Signal Generator User Manual

9kHz - 20GHz / 9kHz - 40GHz

CSG9K20GA / CSG9K40GA

CORECH MICROWAVE LIMITED 科锐微波有限公司

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1. General Remark

Thank you for selecting Corech Microwave CSG series signal generator!

This user manual is valid for the following listed generators and theirs extended version:

Model / PN	Description
CSG9K20GA	9kHz - 20GHz Single Channel Signal Generator
CSG9K40GA	9kHz - 40GHz Single Channel Signal Generator
CSG9K20GD40	9kHz - 20GHz & 9kHz - 40GHz Dual Channel Signal Generator
CSG9K20GD20	9kHz - 20GHz & 9kHz - 20GHz Dual Channel Signal Generator
CSG9K40GD40	9kHz - 40GHz & 9kHz - 40GHz Dual Channel Signal Generator

FOR PROPER AND SAFE USE, PLEASE READ THE MANUAL CAREFULLY BEFORE YOUR OPERATION.

2. Safety Information

Please read the following safety information carefully to prevent personal injury or equipment damage.

2.1 Safety Notifications

- Power Supply: Internal 110V/220V adaptive AC power supply.
- Ground: Before connecting the in/out terminals, please ensure the equipment is grounded correctly.
- Ventilation: Maintain well - ventilated, regularly check and clean the intake and fan of the equipment. This equipment should be more than 10cm away from the wall.
- Electrostatic Protection: Keep the operation in an ESD protective area. Before connecting, please ground the internal and external conductors of the cable to release static.

2.2 Safety Requirements

- Use Only the Specified Fuse.
- Use Matched RF Connectors.
- Do Not Operate Without Covers / Panels.
- Do Not Operate in an Explosive Environment.

2.3 Safety Symbols

	ESD
	Caution
	GND
	Hazardous Voltage

2.4 Operating Environment

Temperature	0 ℃ - 50 ℃
Humidity	0 ℃ - 30 ℃, < 95%
Altitude	≤ 3000m
Vibration	0.21 G Max., 5 Hz - 500 Hz

3. Product Overview

3.1 Language Setting

Set a language of the display by pressing MENU - [System] - [Language] on the front panel.

Default: English

3.2 Front Panel Operation

Function Keys **Touch Screen Display** **Number Keyboard**

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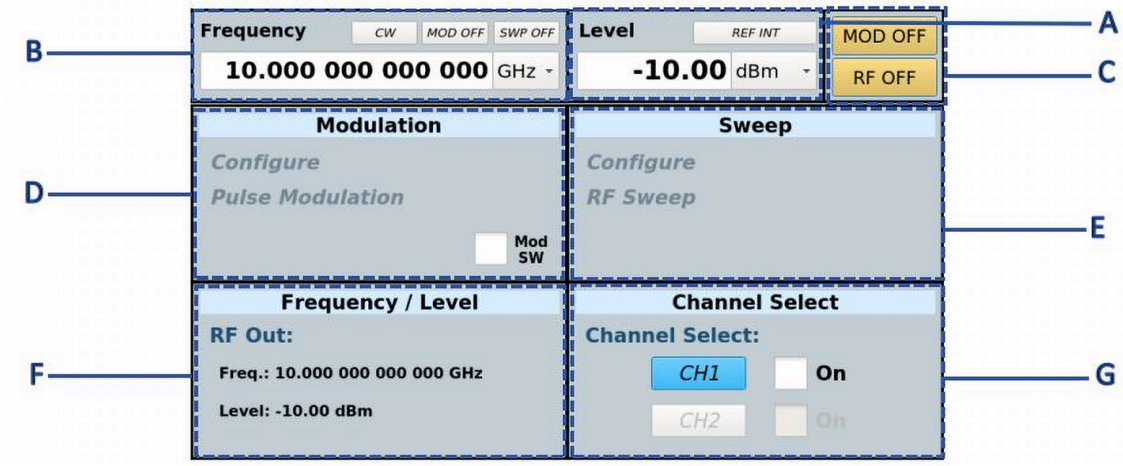
3.2.1 Function Keys

NO.	Function	Description
1	RESET	Revert to the default parameters.
2	MENU	Select and set functions.
3	RF ON/OFF	RF signal output switch.
4	Power Button	Set power-on state or stand-by state.

