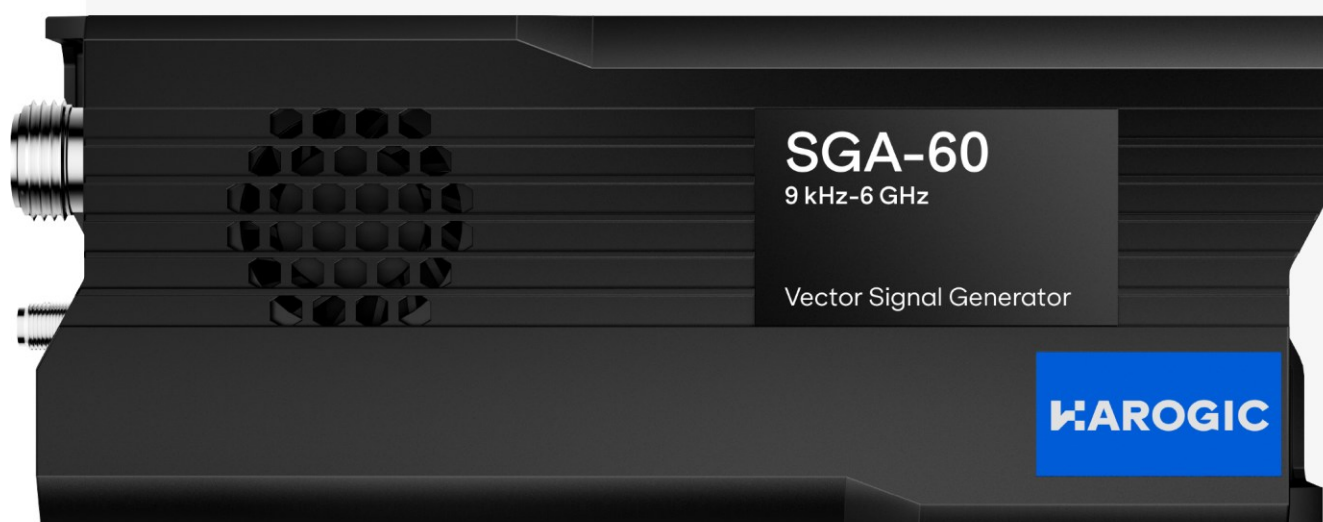




VECTOR SIGNAL GENERATOR QUICK START GUIDE



SG/PG SERIES QUICK START GUIDE

Vector Signal Generator
Up to 6 GHz

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1. Version Update Description

Version Update Description Table

Version	Content	Date
V1.2	1. Added: PG Series Quick Start Guide chapter 2. Added: PG Series Remote Control chapter 3. Added: SGF Series External Interface Description section 4. Added: Playback Bandwidth and Built-in Memory Depth chapter	20/09/2026
V1.1	1. Added: Installing Drivers (Linux) section for the SG series 2. Added: Running Software in Linux System section for the SG series 3. Modified: External Interface Description section for the SG series 4. Added: GNSS Usage Instructions chapter 5. Added: Reference Clock Input and Output chapter	16/07/2026
V1.0	1. Initial version	21/04/2026

2. Operating Environment Requirements

SG series is a USB-based vector signal generator that requires host computer software for operation. The recommended host system environment is detailed in the table below.

The table only specifies the recommended configuration. For systems operating below the recommended specifications, actual performance should be verified through testing.

Table 1 Operating Environment Requirements

Operating System	Windows 11/10/8/7 (requires VS2019 C++ redistributable)
Architecture	Windows: x64 Linux: x64, aarch64
Processor	Intel i3 or above
Memory	8 GB, for generating digital modulation waveforms with PN > 15, 16 GB is recommended for better performance and processing capability
Storage	To support 62.5 MHz real-time IQ streaming in Streaming mode, the hard drive must provide a sustained read/write speed greater than 250 MBytes/s
Data Port	USB 2.0 or USB 3.0 (USB 3.0 recommended); streaming mode is limited by interface bandwidth
Display Resolution	At least 1280 × 800 pixels
Others	Some antivirus software may interfere with normal system operation

3. SG Series Quick Start Guide

This chapter provides a quick start guide for the SG series, including safety instructions, instrument operation, software operation, and external interface descriptions.

3.1 Safety Instructions

1. Adapter Selection: The original manufacturer-provided power adapter is recommended. Alternatively, choose an adapter with matching specifications as detailed in the product manual;
2. DC Power Requirements: Voltage 9 V to 12 V, current ≥ 3 A, ripple < 200 mVpp.

⚠ Failure to comply may result in instrument damage. Always strictly adhere to the product manual.

3.2 Using the SG Series Instruments

3.2.1 Connecting the Instrument

1. Connect the instrument's **power port** to the power adapter using the Type-C cable, and plug the adapter into a power outlet;
2. Connect the instrument's **data port** to the computer or embedded device using the Type-C cable. USB 3.0 is recommended for optimal performance.

