FNIRSI SG-003A signal generator

Product Manual

Contents

1. Product Parameters

Signal	Range	Precision	Resolution	Max load	External power supply
Active current output	0~24mA	±（0.1%+0.005）	0.01mA	750Ω	
Passive current output	0~24mA	±（0.1%+0.005）	0.01mA		0~30V
Voltage output	0~15V	±（0.1%+0.005）	0.01V		
24V circuit	0~24mA	±（0.1%+0.005）	0.01mA		
PWM output (frequency)	0~20K,45K,90K, 180K	±2%	1Hz		
PWM output (duty cycle)	0~100	±2%	1%		
Current input	0~24mA	±（0.1%+0.005）	0.01mA		
Voltage input	0~30V	±（0.1%+0.005）	0.01V		

1.1 With the auto function for voltage and current output,You can choose a single rise, single drop or three cycle modes.

1.2 With input to output conversion, You can choose voltage to active or passive current and current to voltage.

1.3 The output has custom settings , The upper and lower output limits can be set arbitrarily.

1.4 Three language options available, Chinese, Traditional Chinese and English.

1.5 Voltage and current input graphs frame rate at 10 frames

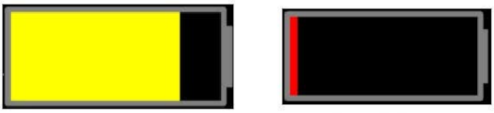
1.6 Powered by a large-capacity lithium battery,use Type-c interface to charge (5V).

1.7 Use environment: 0℃~50℃

1.8 Size: 92mm*72mm*30mm

2. Powered by

Electricity



Less than 20% battery

Powered by 3000mA large-capacity lithium battery

Use Type-c interface to charge,The indicator light is on when charging,The indicator light goes out after full charge,Toggle switch ON/OFF the device

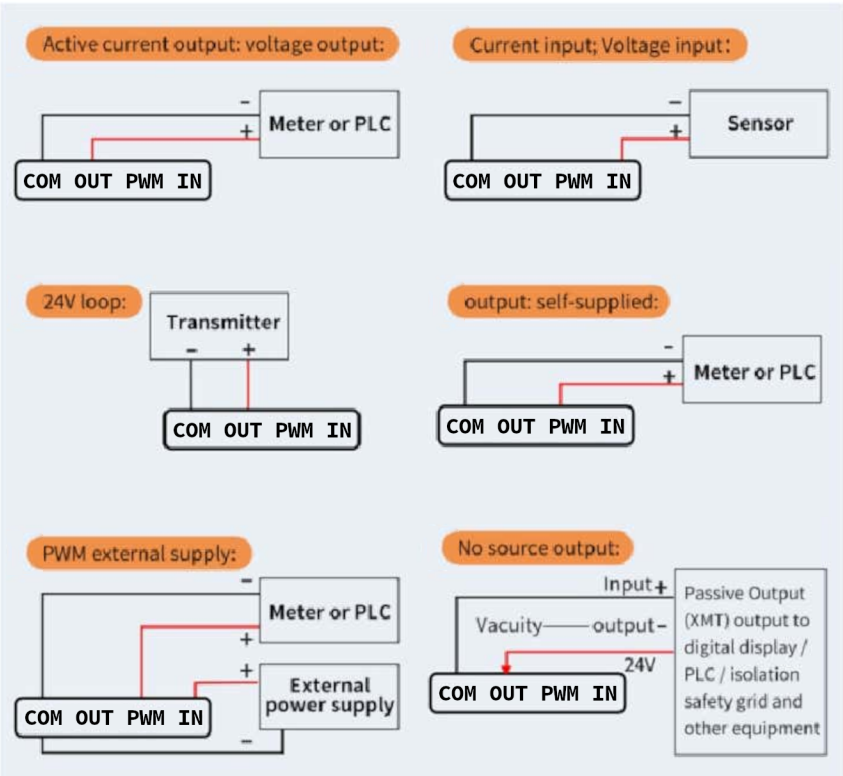
3.Wiring port

IN: Input positive level (cannot be reversed)

