HSA3000-R Series

Spectrum Analyzer Quick Guide

- **HSA3036-R**
- **HSA3075-R**
- **HSA3140-R**
- **HSA3200-R**

For product support, visit : www.owon.com.hk/download

※: The illustrations, interface, icons and characters in the user manual may be slightly different from the actual product. Please refer to the actual product.

General Warranty

We warrant that the product will be free from defects in materials and workmanship for a period of 2 years (1 year for accessories) from the date of purchase of the product by the original purchaser from our company. This warranty only applies to the original purchaser and is not transferable to a third party.

If the product proves defective during the warranty period, we will either repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by our company for warranty work may be new or reconditioned like new. All replaced parts, modules and products become the property of our company.

In order to obtain service under this warranty, the customer must notify our company of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the designated service centre, a copy of the customers proof of purchase is also required.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. We shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than our company representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of not our supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest Sales and Service Offices for services.

Excepting the after-sales services provided in this summary or the applicable warranty statements, we will not offer any guarantee for maintenance definitely declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. We should not take any responsibilities for any indirect, special or consequent damages.

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1. General Safety Requirements

Before use, please read the following safety precautions to avoid any possible bodily injury and to prevent this product or any other connected products from damage. To avoid any contingent danger, ensure this product is only used within the ranges specified.

- **Use Proper Power Cord.** Use only the power cord supplied with the product and certified to use in your country.
- **Product Grounded.** This instrument is grounded through the power cord grounding conductor. To avoid electric shock, the grounding conductor must be grounded. The product must be grounded properly before any connection with its input or output terminals.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markings on this product. Refer to the user manual for more information about ratings before connecting to the instrument.
- **Use Proper Overvoltage Protection.** Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might expose to danger of electrical shock.
- **Do not operate without covers**. Do not operate the instrument with covers or panels removed.
- **Avoid exposed circuit**. Be careful when working on exposed circuitry to avoid risk of electric shock or other injury.
- **Do not operate if any damage.** If you suspect damage to the instrument, have it inspected by qualified service personnel before further use. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by qualified service personnel.
- **Use your Oscilloscope in a well-ventilated area.** Make sure the instrument installed with proper ventilation.
- **Do not operate in damp conditions.** In order to avoid short circuiting to the interior of the device or electric shock, please do not operate in a humid environment.
- **Do not operate in an explosive atmosphere.** In order to avoid damages to the device or personal injuries, it is important to operate the device away from an explosive atmosphere.
- **Keep product surfaces clean and dry.** To avoid the influence of dust or moisture in air, please keep the surface of device clean and dry.
- **Electrostatic Prevention.** 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.
- **Protect the Input Terminals of Instrument.** Do not bend or hit the input terminals and the connected devices, (such as filter, attenuator, etc.) as such stress may cause damages to devices and the instrument. Do not mix

the use of 50Ω and 75Ω connectors and/or cables.

- **Do Not Overload the Input.** To avoid damaging the instrument, the signals at input terminal must be less than 50V DC voltage components and 30 dBm (1 W) AC (RF) components.
- **Appropriate Use of Power Meter.** If you are not sure of the characteristics of signal under measure, follow these recommendations to ensure safe operations: if a RF power meter is available, use it to measure the power level of this signal first; or add a rated external attenuator between signal cable and input terminal of the instrument. Maximum attenuation, reference level and maximum span frequency should be selected, so as to make the signals displayed within the screen.
- **Know About the Specification Conditions of the Instrument.** For maximum performance of the instrument, use the analyzer under specified conditions.
- **Handling Safety.** Please handle with care during transportation to avoid damages to buttons, knob, interfaces and other parts on the panels.

2. Safety Terms and Symbols

Safety Terms

Terms in this manual (The following terms may appear in this manual):



WARNING: Warning indicates conditions or practices that could result in injury or loss of life.



CAUTION: Caution indicates the conditions or practices that could result in damage to this product or other property.

Terms on the product (The following terms may appear on this product):

DANGER: Indicates an immediate hazard or injury possibility.

WARNING: Indicates a possible hazard or injury.

CAUTION: Indicates potential damage to the instrument or other property.

Safety Symbols

Symbols on the product (The following symbols may appear on the product):

	Hazardous Voltage		Refer to Manual
	Chassis Ground		

2.1 General Inspection

When you receive your new instrument, it is recommended that you check the instrument following these steps:

1. **Check for transportation damage.**

   If it is found that the packaging carton or the foamed plastic protection cushion has suffered serious damage, do not throw it away until the complete device and its accessories have been electrically and mechanically checked.