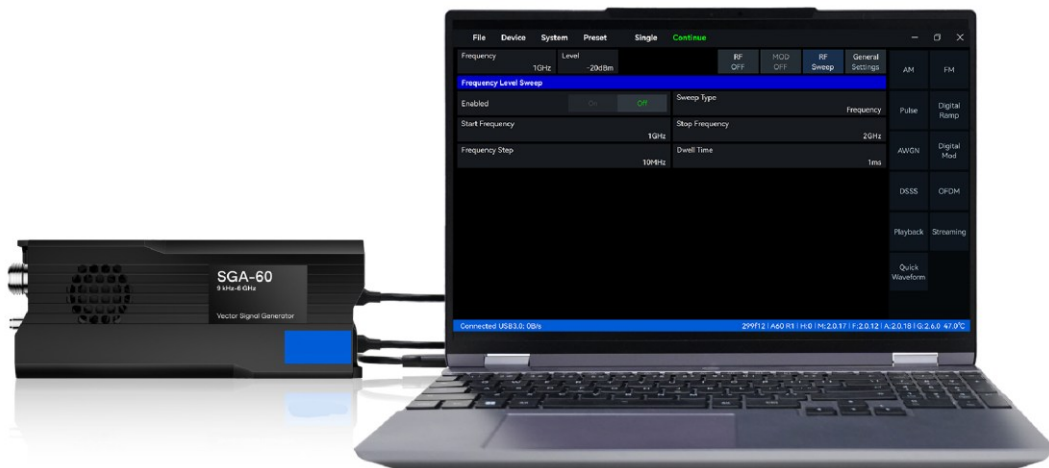


Figure 1 SG series connection diagram

3.2.2 Installing Drivers (Windows)

The following procedure describes how to install the Win10_x64 driver. Note: the Win10 driver is compatible with Windows 11.

1. Verify the OS version and architecture in your computer's system information;
2. Navigate to the folder "Windows\driver\Win10_x64" on the included USB drive;
3. Right-click the "Install_Driver.bat" file and select "Run as administrator" to install the driver;

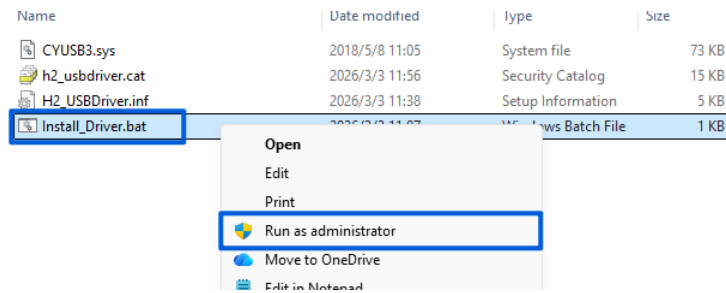


Figure 2 Install the driver

4. Verify that the terminal displays the message "USB Driver Installation Succeeded" to confirm successful installation.

3.2.3 Installing Drivers (Linux)

The following will be an example of installing the driver in Ubuntu 18.04.

1. Copy the "Linux" folder from the supplied USB flash to the system;
2. Go to the "Linux/Install_H2_SDK" directory, right-click the blank space, and choose "Open in Terminal" to open the terminal;
3. In the terminal type "sudo sh install_h2_lib.sh" and enter, according to the prompts to enter the current user password, and then enter again to confirm the installation;
4. After connecting the instrument, type "lsusb" in the terminal, such as ID:6430, ID:04b5 or ID:367f, it means the driver installation is successful.

```

htra@htra: ~/Desktop/Linux/Install_H2_SDK
File Edit View Search Terminal Help
htra@htra:~/Desktop/Linux/Install_H2_SDK$ sudo sh install_h2_lib.sh
[sudo] password for htra:
htra@htra:~/Desktop/Linux/Install_H2_SDK$ lsusb
Bus 004 Device 002: ID 367f:0101
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 004: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 003 Device 003: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 003 Device 002: ID 0e0f:0003 VMware, Inc. Virtual Mouse
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 003: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 002 Device 002: ID 0e0f:0008 VMware, Inc.
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
htra@htra:~/Desktop/Linux/Install_H2_SDK$

```

Figure 3 Checking Whether the Instrument Is Properly Connected in Linux

3.3 Running the Software

3.3.1 Windows System

Assuming the instrument is properly connected and the driver is installed.

1. Copy the SGStudio folder from the USB drive's "Windows" directory to the desktop or another location on your computer;
2. Navigate to the "\bin" folder in the software directory and double-click "SGStudio.exe" to launch the application. The signal generator interface is shown below.

