SNA5000A

Vector Network Analyzer

QuickStart   QS09050_E01A
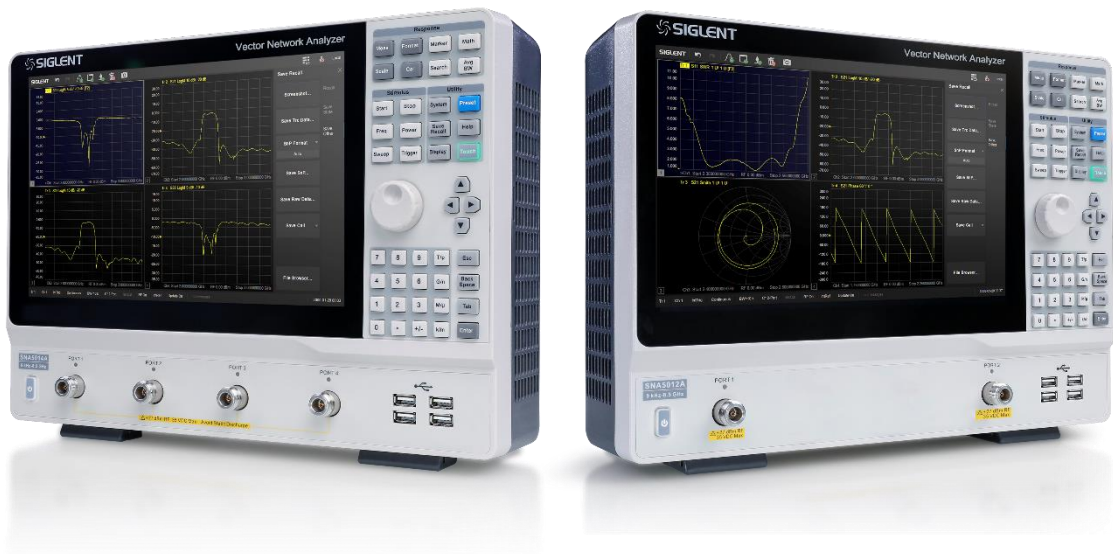
SIGLENT®

SIGLENT TECHNOLOGIES CO., LTD

Contents

1. Copyright and statement

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2. General safety summary

Carefully read the following safety precautions to avoid any personal injury or damage to the instrument and any products connected to it. To avoid potential hazards, please use the instrument as specified:

◆ Only qualified technicians can carry out maintenance of the product.
◆ Only the power cord designed for the instrument and authorized by the local country could be used.
◆ The instrument is grounded through the protective earth conductor of the power cord. To avoid electric shock, please make sure the instrument is grounded correctly before connecting its input or output terminals.
◆ The potential of the signal wire ground is equal to the earth, so do not connect the signal wire to a high voltage.
◆ To avoid fire or electric shock, please look over all ratings and safety labels on the instrument. Before connecting the instrument, please read the manual carefully to gain more information about the ratings.
◆ Do not touch exposed contacts or components when the power is on.
◆ To avoid short-circuiting to the interior of the device or electric shock, please do not operate the instrument in a humid environment.
◆ To avoid damage to the device or personal injury, it is important to operate the device away from an explosive atmosphere.
◆ To avoid the influence of dust and moisture in the air, please keep the surface of the device clean and dry.

Safety terms and symbols:
◆ Terms on the product, these terms may appear on the product.
 DANGER: Indicates direct injuries or hazards that may happen.
 WARNING: Indicates potential injuries or hazards that may happen.
 CAUTION: Indicates potential damages to the instrument or other property that may happen.

◆ Symbols on the product, these symbols may appear on the product:

Hazardous Voltage   Warning   Protective Ground   Earth Chassis Ground

3. General inspection

Inspect the shipping container:

◆ Keep the shipping container or cushioning material until the contents of the shipment have been completely checked and the instrument has passed both electrical and mechanical tests. The consigner or carrier will be responsible for damages to the instrument resulting from shipment. **SIGLENT** will not provide free maintenance or replacement

Inspect the instrument:

◆ If the instrument is found to be damaged, defective, or fails in electrical or mechanical tests, please contact **SIGLENT**.

Check the accessories:

◆ Please check the accessories according to the packing list. If the accessories are incomplete or damaged, please contact your **SIGLENT** sales representative.