2. **Check the Accessories.**

   The supplied accessories are described in the "Appendix A: Accessories" of this Manual. Please ensure that all the listed accessories are present

and undamaged, if any problems are found please contact your distributor or our local office.

3. **Check the Complete Instrument.**

   If there is any physical damage, operational fault, or performance issue please contact your distributor or our local office. If there is any damage to the instrument please ensure you keep the original packaging. Ideally you should always keep the original packaging if the instrument must be returned for repair.

2.2 Safety Precaution before Operation

2.2.1 Check Power Supply

This analyzer can be powered by either the internal lithium battery pack or an AC/DC adapter. The lithium battery is 7.4 V, 9100 mAh. Requirements for the AC/DC adapter are listed in the table below.

Power Supply Parameter	Compatible Range
Output Voltage	12-15VDC
Max. Power	45 W

To prevent or lower the risk of damage to the spectrum analyzer from power interference between instruments, especially from peak pulses produced by large power consumption instruments, a DC regulated power supply is recommended.

2.2.2 Power Cord Selection

When connected to a proper power outlet, the power cord grounds the instrument enclosure. The power cord shall be rated at ≥15 VDC and ≥3 A.

Warning: Improper grounding may cause damage to the instrument, or result in personal injury. Make sure the grounding conductor of the spectrum analyzer is grounded before turning on the instrument. Always use a well-grounded power source. Do not use an external power cable, power cord or an auto transformer without grounded protection. If this product is to be powered via an external auto transformer for voltage reduction, ensure that its common terminal is connected to a neutral (earthed pole) of the power supply.

Warning: Make sure the supply power is stable before turning on the analyzer to protect it from damage. Refer to "First Time to Power on".

2.2.3 Electro-static Discharge (ESD) Protection

ESD is an issue often ignored by users. Damage from ESD on the instrument is unlikely to occur immediately but will significantly reduce the reliability of it. Therefore, ESD precautions should be implemented in the work environment, and applied daily.

Generally, there are two steps to manage ESD protection:

(1) Conductive table mats to connect hands via wrist bands.
(2) Conductive ground mat to connect feet via ankle straps.

Implement both protection methods will provide a good level of anti-static protection. If used alone, the protection will not be as reliable. To ensure user's safety, anti-static components should offer at least 1MΩ isolation resistance.

Warning: The above ESD protections measures cannot be used when working with over 500V!

Make good use of anti-static technology to protect components from damage:

(1) Quickly ground the internal and external conductor of the coaxial cable before it is connected with the spectrum analyzer.
(2) Staff must wear anti-static gloves before touching the connector cord or doing any assemble work.
(3) Assure all the instruments are grounded properly to avoid static storage.

2.3 First Time to Power on

Only use the original AC/DC adapter or supplied battery for power supply.
The maximum RF input level for average continuous power is 30 dBm (or 50 VDC signal input). Do not apply signals exceeding this limit to the analyzer.
Note: Keep ventilation openings unobstructed for proper air circulation and cooling.

Warning: Check the power source before turning on the spectrum analyzer, to protect the device from damage.

(1) Press the power switch on the bottom left of the front panel.
(2) Self-initialization takes about 30 seconds, after the boot screen the spectrum analyzer will default to the scanning curve.
(3) After power on, let the spectrum analyzer warm up for 30 minutes for stabilization to obtain the most accurate results.

3. Primary User Guide

This chapter elaborates the following topics:

- A General Knowledge Of The Structure Of The Instrument
- User Interface
- Function Keys
- Parameter Input
- Build-in Help
- Touch Screen and External Mouse Control
- External Keypad Control
- Basic Measurement

3.1 A General Knowledge Of The Structure Of The Instrument

This chapter gives a brief description and introduction to the operations and functions of the front panel of the instrument, so as to facilitate your operations of the instrument in the shortest time.

3.1.1 Front Panel

On the instrument panel, knobs and function buttons are used to enter different function menus or directly use specific function application.