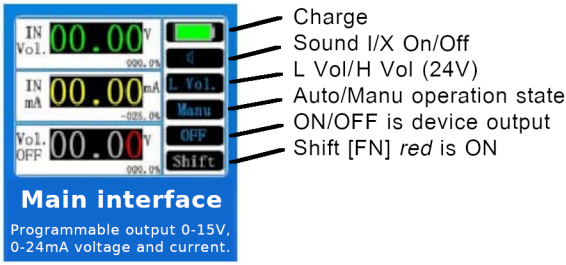
PWM: PWM output terminal (When PWM is not turned on,Directly connected to OUT or IN,Depends on relay selection)

OUT: Positive output

4. Wiring diagram



5. Manual interface



Main interface

Programmable output 0-15V, 0-24mA voltage and current.

5.1 Interface description:When FNIRSI SG-003A is not set.There are four interfaces: manual, PWM, VC conversion, automatic interface and Input waveform interface.

5.2 Button description in non-setting state:When the instrument is not in the setting state,The "ON/OFF" key controls the device output.
Press [FN]*red* [SET] to access System settings.

5.3 Manu interface button operations (when the [FN] is *white*):

5.3.1 [ALT] Switch between the input current graph, Input voltage graph, and the Input voltage and current display.

Input waveform interface

Switchable graph display.
Input voltage / Input current

Note: measure the input voltage,you must switch to this interface.
For details, refer to the notes.

[OUT] will switch between active current, passive current, voltage, and 24V loop outputs.

5.3.2 the 24V loop output is fixed at 24V. The other three can be set using the up, down, left, and right buttons (The up and down keys can be long pressed).

5.4 Non-setting interface key operation (Press **[FN]** at the same time)

5.4.1 [FN] ▲ : Enter the PWM interface. PMW
5.4.2 [FN] ▼ : Enter the VC interface. VCA Con
5.4.3 [FN] ◀ : Enter the automatic interface. Auto
5.4.4 [FN] ▶ : Enter the manual interface. Manu

5.5 Custom Set parameter description:

5.5.1 Custom output: control the upper and lower output limits.
5.5.2 A-20mA DLimit (0-24) : the lowest value of the output active current.
5.5.3 A-20mA ULimit (0-24) : the highest value of the output active current.
5.5.4 P-20mA DLimit (0-24) : the lowest value of passive output current
5.5.5 P-20mA ULimit (0-24) : the highest value of passive current output
5.5.6 0-15V DLimit (0-15) : the lowest value of the output voltage
5.5.7 0-15V ULimit (0-15) : the highest value of the output voltage.

5.6 Supplementary description of custom setting parameters:

Percentage of output = (upper limit-lower limit) * 100%

5.7 Pre-set settings:

The preset setting can be switched to active 20mA , passive 20mA, and 0~15V settings using the [ALT]and [FN] keys or ▲ ▼ keys.
Press [↵] key or right key to enter the setting item, Press the [ESC] key or the left key to return to the system settings.

5.8 Description of preset setting parameters:

Systerm / Presetting / Pre.Set.
Atv.20mA Set, Pas. 20mA Set, 0-15V Set

5.8.1 UP Pre.: manual interface, the preset value of the upper key (when the FN key is red)
5.8.2 Down Pre.: manual interface, preset value by the next key (when the FN key is red)
5.8.3 Left Pre.: manual interface, left-click preset value (when the FN key is red)
5.8.4 Right Pre.: manual interface, right preset value (when the FN key is red)

6.Automatic interface [FN][◀]

6.1 Automatic interface button operation:

6.1.1 OUT key:Switch between Active and Passive current, and Voltage outputs.

6.1.2 ▲ Turn on the output (cycle once) Runs one output cycle

6.1.3 ▼ Automatic output sequence reset

6.1.4 [|▶] Output sequence run/pause

6.2 Auto set(Automatic setting):

Access Auto Set with [FN] 'red' [SET]. Use the up and down keys to select active 20mA, passive 20mA, or 0~15V settings. Press "↵" key or right key to enter the setting,Press ESC or the left key to return to the system settings.

