RIGOL

# EMI Mode

## For RSA6000 Series Spectrum Analyzer

User Guide

Nov. 2025

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E-mail: service@rigol.com

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

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# 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.

- **Use Proper Power Cord.**

  Only the exclusive power cord designed for the instrument and authorized for use within the local country could be used.

- **Ground the Instrument.**

  The instrument is grounded through the Protective Earth lead of the power cord. To avoid electric shock, it is essential to connect the earth terminal of the power cord to the Protective Earth terminal before connecting any inputs or outputs.

- **Observe All Terminal Ratings.**

  To avoid fire or shock hazard, observe all ratings and markers on the instrument and check your manual for more information about ratings before connecting the instrument.

- **Use Proper Overvoltage Protection.**

  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.

- **Do Not Operate Without Covers.**

  Do not operate the instrument with covers or panels removed.

- **Do Not Insert Objects Into the Air Outlet.**

  Do not insert anything into the holes of the fan to avoid damaging the instrument.

- **Use Proper Fuse.**

  Please use the specified fuses.

- **Avoid Circuit or Wire Exposure.**

  Do not touch exposed junctions and components when the unit is powered on.

- **Do Not Operate With Suspected Failures.**

  If you suspect damage occurs to the instrument, have it inspected by RIGOL authorized personnel before further operations. Any maintenance, adjustment or

replacement especially to circuits or accessories must be performed by RIGOL authorized personnel.

- **Provide Adequate Ventilation.**

  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.

- **Do Not Operate in Wet Conditions.**

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

- **Do Not Operate in an Explosive Atmosphere.**

  To avoid personal injuries or damage to the instrument, never operate the instrument in an explosive atmosphere.

- **Keep Instrument Surfaces Clean and Dry.**

  To avoid dust or moisture from affecting the performance of the instrument, keep the surfaces of the instrument clean and dry.

- **Prevent Electrostatic Impact.**

  Operate the instrument in an electrostatic discharge protective environment to avoid damage induced by static discharges. Always ground both the internal and external conductors of cables to release static before making connections.

- **Use the Battery Properly.**

  Do not expose the battery (if available) to high temperature or fire. Keep it out of the reach of children. Improper change of a battery (lithium battery) may cause an explosion. Use the RIGOL specified battery only.

- **Handle with Caution.**

  Please handle with care during transportation to avoid damage to keys, knobs, interfaces, and other parts on the panels.

**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**

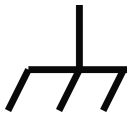
  It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

**Safety Symbols on the Product:**

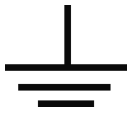
**Hazardous Voltage**

**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://www.rigol.com/intl/services/environmental-protection-statement.html* to download the latest version of the RoHS&WEEE certification file.

# 2 RSA6000 Series Spectrum Analyzer

RSA6000 series is RIGOL's newly launched real-time spectrum analyzer. 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 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**

UGD30101-1110

**Software Version**

00.00.28

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 setting configuration items.

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**.

4. **Connector**

   The connectors on the front or rear panel are usually denoted by the format of "Connector Name (Bold) + Square Brackets (Bold)". For example **[TRIG IN]**.

**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 to 26.5 GHz |
| RSA6140 | 5 kHz to 14 GHz |
| RSA6085 | 5 kHz to 8.5 GHz |

# 4 Quick Start

This chapter gives you a quick review about the user interface of the RSA6000 series spectrum analyzer in EMI mode and its mode settings. For its details about the appearance and dimensions, its front and rear panel, as well as notices during first use of the analyzer, refer to relevant chapters in *RSA6000 User Guide*.

## 4.1 User Interface


**Figure 4.1 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 | Status Display Bar | Displays the meter frequency, meter RBW, meter attenuation, trigger, and other measurement parameters. |
| 3 | Quick Operation Menu | Displays the quick operation menu. |

| No. | Name | Description |
|---|---|---|
| 4 | Menu Control Operation Area | Sets the main measurement parameters such as Meas Setup, Frequency, Sweep, Amplitude, BandWidth, Marker, and 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. |
| 6 | Working Mode | Displays the currently selected working mode. The analyzer provides five modes: GPSA, RTSA, VSA, EMI, and ADM. |
| 7 | Function Navigation Icon | 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 (Average), M (Max Hold), and m (Min 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 V (voltage average), P (Positive Peak), p (Negative Peak), R (RMS Average), Q (Quasi Peak), and E (EMI Average). 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.

## 4.2 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 EMI Freq Scan 1 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 the specified measurement item 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 the specified measurement item 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*".

## 4.3 To View the Option and the Option Installation

1. **View the Installed Option**

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 CENTER > 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 *EMI 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 disconnect the instrument from power source.
- To install the option, send the relevant SCPI command. Installing options by inputting the license code manually is not supported.

# 5 Front Panel Function Keys

This chapter describes in detail the front-panel function keys and their sub-menu functions of RSA6000 series spectrum analyzer in the EMI mode.

## 5.1 Basic Settings

### 5.1.1 FREQ

Sets the frequency parameters of the analyzer.

The frequency range of a channel can be expressed by either of two groups of parameters: Start Frequency/Stop Frequency ( $f_{start}$ / $f_{stop}$ ); or Center Frequency/Span ( $f_{center}$ / $f_{span}$ ). If any of the four parameters is changed, the other three parameters will make adjustment automatically to ensure the coupling relationship among them:

$$f_{center} = (f_{stop} + f_{start})/2$$

$$f_{span} = f_{stop} - f_{start}$$

#### 5.1.1.1 Frequency (Meter)

It is used to set the frequency of the meter in frequency scan. You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

**NOTE**

It is displayed as a greed vertical solid line to indicate the meter frequency in the trace display area of the user interface. You can also click or tap **Display** > **Meter Freq Line** to enable or disable the display of the green vertical line.

| Parameter | Remarks |
|---|---|
| Default | 515 MHz |
| Range | 0 Hz to Fmax[1] |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | Step = RBW (Meter)/2 |
| Left/Right Arrow Key Step | Step = RBW (Meter) * 10 |

**NOTE**

[1]: The maximum measurement frequency Fmax is determined by the instrument model.

#### 5.1.1.2 Midspan Freq

Sets the center frequency of the current channel.

Key Points:

- When you modify the midspan frequency, the start and stop frequency will be modified automatically if the span remains unchanged.
- Modifying the midspan frequency indicates that the frequency is changed along the current channel horizontally, and the adjustable range shall be within the frequency range specified in the technical specifications of the analyzer.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 515 MHz |
| Range | 5 Hz to (Fmax - 5 Hz) |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | Step = RBW (Meter)/2 |
| Left/Right Arrow Key Step | Step = RBW (Meter) * 10 |

#### 5.1.1.3 Span

Sets the frequency range of the current channel.

Key Points:

- When you modify the span, the start and stop frequency will be modified automatically if the midspan frequency remains to be unchanged.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 970 MHz |

| Parameter | Remarks |
|---|---|
| Range | 10 Hz to Fmax |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | step = span/200, Min = 2 Hz |
| Left/Right Arrow Key Step | at 1-2-5 step |

#### 5.1.1.4 Start Freq

Sets the start frequency of the current frequency channel.

Key Points:

- When you modify the start frequency, the span and Midspan Freq will be changed.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 30 MHz |
| Range | 0 Hz to (Fmax - 10 kHz) |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | Step = RBW (Meter)/2 |
| Left/Right Arrow Key Step | Step = RBW (Meter) * 10 |

#### 5.1.1.5 Start Freq Mode

Sets the coupling mode of the start frequency to "Manual" or "Auto". When "Auto" is selected, the start frequency will automatically couple to the start frequency of the first range among the currently enabled ranges in the scan table.

#### 5.1.1.6 Stop Freq

Sets the stop frequency of the current frequency channel.

Key Points:

- When you modify the stop frequency, the span and Midspan Freq will be changed.

- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 1 GHz |
| Range | 10 Hz to Fmax |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | Step = RBW (Meter)/2 |
| Left/Right Arrow Key Step | Step = RBW (Meter) * 10 |

#### 5.1.1.7 Stop Freq Mode

Sets the coupling mode of the stop frequency to "Manual" or "Auto". When "Auto" is selected, the stop frequency will automatically couple to the stop frequency of the last range among the currently enabled ranges in the scan table.

#### 5.1.1.8 X Scale Type

Sets the scale type of X-axis to Lin or Log.

Key Points:

- The X-axis scale type is only related to data display, and will not affect sweep and trace data.
- Modifying the X-axis scale type will neither restart the sweep nor affect the number of sweep points.

### 5.1.2 Display

#### 5.1.2.1 Display

Controls the screen display. You can set the current mode, the current measurement interface or window, and other display-related parameters.

1. **Selected Display Line**

   The available display lines are Display Line1, Display Line2, Display Line3, and Display Line4.

2. **Display Line State**

Enables or disables the display of the display line.

**3. Display Line**

Sets the display line level to change its display location. This line can be used as the reference for the readout.

Key Points:

- This line is a horizontal reference whose amplitude is equal to the set value, and the corresponding amplitude unit is the same as the Y-axis unit.
- You can use the numeric keys, the knob, and the arrow keys on the front panel to modify the display line level; also you can modify it on the touchscreen.
- The display line setting is only valid within the spectrum line display area.
- If the display line is out of the visible spectrum line range, it will be displayed at the top or bottom of the graticule, and indicated as reference level.

| Parameter | Remarks |
|---|---|
| Default | 81.99 dBμV |
| Range | Current amplitude range |
| Unit | dBm, dBmV, dBuV, V, W, A |
| Knob Step | Step = (Scale/Div)/10 |
| Left/Right Arrow Key Step | Step = Scale/Div |

**4. Meter Frequency Line**

Enables or disables the display of the meter frequency line.

When enabled, a green vertical solid line is displayed in the spectrum line display window, which indicates the current frequency of the meter. When disabled, the meter frequency line is hidden.

## 5.1.3 Amplitude

Sets the amplitude parameters of the analyzer. You can modify these parameters to make the signals under test be displayed with minimal errors in the current window, easy for you to observe.

### 5.1.3.1 Reference Level

Sets the maximum power or voltage that can be displayed in the current window.

Key Points:

- The RF link is limited by the maximum mixer level, so when you reduce the attenuation, the instrument may reduce the reference level to meet the mixer level limit. When you increase the attenuation, the reference level remains unchanged.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 106.99 dBμV |
| Range | -63.01 dBμV to 131.99 dBμV |
| Unit | dBm, dBmV, dBuV, V, W, A |
| Knob Step | Step = (Scale/Div)/10 |
| Left/Right Arrow Key Step | Step = Scale/Div |

#### 5.1.3.2 Input Attenuation (Meter)

Sets the attenuation value of the meter.

Key Points:

- In the frequency scan measurement, this value only affects the attenuation of the meter.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 10 dB |
| Range | 0 dB to 40 dB |
| Unit | dB |
| Knob Step | Preamp off, step = 2 dB |
| Left/Right Arrow Key Step | 2 dB |

#### 5.1.3.3 Preamplifier (Meter)

Enables or disables the meter preamplifier. When the signal under test is a low-level signal, enabling the preamplifier can reduce the displayed average noise level, so that you can distinguish low-level signals from the noise. By default, the preamp gain is 20 dB.

#### 5.1.3.4 Y Axis Unit

Sets the unit of the Y-axis to dBm, dBmV, dBμV, Volts, Watts, or Ampere. Wherein, dBm, dBmV, and dBμV are for Log unit; Volts and Watts are for Linear unit; Ampere is the unit for Current.