4. Preparing for use

◆ **Adjust the supporting legs:**

For benchtop operation, you may want to use the supporting legs. Adjust the supporting feet appropriately to tilt the VNA upwards.
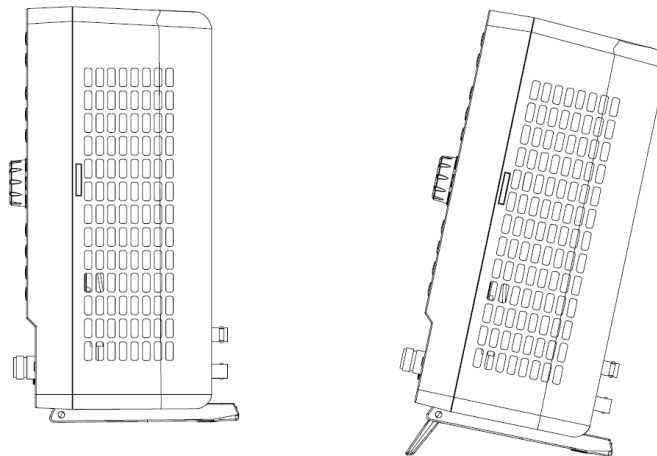

Figure 4-1 adjusting of supporting legs

◆ **Connect to AC power supply:**

The equipment accepts 100-240 V, 50/60/400Hz AC power supply. Please use the power cord provided in the accessory to connect the instrument to the power source

5. Front panel

Figure 5-1 Front panel
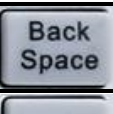
Table 5-1 Front panel area description:

No.	Items	Description
A	LCD Touchscreen	12.1 inch color TFT capacitive LCD touchscreen. **Notes:** Avoid touching the LCD touchscreen with sharp objects. The effective pixel ratio of screen is more than 99.998%s, so it doesn't mean a fault when the screen has some black/blue/green/red fixed points less than 0.002%. Screen Protection Programs are not recommended. The LCD screen is unlikely to suffer image burn-in.
B	Response	Include the setting of measurement parameters, parameter format, markers, calibration, and so on.
	Utility	Includes the function keys of the system, help, display, and so on.
	Stimulus	Includes the setting of measurement frequency, sweep time, sweep points, trigger, and so on.
C	Navigation	Press the up, down, left, and right buttons to select the desired operation.
D	Knob	Rotate the knob left or right to move a cursor or change a parameter value, the effect of pressing the knob is the same as "Enter".
E	Numeric	Include the parameter numbers and units.
F	USB Hub	Includes four USB ports for data exchange and power supply for peripherals, the total current of four USB ports is less than 2 A.
G	Test ports	Connect to the DUT for signal transmission and reception.
H	Power Switch	Power on/off.

Table 5-2 Front panel functional keyboard description:

Keys	Description
Meas	Set the single-ended/ differential S-parameter measurement, reference/ measurement receivers power measurement, and so on.
Format	Set the measurement parameter display format, such as Log Mag, Lin Mag, Smith Chart, Polar Chart, SWR, Phase, and so on.
Marker	Set markers to obtain the value of measurement parameters.
Math	Store measurement data in memory to compare current data with previous data, time domain analyzing of measurement results, and so on.
Scale	Set the scale of the parameter level.
Cal	Include the setting of S parameter calibration and power calibration.
Search	Press this button to get the measurement parameter's maximum/minimum value, bandwidth, Q-factor, and so on.
Avg BW	Press this button to smooth/average measurement data, set the receiver's IF bandwidth, and so on.
Start	Set the start frequency.
Stop	Set the stop frequency.
Freq	Set frequency dependent parameters like start frequency, stop frequency, center frequency, frequency span, and measurement point.
Power	Set the RF power level, turn on/off RF power, and so on.
Sweep	Set sweep parameters like mode, sweep point, sweep time, log/line frequency sweep mode, and so on.
Trigger	Press this button to choose the trigger source, set the trigger mode, and so on.
System	Set the IP address, system time, language, and so on.
Preset	Press this button to revert to the default parameters.
Save Recall	Save and recall the measurement data, status, and calibration data.
Help	Open the help file.
Display	Set the measurement window, measurement channel, measurement trace, and so on.
Touch	Press this button to turn on/off the screen's touch function.

Table 5-3 Front panel digital keyboard description:

Keys	Description
T/p	When setting the frequency, press this key to set the unit as THz. if the input is time-related, press this key to set the unit as ps.
G/n	When setting the frequency, press this key to set the unit as GHz. if the input is time-related, press this key to set the unit as ns.
M/µ	When setting the frequency, press this key to set the unit as MHz if the input is time-related, press this key to set the unit as us.
k/m	When setting the frequency, press this key to set the unit as kHz. if the input is time-related, press this key to set the unit as ms.
Esc	During the parameter editing process, pressing this button will clear the input of the active function area and exit the parameter input state. Press this button to return to local control if previously controlling the instrument remotely.
Back Space	During the parameter editing process, pressing this button will clear the input of the active function area from right to left.
Tab	Pressing this button will activate every sub-function area from top to bottom in turn.
Enter	In the parameter input process, pressing this button will end the parameter input process and add the currently set units for the parameter.

