RIGOL

RSA6000 Series

Real-Time Spectrum Analyzer

Quick Guide

Jul. 2025

Guaranty and Declaration

Copyright

Trademark Information

RIGOL®is the trademark of RIGOL TECHNOLOGIES CO., LTD.

Software Version

Software upgrade might change or add product features. Please acquire the latest software version from **RIGOL** website or contact **RIGOL** to upgrade the software.

Notices

- RIGOL products are covered by P.R.C. and foreign patents, issued and pending.
- RIGOL reserves the right to modify or change parts of or all the specifications and pricing policies at the company's sole decision.
- Information in this publication replaces all previously released materials.
- Information in this publication is subject to change without notice.
- RIGOL shall not be liable for either incidental or consequential losses in connection with the furnishing, use, or performance of this manual, as well as any information contained.
- Any part of this document is forbidden to be copied, photocopied, or rearranged without prior written approval of RIGOL.

Product Certification

RIGOL guarantees that this product conforms to the national and industrial standards in China as well as the ISO9001:2015 standard and the ISO14001:2015 standard. Other international standard conformance certifications are in progress.

Contact Us

If you have any problem or requirement when using our products or this manual, please contact RIGOL.

E-mail: service@rigol.com

Website: *http://www.rigol.com*

Section	Description	Page

List of Figures

1 Safety Requirement

1.1 General Safety Summary

Please review the following safety precautions carefully before putting the instrument into operation so as to avoid any personal injury or damage to the instrument and any product connected to it. To prevent potential hazards, please follow the instructions specified in this manual to use the instrument properly.

1. Only the exclusive power cord designed for the instrument and authorized for use within the destination country could be used.
2. Ensure that the instrument is safely grounded.
3. Observe all terminal ratings.
4. Use proper overvoltage protection.
5. Do not operate without covers.
6. Do not insert objects into the air outlet.
7. Use the proper fuse.
8. Avoid circuit or wire exposure.
9. Do not operate the instrument with suspected failures.
10. Provide adequate ventilation.
11. Do not operate in wet conditions.
12. Do not operate in an explosive atmosphere.
13. Keep instrument surfaces clean and dry.
14. Prevent electrostatic impact.
15. Handle with caution.

WARNING

Equipment meeting Class A requirements may not offer adequate protection to broadcast services within residential environment.

1.2 Safety Notices and Symbols

Safety Notices in this Manual:

WARNING

Indicates a potentially hazardous situation or practice which, if not avoided, will result in serious injury or death.

CAUTION

Indicates a potentially hazardous situation or practice which, if not avoided, could result in damage to the product or loss of important data.

Safety Notices on the Product:

- **DANGER**

  It calls attention to an operation, if not correctly performed, could result in injury or hazard immediately.

- **WARNING**

  It calls attention to an operation, if not correctly performed, could result in potential injury or hazard.

- **CAUTION**

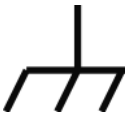
  It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

Safety Symbols on the Product:

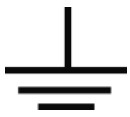
Hazardous Voltage

Safety Warning

Protective Earth Terminal



Chassis Ground



Test Ground

1.3 Measurement Category

Measurement Category

This instrument can make measurements in Measurement Category I.

WARNING

This instrument can only be used for measurements within its specified measurement categories.

Measurement Category Definitions

- **Measurement category I** is for measurements performed on circuits not directly connected to MAINS. Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits. In the latter case, transient stresses are variable. Thus, you must know the transient withstand capability of the equipment.
- **Measurement category II** is for measurements performed on circuits directly connected to low voltage installation. Examples are measurements on household appliances, portable tools and similar equipment.
- **Measurement category III** is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit-breakers, wiring (including cables, bus-bars, junction boxes, switches and socket-outlets) in the fixed installation, and equipment for industrial use and some other

equipment. For example, stationary motors with permanent connection to a fixed installation.

- **Measurement category IV** is for measurements performed at the source of a low-voltage installation. Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units.

1.4 Ventilation Requirement

This instrument uses a fan to force cooling. Please make sure that the air inlet and outlet areas are free from obstructions and have free air. When using the instrument in a bench-top or rack setting, provide at least 10 cm clearance beside, above and behind the instrument for adequate ventilation.

