

Spectrum Host Computer Software Help

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1. Overview

Welcome to the help of host computer software. This manual aims to help you quickly master the installation and use of host computers.

The manual is divided into two main chapters:

- **Chapter 1: How to Install the Host Computer**

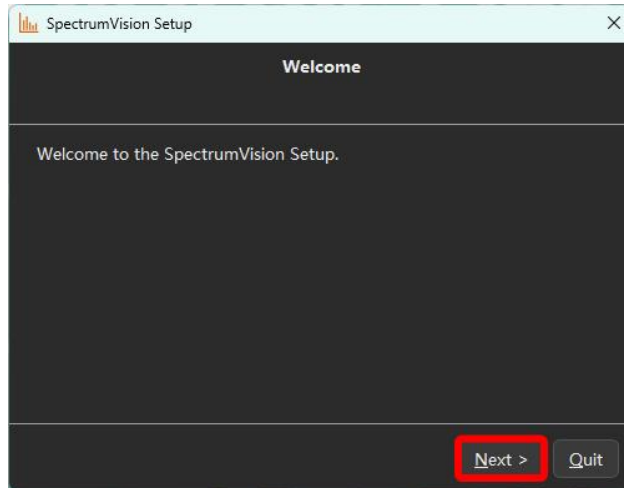
This chapter introduces the installation process of the host computer in detail, including the installation steps and solutions to common problems. Through this chapter, you can easily complete the installation and configuration of the host computer, laying the foundation for subsequent use.

- **Chapter 2: How to Use the Host Computer**

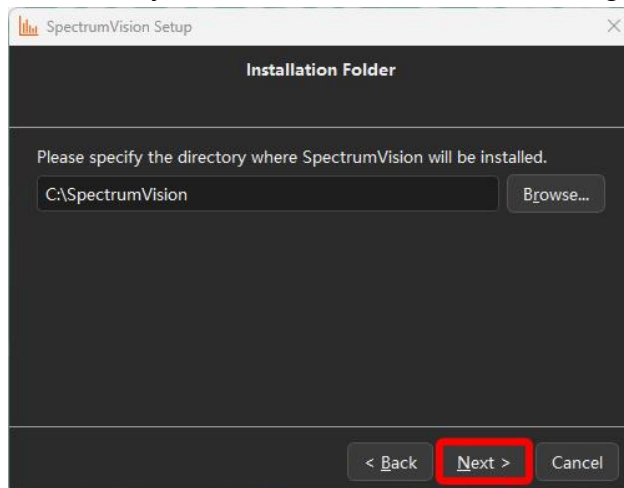
This chapter focuses on the core functions and operation methods of the host computer, covering the instructions for using the network and USB connection. You will learn how to monitor in real time by connecting devices, configuring parameters, and more. In addition, this chapter provides practical tips and precautions to help you avoid common mistakes and improve operational efficiency.

2. How to install the host computer

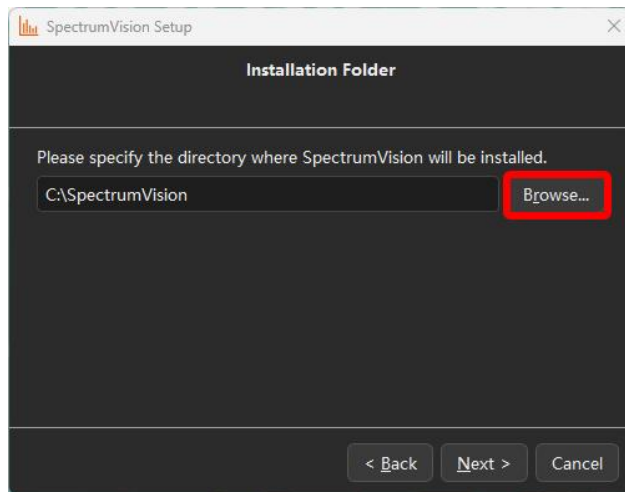
- (1) Get the host computer installation package from the official website, double-click the installation package  SpectrumVision .
- (2) Go to the welcome screen and click "**Next**" as shown in the figure below.



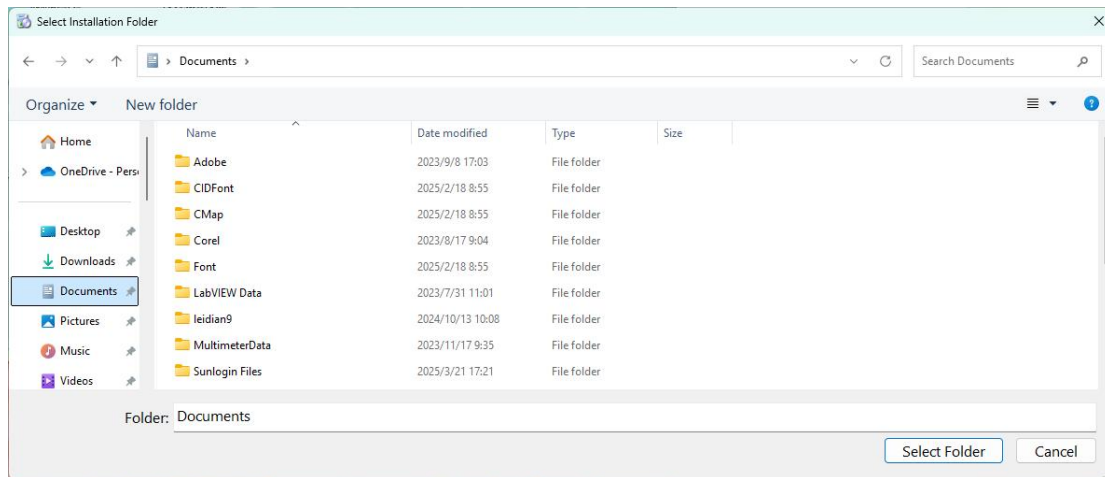
- (3) Enter the installation folder interface to determine whether to change the installation path.
 - 1) If you don't need to change the software installation location, you can directly click "**Next**", as shown in the figure below.



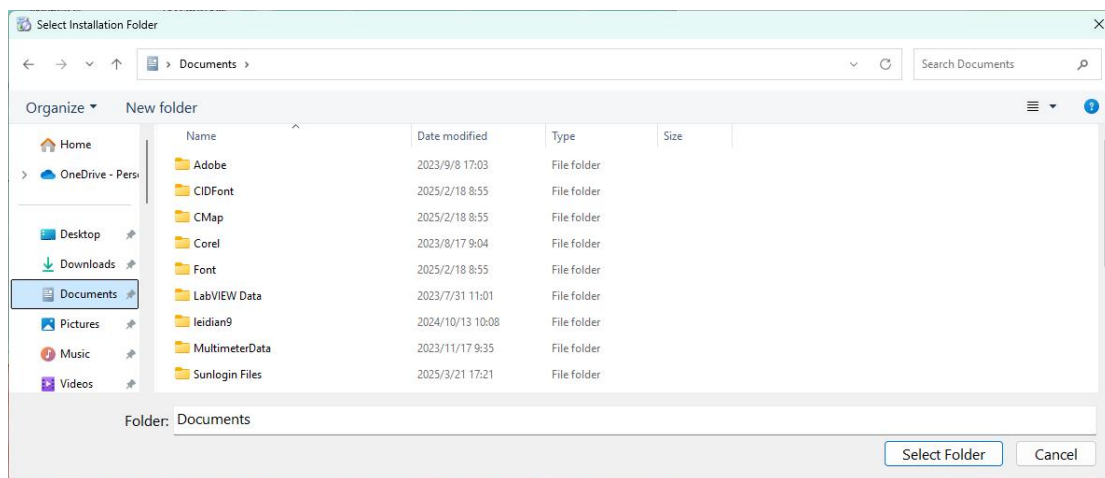
- 2) If you need to change the software installation location, follow the steps below.
 - ① Click on "**Browse**" as shown in the image below.

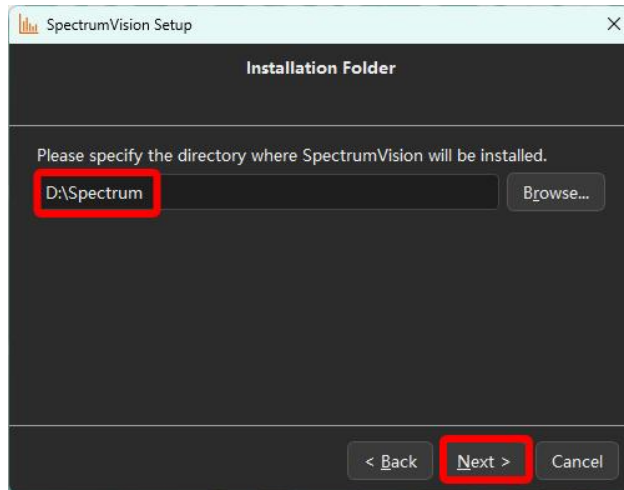


- ② Enter the Select Installation Folder interface and select the software installation location, as shown in the figure below.

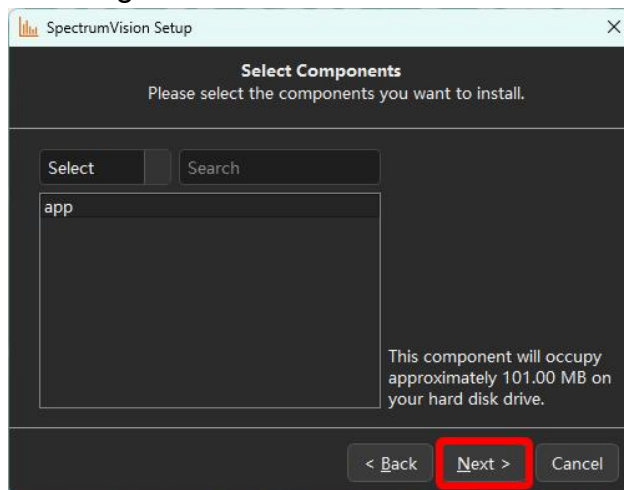


- ③ Click **"Select Folder"** to save the software installation location, and click **"Next"** to enter the component selection interface, as shown in the figure below.

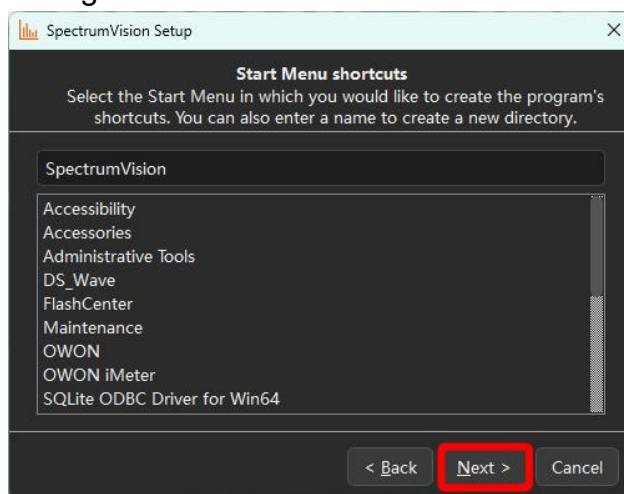




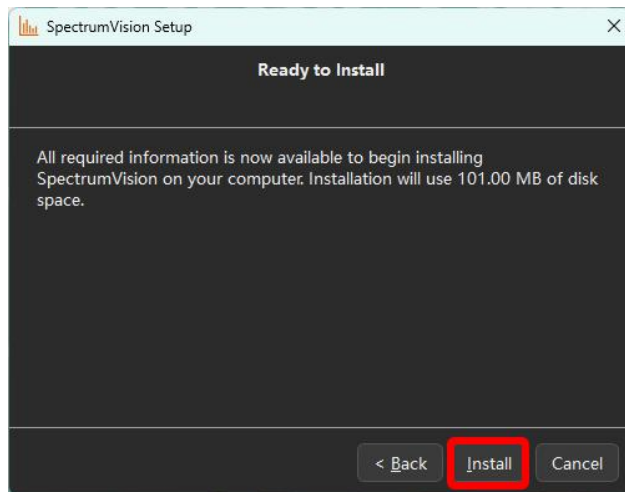
- (4) Click "**Next**" to enter the Start menu shortcut interface, as shown in the image below.



