用菜单翻页键 打开第 2/3 页菜单，然后按 **步进扫描** 软键，进入步进扫描参数设置界面。

- 起始频率

  按 **起始频率** 软键，使用数字键盘输入起始频率的数值 1，然后在弹出的单位菜单或单位按键中选择所需的单位 GHz。

- 终止频率

  按 **终止频率** 软键，使用数字键盘输入终止频率的数值 2，然后在弹出的单位菜单或单位按键中选择所需的单位 GHz。

- 起始电平

  按 **起始电平** 软键，使用数字键盘输入起始电平的数值-20，然后在弹出的单位菜单或单位按键中选择所需的单位 dBm。您也可以按 **Enter** 键选择默认单位 dBm。

- 终止电平
  按 **终止电平** 软键，使用数字键盘输入终止电平的数值 0，然后在弹出的单位菜单或单位按键中选择所需的单位 dBm。您也可以按 **Enter** 键选择默认单位 dBm。

- 扫描点数
  按 **点数** 软键，使用数字键盘输入扫描点的个数 10，然后按 **确定** 软键或 **Enter** 键。

- 驻留时间
  驻留时间表示一个扫描步进持续的时间。
  按 **驻留时间** 软键，使用数字键盘输入时间数值 500，然后在弹出的单位菜单或单位按键中选择所需的单位 ms。

3. 启用 RF 扫描

按 **SWEEP** → **扫描类型** ，选择“频率和电平”，同时启用频率和幅度扫描功能。

此时，射频信号源以当前设置值从起始频率和电平到终止频率和电平进行连续步进扫描。用户界面频率区和幅度区分别显示频率和幅度扫描进度条以及连续扫描标志。

4. 打开 RF 输出

按下 **RF** 键，背灯点亮，用户界面状态栏显示 RF 标志，打开 RF 输出。此时，**[RF OUTPUT 50Ω]** 连接器以当前配置输出 RF 扫描信号。

图 10 输出 RF 扫描信号参数设置界面

输出 RF 已调信号

本小节以幅度调制（AM）为例，介绍输出一个 AM 已调信号：载波频率为 800 MHz，载波幅度为-20 dBm，AM 调制深度为 60%，调制频率为 20 kHz。

1. 恢复出厂设置

按 **System** → **复位** → **预置类型** → “出厂设置”，然后按 **Preset** 键恢复出厂设置（调制源默认为内部，调制波形默认为正弦）。

2. 设置载波频率和幅度

(1) 载波频率

按 **FREQ** → **频率** ，使用数字键盘输入频率的数值 800，然后在弹出的单位菜单或单位按键中选择所需的单位 MHz。

(2) 载波幅度

按 **LEVEL** → **电平** ，使用数字键盘输入幅度的数值-20，然后在弹出的单位菜单或单位按键中选择所需的单位 dBm。您也可以按 **Enter** 键选择默认单位 dBm。

3. 设置 AM 调制参数

(1) 按 **AM** 键，进入调幅参数设置界面。

(2) 按 **调制深度** 软键，使用数字键盘输入调制深度数值 60，然后在弹出的单位菜单中或按 **Enter** 键选择所需的单位%。

(3) 按 **调制频率** 软键，使用数字键盘输入所需的频率值 20，然后在弹出的单位菜单或单位按键中选择所需的单位 kHz。

(4) 按 **开关** 软键，选择“打开”，开启 AM 功能。**AM** 功能键背灯点亮。

4. 打开 RF 调制输出

按下 **MOD** 键，背灯点亮，然后按下 **RF** 键，背灯点亮，用户界面状态栏显示 MOD 和 RF 标志，打开 RF 调制输出。此时，**[RF OUTPUT 50Ω]** 连接器以当前配置输出已调制的 RF 信号。

注意：**RF** 按键和 **MOD** 按键背灯必须都处于点亮状态。

图 11 输出 RF 已调信号参数设置界面

远程控制

DSG3000 支持通过 USB、LAN 或 GPIB 接口与计算机进行通信从而实现远程控制。远程控制基于 SCPI 命令集（Standard Commands for Programmable Instruments，用于可编程仪器的标准命令集）实现。本小节将介绍如何使用 **RIGOL** 提供的通用 PC 软件 Ultra Sigma 发送 SCPI 命令并通过 USB 接口对射频信号源进行远程控制。有关命令的详细说明请参考本产品的《编程手册》。

注意：当仪器工作在远程模式时，用户界面显示 Rmt 图标，前面板按键被锁定（Esc 除外）。此时，您可以按 Esc 键退出远程模式。

1. 安装 Ultra Sigma 软件

获取 Ultra Sigma 软件，然后按照指导正确安装软件及所需组件。该软件可从标配附件的资源光盘中获得，您也可以登陆 www.rigol.com 网站下载最新软件版本。

2. 通过 USB 控制

(1) **连接设备**

使用 USB 数据线连接射频信号源（USB Device）与计算机（USB Host）。

(2) **安装 USB 驱动**

本射频信号源为 USBTMC 设备，将射频信号源与 PC 正确连接并且开机后（信号源将自动配置为 USB 接口），PC 将弹出硬件更新向导对话框，请按照向导的提示安装“USB Test and Measurement Device”驱动程序。

(3) **搜索设备资源**

打开 Ultra Sigma，软件将自动搜索当前连接到 PC 上的射频信号源资源，您也可以点击 USB-TMC 进行搜索。

(4) **查看设备资源**

搜索到的资源将出现在“RIGOL Online Resource”目录下，并且显示仪器的型号和 USB 接口信息，如下图所示：

图 12 查看 USB 仪器资源

(5) **通讯测试**

右击资源名“DSG3060 (USB0::0x1AB1::0x0992::DSG3A1301080006::INSTR)”，选择“SCPI Panel Control”，打开远程命令控制面板，即可通过该面板发送命令和读取数据。

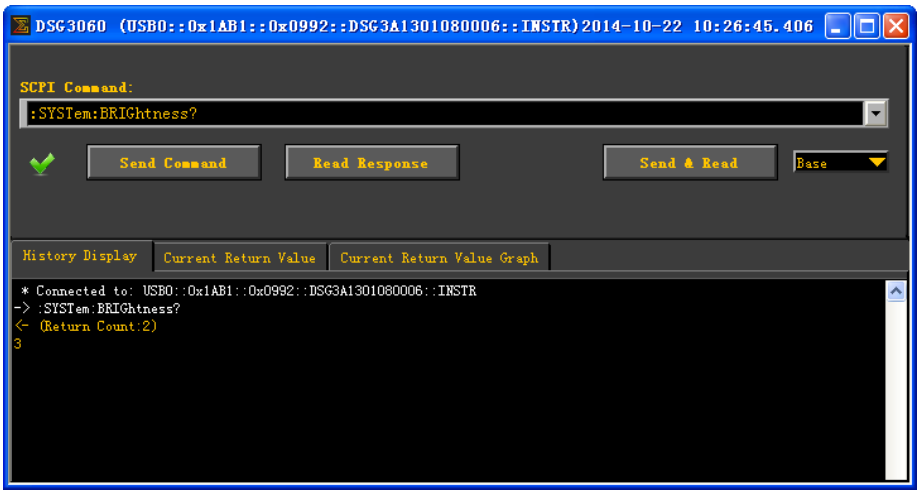


图 13 通过 USB 读写命令

故障处理

下面列举了 DSG3000 在使用过程中可能出现的故障及排查方法。当您遇到这些故障时，请按照相应的步骤进行处理，如不能处理，请与 **RIGOL** 联系，同时请提供您机器的设备信息（获取方法：**System** → 信息 → 系统信息）。

1. 如果按下电源键，射频信号源仍然黑屏，没有任何显示：

(1) 检查风扇是否转动；
   — 如果风扇转动，屏幕不亮，可能是屏幕连接线松动。
   — 如果风扇不转，说明仪器并未成功开机，请参考步骤(2)处理。
(2) 检查电源接头是否已正确连接，电源开关是否已打开。
(3) 检查电源保险丝是否已熔断。如需更换保险丝，请使用仪器指定规格的保险丝（AC 250V，T2A）。
(4) 做完上述检查后，重新启动仪器。
(5) 如果仍然无法正常使用本产品，请与 **RIGOL** 联系。

2. 屏幕显示太暗，看不清：

(1) 检查液晶屏的亮度设置值是否太小。
(2) 按 **System** → 显示 → 亮度 软键，使用数字键或上下方向键调节射频信号源液晶屏的亮度至合适的状态。

3. 射频信号源被锁定：

(1) 检查射频信号源是否工作在远程控制模式（远程控制时，用户界面状态栏显示 Rmt 标志）。按 **Esc** 键可退出远程控制模式，解锁前面板。
(2) 确认射频信号源是否工作在本地屏幕锁定状态（屏幕锁定时，前面板操作被禁止）。按 **Esc** 键可解锁屏幕，退出锁定状态。
(3) 如果信号源界面显示进度条，表示正在进行某个操作。例如，保存文件时，显示进度条表示正在进行保存。此操作进行中，前面板被锁定。
(4) 按 **Preset** 或重新启动信号源的电源，也可解除锁定。