CAUTION

Inadequate ventilation may cause an increase of temperature in the instrument, which would cause damage to the instrument. So please keep the instrument well ventilated and inspect the air outlet and the fan regularly.

1.5 Working Environment

Temperature

Operating: 0℃ to +50℃

Non-operating: -20℃ to +70℃

Humidity

- **Operating:**

  Below +30℃: ≤95% RH (without condensation)

  +30℃ to +40℃: ≤75% RH (without condensation)

  +40℃ to +50℃: ≤45% RH (without condensation)

- **Non-operating:**

  Below +40℃: 5%~ 90% (without condensation)

  ≥+40℃ to ＜+60℃: 5%~ 80% (without condensation)

  >+60℃ to ＜+70℃: 5%~ 40% (without condensation)

WARNING

To avoid short circuit inside the instrument or electric shock, never operate the instrument in a humid environment.

Altitude

Operating: below 3 km

Protection Level Against Electric Shock

- **Contact discharge:**±4 kV
- **Air discharge:**±8 kV

Installation (Overvoltage) Category

This product is powered by mains conforming to installation (overvoltage) category II.

WARNING

Ensure that no overvoltage (such as that caused by a bolt of lightning) can reach the product. Otherwise, the operator might be exposed to the danger of an electric shock.

Installation (Overvoltage) Category Definitions

Installation (overvoltage) category I refers to signal level which is applicable to equipment measurement terminals connected to the source circuit. Among these terminals, precautions are done to limit the transient voltage to a low level.

Installation (overvoltage) category II refers to the local power distribution level which is applicable to equipment connected to the AC line (AC power).

Pollution Degree

Pollution Degree 2

Pollution Degree Definition

- **Pollution Degree 1:** No pollution or only dry, nonconductive pollution occurs. The pollution has no effect. For example, a clean room or air-conditioned office environment.
- **Pollution Degree 2:** Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation is to be expected. For example, indoor environment.
- **Pollution Degree 3:** Conductive pollution or dry nonconductive pollution that becomes conductive due to condensation occurs. For example, sheltered outdoor environment.
- **Pollution Degree 4:** The pollution generates persistent conductivity caused by conductive dust, rain, or snow. For example, outdoor areas.

Safety Class

Class 1 – Grounded Product

1.6 Care and Cleaning

Care

Do not store or leave the instrument where it may be exposed to direct sunlight for long periods of time.

Cleaning

Clean the instrument regularly according to its operating conditions.

1. Disconnect the instrument from all power sources.
2. Clean the external surfaces of the instrument with a soft cloth dampened with mild detergent or water. Avoid having any water or other objects into the chassis via the heat dissipation hole. When cleaning the LCD, take care to avoid scarifying it.

CAUTION

To avoid damage to the instrument, do not expose it to caustic liquids.

WARNING

To avoid short-circuit resulting from moisture or personal injuries, ensure that the instrument is completely dry before connecting it to the power supply.

1.7 Environmental Considerations

The following symbol indicates that this product complies with the WEEE Directive 2012/19/EU.

The equipment may contain substances that could be harmful to the environment or human health. To avoid the release of such substances into the environment and avoid harm to human health, we recommend you to recycle this product appropriately to ensure that most materials are reused or recycled properly. Please contact your local authorities for disposal or recycling information.

You can click on the following link *https://int.rigol.com/services/services/declaration* to download the latest version of the RoHS&WEEE certification file.

2 Document Overview

This manual gives you a quick review about the front and rear panel of RSA6000 series, the user interface, and its basic operation method.

TIP

For the latest version of this manual, download it from the official website of RIGOL (*http://www.rigol.com*).

Publication Number

QGD27100-1110

Software Version

Software upgrade might change or add product features. Please acquire the latest version of the manual from RIGOL website or contact RIGOL to upgrade the software.

Format Conventions in this Manual

1. **Key**

   The front panel key is denoted by the menu key icon. For example, 

indicates the "System" key.

2. **Menu**

   The menu item is denoted by the format of "Menu Name (Bold) + Character Shading" in the manual. For example, **Setup** indicates clicking or tapping the "Setup" sub-menu under the "System" menu to view the basic system settings.