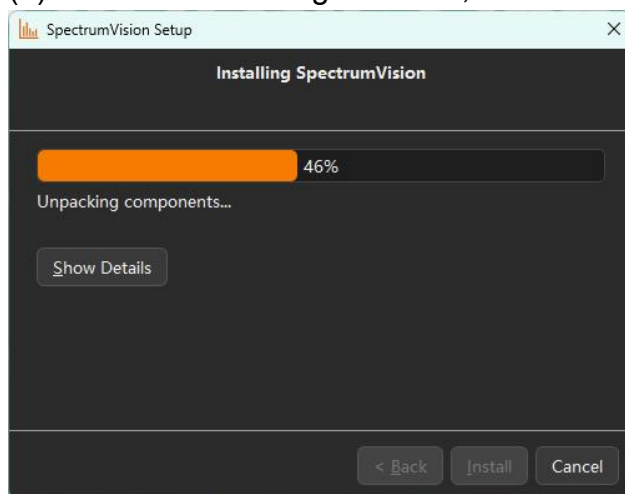
- (5) In the start menu shortcut interface, click "**Next**" after the selection is completed to enter the preparation for installation interface, as shown in the figure below.



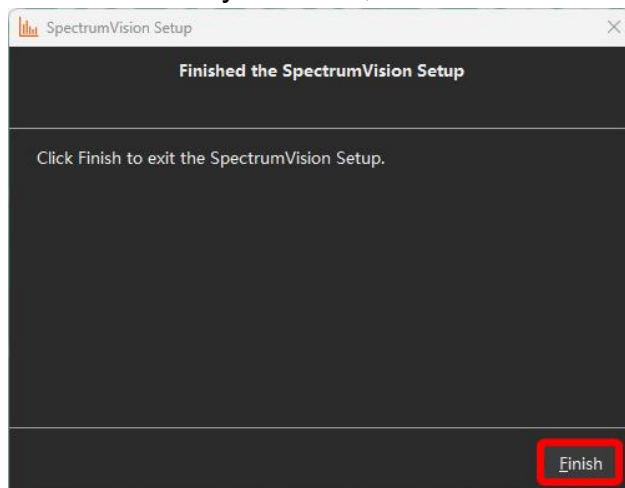
- (6) Click "**Install**" to enter the preparation for installation interface, as shown in the figure below.



(7) Enter the Installing interface, as shown in the figure below.



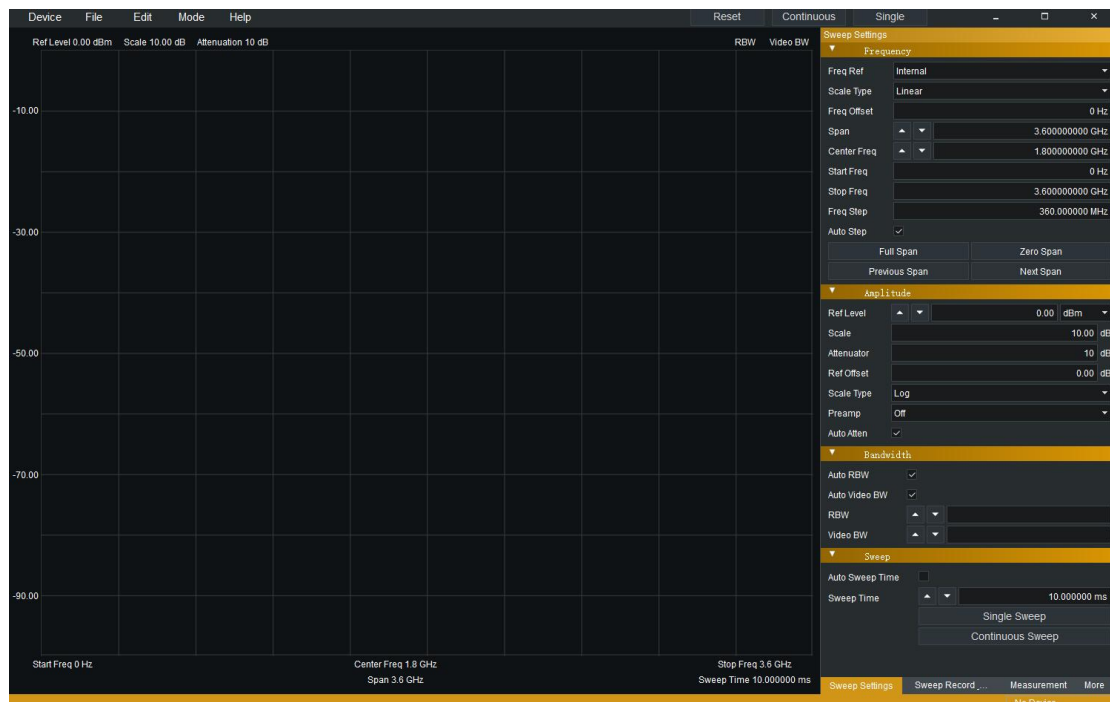
(8) Click "**Finish**" to exit the installation wizard, and the host computer is successfully installed, as shown in the figure below.



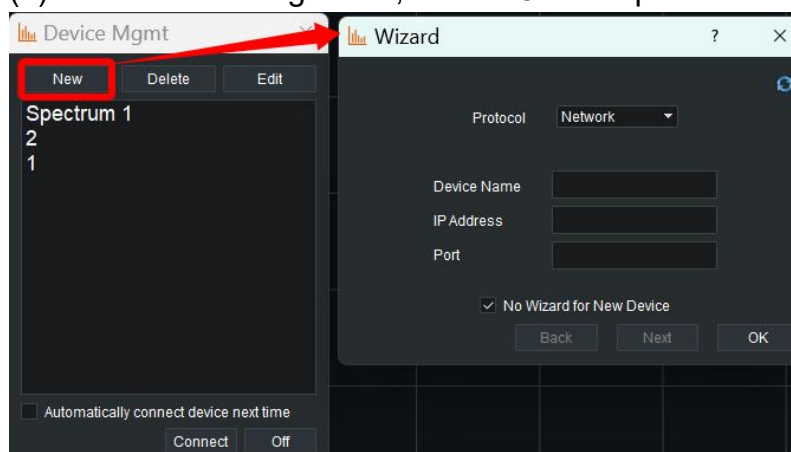
3. How to use the host computer

How to use the network to connect to the host computer

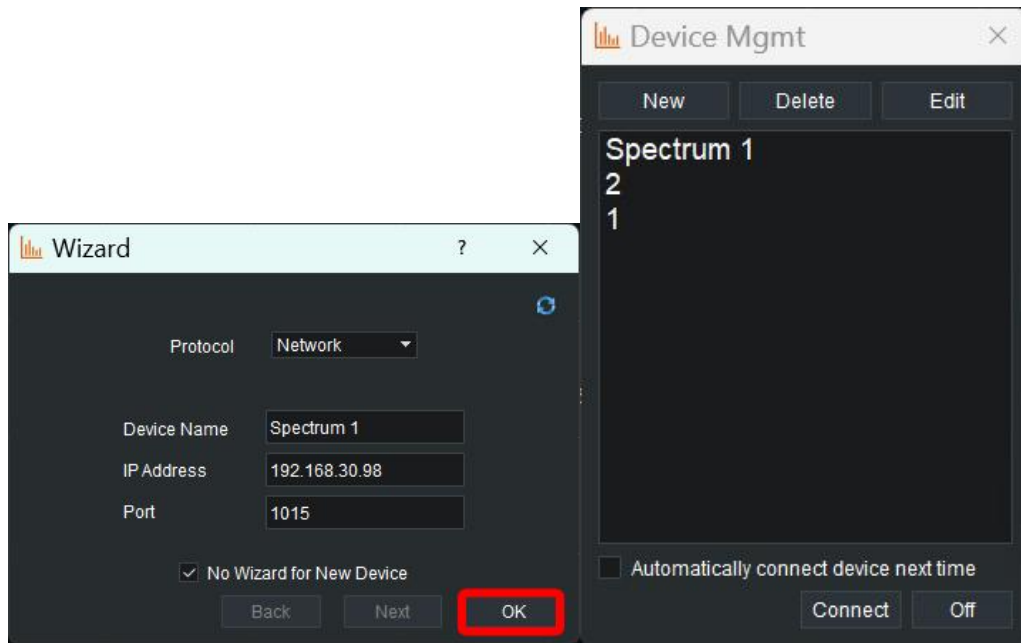
- (1) Double-click to open the upper computer and enter the upper computer interface.



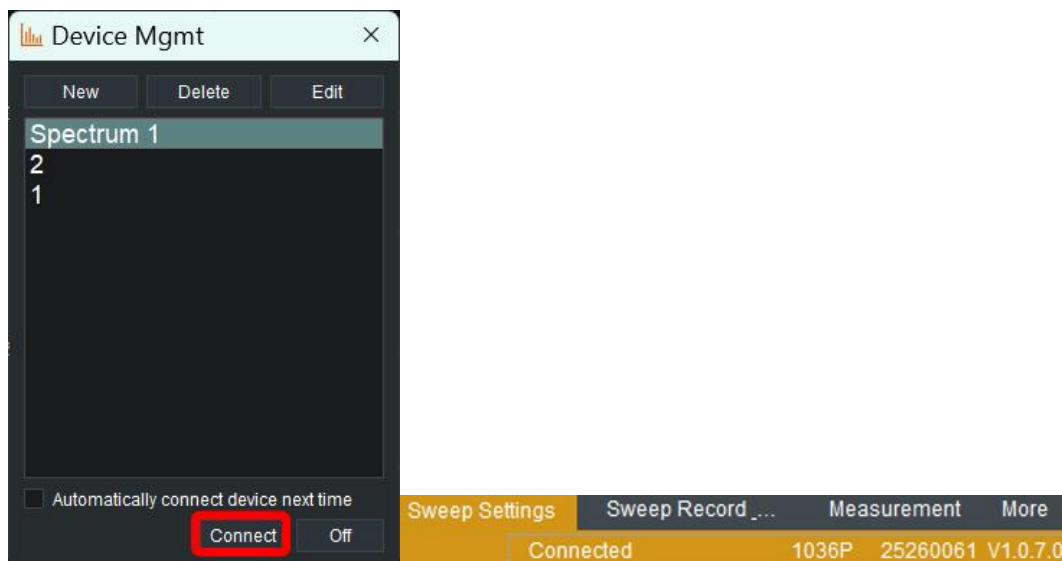
- (2) In Device Management, click "**New**" to open the Add Device wizard.



- (3) Select "**Network**" in the protocol drop-down box, enter the device name, IP address and port number (consistent with the system information in the spectrum), and click "**OK**" after the input is completed to add the device.
Note: The computer and the spectrum analyzer must be in the same network segment.



- (4) Select the name of the device that needs to be connected, click "**Connect**", and the lower right corner shows that it is connected, which means the connection is completed.



How to connect to the host computer using USB

Device Connection and Driver Installation Instructions

To ensure stable communication between the device and the host computer, please read the following driver installation guide carefully before starting operation:

1. Recommended solution: NI VISA driver connection (preferred)

The NI VISA driver is the default and recommended for this device to connect. The scheme has good compatibility and communication stability.

Installation Guide: Please refer to the attached document "NIVISA & USB Driver_Installation_Guide_V1.2" to install and configure the driver.

Simplified operation: If you have successfully installed the NI VISA driver and completed device identification, you can skip driver debugging and directly proceed to software connection operations.

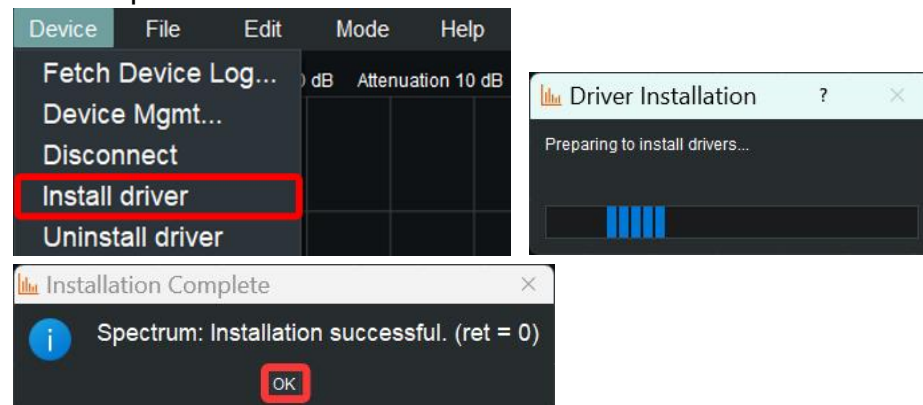
2. Alternative: Local drive connection

If the NI VISA driver cannot be used normally due to system environment limitations or other special reasons, you can try using the device-specific host computer driver. The specific installation and configuration steps are as follows:

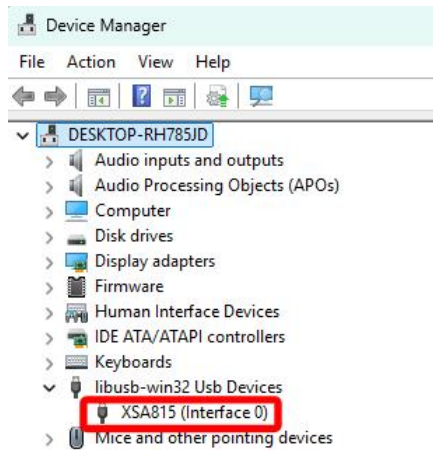
How to install the driver

To use USB to connect to the host computer, you need to install the corresponding driver first.