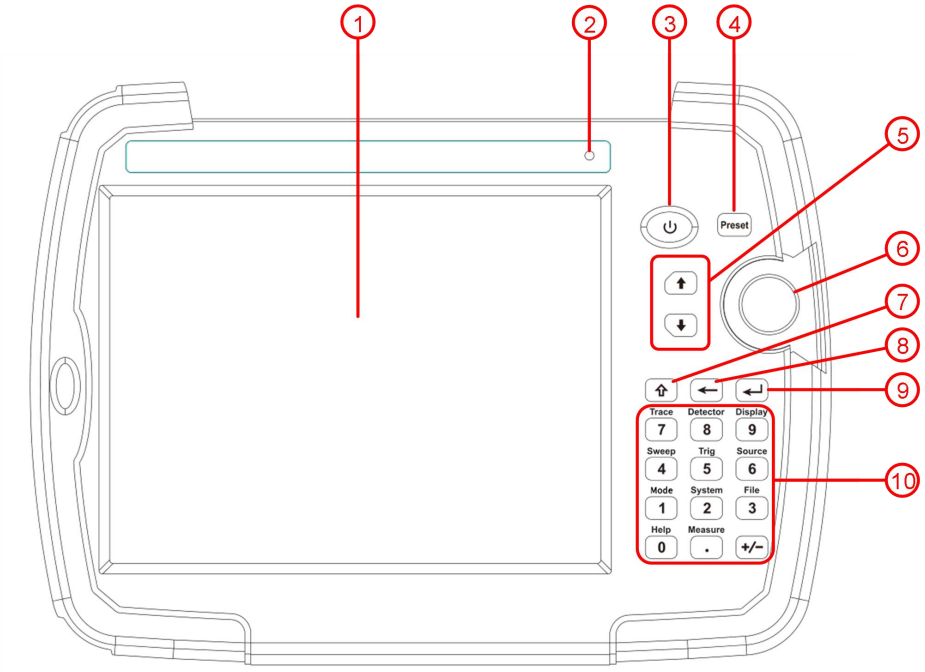


Figure 3-1: Front Panel

NO.	Description
1	LCD touchscreen.
2	**Light Sensor**: Adjusts the screen backlight according to the environmental light. This state can be specified in [Display]→ [ScreenSetting›] → [Brightness Auto].
3	**Power key**: Long push to turn on the analyzer, push to turn on/off the LCD display, long push to turn off the analyzer.
4	**Preset key**: Resets the analyzer to a known state. This state can be specified in [System]→ [PowerOn/Preset›] → [Preset›].
5	Arrow keys.

6	Rotary knob.
7	**Shift key**: Press the Shift key to active it, the light is on. When the Shift key is active, pressing a number key will execute the upper function. Long press the Shift key to active it persistently. To switch to the brief active status, short press the Shift key.
8	**Backspace key**: Deletes the last character from input.
9	**Enter key**: Confirms a parameter selection or configuration.
10	Function / numeric keypad.

3.1.2 Top Panel

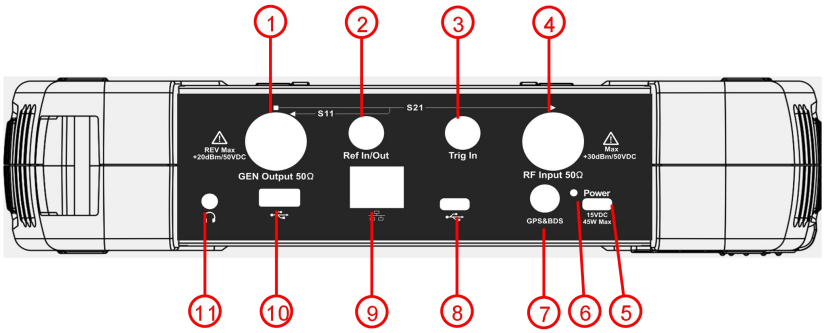


Figure 3-2: Top Panel

NO.	Name	Description
1	GEN Output connector (50 Ω)	The output for the built-in tracking generator.
2	10MHz IN/OUT	Supports reference clock input and output.
3	EXT Trig In connector	Connects to an external TTL signal.
4	RF Input connector (50 Ω)	Connector for RF input.
5	DC power connector	Connect to DC power via the power adapter. Ensure the power supply circuit is properly earthed for protection.
6	LED indicator	Green light when external DC power is connected. Red light when the battery is charging. Blinking light when charge suspend or battery absent.
7	GPS & BDS antenna interface	Connect an external positioning antenna to obtain current satellite positioning coordinates.
8	USB Device interface	MICRO-USB type. Connects to a PC. This USB interface supports PictBridge printer and remote-control connection.
9	LAN interface	Through this interface, the analyzer can be connected to your local network for remote

		control.
10	Mouse keyboard and other USB device interface	Type A. Connects to a USB memory stick.
11	Headphone jack	Insert the headset to listen to the sound after signal demodulation.