3.2.2 Touch Screen Display

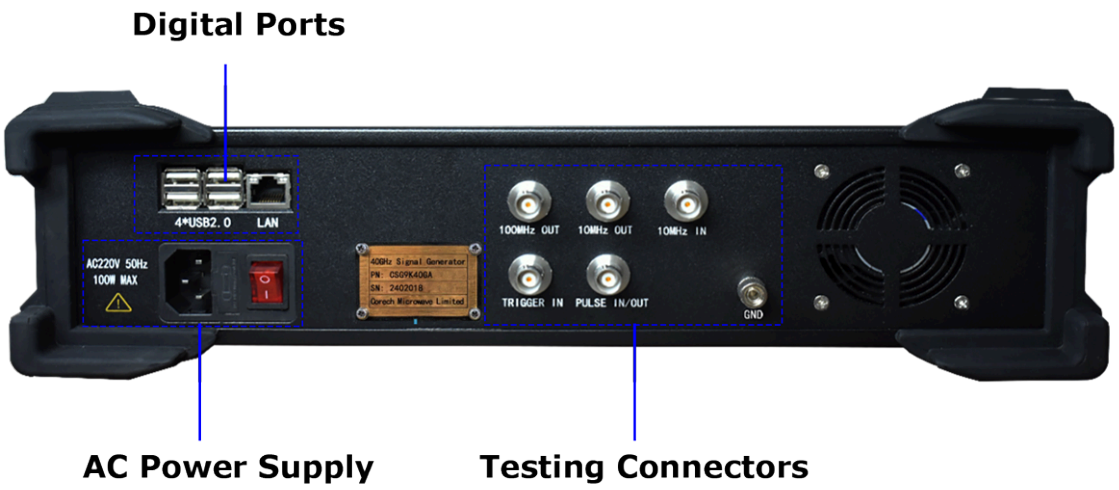


Area	Function	Description
A	Set Power	• Touch this area to set power. • Display the current power level and reference status.
B	Set Frequency	• Touch this area to set frequency. • Display the current frequency, RF output status, modulation on/off status and swee p on/off status.
C	Modulation Switch	• Touch this area to switch on/off the modulation and RF signal. • Display modulation on/off and RF on/off status.
D	Set Modulation	• Touch this area to set modulation status. • Display current modulation status.
E	Set Sweep	• Touch this area to set sweep status. • Display current sweep status.
F	Amplitude & Frequency Display	• Touch this area to set power. • Display current power and frequency set value.
G	Select Channels	• Touch this area to select RF channels. • Display current selected channel and its on/off status.

3.2.3 Number Keyboard

No.	Definition	Description
1	Direction Key	• Up/down keys are for value increase or decrease. • Left/right keys are for cursor movement and Tap.
2	Knob	• Rotate the knob to change the selected value.
3	Number Keys	• Insert numbers.
4	Back	• Revoke the last inserted data one by one.
5	ESC	• Close the current active area.
6	OK	• Confirm the current set parameter.
7	FREQ	• Press the button and set frequency.
8	LEVEL	• Press the button and set power level.
9	Unit Keys	• Insert suitable unit for the parameter.

3.3 Rear panel Operation



3.3.1 AC Power Input Terminal

This equipment can operates with AC power from 110V - 220V, 50Hz - 60Hz. Standard IEC, fuse and 2nd switch included.

3.3.2 Digital Interface

NO.	Interface	Description
1	4*USB2.0 Host	• Connecting to an external USB device. • The interface reads the data or state file from the U disk, or stores the current instrument state/data to the U disk.
2	LAN Interface	• 100Mbps LAN Interface. • Connecting to a computer. • The interface conducts remote control or data transmission.