- (1) Click "**Device**" in the upper left corner, select "**Install driver**", and the driver installation progress bar will pop up on the screen. After the installation is completed, a successful installation prompt will pop up. Click "**OK**" to complete the driver installation.

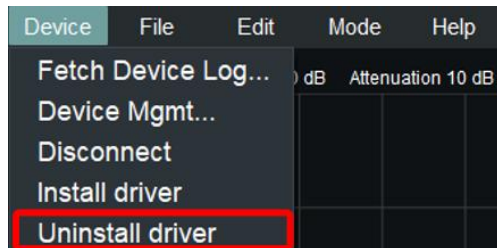


- (2) Connect USB to your computer and open Device Manager to see the connected devices.



How to uninstall the driver

- (1) Click "**Device**" in the upper left corner, select "**Uninstall driver**", and wait a moment to uninstall successfully.

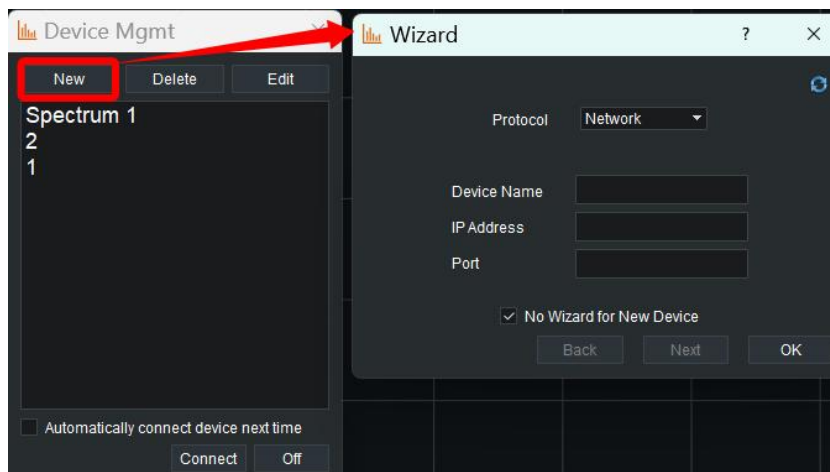


How to connect to the host computer

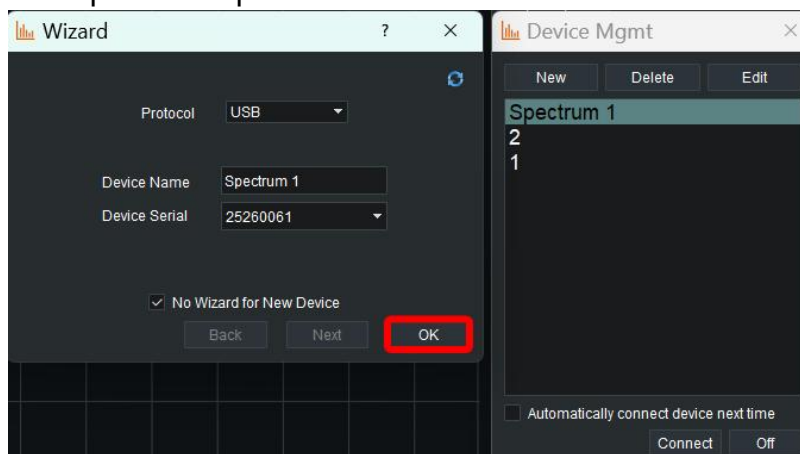
- (1) Double-click to open the upper computer and enter the upper computer interface.



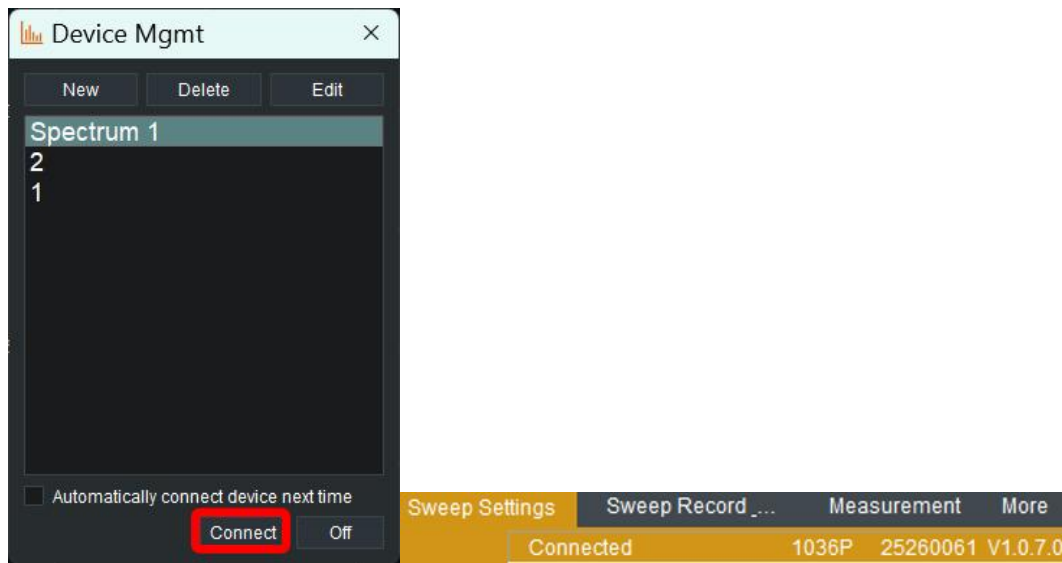
(2) In Device Management, click "**New**" to open the Add Device wizard.



(3) Select "**USB**" in the protocol drop-down box, enter the device name and select the device serial number, and click "**OK**" to add the device after the input is completed.



- (4) Select the name of the device to be connected, click "**Connect**", and the lower right corner shows that it is connected, which means the connection is completed.



How to use the host computer

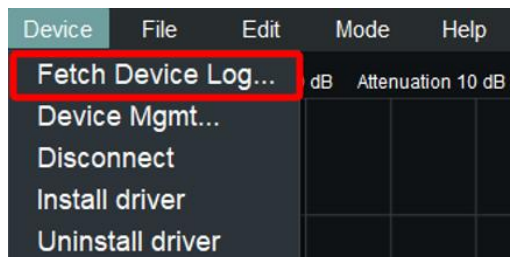
Note:

- When the host computer is successfully connected, the keys on the instrument panel will not be operable, and all operations need to be carried out through the software interface.
 - **Use the network to connect to the upper computer:** To resume the operation of the instrument panel, press the **Preset** key on the instrument panel. At this time, the software interface will not be operable.
 - **Use USB to connect to the host computer:** To resume the operation of the instrument panel, please first click "**Disconnect**" on the host computer interface, and then press the **Preset** key on the instrument panel. At this time, the software interface will not be operable.
 - To resume instrument software operation, reconnect the host computer.
- (1) When the connection is successful, the current waveform is displayed.

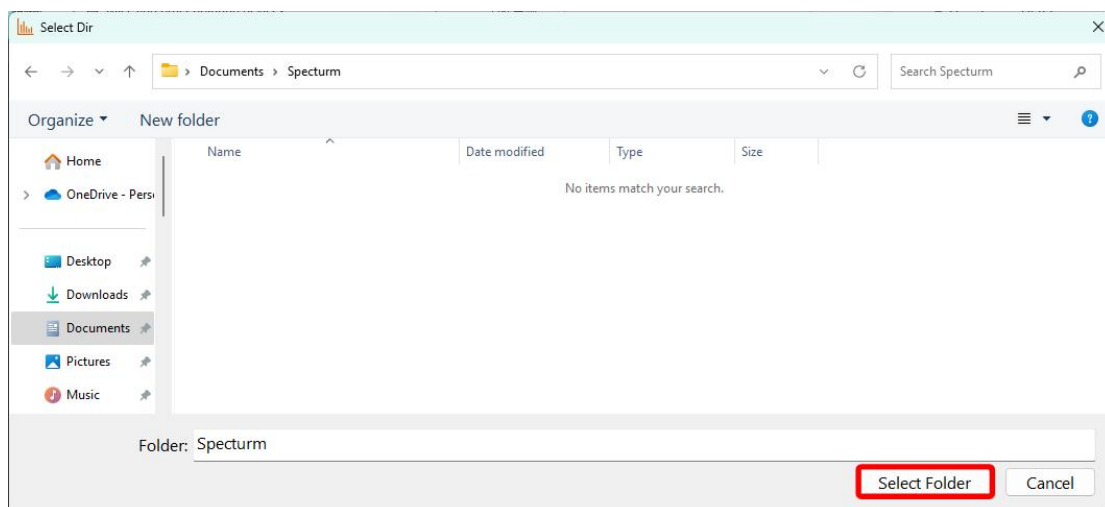


How to get device logs

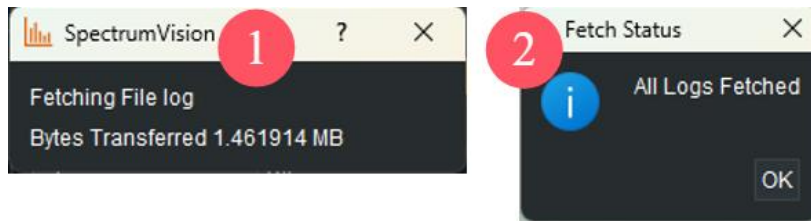
(1) Click on "**Device**" in the top left corner and select "**Fetch Device Log...**".



(2) Select a folder to store logs, and click "**Select Folder**" when the selection is complete.

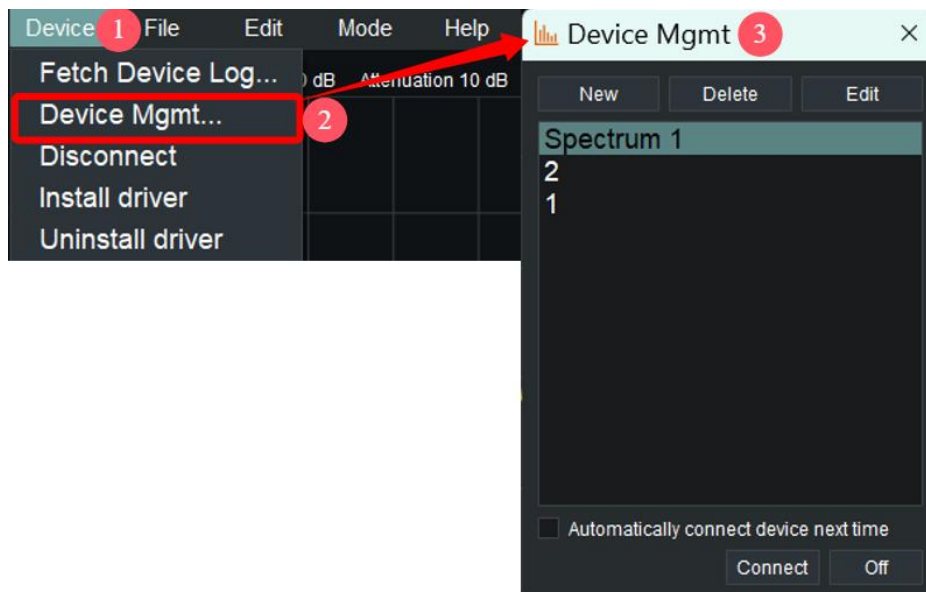


(3) The host computer automatically starts to obtain all logs, and the "**All Logs Fetch**" prompt pops up.