4. 设置正确但波形输出不正确：

(1) 没有 RF 输出
   — 检查信号连接线是否与相应的 **[RF OUTPUT 50Ω]** 端口紧固连接。
   — 检查连接线是否有内部损伤。
   — 检查连接线与测试仪器是否紧固连接。
   — 检查 **RF** 键背灯是否点亮。如果未点亮，按该键使其点亮，并且用户界面状态栏显示 RF 标志。此时 RF 输出已正确打开。
   — 检查 RF 信号的输出幅度是否过小，适当调整输出幅度的大小。

(2) RF 输出上没有调制
- 检查信号连接线是否与相应的 **[RF OUTPUT 50Ω]** 端口紧固连接。
- 检查连接线是否有内部损伤。
- 检查连接线与测试仪器是否紧固连接。
- 检查 **MOD** 和 **RF** 按键背灯是否都处于点亮状态，并且需查看调制 **开关** 是否打开。
- 检查调制参数设置是否合适，适当调整调制参数。
- 如果使用外部调制源，请确保外部源连接正确并且有输出，同时应在信号源指定的范围内工作。

5. 扫描发生异常：

(1) 扫描出现停滞

用户界面频率区/幅度区显示扫描进度条，表示正在进行扫描操作。若出现扫描停滞，应检查以下几点：
- 至少打开一种扫描类型：按 **SWEEP** → **扫描类型**，选择“频率”、“幅度”或“频率和幅度”。
- 如果是单次扫描模式，按 **单次** 软键满足触发条件时，则启动一次扫描。
- 如果扫描触发方式不是自动触发，按 **SWEEP** → **触发方式** → **自动触发** ，以确定是否是扫描触发丢失阻塞了扫描。
- 如果点触发方式不是自动触发，按 **SWEEP** → **点触发方式** → **自动触发** ，以确定是否是点触发丢失阻塞了扫描。
- 确定驻留时间设置值是否太大或太小，导致看不到扫描。
- 确认在步进扫描或列表扫描中至少设置了两个点。

(2) 列表扫描驻留时间不正确
- 按 **SWEEP** → **列表扫描** 软键，进入扫描列表编辑界面。
- 确认列表扫描驻留时间值是否正确。
- 若驻留时间值不正确，重新编辑；若驻留时间值正确，跳转到下一步。
- 按 **SWEEP** → **扫描方式** ，确认选择“列表”扫描方式。
  如果此时选择的是“步进”扫描，信号源按照步进扫描设置的驻留时间进行扫描。

(3) 调用的寄存器中列表扫描信息丢失
- 列表扫描信息不能作为仪器状态的一部分被存储在仪器状态寄存器中。
- 信号源只能使用当前列表扫描，您可保存列表扫描数据到仪器本地目录。

(4) 在列表或步进扫描中，幅度没有变化
- 确认扫描类型设置为幅度或频率和幅度。
- 如果当前扫描类型设置为频率，幅度值不会改变。

6. U 盘设备不能被识别：

(1) 检查 U 盘设备是否连接至其他仪器或计算机上可以正常工作。
(2) 确认使用的为 Flash 型 U 盘设备，本仪器不支持硬盘型 U 盘设备。
(3) 重新启动仪器后，再插入 U 盘设备进行检查。
(4) 如果仍然无法正常使用 U 盘，请与 **RIGOL** 联系。

7. 按键无响应或串键：

(1) 开机后，确认是否所有按键均无响应。
(2) 按 **System** → 自检 → 键盘测试，进入键盘测试界面。依次按下前面板上的功能按键，确认是否有按键无响应或者串键现象。
(3) 如存在上述故障，可能是键盘连接线松动或者键盘损坏，请勿自行拆卸仪器，并及时与**RIGOL**联系。

8. 性能指标测试没有通过：

(1) 检查射频信号源是否在校准周期内（校准周期为1年）；
(2) 确认是否在测试之前将射频信号源预热了至少30分钟；
(3) 检查射频信号源是否处于规定环境温度下；
(4) 确认测试是否处于强磁环境下进行；
(5) 检查射频信号源以及测试系统的供电是否有强干扰；
(6) 检查使用的测试设备的性能是否符合要求；
(7) 确保使用的测试设备在校准周期内；
(8) 检查使用的测试设备是否在其手册要求的工作条件下；
(9) 检查所有的连接是否紧固；
(10) 查看所有的线缆是否有内部损伤；
(11) 确保操作符合性能校验手册要求的设置和流程；
(12) 确认误差计算是否有失误；
(13) 正确理解本产品对“典型值”和“标称值”的定义：
— 典型值：指产品在特定条件下的性能指标。
— 标称值：指产品应用过程中的近似量值。

RIGOL

Quick Guide

DSG3000 Series RF Signal Generator

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Product Certification

RIGOL guarantees 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 certification is 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
Website: www.rigol.com

Safety Requirement

General Safety Summary

Please review the following safety precautions carefully before putting the instrument into operation so as to avoid any personal injury or damage to the instrument and any product connected to it. To prevent potential hazards, please use the instrument only specified by this manual.

Use Proper Power Cord.
Only the power cord designed for the instrument and authorized for use within the local country could be used.

Ground the Instrument.
The instrument is grounded through the Protective Earth lead of the power cord. To avoid electric shock, it is essential to connect the earth terminal of the power cord to the Protective Earth terminal before connecting any inputs or outputs.

Connect the Probe Correctly.
If a probe is used, do not connect the ground lead to high voltage since it has isobaric electric potential as the ground.

Observe All Terminal Ratings.
To avoid fire or shock hazard, observe all ratings and markers on the instrument and check your manual for more information about ratings before connecting the instrument.

Use Proper Overvoltage Protection.
Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might be exposed to the danger of electrical shock.

Do Not Operate Without Covers.
Do not operate the instrument with covers or panels removed.

Do Not Insert Anything Into the Holes of Fan.
Do not insert anything into the holes of the fan to avoid damaging the instrument.

Use Proper Fuse.
Please use the specified fuses.

Avoid Circuit or Wire Exposure.
Do not touch exposed junctions and components when the unit is powered.

Do Not Operate With Suspected Failures.

If you suspect damage occurs to the instrument, have it inspected by **RIGOL** authorized personnel before further operations. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by **RIGOL** authorized personnel.

Keep Well Ventilation.

Inadequate ventilation may cause an increase of instrument temperature which would cause damage to the instrument. So please keep the instrument 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 the instrument in a humid environment.

Do Not Operate in an Explosive Atmosphere.

In order to avoid damage 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 and/or moisture in the air, please keep the surface of the device clean and dry.

Electrostatic Prevention.

Operate the instrument in an electrostatic discharge protective environment to avoid damage induced by static discharges. Always ground both the internal and external conductors of cables to release static before making connections.

Proper Use of Battery.

If a battery is supplied, it must not be exposed to high temperature or in contact with fire. Keep it out of the reach of children. Improper change of battery (note: lithium battery) may cause explosion. Use **RIGOL** specified battery only.

Handling Safety.

Please handle with care during transportation to avoid damage to keys, knob interfaces and other parts on the panels.

Safety Terms and Symbols

Terms Used in this Manual. These terms may appear in this manual:

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

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

Terms Used on the Product. These terms may appear 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.

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

Hazardous Voltage

Safety Warning

Protective Earth Terminal

Chassis Ground

Test Ground

Allgemeine Sicherheits Informationen

Überprüfen Sie diefolgenden Sicherheitshinweise sorgfältigumPersonenschädenoderSchäden am Gerätundan damit verbundenen weiteren Gerätenzu vermeiden. Zur Vermeidung vonGefahren, nutzen Sie bitte das Gerät nur so, wiein diesem Handbuchangegeben.

Um Feuer oder Verletzungen zu vermeiden, verwenden Sie ein ordnungsgemäßes Netzkabel.
Verwenden Sie für dieses Gerät nur das für ihr Land zugelassene und genehmigte Netzkabel.

Erden des Gerätes.
Das Gerät ist durch den Schutzleiter im Netzkabel geerdet. Um Gefahren durch elektrischen Schlag zu vermeiden, ist es unerlässlich, die Erdung durchzuführen. Erst dann dürfen weitere Ein- oder Ausgänge verbunden werden.

Anschluss einesTastkopfes.
Die Erdungsklemmen der Sonden sindauf dem gleichen Spannungspegel des Instruments geerdet. SchließenSie die Erdungsklemmen an keine hohe Spannung an.

Beachten Sie alle Anschlüsse.
Zur Vermeidung von Feuer oder Stromschlag, beachten Sie alle Bemerkungen und Markierungen auf dem Instrument. Befolgen Sie die Bedienungsanleitung für weitere Informationen, bevor Sie weitere Anschlüsse an das Instrument legen.

