



LSG Series Signal Generator

User Manual



Saluki Technology Inc.

The document applies to the signal generator of the following models:

- LSG022 Signal Generator (100 kHz - 22 GHz).

Standard pack and accessories:

- 1 × Signal Generator Host
- 1 × USB Power Adapter
- 1 × USB Cable (USB2.0, Type-C to USB-A)
- 1 × U Disk (Software & User Manual)
- 1 × Certificate of Calibration
- 1 × Carrying Case

Preface

Thank you for choosing Saluki Technology Products.

We devote ourselves to meeting your demands, providing you high-quality measuring instrument and the best after-sales service. We persist with “superior quality and considerate service”, and are committed to offering satisfactory products and service for our clients.

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Saluki Technology

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Product Quality Assurance

The warranty period of the product is three years from the date of delivery. The instrument manufacturer will repair or replace damaged parts according to the actual situation within the warranty period.

Product Quality Certificate

The product meets the indicator requirements of the document at the time of delivery. Calibration and measurement are completed by the measuring organization with qualifications specified by the state, and relevant data are provided for reference.

Quality/Settings Management

Research, development, manufacturing and testing of the product comply with the requirements of the quality and environmental management system.

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Safety Notice



The instrument casing can prevent users from touching the internal parts of the instrument, but the casing is not waterproof. Please cut off the power as soon as possible when liquid enters the interior.



This product does not require forced ventilation. When the instrument needs to be installed in a enclosed space, please keep the air circulation in the enclosure to ensure the stability of the instrument's performance.



The RF output port on the front panel is only used for signal output. Adding electrical signals to this port should be avoided. The port can only withstand AC signal power not exceeding +25 dBm or DC voltage input of 16 V (for a duration not exceeding 1 minute), otherwise the internal circuit may be damaged and malfunction will take place.

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1 Overview

The LSG022 RF Signal Generator is a signal generator that can meet your needs within the 100 kHz to 20 GHz frequency range. You can use it to generate the signals required for manufacturing, R&D, repair service, and education. The supported signal includes follows:

- CW signal
- Frequency Step sweep or amplitude sweep signal
- AM signal
- FM signal
- Phase modulated signal
- Pulse modulated signal

LSG022 supports the USB virtual-instrument technology, which is connected to the computer through USB and controlled by LSG022 software. The product support the SCPI remote control and file operation.

The LSG022 can be equipped with an industrial computer option to support desktop used, very similar to a traditional desktop instrument.

This manual is written according to LSG022 analog signal generator software version V1.0. Since we are constantly updating the product software to better meet your demands, please download the latest user manual on the Saluki website (www.salukitec.com) in time.

2 Start To Use

2.1 Software Installation

The LSG022 itself do not have a display interface, and the parameter settings and display function are provided by the software on PC .The application that controls this product needs to be installed on the PC before use. You can download or run the installer on the CD-ROM. This software installation package runs on Microsoft Windows systems, 32-bit and 64-bit versions are all available.



The installation files provided on the CD-ROM only support Windows XP sp1 and above operating systems. If you use other version of the operating system, please contact your Saluki dealer or FAE service for further information.

Run the installer by double click, specify the installation location and select Install. The installer will automatically complete the installation steps, as shown in Figure 1.

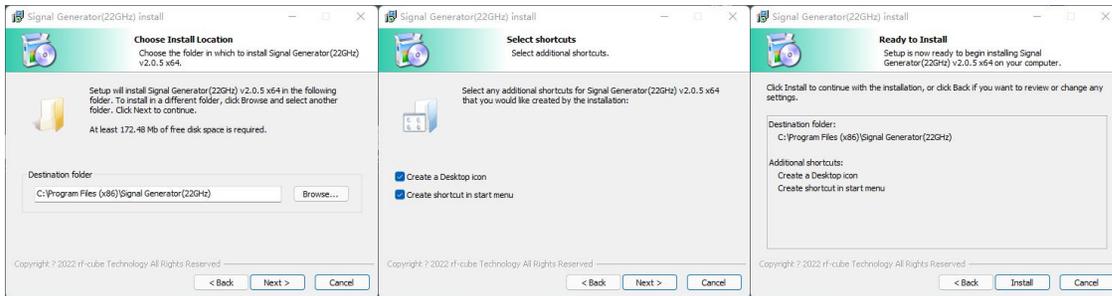


Fig. 1 Run the installer

The installation will launch the USB driver installation automatically. Please follow the installation prompts to install the USB driver, as shown in Fig. 2.