3.3.3 Testing Ports

NO.	Ports	Description
1	PULSE IN/OUT	• PULSE IN: In external modulation mode, this port is used to input external pulse signals. • PULSE OUT: In internal modulation mode, this port is used to output the pulse signal generated by the internal generator.
2	TRIGGER IN	In pulse modulation, input the external trigger signal.
3	10MHz IN	10MHz reference input.
4	10MHz OUT	10MHz reference output.
5	100MHz OUT	100MHz reference output.

4. Main Parameters

4.1 Electrical & Mechanical Specifications

Parameter	Min.	Typ.	Max.	Note
Frequency Range	9kHz		40GHz	
Frequency Resolution		0.001Hz		
Operating Mode	CW / Sweep			
SSB Phase Noise			-100dBc / Hz@1kHz	
			-106dBc / Hz@10kHz	
			-105dBc/ Hz@100kHz	
Spurious		-80dBc@10GHz		
Harmonics		-50dBc@10GHz		
2_{nd} Harmonics		-80dBc		
Sweep		10ms		
Pulse		50ns		≥100MHz
		120ns		<100MHz
Output Power	-120dBm		+17dBm	
10MHz Signal Output				
Output Power	0dBm			
SSB Phase Noise			-140dBc/Hz@1kHz	
100MHz Signal Output				
Output Power	0dBm		-150dBc/Hz@1kHz	
SSB Phase Noise				
Dimensions	360mm × 360mm × 89mm			Corner Pad Not Included
Weight			10kg	

4.2 Interface Definition

4.2.1 Front

Ref.	Function	Description
A	DC ON/OFF	
B	RF ON/OFF	
C	Menu	
D	Reset	
E	Keyboard	
F	Knob	
G	RF Output	2.9mm-Male
H	Direction Key	
I	Screen	5 inch

4.2.2 Rear

Ref.	Function	Description
A	USB Ports	4×USB2.0
B	Ethernet Port	RJ45
C	100MHz Output	BNC - Female
D	10MHz Output	BNC - Female
E	10MHz Input	BNC - Female
F	Fan	Exhaust
G	GND Terminal	
H	Pulse Signal Input/Output	BNC - Female
I	Trigger Signal In	BNC - Female
J	Name Plate	
K	AC ON/OFF	
L	Fuse Holder	
M	AC Power Port	AC110V/ AC220V

5. Power On/Off

This chapter introduces the power on/off steps of the equipment in detail.

5.1 Check before the first power-on

5.1.1 Completeness

Refer to the "Packing List" to check whether the accessories accompanying the device are complete. If you find that the accessories are missing or damaged, please contact Corech Microwave or authorized dealers in time.

5.1.2 Appearance

When receiving the equipment, check the packaging, the appearance of the equipment and the display screen in order, if there is any deformation or damage, please contact Corech Microwave or authorized dealers.

5.2 Connection

5.2.1 Ground

Connect the grounding post @"G" on the rear panel to the ground wire, and ensure that the ground wire is reliably grounded, floating or poor grounding may lead to the cause personal injury and equipment damage.

5.2.2 AC Power Connection

110V/220V, 50-60GHz adaptive power supply. Use the supplied power cord to connect the AC power port @"M" on the rear panel to the external power socket and ensure a reliable connection.

5.3 Power on operation

5.3.1 Start

After make sure the correct GND and AC connection, you can start powering on the equipment.

5.3.2 Standby

Press the "|" direction on the AC switch @"K" on the rear panel, the switch glows red. Meanwhile, The red light on the DC switch@"A" on the front panel is on, the equipment goes into standby state.

5.3.3 Power on

In the standby state, press the DC switch, as its green light on, the equipment powers on. At approx. 15s later, the equipment goes into operation state.

5.4 Power off operation

5.4.1 Standby

In the operation state, press the DC switch, as its green light off, red light on, the equipment goes into standby state.