Verwenden Sie einen geeigneten Überspannungsschutz.
Stellen Sie sicher, daß keinerlei Überspannung (wie z.B. durch Gewitter verursacht) das Gerät erreichen kann. Andernfallsbestehtfür den Anwender die GefahreinesStromschlages.

Nicht ohne Abdeckung einschalten.
Betreiben Sie das Gerät nicht mit entfernten Gehäuse-Abdeckungen.

Betreiben Sie das Gerät nicht geöffnet.
Der Betrieb mit offenen oder entfernten Gehäuseteilen ist nicht zulässig. Nichts in entsprechende Öffnungen stecken (Lüfter z.B.)

Passende Sicherung verwenden.
Setzen Sie nur die spezifikationsgemäßen Sicherungen ein.

Vermeiden Sie ungeschützte Verbindungen.
Berühren Sie keine unisolierten Verbindungen oder Baugruppen, während das Gerät in Betrieb ist.

Betreiben Sie das Gerät nicht im Fehlerfall.
Wenn Sie am Gerät einen Defekt vermuten, sorgen Sie dafür, bevor Sie das Gerät wieder betreiben, dass eine Untersuchung durch **RIGOL** autorisiertem Personal durchgeführt wird. Jedwede Wartung, Einstellarbeiten oder Austausch von Teilen am Gerät, sowie am Zubehör dürfen nur von **RIGOL** autorisiertem Personal durchgeführt werden.

Belüftung sicherstellen.
Unzureichende Belüftung kann zu Temperaturanstiegen und somit zu thermischen Schäden am Gerät führen. Stellen Sie deswegen die Belüftung sicher und kontrollieren regelmäßig Lüfter und Belüftungsöffnungen.

Nicht in feuchter Umgebung betreiben.
Zur Vermeidung von Kurzschluß im Geräteinneren und Stromschlag betreiben Sie das Gerät bitte niemals in feuchter Umgebung.

Nicht in explosiver Atmosphäre betreiben.
Zur Vermeidung von Personen- und Sachschäden ist es unumgänglich, das Gerät ausschließlich fernab jedweder explosiven Atmosphäre zu betreiben.

Geräteoberflächen sauber und trocken halten.
Um den Einfluß von Staub und Feuchtigkeit aus der Luft auszuschließen, halten Sie bitte die Geräteoberflächen sauber und trocken.

Schutz gegen elektrostatische Entladung (ESD).
Sorgen Sie für eine elektrostatisch geschützte Umgebung, um somit Schäden und Funktionsstörungen durch ESD zu vermeiden. Erden Sie vor dem Anschluß immer Innen- und Außenleiter der Verbindungsleitung, um statische Aufladung zu entladen.

Die richtige Verwendung desAkku.
Wenneine Batterieverwendet wird, vermeiden Sie hohe Temperaturen bzw. Feuer ausgesetzt werden. Bewahren Sie es außerhalbder Reichweitevon Kindern auf. UnsachgemäßeÄnderung derBatterie (Anmerkung: Lithium-Batterie) kann zu einer Explosion führen. VerwendenSie nur von **RIGOL** angegebenenAkkus.

Sicherer Transport.
Transportieren Sie das Gerät sorgfältig (Verpackung!), um Schäden an Bedienelementen, Anschlüssen und anderen Teilen zu vermeiden.

Sicherheits Begriffe und Symbole

Begriffe in diesem Guide. Diese Begriffe können in diesem Handbuch auftauchen:

WARNING
Die Kennzeichnung WARNING beschreibt Gefahrenquellen die leibliche Schäden oder den Tod von Personen zur Folge haben können.

CAUTION
Die Kennzeichnung Caution (Vorsicht) beschreibt Gefahrenquellen die Schäden am Gerät hervorrufen können.

Begriffe auf dem Produkt. Diese Bedingungen können auf dem Produkt erscheinen:

DANGER	weist auf eine Verletzung oder Gefährdung hin, die sofort geschehen kann.
WARNING	weist auf eine Verletzung oder Gefährdung hin, die möglicherweise nicht sofort geschehen.
CAUTION	weist auf eine Verletzung oder Gefährdung hin und bedeutet, dass eine mögliche Beschädigung des Instruments oder anderer Gegenstände auftreten kann.

Symbole auf dem Produkt. Diese Symbole können auf dem Produkt erscheinen:

Gefährliche Spannung

Sicherheits-Hinweis

Schutz-erde

Gehäusemasse

Erde

General Care and Cleaning

General 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. 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 or water). When cleaning the LCD, take care to avoid scarifying it.

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

WARNING
To avoid short-circuit and personal injury resulting from moisture, make sure the instrument is completely dry before reconnecting it to power supply.

Environmental Considerations

The following symbol indicates that this product complies with the WEEE Directive 2002/96/EC.

Product End-of-Life Handling

The equipment may contain substances that could be harmful to the environment or human health. In order to avoid release of such substances into the environment and harm to human health, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately. Please contact your local authorities for disposal or recycling information.

Document Overview

Format Conventions in this Manual

1. **Key:**
   The key at the front panel is denoted by the format of "Text Box + Key Name (Bold)" in the manual, for example, **FREQ** denotes the **FREQ** key.

2. **Menu:**
   The menu is denoted by the format of "Character Shading + Menu Word (Bold)" in the manual, for example, **Frequency** denotes the frequency item under **FREQ**.

3. **Connector:**
   The connector at the front or rear panel is denoted by the format of "Square Brackets + Connector Name (Bold)" in the manual, for example, **[RF OUTPUT 50Ω]**.

4. **Operation Steps:**
   The next step of the operation is denoted by an arrow "→" in the manual. For example, **FREQ** → **Frequency** denotes pressing **FREQ** at the front panel and then pressing **Frequency**.

Content Conventions in this Manual

DSG3000 series RF signal generator includes DSG3030 and DSG3060. In this manual, DSG3060 is taken as an example to illustrate the basic operations of the signal generator. For more details, please refer to *DSG3000 Series RF Signal Generator User's Guide*.

Manuals of this Product

The manuals of this product mainly include the quick guide, user's guide, programming guide and data sheet. For the newest version of the desired manual, download it from www.rigol.com.

Contents

Quick Start

General Inspection

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 passed both electrical and mechanical tests.

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

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

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

Front Panel Overview

The front panel of DSG3000 series RF signal generator is as shown in the figure below.

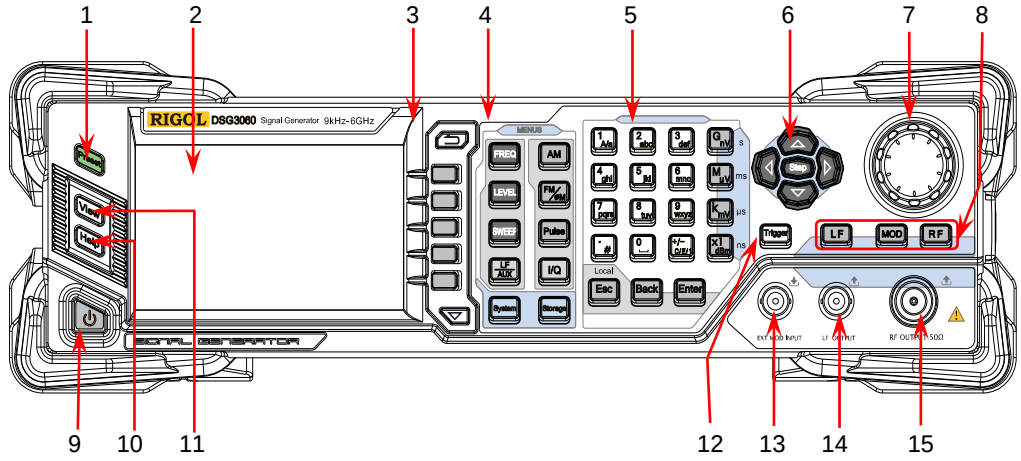


Figure 1 Front Panel

1. Restore to Preset Key

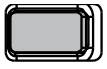
Restore the instrument to the preset state (factory state or user-stored state).

2. LCD

4.3 inch TFT high-resolution (480×272) color LCD. The current settings and state of the instrument can be clearly displayed. For the detailed information, refer to "**User Interface**".

3. Menu Control Keys

Quit the current menu and return to the previous menu.



Menu softkeys. Correspond to the menus at the left and pressing the softkey will activate the corresponding menu.

Menu page up/down key.

4. Function Keys

Set the frequency, frequency offset and phase of the RF output signal.

Set the amplitude and attenuation of the RF output signal and provide the flatness calibration function.

Set the sweep type, sweep manner and sweep mode.

Set the parameters relating to amplitude modulation (AM).

Set the parameters relating to frequency modulation (FM) and phase modulation (ØM).

Set the parameters relating to pulse modulation.

Set the parameters relating to I/Q modulation.

Set the parameters relating to LF output, the instrument options and other extended functions.