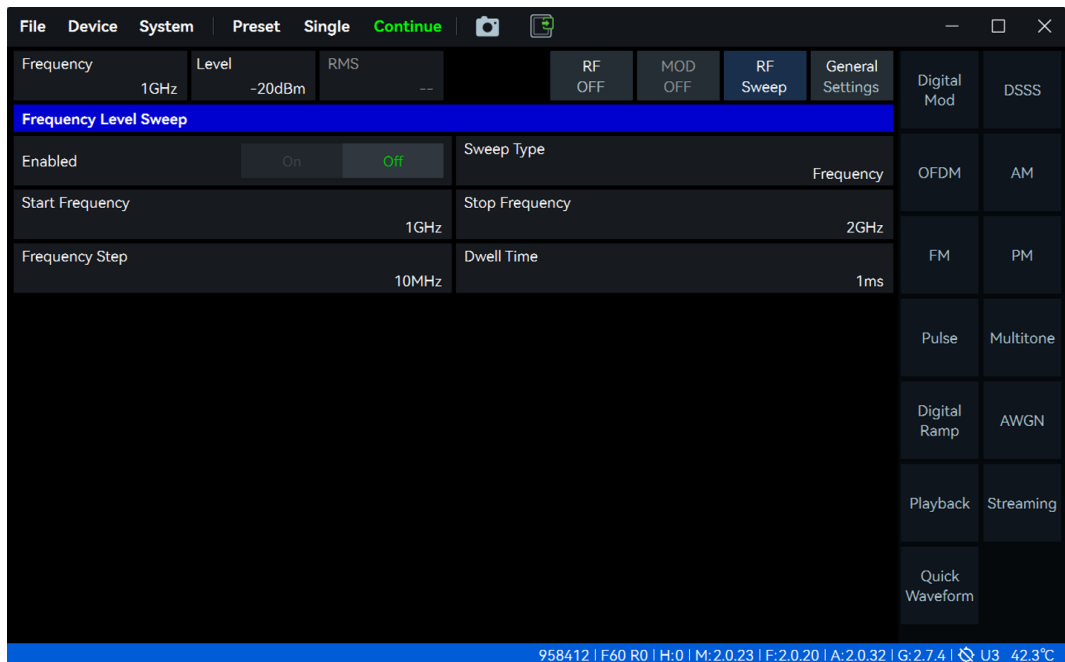


Figure 4 Normal software operating interface

As shown above, the status bar at the bottom of the interface displays the following information from left to right: USB real-time transfer speed (USB: 0B/S), device UID (169eXXXX3435), device model, hardware version, MCU version, FPGA version, API version, GUI version, and instrument operating temperature.

3.3.2 Linux System

1. Copy the compressed package for the corresponding architecture obtained from technical support to the Linux system, and decompress it;
2. Navigate to the bin folder under the software installation package directory, then double-click the software icon, or enter `./app.sh` in the terminal within the current directory to launch the software.

3.4 External Interface Description

3.4.1 SGA Series External Interface Description



Figure 5 SGA Series Instrument Interface Description

Table 2 SGA Series Interface Description

No.	Interface Name	Description
1	RF Signal Output	N (F), output impedance 50 Ω
2	GNSS Antenna Input	SMA (F)
3	Reserved Interface	/
4	Medium Power Output (Option 10)	SMA (F), the typical maximum output power is ≥ 25 dBm from 10 MHz to 6 GHz
5	Power Port	Instrument charging port, Type-C 12 V 3A
6	Data Port	Type-C, USB 3.0 recommended (USB 2.0 supported but bandwidth limited)
7	Reference Clock Input	MMCX (F), supports 10 MHz reference clock
8	Reference Clock Output	MMCX (F), outputs 100 MHz clock signal
9	Reserved Interface	/
10	Multi-function AUXIO	Refer to the following table for detailed description
11	Device Status Indicator	At any given moment, only one color indicator light is lit. Green: Normal status. Red: Abnormal status. Yellow: Remote update failed

Table 3 Multi-function AUXIO Pin Description for Port 10 (orientation shown from right to left)

Pin	Name	Direction	Voltage Standard	Description
1	TRG in	I	3.3 V	External trigger input
2	TRG out	O	3.3 V	Trigger output
3	TRG IO3	/	/	/
4	GND	/	/	Ground
5	NC	/	/	/
6	3V3D	O	/	Power output, 3.3 V
7	UART_RX	/	/	/
8	GND	/	/	Ground
9	UART_TX	/	/	/
10	NC	/	/	/
11	NC	/	/	/
12	NC	/	/	/
13	GND	/	/	Ground
14	NC	/	/	/

3.4.2 SGF Series External Interface Description



Figure 6 SGF Series Instrument Interface Description

Table 4 SGF Series Interface Description

No.	Interface Name	Description
1	RF Signal Output	N (F), output impedance 50 Ω
2	GNSS Antenna Input	SMA (F)
3	Reserved Interface	/
4	Medium Power Output (Option 10)	SMA (F), the typical maximum output power is ≥ 25 dBm from 10 MHz to 6 GHz
5	Power Port	Instrument charging port, Type-C 12 V 3A
6	Data Port	Type-C, USB 3.0 recommended (USB 2.0 supported but bandwidth limited)
7	Reference Clock Input	MMCX (F), supports 10 MHz reference clock
8	Reference Clock Output	MMCX (F), outputs 100 MHz clock signal
9	Reserved Interface	/
10	Multi-function AUXIO	Refer to the following table for detailed description
11	Device Status Indicator	At any given moment, only one color indicator light is lit. Green: Normal status. Red: Abnormal status. Yellow: Remote update failed

Table 5 Multi-function AUXIO Pin Description for Port 10 (orientation shown from right to left)

Pin	Name	Direction	Voltage Standard	Description
1	TRG in	I	3.3 V	External trigger input
2	TRG out	O	3.3 V	Trigger output
3	TRG IO3	/	/	/
4	GND	/	/	Ground
5	NC	/	/	/
6	3V3D	O	/	Power output, 3.3 V
7	UART_TX	/	/	/
8	GND	/	/	Ground
9	UART_RX	/	/	/
10	NC	/	/	/
11	NC	/	/	/
12	NC	/	/	/
13	GND	/	/	Ground
14	NC	/	/	/

4. PG Series Quick Start Guide

This chapter provides a quick start guide for the PG series, including safety instructions, instrument operation, and external interface descriptions.