5.4.2 Power off

In the standby state, press the "o" direction on the AC switch, its red light off. Meanwhile, the red light of the DC switch off at 3s later, the equipment goes into power off state.

6. Menu and Setting

6.1 Control: Keyboard, Touch Screen and SCPI.

6.2 Set Frequency

Step 1 - Reset:

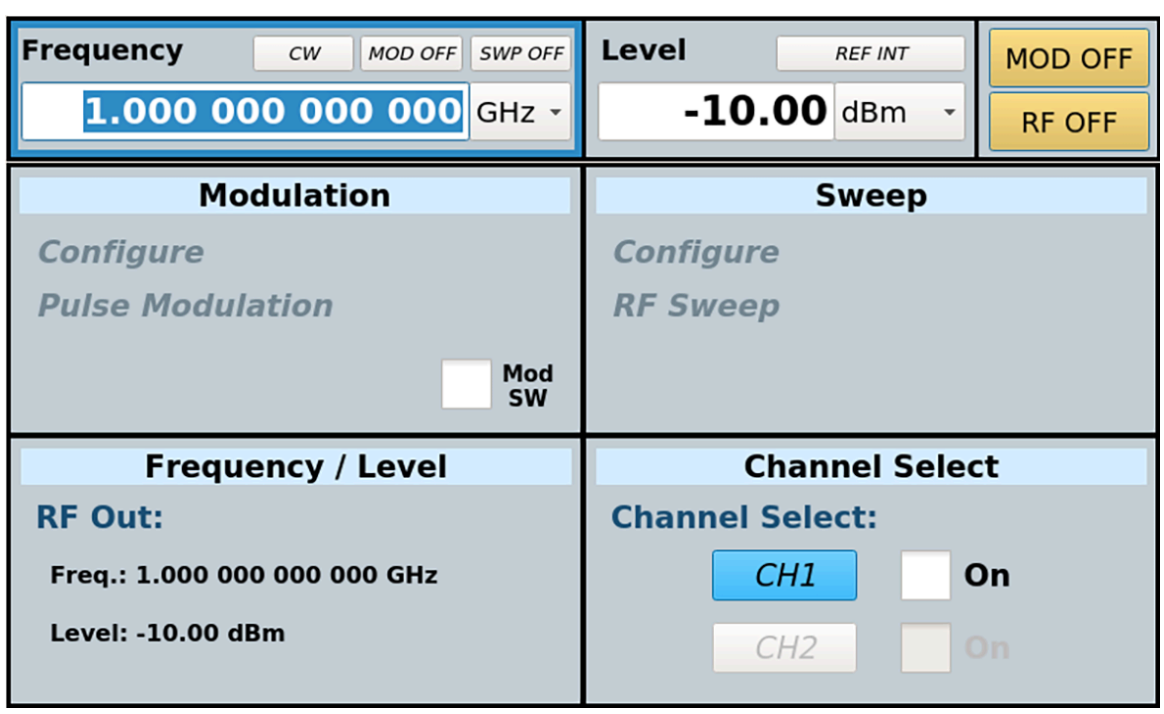
Press the【RESET】key on the front panel, reset the equipment into initial state.

Step 2 - Type in the value:

Press the【FREQ】key on the front panel or touch the Frequency Set area on the screen, type in the specific value and press【G/n】key on the front panel to finish this step. In this step, you can also rotate the knob to adjust the value.