Store and recall the instrument state, flatness calibration data, sweep list and so on.

Set the system-related parameters.

5. Numeric Keyboard

The numeric keyboard supports Chinese characters, English uppercase/lowercase characters, numbers and commonly used symbols (include the decimal point, #, space and positive/negative sign +/-). It is mainly used to edit the file or folder name or set parameters.

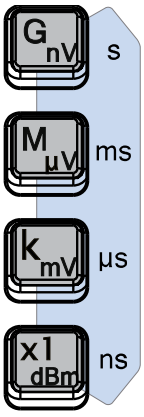
The multiplexing key of number and letter is used to directly input the desired number or letter.

Used to switch among Chinese, English and number input modes.
When setting parameters, the input mode is fixed at number and this key is used to input the sign (“+” or “-”) of the value.

In number input mode, press this key to input 1.
In English input mode, press this key to switch between uppercase and lowercase letter inputs.

The multiplexing key of 0 and space.
In number input mode, press this key to input 0.
In Chinese or English input mode, press this key to input a space.

In number input mode, press this key to insert a decimal point at the current cursor.
In English input mode, press this key to input “#”.
In Chinese input mode, this key is invalid.



Used to set the unit of the parameter.
When setting a parameter, after inputting the numbers using the numeric keyboard, press any of the keys to select the corresponding unit. The unit selected is related to the type of the parameter to be set.

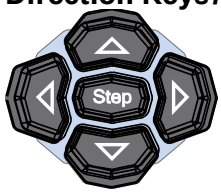
Parameter	G_{nV}	$M_{\mu V}$	k_{mV}	$X1_{dBm}$
Frequency	GHz	MHz	kHz	Hz
Amplitude	nV	µV	mV	dBm
Period	s	ms	µs	ns

When setting parameters, use this key to clear the number in the active function area and exit the parameter input state.
When editing filenames, use this key to clear the characters in the input bar.
During keyboard test, use this key to exit the current test state.
When the instrument is in remote mode, use this key to return to local mode.

When setting parameters, use this key to delete the number at the left of the cursor.
When editing filenames, use this key to delete the character at the left of the cursor.
For the storage function, it is used to fold the directory currently selected.

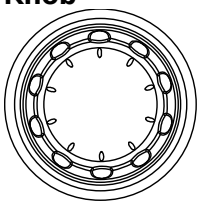
When setting parameters, use this key to finish the parameter input and add the default unit for the parameter.
When editing filenames, use this key to input the character currently selected by the cursor.
For the storage function, it is used to unfold the directory currently selected.

6. Direction Keys/Step Key



When setting parameters, **Step** is used to set the step of the parameter currently selected.
The left/right direction key is used to enter the parameter editing state and move the cursor to the specified digit.
The up/down direction key is used to modify the value at the cursor or modify the parameter value at the current step.
For the storage function, the left/right direction key is used to fold or unfold the directory currently selected.
The up/down direction key is used to select the current directory or file.
When editing filenames, they are used to select the desired character.

7. Knob



When setting parameters, it is used to modify the value at the cursor or modify the parameter value at the current step.
When editing filenames, it is used to select the desired character.
For the storage function, it is used to select the current directory or file.

8. Output Control Keys

Used to turn on or off the LF output.

- Press this key, the backlight goes on and the LF label is displayed in the status bar in the user interface. The LF output is turned on. At this point, the **[LF OUTPUT]** connector outputs LF signal according to the current configuration.
- Press this key again, the backlight goes out and the LF output is turned off.

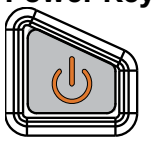
Used to turn on or off the RF output.

- Press this key, the backlight goes on and the RF label is displayed in the status bar in the user interface. The RF output is turned on. At this point, the **[RF OUTPUT 50Ω]** connector outputs RF signal according to the current configuration.
- Press this key again, the backlight goes out and the RF output is turned off.

Used to turn on or off the RF modulation output.

- Press this key, the backlight goes on and the MOD label is displayed in the status bar in the user interface. The RF modulation output is turned on. At this point, the **[RF OUTPUT 50Ω]** connector outputs modulated RF signal according to the current configuration (the backlight of **RF** must go on).
- Press this key again, the backlight goes out and the RF modulation output is turned off.

9. Power Key



Turn on or off the signal generator. When this key is turned off, the signal generator is in standby state and it will be powered off only when the power switch at the rear panel is turned off and the power cord is removed.

Press **System** → **Power Status** to select "Open" or "Default". When "Default" is selected, after the instrument is powered on and the power switch at the rear panel is turned on, you need to press this key to start the instrument. When "Open" is selected, the instrument will start automatically after it is powered on and the power switch at the rear panel is turned on.

10. Built-in Help System

To get the help information of any front panel key or menu softkey, press this key and then press the desired key.

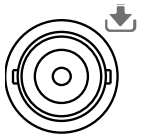
11. View Switch Key

It is used to switch the interface display mode to normal mode or parameter zoom-in mode.

12. Trigger Control Key

When the trigger type of **Sweep** is "Key", press this key once to trigger a sweep.
When the trigger mode of **Pulse** is "Key", press this key once to enable a pulse modulation.

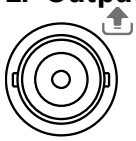
13. External Modulation Input Connector



When the modulation source of AM, FM and ΦM is external, this connector is used to input the external modulating signal.

EXT MOD INPUT

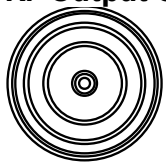
14. LF Output Connector



LF OUTPUT

When the backlight of **LF** goes on, this connector is used to output LF signal.

15. RF Output Connector



RF OUTPUT 50Ω

When the backlight of **RF** goes on, this connector is used to output RF signal and RF sweep signal.
When the backlights of **RF** and **MOD** go on, this connector is used to output RF modulated signal.

CAUTION
To avoid damage to the instrument, the reverse DC voltage on the RF output connector cannot exceed 50 V, the reverse power must be less than +10 dBm in 9 kHz~1 MHz frequency range and +30 dBm in 1 MHz~6 GHz frequency range.

Rear Panel Overview

The rear panel of DSG3000 series RF signal generator is as shown in the figure below.

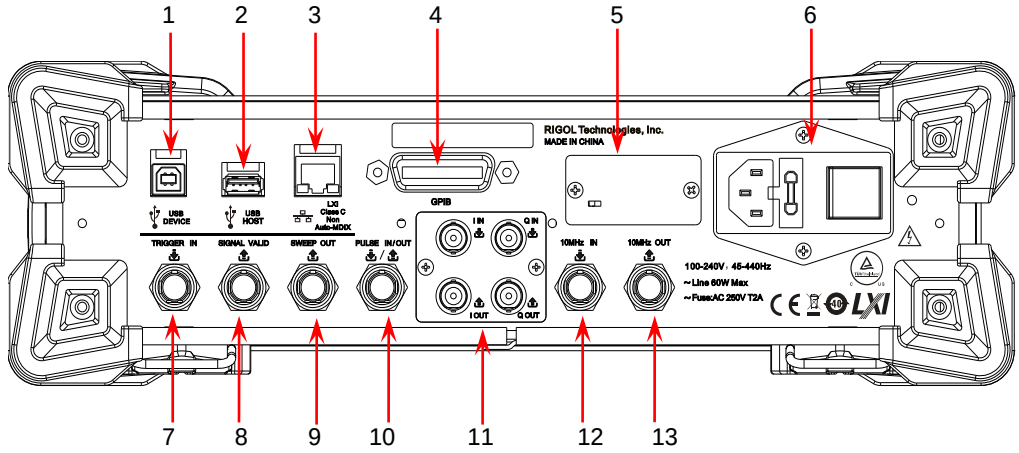
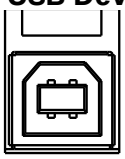


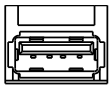
Figure 2 Rear Panel

1. USB Device



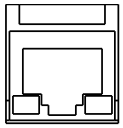
It is used to connect the PC to realize remote control.

2. USB Host



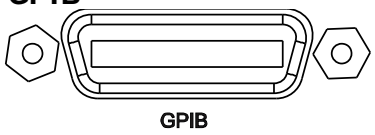
It is used to connect the USB storage device to update the system or store system state and sweep list. You can also connect the USB power sensor or RX1000.

3. LAN



It is used to connect the PC or network to realize remote control.

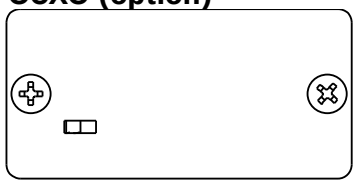
4. GPIB



GPIB

It is used to connect the PC to realize remote control.

5. OCXO (option)

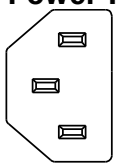


OCXO is oven controlled crystal oscillator and can provide frequency reference source with higher temperature stability.