3. **Operation Procedures**

   The next step of the operation is denoted by "**>**" in the manual. For example, 
> Save indicates that first clicking or tapping the icon 
, then clicking or tapping **Save**.

Content Conventions in this Manual

The RSA6000 series spectrum analyzer includes the following models. Unless otherwise specified, this manual takes RSA6265 as an example to illustrate the functions and operation methods of the RSA6000 series.

Model	Frequency Range
RSA6265	5 kHz ~ 26.5 GHz
RSA6140	5 kHz ~ 14 GHz

Model	Frequency Range
RSA6085	5 kHz ~ 8.5 GHz

3 Product Overview

RSA6000 series is RIGOL's newly launched spectrum analyzer product. Its excellent performance in SFDR, phase noise, amplitude accuracy and test speed makes it applicable in various test scenarios such as spectrum analysis, real-time spectrum analysis, vector signal analysis, pulse analysis. RSA6000 series real-time spectrum analyzer has a strong expansion capability, allowing you to build the test system or perform user-defined development via various digital and analog output interfaces. With its excellent performance and flexible configuration, it can meet your test demands in various application scenarios such as wireless communication, automobile electronics, Internet of Things (IoT), and etc.

3.1 Front Panel

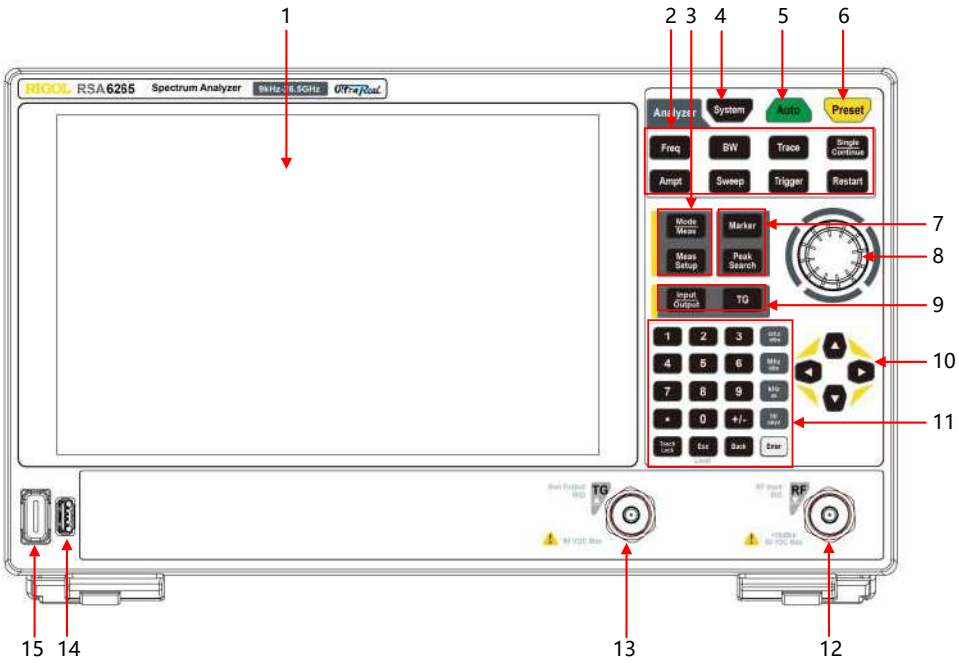


Figure 3.1 Front Panel

No.	Description	No.	Description
1	LCD	9	Input/Output and TG Function Keys
2	Measurement Function Keys	10	Arrow Keys
3	Mode Setting	11	Numeric Keypad
4	System Key	12	RF Input Connector

No.	Description	No.	Description
5	Auto Setting	13	TG Output Connector
6	Preset	14	USB HOST Interface
7	Marker and Peak Search	15	Power Key
8	Knob		