Step 3 - RF switch on:

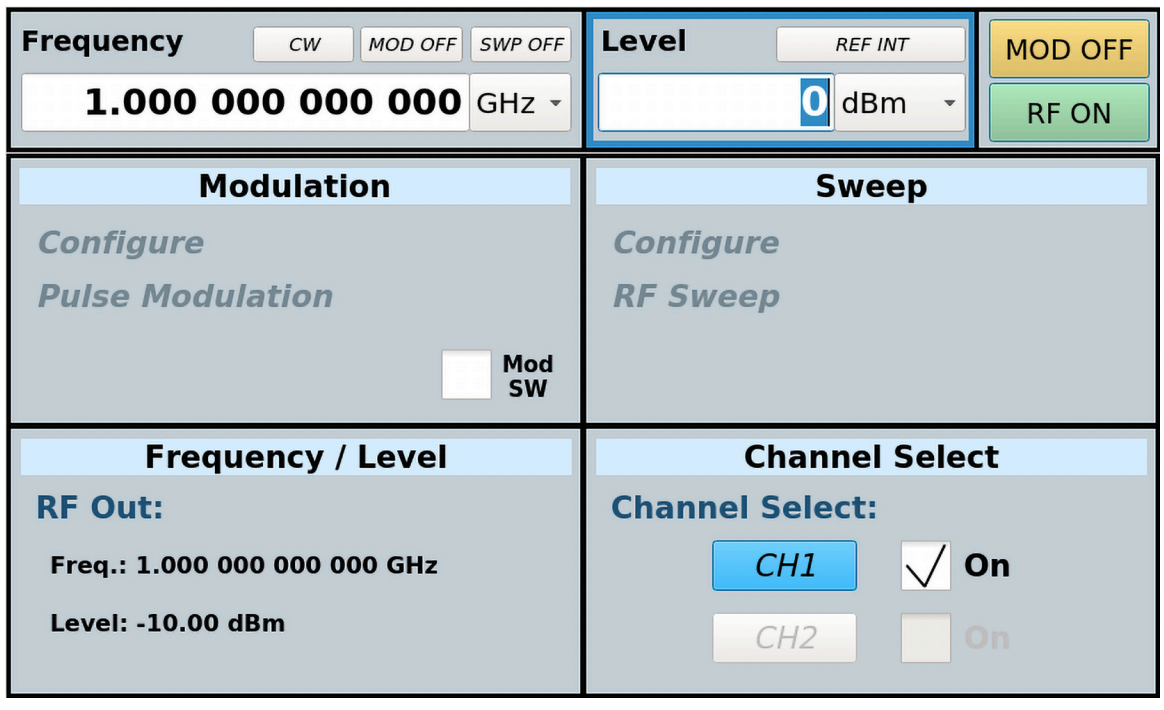
Press【RF ON/OFF】key on the front panel, touch the Modulation Switch area or the Channel Select area to switch on the RF output. As the "RF ON" show on the modulation switch area and the color turns green, RF switch on.