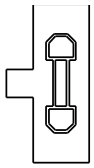
Note: Forty minutes of warm-up is required for the OCXO to reach its rated frequency.

About the ordering information of the option, please refer to the data sheet.

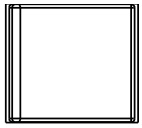
6. Power Input Connector, Fuse and Switch



Power input connector.
The AC power supplies supported by this signal generator are 100-240 V, 45-440 Hz. The maximum input power of the instrument cannot exceed 60 W. When the signal generator is connected to AC power supply via this connector, the instrument selects the correct voltage range automatically and users do not need to select the voltage range manually.

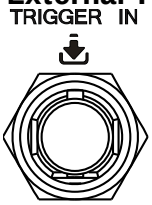


Fuse.
The fuse specification of this signal generator is AC 250 V, T2A.
If the fuse needs to be replaced, please refer to "**To Replace the Fuse**".



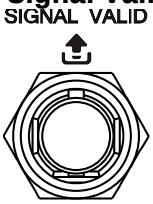
Power Switch
It is used to turn on or off the signal generator.

7. External Trigger Input Connector



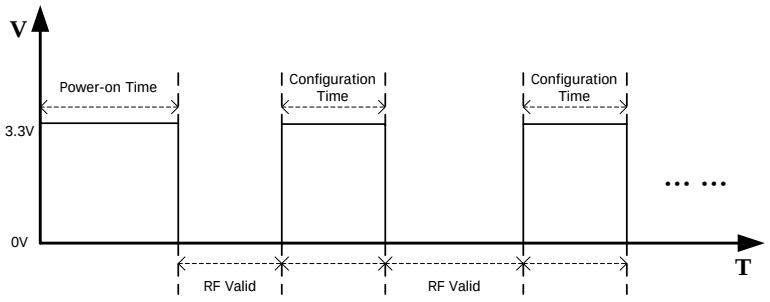
When the trigger mode of **Sweep** or "Swp-Sine" of LF output is "Ext", this connector is used to input the external trigger signal.

8. Signal Valid Output Connector

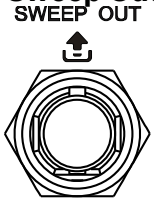


When the RF output frequency or amplitude is modified, after certain response and processing time, the internal circuit of the instrument outputs RF signal with the specified frequency and amplitude via the RF output connector at the front panel. During this process, the **[SIGNAL VALID]** connector outputs a pulse sync signal, indicating that the RF output signal is valid.

- High Level (3.3 V): indicate that the RF signal is in configuration;
- Low Level (0 V): indicate that the RF signal is stable (namely, the signal is valid).



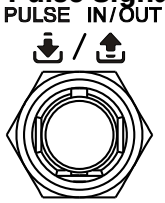
9. Sweep Output Connector



When the RF sweep function is enabled, the **[SWEEP OUT]** connector outputs a signal (0 V to +10 V) while the RF output connector at the front panel outputs the sweep signal according to the current setting. Each sweep corresponds to an output cycle.

- When the sweep type is step, this output signal is related to the sweep shape ("Triangle" or "Ramp") currently selected.
- When the sweep type is list, the default of this output signal is ramp.

10. Pulse Signal Input/Output Connector



The function of this connector is determined by the current working mode of the pulse modulation.

PULSE IN:

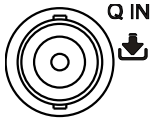
- When the modulation source of **Pulse** is external, this connector is used to input the external pulse signal.
- When the modulation source of **Pulse** is internal and the trigger mode is "Ext Trig", this connector is used to input the external trigger signal.
- When the modulation source of **Pulse** is internal and the trigger mode is "Ext Gate", this connector is used to input the external gated signal.

PULSE OUT:

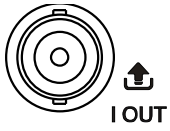
When the modulation source of **Pulse** is internal and the switch of pulse output is "On", this connector is used to output the pulse signal of the internal generator. This output signal is related to pulse mode ("Single", "Double" or "Train") currently selected.

11. I/Q Modulating Signal Input/Output Connectors (option)

When I/Q modulation type is external, it is used to input the I (In-Phase) baseband signal of I/Q modulation.



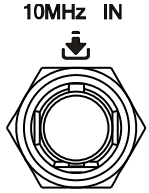
When I/Q modulation type is external, it is used to input the Q (Quadrature Phase) baseband signal of I/Q modulation.



It is used to output the I (In-Phase) components of I/Q modulation of the built-in baseband generator.

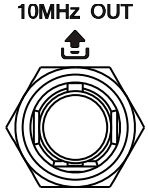
It is used to output the Q (Quadrature Phase) components of I/Q modulation of the built-in baseband generator.

12. Reference Signal Input Connector



It is used to input the external 10 MHz reference clock signal which is usually used to realize the synchronization with other instruments. For more information about the external clock signal specification of this connector, please refer to the data sheet.

13. Reference Signal Output Connector



It is used to output the 10 MHz reference clock signal generated by the internal crystal oscillator of the instrument and usually used to realize the synchronization with other instruments. For more information about the output clock signal specification of this connector, please refer to the data sheet.

To Use DSG3000 for the First Time

To Connect to Power

Please connect the signal generator to AC power supply using the power cord supplied in the accessories as shown in the figure below. The AC power supplies supported by this signal generator are 100-240 V, 45-440 Hz. The maximum input power of the instrument cannot exceed 60 W. When the signal generator is connected to AC power supply via this connector, the instrument select the correct voltage range automatically and users do not need to select the voltage range manually.

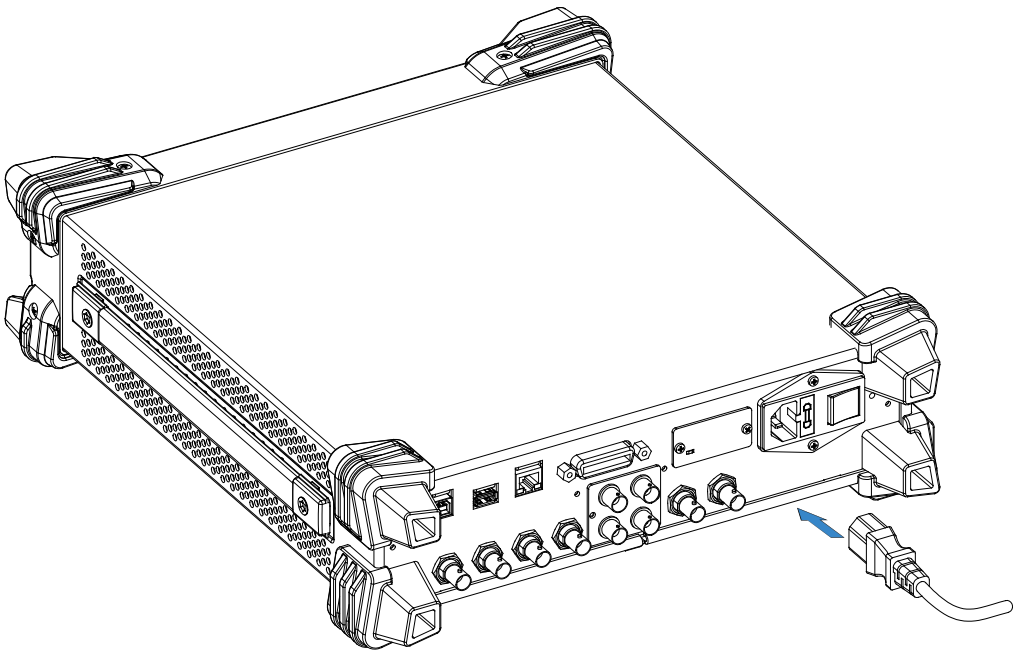


Figure 3 To Connect to Power

CAUTION
To avoid electric shock, make sure that the instrument is correctly grounded.

Power-on Inspection

After the power supply is correctly connected, press the power switch at the rear panel and the power key at the front panel to turn on the signal generator. During the start-up, the instrument performs initialization and self-test. After that, the instrument enters the default interface.

To Set the System Language

DSG3000 series RF signal generator supports multiple system languages. You can press **System**→ **Language** to switch the system language.

To Replace the Fuse

To replace the fuse, please use the specified fuse and follow the steps below.

1. Turn off the instrument, cut off the power supply and remove the power cord;
2. Use a small straight screwdriver to prize out the fuse seat;
3. Take out the fuse;
4. Replace the old fuse with a specified fuse;
5. Re-install the fuse seat.