6.3 Automatic setting parameter description:

6.3.1 Auto. Mode: Select single ascending（UP）, single descending(DO) and Cycle

6.3.2 Cycle T(imes): 0 is unlimited times,9999 is the maximum number

6.3.3 Initial(value): Value at the beginning of each cycle mode

6.3.4 INC. Value (Incremental): the value to be increased each time.

6.3.5 DEC. Value(Decrement): the value to be decreased each time.

6.3.6 INC. Time (Increment):The time between each increment

6.3.7 DEC. Time (Decrement): the time between each decrement.

6.3.8 S. Delay (starting delay): the delay time at the initial value

6.3.9 E. Delay (end): Delay time at the end value.

6.3.10 E. Value (end):The value at which the loop mode ends each time.

6.4 Supplement to the description of automatic setting parameters:

6.4.1 Single ascending（UP）:

The initial value is compared with the end value,the relatively small one is the starting value , the relatively large one is the end value

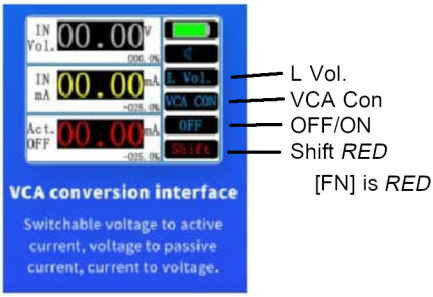
The hold will not automatically close when the ascent mode reaches the end value.

6.4.2 Single descending(DO):

In descending mode,The initial value is compared with the end value,the relatively small is the starting value,the relatively large one is the end value

When the falling mode reaches the end value, the hold will not automatically close.

7.VC conversion interface



7.1 VC interface button operation:

[OUT] Selects: Voltage into active current, Voltage to passive current, or current into voltage.

7.2 Systerm / Sig.Con setting parameter description:

7.2.1 VC Con.: ON/OFF, enable/disable VC conversion.

7.2.2 Con. Mode: Voltage into active current, passive current and current into voltage.

7.2.3 V ULlimit: The lowest value of the output voltage after conversion.

7.2.4 V DLlimit: The highest value of the output voltage after conversion.

7.2.5 mA ULimt: The lowest value of current output after conversion.

7.2.6 mA Dlimit: The highest value of current output after conversion.

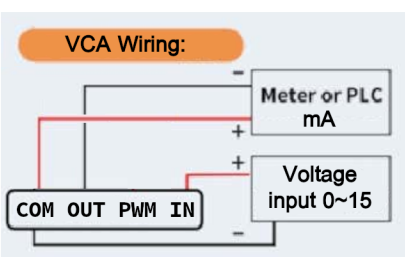
7.2.7 Over ran(range): ON/OFF, if input is higher than 100%, output is higher than 100%

7.3 Signal conversion setting parameter description supplement:

7.3.1 Output voltage = input current / (current upper limit-current lower limit) * (voltage upper limit-voltage lower limit) + voltage lower limit

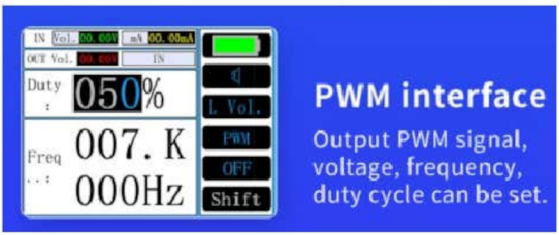
7.3.2 Output current = input voltage / (upper limit of voltage-lower limit of voltage) * (upper limit of current-lower limit of current) + lower limit of current

7.3.3 Even if the overrange is turned on, the input and output cannot exceed the maximum range of the instrument.



8.PWM interface

Output PWM signal, voltage, frequency, duty cycle can be set



8.1 Button operation on the PWM interface ([FN] *white*):

8.1.1 OUT key: the frequency can be set to 45, 90, 180KHZ.

8.1.2 ▲, ▼, ◀ and ▶ : Set the value of the voltage output (▲ ▼ can be long pressed).