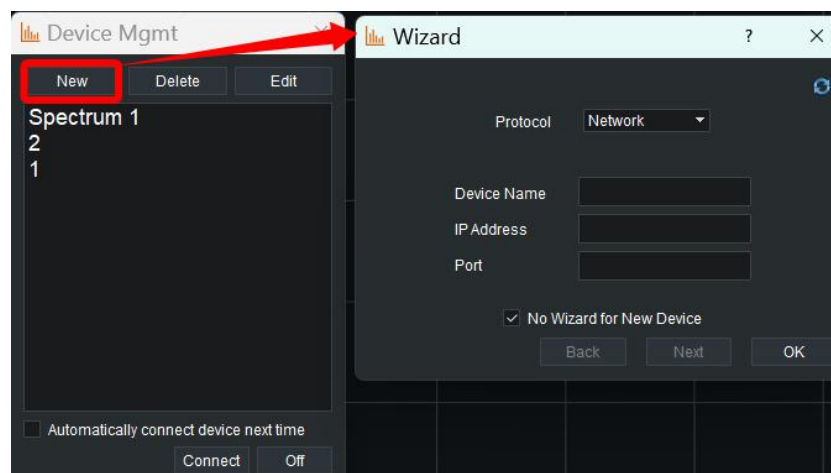
How to make device management settings

- (1) Click "**Device**" in the upper left corner and select "**Device Mgmt...**" to bring up the Device Manager interface.

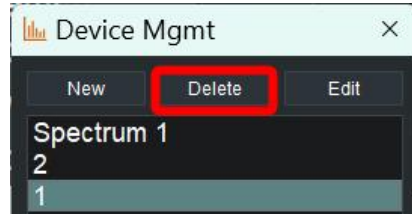


- (2) In the device management interface, you can create, delete, edit and connect devices.

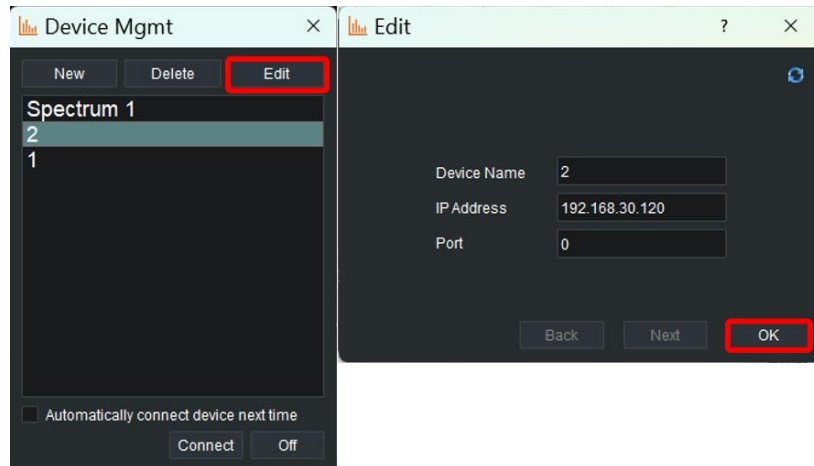
- ① Click New and follow the wizard prompts to complete the device addition.



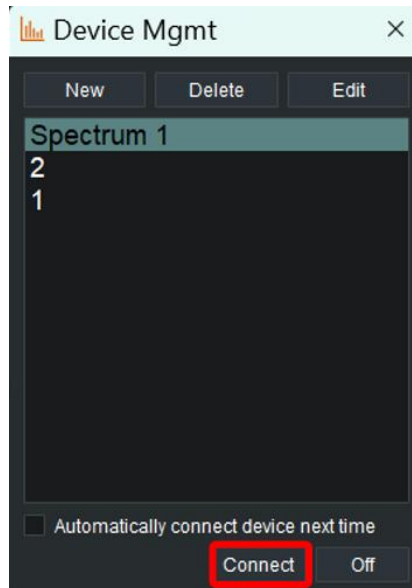
- ① Select the device you want to delete and click "**Delete**" to delete the device.



- ② Select the device to be modified, click "**Edit**", and click "**OK**" after the modification is completed to save the device information.

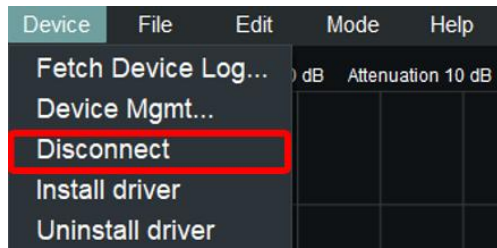


- ③ Click on the device you want to connect to and click "**Connect**" to complete the connection.



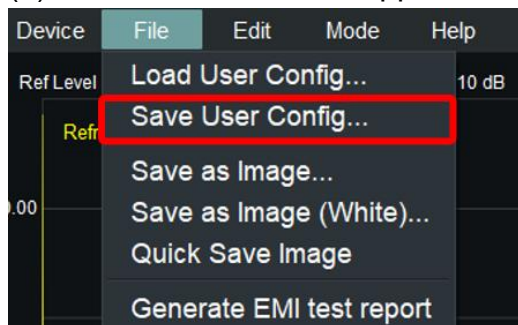
How to disconnect

- (1) Click on "**Device**" in the upper left corner and select "**Disconnect**".

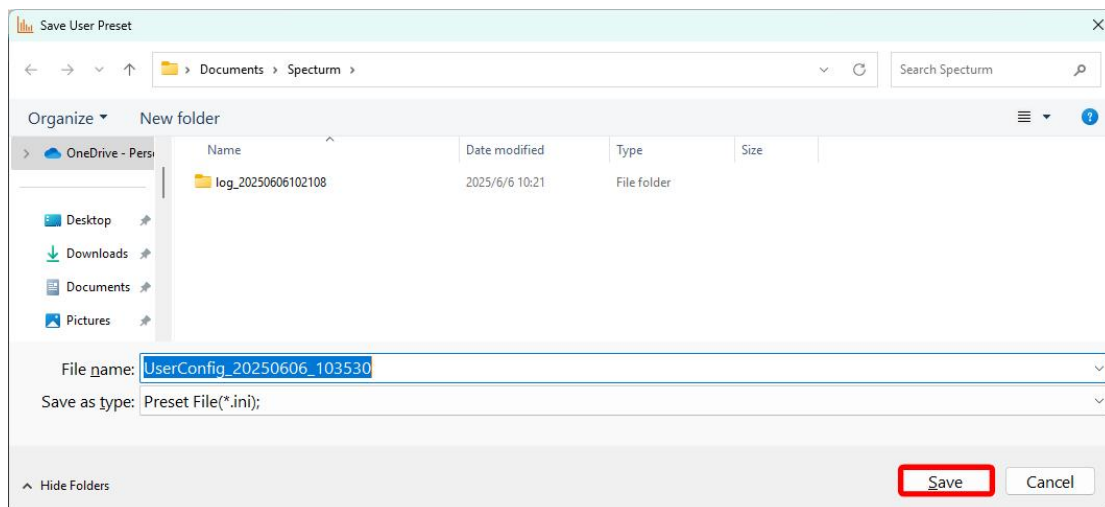


How to save/load user configuration

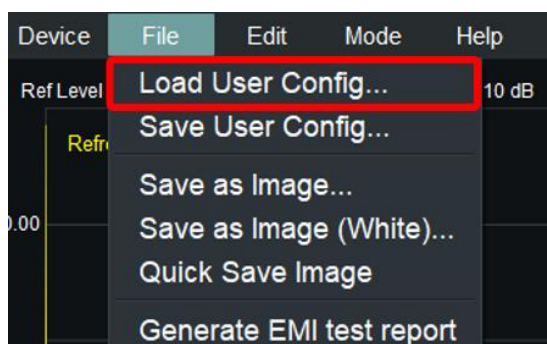
(1) Click on **"File"** in the upper left corner and select **"Save User Config..."**.



(2) Select the file saving path and click **"Save"** to save the current user configuration.

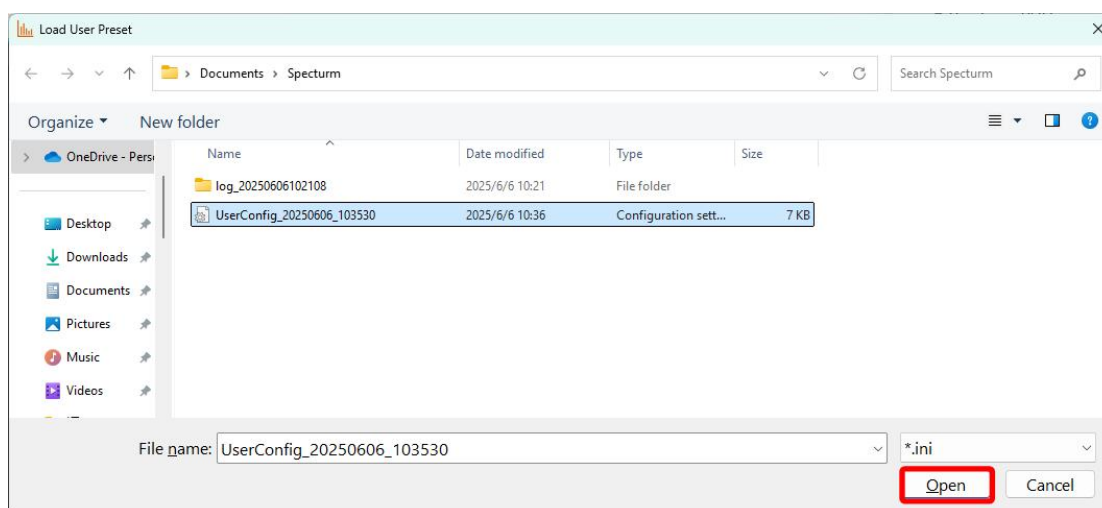


(3) Click on **"File"** in the upper left corner and select **"Load User Config..."**.



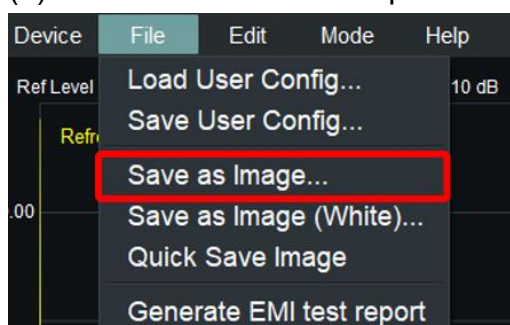
(4) Find the saved user profile, select the file, and click **"Open"** to load the

saved user profile.



How to save a picture

(1) Click on "File" in the top left corner and select "Save as Image...".



Note:

Select "**Save as Image (White)...**", then the background color of the saved picture is white.

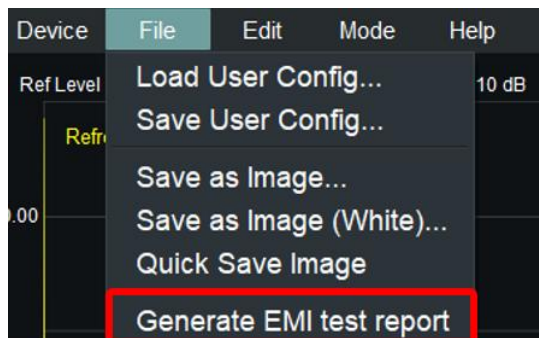
Select "**Quick Save Image**" and the picture will be saved under the default path.

(2) Select the file saving path and click "**Save**" to save the current picture.



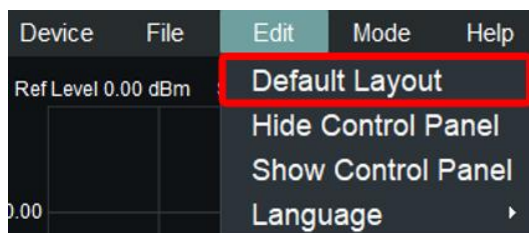
How to generate an EMI test report

- (1) Click "File" in the upper left corner and select "**Generate EMI test report**".