Note:

- USB Host



The analyzer may serve as a "host" device to connect to external USB devices. This interface can be used for accessing a USB flash drive or more devices after expansion via USB HUB, such as external keyboard or mouse.

- GEN Output 50Ω (tracking generator output 50Ω), VNA 1 port



The output of the tracking generator can be connected to a receiver through an N type male connector, users can purchase this option if required.
In vector network analysis mode, this port serves as the single port for S11 and the output port for S21.

⚠ **Caution:** Input voltage at RF input port must not be higher than 50 V DC to avoid damage to the attenuator and input mixer tracking generator.

- RF Input 50Ω, VNA 2 port

The RF input may be connected to a device via a N type connector
In vector network analysis mode, this port serves as the input port for S21.

⚠ **Caution:** When input attenuator is higher than 10 dB, the RF port input signal must be less than +30 dBm.

3.1.3 Rear Panel

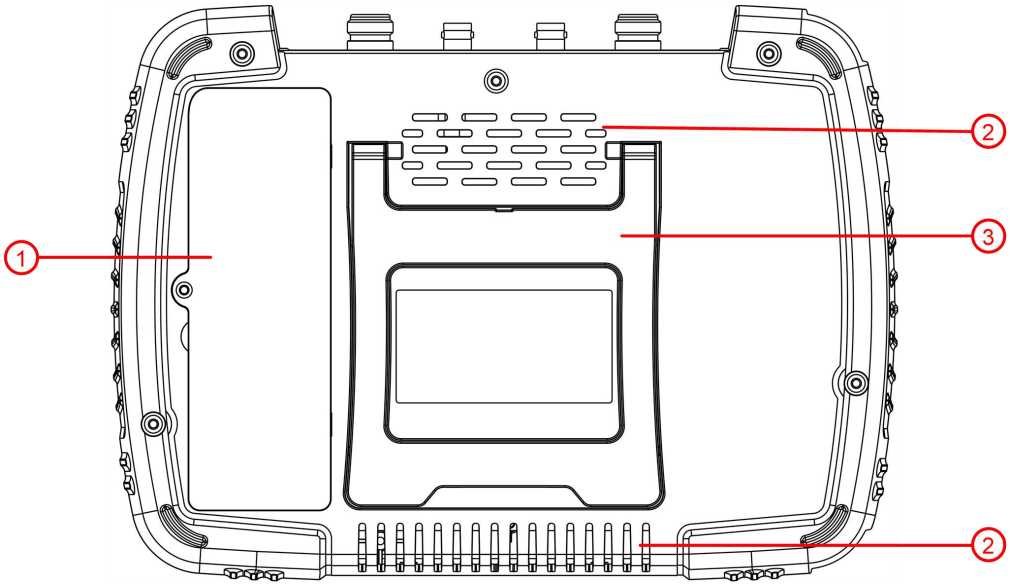


Figure 3-3: Rear Panel

NO.	Description
1	Battery compartment
2	Air vents
3	Tilt stand

3.2 User Interface



Figure 3-4: User Interface

NO.	Name	Description	Related Key
1	File	Display local saved files	File
2	Quick Save	Save the file according to the currently set quick save format type	System→[Save/Recall] → [Set Quick Save]
3	External reference	Set the reference frequency as **Int** (internal) or **Ext** (external) input	FREQ→ [Freq Ref]
4	Preamplifier	Turn on/off the preamplifier	AMPTD→ [Preamplifier]
5	Sweep status	Set the sweep status to **Single** or **Cont** (continuous)	Sweep→ [Sweep Single] or [Sweep Cont]
6	Tracking generator	Turn on/off the source output	Source→[Track GEN]

7	Trigger type	Set the trigger type to **Auto**, **Video**, **Pos** (external positive edge), **Neg** (external negative edge)	Trig
8	Continuous peak search	Enable/Disable continuous peak search	Marker→ [Peak Search]
9	Automatic search	Searching automatically	Auto
10	Audio demodulation	Turn on audio demodulation	Mode→ [Demod＞]
11	FFT mode	When RBW is set to less than 10kHz, automatically switch to FFT mode	
12	Remote control	Turn on remote control	
13	LAN access sign	LAN access sign	
14	USB access sign	USB access sign	
15	UNCAL sign	Measurement is not calibrated	
16	Date/Time	Display the date/time of system. Click to display the interface of date modification	System → [Setting ＞] →[Date/Time＞]
17	Battery icon	Charging and current battery level indicator	
18	Marker readout	Display the frequency value (time during zero scan span) and amplitude value of current frequency standard. Display the frequency standard function of response when the frequency standard function can be enabled	Marker
19	Trace 1	Display the current type of trace 1 is refresh, and peak is detected positive	