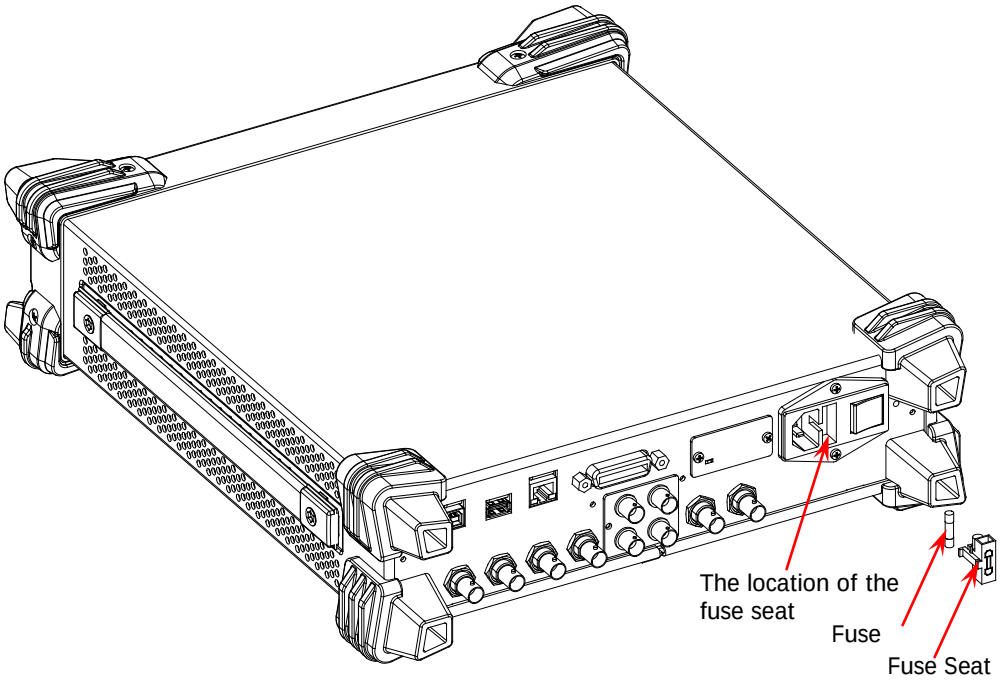


Figure 4 To Replace the Fuse

WARNING

To avoid electric shock, make sure that the instrument is turned off, the power supply is disconnected and the fuse used is up to standard before replacing the fuse.

User Interface

The user interface of DSG3000 series RF signal generator provides two display modes: normal display mode and parameter zoom-in mode. At power-on, the instrument enters the normal display mode by default. In this manual, the normal display mode of DSG3060 is taken as an example to illustrate the user interface of the instrument.

Normal Display Mode

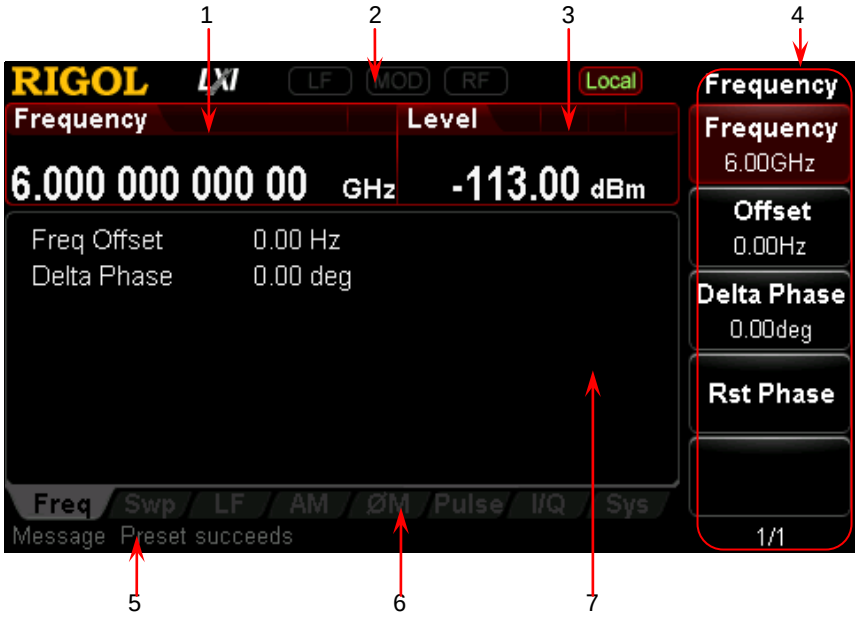


Figure 5 User Interface (Normal Display Mode)

1. Frequency Area

Display the current frequency setting of the RF signal generator.

- Offs: Displayed when the frequency offset is not 0 Hz.
- : Continuous sweep label. Displayed when the sweep type is “Freq” or “Freq&Lev” and the sweep mode is “Cont”.
- : Single sweep label. Displayed when the sweep type is “Freq” or “Freq&Lev” and the sweep mode is “Single”.
- : Forward sweep label. Displayed when the sweep type is “Freq” or “Freq&Lev” and the sweep direction is “Fwd”.
- : Down sweep label. Displayed when the sweep type is “Freq” or “Freq&Lev” and the sweep direction is “Down”.
- : Frequency sweep progress bar. Displayed when the sweep type is “Freq” or “Freq&Lev”.

2. Status Bar

Indicate the states of some of the RF signal generator functions.

- LF: Displayed when the LF output is enabled.
- MOD: Displayed when the RF modulation output is enabled.
- RF: Displayed when the RF output is enabled.
- Rmt: The RF signal generator is working in remote control mode.
- Local: The RF signal generator is working in local mode.

3. Amplitude Area

Display the current level setting of the RF signal generator.

- AH: Displayed when the attenuation mode is “Fixed”.
- ALC: Displayed when the ALC state is “On”.
- ALC: Displayed when the ALC state is “Auto”.
- UF: Displayed when the flatness calibration switch is “On”.
- Offs: Displayed when the amplitude offset is not 0 dB.
- : Continuous sweep label. Displayed when the sweep type is “Level” or “Freq&Lev” and the sweep mode is “Cont”.
- : Single sweep label. Displayed when the sweep type is “Level” or “Freq&Lev” and the sweep mode is “Single”.
- : Forward sweep label. Displayed when the sweep type is “Level” or “Freq&Lev” and the sweep direction is “Fwd”.
- : Down sweep label. Displayed when the sweep type is “Level” or “Freq&Lev” and the sweep direction is “Down”.
- : Amplitude sweep progress bar. Displayed when the sweep type is “Level” or “Freq&Lev”.

4. Menu Display Area

This area defines the annotations of the menu softkeys at the right of the screen. The annotations of the menu softkeys change according to the function selected. Pressing any softkey can enable the corresponding function.

5. Error Message Display Area

Display the message in abbreviated form. When multiple messages are generated, only the latest message will be displayed. To view the messages recently displayed, press **System** → **Information** → **System Msg**.

6. Function Status Area

Display the current active states of each function. Each function corresponds to at most four kinds of states as shown in the table below.

Type	Explanation	Example
Gray text on a black background	The function is not selected and enabled.	AM
Black text on a gray background	The function is selected and you can set the corresponding parameters.	AM
White text on a gray background	The function is selected and enabled.	AM
White text on a black background	The function is not selected but it is enabled.	AM

The status labels in the function status area as shown in the figure below.

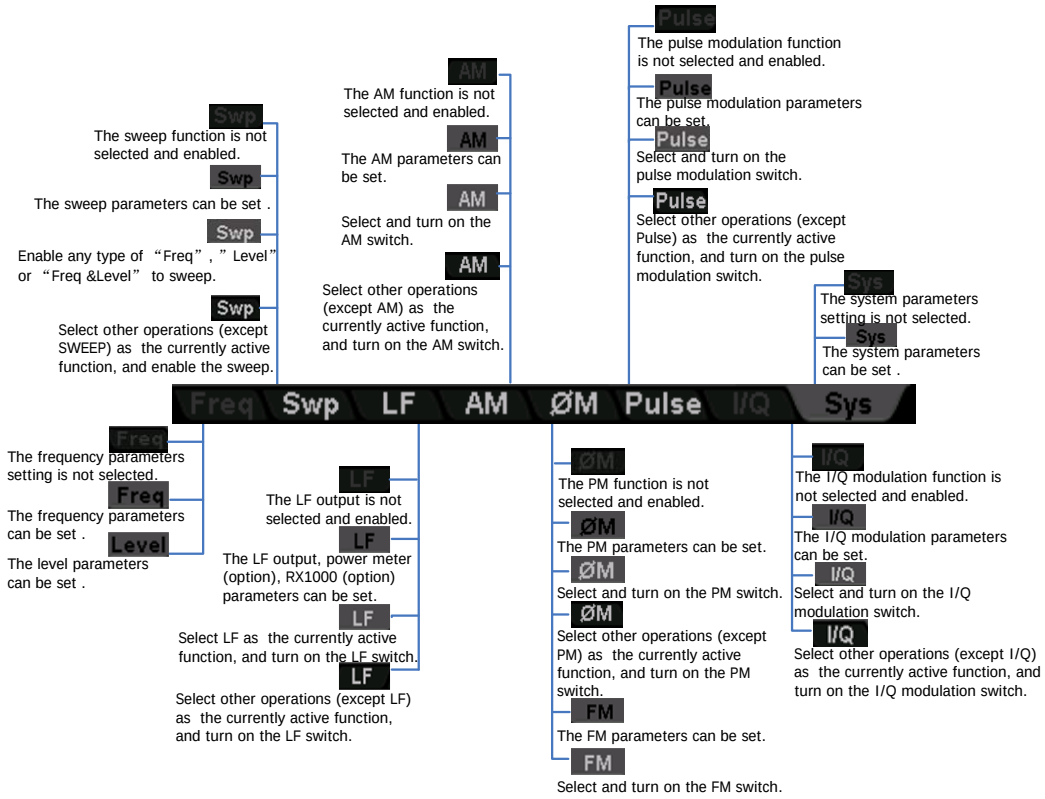


Figure 6 Labels in Function Status Area

7. Text Display Area

Display the corresponding parameter information of the current function of the RF signal generator.