6.3 Set Power Level

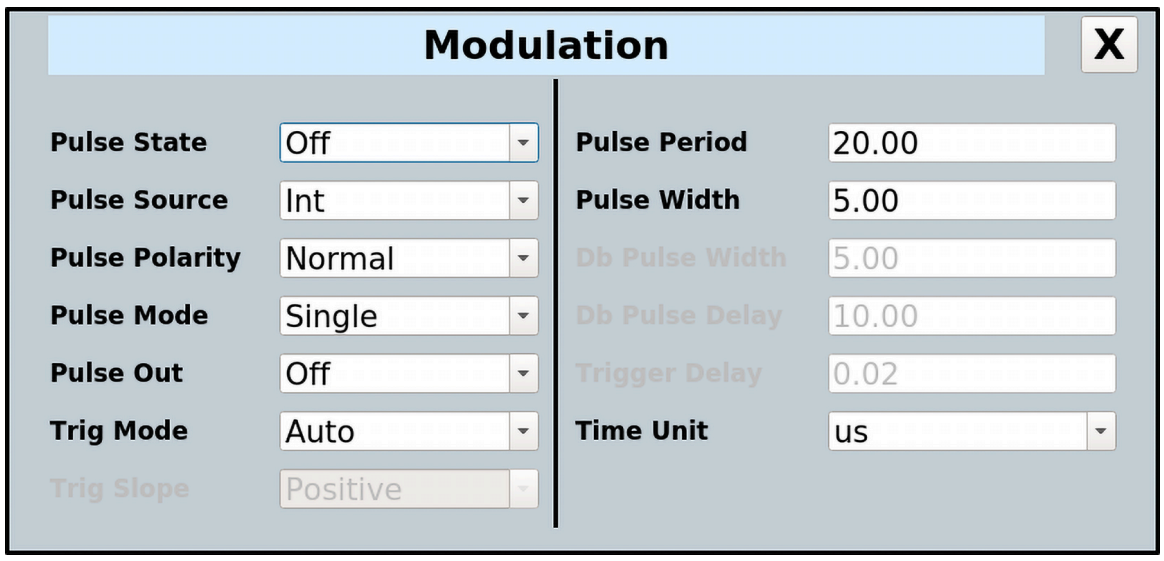
Type in the value

Press【LEVEL】key on the front panel or the Power Level Set area, type in the specific value and press 【X1 dBm】key on the front panel to finish this step. In this step, you can also rotate the knob to adjust the value.



6.4 Set Pulse Mode

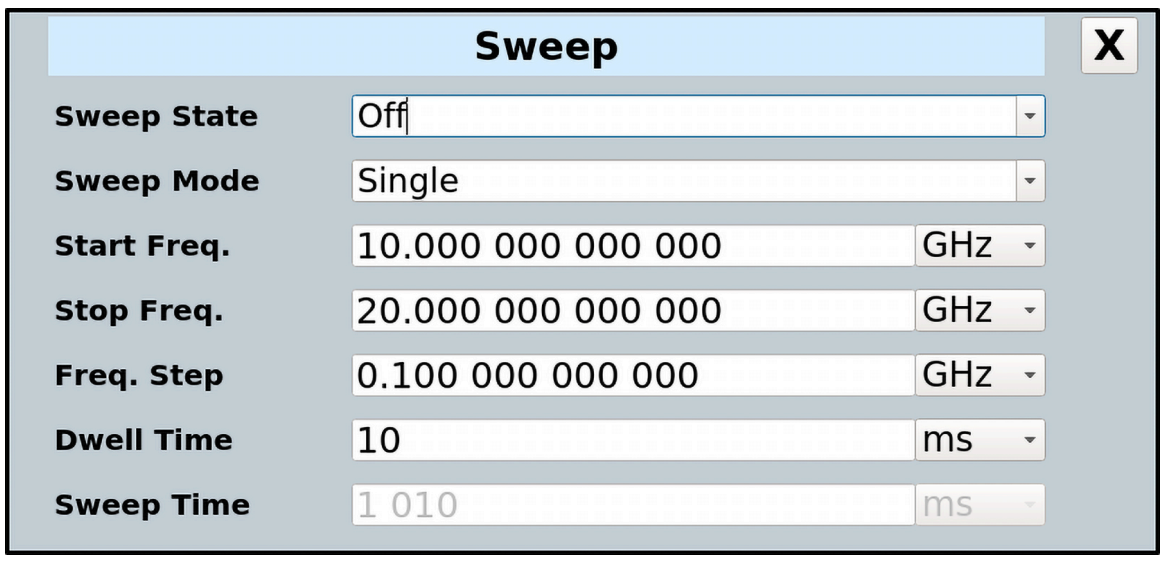
Tap the Modulation area on the home page to set pulse parameters.