Key Points:

The conversion relations between units are as follows:

$$dBm = 10lg\left(\frac{Volts^2}{R} \times \frac{1}{0.001W}\right)$$

$$dB\mu V = \left(20lg \frac{Volts}{1\mu V}\right)$$

$$dBmV = \left(20lg \frac{Volts}{1mV}\right)$$

$$Watts = \frac{Volts^2}{R}$$

$$Ampere = \frac{Volts}{R}$$

Wherein, $R$ denotes the reference resistance.

#### 5.1.3.5 Scale/Div

Sets the Y scale per division.

Key Points:

- The amplitude range to be displayed can be adjusted by setting the scale.
- The currently displayed range of the signal amplitude is as follows:

  Min. value: reference level - 10 x current scale value;

  Max. Value: reference level

- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 10 dB |
| Range | 0.1 dB to 20 dB |
| Unit | dB |
| Knob Step | 1 dB |
| Left/Right Arrow Key Step | at 1-2-5 step |

#### 5.1.3.6 Ref Offset

Adds an offset value to the reference level to compensate for gains or losses generated between the DUT and the analyzer input.

Remarks:

- The offset value does not affect the trace position, but will modify the reference level readout and the marker amplitude readout.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 0 dB |
| Range | -300 dB to 300 dB |
| Unit | dB |
| Knob Step | 1 dB |
| Left/Right Arrow Key Step | 5 dB |

## 5.2 Sweep and Function Settings

### 5.2.1 Bandwidth

#### 5.2.1.1 RBW (Meter)

Sets the resolution bandwidth (RBW) of the meter. You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 120 kHz |
| Range | 100 Hz to 10 MHz[1] |
| Unit | GHz, MHz, kHz, Hz, mHz |
| Knob Step | at 1-3-10 step |
| Left/Right Arrow Key Step | at 1-3-10 step |

**NOTE**

When the EMC standard is set to "None", and "Gauss" filter is selected, the RBW range is as above. When "EMI" is selected, resolution bandwidth can only be set to 200 Hz, 9 kHz, 120 kHz, or 1 MHz.

#### 5.2.1.2 RBW Mode(Meter)

Sets the RBW mode of the meter to "Manual" or "Auto".

Key Points:

- When you set it to "Manual", set the RBW(Meter) value manually.
- When you set it to "Auto", RBW is automatically coupled to the frequency of the meter.
- When the EMC standard is set to "None", the "RBW Mode(Meter)" menu is grayed out and disabled. You can manually set the RBW. When the EMC standard is set to "CISPR", "Auto" is, by default, selected under the "RBW Mode(Meter)" menu.

| Frequency (Meter) Fmet | RBW |
|---|---|
| Fmet < 150 kHz | 200 Hz |
| 150 kHz ≤ Fmet < 30 MHz | 9 kHz |
| 30 MHz ≤ Fmet < 1 GHz | 120 kHz |
| Fmet ≥ 1 GHz | 1 MHz |

#### 5.2.1.3 Filter Type(Meter)

Sets the RBW filter type.

Key Points:

- The RSA6000 series supports two kinds of RBW filters: Gauss and EMI.
- When the EMC standard is set to "CISPR", "Filter Type(Meter)" menu is disabled and grayed out. By default, EMI is selected for the Filter Type(Meter). When "EMI" is selected, resolution bandwidth can only be set to 200 Hz, 9 kHz, 120 kHz, or 1 MHz.
- When the EMC standard is set to "None", by default, "Gauss" is selected for the Filter Type(Meter).

### 5.2.2 Sweep

Sets the sweep-related parameters.

#### 5.2.2.1 Scan Mode

Sets the current scan mode to "Single" or "Cont".

#### 5.2.2.2 Meter Meas Mode

**Single**

Sets the meter measurement mode to Single. The meter performs a single measurement and then stops. You can launch the meter by switching the mode to Continuous.

**Continuous**

Sets the meter measurement mode to Continuous. Only when you set the current setting to Single scan mode or re-launch the scan sequence, can this measurement be stopped.

#### 5.2.2.3 Start Sequence

Starts pre-scan, peak search, or the re-measurement according to the selected frequency scan mode.

#### 5.2.2.4 Clear List and Start

After clicking or tapping this menu, all the signals in the signal list will be cleared. Then, the selected scan sequence will be launched. If the selected scan sequence is

being scanned and is in the Cont scan mode, you need to click or tap **Abort Sequence** to stop scan. In other conditions, when the measurement is completed, the scan sequence is stopped automatically.

#### 5.2.2.5 Sequence Control

Selects "Pause" to pause the current pre-scan, peak search, or the re-measurement operation. Note, the pause operation can be executed only between the two scan ranges.

Selects "Resume" to resume to scan from the scan point where you pause in the pre-scan, peak search, or the re-measurement.

#### 5.2.2.6 Abort Sequence

Aborts the current sweep, search, or the measurement.

### 5.2.3 Trigger

Selects the trigger source and sets trigger-related parameters.

#### 5.2.3.1 Trigger Source

Sets the trigger source to "Free Run" or "External".

#### 5.2.3.2 Free Run

The trigger conditions are met at any time, that is, the analyzer generates trigger signals continuously.

#### 5.2.3.3 External Trigger

In this mode, an external signal is input via the **[TRIG IN]** connector on the rear panel. When the signal meets the set trigger conditions, a trigger signal is generated.

1. **Slope**

   Sets the trigger polarity for External Trigger to "POS" or "NEG".

2. **Delay State**

   Enables or disables the trigger delay function. After the trigger delay function is enabled, you can set the trigger delay time.

3. **Delay Time**

   Sets the time interval during which the instrument waits to start the sweep operation after the trigger signal that meets the trigger conditions is generated.

You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 1 µs |
| Range | 0 µs to 500 ms |
| Unit | s, ms, µs, ns, ps |
| Knob Step | trigger delay/100, Min = 1 µs |
| Left/Right Arrow Key Step | at 1-1.5-2-3-5-7.5 step |

#### 5.2.3.4 Holdoff State

Turns on or off the trigger holdoff function.

#### 5.2.3.5 Holdoff Time

Sets the holdoff time between trigger signals. You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

When the trigger conditions are met, the trigger occurs. Then, the delay begins, and the holdoff time begins. During the holdoff time, new trigger signals will be ignored. For a free-running trigger, the holdoff value is the minimum time between two trigger signals.

| Parameter | Remarks |
|---|---|
| Default | 100 ms |
| Range | 100 µs to 500 ms |
| Unit | s, ms, µs, ns, ps |
| Knob Step | trigger holdoff time/100, Min = 1 µs |
| Left/Right Arrow Key Step | at 1-1.5-2-3-5-7.5 step |

#### 5.2.3.6 Auto Trig State

Enables or disables the auto trigger function.

#### 5.2.3.7 Auto Trig

Sets the time that the instrument will wait for the trigger conditions to be met. When the set waiting time times out, the instrument will not wait and start to initiate the sweep measurement.

| Parameter | Remarks |
|---|---|
| Default | 100 ms |
| Range | 1 ms to 100 s |
| Unit | s, ms, µs, ns, ps |
| Knob Step | auto trigger time/100, Min = 1 µs |
| Left/Right Arrow Key Step | at 1-1.5-2-3-5-7.5 step |

## 5.2.4 Trace

Sets the Trace-related parameters.

#### 5.2.4.1 Selected Trace

RSA6000 series can display at most 3 traces synchronously in EMI mode. Select the corresponding trace to set the relevant parameters for the specified trace. By default, Trace1 is selected, and the trace type is "Clear Write".

**NOTE**

The trace currently displayed on the screen can be saved to the internal or external memory. If needed, you can recall it at any time. For details about saving the file, refer to descriptions in *Save*.

#### 5.2.4.2 Next Trace

Click or tap **Next Trace** to select the next trace to be displayed.

#### 5.2.4.3 Trace Type

Sets the type of the currently selected trace. The system calculates the sweep data in the specified operation method according to the selected trace type. The results will not be displayed unless you set "Trace Update" and "Trace Display" to "ON". Trace types include Clear Write, Average, Max Hold, and Min Hold.

**1. Clear Write**

Sets the trace data to a minimum value, and displays the real-time sweep data of each point on the trace.

2. **Average**

   Displays an average trace, which is represented by averaging the data of each point on the trace. The type of the trace is displayed to be smooth.

3. **Max Hold**

   Maintains and displays a max hold trace, which represents the maximum data value on a point-by-point basis. When a new maximum value is generated, data will be updated, and the newly updated maximum value prevails.

4. **Min Hold**

   Maintains and displays a min hold trace, which represents the minimum data value on a point-by-point basis. When a new minimum value is generated, data will be updated, and the newly updated minimum value prevails.

#### 5.2.4.4 Detector Type

Sets the detector for the current sweep and applies the selected detector type to the current trace. The available trace detectors include Pos Peak, Neg Peak, Average (Voltage), Quasi Peak, EMI Average, and RMS Average.

1. **Pos Peak**

   For each trace point, Positive Peak detector displays the maximum value of data sampled within the corresponding time interval.

2. **Neg Peak**

   For each trace point, Negative Peak detector displays the minimum value of data sampled within the corresponding time interval.

3. **Average (Voltage)**

   For each data point, average (see equation below) all the sampled data within the corresponding time interval and display the result.

$$V_{AV} = \frac{1}{N} \times \sum_{i=1}^{N} v_i$$

   Wherein, $V_{AV}$ is the average of voltage in V; $N$ is the number of sampled values for each point displayed; $v_i$ is the envelope of the sampled value in V.

4. **Quasi Peak**

   It is a weighted form of peak detector. For each data point, the detector detects the peaks within the corresponding time interval. The peaks detected are

weighted using circuit with specified charge and discharge structures as well as the display time constant specified in the CISPR 16 standards and the result is displayed. Quasi Peak detector is applicable to EMC testing.

**NOTE**

Compared with the discharge time, the charge time of Quasi Peak detector is much shorter and can reflect the amplitude as well as time distribution of the signal.

**5. EMI Average**

EMI average detector is used to measure the envelope voltage of the signal and calculate the average value to evaluate the electromagnetic interference. It is primarily used for narrowband signal detection under broadband noise conditions in EMI testing. It can effectively reject high-frequency noise and recover narrowband signals concealed by broadband noise.

**6. RMS Average**

RMS (Root Mean Square) averaging is a processing method used to smooth spectral data and accurately reflect the average power of the signal. For each data point, perform mean square root operation (see equation below) of the sampled data within the corresponding time interval and display the result. RMS average only refers to the RMS data in the Gaussian filter.

$$V_{RMS} = \sqrt{\frac{1}{N} \times \sum_{i=1}^{N} v_i^2}$$

Wherein, $V_{RMS}$ is the root mean square value of voltage, expressed in V; $N$ is the number of sampled values for each point displayed; $v_i$ is the envelope of the sampled value, expressed in V. Reference impedance $R$ can be used to calculate power based on the formula: $P = \frac{v_{RMS}^2}{R}$.

### 5.2.4.5 Detector Auto

Enables or disables the Detector Auto function. By default, Detector Auto is enabled. If you set the detector type manually, please disable the Detector Auto function.

### 5.2.4.6 Trace Update

Enables or disables trace update.

### 5.2.4.7 Trace Display

Enables or disables the trace display.