Parameter Zoom-in Mode

In normal display mode, pressing the display switch key **View** at the left of the screen can switch to the parameter zoom-in mode as shown in the figure below.

Figure 7 User Interface (Parameter Zoom-in Mode)

To Use the Built-in Help System

The DSG3000 built-in help system provides help information for all the function keys and menu softkeys at the front panel. Users can view the help of any key when operating the instrument.

1. **Acquire the built-in help**
   Press **Help** and the prompt message about how to acquire the help information is displayed in the test display area of the user interface, as shown in Figure 8. Then, press the desired key and the help information of that key is displayed in the text display area.

Figure 8 Help Interface

2. Page up/down

When the help information is displayed on multiple pages, users can acquire the help information on the previous or next page using the direction keys or knob.

3. Turn off the current help information

When the help information is displayed in the text display area, pressing any key (except the direction keys and knob) at the front panel will turn off the help information currently displayed.

4. Acquire the help information of a menu softkey

Press **Help** and help information is displayed in the text display area. Then, press the desired menu softkey, the help information of the menu item corresponding to this menu softkey is displayed in the text display area.

5. Acquire the help information of any function key

Press **Help** and help information is displayed in the text display area. Then, press any function key and the function help information of this key is displayed in the text display area.

Basic Operations

To Output RF Signal

Output a RF signal with 1 GHz frequency and -40 dBm amplitude from the **[RF OUTPUT 50Ω]** connector.

1. Restore to factory setting

Press **System** → **Reset** → **Preset Type** → "Factory" and then press **Preset** to restore the factory setting (by default, the frequency offset is 0 Hz and the amplitude offset is 0 dB).

2. Frequency setting

Press **FREQ** → **Frequency**, use the numeric keyboard to input the frequency value (1) and select the desired unit (GHz) from the pop-up unit menu or unit keys.

- The frequency units available are GHz, MHz, kHz and Hz.
- Pressing **Enter** can select the default unit Hz.
- You can also press the left/right direction key to enter the parameter editing state and move the cursor to the specified digit; and then use the up/down direction key or knob to modify the value.
- After the frequency is set, you can use the up/down direction key or knob to modify the frequency at the current step.
- Press **FREQ** → **Frequency** and then press **Step** to set the step.

3. Amplitude setting

Press **LEVEL** → **Level**, use the numeric keyboard to input the amplitude value (-40) and select the desired unit (dBm) from the pop-up unit menu or unit keys. You can also press **Enter** to select the default unit dBm.

- The amplitude units available are dBm, -dBm, mV, uV and nV.
- You can also press the left/right direction key to enter the parameter editing state and move the cursor to the specified digit; and then use the up/down direction key or knob to modify the value.
- You can also use the up/down direction key or knob to modify the amplitude at the current step.
- Press **LEVEL** → **Level** and then press **Step** to set the step.

4. Enable the RF output

Press **RF**, the backlight goes on and the RF label is displayed in the status bar of

the user interface. The RF output is enabled. At this point, the **[RF OUTPUT 50Ω]** connector outputs RF signal according to the current configuration.

Figure 9 Parameter Setting Interface (To Output RF Signal)

To Output RF Sweep Signal

This section introduces how to output a RF sweep signal by configuring continuous linear step sweep. Set the frequency range to 1 GHz ~ 2 GHz, the amplitude range to -20 dBm ~ 0 dBm, the number of sweep points to 10 and the dwell time to 500 ms.

1. Restore to factory setting

Press **System** → **Reset** → **Preset Type** → "Factory" and then press **Preset** to restore the factory setting (by default, the sweep mode is continuous, the sweep type is step and the sweep space is linear).

2. Step sweep parameter setting

Press **SWEEP** and use the menu page up/down key to turn to the 2/3 menu page; then, press **Step Swp** to enter the step sweep parameter setting interface.

- Start Frequency
  Press **Start Freq**, use the numeric keyboard to input the start frequency value (1) and select the desired unit (GHz) from the pop-up unit menu or unit keys.

- Stop Frequency
  Press **Stop Freq**, use the numeric keyboard to input the stop frequency value (2) and select the desired unit (GHz) from the pop-up unit menu or unit keys.

- Start Level
  Press **Start Lev**, use the numeric keyboard to input the start level value (-20) and select the desired unit (dBm) from the pop-up unit menu or unit keys. You can also press **Enter** to select the default unit (dBm).

- Stop Level
  Press **Stop Lev**, use the numeric keyboard to input the stop level value (0) and select the desired unit (dBm) from the pop-up unit menu or unit keys. You can also press **Enter** to select the default unit (dBm).

- Sweep Points
  Press **Points**, use the numeric keyboard to input the number of sweep points (10) and then press **OK** or **Enter**.

- Dwell Time
  The dwell time indicates the duration of a sweep step.
  Press **Dwell Time**, use the numeric keyboard to input the time value (500) and select the desired unit (ms) from the pop-up unit menu or unit keys.

3. Enable the RF sweep

Press **SWEEP** → **Sweep** and select "Freq&Level" to enable the frequency and amplitude sweep functions at the same time.

At this point, the RF signal generator sweeps from the start frequency and level to the stop frequency and level continuously at certain step according to the current settings. The frequency and amplitude sweep progress bars as well as the continuous sweep label are displayed in the frequency and amplitude areas in the user interface respectively.

4. Enable the RF output

Press **RF**, the backlight goes on and the RF label is displayed in the status bar of the user interface. The RF output is enabled. At this point, the **[RF OUTPUT 50Ω]** connector outputs RF sweep signal according to the current configuration.

Figure 10 Parameter Setting Interface (To Output RF Sweep Signal)

To Output RF Modulated Signal

This section introduces how to output an AM modulated signal. Set the carrier frequency to 800 MHz, the carrier amplitude to -20 dBm, the AM modulation depth to 60% and the modulation frequency to 20 kHz.

1. Restore to factory setting

Press **System** → **Reset** → **Preset Type** → "Factory" and then press **Preset** to restore the factory setting (by default, the modulation source is internal and the modulation waveform is sine).

2. Set the carrier frequency and amplitude

(1) Carrier Frequency
Press **FREQ** → **Frequency**, use the numeric keyboard to input the frequency value (800) and select the desired unit (MHz) from the pop-up unit menu or unit keys.

(2) Carrier Amplitude
Press **LEVEL** → **Level**, use the numeric keyboard to input the amplitude value (-20) and select the desired unit (dBm) from the pop-up unit menu or unit keys. You can also press **Enter** to select the default unit (dBm).

3. Set the AM modulation parameters

(1) Press **AM** to enter the amplitude modulation parameter setting interface.

(2) Press **Depth**, use the numeric keyboard to input the value of the modulation depth (60) and select the desired unit (%) from the pop-up unit menu or by pressing **Enter**.

(3) Press **Freq**, use the numeric keyboard to input the frequency value (20) and select the desired unit (kHz) from the pop-up unit menu or unit keys.

(4) Press **Switch** and select "On" to enable the AM function. The backlight of **AM** goes on.

4. Enable the RF modulation output

Press **MOD** and the backlight goes on; then, press **RF** and the backlight goes on. The MOD and RF labels are displayed in the status bar of the user interface. The RF modulation output is enabled. At this point, the **[RF OUTPUT 50Ω]** connector outputs RF modulated signal according to the current configuration.

Note: The backlights of **RF** and **MOD** must have gone on.

Figure 11 Parameter Setting Interface (To Output RF Modulated Signal)

Remote Control

DSG3000 supports to build communication with the PC via USB, LAN or GPIB interface to realize remote control. The remote control is realized on the basis of the SCPI command set (Standard Commands for Programmable Instruments). This section introduces how to send SCPI commands through the **RIGOL** common PC software Ultra Sigma to control the RF signal generator remotely via the USB interface. For the detailed information of the commands, refer to *DSG3000 Programming Guide*.

Note: When the instrument is in remote mode, Rmt is displayed in the user interface and all the front panel keys (except **Esc**) are locked. At this point, you can press **Esc** to exit the remote mode.

1. Install Ultra Sigma

Acquire the Ultra Sigma software and install it as well as its components according to the instructions. This software is contained in the resource CD in the standard accessories. You can also download the latest version of the software from www.rigol.com.