Fig. 2 Install the USB driver

After the installation of the USB driver is, the installer will launch of Microsoft .Net Framework installation, as shown in Fig. 3. If your computer already has a correct version of .Net Framework, Windows will prompt you do not need to install it. Follow the system prompts.

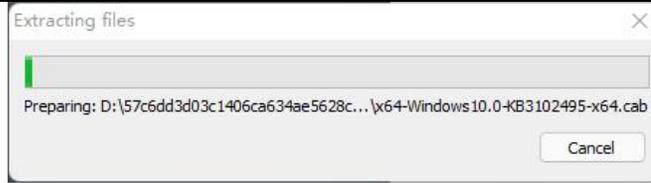


Fig. 3 Install .Net Framework

After the steps all above, the installer will prompt that the installation is complete. Click Finish to complete the installation.

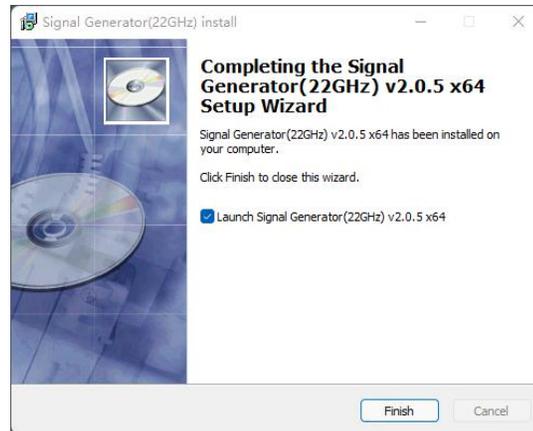


Fig. 4 The installation is complete

2.2 Hardware Connection

Insert USB cable's Type-C plug into (1) and insert the AC/DC power adapter's DC plug into (2) in rear pane. Insert USB cable's USB-A plug into one of your PC's USB sockets. Insert the adapter's AC plug into your 220VAC power system. If the power is OK, the indicator button (3) LED will turn blue.

The AC to DC adapter is 220VAC-12V/2A. The DC socket is a 5.5mm/2.5mm circular connector. The USB cable is a Type-C to USB-A cable with locking screws. The cable meets the transfer rate requirement for USB2.0 standard.

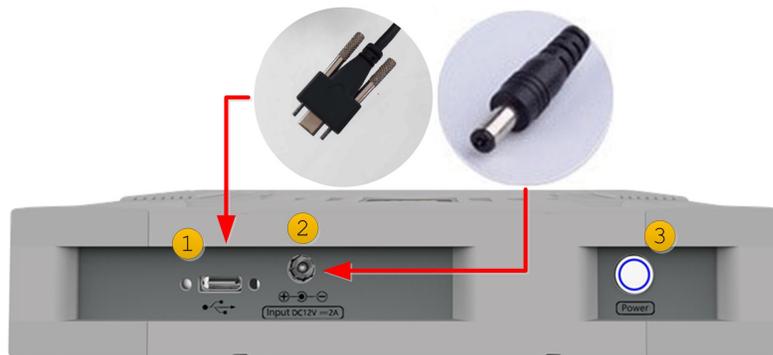


Fig. 5 Connect the Power Adapter and USB Cable



The power adapter in accessories is a two pin plug without ground pin. If you need the LSG022 to share the ground with the AC power supply system, you need to connect your ground wire to the metal part of the LSG022 metal case.

2.3 Confirm Connection Status

After LSG022 is powered and USB cable is connected to PC, enter the “Device Manager” of the windows control panel to check whether the LSG022 is recognized by the system. If it is correctly recognized, the Silicon Labs USB Device should be visible and in normal working state, as shown in the figure below.