# 5.3 Measurement Settings

## 5.3.1 Meas Setup

### 5.3.1.1 Meas Setup

**1. Scan Table**

Sets the parameters for 10 ranges in the scan table.

**a. Available range**

The range specifies the scan range. 10 ranges are available for you to choose.

**b. Select or unselect the range**

Check or uncheck the checkbox of the specified range No. When you check the checkbox of the specified range number, the selected range will be chosen as a part of the measurement. When the checkbox is selected, the checkbox of the specified range No. is filled in green, with a tick (√) in it.

**c. Start**

Sets the start frequency of the selected scan range.

**d. Stop**

Sets the stop frequency of the selected scan range.

**e. Points**

Sets the number of sweep points for the selected scan range.

**f. Sweep Time**

Sets the time to sweep the selected range for one time.

**g. Auto Sweep Time**

Enables or disables the auto sweep time function of the selected scan range. When enabled, the instrument is configured with a sweep time automatically. When disabled, you can set the sweep time manually for the selected range.

You can click or tap to check or uncheck the checkbox of Auto under the Sweep Time column. If checked, the checkbox above "Auto" is filled in green, with a tick (√) in it, indicating the auto sweep time is enabled for the selected range.

**h. RBW**

Sets the RBW of the selected scan range. Reducing RBW can gain a higher frequency resolution, but will also prolong the sweep time.

**i. Auto RBW**

Enables or disables the auto RBW of the selected scan range. When enabled, the instrument is configured with RBW value automatically. When disabled, you can set RBW manually for the selected range.

You can click or tap to check or uncheck the checkbox of Auto under the RBW column. If checked, the checkbox above "Auto" is filled in green, with a tick (√) in it, indicating the auto RBW is enabled for the selected range.

**j. Filter Type**

Sets the RBW filter type for the selected range. It can be set to "Gauss" or "EMI".

When the EMC standard is set to "CISPR", the **Filter Type** menu is disabled and grayed out. By default, EMI is selected for the Filter Type. When "EMI" is selected, RBW can only be set to 200 Hz, 9 kHz, 120 kHz, or 1 MHz. When the EMC standard is set to "None", by default, "Gauss" is selected for the Filter Type(Meter).

**k. ATT**

Sets the attenuation value of the selected scan range.

**l. Auto Attenuator**

Enables or disables the auto attenuation function of the selected scan range. When enabled, the instrument is configured with an attenuation value automatically. When disabled, you can set the attenuation value manually for the selected range.

You can click or tap to check or uncheck the checkbox of Auto under the ATT column. If checked, the checkbox above "Auto" is filled in green, with a tick (√) in it, indicating that the auto attenuation is enabled for the selected range.

**m. PA**

Enables or disables the preamplifier for the selected scan range.

**2. Average Count**

Specifies the number of average counts (N) for Average, Max Hold, and Min Hold. For Average, the greater the value of N, the smoother the trace is displayed. In Average, Max Hold, and Min Hold modes, when the scan sequence is "Scan Only" and performing the single scan, the instrument will not stop sweeping until the sweep count has reached N. Besides "Scan Only", when you perform other types of scan sequence, if the selected trace type is set to "Average", "Max Hold", "Min Hold", then the sweep will not stop measurement until a specified number of times of measurement is performed.

| Parameter | Remarks |
|---|---|
| Default | 1 |
| Range | 1 to 10,000 |
| Unit | N/A |
| Knob Step | 1 |
| Left/Right Arrow Key Step | 1 |

**3. Average Type**

Selects the average type to "Log", "RMS", or "Scalar".

- **Log**: In this mode, all filtering and averaging processes select the log unit (dB). This average type is the most effective one for finding the low-level signal that is close to the noise amplitude. The formula is shown as follows:

$$NewAvg = \frac{(k-1) \times OldAvg + Newdata}{k}$$

In the above formula, the parameter unit is dB.

- **RMS**: In this mode, all filtering and averaging processes work on the power (the square of the amplitude) of the signal. This average type is best for measuring the true time average power of complex signals. As the voltage result is in proportion to the square root of the average of the square of the voltage, it is also called the root mean square. The formula is shown as follows:

$$NewAvg = 10log\left(\frac{(k-1) \times 10^{\frac{OldAvg}{10}} + 10^{\frac{Newdata}{10}}}{k}\right)$$

In the above formula, the parameter unit is dB.

- **Scalar**: In this mode, all filtering and averaging processes work on the voltage envelope of the signal. This average type is the most appropriate one for observing the great envelope fluctuations of AM or pulse-modulated signals such as radar and TDMA transmitters. The formula is shown as follows:

$$NewAvg = 20log\left(\frac{(k-1)\times 10^{\frac{OldAvg}{20}} + 10^{\frac{Newdata}{20}}}{k}\right)$$

In the above formula, the parameter unit is dB.

**4. Avg Auto**

Sets the status of auto average. When the auto average function is enabled, the instrument will select the best average type based on the current settings. When you select one of the average types manually, the instrument will apply the selected type, and the auto average status is set to Manual.

**5. Auto Couple**

When you enable "Auto Couple" function, all the manual/auto settings in the current measurement mode will be set to "Auto". This operation does not affect other measurement modes.

In auto state, the auto coupled parameters are changed with their coupled parameters. The auto coupling operation will ensure the optimal performance of the instrument. After the operation, all the auto coupled parameters will immediately be automatically reset based on the coupled parameters.

**6. Scan Sequence**

If a scan sequence is currently executed, then the "Scan Sequence" menu is grayed out and disabled.

**a. Scan Only**

Only performs the pre-scan operation.

**b. Search Only**

Only performs the peak search operation.

**c. Scan-Srch-Ms**

Performs the pre-scan, peak search, and final measurement.

**d. Scan-Search**

Performs the pre-scan and peak search.

**e. Srch-Meas**

Performs the peak search and final measurement.

**f. Re(measure)**

Performs the final measurement.

### 5.3.1.2 Signal List

Sets the parameters for the signal list. The signal list is displayed below the measurement window, as shown in the following figure.

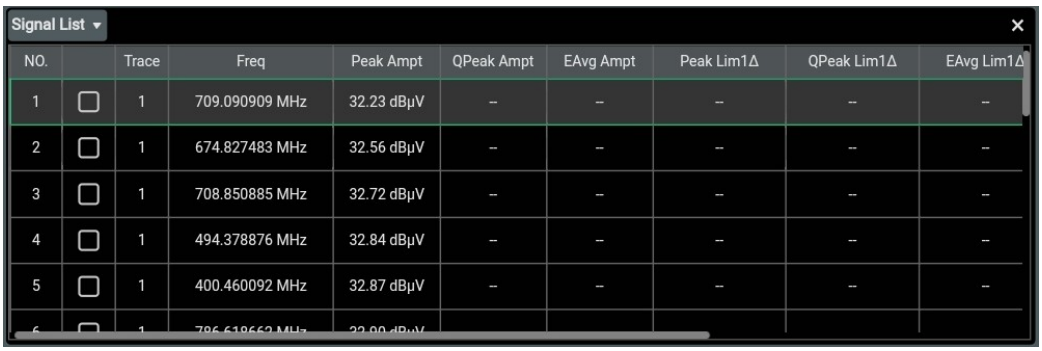



**Figure 5.4 Signal List**

| Parameter | Remarks |
|---|---|
| No. | Indicates the signal number. |
| Checkbox | When the checkbox is checked, it indicates that the current signal is selected. |
| Trace | Indicates the specified trace under test. |
| Freq | Indicates the frequency of the point currently searched that meets the peak criteria. |
| Peak Ampt | Positive peak detector amplitude<br>Displays the corresponding amplitude when the current trace detector type is Pos Peak after the search operation is executed. Displays the corresponding detector amplitude of the final measurement detector 1 type after the final measurement is performed. If no measurement data are found, "--" is displayed. |
| QPeak Ampt | Quasi-peak detector amplitude<br>Displays the corresponding amplitude when the current trace detector type is Quasi Peak after the search operation is executed. Displays the corresponding detector amplitude of the final measurement detector 2 type after the final measurement is performed. If no measurement data are found, "--" is displayed. |
| Eavg Ampt | EMI Average detector amplitude<br>Displays the corresponding amplitude when the current trace detector type is EMI Average after the search operation is |

| Parameter | Remarks |
|---|---|
| | executed. Displays the corresponding detector amplitude of the final measurement detector 3 type after the final measurement is performed. If no measurement data are found, "--" is displayed. |
| Peak Lim1Δ | Difference between positive peak detector amplitude and Limit1.<br>Only when the corresponding limit line is enabled and the final measurement is performed, the difference between the detector amplitude of the currently selected measurement detector1 type and the limit line (1 to 6) is displayed. If no measurement data are found, "--" is displayed. |
| QPeak Lim1Δ | Difference between Quasi peak detector amplitude and Limit1.<br>Only when the corresponding limit line is enabled and the final measurement is performed, the difference between the detector amplitude of the currently selected measurement detector2 type and the limit line (1 to 6) is displayed. If no measurement data are found, "--" is displayed. |
| EAvg Lim1Δ | Difference between EMI Average detector amplitude and Limit1.<br>Only when the corresponding limit line is enabled and the final measurement is performed, the difference between the detector amplitude of the currently selected measurement detector3 type and the limit line (1 to 6) is displayed. If no measurement data are found, "--" is displayed. |
| Ampt Correction | Sets the parameters related to the amplitude correction to compensate for the gain or loss from external devices. |
| RBW | Sets the RBW of the selected scan range of the current signal. |
| TimeStamp | Displays the current signal measurement time. |

**NOTE**

The currently displayed signal list can be saved to the internal or external memory of the analyzer. If needed, you can recall it at any time.

**1. Select Signal**

Selects the specified signal number from the signal list.

**2. Signal->Meters**

Sets the frequency of the meter to the frequency of the selected signal.

3. **Mark Signal**

   Performs the signal marking operation. Check the checkbox of the selected signal to mark the signal.

4. **Mark All**

   Marks all the signals in the signal list.

5. **Mark Duplicates All**

   Marks all the duplicated signals in the signal list.

6. **Mark Duplicates Upper**

   If the current signal list has several pages of data, click or tap this menu to mark the duplicated signals in the signal list upward.

7. **Mark Duplicates Lower**

   If the current signal list has several pages of data, click or tap this menu to mark the duplicated signals in the signal list downward.

8. **Clear Mark**

   Unmarks the selected signals in the signal list.

9. **Clear All Marks**

   Unmarks all the signals in the signal list.

10. **Delete**

    Deletes the signal of the selected type.

    - Current: deletes the currently selected signal from the signal list.
    - All: deletes all the signals from the signal list.
    - Marked: deletes all the marked signals from the signal list.
    - Unmarked: deletes all the unmarked signals from the signal list.

11. **Signal Zoom**

    Takes midspan as the reference to zoom the coordinate display of the currently selected signal to 10% of the current span.

12. **Zoom Out**

    Returns the coordinate display of the currently selected signal to its previous display setting prior to the Signal Zoom operation.

13. **Sort Signals**

Sorts the signal in the signal list according to "Freq", "Det Ampt", "ΔDet Ampt", or "Time Stamp".

**14. Det Ampt Sort**

"Det1", "Det2", and "Det3" are available to choose.

**15. ΔDet Ampt Sort**

"Det1", "Det2", and "Det3" are available to choose.

**16. Sort Order**

Sorts the signal in ascending or descending order.