4.1 Safety Instructions

4.1.1 Safety Guidelines

- **Appearance Inspection:** Confirm that the instrument enclosure is intact and free from any damage.
- **Accessory Inspection:** Ensure that the power cable and adapter are not damaged.
- **Ventilation Inspection:** Keep the fan outlet unobstructed.
- **Environmental Inspection:** Ensure that the instrument is dry, free from moisture and condensation, and that the ambient temperature meets the requirements specified in the product datasheet.
- **Operation Monitoring:** Ensure that the fan operates properly and that the operating temperature and humidity are within the ranges specified in the product datasheet.
- **Connection Compliance:** Properly connect all external interfaces. Ensure that all external input and output signals comply with the product specifications.
- **Battery Management:** If the battery level is low, connect the power adapter promptly to charge the instrument.
- **Storage Requirements:** Fully power off the instrument and store it in an environment that meets the temperature and humidity requirements specified in the product datasheet.
-  **Abnormal Condition Handling:** If the instrument is damaged, operates abnormally, overheats, emits an unusual odor, or produces abnormal sounds, stop using it immediately and contact official after-sales support.
-  **Safety Warning:** Do not disassemble the instrument enclosure to avoid personal injury or instrument damage.

4.1.2 Power Adapter Selection

Adapter Selection: The original manufacturer-provided power adapter is recommended. Alternatively, choose an adapter with matching specifications as detailed in the product manual

4.1.3 Battery Replacement

The PG series instruments support battery replacement. If battery replacement is required, please contact the official after-sales service channel for assistance. Do not disassemble the instrument by yourself.

4.2 Initial Use of the Instrument

After long-distance transportation, the battery level of the instrument may be below 5%. Before using the instrument for the first time, it is recommended to connect the supplied power adapter and then power on the instrument.

4.2.1 Powering On and Off the Instrument

Press the **power button** on the top of the instrument to turn the instrument on or off. After the instrument is powered on, the power indicator lights up; after shutdown, the power indicator turns off.

4.2.2 Charging Indicator

When the instrument is connected to the power adapter, the charging status indicator flashes green, indicating that the battery is being charged. When the battery is fully charged, the charging indicator remains solid green.

4.2.3 Running the Software

Press the power button. After the instrument starts up, it will enter the desktop environment and automatically launch the software.

4.3 External Interface Description

For user convenience, all interfaces of the instrument are integrated into the top panel. For detailed descriptions of each interface, please refer to the following table.

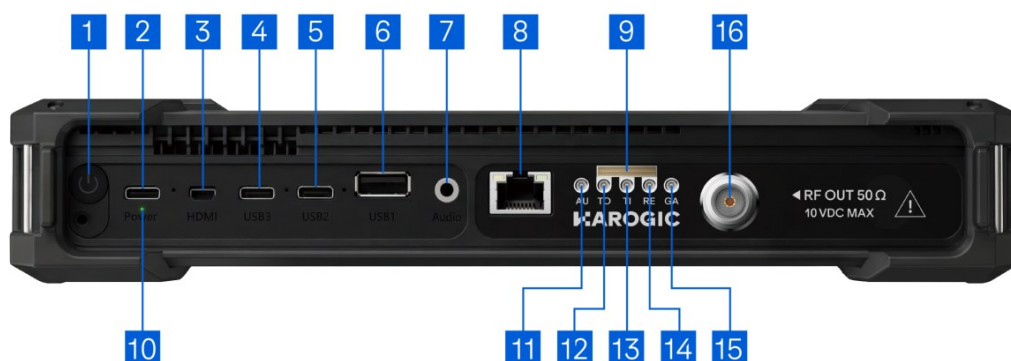


Figure 7 Top Panel Interface Description of the New PG Series Instruments

Table 6 All-New PG Series Interface Description

No.	Interface Name	Description
1	Power Button	Turn the instrument on/off
2	Charging Port	Charging port of the instrument, supports USB PD 3.0 (65 W), connect the power supply according to the operating voltage requirements of the instrument
3	Micro HDMI	External display expansion
4	USB3	USB interfaces: USB2 is a USB 3.0 interface, while USB1 and USB3 are USB 2.0 interfaces. Used to connect external storage devices, USB keyboards, and mice. It can also connect to a driver-free Hub with an Ethernet port, enabling connection to a PC via an Ethernet cable for remote control of the instrument
5	USB2	
6	USB1	
7	Audio Output	3.5 mm headphone jack, the volume can be adjusted through "System" -> "Parameter Settings" -> "Volume" in the menu.
8	Ethernet Port	Gigabit Ethernet port
9	Multi-function AUXIO	Refer to the following table for detailed description
10	Charging Indicator	Flashing green indicates charging; solid green indicates that charging is complete
11	Reserved Interface	/
12	Trigger Output	3.3 V CMOS
13	Trigger Input	3.3 V CMOS, high impedance input, maximum trigger rate of 500 times/s
14	Reference Clock Input/Output	Reference Clock Input: MMCX (F), amplitude ≥ 1.5 Vpp, input impedance 200 Ω . Supports sine wave, square wave, and clipped sine wave signals. Reference Clock Output: output impedance 50 Ω , 100 MHz.
15	GNSS Antenna	MMCX (F)
16	RF Signal Output	N (F), output impedance 50 Ω

Table 7 Multi-function AUXIO Pin Description for Port 9 (orientation shown from left to right)