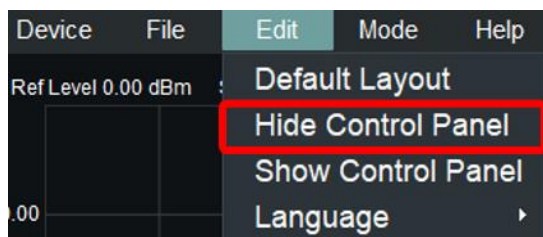


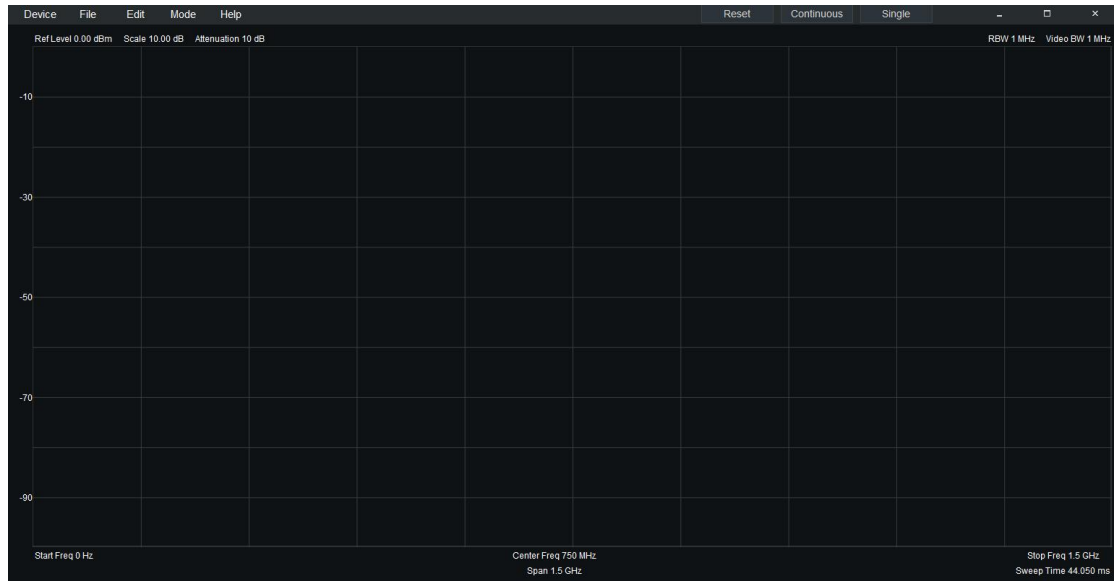
How to do panel settings

- (1) Click "**Edit**" in the upper left corner, select "**Default Layout**", and the host computer interface can restore the default interface.

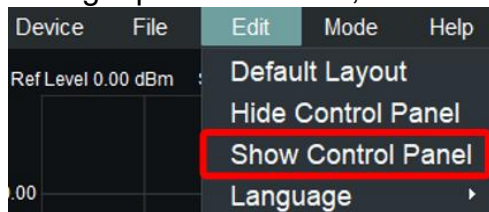


- (2) Click "**Edit**" in the upper left corner and select "**Hide Control Panel**", the right control panel is hidden.

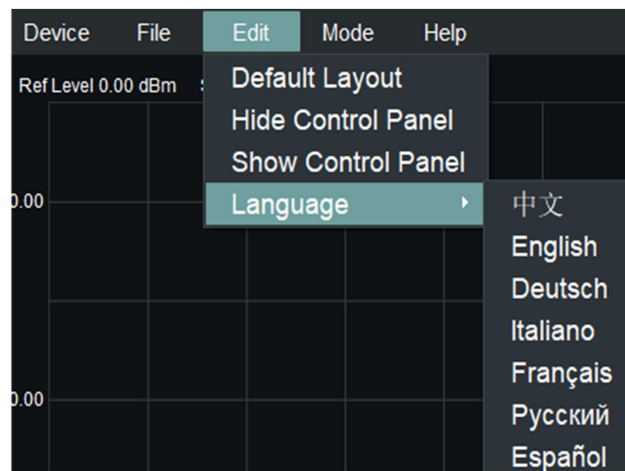




- (3) Click "**Edit**" in the upper left corner and select "**Show Control Panel**". If the right panel is hidden, it will be reopened.



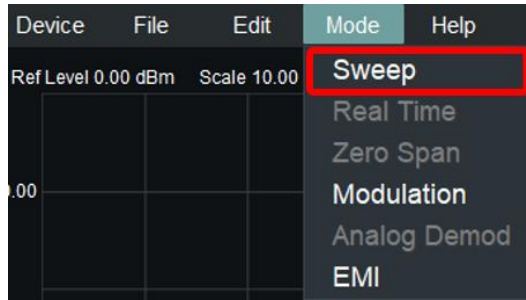
- (4) Click "**Edit**" in the upper left corner and select "**Language**" to select the desired language.



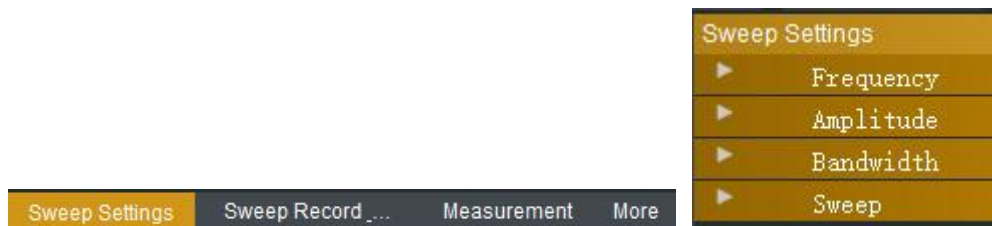
How to set parameters

Sweep Mode

- (1) Click "**Mode**" in the upper left corner, select "**Sweep**", and the parameters will be displayed in the list on the right.



(2) Click "**Sweep Settings**" in the lower right corner to enter the scan settings menu, including: frequency, amplitude, bandwidth, scan.



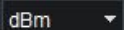
① Click "**Frequency**" to set related parameters. You can directly enter the required value through the keyboard or double-click the value input box to call up the numeric keyboard interface, and enter the required value to modify the parameters.



- **Freq Ref:** Set the frequency reference as an internal or external time base input as a reference for the whole machine. When switching to the outside, if it is determined that the external signal is not locked, a prompt "External reference is not locked" will pop up and automatically switch back to the inside.
- **Scale Type:** Set the scale type to switch the frequency axis to linear or logarithmic, and the default is linear.
- **Freq Offset:** Add the set offset to the displayed frequency value, including the frequency standard frequency value. This does not affect the frequency range of the scan.
- **Span:** Set the frequency range of the current channel, press  /  the parameter value can be adjusted by frequency step (adjusting this parameter will affect the center frequency, start frequency, stop frequency, and frequency step parameter values).

- **Center Freq:** Set the spectrum analyzer to the center frequency mode. Press  /  can adjust the parameter value (adjusting this parameter will affect the start frequency and stop frequency parameter values).
- **Start Freq:** Set the start frequency of the spectrum analyzer.
- **Stop Freq:** Set the stop frequency of the spectrum analyzer.
- **Freq Step:** Adjust the center frequency step amount. Modifying the center frequency with a fixed step value can achieve the purpose of continuously switching measurement channels.
- **Auto Step:** When automatic stepping is checked, set frequency stepping to automatic mode. If it is a non-zero sweep width, the frequency step is 1/10 of the sweep width, and if it is zero sweep width, the step is equal to 1 Hz.
- **Full Span:** The setting sets the sweep width to the maximum.
- **Zero Span:** Sets the sweep width to 0. At this time, the start and end frequencies are equal to the center frequency, and the horizontal axis is the time coordinate.
- **Previous Span:** causes the spectrometer to return the previously selected sweep width.
- **Next Span:** Causes the spectrometer to return the next selected sweep width.

② Click "**Amplitude**" to set amplitude-related parameters.

- **Ref Level:** Sets the maximum power or voltage value that can be displayed in the current window. Press  /  the reference level value may be increased or decreased. Drop down  the reference level units [dBm], [dBμW], [dBμA], [dBmV], [dBμV], [W], and [V] can be selected.
- **Scale:** Set the scale size of each grid on the vertical axis. This function can only be used when the scale type is logarithmic. 0.01 ~ 1000 dB logarithmic amplitude scale can be set. The default value is 10dB/cell.
- **Attenuator:** Set up the RF front-end attenuator so that large signals can pass through the mixer with low distortion (small signals can have low noise). Effective only in internal mixing mode, used to adjust the input attenuator of the spectrum analyzer. In automatic mode, the input attenuator is associated with a reference level.
- **Ref Offset:** When there is gain or loss between the device under test and the input of the spectrum analyzer, an offset value is added to the reference level to compensate for the resulting gain or loss.
- **Scale Type:** Select whether the scale type displayed on the vertical axis is linear scale or logarithmic scale, and the default

scale is logarithmic scale. When selecting linear amplitude scales, the unit is generally V by default, and other unit types can be set.

- **Preamp:** Set the RF front-end amplifier switch. When the measurement signal is small, turning on the preamplifier reduces the display average noise level, thereby resolving small signals in the noise.
- **Auto Atten:** When auto-decay is checked, set the attenuator to auto-decay mode.

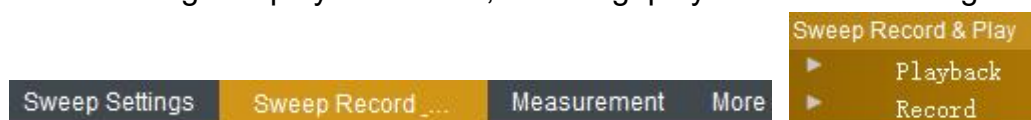
③ Click "**Bandwidth**" to set bandwidth-related parameters.

- **Auto RBW:** When Auto-Resolution Bandwidth is checked, it will decrease following the decrease in sweep width (non-zero sweep width).
- **Auto Video BW:** When Automatic Video Bandwidth is checked, it will follow the RBW change when VBW is Automatic.
- **RBW:** Adjusting the resolution bandwidth and reducing RBW can obtain higher frequency resolution, but it will also lead to longer scanning time (when the scanning time is automatic, it is affected by both RBW and VBW).
- **Video BW:** Sets the video bandwidth to filter out noise outside the video band. Reducing VBW can make the spectral lines smoother, thus highlighting the small signal submerged in noise, but it can also lead to longer scan time (when the scan time is automatic, it is affected by both RBW and VBW).

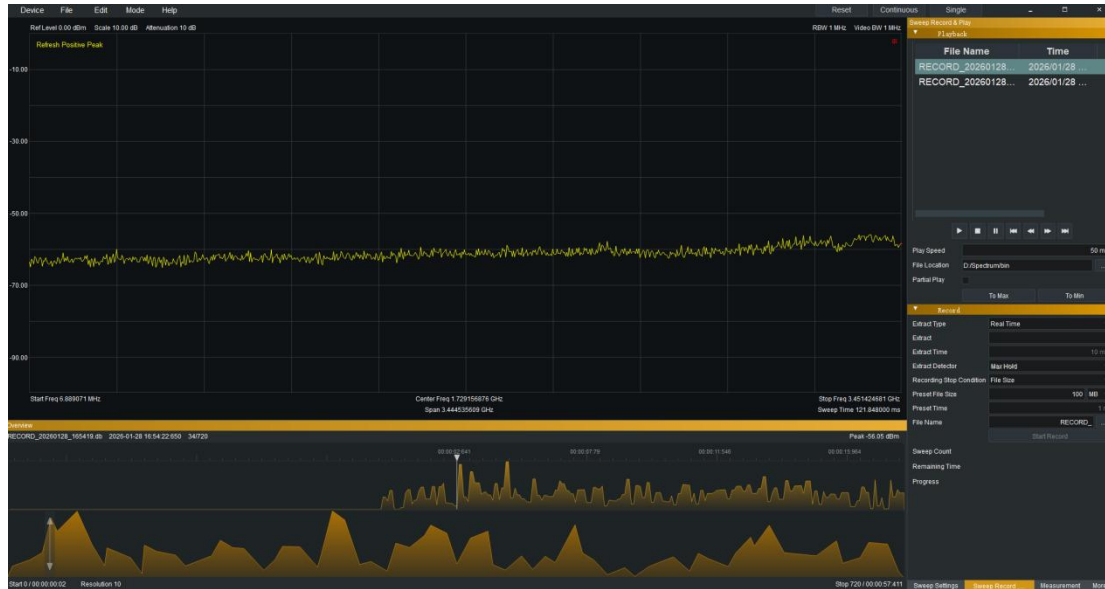
④ Click "**Sweep**" to set scan-related parameters.

- **Auto Sweep Time:** When automatic scanning time is checked, it will be automatically scanned if it meets the conditions.
- **Sweep Time:** Set the time for the spectrum analyzer to complete a scan within the scan wide range.
- **Single Sweep:** Set to single scan mode, the scan will be restarted when the next trigger signal comes or changes parameters.
- **Continuous Sweep:** Set to continuous scan mode.

(3) Click "**Sweep Record_...**" in the lower right corner to enter the scan recording and playback menu, including: playback and recording.



① Click "**Playback**" to set playback related parameters.



▶: Play the file.

■: Exit playback mode.

⏸: Pause playback.

⏮ / ⏭: Select the previous/next file for playback.

⏮ / ⏭: Plays the previous/next frame waveform.

- **Playback Speed:** Set the playback speed.
- **File Location:** Select the location of the playback file.
- **Partial Play:** When partial playback is checked, the playback file can be partially played.
- **To Max:** Press this button and the waveform plays directly to the maximum value.
- **To Min:** Press this button and the waveform plays directly to the minimum value.

② Click "**Record**" to set recording related parameters.