**17. Auto Sort**

Enables or disables the auto sort function. When enabled, the measurement will sort the signal according to the previously set sort order and sort type. Otherwise, the signal will be added to the signal list based on the descending order of the trace amplitude.

#### 5.3.1.3 Final Meas

**1. Select Detector**

Selects the detector to be "Det1", "Det2", or "Det3".

**2. Detector Type**

Sets the detector type. The available detector types include Pos Peak, Neg Peak, Average, Quasi Peak, EMI Average, RMS Average. You can also select "OFF" to disable the detector.

**3. Dwell Time**

Sets the dwell time of the selected detector.

| Parameter | Remarks |
|---|---|
| Default | 200 ms |
| Range | 50 µs to 60 s |
| Unit | ps, ns, µs, ms, s |
| Knob Step | 1 µs |
| Left/Right Arrow Key Step | 1 µs |

**4. Limit for Delta**

Sets the limit line of the current detector measurement, so as to obtain the limit delta data in the signal list. The available limits include "Limit Line1" through "Limit Line6".

5. **(Re)measure**

   Sets the type of the re-measurement to "Current Signal", "All Signal", or "Marked Signal".

   - If you select the type of the marked signal, but the marked signal is not found in the signal list, then re-measurement cannot be executed.
   - If a scan sequence is currently executed, then the Re(measure) menu is grayed out and disabled.

#### 5.3.1.4 Meters Control

Sets the parameters of the meter.

1. **Select Meter**

   Specifies the currently selected meter to "Meter 1", "Meter 2", or "Meter 3".

2. **Meter State**

   Enables or disables the selected meter.

   - When enabled, the histogram of the selected meter is displayed in the meter window, and the instrument performs measurements with the specified detector type.
   - When disabled, the selected meter is not displayed in the specified area and the instrument does not execute measurements.

3. **Detector**

   Sets the detector of the selected meter to "Pos Peak", "Neg Peak", "Average", "Quasi Peak, "EMI Average", or "RMS Average".

4. **Line State**

   Enables or disables the limit line of the selected meter.

5. **Meter Limit Value**

| Parameter | Remarks |
|---|---|
| Default | 80 dBμV |
| Range | -250 dBμV[1] to 250 dBμV |

| Parameter | Remarks |
| --- | --- |
| Unit | -dBμV, dBμV, mV, μV |
| Knob Step | 1 |
| Left/Right Arrow Key Step | 5 |

**6. Limit Line**

Sets the limit line of the selected meter. The available choices include "OFF", "Limit Line1", "Limit Line2", "Limit Line3", "Limit Line4", "Limit Line5", and "Limit Line6".

**7. Peak Hold Type**

Sets the peak hold type of the meter to "Adjustable" or "Infinite".

- When you select "Infinite", the peak hold line of the selected meter will not be reset. The "Adjust Time" menu is disabled and grayed out.
- When you select "Adjust", the peak hold line of the selected meter will be reset to the current signal value after the set peak hold time. At this time, you can set the peak hold time in the "Adjust Time".

**8. Adjust Time**

Sets the peak hold time for the meter.

**9. Dwell Time**

Sets the dwell time of the meter detector.

**10. Reset Peak Hold**

Resets the peak hold lines of all the currently enabled meters to the current signal value.

**11. Reset Peak Hold on Freq Change**

Enables or disables resetting peak hold on frequency change.

**12. Couple to Signal**

Enables or disables the coupling function of the meter and the signal list. When enabled, the instrument will search for the signal frequency that is closest to that of the current meter from the signal list automatically and modify the meter frequency to the frequency of the signal.

**13. Couple to Marker**

Enables or disables the coupling function of the meter and the current marker. When enabled, the instrument sets the meter frequency to the frequency at the current marker.

**14. Meter->Signal**

Replaces the frequency of the currently selected signal with the currently set frequency of the meter. The measured value is cleared, recorded as "---".

**15. Meters->List**

Adds the currently set meter frequency to the signal list. The measured value is cleared, recorded as "---".

**16. MeterMax->Signal**

Replaces the frequency of the currently selected signal with the currently set frequency of the meter. The measured value is updated to the corresponding detector (if any) column.

**17. MeterMax->List**

Adds the currently set meter frequency to the signal list. The measured value is updated to the corresponding detector (if any) column.

### 5.3.1.5 EMC Measurement Standard

Sets the EMC Standard to "None" or "CISPR".

- When "None" is selected, the filter type is set to Gauss and the filter bandwidth is -3 dB. When the trace detector or meter detector is set to "Quasi Peak", "EMI Average", or "RMS Average", the instrument automatically switches the EMC standard to "CISPR". When the filter type is set to EMI, the filter bandwidth is -6 dB.
- When "CISPR" is selected, for Meter 1, the detector is, by default, positive peak; for Meter 2, the detector is, by default, quasi peak; for Meter 3, the detector is, by default, EMI average.

### 5.3.1.6 Search

**1. Search Criteria**

Sets the search criteria. When the peak that meets the search criteria is found, the signal will be added to the signal list.

- Peak Criteria: performs the search and finds the peak that meets the peak criteria.
- PK Crit & LIM: performs the search and finds the peak that meets the peak criteria and limit line criteria.
- SubRng & LIM: performs the search and finds the peak that meets the peak criteria for each subrange and limit line criteria. After this mode is selected, the

whole span is divided into n subranges. Wherein, n is set by the "Subrange Num" menu.

2. **Peak Num State**

   Enables or disables the setting of the number of peaks.

3. **Peak Num**

   When the search criteria is set to "Peak Criteria" or "Pk Crit & LIM", set the maximum number of peaks searched.

4. **Subrange Num**

   Sets the number of subranges for the signal search.

#### 5.3.1.7 Limit

Sets the parameters of limit lines. After pressing Preset, the limit line measurement function is disabled, but the data of the limit lines will be reserved. The limit line data will only be deleted when the loading mode is Default. When you exit the measurement mode, the limit line data will not be deleted.

1. **Test Limits**

   Selects whether the displayed traces are tested against the displayed limit lines. For each displayed trace, the corresponding limit line is turned on, and a message will be displayed at the upper-left corner of the trace to indicate whether the test passes or fails.

2. **Select Limit**

   Selects the current limit line. By default, it is Limit1.

3. **Limit State**

   Enables or disables the display of the limit line. When the limit line is on, the measurement interface displays the limit line, and the corresponding traces are tested based on the current limit lines.

4. **Edit Limit**

   When "Limit State" is set to "ON", this menu is valid. Click or tap this menu to enter the editing sub-menu, and the limit line editing window is displayed.

   - **Select Limit:** Selects the current limit line. By default, it is Limit1.
   - **Append Point:** Inserts an edit point.
   - **X Offset:** Sets the frequency offset of the current limit line.
   - **Y Offset:** Sets the amplitude offset of the current limit line.
   - **Apply Offset:** Adds the X and Y offsets to each point of the current mask.

- **X to CF**: When "Fixed" is selected, the frequency of the current editing point will not be affected by the center frequency. When "Relative" is selected, the frequency of the current editing point is the difference between the frequency of the point and the current center frequency. At this time, if the center frequency changes, then the position of the current editing point changes along with the center frequency.
- **Y to RF**: When "Fixed" is selected, the amplitude of the current editing point will not be affected by the reference level. When "Relative" is selected, the amplitude of the current editing point is the difference between the amplitude of the point and that of the current reference level. At this time, if the reference level changes, then the position of the current editing point changes along with the reference level.
- **Build From:** Sets a trace for building the limit line. The range is from Trace1 to Trace3.
- **Copy From:** Copies from the selected limit line to the current limit line. The range is from Limit1 to Limit6.
- **Del Point:** Deletes the point that you are editing.
- **Delete Limit:** Deletes the limit line you are editing.
- **Limit Test Trace:** Sets the trace for the current limit line test. The range is from Trace1 to Trace3.
- **Freq Interpolation:** Sets the frequency interpolation for the current limit line to "Linear" or "Log".
- **Ampt Interpolation:** Sets the amplitude interpolation for the current limit line to "Linear" or "Log".
- **Margin State:** Enables or disables the display of the margin. When you enable the display of the margin, the measurement interface displays the margin lines; when you disable the display of the margin, the margin is invalid.
- **Margin:** Sets the margin for the current limit line.

- **Description:** Adds the descriptions for the limit line.
- **Comment:** Adds the comments for the limit line.

5. **Import Limit**

   Click or tap **Import Limit**, then the file management interface is displayed. You can select the desired file to be imported.

6. **Export Limit**

   Click or tap **Export Limit**, then the file management interface is displayed. You can select the desired file to be exported. Click or tap **Export** to export the selected file.

7. **Delete All Limits**

   Deletes all limit lines. After you click or tap this menu, the data of all the limit lines will be cleared and they will be restored to factory defaults.

#### 5.3.1.8 Global CF Mode

1. **Global CF Mode**

   Turns on or off the global center frequency. In any working mode, if you enable the global center frequency mode, then the global center frequency will be set to the center frequency of the current mode. When a different working mode is selected, the global center frequency will be set to the center frequency of the previous working mode, that is, the one that is before switching the working mode. If you change the center frequency in any working mode, then the global center frequency will change with it.

2. **Global CF**

   Sets the global center frequency. It is only available when you enable the global CF mode.

# 5.4 Marker Measurement

## 5.4.1 Marker

Marker is a triangle sign (as shown in the following figure), which is used for marking the point on the trace. Reads the amplitude and frequency of a certain point on the trace via marker.

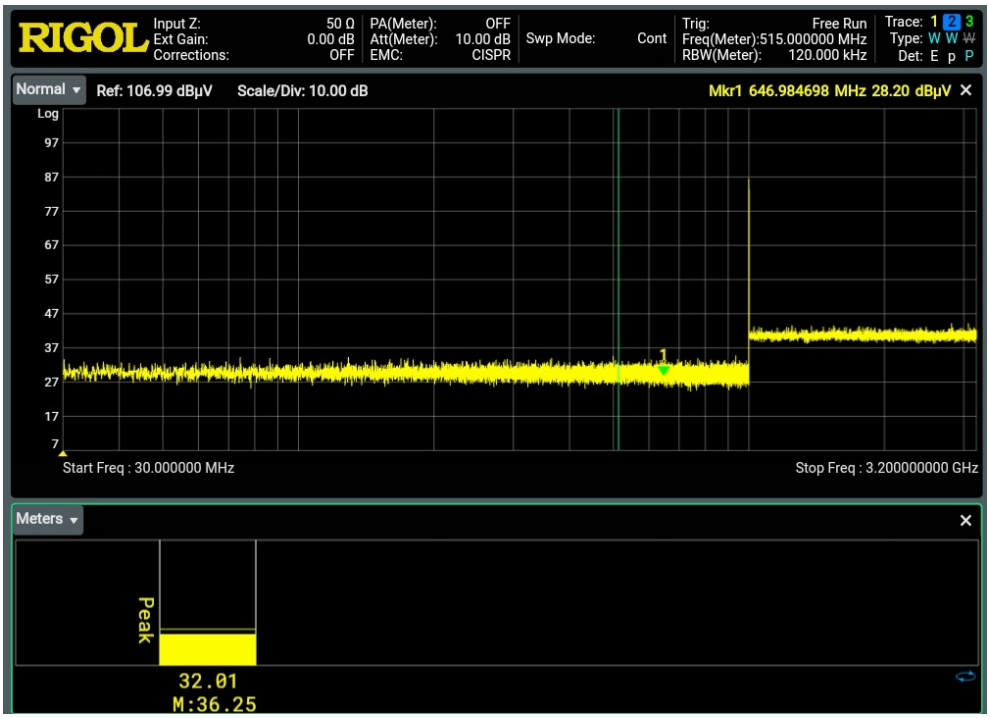



**Figure 5.5 Marker**

Key Points:

RSA offers 8 markers, and only a single marker or one pair of markers can be turned on each time.