Pin	Name	Direction	Voltage Standard	Description
1	NC	/	/	Reserved
2	NC	/	/	Reserved
3	NC	/	/	Reserved
4	GND	/	/	Ground
5	NC	/	/	Reserved
6	3V3D	O	/	Power output, 3.3 V
7	USART1_RX	/	/	/
8	GND	/	/	Ground
9	USART1_TX	/	/	/
10	GPIO3	O	3.3 V CMOS	Programmable General-Purpose Digital Output
11	GPIO2	O	3.3 V CMOS	Programmable General-Purpose Digital Output
12	GPIO1	O	3.3 V CMOS	Programmable General-Purpose Digital Output
13	GND	/	/	Ground
14	GPIO0	O	3.3 V CMOS	Programmable General-Purpose Digital Output

5. Playback Bandwidth and Memory Depth

The instrument supports both Playback mode and Streaming mode. IQ playback bandwidth and waveform memory depth vary depending on the instrument series and model. The waveform memory depth determines the amount of IQ data that can be preloaded for playback. When using the instrument, configure the software or API parameters according to the specific model and configuration, and load the corresponding baseband IQ data for playback.

Table 8 Vector Signal Generator Playback Bandwidth and Built-in Memory Depth

Series/Model	IQ Playback Bandwidth	Built-in Memory Depth	Configuration
SGA Series	100 MHz	128 MB	Standard
SGF Series	100 MHz	128 MB	Standard
	320 MHz	1 GB	Option 53
PGA Series	100 MHz	128 MB	Standard

6. GNSS Usage Instructions

The instrument has a built-in GNSS module. The configuration and operating procedures are as follows:

1. Connect the GNSS antenna and position it with a clear, unobstructed view of the sky.
 - SG Series: Antenna -> instrument's [No. 2 GA interface](#)
 - PG Series: Antenna -> instrument's [No. 15 GA interface](#)
2. In the host software, select "System" -> "GNSS Info" from the menu bar. Wait approximately 1 to 3 minutes for satellite lock. The corresponding GNSS information will then be displayed in the pop-up window.

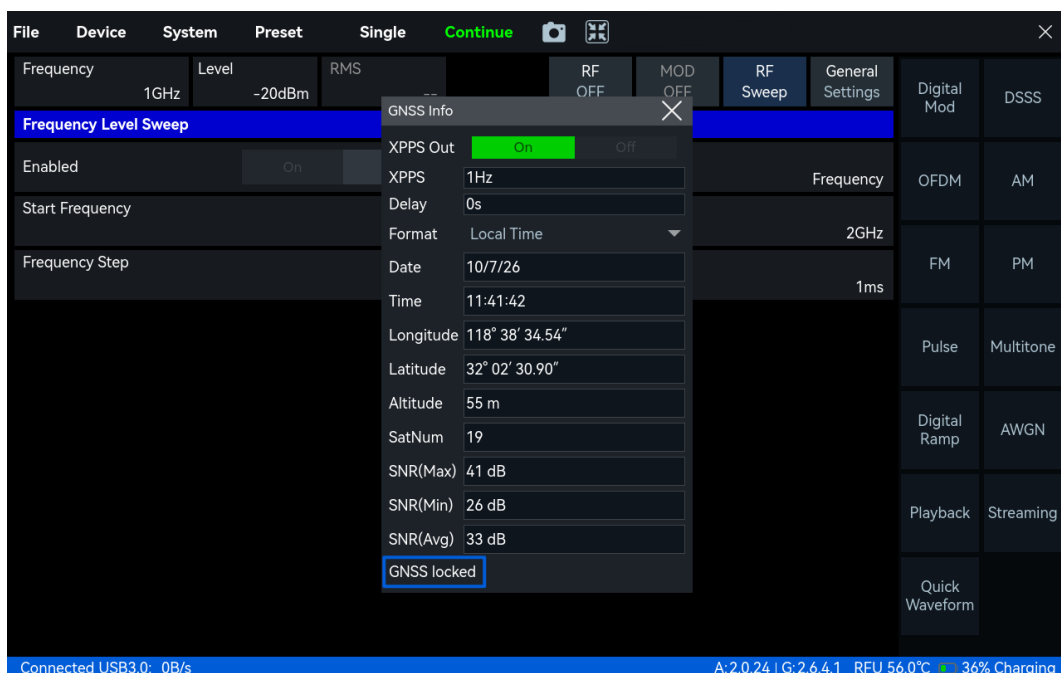


Figure 8 Connecting the External GNSS Antenna

Note: GNSS lock time is affected by antenna gain and weather conditions. An active GNSS antenna with a gain of ≥ 30 dB is recommended.

7. Reference Clock Input and Output

7.1 Reference Clock Input

7.1.1 Hardware Connection

- SG Series: Antenna -> instrument's [No. 7 MMCX \(F\)](#) interface
- PG Series: Antenna -> instrument's [No. 14 MMCX \(F\)](#) interface

7.1.2 Software Operation

In the software main settings area, click "General Settings" -> "RefCLKSource", select "External", and set the "ExtRefCLKFreq" to 10 MHz.