- **Extract type:** Set the extraction type to Real Time, Time, or Number of Scans.
- **Extract:** When the extraction type is "Sweep Count", the number of extractions can be set.
- **Extract Time:** When the extraction type is "Time", the extraction time can be set.
- **Extract Detector:** When the scan type is Time or Number of Scans, it can be set to Max Hold or Average.
- **Recording Stop Condition:** Set the recording stop condition to "File Size" or "Time"
- **Preset File Size:** When the recording stop condition is "File Size",

the file size can be preset, pull down **MB** unit can be set.

- **Preset Time:** When the recording stop condition is "Time", the file recording time can be preset.
- **File Name:** Set the file name, click "..." to select the file save location.
- **Start Record:** Click Start Recording, and you can record according to the set parameters. A prompt will pop up on the screen when the file is saved successfully. Click "OK" to complete the recording.
- **Sweep Count:** Displays the current number of scans.
- **Remaining Time:** Displays the time remaining for the record.
- **Progress:** Displays the progress of the record.

(4) Click "**Measurement**" in the lower right corner to enter the measurement menu, including: trace, marker, peak list, channel power, occupied bandwidth, trace math, window measurement and other measurements.



① Click "**Trace**" to set trace-related parameters.

- **Trace:** Select the trace, providing 1, 2, 3, 4, 5 traces, where the color of the number corresponds to the color of the trace.
- **Type:** Sets the trace type.
 - **Refresh:** Refresh the current spectrum curve, take real-time scanned data from each point of the trace, and display the latest spectrum trace.
 - **Max Hold:** Displays the maximum response of the input signal held in the trace. In this mode, the trace may receive scan data continuously.
 - **Min Hold:** Displays the minimum response of the input signal held in the trace. In this mode, the trace may receive scan data continuously.
 - **Average:** Average the current trace. Each point of the trace shows the result of averaging the data after multiple scans. This type of trace displays smoothly. The average number of traces defaults to 100, with a maximum of 1000.
 - **View:** Displays the current trace without refreshing for easy observation, reading and comparison.

- **Blanking:** Does not display the current trace. But the contents of the trace register remain intact and are not refreshed.
 - **Detect:** Set the detection type.
 - **Positive Peak:** Select the positive peak detection mode, and use this mode detector to select the maximum value in the sampled data segment and display it on the corresponding pixel.
 - **Negative Peak:** Select the negative peak detection mode, which allows the detector to select the minimum value in the sampled data segment and display it on the corresponding pixel.
 - **Sampling:** Set the detector to the sampling detection mode. This mode is commonly used for video averaging and noise frequency scaling functions.
 - **Normal:** When noise is detected, this detection mode alternately displays positive peaks and negative peaks. Otherwise, only positive peaks are displayed.
 - **Voltage Avg:** Set the detector to voltage averaging detection mode. This mode calculates the average of the voltages of all samples in the sampling region.
 - **RMS Avg:** Set the detector to RMS Averaging detection mode. This mode calculates the RMS average power of all samples in the sampling region.
 - **Avg Count:** Sets the average number of trace scans.
 - **Color:** Click to modify the corresponding trace color.
 - **Copy To:** Copies the set trace parameters to another trace.
 - **Swap:** Swaps the parameters of the selected trace.
 - **Refresh:** Refresh the waveform.
 - **Save:** Saves trace settings.
- ② Click "**Marker**" to set the parameters related to the frequency standard.
- **Marker:** Switches the currently selected frequency standard.
 - **Type:** Set the frequency standard type.
 - **Off:** Close the currently open frequency standard and its related functions, and the frequency standard will no longer be displayed.
 - **Normal:** One of the types of frequency standards. Ordinary measurement mode, activating the frequency standard, is used to measure the X (frequency or time) and Y (amplitude) values at a point on the trace. When [Normal] is selected, a frequency label identified by the current frequency label, such as "1", appears on the trace.

- **Diff:** One of the types of frequency standards. Used to measure the difference between Reference Point and Point on Trace: X (frequency or time) and Y (amplitude) values. After selecting [Difference], a pair of frequency standards will appear on the trace: the reference frequency standard and the difference frequency standard. The amplitude difference and frequency difference between the two frequency standards will be displayed in the upper right corner of the active area and the display area. If a single frequency standard already exists, [Difference] will place a stationary frequency standard and an active frequency standard to the original position and the single frequency standard position.
- **Place To:** Places the scale into the selected trace.
- **Frequency:** When the type is set to "Normal", the frequency standard frequency can be set.
- **Interpolated Frequency:** When the type is set to Difference, the difference frequency can be set.
- **Peak Search:** When peak search is checked, peaks can be searched continuously.
- **Peak Height:** Sets the peak height.
- **NdB:** When NdB is checked, the NdB bandwidth measurement function is turned on.
- **NdB size:** Sets the NdB size.
- **Marker Noise:** Turn on or off the frequency standard noise function. Perform the function of marking noise on the selected frequency standard, and then read the noise power density value at the frequency standard. When turned on, the average noise level read out at the frequency scale is the noise power normalized to the 1Hz bandwidth.
- **Update:** When Update is checked, the frequency standard will be updated in real time.
- **To Freq Span Δ :** Set the frequency value of the frequency sweep width equal to the frequency standard difference value, so that the sweep width can be rapidly reduced as required.
- **To Freq Center Δ :** Set the center frequency of the spectrum analyzer to be equal to the frequency standard difference value.
- **To Freq Step:** Set the center frequency step of the spectrum analyzer according to the frequency at the current frequency standard.
- **To Center Freq:** Set the center frequency equal to the frequency standard frequency. This feature quickly moves the signal to the center of the screen.
- **To Start Freq:** Set the start frequency of the spectrum analyzer according to the frequency at the current frequency standard.

- **To Stop Freq:** Set the termination frequency of the spectrum analyzer according to the frequency at the current frequency standard.
- **To Ref Level:** Set the reference level of the spectrum analyzer according to the amplitude at the current frequency standard.
- **Next Peak:** Moves the active frequency mark to the next highest point on the trace associated with the current frequency mark position. When this key is pressed repeatedly, the lower peak point can be found quickly.
- **Left Peak:** Find a peak to the left of the current frequency standard position. The next peak must meet the current peak and peak threshold criteria.
- **Right Peak:** Find the next peak to the right of the current frequency standard position. The next peak must meet the current peak and peak threshold criteria.
- **Min Peak:** Find the minimum peak value at the current frequency standard position.
- **Max Peak:** Find the maximum peak value at the current frequency standard position.
- **Peak-Peak:** Peak search and minimum search are performed simultaneously, and marked with a "difference pair" frequency standard, where the peak search result is marked with a difference frequency standard, and the minimum search result is marked with a reference frequency standard.

③ Click "**Peak List**" to set the parameters related to the peak list.

- **On:** When on is checked, the peak list function will be turned on. When the peak list is turned on, below is a list of all frequency standards that meet the peak conditions.
- **Target Trace:** Toggles the target trace.
- **Peak Height:** Sets the peak height.
- **Search Mode:** Set the search to the maximum or minimum mode.
- **Arrange:** Set the sort of peak list to frequency or amplitude mode.
- **Max Peaks:** Sets the maximum number of peaks to be displayed.

④ Click "**Channel Power**" to set channel power related parameters.

- **On:** When on is checked, the channel power function is turned on. The channel power is used to measure the channel power of the transmitter, and the absolute value of the main channel power is obtained by linear power integration according to the channel bandwidth set by the user.
- **Target Trace:** Toggles the target trace.
- **Bandwidth:** Sets the channel bandwidth.
- **Power:** Automatically calculates the power value and cannot be

set.

- **Start Record:** Record the channel power value and the adjacent channel power value.
- **Change Dir:** Change the location where the channel power file is saved.

⑤ Click "**Occupied BW**" to set parameters related to occupied bandwidth.

- **On:** When Turn on is checked, the bandwidth occupation function is turned on. Occupied bandwidth is a measure of the bandwidth occupied by the transmitter signal. It can be measured from the ratio of in-band power to the total power in the frequency span. The default value is 99% (the user can set this value).
- **Target Trace:** Toggles the target trace.
- **Power%:** Set the power.

⑥ Click "**Trace Math**" to set the related parameters of trace operation.

- **On:** When Turn on is checked, the trace operation function will be turned on.
- **Op1:** Toggle trace.
- **Op2:** Switch traces.
- **Result:** Toggle traces.
- **Operation:** Switch the operation type Power Difference, Power Sum, Log Offset, or Log Difference.
- **Offset:** Sets the offset parameter.

⑦ Click "**Window Meas**" to set window measurement related parameters.

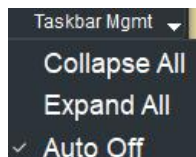
- **Window Meas:** Check to turn on window measurement mode.
- **Amp Line:** Turn on or off the amplitude line. When the window measurement is opened, the amplitude line is opened by default.
- **Freq Line:** Turn on or off the frequency line, and the frequency line is turned on by default when the window measurement is turned on.
- **Window Sweep:** Turn on or off the window scanning. When the window scanning is turned on, only the inside of the window formed by the intersection of amplitude lines and frequency lines is scanned, and the periphery is stopped scanning; Full frequency scans when off.
- **Start Freq:** Set the start frequency of the frequency line
- **Stop Freq:** Set the stop frequency of the frequency line
- **Upper Amp:** Set upper amplitude, click  can switchable amplitude units.
- **Lower Amp:** Set lower amplitude, click  can switchable amplitude units.

- ⑧ Click "**Other Meas**" to set other measurement-related parameters.
- **2D Spectrum:** Check to turn on 2D spectrum.
 - **3D Spectrum:** Check to turn on 3D spectrum.
 - **Region Meas:** Check to turn on the area measurement mode.
 - **3rd IMD Meas:** Check to turn on the third-order intermodulation distortion measurement mode.

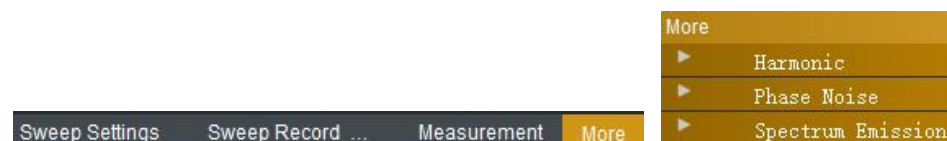
- ⑨ Click **Reset Data** in the lower right corner, can reset the selected data.



- ⑩ Click **Taskbar Mgmt** in the lower right corner, you can set the measurement list status.



- (5) Click "**More**" in the lower right corner to enter more menus, including: harmonics, phase noise and spectrum emission templates.



- ① Click "**Harmonic**" to set harmonic-related parameters.
- **On:** When on is checked, the harmonic function is turned on.
 - **Fundamental:** Set the fundamental frequency. When the harmonic measurement mode is turned on, set the center frequency in the spectrum mode according to the number of harmonics.
 - **Number of Harmonics:** Set the number of harmonics that can be displayed, which can be displayed up to the tenth harmonic. When the fundamental frequency is set, the upper limit of the number of

harmonics will change due to the limited measurement range of the spectrum instrument.

- **RBW:** Adjusting the resolution bandwidth and reducing RBW can obtain higher frequency resolution, but it will also lead to longer scanning time (when the scanning time is automatic, it is affected by both RBW and VBW).
- **Resolution Bandwidth Auto:** If the resolution bandwidth is checked, it will be automatic mode, which will decrease with the decrease of sweep width (non-zero sweep width).

② Click "**Phase Noise**" to set phase noise related parameters.

- **On:** When on is checked, the phase noise function is turned on.
- **Automatic Amplitude:** The reference level is adjusted based on the peak signal noise.
- **Start Offset:** The starting frequency offset value is a fixed value, and the phase noise value at this frequency offset is measured in increments of multiples of 10.
- **Stop Offset:** The termination frequency offset value is a fixed value, which is used as the upper limit of the frequency offset value.
- **Carrier Freq:** Set the carrier frequency. When the phase noise measurement mode is turned on, set the carrier frequency to the starting frequency in the spectrum mode.

③ Click "**Spectrum Emission**" to set the related parameters of the spectrum emission template.

- **On:** When on is checked, the spectrum emission template function will be turned on.
- **Center Freq:** Set the center frequency.
- **Ref Level:** Sets the reference level value.
- **Template:** Set the transmit template to "UE", "3GPP", "802.11 b", "802.11 g", "802.11 n", or "802.16".