### 5.4.1.1 Selected Marker

RSA6000 series provides 8 markers. By default, Marker1 is selected under "Selected Marker". After you select a marker, you can set parameters such as the marker mode and the marker trace. The currently enabled marker will be marked on the trace selected under "Marker Trace". The readout of the currently activated marker at the marker point will be displayed at the upper-right corner of the window.

### 5.4.1.2 Next Marker

Click or tap **Next Marker** to select the next enabled marker.

### 5.4.1.3 Marker Mode

Sets the type of the marker. The available marker modes include Position, Delta, Fixed, and OFF.

**1. Position**

It is used to measure the X (Frequency or Time) and Y (Amplitude) values of a certain point on the trace. When "Position" is selected, a marker indicated by a number (e.g., "1") appears on the trace.

**Key Points:**

- If no active marker exists currently, a marker will be enabled at the center frequency of the current trace.
- The readout resolution of the X-axis (frequency or time) is related to the span. To obtain a higher readout resolution, reduce the span.

**2. Delta**

It is used to measure the difference between "reference point" and "certain point on the trace": X (frequency or time) and Y (amplitude) value. When "Delta" is selected, a pair of markers appears on the trace: Reference Marker (marked by "X") and the Delta Marker (marked by "△").

**Key Points:**

- If an active marker exists currently, then activate a reference marker at the current marker; otherwise activate both the reference marker and Delta marker at the same time at the center frequency.
- When you change the position of the Delta marker, the position of the reference marker remains unchanged, but the frequency (or time) difference between the two markers will change along with it.
- The frequency (or time) difference between the two markers and the amplitude difference between them are displayed in the measurement result bar at the upper-right corner of the screen.

**Application of the "Delta" Marker:**

It is used to measure the S/N ratio of the single spectrum signal. Move the reference marker to the location where the signal resides, and move the Delta marker to the location where the noise resides. The amplitude displayed in the measurement results is S/N ratio.

**3. Fixed**

When you select "Fixed" marker, you can directly or indirectly set the X-axis and Y-axis values for the marker. Once specified, its position remains unchanged, and its Y-axis value does not change along with the trace. The fixed marker is generally used as the reference marker for the Delta marker. It is indicated by the sign "×".

**4. OFF**

Turns off the marker currently selected. Then, the marker information displayed on the screen and the functions concerning the marker will also be disabled.

#### 5.4.1.4 Reference Marker

Sets the reference marker for the current marker. By default, the reference marker is the marker next to it.

**Key Points:**

- Each marker can have another marker to be its reference marker.
- If the current marker is a Delta marker, the measurement result of the marker will be determined by the reference marker.
- Any marker cannot take itself to be the reference marker.

#### 5.4.1.5 Marker Trace

Selects the trace that the current marker marks. It can be Trace 1, Trace 2, and Trace3. One marker can only mark one trace. The selected trace determines the position of the marker and the final readout results.

#### 5.4.1.6 Marker Trace Auto

Enables or disables the auto marking trace function.

**Key Points:**

- When you enable the marker's auto marking trace function, the marker shifts from its off state to on state, and the marker's marking trace is automatically determined by the instrument.
- When you disable the marker's auto marking trace function, whatever states of the marker and the trace, the marker will be associated to the current marker trace.
- If you specify the marker's marking trace manually, the marker's auto marking trace function is automatically disabled.

#### 5.4.1.7 Marker Freq

Sets the frequency of the marker to change the position of the marker on the trace. Click or tap this menu to modify the value to change the position of the marker.

| Parameter | Remarks |
|---|---|
| Unit | GHz, MHz, kHz, Hz |

| Parameter | Remarks |
| --- | --- |
| Knob Step | span/(number of sweep points - 1) |
| Left/Right Arrow Key Step | span/(number of sweep points - 1) * 100 |

#### 5.4.1.8 Line State

Enables or disables the marker line.

**Key Points:**

- When you enable the marker line, a cross line is displayed at the amplitude point where the marker resides. The width of the horizontal line and the height of the vertical line are consistent with the length and height of the graticule in the waveform display area.
- If the marker is not visible in the selected area, extend the marker line to the display area for better observation. This function is useful for the marker outside the display area. The marker extension line can better display the amplitude of the marker, making it easy for you to observe and compare.

#### 5.4.1.9 Couple Markers

Enables or disables the marker coupling function.

**Key Points:**

- When this function is enabled, moving any marker will enable other markers (except the Fixed or Off marker) to move with it.
- The fixed marker does not move along with other marker, but if the fixed marker moves, other non-fixed markers will move with it.

#### 5.4.1.10 All Markers Off

Turns off all the enabled markers and their related functions.

## 5.4.2 Marker Function

#### 5.4.2.1 Selected Marker

Selects the marker for measurement. The available choices include Marker 1 through Marker 8.

#### 5.4.2.2 Meas at Marker Window

Enables or disables the display of the marker measurement window. When enabled, the marker measurement window is displayed at the upper-left corner of the user interface, displaying the result for performing the final measurement.

### 5.4.3 Marker To

Adds the new measurement results to the existing signal list.

#### 5.4.3.1 Marker->List

Adds the frequency at the current marker to the signal list.

Key Points:

- The newly added signal information is sorted according to the current ordering rule.
- If the trace detector matches the detector in the signal list, then the corresponding amplitude and limit delta values will be updated.

#### 5.4.3.2 Meas at Mkr->List

Adds the current marker measurement results (including frequency, marker amplitude, and limit delta) to the signal list.

Key Points:

- If the invalid marker measurement is executed, then errors may occur. You cannot add the measurement results to the signal list.
- The newly added signal measurement result information is sorted according to the current ordering rule.
- If the trace detector matches the detector in the signal list, then the corresponding amplitude and limit delta values will be updated.

#### 5.4.3.3 Meter->Mkr Freq

Sets the frequency of the meter to the frequency at the currently selected marker.

#### 5.4.3.4 Marker->Meter Frequency

Sets the frequency at the currently selected marker to the frequency of the meter.

## 5.4.4 Peak Search

The peak search function enables the marker to move to the specific signal peak point, and then in combination with the function of Delta marker, it can provide a powerful analysis capability.

#### 5.4.4.1 Peak Search

Performs the peak search function.

**Key Points:**

- If Max is selected for Search Mode, the system will search for the maximum value on the trace and mark it with a marker.
- If Config is selected for Search Mode, the system will search for the peak of the specified parameter on the trace and mark the peak with a marker.
- The peak search for the Next Peak, Next Peak Right, Next Peak Left, or peaks in the peak table must meet the specified peak search condition.
- When no peak meets the specified peak search condition, "No peak found" is displayed.

#### 5.4.4.2 Next Peak

Searches for and marks the peak whose amplitude on the trace is next to that of the current peak and which meets the peak search condition.

#### 5.4.4.3 Next Peak Right

Searches for and marks the nearest peak which is located at the right side of the current peak and meets the peak search condition.

#### 5.4.4.4 Next Peak Left

Searches for and mark the nearest peak which is located at the left side of the current peak and meets the peak search condition.

#### 5.4.4.5 Minimum Search

Searches for and marks the peak with the minimum amplitude on the trace.

## 5.4.5 Peak Config

**1. Peak Threshold**

Sets the minimum value of the peak amplitude. Only when the peak is greater than the peak threshold, can it be judged as a peak.

| Parameter | Remarks |
|---|---|
| Default | 16.99 dBμV |
| Range | -93.01 dBμV to 106.99 dBμV |
| Unit | dBm, dBmV, dBuV, V, W, A |
| Knob Step | 1 dBμV |
| Left/Right Arrow Key Step | 5 dBμV |

**2. Threshold State**

Enables or disables the peak threshold function. When the peak threshold function is enabled, you can set the peak threshold value.

**3. Peak Excursion**

Sets the excursion of the peak amplitude. It defines the minimum amplitude variation required for a signal to be identified as peak.

| Parameter | Remarks |
|---|---|
| Default | 6 dB |
| Range | 0 dB to 100 dB |
| Unit | dB |
| Knob Step | 1 dB |
| Left/Right Arrow Key Step | 5 dB |

**4. Excursion State**

Enables or disables the peak excursion function. When the peak excursion function is enabled, you can set the Peak Excursion value.

**5. Threshold Line**

Sets whether to display the peak threshold line or not. By default, it is OFF.

Key Points:

- When the threshold line is enabled, the threshold line displays on the screen, representing the amplitude.
- If the excursion state is enabled, then the peak excursion line will be displayed above the peak threshold, and the peak excursion value will be displayed at the left section.


**Figure 5.6 Threshold Line**

### 6. Search Mode

Sets the peak search condition: maximum value on the trace or the peak that meets the search criteria.

- The available options are Max and Config. If "Max" is selected, the system searches for the maximum value on the trace. This setting applies only to the peak search executed by pressing Peak Search. Other searches such as Next Peak, Next Peak Right, and Next Peak Left are all searched based on "Parameter".
- If "Parameter" is selected, the system searches for the peak that meets the search criteria on the trace.

## 5.5 Input/Output

Sets the input/output interface.

### 5.5.1 Input Impedance

Sets the input impedance for voltage-to-power conversions. The default input impedance is 50 Ω. To measure a 75 Ω device, you should use a 75 Ω to 50 Ω adapter (option) supplied by RIGOL to connect the analyzer with the system under test, and then set the input impedance to 75 Ω.

### 5.5.2 Ext Gain

Compensates for gain or loss in the measurement system outside the instrument.

**Key Points:**

- This value can change the trace position, but will not change the Y-axis reference value and scale.
- You can use the numeric keys, the knob, or arrow keys to modify this parameter; you can also use the touch screen to modify the parameter.

| Parameter | Remarks |
|---|---|
| Default | 0 dB |
| Range | -120 dB to 120 dB |
| Unit | dB |
| Knob Step | 1 dB |
| Left/Right Arrow Key Step | 1 dB |

### 5.5.3 Trig Out

**Trig Out**

Enables or disables the trigger output.

**Trig Out Polarity**

Click or tap to select "Positive" or "Negative" under **Trig Out Polarity**.

## 5.5.4 Amplitude Correction

The amplitude correction is an important tool for improving the measurement accuracy. It can compensate the amplitude errors caused by the device gain and loss during transmission to ensure the accuracy and consistency of the measurement results. The available amplitude corrections of the RSA6000 series spectrum analyzer include "Antenna", "Cable", "User", and "Other".

When the amplitude correction is enabled, you can enable the correction, apply all the corrections, delete all the amplitude corrections, edit the correction, import and export the correction files.

**Select the Amplitude Correction Type**

The available amplitude correction types include Antenna, Cable, Other, and User.

**Correction Switch**

Click or tap the ON/OFF tab for **Enable** to enable or disable the correction.

**Edit**

- Append Point: Appends one correction data point.
- Delete Point: Deletes one correction data point.
- Delete: Deletes all the added amplitude correction points.
- Freq Interpolation: Sets the frequency interpolation for the Amplitude Correction to "Lin" or "Log".
- Description: Adds the descriptions for the amplitude correction.
- Comment: Adds the comments for the amplitude correction.