3.2 Rear Panel

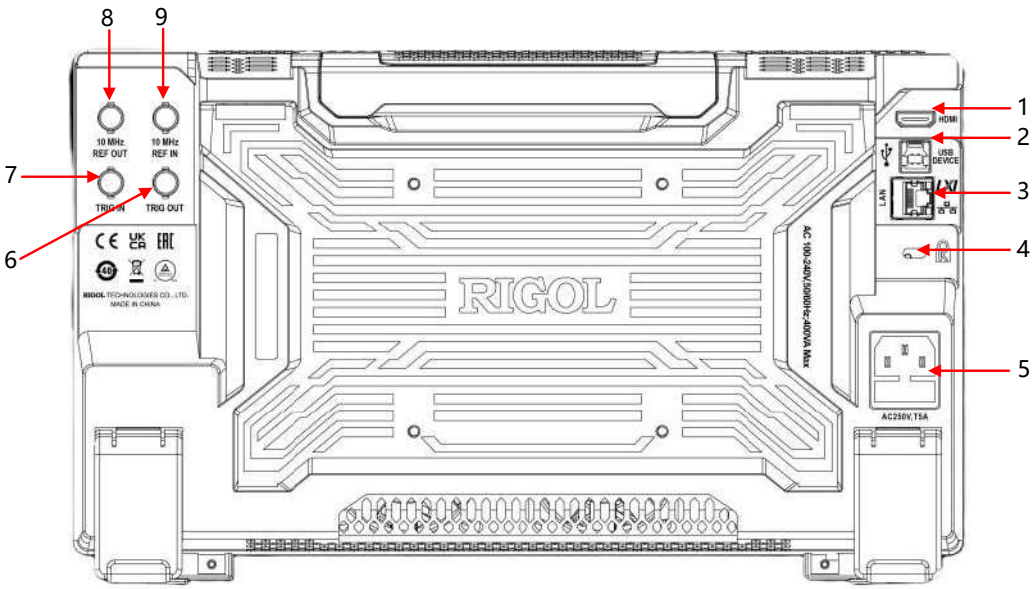


Figure 3.2 Rear Panel

No.	Description	No.	Description
1	HDMI Video Output	6	TRIG OUT
2	USB DEVICE Interface	7	TRIG IN
3	LAN Interface	8	10 MHz REF OUT Reference Clock Output
4	Security Lock Hole	9	10 MHz REF IN Reference Clock Input
5	AC Power Cord Connector		