■ The configuration template is set to "UE", and the following parameters can be set.

a. Channel Setup

- ◆ **Channel IBW:** Set the channel integration bandwidth, which is used to calculate the power value in the test main channel.
- ◆ **Channel Span:** Sets the channel sweep width.
- ◆ **Resolution Bandwidth Auto:** Set the channel resolution bandwidth to auto mode.
- ◆ **RBW:** Sets the channel resolution bandwidth.
- ◆ **Measure Ref Type:** Select the total carrier power or power spectral density as the reference value.
- ◆ **Carrier Total Power Reference Auto:** The

reference value is calculated according to the power sum in the channel, channel integration bandwidth and channel resolution bandwidth.

- ◆ **Total Pwr Ref:** Set the reference value yourself.
- ◆ **Power Spectral Density Reference Auto:** The reference value is calculated based on the power sum in the channel and the channel resolution bandwidth.
- ◆ **PSD Ref:** Set the reference value yourself.

b. Offset Setup

- ◆ **Select Offset:** Select the offset index.
- ◆ **On:** Sets the selected offset on or off. If the start frequency equals the end frequency when the offset is off or on, the offset segment trace and template are not displayed.
- ◆ **Start Freq:** Sets the start frequency of the selected offset.
- ◆ **Stop Freq:** Sets the stop frequency of the selected offset.
- ◆ **Resolution Bandwidth Auto:** Set the channel resolution bandwidth to auto mode.
- ◆ **RBW:** Sets the resolution bandwidth of the selected offset.
- ◆ **Pass/Fail Mask:** Set the option to use an absolute or relative template.
- ◆ **Abs Start Ampt:** Sets the absolute start amplitude of the selected offset.
- ◆ **Abs Stop Ampt:** set the reference value by yourself.
- ◆ **Absolute End Amplitude Auto:** Set to the same value as the absolute start amplitude.
- ◆ **Rel Start Ampt:** Sets the relative start amplitude of the selected offset.
- ◆ **Rel Stop Ampt:** set the reference value by yourself.
- ◆ **Relative End Amplitude Auto:** Set to the same value as the relative start amplitude.

- The configuration template is set to "3GPP", and the following parameters can be set.

On: Turn on or off the 3GPP template.

- a. **Channel Setup:** Please refer to Configuration Template Settings to "UE" to adjust parameters.
- b. **Offset Setup:** Refer to Configuration template settings to "UE" adjustment parameters.
- c. **Duplex Mode**
 - ◆ **Duplex Mode:** Select the duplex mode as frequency

division duplex or time division duplex.

◆ **Transmission:**

FDD: Select the transmission mode base station or user.

TDD: Select the transmission mode base station or user.

◆ **Chip Rate:** Time Division Duplex: Select chip rate, options 1.28 M, 3.84 M, 7.68 M.

◆ **Max Out Pwr:**

FDD: Select maximum output power, option $P \geq 43$, $39 \leq P < 43$, $31 \leq P < 39$, $P < 31$.

TDD: Select maximum output power, option $P \geq 43$, $39 \leq P < 43$, $31 \leq P < 39$, $P < 31$; $P \geq 34$, $26 \leq P < 34$, $P < 26$. When the chip rate is 1.28 M, the last three items are selected, and when the chip rate is 3.84 M and 7.68 M, the first four items are selected.

◆ **Add Max Out Pwr:** Frequency Division Duplex: Additional options None, $6 \leq P < 20$, $P < 6$ when the maximum output power is selected as $P < 31$.

- The configuration template is set to "802.11 b", please refer to Configuration Template Set to "UE" to adjust the parameters.

On: Turns the 802.11 b template on or off.

- The configuration template is set to "802.11 g". Please refer to the configuration template set to "user" to adjust the parameters.

On: Turn on or off the 802.11 g template.

Modulation: Select the modulation mode OFDM or DSSS/PBCC/CCK.

- The configuration template is set to "802.11 n", please refer to Configuration Template Set to "UE" to adjust the parameters.

On: Turns the 802.11 n template on or off.

Channel BW: Select the channel bandwidth of 20M or 40M.

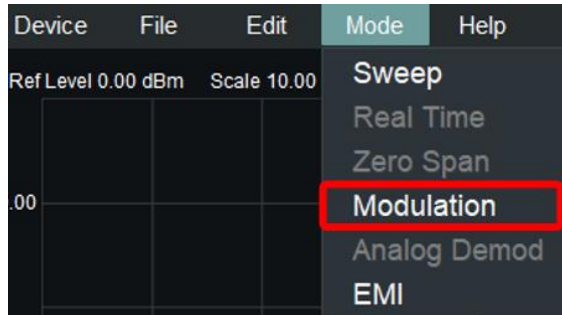
- The configuration template is set to "802.16", please refer to Configuration Template Set to "UE" to adjust the parameters.

On: Turns the 802.16 template on or off.

Channelization: Select the channelization parameter 10M or 20M.

Modulation analysis mode

(1) Click "**Mode**" in the upper left corner, select "**Modulation**", and the parameters will be displayed in the list on the right.



- ① Click "**Modulation**" to set relevant parameters.
 - **Measurement:** Switch modulation mode: AM or FM.
 - **Color:** Toggle the waveform color.
 - **Data Reset:** Set the maximum, minimum and average data reset under the modulation signal.
- ② Click "**Frequency**" to set relevant parameters.
 - **Freq Ref:** Sets the frequency reference of the modulated signal.
 - **Carrier Freq:** Sets the carrier frequency of the modulated signal.
- ③ Click "**Amplitude**" to set relevant parameters.
 - **Ref Level:** Sets the reference level of the modulated signal.
 - **Preamp:** Turn the pre-amplification function on or off.
- ④ Click "**Bandwidth**" to set relevant parameters.
 - **Demodulation bandwidth:** Sets the demodulation bandwidth of the modulated signal.
- ⑤ Click on "**Depth Axis**" to set the relevant parameters (AM modulation only).
 - **Ref Depth:** Sets the reference offset position, expressed as a vertical percentage.
 - **Position:** Sets the reference position of the waveform on the depth axis.
 - **Scale:** Manually set the scale of each grid.
 - **Scale Auto:** Automatically set the scale of each grid.
- ⑥ Click on "**Deviation axis**" to set the relevant parameters (FM modulation only).
 - **Ref Depth:** Sets the reference offset position, expressed as a

vertical frequency.

- **Position:** Sets the reference position of the waveform on the depth axis.
- **Scale:** Manually set the scale of each grid.
- **Scale Auto:** Automatically set the scale of each grid.

⑦ Click "**Time Axis**" to set relevant parameters.

- **Ref Depth:** Set the start reference time in the timeline.
- **Position:** Sets the reference position of the waveform on the timeline.
- **Scale:** Manually set the scale of each grid.
- **Scale Auto:** Automatically set the scale of each grid.

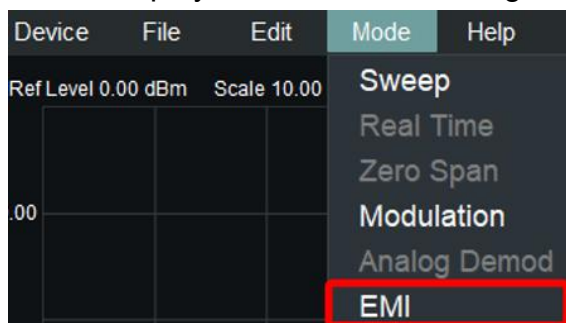
⑧ Click "**Trig**" to set relevant parameters.

- **AF Trigger:** Set the AF Trigger to ON or OFF.
- **Edge:** Set rising edge or falling edge trigger
- **Trigger Mode:** Set the trigger mode to single trigger or continuous trigger.
- **Trigger Depth:** Sets the trigger amplitude (AM modulation only).
- **Trigger amplitude:** Set the trigger amplitude (FM modulation only).
- **Trigger Delay:** Sets the trigger delay time.

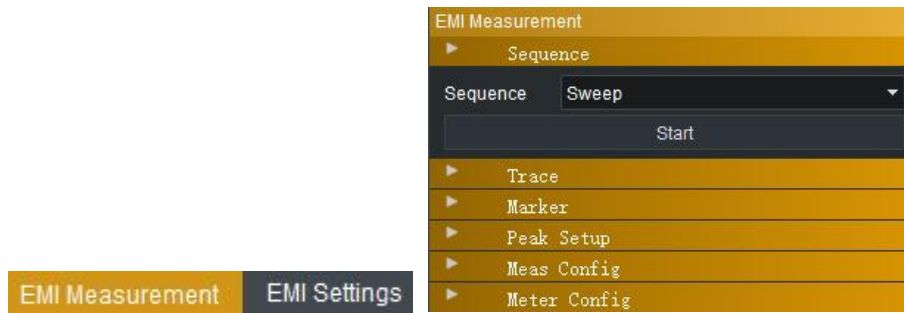
EMI Mode

This function can only be used if the lower computer has turned on the EMI optional function.

(1) Click "**Mode**" in the upper left corner, select "**EMI**", and the parameters will be displayed in the list on the right.



(2) Click "**EMI Measurement**" in the lower right corner to enter the EMI measurement settings menu, including: process, trace, frequency standard, search settings, measurement configuration and measurement configuration. You can directly enter the required value through the keyboard or double-click the value input box to call up the numeric keyboard interface, and enter the required value to modify the parameters.



① Click "Sequence" to set relevant parameters.

- Sequence: Different processes are set up, and the measurement content is different.
 - Sweep: Only measurements related to scanning are made.
 - Search Only: The current trace is searched, and the search is only meaningful after the trace scan is complete, otherwise the measured signal will be inaccurate.
 - Scan & Search & Meas: The sequence is carried out according to scan, search and measure.
 - Scan & Search: Scan and search are measured in combination.
 - Search & Meas: Combine the search and measurement to measure.
 - Measurement: Each frequency in the peak signal list is measured sequentially. When the measurement result is greater than the corresponding limit line frequency value, the list difference is displayed in red.
- Start/Pause: Perform segmented scanning according to the CISPR frequency band in the scanning configuration, and start or stop the test after selecting the process. When the scan is completed, enter the Meter measurement.

② Click "Trace" to set relevant parameters.

- **Trace:** Select the trace, providing 1, 2, 3, 4, 5 traces, where the color of the number corresponds to the color of the trace.
- **Type:** Sets the trace type.
 - **Refresh:** Refresh the current spectrum curve, take real-time scanned data from each point of the trace, and display the latest spectrum trace.
 - **Max Hold:** Displays the maximum response of the input signal held in the trace. In this mode, the trace may receive scan data continuously.
 - **Min Hold:** Displays the minimum response of the input signal held in the trace. In this mode, the trace may receive scan data continuously.

- **Average:** Average the current trace. Each point of the trace shows the average result of data after multiple scans. This type of trace displays smoothly. The average number of traces defaults to 100, with a maximum of 1000.
 - **View:** Displays the current trace without refreshing for easy observation, reading and comparison.
 - **Blanking:** Does not display the current trace. But the contents of the trace register remain intact and are not refreshed.
 - **Detect:** Set the detection type.
 - **Positive Peak:** Select the positive peak detection mode, and use this mode detector to select the maximum value in the sampled data segment and display it on the corresponding pixel.
 - **Quasi-Peak:** Set the detector to the quasi-peak detection mode. This detection mode can only be selected when the EMI filter is turned on. A quasi-peak detector is a peak detector weighted by time and signal repetition rate, specified by the CISPR 16-1-1 standard. Quasi-peak detection is characterized by fast charging times and slow decay times.
 - **RMS Avg:** Set the detector to RMS Averaging detection mode. This mode calculates the RMS average power of all samples in the sampling region.
 - **Avg Count:** Sets the average number of trace scans.
 - **Color:** Click to modify the corresponding trace color.
- ③ Click "**Marker**" to set relevant parameters.
- **Marker:** Switches the currently selected frequency standard.
 - **Type:** Set the frequency standard type.
 - **Off:** Close the currently open frequency standard and its related functions, and the frequency standard will no longer be displayed.
 - **Normal:** One of the types of frequency standards. Ordinary measurement mode, activating the frequency standard, is used to measure the X (frequency or time) and Y (amplitude) values at a point on the trace. When [Normal] is selected, a frequency label identified by the current frequency label, such as "1", appears on the trace.
 - **Diff:** One of the types of frequency standards. Used to measure the difference between Reference Point and Point on Trace: X (frequency or time) and Y (amplitude) values. After selecting [Difference], a pair of frequency standards will appear on the trace: the reference frequency standard and

the difference frequency standard. The amplitude difference and frequency difference between the two frequency standards will be displayed in the upper right corner of the active area and the display area. If a single frequency standard already exists, [Difference] will place a stationary frequency standard and an active frequency standard to the original position and the single frequency standard position.