2. Control via USB

(1) **Connect the device**
Connect the RF signal generator (USB Device) and PC (USB Host) using a USB cable.

(2) **Install USB drive**
This RF signal generator is USBTMC device and the **Found New Hardware Wizard** will be displayed after the RF signal generator is correctly connected to the PC (the signal generator will be automatically configured to USB interface) and both of them are started. Please install the "USB Test and Measurement Device" drive program according to the instructions.

(3) **Search for device resource**
Start Ultra Sigma and the software will search for the RF signal generator resource currently connected to the PC automatically. You can also click USB-TMC to search for the resource manually.

(4) **View the device resource**

The resource found together with the instrument model and USB interface information will be displayed under the “RIGOL Online Resource” directory, as shown in the figure below.

Figure 12 View the USB Device Resource

(5) **Communication test**

Right-click the resource name “DSG3060 (USB0::0x1AB1::0x0992::DSG3A1301080006::INSTR)” and select “SCPI Panel Control” to open the remote command control panel through which you can send commands and read data.

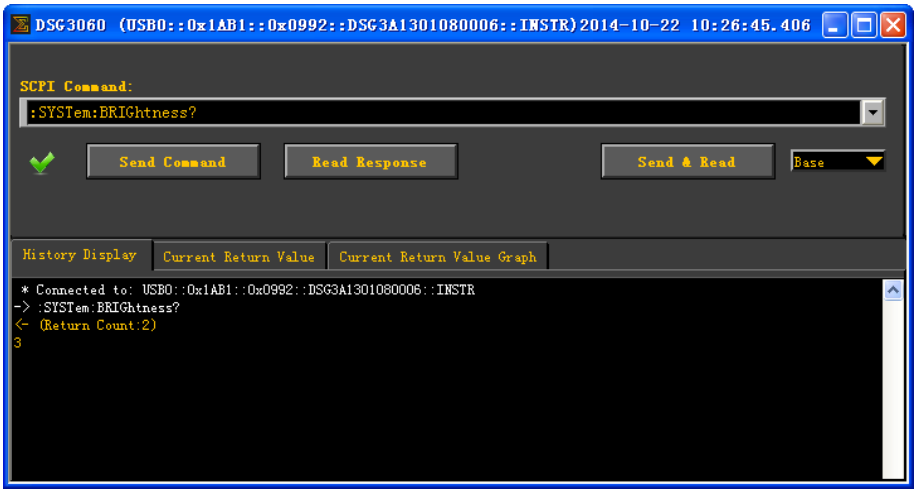


Figure 13 Read and Write Command via USB

Troubleshooting

The commonly encountered failures and their solutions are listed below. When you encounter those problems, please solve them following the corresponding steps. If the problem remains still, please contact **RIGOL** and provide your device information (**System** → **Information** → **System Info**).

1. The screen of the RF signal generator is still dark (no display) after pressing the power key:

(1) Check whether the fan is running;
- If the fan is running but the screen is dark, the screen connecting wire might be loose.
- If the fan is not running, the instrument does not start successfully and please go to step (2).

(2) Check whether the power is correctly connected and the power switch is really on.
(3) Check whether the fuse is burned out. If the fuse needs to be replaced, please use the specified fuse (AC 250V, T2A).
(4) Restart the instrument after finishing the above inspections.
(5) If it still does not work correctly, please contact **RIGOL**.

2. The screen is too dark and cannot be seen clearly:

(1) Check whether the brightness setting of the LCD screen is too low.
(2) Press **System** → **Display** → **Brightness** and use the numeric keys or up/down direction keys to adjust the brightness of the LCD screen of the RF signal generator to a proper value.

3. The RF signal generator is locked:

(1) Check whether the RF signal generator is in remote control mode (in remote control, 

is displayed in the status bar of the user interface). Pressing **Esc** can exit the remote control mode and unlock the front panel.
(2) Check whether the RF signal generator is in local mode with the screen being locked (when the screen is locked, front panel operations are not available). Pressing **Esc** can unlock the screen and exit the locking state.
(3) If progress bar is displayed on the screen of the signal generator, some operation is in progress. For example, when saving a file, the progress bar will be displayed indicating that the save operation is in progress. At this point, the front panel is locked.
(4) Pressing **Preset** or restarting the signal generator can also unlock the instrument.

4. The setting is correct but the waveform output is incorrect:

(1) There is no RF output
- Check whether the signal connecting wire is tightly connected to the corresponding **[RF OUTPUT 50Ω]** connector.
- Check whether the connecting wire has internal damage.
- Check whether the connecting wire is tightly connected to the test instrument.
- Check whether the backlight of **RF** goes on. If not, press this key to illuminate the backlight. At this point, the RF label is displayed in the status bar of the user interface and the RF output is enabled.
- Check whether the output amplitude of the RF signal is too small. Adjust the output amplitude properly.

(2) The RF output is not modulated
- Check whether the signal connecting wire is tightly connected to the corresponding **[RF OUTPUT 50Ω]** connector.
- Check whether the connecting wire has internal damage.
- Check whether the connecting wire is tightly connected to the test instrument.
- Check whether the backlights of **MOD** and **RF** are both illuminated and check whether the modulation **Switch** is set to "On".
- Check whether the modulation parameter setting is correct and adjust the parameter appropriately.
- If external modulation source is used, make sure that the external source is correctly connected and outputs signal. At the same time, the external source should work within the specified range of the signal generator.

5. The sweep is abnormal:

(1) The seep stagnates

The sweep progress bar is displayed in the frequency area/amplitude area in the user interface indicating that the sweep is in progress. If the sweep stagnates, please check:
- At least one manner of sweep is enabled. Press **SWEEP** → **Sweep** to select "Freq", "Level" or "Freq&Level".
- If single sweep mode is selected, press **Single** and the instrument performs a sweep if the trigger condition is met.
- If the sweep trigger mode is not set to auto, press **SWEEP** → **Trig** → "Auto" to make sure whether the sweep stagnates due to the loss of sweep trigger.
- If the point trigger mode is not set to auto, press **SWEEP** → **Point Trig** → "Auto" to make sure whether the sweep stagnates due to the loss of point trigger.
- Make sure whether the dwell time is too large or too small that the sweep cannot be seen.

— Make sure that at least two points are set in the step sweep or list sweep.

(2) The dwell time of list sweep is incorrect
— Press **SWEEP** → **List Swp** to enter the sweep list editing interface.
— Make sure whether the dwell time of the list sweep is correct.
— If the dwell time is incorrect, re-edit it; if it is correct, turn to the next step.
— Press **SWEEP** → **Sweep Type** to make sure that "List" sweep is selected.
If "Step" sweep is currently selected, the signal generator sweeps according to the dwell time of the step sweep.

(3) The list sweep information recalled from the register is lost
— The list sweep information cannot be stored in the status register of the instrument as a part of the instrument state.
— The signal generator can only use the current list for sweep and you can store the list sweep data to the local directory of the instrument.

(4) In list or step sweep, the amplitude does not change
— Make sure that the sweep manner is set to "Level" or "Freq&Level".
— If the sweep manner is currently set to "Freq", the amplitude will not change.

6. The USB storage device cannot be recognized:

(1) Check whether the USB storage device can work normally when connected to other instrument or PC.
(2) Make sure that the USB storage device used is Flash type. This instrument does not support hardware USB storage device.
(3) Restart the instrument and insert the USB storage again to check whether it can work normally.
(4) If the USB storage device still cannot be used normally, please contact **RIGOL**.

7. No response or incorrect response when key is pressed:

(1) After starting the instrument, make sure that whether all the keys are irresponsive.
(2) Press **System** → **Self-test** → **Key Test** to enter the keyboard test interface. Press the function keys at the front panel sequentially and check whether some key gives no response or incorrect response when it is pressed.
(3) If the above failures occur, the keyboard connecting wire might be loose or the keyboard is damaged. Please do not disassemble the instrument and contact **RIGOL**.

8. Performance specification test is not passed:

(1) Check whether the RF signal generator is within calibration period (1 year).

(2) Make sure that the RF signal generator is warmed up for at least 30 minutes before test.
(3) Check whether the RF signal generator is under the specified temperature.
(4) Check whether the test is under the magnetic environment.
(5) Check whether the power supplies of RF signal generator and test system have strong interference.
(6) Check whether the performance of the test device meets the requirement.
(7) Make sure that the test device is within calibration period.
(8) Check whether the test device meets the required conditions of the manual.
(9) Check whether all connections are tight.
(10) Check whether all cables have internal damage.
(11) Make sure that the operations conform to settings and processes which are required by the performance verification manual.
(12) Check whether the error calculation is a mistake.
(13) The definitions of “Typical Value” and “Nominal Value” for this product should be correctly understood.
   — Typical Value: the performance specification of this product under specified conditions.
   — Nominal Value: the approximate quantity of the product during application.