3.3 User Interface

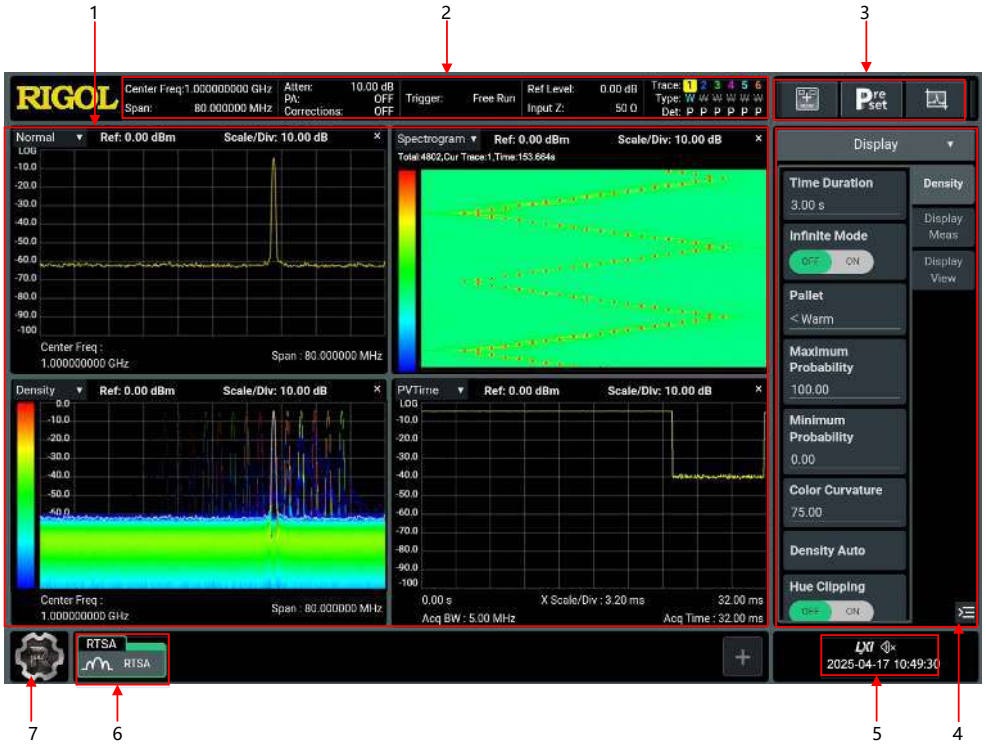


Figure 3.3 User Interface

No.	Name	Description
1	Multi-pane Windowing Display Area	If you enable multiple functions, multiple windows can be displayed on the screen at one time.
2	Measurement Item Status Bar	Displays the frequency, amplitude, span, trigger, trace indicator, etc.
3	Quick Operation Menu	Displays the quick operation menu.
4	Menu Control Operation	You can set the various parameters required for the measurement, such as measurement settings, frequency, span, scan, amplitude, bandwidth, trace, cursor, etc.
5	Notification Area	Displays the USB storage device icon, LAN connection icon, sound icon, remote control icon, and system time. You can click or tap this area to enter the System menu.

No.	Name	Description
6	Working Mode	Display, add or delete currently selected working mode. The analyzer provides five modes: GPSA, RTSA, VSA, EMI, and ADM.
7	Function Navigation	Click or tap the icon to open the function navigation menu. Click or tap the specified menu icon to enter the specified function setting menu.

NOTE

[1]: The trace indicator is shown in the following figure.

- The first line displays the trace number. The color of the number is the same as that of the trace.
- The second line displays the trace type, including W (Clear/Write), A (Trace Average), M (Maximum Hold), and m (Minimum Hold). The letters with different colors and in different forms show different meanings:
  - The letter in blue indicates that the trace is updating.
  - The letter in gray indicates that the trace is not updated.
  - The letter with strikethrough and in gray color indicates that the trace will neither be updated nor displayed.
  - The letter with strikethrough and in blue color indicates that the trace is updating but not displayed. It is useful in trace math operation.
- The third line displays the detector type of each trace, including N (Normal, only available in GPSA mode), V (Voltage Average, only available in GPSA mode), P (Positive Peak), p (Negative Peak), S (Sample), R (RMS Average, only available in GPSA mode), Q (Quasi-Peak, only available in GPSA mode), and A (Average, only available in RTSA mode). If it shows "f", it indicates that it is math operation trace. The letter in blue in the third line (detector type) indicates that the detector is in auto state; the letter in white indicates that it is in manual state.

4 To Prepare for Use

4.1 To Adjust the Supporting Legs

You can unfold the supporting legs to use them as stands to tilt the instrument upwards for easier operation and observation. You can also fold the supporting legs when the instrument is not in use for easier storage or shipment.

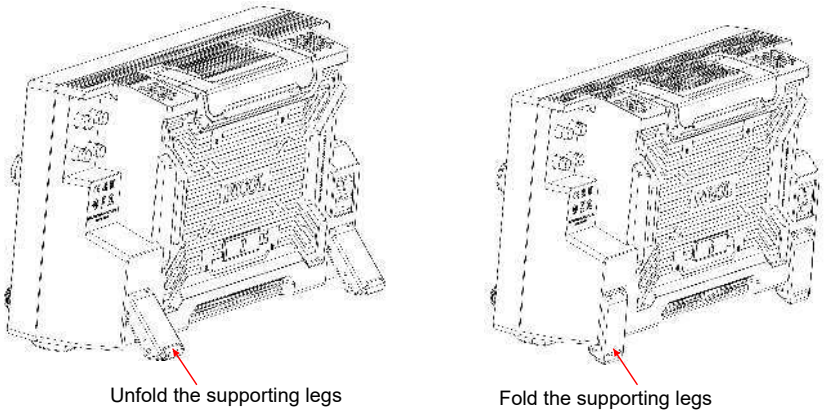
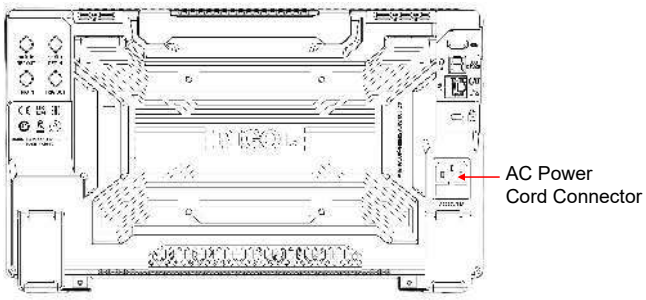