20	Trace 2	Display the current type of trace 2 is max. hold, and peak is detected negative	
21	Trace 3	Display the current type of trace 3 is hold, and peak is detected sample	
22	Trace 4	Display the current type of trace 4 is average, and peak is detected normal	
23	Trace 5	Display the current type of trace 5 is view, and peak is detected voltage average	
24	Marker readout	Display the frequency value (time during zero scan span) and amplitude value of current frequency standard. Display the frequency standard function of response when the frequency standard function can be enabled	Marker
25	Menu item	Menu item of current function	
26	Measure mode	Current measurement mode	Mode
27	Sweep Time	System sweep time	Sweep→[Sweep Time]
28	Stop frequency	Display stop frequency	FREQ→ [Stop Freq]
29	Span	Display span width	SPAN→[Span]
30	Center frequency	Display center frequency	FREQ→ [Center Freq]
31	Touchscreen Numeric Keypad	Click on the location where you need to modify the input parameters to bring up the menu.	
32	Video bandwidth	Display video bandwidth	BW→ [VBW]

33	Start frequency	Display start frequency	FREQ→ [Start Freq]
34	Resolution bandwidth	Display resolution bandwidth	BW→[RBW]
35	Marker	Display current activated marker	Marker
36	Amplitude Scale	Display amplitude scale	AMPTD→ [Scale/Div]
37	Amplitude Scale Type	**Log** (logarithmic) or **Line** (linear)	AMPTD→ [Scale Type]
38	Attenuation	Display input attenuation setting	AMPTD→ [Attenuation]
39	Reference level	Reference level	AMPTD→ [Ref Level]

Note:
1~9: The switch can be toggled through touch screen or mouse click.
1~24: The current trace interface can be accessed and modified through touch screen or mouse click.
27, 32, 34, 39: If there is an asterisk (*) displayed before it, indicating that the item is in manual setting mode.
30~34: Click to summon the digital input keyboard interface.

3.3 Function Keys

3.3.1 Function Softkeys

There are 6 function softkeys horizontally arranged along the bottom of the interface screen. Press one of the function softkeys to show the submenu along the right side of the display.



- **FREQ:** Activates the center-frequency function, and accesses the frequency function menu.
- **SPAN:** Activates the frequency sweep span function, and set Full Span\Zero Span\Last Span.
- **AMPT:** Activate the reference level function to pop up the soft menu for amplitude setting. This menu covers spectrum analyzer amplitude parameters, including reference level, attenuator, scale, unit and preamplifier. Note that reference level and attenuator settings are coupled.
- **Auto:** Searches the signal automatically within the full frequency range.
- **BW:** Activate the resolution bandwidth function and operate the corresponding softkey.
- **Marker:** View marker menu.

- **Marker:** Accesses the marker control keys that select the type and number of markers and turns them on and off.
- **Marker Fctn:** Marker measurement function menu, including N dB bandwidth measurement, marker noise, frequency counter and field strength measurement.
- **Marker→:** Accesses the marker function softkeys that allow you to set other system parameters based on the current marker value.
- **Peak:** Places a marker on the highest peak, and accesses the Peak functions menu.

3.3.2 Function HardKeys

Press the ⇧ key, then press a numeric key. The corresponding function will appear in the menu on the right side of the screen.

⇧ **key:**

(1) Press ⇧ key, the light is on.

(2) When the indicator light is on, press the numeric key to activate its corresponding function.

(3) Long press this key to active it persistently.

(4) Short-press again to return to the numeric keypad.



- **Trace:** The trace measurement and display mode can be set, and the related trace can be operated.
- **Detector:** Set the detection mode.
- **Display:** Set the parameters displayed on the screen.
- **Sweep:** The system is set to single or continuous scanning mode. Users can also set the scanning mode and scanning time.
- **Trig:** Set the triggering mode and related parameters of the sweep frequency.
- **Source:** Trace source Settings.
- **Mode:** Switch between scanning spectrum mode, real-time spectrum

mode, network division mode, demodulation mode and other modes.