Power switch:

◆ An Orange light constantly on indicates the instrument is in the stand-by state. Pressing this button will cause the instrument to begin the start-up process and the power switch light will turn white.

◆ A White light constantly on indicates the instrument is in the operating state. A short press (1 second) will cause the instrument to save the current settings and then return to the stand-by state and the light will turn Orange.

◆ A long press (3 seconds) will cause the instrument to go to the stand-by state immediately without saving the settings.

RF connectors:

Figure 5-2 Front panel RF connectors (2-port-VNA)

Figure 5-3 Front panel RF connectors (4-port-VNA)

◆ The number of RF connectors are two or four, depending on the instrument type.   2-port-VNAs have two RF ports.   4-port-VNAs have four RF ports.

◆ When an RF connector is transmitting an RF signal, the corresponding orange light above the RF connector will be lit up.

◆ To avoid damage to the instrument, the RF connector input signal must meet the following: The DC voltage and the maximum continuous RF power cannot exceed 35V and 27 dBm respectively.
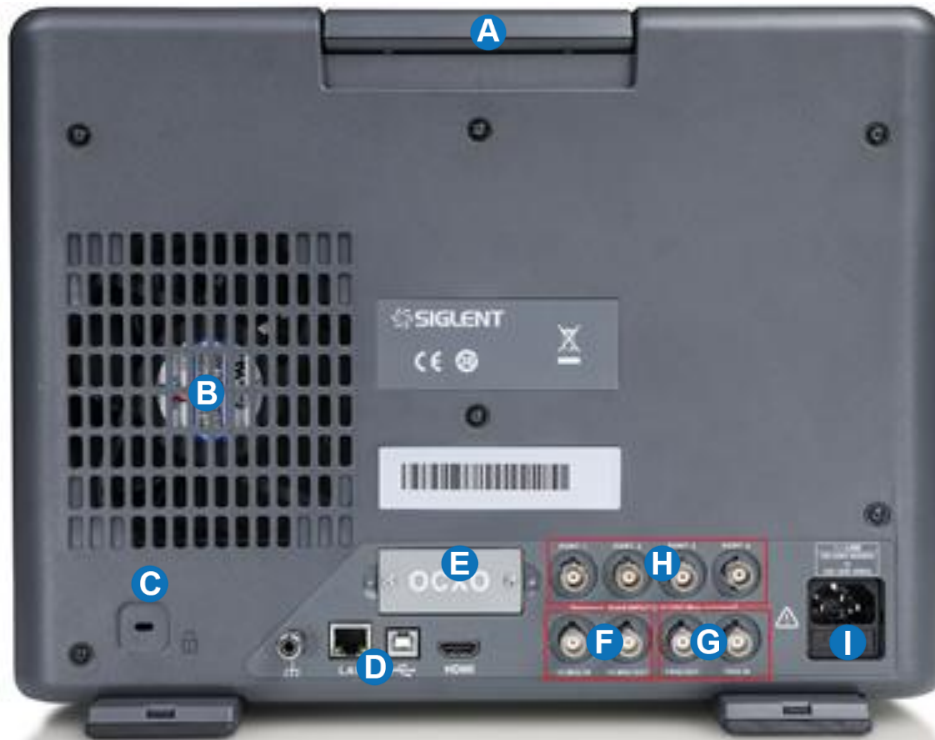
6. Rear panel

Figure 6-1 Rear panel

Table 6-1 Rear panel area description:

No.	Items	Description
A	Handle	Portable handle to carry the instrument conveniently.
B	Fan	Used to cool down internal components of the instrument.
C	Lock	Used to fix the instrument to a fixed object such as a table to keep it from stolen.
D	Ground Terminal	Connects the instrument metallic shell and all metal connectors to a common ground point. Only connect to earth (0 V) potential planes.
	LAN Port	Used to connect the instrument to a LAN network for data exchange with peripherals such as PCs.
	USB Port	Include one USB port for data exchange with peripherals.
	HDMI Port	Connect the port to an external monitor.
E	OCXO	Install the OCXO option to get the high-performance reference source.
F	10MHz Ref Signal Input	The characteristic impedance of this port is 50Ω. The detectable input frequency and power range are 10 MHz ± 10 ppm, -3 dBm to +10 dBm respectively. When there is a 10 MHz external reference signal entering the port, the VNA's transmitting signal will be locked into this 10 MHz external reference signal, otherwise the VNA's transmitting signal will be locked to the internal 10 MHz reference signal.