Figure 4.1 Adjust the Supporting Legs

4.2 To Connect to AC Power

Please use the power cord provided in the accessories to connect the spectrum analyzer to the AC power source. The AC power supply specification of this spectrum analyzer is 100-240 V, 50/60 Hz. The power consumption of the instrument cannot exceed 85 W. When the spectrum analyzer is connected to the AC power source via the power cord, the instrument automatically adjusts itself to within the proper voltage range, and you do not need to select the voltage range manually.



CAUTION

To avoid electric shock, ensure that the instrument is correctly grounded.

4.3 Turn-on Checkout

After connecting the instrument to the power source properly, press  on the front panel to start the spectrum analyzer. Then, you will see an initial splash screen. Following the start-up screen which shows the start-up initialization process information, the sweep curve is displayed.

4.4 To Set the System Language

This series supports multiple system languages. To select the desired language, click or tap  > **System** > **Setup** > **Language**.

5 Mouse/Keypad Board/Touch Screen Operation Rule

5.1 Mouse Operation Rule

Connect the mouse to the instrument via the USB HOST interface to perform the following operations. Note that you can only use the left mouse button to perform the left-click operation. Left-right click and mouse rolling operation are not allowed.

1. Click the mouse to select the menu and window.

2. Long press the left mouse button to drag the displayed data or window.

3. In the Marker menu, click the mouse to move the marker, but you are unable to use the mouse to add a marker.

5.2 Keypad Board Operation Rule

After the keypad board is properly connected to the instrument via the USB HOST interface, and then you can use the shortcut keys on the keypad to perform the same function as what you do with the Function Key. The following table lists the short-cut key that corresponds to the function key.

Function Key	Keypad Shortcut Key[1]
Mode	Alt + o
Meas Setup[2]	Shift + e
Auto	Ctrl + Alt + a
Preset	Ctrl + Alt + p
Freq[2]	Shift + f
AMPT[2]	Shift + a
BW[2]	Shift + b
Trace[2]	Shift + t
Sweep[2]	Shift + w

Function Key	Keypad Shortcut Key[1]
Input Output[2]	Shift + i
TG[2]	Shift + g
Single/Continue	F11
Marker[2]	Shift + m
Marker To[2]	Shift + k
Peak[2]	Shift + p
Marker Function[2]	Shift + u
Trigger[2]	Shift + r
System[2]	Shift + y
Restart	F12
Recall	Ctrl + r
Quick save	Ctrl + Alt + q
Help	Alt + F1
Touch Lock	Alt + F3
10 Numberic Keys and 1 Decimal Point	Numeric keys (1, 2, 3, 4, 5, 6, 7, 8, 9, 0) and dot (.)
-	-
Esc	Esc
Back	Backspace
Enter	Enter
Arrow Keys (Up/Down, Left/Right)	↑, ↓, ←, →

NOTE

[1]: Except the short-cut keys mentioned in the above table, other user-defined keys are invalid.

[2]: If the Caps Lock key is enabled, it indicates that you have pressed down the Shift key. Therefore, all the short-cut key concerning "Shift+letter" operations can be performed by just

pressing down the specified letter when the Caps Lock key is enabled. For example, if you want to use the short-cut key "Shift+f" to perform the specified operation, first enable the Caps Lock key, then press down the letter "f".

5.3 Touch Screen Operation Rule

RSA6000 series provides 10.1'' capacitive multi-touch screen; supporting many gesture-enabled touch operations.

1. In the non-Marker menu:

- Using one finger to slide left and right in the trace window can modify the center frequency; using one finger to slide up and down in the trace window can modify the reference level.
- Stretching and pinching two fingers horizontally in the trace window can reduce and increase the span respectively. Stretching and pinching two fingers vertically in the trace window can reduce and increase the Y-scale respectively.

2. In the Marker menu:

- In the blank area of the marker trace, long tapping on the area can add one marker.
- Tapping the marker and holding on it can drag the marker.