Fig. 6 Check whether the LSG022 is correctly identified in “Device Manager”

Double-click the software icon to launch the LSG022 software. Every time when LSG022 is connected to PC, the software will automatically read the device calibration and configuration data , complete the initialization step and enter the working state. Before it entering the working state, all buttons on the GUI are disabled, and a prompt box of "read calibration data" is shown. This process may take several seconds. When you see the software buttons in available state, it means that the USB connection and hardware status are correct.

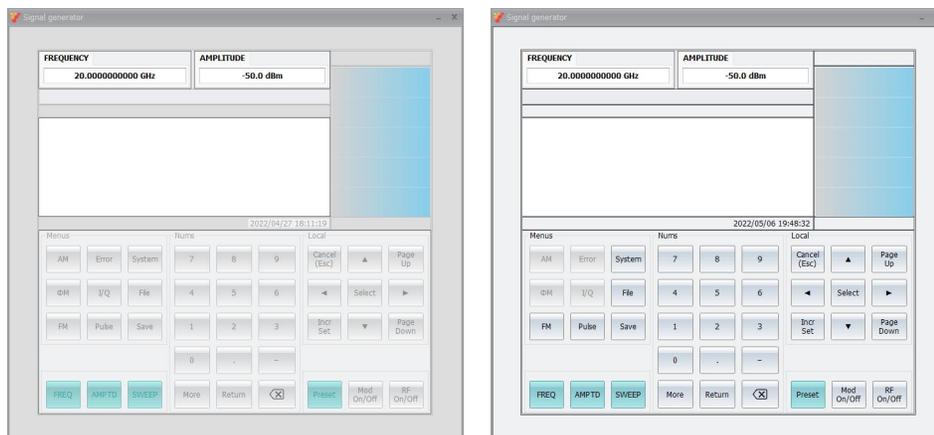


Fig. 7 (Left)GUI when Initializing. (Right)GUI when in working state

2.4 Front Panel Description

The front panel function is shown in Fig. 8.



Fig. 8 Elements in front panel

1. RF Output — Steel SMA female connector, 50 ohm matched impedance.
2. RF Indicator — Green light for RF output on and orange light for RF output off.
3. Pulse input — SMA female connector. Feed TTL or LVTTTL signal for pulse modulation.
4. Trigger input — SMA female connector. Feed TTL or LVTTTL signal for trigger operation.
5. Internal reference output — SMA female connector, output the internal 10 MHz reference source signal.
6. Reference source input — SMA female connector, connect it to 10 MHz external reference source signal for reference synchronization.

2.5 Rear Panel Description

The front panel function is shown in Fig. 9.



Fig. 9 Elements in rear panel

1. USB socket: USB2.0, Type-C socket.
2. Power socket: 5.5mm/2.5mm circular connector. DC input, 12VDC, maximum operating current 1.5A.
3. RF button: Press the button to turn on/off. the RF output.

3 Software Function Description

The software operation is almost similar to a traditional desktop signal generator. The function items are shown in Fig. 10. Each functional area are described as follows:

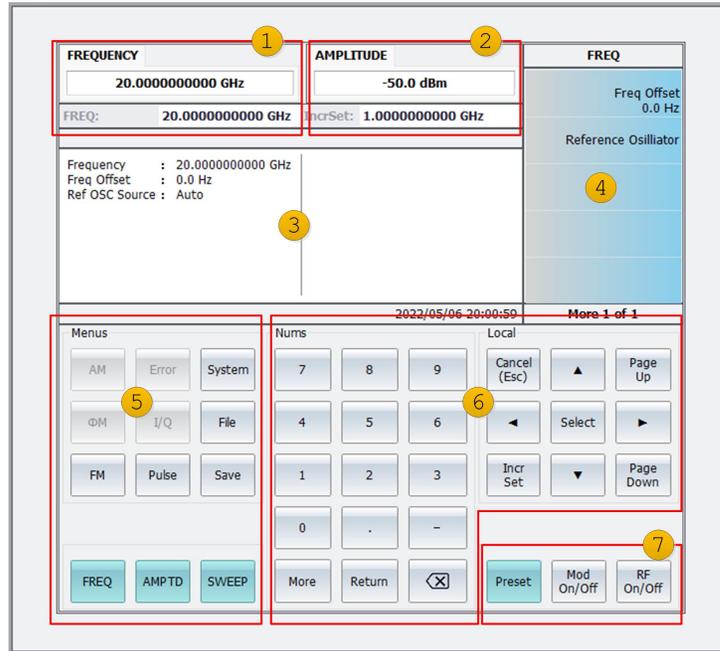


Fig. 10 Functional Division

1. Frequency setting and display

Set the frequency, click to input, support keyboard. After setting, the current frequency is displayed.

2. Amplitude setting and display

Set the amplitude, click to input, support keyboard. After setting, the current amplitude is displayed.

3. Current status and system information

The current settings, working status, and system prompts, including error messages, are displayed here.

4. Menu

The menu part cooperates with the Menu panel (5) to complete the operation, and cooperates with input panel (6) for unit selection. The menu page has 5 grids. In some cases, there are more than 5 menu items, click the PageUp/PageDown of the input panel (6) for page turning.

5. Function panel

The function buttons are in this area. Click to enter related settings.

Two main function items: frequency setting (FREQ), amplitude setting (AMPTD), sweep setting (SWEEP).

Two small function items: FM modulation (FM), pulse modulation (Pulse).

Three system function items: system setting(System), preset file (File), storage (Save).

6. Input panel

Click buttons for enter numbers, as well as other input keys. Corresponds to keyboard keys for input without keyboard (such as touch screen).

7. Basic function buttons

RF switch (RF On/Off), modulation switch (Mod On/Off), factory preset button (Preset).

4 Remote Control

LSG022 signal generator supports remote control via SCPI commands. This chapter explains how to control the product remotely. For more detailed SCPI command set details, please refer to "LSG022 SCPI Programming Manual".

The remote control terminal controls the product by communicating with the LSG022 software. The connection method for remote control is shown in Fig. 11. Details are explained as follows:

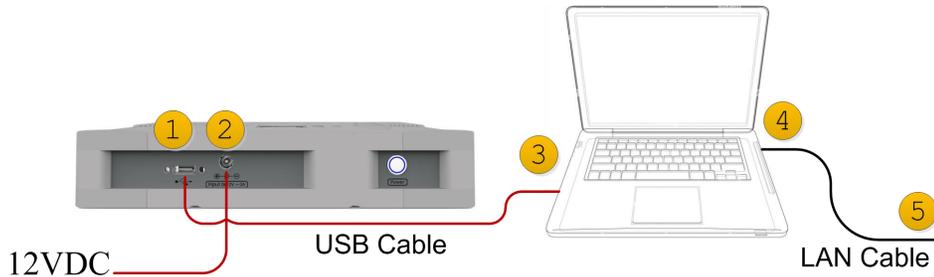


Fig. 11 Remote control connection method

1. Connect LSG022 with PC

Use the accessory USB cable to connect the Type-C port (1) of the LSG022 and the computer USB port (3);
Apply a 12VDC 2A power supply to LSG022 power supply port (2);

2. Connect PC and remote control host

Connect the LAN port (4) of the PC to the remote control terminal (5) (if your remote control host program is running on this PC, no connection is needed);

3. Set up and run

Set the PC's IPv4 address for the LAN port;

Set the PC's IPv4 settings and firewall settings to ensure that the remote control host can access the PC (usually use the "ping" command for test);

Launch the LSG022 software on PC and wait for the initialization to complete;

4. Verify

Send SCPI commands through Telnet or Socket on the remote control host. and you will get the reply message from LSG022. For command details, please refer to "LSG022 SCPI Programming Manual".

Instrument IP address: the IP address of the PC;

Telnet port: 6023;

Socket port: 6025.

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