**Apply all the Amplitude Correction**

Click or tap the ON/OFF tab for **Apply All** to enable or disable applying all the amplitude corrections. When enabling the "Apply All" function, all the currently enabled correction data will all apply to the trace. At this time, the data shown on the screen are those that have undergone amplitude correction.

**Delete All Amplitude Correction**

Click or tap **Delete All** to delete all the amplitude correction data and parameters. Then the amplitude correction is disabled automatically.

**Import**

Click or tap **Import**, and then file management interface is displayed. Select a file, and then click or tap **Import** to import the file.

**Export**

Click or tap **Export**, and then file management interface is displayed. Select a file, and then click or tap **Export** to export the file.

# 5.6 Shortcut Key

## 5.6.1 Preset

Recalls the preset setting and restores the system settings of the analyzer to a specified status.

Press Preset on the front panel to restore the instrument to its factory default settings.

You can also click or tap Preset at the upper-right corner of the screen to recall the factory settings. The following table lists the factory default settings (except items specified in Note [1]) or user-defined settings.

| Parameter Name | EMI Parameter |
|---|---|
| **Frequency** | |
| Frequency (Meter) | 515 MHz |
| Midspan Freq | 515 MHz |
| Start Freq | Auto, 30 MHz |
| Stop Freq | Auto, 1 GHz |
| X Scale Type | Log |
| Span | 970 MHz |
| **Display** | |
| Selected Display Line | Display Line1 |
| Display Line | OFF, 81.99 dBμV |
| Meter Freq Line | ON |
| **Amplitude** | |
| Reference Level | 106.99 dBμV |
| Input Attenuation (Meter) | 10 dB |
| Preamplifier (Meter) | OFF |
| Y Axis Unit | dBμV |

| Parameter Name | EMI Parameter |
|---|---|
| Scale/Div | 10 dB |
| Ref Offset | 0 dB |
| **Bandwidth** | |
| RBW (Meter) | Auto, 120 kHz |
| Filter Type(Meter) | EMI |
| **Trigger** | |
| Trigger Source | Free Run |
| Trigger Holdoff | OFF, 100 ms |
| Auto Trig | OFF, 100 ms |
| Slope | POS |
| Trigger Delay | Off, 1 us |
| **Trace** | |
| Selected Trace | Trace 1 |
| Trace Type | Clear Write |
| Detector Type | Pos Peak |
| Detector Auto | ON |
| Trace Update | ON |
| Trace Display | ON |
| **Meas Setup** | |
| Setting | |
| Avg Number | 1 |
| Average Type | Scalar |
| Average Auto | Auto |
| Scan Sequence | Scan Only |

| Parameter Name | EMI Parameter |
|---|---|
| Signal List | |
| Select Signal | 1 |
| Delete | All |
| Sort Signals | Freq |
| Detector Amplitude Sort | Det1 |
| Delta Detector Amplitude Sort | Det1 |
| Sort Order | ASCE |
| Auto Sort | ON |
| Final Meas | |
| Select Detector | Det1 |
| Detector Type | Pos Peak |
| Dwell Time | 200 ms |
| Limit for Delta | Limit Line1 |
| Re(measure) | Current Signal |
| Meters Control | |
| Select Meter | Meter1 |
| Meter State | ON |
| Detector | Pos Peak |
| Limit State | OFF |
| Limit Line | OFF, 80 dBμV |
| Peak Hold Type | Infinite |
| Adjust Time | 2 s |
| Dwell Time | 10 ms |

| Parameter Name | EMI Parameter |
|---|---|
| Reset Peak Hold on Freq Change | OFF |
| Couple to Signal | OFF |
| Couple to Marker | OFF |
| EMC Standard | |
| EMC Standard | CISPR |
| Search | |
| Search Criteria | Peak Criteria |
| Peak Number | ON, 25 |
| Limit | |
| Test Limits | OFF |
| Selected Limit | Limit1 |
| Limit State | OFF |
| Test Trace | Trace 1 |
| X Offset | 0 Hz |
| Y Offset | 0 dB |
| X Axis Type | Fixed |
| Y Axis Type | Fixed |
| Build From Trace | Trace 1 |
| Copy from Limit | Limit1 |
| Test Limits | Limit1 |
| Frequency Interpolation | Lin |
| Amplitude Interpolation | Log |
| Margin | Off, 0 dB |
| Global | |

| Parameter Name | EMI Parameter |
|---|---|
| Global CF | OFF, 515 MHz |
| **Marker** | |
| Marker Setup | |
| Selected Marker | Marker 1 |
| Marker Mode | Position |
| Reference Marker | Marker 2 |
| Marker Trace | Trace 1 |
| Line State | OFF |
| Couple Markers | OFF |
| Marker Function | |
| Selected Marker | Marker 1 |
| Meas at Marker Window | OFF |
| Peak Config | |
| Peak Threshold | 16.99 dBμV |
| Peak Excursion | On, 6 dB |
| Threshold Line | OFF |
| Peak Config Parameters | Max. |
| **System**[1] | |
| Power On | Preset |
| Power Switch | OFF |
| Beeper | OFF |
| Screen Brightness | 80% |
| Fan Speed | 56% |

| Parameter Name | EMI Parameter |
|---|---|
| Display Time | ON |
| Auto Calibrate | OFF |
| Language | English |

**NOTE**

[1]: Not affected by Preset settings.

### 5.6.2 Single/Continue

Press Single Continue to set the sweep mode to Single or Continuous. For detailed setting methods, refer to the descriptions in *Meter Meas Mode*.

### 5.6.3 Restart

Press Restart to restart to sweep. After performing this operation, the sweep or measurement is restarted. The Restart operation aborts the current sweep or measurement. It resets the sweep and trigger systems. All the previously measured data will be remeasured.

## 5.7 System Function

### 5.7.1 System

Sets the system parameters.

#### 5.7.1.1 I/O Setting

The analyzer supports the LAN or USB communication interface. In the **System** menu, click or tap **I/O** to enter the I/O setting menu to configure the following parameters.

**Network Status**

Different prompts will be displayed according to the current network connection status.

- DISCONNECTED!
- CONNECTED

**MAC Address**

The MAC address of each oscilloscope is unique. When assigning the IP address for the oscilloscope, the system uses the MAC address to identify the instrument.

**VISA Address**

Displays the VISA address currently used by the the instrument.

**IP Configuration Type**

The configuration type of the IP address can be DHCP, Auto IP, or Static IP. In different IP configuration types, the configurations for IP address and other network parameters are different.

- **DHCP**

  If "DHCP" is selected, the DHCP server in the current network will assign the network parameters (e.g. IP address, Subnet, Gateway, and DNS) for the the instrument.

- **Auto IP**

  When "Auto IP" is selected, the instrument will acquire the IP address ranging from "169.254.0.1" to "169.254.255.254" and the subnet mask (255.255.0.0) automatically based on the current network configuration. The "Auto IP" works only when "DHCP" is not selected or connection is failed.

- **Static IP**

  If "Static IP" is selected, the instrument is configured with static IP. In this case, you need to disable DHCP and Auto IP manually. At this time, you need to set the IP address, Subnet, Gateway, and DNS manually. At this time, you can self-define the network parameters (e.g. IP address) of the instrument.

  - **Set the IP address**

    The format of the IP address is nnn.nnn.nnn.nnn. The range of the first segment (nnn) of the address is from 0 to 255 (except 127); wherein, the valid range is from 0 to 223. The range for the other three segments is from 0 to 255. You are recommended to ask your network administrator for an IP address available.

    This setting will be saved to the non-volatile memory; if "Power On" is set to "Last", then DHCP and Auto IP are disabled at the next power-on. The instrument will load the preset IP address automatically.

  - **Set the subnet mask**

    The format of the subnet mask is nnn.nnn.nnn.nnn. Wherein, the range of "nnn" is from 0 to 255. You are recommended to ask your network administrator for a subnet mask available.

This setting will be saved in the non-volatile memory; if "Power On" is set to "Last", then DHCP and Auto IP are disabled at the next power-on. The instrument will load the preset subnet mask automatically.

- **Set the default gateway**

  You can set this parameter in Static IP mode. The format of the gateway is nnn.nnn.nnn.nnn. The range of the first segment (nnn) is from 0 to 223 (except 127), and the range for the other three segments is from 0 to 255. You are recommended to ask your network administrator for a gate address available.

  This setting will be saved to the non-volatile memory; if "Power On" is set to "Last", then DHCP and Auto IP are disabled at the next power-on. The instrument will load the preset gateway automatically.

- **Set the DNS address**

  You can set this parameter in Static IP mode. The format of the DNS address is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) of the address is from 0 to 223 (except 127); and the range for the other three segments is from 0 to 255. You are recommended to ask your network administrator for an address available.

  Generally, you do not need to set the DNS, therefore this parameter setting can be ignored.

**TIP**

- When the three IP configuration types are all turned on, the priority of the parameter configuration from high to low is "DHCP", "Auto IP", and "Static IP".
- The three IP configuration types cannot be all turned off at the same time.

**mDNS**

Click or tap the ON/OFF tab for **mDNS** to enable or disable the multicast Domain Name System (mDNS). This system is used to provide the function of DNS server for service discovery in a small network without a DNS server.

**Host Name**

If mDNS is enabled, you need to configure the mDNS host name, supporting inputting a maximum of 26-byte strings.

**Apply the Network Parameter Setting**

Click or tap **Apply** to validate the current network parameter setting.

**Reset the Communication Interface**

Click or tap **Reset**, then the prompt message "Are you sure to reset interface settings" is displayed. Click or tap **Confirm** to confirm resetting interface settings.

### 5.7.1.2 Basic Settings

In the **System** menu, click or tap **Setup** to enter the basic setting menu.

**Language**

This product supports menus in multiple languages. Both Chinese and English are available for the display of the help information, prompt messages, and interface. Click or tap the drop-down button of **Language** to select the specified system language from the drop-down list.

**Power On**

You can set the system configuration to be recalled when the oscilloscope is powered on again after power-off. Click or tap "Preset" or "Last" for **Power On**.

- Last: returns to the setting of the system at last power-off.
- Preset: restores the system to its factory setting.

**Power Switch**

- OFF: After the analyzer is connected to power, you need to press the Power key on the front panel to power on the instrument.
- ON: After the analyzer is connected to power, it will be powered on automatically.

**Beeper**

Click or tap the ON/OFF tab for **Beeper** to enable or disable the beeper. When the beeper is enabled, you can hear the sound of the beeper when you perform the following operations:

- Press a key or a menu key on the front panel
- Enable the touch screen
- When a prompt message is displayed

**Screen Brightness**

Drag the slide bar of **Screen Brightness** to set the screen brightness. Its settable range is from 0% to 100%.

**Fan Speed**

Click or tap the slide bar at the right side of **Fan Speed** to set the fan speed of the instrument. Its settable range is from 0% to 100%.

**Display Time**

Click or tap the ON/OFF tab for **Display Time** to enable or disable the display of the system time.

The system time (date and time) is displayed in the Notification Area at the lower-right corner of the screen. The date is displayed in "yyyy/mm/dd" format, and the time is displayed in "hh:mm:ss" format. When you save the waveform, the output file will contain the time information. Users can set the system time.