6 To Use the Built-in Help System

The built-in help document of the RSA6000 series provides information about the functions and menu introductions of the instrument.

Click or tap  > **Help** to enter the help system. You can get its help information by clicking on the link for the introduction of the specified function.

7 To View the Option and the Option Installation

This series spectrum analyzer provides many options to meet various measurement requirements. If you need any of these options, order them according to the Order No. available in *RSA6000 User Guide*, and then install the options according to this section. Besides, you can also view the options currently installed on the spectrum analyzer and activate the newly purchased option.

1. View the Installed Option

The instrument is installed with the trial versions of the options before leaving factory. You can use the option for a trial period of 2,160 minutes starting from the first time you power on the spectrum analyzer. If your instrument has currently installed the option, perform the following operations to view the name of the installed option and other detailed information about the option from the option list.

- Click or tap the function navigation icon  at the lower-left corner of the screen, and then select **System** to enter the system setting menu.
- Click or tap **Options** to view the options currently installed.

2. Install the Option

The option license is a string with a fixed number of characters. Each instrument has one unique license. The license file should be in specific format, with the filename extension "*.lic". After you purchase an option, you will obtain a key (used for obtaining the license). Then, you can install the option according to the following steps.

a. Obtain an option license

a. Log in to the **RIGOL** official website (*http://www.rigol.com*), click **SERVICE CENTRE > License Activation** to enter the license activation interface.

b. Input the correct key, serial number (To obtain the serial number, click or tap the function navigation icon  at the lower-left corner of the screen first, then click or tap **System**. Click or tap **About** to acquire the serial number of the instrument.), and verification code. Click **Generate** to acquire the download link for the option license file.

b. Install the option

a. Install the option by sending SCPI commands. For details, refer to *RSA6000 Programming Guide*.

b. After installation, a prompt message "Option activated successfully" is displayed. After the option has been installed, you are recommended to restart the instrument.

TIP

- During the installation process, you are not allowed to power off the instrument.
- To install the option, send the SCPI command. Installing options by inputting the license code manually is not supported.

8 Mode Setting

8.1 Mode Setting

RSA6000 provides five measurement modes: GPSA, RTSA, ADM (option), EMI (option), and VSA (option). Press the front-panel key Mode Meas to enter the measurement setting menu. You can also click or tap VSA DMA to select the desired measurement mode.

1. **GPSA**

   GPSA adopts two analysis methods: swept SA and FFT. It can not only carry out frequency domain analysis, but also time domain (zero span) analysis.

   Select GPSA. In this working mode, you can click or tap to select multiple measurements under **Measurement**. For details, refer to relevant chapters in *RSA6000 User Guide*.

2. **RTSA**

   RTSA provides the real-time signal analysis function, enabling you to capture the complex signal seamlessly.

   Select RTSA. In this working mode, you can click or tap to select multiple measurements under **Measurement**. For details, refer to relevant chapters in *RSA6000 User Guide*.

3. **VSA**

   VSA mode provides the standard vector signal analysis function. If you need this function, please purchase this option (order No. RSA6000-VSA), and install it according to instructions in "*To View the Option and the Option Installation*".

4. **EMI**

   EMI mode provides the EMI pre-compliance measurement function. If you need this function, please purchase this option (order No. RSA6000-EMI), and install it according to instructions in "*To View the Option and the Option Installation*".

5. **ADM**

   ADM mode provides the analog signal demodulation function. In this mode, you can click or tap to select AM, FM, or PM under **Measurement**. If you need this function, please purchase this option (order No. RSA6000-ADM), and install it according to instructions in "*To View the Option and the Option Installation*".

9 Remote Control

The instrument can be remotely controlled in the following several methods:

- **User-defined Programming**

  You can program and control the instrument by using the SCPI (Standard Commands for Programmable Instruments) commands.For details about the SCPI commands and programming, refer to *Programming Guide*.

- **PC Software**

  You can use the PC software to send commands to control the instrument remotely. RIGOL Ultra Sigma is recommended. You can download the software from RIGOL official website (*http://www.rigol.com*).

  Operation Procedures:

  - Set up communication between the instrument and PC.
  - Run Ultra Sigma and search for the instrument resource.
  - Open the remote command control panel to send commands.