Parameters	Valid Range	Default Value	Description
Pulse State	On|Off	Off	On/off state of the signal source
Pulse Source	Int|Ext	Int	Internal/external signal source of the pulse modulation.
Pulse Polarity	Normal | Inverse	Normal	The modulation polarity of the pulse signal.
Pulse Mode	Single| Double	Single	Select single pulse mode or double pulse mode.
Pulse Out	On|Off	Off	This parameter is enable only in internal modulation.
Trig Mode	Auto|Ext Trig	Auto	External trigger or automatic trigger of the pulse modulation.
Trig Slope	Positive| Negative	Positive	This parameter is enable only in external trigger mode.
Time Unit	μs|ms|s	μs	Time unit of the pulse modulation.
Pulse Period	0.11μs - 100.00s	20.00μs	Time period of the pulse modulation. If, the set pulse period ≤ the current pulse width, it would automatically adjust to be ≥ current pulse width.
Pulse Width	0.10μs - 99.999 999 99s	5.00μs	Width of the pulse signal. If, the set pulse width ≥ the current pulse period, it would automatically adjust to be ≤ current pul se period.
Double Pulse Width	0.10μs - 99.999 999 99s	5.00μs	This parameter is enable only in double pulse mode.
Double Pulse Delay	0.10μs - 100.00s	0.10μs	This parameter is enable only in double pulse mode.
Trigger Delay	0.02μs - 100.00s	0.02μs	This parameter is enable only in external trigger mode.

6.5 Set Sweep Mode

Tap the Sweep area on the home page to set sweep parameters.



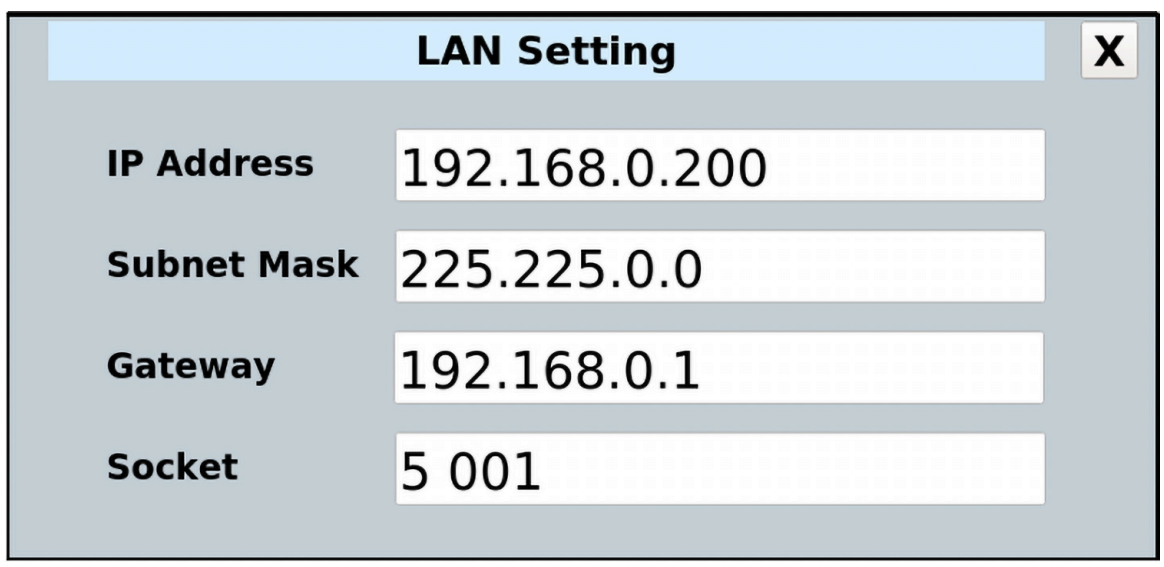
Parameters	Valid Range	Default Value	Description
Sweep State	On|Off	Off	On/off state of the sweep function.
Sweep Mode	Single|Continuous	Single	Single sweep mode or double sweep mode.*
Start Freq.	9kHz - 40GHz	10GHz	Set the start frequency of the sweep.
Stop Freq.	9kHz - 40GHz	20GHz	Set the stop frequency of the sweep.
Freq. Step	On|Off	Off	Set the frequency step of the sweep.
Dwell Time	10ms - 10s	10ms	Set the dwell time of every frequency point, phase-locked time included.
Sweep Time	-	-	Sweep time is automatically calculated and displayed. Read-only.

* **Single Sweep Mode:** From the start freq., the output frequency accumulates/decreases according to the sweep step, and each point stays for the dwell time and then switches to the next point until the frequency stops, as the sweep stops.