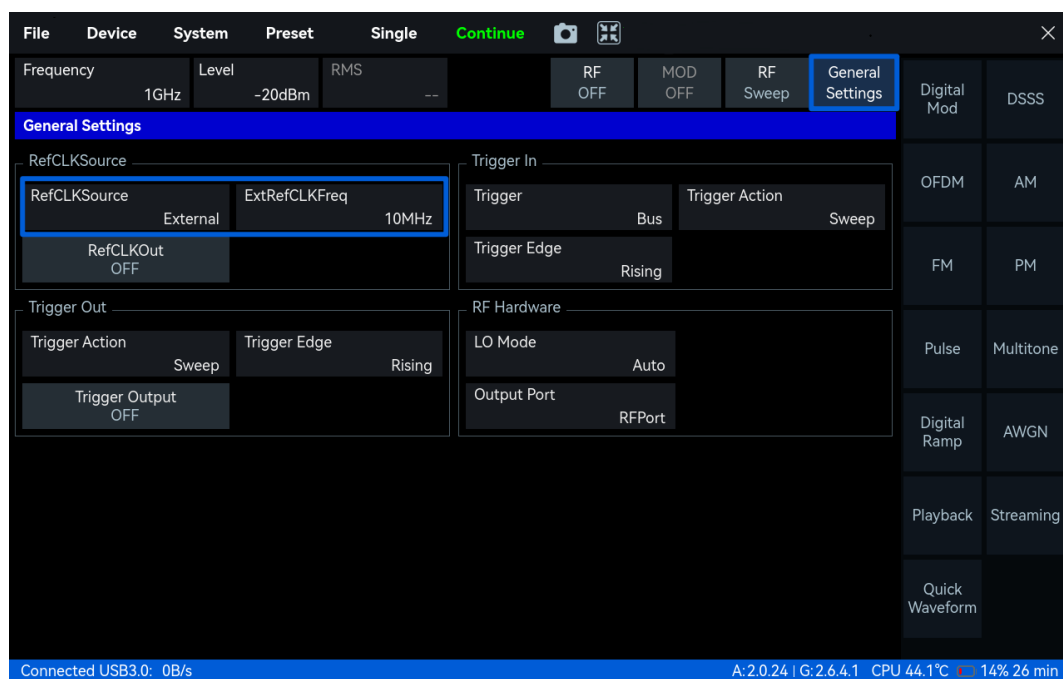


Figure 9 Setting the External Reference Clock Source

7.2 Reference Clock Output

7.2.1 Hardware Connection

- SG Series: Antenna -> instrument's [No. 8 MMCX \(F\)](#) interface
- PG Series: Antenna -> instrument's [No. 14 MMCX \(F\)](#) interface

7.2.2 Software Operation

In the software main settings area, click "General Settings", and enable "RefCLKOut" under the "RefCLKSource" section.

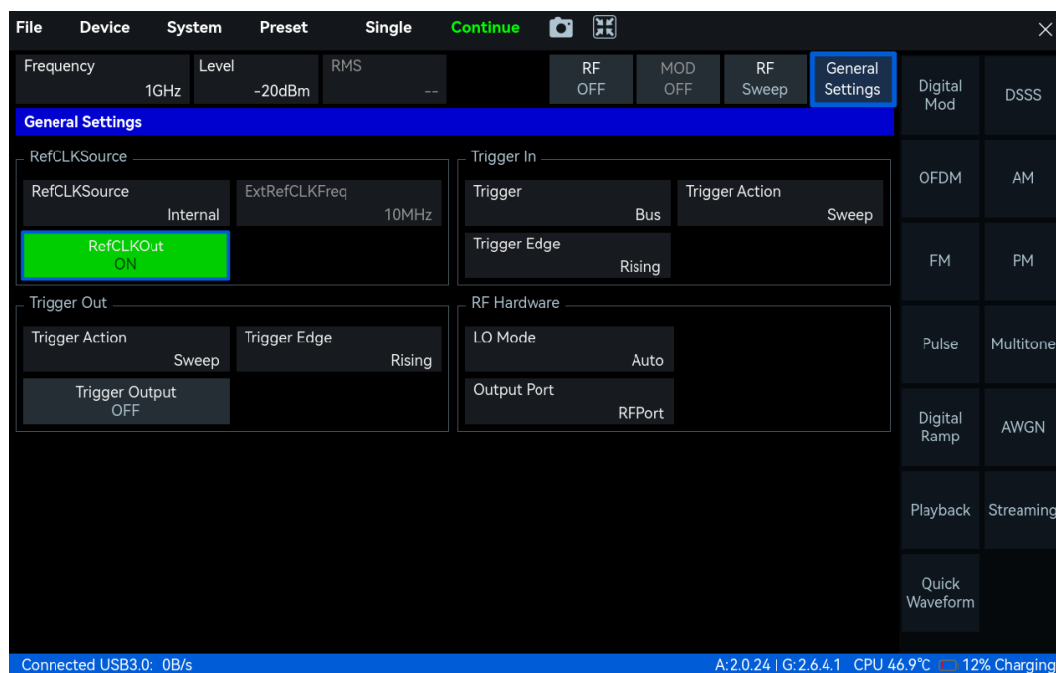


Figure 10 Setting the Reference Clock Output

8. PG Series Remote Control

8.1 Direct Ethernet Connection

1. Click "File" -> "Exit" in the menu bar, or click the "✕" icon in the upper-right corner of the software interface to exit the software running on the PG series;
2. Copy all files from the "/software/SGStudio/bin/CalFile" directory on the instrument to the corresponding "/bin/CalFile" directory of the software on the PC;
3. Use an Ethernet cable to connect the instrument's network port to the network port of the host computer or embedded instrument;
4. Open "Settings" -> "Network & Internet" -> "Properties" on the PC, manually configure the IPv4 address (e.g., "192.168.1.2") and subnet mask ("255.255.255.0"), and ensure that the PC and the instrument IP address ("192.168.1.100") are in the same network segment.