8.2 PWM interface button operation ([FN] *red*):

8.2.1 OUT key: Control the relay,switch the PWM amplitude.(PWM will affect output or input)

8.2.2 ▲, ▼, ◀ and ▶ : Set the duty cycle and frequency values (▲ ▼ can be long pressed).

8.3 PWM frequency accuracy:

The PWM is generated by the internal hardware of the microcontroller.The accuracy is affected by 72Mhz/100,Also affected by MOS tube. If the set frequency is divisible by 720,000,The accuracy is relatively high.If it is not, the accuracy deviation will be greater.

9.Key operation of system settings

Press the [FN] key to switch the [FN] color. When [FN] is red, press [SET]: Enter the setting interface.

9.1 Key operation instructions of the system setting interface

9.1.1 [ALT] : Move up
9.1.2 [ESC] : Exit system settings
9.1.3 [FN] : Move down
9.1.4 [↵] : confirm & enter

9.2 In the system settings interface,Key operation instructions for entering the next level of settings

9.2.1 [ALT] : Move up
9.2.2 [ESC] : Move down
9.2.3 [FN] : ①Exit the current interface & enter the confirm modification interface
9.2.4 Up and down keys: set the value of the parameter
9.2.5 ◄ , ► select parameter counting unit (move left and right)

9.3 Confirm to modify the interface button operation instructions:

9.3.1 "ALT" key, "ESC" key/up and down keys: Move up and down
9.3.2 [↵] : Confirm selection

10.Other settings

10.1 Description of other setting parameters:

10.1.1 Restore factory settings（Factory Reset）: format all stored data

10.1.2 Voltage map height*: every 0.01V of the voltage map height = "voltage map height*" pixels.

10.1.3 Current map height*: every 0.01mA of current map height = "current map height*" pixels. For example, now it is 4.00mA, and the "current graph high*" is 0.05.In the image, it is 400*0.05=20,y=the 20th pixel on the Y axis

10.1.4 Battery voltage*（Electric）: The battery power is directly read the battery voltage,Battery voltage = "Battery voltage *" * AD value.

10.1.5 Language settings（Language）: Chinese, Traditional Chinese, and English.

10.1.6 System output voltage（System vol.）:Voltage selection when outputting active current,High voltage or low voltage.

10.1.7 Screen backlight（Scre. light）: Set the screen brightness to 0~100%.

10.1.8 Button backlight（Butt. light）: Set the button backlight brightness to 0~100%

10.1.9 Key tone（Key Voice）: set the volume of the tone

10.1.10 Success sound（Succ. voice）: Set the prompt sound for successful button operation

10.1.11 Failure sound（Fail. voice）: Set the prompt sound of button operation failure

10.1.12 Long press speed（Even speed）:The up and down keys have a long press function,Set the speed of the long press for these two buttons,the larger the value, the slower the speed

11.NOTE:

11.1 Read this manual carefully before use

11.2 Exceed the product parameter range during use,It may cause temporary abnormal operation of this instrument,even completely damaged

11.3 The equipment uses itself to detect the signal sent out by itself, and there will be a large error

11.4 Supplement to other setting parameter descriptions：Modify all parameters carefully

11.5 If the user needs to measure the input voltage, he must switch to the input voltage waveform interface,Cant connect the two ends of the circuit under test in parallel on the main interface for voltage measurement,will cause damage

NOTE: The main interface is for measuring input current configuration. At this time, the input resistance of the device is low. If it is connected in parallel to both ends of the curcuit under test, it is possible to burn the device under test.