Repeat Sweep Mode: From the start freq., the output frequency accumulates/decreases according to the sweep step, and each point stays for the sweep dwell time and then switches to the next point until the frequency stops. It returns to the start freq, and begins to repeat a new round of sweep.

6.6 Set LAN

Press the MENU key on the front Panel, select [System]-[LAN Setting] to check set LAN parameters including: IP Address, Subnet Mask, Gateway, Socket.



7. Fault Diagnosis and Troubleshooting

7.1 Standby Light Not Working

- Step 1: Check the AC switch state, the AC power, and the external circuits.
- Step 2: After troubleshooting, re-power on the equipment.
- Step 3: If the standby light still not working, check if the fuse blown, if yes, replace the fuse and power-on again.
- Step 4: If the fault was caused by the power supply of the signal source, it needs to be returned to and repaired by the manufacturer.

7.2 Fan Not Working

- If the fan doesn’t work in power-on state, check whether the fan is stuck by obstacles.
- If yes, turn off the equipment to remove the obstacles and clean the fan.
- If the fault still not solved, please return the equipment to the manufacturer for Maintenance.

7.3 Keyboard Not Working, Key Ghosting / Key Chatter

If the fault occurred in power-on state, please return the equipment to the manufacturer for Maintenance.

7.4 USB Device Not Recognized

- Step 1: Check if the U disk works in other equipment or computers.
- Step 2: If yes, reset the equipment and insert the U disk again.
- Step 3: If the fault still not solved, please return the equipment to the manufacturer for Maintenance.

8. Routine Maintenance

8.1 Clean Product Surface

- Step 1: Turn off the power and disconnect the power cable of the equipment.
- Step 2: Wipe the surface with a dry or slightly damp soft cloth; do not wipe the inside of the equipment.
- Step 3: Do not use chemical cleaners, such as alcohol, acetone, or dilutable cleaners.

8.2 Clean the Screen

- Step 1: Turn off the power and disconnect the power cable of the equipment.
- Step 2: Wipe the Screen with a clean, soft cotton cloth moistened with a cleaning agent.
- Step 3: Dry the Screen with a clean, soft cotton cloth.
- Step 4: Reconnect the power cable only after the cleaning agent has completely dried.

Note: The screen has an anti-static coating. Do not use cleaners containing fluoride, acid, or alkaline substances. Do not spray cleaner directly onto the screen, as it may seep into equipment and cause the damage.

8.3 Testing Ports Maintenance

If the connectors are damaged or dusty, it may affect test results. Please maintain these connectors as follows:

- Clean the connectors regularly.
- To prevent ESD, do not touch the connectors directly.
- Do not use damaged connectors.
- Use an electric blower to clean the connectors; Do not use abrasive tools such as sandpaper to polish the connector surface.

9. Repair and Disassembly

Only authorized personnel may open the equipment. Before disassembly operations, the
power cable must be disconnected to prevent personnel injury and equipment damage.

Disassembly, repair, and replacement of parts for the equipment must be carried out by specialized engineers from the manufacturer. After repair or replacement, the technical specifications and safety performance must be tested to ensure normal operation.

10. Transportation

Before transportation and handling, please take necessary protective measures to avoid damage. The handles on the equipment is intended for use during single-item handling only. They must not be used for securing or bundling during transportation. To prevent personnel injury and equipment damage, please follow relevant safety transportation regulations.

11. Disposal/Environmental Protection

Certain substances contained in this product may be harmful to the environment or human health. To avoid contaminating the environment or posing risks to human health, do not dispose of this product as unsorted waste. This product should be sorted for recycling to ensure that most materials can be properly reused or recycled. For information on disposal or recycling, please contact the relevant local authorities.

12. Warranty and Technical Support:

CSG series of signal generators are warranted for a period of 3 years from the date of shipment. Misuse and consequential damages are not covered by this warranty.
We'll response instantly for your pre-sales and after- sales technical problems.

END

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