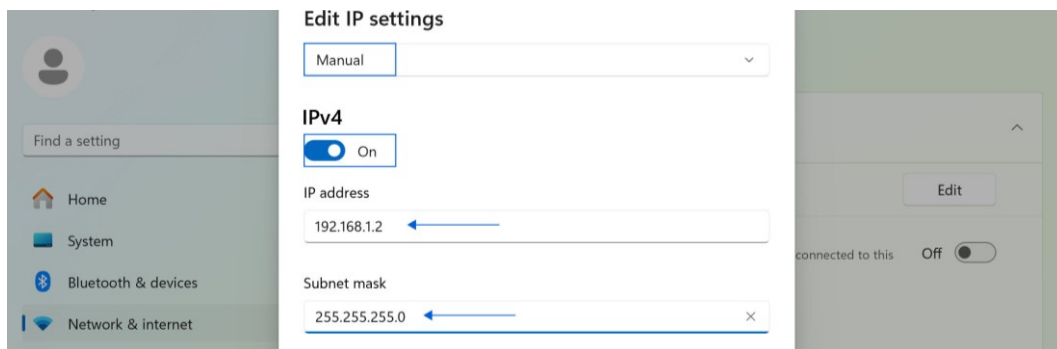


Figure 11 Configuring the IP Address and Subnet Mask

5. On the PC, open command prompt (cmd), enter "ping 192.168.1.100" to verify that the network connection is working properly.

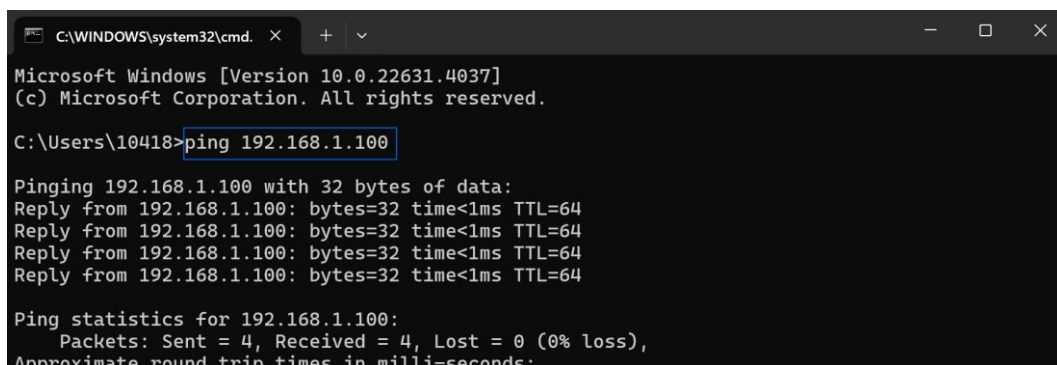


Figure 12 Testing Instrument Network Connection (ping Command)

6. Double-click the executable file in the bin folder of the PC-side software directory to launch the signal generator software.
7. Click "Device" -> "ETH Connect" in the menu bar. Confirm the IP address in the pop-up window, then click "Connect" to enable remote control of the instrument.

⚠ Note: The software on the instrument and the PC-side software cannot be running simultaneously.