- **Date:** Click or tap the "Date" area, then the date setting interface is displayed. Select a proper date, then click or tap **Confirm** to confirm the date modification.
- **Time:** Click or tap the "Time" area, then the time setting interface is displayed.
  - Click or tap the Hour/Minute number and then drag the hour/minute hand to modify the time.
  - After setting, click or tap **Confirm** to confirm the setting.

### 5.7.1.3 About this Spectrum

In the **System** menu, click or tap **About**, and then you can view the model, version, and other information about this spectrum analyzer in **About** menu.

- **Model**

  Indicates the product model.
- **Serial number**

  Indicates the serial number of the product, the unique identification for the product.
- **Firmware**

  Indicates the firmware version number of the product.
- **Hardware**

  Indicates the hardware version number of the product.
- **Build**

  Indicates the creation time for the software version.
- **Android.Build**

  Indicates the creation time of the Android operating system.
- **Android.Version**

  Indicates the version number of the Android operating system. For example, 7.1. 0.
- **Launcher**

Indicates the desktop UI version number of the Android operating system.

- **WebControl**

  Indicates the version number of browser remote control module.

- **Upgrade**

  Click or tap **Upgrade**, and the file management interface is displayed. Select the desired upgrade file to upgrade the system. For detailed operations, refer to the descriptions in *Update*.

#### 5.7.1.4 Options

In the "System" menu, click or tap **Options**, then all the options that have currently been installed can be displayed. For the procedures of installing the option, refer to descriptions in *To View the Option and the Option Installation*.

#### 5.7.1.5 Calibration

1. **Calibrate Now**

   Click or tap this menu, and the analyzer will use the internal calibration source to perform the self-calibration immediately.

2. **Auto Calibrate**

   Enables or disables auto self-calibration. If auto self-calibration is enabled, the analyzer will perform one self-calibration after it is launched.

### 5.7.2 File

RSA6000 series spectrum analyzer allows you to save various types of files to the internal or external memory, and recall them when necessary.

Click or tap  > **File** to enter the file management interface.

#### 5.7.2.1 File

Click or tap **File** to enter the file management interface. You can use the gesture-enabled touch screen operation or use the mouse to click on the screen to select the corresponding file or folder. Displays all the files with the specified file types. When you select a file or folder, you can click or tap **Rename**, **Cut**, **Copy**, **Paste**, **Cancel**, **Delete**, or **Security Clear** to perform the specified operation.

The available file types include: State, Trace+State, Measurement Data, Limit, Screen Image, Correction, Signal List, and Scan Table. The descriptions for various file types are shown in the following table.

| File Type | Format | Suffix Name |
|---|---|---|
| State | BIN | .sta |
| Trace+State | BIN | .trs |
| Measurement Data | CSV | .csv |
| Limit | CSV | .csv |
| Correction | CSV | .csv |
| Screen Image | IMAGE | .jpg/bmp/png |
| Signal List | CSV | .csv |
| Scan Table | CSV | .csv |

**NOTE**

RSA6000 can only recognize files whose filenames consist of Chinese characters, English letters, or numbers. If the filename or folder name contains strings other than the above mentioned characters, the file or the folder might not be displayed normally in the file manager interface.

#### 5.7.2.2 Copy

Copies the currently selected file or folder.

#### 5.7.2.3 Cut

Cuts the currently selected file or folder from the specified path.

#### 5.7.2.4 Paste

Pastes the file or folder.

When the current path has contained a file or folder whose name is the same as the one that you want to paste, after you perform the paste operation, the original file or folder will be overwritten.

#### 5.7.2.5 Rename

Renames a file that has been stored. After you select a file, click or tap this menu name to input a new filename.

#### 5.7.2.6 Delete

Deletes the selected file.

#### 5.7.2.7 New Folder

Creates a folder under the current directory, and the file is named with a default filename. To modify this filename, click or tap **Rename** to rename the file.

#### 5.7.2.8 Security Clear

Click or tap **SecurityClear**, then a prompt message "Confirm SecurityClear?" is displayed. Click or tap **Confirm** to clear all the saved files from the internal memory. Click or tap **Cancel** to cancel security clear operation.

### 5.7.3 Recall

RSA6000 allows you to recall various types of files from the internal or external storage memory.

Click or tap  > **Recall** to enter the file recalling menu. The available file types to be recalled include: State, Trace+State, Measurement Data, Limit, Correction, Signal List, and Scan Table.

#### 5.7.3.1 State

Click or tap **State** to enter the state recalling menu. The state can be recalled from the register or the file.

1. **Load from File**

   Click or tap **Load from File** to enter the file management interface. Select a file and then click or tap **Confirm** to confirm loading the specified file.

2. **Register1 through Register16**

   When any one of the items from Register1 to Register16 is selected, the state of the specified register will be recalled.

#### 5.7.3.2 Trace & State

Click or tap **Trace & State** to enter the trace & state recalling menu. The state of the instrument and the selected trace can be recalled from the register or the file.

1. **Load from File**

   Click or tap **Load from File** to enter the file management interface. Select a file to be loaded, and then click or tap **Recall** to recall the file.

2. **Select Trace**

   When any one of the items from Trace1 to Trace3 is selected, the specified trace is recalled.

**3. Register1 through Register16**

When any one of the items from Register1 to Register16 is selected, the state of the specified register will be recalled.

#### 5.7.3.3 Measurement Data

Click or tap **Meas Data** to enter the measurement data recalling menu.

**1. Load from File**

Click or tap **Load from File** to enter the file management interface. Select a file to be loaded, and then click or tap **Recall** to recall the file.

**2. Measure Type**

Selects the measurement data type to be loaded. The supported measurement types include Trace1, Trace2, and Trace3.

#### 5.7.3.4 Limit

Click or tap **Limit** to enter the limit line recalling menu.

**1. Load from File**

Click or tap **Load from File** to enter the file management interface. Select a file and then click or tap **Confirm** to confirm loading the specified file.

**2. Select Limit**

When any one of the items from Limit1 to Limit6 is selected, the specified limit line is recalled.

#### 5.7.3.5 Amplitude Correction

Click or tap **Correction** to enter the amplitude correction recalling menu. Select the amplitude correction type (Antenna, Cable, Other, and User) to load it from the specified path. The data will be loaded in .csv format. They are separated with a comma, and this is convenient for you to analyze the data in software like Excel.

#### 5.7.3.6 Signal List

Click or tap **Load from File**, then the file management interface is displayed. Select a file and then click or tap **Confirm** to confirm loading the specified file.

#### 5.7.3.7 Scan Table

Click or tap **Load from File**, then the file management interface is displayed. Select a file to be loaded, and then click or tap **Confirm** to confirm loading the specified file.

## 5.7.4 Save

RSA6000 allows you to save various types of files to the internal or external memory.

Click or tap  > **Save** to enter the file saving interface. The available file types to be saved include: State, Preset, Trace+State, Measurement Data, Limit, Correction, Screen, Signal List, and Scan Table.

### 5.7.4.1 State

Click or tap **State** to enter the state saving menu. The state can be saved to the register or the file.

1. **Save to File**

   Click or tap **Save to File** to save the current state in the default filename or user-defined filename.

2. **Register1 through Register16**

   When any one of the items from Register1 to Register16 is selected, the current state of the instrument will be saved to the corresponding register. The register supports quick save and recalling instrument state. The register menu displays the time for saving the instrument state.

### 5.7.4.2 Preset

1. **Select Preset**

   Click or tap **Select Preset** to select the desired preset settings. The available choices include "Default", "User1", "User2", "User3", "User4", "User5", and "User6".

2. **Register1 through Register16**

   When any one of the items from Register1 to Register16 is selected, the current state of the instrument will be saved to the corresponding register. The register supports quick save and recalling instrument state. The register menu displays the time for saving the instrument state.

### 5.7.4.3 Trace & State

Click or tap **Trace & State** to enter the trace & state saving menu. The state of the instrument and the selected trace can be saved to the register or the file.

1. **Save to File**

   Click or tap this menu to save the current state and trace in the default filename or user-defined filename.

2. **Select Trace**

Selects the trace to be saved. You can select any single trace from Trace1 to Trace3.

3. **Register1 through Register16**

When any one of the items from Register1 to Register16 is selected, the current state of the instrument will be saved to the corresponding register. The register supports quick save and loading instrument state. The register menu displays the time for saving the instrument state.

#### 5.7.4.4 Measurement Data

Click or tap **Meas Data** to enter the measurement data saving menu. The selected measurement data can be saved to the specified file. The data will be saved in .csv format. They are separated with a comma, and this is convenient for you to analyze the data in software like Excel.

1. **Save to File**

Click or tap this menu to save the currently selected type of measurement data in the default filename or user-defined filename.

2. **Measure Type**

Selects the measurement data type to be saved. The data types supported by the instrument include Trace1, Trace2, and Trace3.

3. **Edit Report**

After selecting the EMI measurement type, click or tap this menu to edit the measurement report to be generated.

**a.** Environment

| Menu Name | Description |
|---|---|
| Temperature | Enables or disables the display of the temperature. |
| Humidity(RH) | Enables or disables the display of the relative humidity. |
| Testing Place | Enables or disables the display of the testing place. |
| Testing Distance | Enables or disables the display of the testing distance. |
| Polar Direction | Enables or disables the display of the polar direction. |
| Other Explanation | Enables or disables the display of other explanations. |

When you check the checkbox of the specified item, you can input the relevant information into the input field with the pop-up virtual keyboard.

**b.** Header

| Menu Name | Description |
|---|---|
| Client | Enables or disables the display of the client information. |
| Operator | Enables or disables the display of the operator information. |
| Product Desc | Enables or disables the display of the product description. |

When you check the checkbox of the specified item, you can input the relevant information into the input field with the pop-up virtual keyboard.

**c.** Ampt Corr

Selects the displayed correction data to "Full Data". You can also select "OFF" to disable the display of the correction data.

**d.** Limits

Selects the displayed limit line data to "Full Data". You can also select "OFF" to disable the display of the limit line data.

**e.** Screen

Sets the screen image color in the report to "Inverted" or "Normal". You can also select "OFF" to disable the display of the screen image.

**f.** Table & List

- Scan Table: enables or disables the display of the scan table.
- Signal List: enables or disables the display of the signal list.

**g.** Output Format

Sets the output format of the report to "HTML" or "PDF". When you select "HTML", the report is saved in "*.html" format. When you select "PDF", the report is saved in "*.pdf" format.

**4. Export Report**

Click or tap this menu to save the current measurement data report to the default path (/emi/measdata).

**5. Report Name**

Click or tap this menu to set the report file name with the pop-up virtual keyboard.

#### 5.7.4.5 Limit

Click or tap **Limit** to enter the limit line saving menu. The selected limit line is saved to the file.

1. **Save to File**

   Click or tap **Save to File** to save the currently selected limit line in the default filename or user-defined filename.

2. **Select Limit**

   Selects the limit line to be saved. You can select any one of the limit lines (from Limit1 to Limit6).

#### 5.7.4.6 Amplitude Correction

Click or tap **Correction** to enter the amplitude correction saving menu. Select the specified amplitude correction type (Antenna, Cable, Other, and User) to save to the specified path. The data will be saved in .csv format. They are separated with a comma, and this is convenient for you to analyze the data in software like Excel.

#### 5.7.4.7 Screen Image

Click or tap **Screen** to enter the screen saving menu. You can also click or tap  on the quick operation toolbar to quick save the screen image.

1. **Save to File**

   Click or tap **Save to File** to save the current screenshot in the default filename or user-defined filename.