	10MHz Ref Signal Output	This port can output a 10 MHz reference signal so that it can be used as a clock by other equipment. The characteristic impedance, output frequency, and power range are 50 Ω,10 MHz ± 10 ppm, -3 dBm to +10 dBm respectively.
G	Trigger In	When there is an external trigger signal, the VNA will use this external trigger signal instead of the internal trigger signal. Input level: Low threshold voltage: 1.1 V High threshold voltage: 2.5 V Input level range: 0 to + 5 V Pulse width: ≥ 2µs Polarity: Positive or negative
	Trigger Out	This port can output a trigger signal so that it can be used by other equipment. Max output current: 20 mA Output level: Low-level voltage: 0 V High-level voltage: 3.3 V Pulse width: 1µs Polarity: Positive or negative
H	Bias-Tees Ports	Connect an external DC voltage source to this port to provide DC power for the DUT such as power amplifiers. The DC voltage and current cannot exceed 35 V, the rated current of the input fuse.
I	AC Power Port and Fuse	The equipment accepts 100-240V, 50/60/400Hz AC power supply. Please connect the VNA to the AC power supply with the supplied power cord. Make sure the current does not exceed the rated current of the fuse.

7. User interface

Figure 7-1 User interface

Table 7-1 User interface description:

No.	Items	Description
A	Active Entry	Add or delete markers, traces, windows, withdraw from the operation, screenshot, and so on.
B	Marker Readout	Display the current marker's frequency and level.
C	Trace Status	Display the currently activated trace. The maximum number of traces is 256.
D	Soft Keys	Select the display types of measurement parameters, such as Log Mag, Lin Mag, Phase, Delay, Smith, Polar, SWR, and so on.
E	Soft tabs	Display all parameter's format supported by instrument.
F	Windows number	Display the currently activated window, we can add 36 windows at most.
G	Stimulus Range	Display the stimulus signal of the current activated window, including start frequency, stop frequency, and RF power level.
H	Status Bar	Display the trigger mode, intermediate frequency bandwidth (IFBW), calibration data status, RF power switch on or off, and update state.
I	Message Bar	Display the system time and error logs.

8. Firmware operation

Check system information

Press Help →Utility →About to check the system information, including:

◆ Product model

◆ Serial number

◆ Software version

◆ FPGA version

◆ Hardware version

Load option

Follow this procedure to load option:

1. Press System →Utility →Options →License to enter the option interface.

2. Click the drop-down box to choose the license type need to be installed, enter a license in the input box and click Install to finish the license installing.

3. If the installations succeed, the prompt message "license was successfully installed" will pop-up. If not, the prompt message "license was entered incorrectly" will pop-up.

   Note: The VNA comes with trial options that have a finite number of uses. This is to allow users to evaluate the available options without purchasing them. You can find the remaining number of trials at top of the option interface. When the remaining time of a certain function is zero, the function will be disabled. When a license is successfully installed for a certain function, the remaining times will be shown as "—" and the type of the license is permanent, which means users have unrestricted access to the function.

Firmware upgrade

Follow this procedure to update the instrument firmware

1. Download the firmware package from official **SIGLENT** websites only.

2. Extract and copy the .ADS file into the root directory of a USB stick.

3. Insert the USB stick into a USB port, Press System → Upgrade, and select the update file, click OK to update the system software.

4. The progress bar will appear on the screen while updating, the instrument will restart automatically if updates succeed or display a pop-up prompt box if updates fail.

   Note: Please ensure that line power is constant during the upgrade by using an Uninterruptible Power Supply (UPS), Failure to maintain line power may be cause upgrade failure or instrument damage.

9. Touch operation

The VNA provides a 12.1 inch capacitive touch screen to support various gesture operations, including:

- ◆ Click on the screen parameters or menu to edit the parameters.
- ◆ A Left or right swipe switches menus.
- ◆ An Up or down swipe switches menus.
- ◆ Press the screen to choose trace and windows needed.

Note: Press the Touch button on front panel to enable/disable the screen's touch function.

10. Help information

The built-in help system provides help information for each function and menu option on the front panel. Press Utility → Help, then the center of the screen will display the help file. Click to enter the corresponding directory.

11. Remote control

The VNA supports communication with compatible computers via USB, LAN, and GPIB-USB interfaces. By using these interfaces, in combination with programming languages and/ or NI-VISA software, users can remotely control the VNA.

12. Product certification

SIGLENT 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.

13. For more product information

You can obtain the instrument information and installation status of all options through Utility menu, for more information of this product, please refer to the following manuals (you can also download them from the **SIGLENT** web site):

- ◆ **SNA5000A Vector Network Analyzer user manual:**
  Provides detailed introductions of the functions of this instrument.
- ◆ **SNA5000A Vector Network Analyzer programming manual:**
  Provides detailed introductions of the SCPI commands and programming of this instrument.
- ◆ **SNA5000A Vector Network Analyzer Data Sheet:**
  Provides the main characteristics and specifications of this instrument.

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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