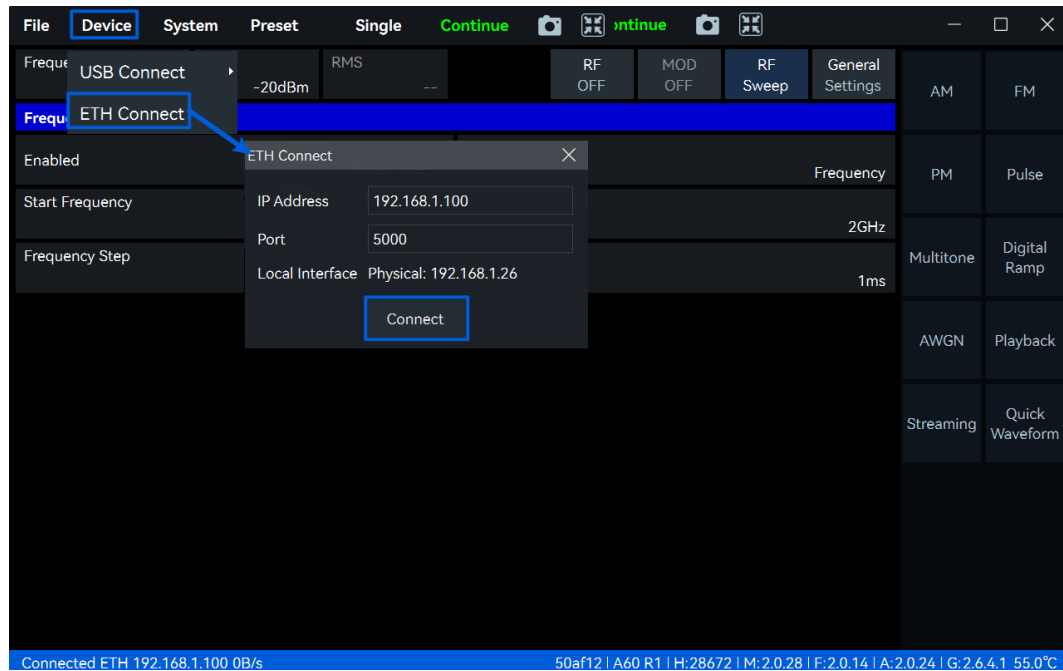


Figure 13 Connecting to an ETH Device

8.2 Local Area Network (LAN) Connection

1. Connect the Ethernet port of the PG series instrument to the router's Ethernet port using an Ethernet cable.
2. Click "File" -> "Exit" in the menu bar to return to the instrument desktop. Then copy all contents from the "/software/SGStudio/bin/CalFile" folder on the instrument and paste them into the corresponding "/bin/CalFile" directory of the software on the PC.
3. Click the terminal icon ">" in the lower-left corner of the desktop. Enter "ifconfig" in the terminal to check the IP address assigned to the instrument by the router. In this example, the IP address is "192.168.31.56".

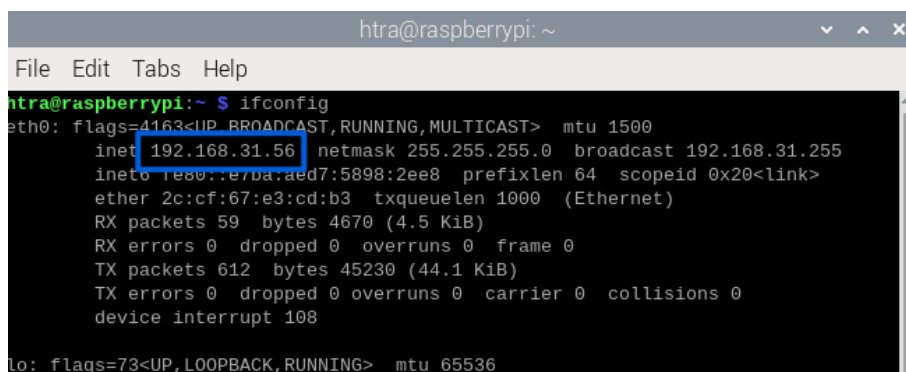


Figure 14 Check the Instrument's Current IP Address

4. Connect the PC to the same router via Wi-Fi and ensure that the PC and the instrument are within the same local area network.
5. Double-click the executable file in the bin folder of the PC-side software directory to launch the signal generator software.
6. Click "Device" -> "ETH Connect" in the menu bar. In the pop-up window, change the "IP Address" to "192.168.31.56" and click "Connect" to enable remote control of the PG series instrument.

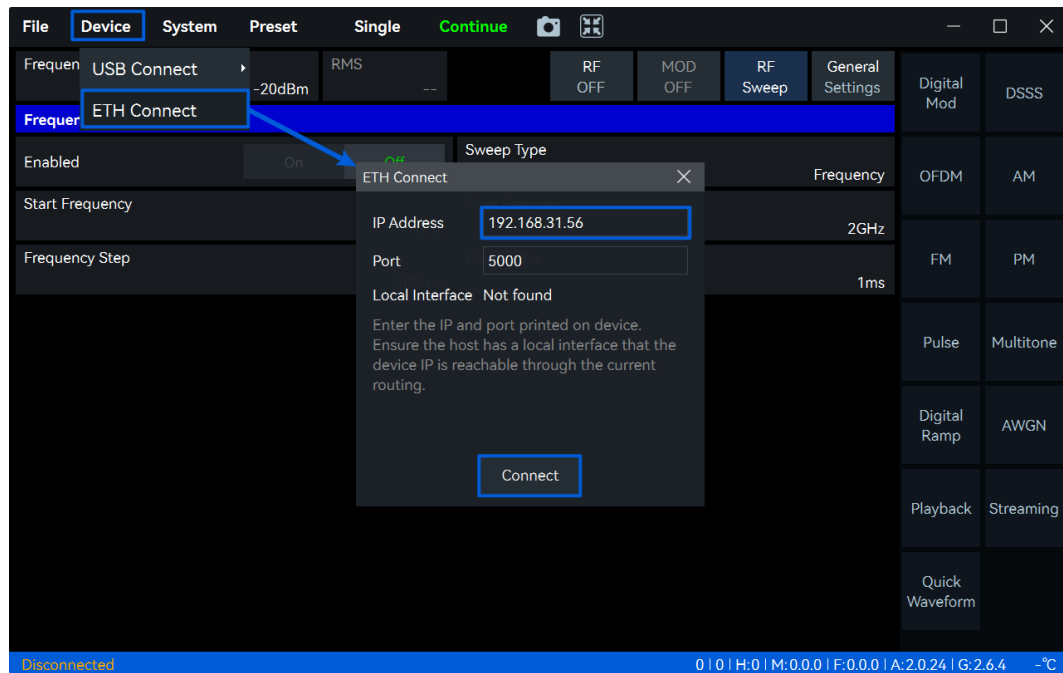


Figure 15 Connecting a PC to a PG Series Instrument over LAN

 www.harogic.com

 info@harogic.com

 +65-8299 8857