- **Web Control**

  This instrument supports Web Control. Connect the instrument to the network, then input the IP address of the instrument into the address bar of the browser of your computer. The web control interface is displayed. Click Web Control to enter the web control page. Then you can view the display of the real-time interface of the instrument. Through the Web Control, you can migrant the device control to the control terminals (e.g. PC, mobile phone, iPad, and other smart terminals) to realize remote control of the instrument.

This instrument can be connected to the PC via the USB HOST interface or LAN interface to set up communication and realize remote control. The remote control can be realized by using SCPI (Standard Commands for Programmable Instruments) commands.

CAUTION

Before setting up communication, please turn off the instrument to avoid causing damage to the communication interfaces.

10 More Product Information

1. Obtain the Device Information

   Click or tap > **System** > **About** to obtain the information of the instrument, such as the model, serial number, and hardware version number.

2. View the Option Information and Install the Option

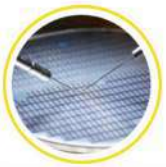
   The instrument is installed with the trial version of the option before leaving factory. The trial time is about 2,160 minutes starting from the time you power on the instrument for the first time. Click or tap > **System** > **Options** to view the options currently installed and their information. For details, refer to descriptions in *To View the Option and the Option Installation*.

For more information about this instrument, log in to the official website of RIGOL (*http://www.rigol.com*) to download relevant manuals.

- *RSA6000 Data Sheet* provides the main features and technical specifications of the instrument.
- *RSA6000 User Guide* introduces GPSA and RTSA modes, operation methods, remote control methods, troubleshooting, order information, and etc.
- *RSA6000 Programming Guide* provides detailed descriptions of SCPI commands concerning GPSA and RTSA modes, and programming examples of the instrument.
- *VSA User Guide* introduces VSA mode, operation methods, and order information.
- *VSA Programming Guide* provides detailed descriptions of SCPI commands concerning VSA mode of the instrument.
- *ADM User Guide* introduces ADM mode, operation methods, and order information.
- *ADM Programming Guide* provides detailed descriptions of SCPI commands concerning ADM mode of the instrument.
- *EMI User Guide* introduces EMI mode, operation methods, and order information.
- *EMI Programming Guide* provides detailed descriptions of SCPI commands concerning EMI mode of the instrument.

Boost Smart World and Technology Innovation

Industrial Intelligent Manufacturing



Semiconductors

Education& Research

Communication

System Integration

New Energy

- Cellular-5G/WIFI
- UWB/RFID/ ZIGBEE
- Digital Bus/Ethernet
- Optical Communication

- Digital/Analog/RF Chip
- Memory and MCU Chip
- Third-Generation Semiconductor
- Solar Photovoltaic Cells

- New Energy Automobile
- PV/Inverter
- Power Test
- Automotive Electronics

Provide Testing and Measuring Products and Solutions for Industry Customers

HEADQUARTER

RIGOL TECHNOLOGIES CO., LTD.
No.8 Keling Road, New District,
Suzhou,JiangSu, P.R.China
Tel: +86-400620002
Email: info-cn@rigol.com

EUROPE

RIGOL TECHNOLOGIES EU GmbH
Carl-Benz-Str.11
82205 Gilching
Germany
Tel: +49(0)8105-27292-0
Email: info-europe@rigol.com

NORTH AMERICA

RIGOL TECHNOLOGIES, USA INC.
10220 SW Nimbus Ave.
Suite K-7
Portland, OR 97223
Tel: +1-877-4-**RIGOL**-1
Email: sales@rigol.com

JAPAN

RIGOL JAPAN CO., LTD.
5F,3-45-6,Minamiotsuka, Toshima-Ku,
Tokyo,170-0005,Japan
Tel: +81-3-6262-8932
Fax: +81-3-6262-8933
Email: info.jp@rigol.com

KOREA

RIGOL KOREA CO,. LTD.
5F, 222, Gonghang-daero,
Gangseo-gu, Seoul, Republic of Korea
Tel: +82-2-6953-4466
Fax: +82-2-6953-4422
Email: info.kr@rigol.com

For Assistance in Other Countries

Email: info.int@rigol.com