2. **Screenshot Info**

   **a.** Image Format

   Click or tap Format to select the file format of the current screen image to be "*png", "*.bmp", or "*.jpg".

   **b.** Invert

   Click or tap the ON/OFF tab for **Invert** to enable or disable inverting the color of the current screen image.

#### 5.7.4.8 Signal List

Click or tap **Save to File**, then the file management interface is displayed. Select a file to be saved, and then click or tap **Save** to save the file.

#### 5.7.4.9 Scan Table

Click or tap **Save to File**, then the file management interface is displayed. Click or tap **Save** to save the file.

### 5.7.5 Update

This instrument supports local upgrade.

1. Click or tap  > **Update**, then the File Management interface is displayed. Select the update file. For detailed operations, refer to the descriptions in *File*.
2. Click or tap **Confirm** to complete the local upgrade.

### 5.7.6 Help Menu

The built-in help file 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.

### 5.7.7 Shutdown

- Click or tap the function navigation icon  at the lower-left corner of the screen to enter the function navigation. Click or tap **Shutdown** to shut down the instrument. Then, a prompt message "Are you sure to shutdown?" is displayed. Click or tap **Confirm** to confirming shutting down the instrument.
- Press down the power key  , then a prompt message "Are you sure to shutdown?" is displayed. Click or tap **Confirm** to confirming shutting down the instrument.
- Press the power key  continuously for two times to turn off the instrument.
- Long press the power key  for three seconds to turn off the instrument.

### 5.7.8 Restart

Click or tap the function navigation icon  at the lower-left corner of the screen to enter the function navigation. Click or tap **Restart** to restart the instrument. Then, a prompt message "Are you sure to restart?" is displayed. Click or tap **Confirm** to restart the instrument.

# 6 Remote Control

This instrument supports Web Control remote operation. Web Control is Web-based remote control operation. With Web control, you can access and operate the LAN-connected instrument via the web page on any smart terminals such as PC, mobile, and iPad, without needing to install any software. The operation procedures are as follows:

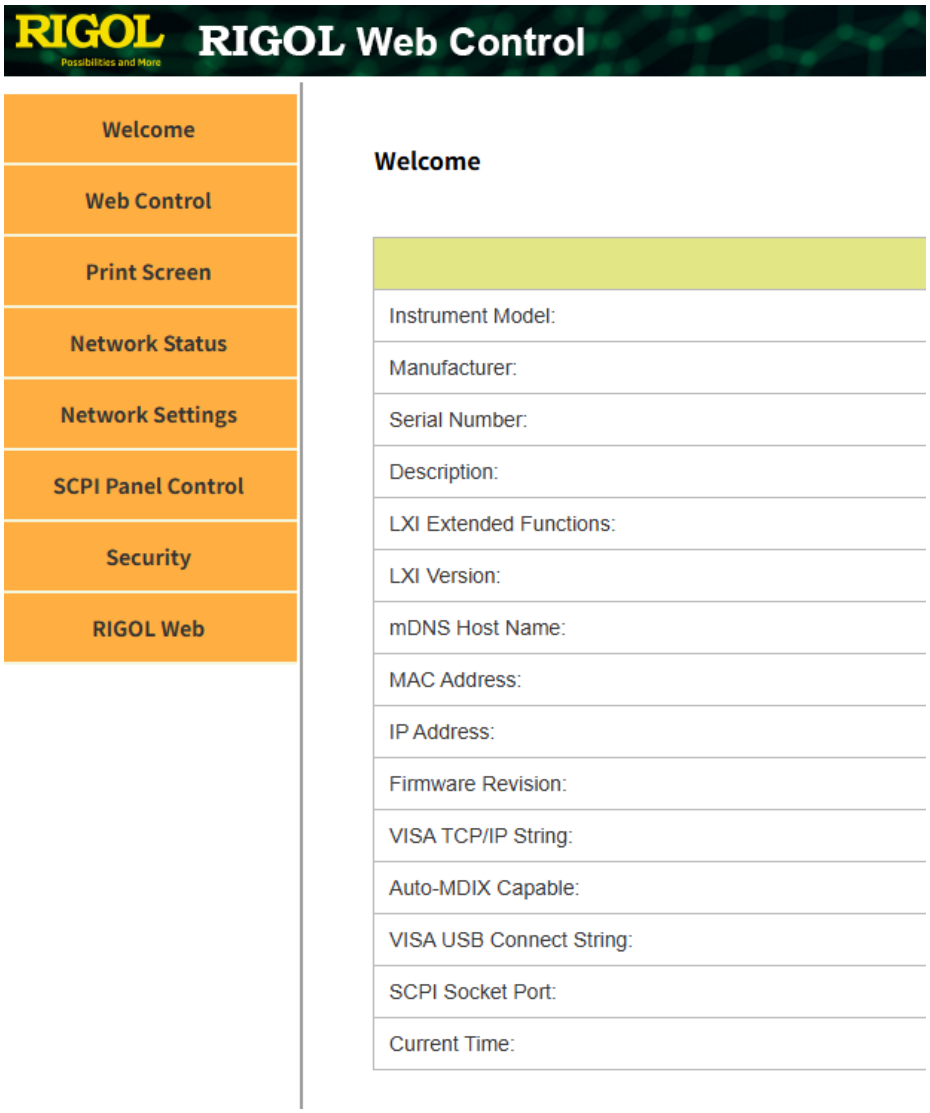
1. Connect the instrument to the network

   Ensure that the rear-panel LAN interface is connected to the network. Note that the instrument must be connected to the network where the control terminal is located. Then you can operate the instrument in remote way by accessing the network.

2. Obtain the IP address

   In the **System** menu, click or tap **IO** to view the IP address of the instrument.

3. Input the IP address of the instrument into the browser address bar, then press Enter to access the web page, as shown in the following figure.




4. Click **Web Control** on the left side of the screen to enter the instrument remote control interface. You can use the mouse to remotely control the instrument in real time, with the same effect as operating the instrument directly.
5. Click **Print Screen**, and you can select "Take Screenshot" or "Record Screen" to capture the current screen shot.
6. Click **Network Settings** to configure the network. Note that login is required when changing the network configuration. When you first log in to the Web Control, use the user name "admin" and the password "rigol"..
7. The SCPI Panel Control function allows the user to send SCPI commands through the web interface for remote programming control of the instrument. Click **SCPI Panel Control** to enter the commands into the SCPI Command input field. After inputting the commands, click the **Send&Read** button to send the command and read the returned value.

   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* of this series of product.

8. Close the browser to exit the instrument remote control interface.

Only one user can access the instrument IP address for remote control operation at a time. First come, first served. Concurrent logins are not allowed. If the connection is interrupted, you can refresh the browser to load the page.

**CAUTION**

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

# 7 Troubleshooting

**1. When I power on the instrument, the instrument stays black and does not display anything.**

**a.** Check whether the power is correctly connected.

**b.** Check whether the power key is really pressed.

**c.** Check whether the fuse is blown. If you need to replace the fuse, use only the specified fuse that conforms to the product.

**d.** Restart the instrument after finishing the above inspections.

**e.** If the problem still persists, please contact RIGOL.

**2. The USB storage device cannot be recognized.**

**a.** Check whether the USB storage device can work normally when connected to other instruments or PC.

**b.** Make sure that the USB storage device is FAT32 format and flash type. The insrument doesn't support hardware USB storage device.

**c.** After restarting the instrument, insert the USB storage device again to check whether it can work normally.

**d.** If the USB storage device still cannot work normally, please contact RIGOL.

**3. The touch functions cannot be used normally.**

**a.** Check whether you have locked the touch screen. If yes, unlock the touch screen.

**b.** Check whether the screen or your finger is stained with oil or sweat. If yes, please clean the screen or dry your hands.

**c.** Check whether there is a strong magnetic field around the instrument. If the instrument is close to the strong magnetic field (e.g. a magnet), please move the instrument away from the magnet field.

**d.** If the problem still persists, please contact RIGOL.

# 8 Appendix

## 8.1 Appendix A: Options and Accessories

| | Description | Order No. |
|---|---|---|
| Model | Real-time Spectrum Analyzer, 5 kHz to 8.5 GHz | RSA6085 |
| | Real-time Spectrum Analyzer, 5 kHz to 14 GHz | RSA6140 |
| | Real-time Spectrum Analyzer, 5 kHz to 26.5 GHz | RSA6265 |
| Standard Accessory | Power Cord | - |
| Options | Vector Signal Analysis Application Software | RSA6000-VSA |
| | EMI Measurement Application Software | RSA6000-EMI |
| | Analog Demodulation Application Software | RSA6000-ADM |
| | Preamplifier (PA), 8.5 GHz | RSA6000-P08 |
| | Preamplifier (PA), 14 GHz | RSA6000-P14 |
| | Preamplifier (PA), 26.5 GHz | RSA6000-P26 |
| | 200 MHz Analysis Bandwidth | RSA6000-B200 |
| | 200 MHz Real-time Bandwidth | RSA6000-RB200 |
| | Advanced Measurement Kit | RSA6000-AMK |
| | 8.5 GHz Tracking Generator Output | RSA6000-T08 |
| Optional Accessories | DSA utility kit. Refer to *Note[1]* for details. | DSA Utility Kit |
| | RF adaptor kit. Refer to *Note[2]* for details. | RF Adaptor Kit |
| | Includes: 50 Ω to 75 Ω adaptor (2pcs) | RF CATV Kit |
| | Includes: 6 dB attenuator (1pcs), 10 dB attenuator (2pcs) | RF Attenuator Kit |
| | 30 dB high-power attenuator, with the max. power of 100 W | ATT03301H |
| | N(M)-N(M) RF Cable | CB-NM-NM-75-L-12G |
| | N(M)-SMA(M) RF Cable | CB-NM-SMAM-75-L-12G |
| | Near-field Probe | NFP-3 |
| | USB Cable x1 | CB-USBA-USBB-FF-150 |

**NOTE**

- For all the mainframes, accessories, and options, please contact the local office of RIGOL.
- [1]: Includes N-SMA cable, BNC-BNC cable, N-BNC adaptor, N-SMA adaptor, 75 Ω-50 Ω adaptor, 900 MHz/1.8 GHz antenna (2pcs), 2.4 GHz antenna (2pcs)
- [2]: Includes: N(F)-N(F) adaptor (1pcs), N(M)-N(M) adaptor (1pcs), N(M)-SMA(F) adaptor (2pcs), N(M)-BNC(F) adaptor (2pcs), SMA(F)-SMA(F) adaptor (1pcs), SMA(M)-SMA(M) adaptor (1pcs), BNC T type adaptor (1pcs), 50 Ω SMA load (1pcs), 50 Ω BNC impedance adaptor (1pcs)

## 8.2 Appendix B: Warranty

RIGOL TECHNOLOGIES CO., LTD. (hereinafter referred to as RIGOL) warrants that the product mainframe and product accessories will be free from defects in materials and workmanship within the warranty period. If a product proves defective within the warranty period, RIGOL guarantees free replacement or repair for the defective product.

To get repair service, please contact your nearest RIGOL sales or service office.

There is no other warranty, expressed or implied, except such as is expressly set forth herein or other applicable warranty card. There is no implied warranty of merchantability or fitness for a particular purpose. Under no circumstances shall RIGOL be liable for any consequential, indirect, ensuing, or special damages for any breach of warranty in any case.

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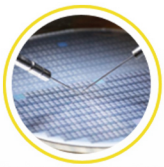

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