- **Place To:** Places the scale into the selected trace.
- **Set Frequency:** Set the frequency standard frequency.
- **Peak Search:** When peak search is checked, the extreme value amplitude is automatically searched.
- **Peak Height:** Sets the peak height.
- **Peak Threshold:** Sets the peak threshold.
- **Update:** When Update is checked, the frequency standard will be updated in real time.
- **Mkr→List:** Add the frequency corresponding to the current frequency standard to the peak List.
- **Mkr→Meter:** The frequency measured by Meter is set to the frequency corresponding to the current frequency standard.
- **Meter→Mkr:** The frequency of the currently selected frequency standard is set to the Meter frequency.
- **To Center Freq:** The center frequency is set to the frequency value corresponding to the current cursor.
- **Peak-Peak:** Sets the current cursor to the difference state, and the reference mark is the frequency at the minimum amplitude value, and the Marker mark is the frequency at the maximum amplitude value.
- **Next Peak:** Find the peak on the trace that is under the current peak grid and satisfies the search criteria with the smallest amplitude difference, and mark it with a cursor.
- **Left Peak:** Find the peak on the trace that is to the left of the current peak and is closest to it that satisfies the search criteria, and mark it with a cursor.
- **Right Peak:** Find the peak on the trace that is to the right of the current peak and is closest to it that satisfies the search criteria, and mark it with a cursor.
- **Close All:** Close all open frequency standards and related functions, and the frequency standards will no longer be displayed.

④ Click "Peak Setup" to set relevant parameters.

- **Select Section:** Select the current segment.
- **Peak Threshold:** specifies the minimum value of the peak amplitude, only peaks greater than the peak limit may be judged as peaks.

- **Peak Offset:** Specifies the difference between the peak value and the amplitude of the minimum values on the left and right sides. A peak whose difference is greater than the peak offset may be judged as a peak.
- **Peak Num:** Specifies the maximum number of peaks under the segment.

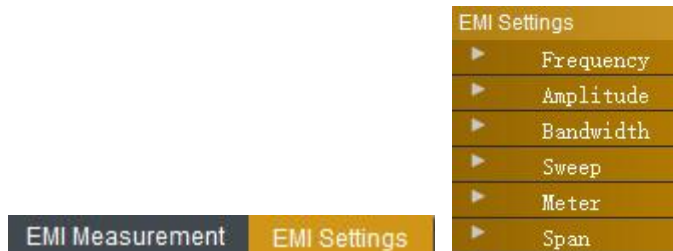
⑤ Click "**Meas Config**" to set relevant parameters.

- **Meas Signal:** Set the measurement signal type.
 - **Current Signal:** Measures only the currently selected signal in the peak list, valid if and only if the process is measurement.
 - **All Signal:** Measures all signals in the peak list, valid if and only if the process is a measurement.
 - **Marker Signal:** Measures only marked signals in the peak list, valid if and only if the flow is a measurement.
- **Detector:** The default is selected as 1, 1 is only a positive peak detector, 2 is only a quasi-peak detector, and 3 is only a RMS average detector.
- **Switch:** Turn on/off the detector switch.
- **Dwell Time:** Sets the dwell time of the current detector.

⑥ Click "**Meter Config**" to set relevant parameters.

- **Meter mode:** Set the scanning mode of Meter measurement.
 - **Single Sweep:** The scan will stop after only one scan of the metering frequency.
 - **Continuous Sweep:** Continuous sweep of the metering frequency.
- **Dwell time:** Sets the dwell time of metering mode.
- **Meter Select:** The default selection is Metering 1 as the current metering. Set different metering parameters.
- **Meter Detector:** Meter 1 in the default menu button list corresponds to a positive peak detector, 2 corresponds to a quasi-peak detector, and 3 corresponds to a voltage average detector. The detector currently selected for measurement can be any one of the three detectors.
- **Meter Limit:** Sets the limit value of the current metrology detector. It is used to judge whether the amplitude at this frequency exceeds the limit standard in the metering state.
- **Meter Switch:** Turn on or off the currently selected metering detector.
- **Limit Switch:** Whether the limit value of the current metering is displayed.
- **Reset Max Hold:** Reset the historical maximum values measured by the Meter of the three geophones.

- **Limit To Value:** Read the limit line data under the metering detector according to the metering frequency.
 - **Close All:** All detector interfaces in Meter measurement are closed, and the measurement results are not displayed.
- (3) Click "**EMI Settings**" in the lower right corner to enter the EMI settings menu, including: frequency, amplitude, bandwidth, scanning, metering and scanning width.



- ① Click "**Frequency**" to set relevant parameters.

- **Meter:** Set the metering frequency.
- **Center Freq:** Sets the center frequency of the current scan.
- **Start Freq:** Set the start frequency.
- **Stop Freq:** Set the termination frequency.
- **Freq Step:** Set the frequency step.
- **Auto Step:** Set frequency step to automatic mode.
- **Freq Ref:** Set the frequency reference as an internal or external time base input as a reference for the whole machine.
- **Freq Offset:** Sets the frequency offset.

- ② Click "**Amplitude**" to set relevant parameters.

- **Ref Level:** Sets the reference level, indicating the maximum power/level value that the current grid can display.
- **Scale:** Set the size of each scale on the vertical axis, so as to adjust the amplitude range that can be displayed at present.
- **Attenuator:** Set the attenuator so that large signals can have low distortion and small signals can pass through the mixer with low noise.
- **Ref Offset:** When there is gain or loss between the device under test and the spectrum analyzer input, an offset value is added to the reference level to compensate for the resulting gain or loss.
- **Scale Type:** The scale types displayed on the vertical axis are linear and logarithmic, and the default is logarithmic scale.
- **Preamp:** Set the RF front-end amplifier switch. When the measurement signal is small, turning on the preamplifier reduces the display average noise level, thereby resolving small signals in the noise.
- **Auto Atten:** In automatic mode, the attenuation value is

automatically adjusted according to the preamplifier state and the value of the current reference level.

③ Click "**Bandwidth**" to set relevant parameters.

- **Select Section:** Toggle segmentation.
- **Scan RBW:** Sets the scan resolution bandwidth.
- **Meter RBW:** Set the metering resolution bandwidth.

④ Click "Sweep" to set relevant parameters.

- **Sweep Mode:** Switch the scan mode to single or continuous.
- **Sweep Count:** Only valid if the scan mode is set to a single scan.
- **Select Section:** According to the CISPR configuration file, select the current segment, the default is 1.
- **RBW/Step:** Set the resolution bandwidth step under the selection segment. Maximum sweep width = number of scanned points * (resolution bandwidth/resolution bandwidth step)
- **Dwell Time:** Sets the dwell time.

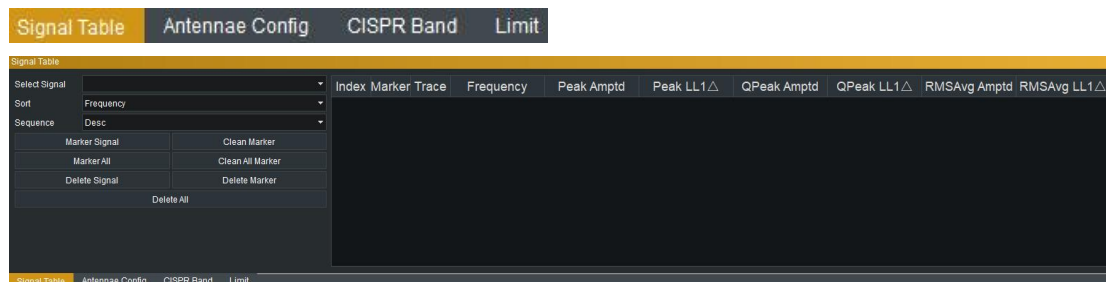
⑤ Click "Meter" to set relevant parameters.

- **Dwell Time:** Sets the dwell time.
- **Single:** Scanning will be stopped after only one scan of the metering frequency.
- **Continuous:** A continuous scan of the metering frequency is performed.

⑥ Click "**Span**" to set relevant parameters.

- **Span:** Sets the sweep width. Under the same CISPR configuration, the larger the scan width, the larger the number of scan points.
- **CISPR Band:** Enter the file list and load the CISPR configuration file. A CISPR configuration must be loaded before EMI scanning, otherwise scanning is not allowed.

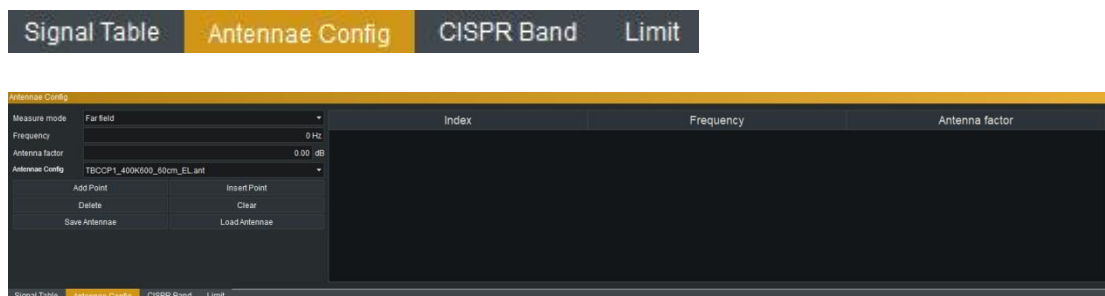
(4) Click "Signal Table" in the lower left corner to enter the signal table setting menu.



- **Select Signal:** The default current signal is 1, and the index is used as the current signal.
- **Sort:** Select how to sort.

- ◆ **Frequency:** Sorts all signals in the signal list by frequency.
- ◆ **Detection Result 1:** Sort the magnitude of the positive peak.
- ◆ **Detection Result 2:** Sort the size of the alignment peak.
- ◆ **Detection Result 3:** Sort the size of the average effective value voltage.
- ◆ **Difference Result 1:** Sort the magnitude of the positive peak difference.
- ◆ **Difference Result 2:** Sort the magnitude of the peak difference.
- ◆ **Difference Result 3:** Sort the magnitude of the average difference of effective value voltages.
- **Sequence:** The peak signal list is arranged in ascending order or descending order.
- **Marker Signal:** Marks the current signal.
- **Clear Marker:** Clears the flag of the current signal.
- **Marker All:** Mark all signals in the peak signal list.
- **Clear All Marker:** Clear all signals in the peak signal list of flags.
- **Delete Signal:** Removes the current signal from the list.
- **Delete Marker:** Delete all signals that have been tagged.
- **Delete All:** Delete all signals in the signal list.

(5) Click "Antenna Config" in the lower left corner to enter the settings menu.



- **Measure mode:** Switch to near-field or far-field antenna measurement configuration.
- **Frequency:** Set the antenna frequency.
- **Antenna factor:** Sets the antenna factor.
- **Antenna Config:** Switchable .ant file.
- **Add Point:** Click to add the current antenna configuration in the list on the right.
- **Insert Point:** Click to insert the current antenna configuration in the list on the right.
- **Delete:** Select the desired antenna to be deleted in the list on the right to delete the antenna.
- **Clear:** Clears all antenna information in the list.
- **Save Antenna:** Save as a .ant file.
- **Load Antenna:** Loads the saved .ant file.

(6) Click "**CISPR Band**" in the lower left corner to enter the settings menu.

- **Select Section:** Toggle segmentation.
- **Start Freq:** Set the start frequency.
- **Stop Freq:** Sets the termination frequency.
- **RBW:** Sets the resolution bandwidth.
- **RBW/Step:** Set the resolution bandwidth step under the selection segment.
- **Dwell Time:** Sets the dwell time.
- **Peak Threshold:** specifies the minimum value of the peak amplitude, only peaks greater than the peak limit may be judged as peaks.
- **Peak Offset:** Specifies the difference between the peak value and the amplitude of the minimum values on the left and right sides.
- **Peak Num:** Specifies the maximum number of peaks under the segment. Sets the number of peaks for the current segment.
- **Load CISPR:** Load the CISPR configuration.

(7) Click "**Limit**" in the lower left corner to enter the settings menu.

- **Limit Line Edit:** The default selection is 1, index 1 in the menu list is only as the limit line for positive peaks, 2 as the limit line for quasi-peaks, and 3 as the limit line for averaging valid values only. Different CISPR configurations have different limit lines, and users can also edit the limit lines without detection separately.
- **Amp Offset:** All limits are offset in amplitude.
- **Freq Offset:** All limits are frequency offset.
- **Add Point:** Make additions to the restriction line.
- **Insert Point:** Inserts the restriction line.
- **Delete:** Delete the selected restriction line.
- **Clear:** Clear all restriction lines.

- **Save Limit Line:** Saves the currently selected constraints.
- **Load Limit Line:** Calls the restriction line saved inside the device.