- **System:** System parameter setting and instrument calibration operation menu.
- **File:** Browse, delete, export, load, power on, and reset stored files.
- **Help:** On the spectrum analyzer help menu, click this key once to open the system help function, and then click again to disable the help function.
- **Measure:** The expanded measurement functions based on the spectrometer platform include adjacent channel power measurement, channel power measurement, occupied bandwidth measurement, etc. For specific measurement function parameter Settings, refer to the measurement Settings menu.

3.4 Parameter Input

Use the numeric keypad, knob and arrow keys to enter parameter values.

3.4.1 Numeric Keypad

Enters a specific value, the submenu typically shows the selectable units. Press the desired unit or press ↵ Enter key to complete the entry.



(1) **Numeric keys:** Numbers 0-9 are available to be used.

(2) . **Decimal key:** A decimal point "." will be inserted at the cursor position when this key is pressed.

(3) +/− **Sign key:** Sign key "+/-" is to toggle the sign of a parameter. When pressed the first time, a "-" will be inserted and changed into "+" following the second press.

(4) ← **Backspace key**

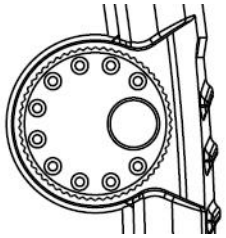
- During the process of parameter editing, this key will delete the characters on the left side of the cursor.
- While in the process of file name editing, pressing this key will delete

characters that have been entered.

(5) **Enter key:** When pressed, the system will complete the input process and insert a default measurement unit for the parameter automatically.

3.4.2 Rotary Knob

During parameter editing, turn the knob clockwise to increase, or counterclockwise to decrease the parameter values at specified steps.



3.4.3 Arrow keys



- Increase or decrease the parameter value at specific steps while editing a parameter.
  Note: Press **FREQ**→[**CF Step**] to set the center frequency step.
- Move the cursor though the directory tree in the **File** function.

3.5 Build-in Help

The built-in help provides information that refers to every function key and menu key on the front panel. Users can view this help information if required.

1. How to acquire built-in help

Short or long press . When the indicator lights up, press **Help** to bring up help prompts in the center of the screen.

2. Page up and down

If help information is displayed in different pages, more information can be displayed through the up and down direction buttons or by clicking and dragging the scroll bar.

3. Acquire the menu help

A message about how to obtain help information will be shown, press the menu keys to get the corresponding help.

4. Acquire the help information of any function key

A help window will pop up in the center of the screen. Press ⇧ to view help information for the corresponding key functions.

5. Close the current help information

Press ⇧ key then press **Help** to close help.

3.6 Touch Screen and External Mouse Control

The display screen is of touchable type. Analyzer can be controlled by different gestures.
Instructions for touch screen and mouse control are as below. Operation can also be realized via the buttons/knobs in bracket.

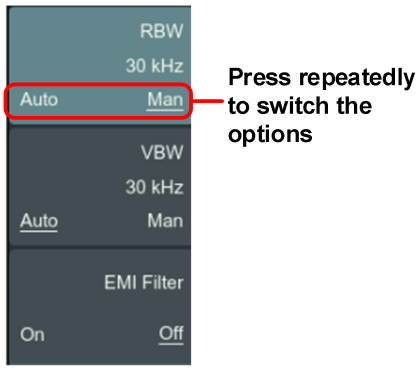
- Click the menu at the top of the screen to switch the corresponding switch or option. For details, refer to the User Interface on Page 11.



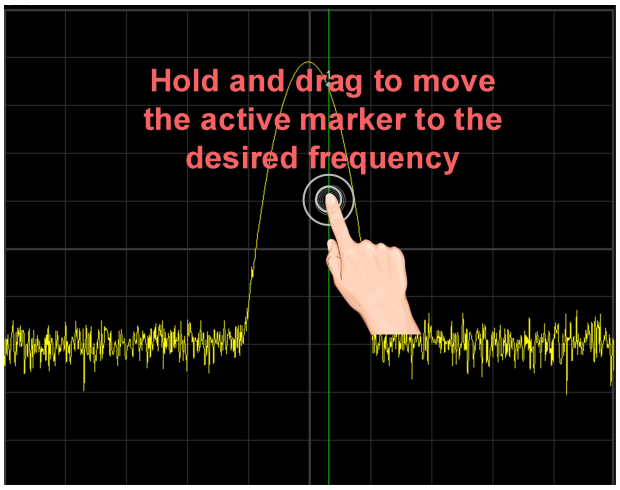
- **Menu softkey**: Touch the menu softkeys in the bottom.



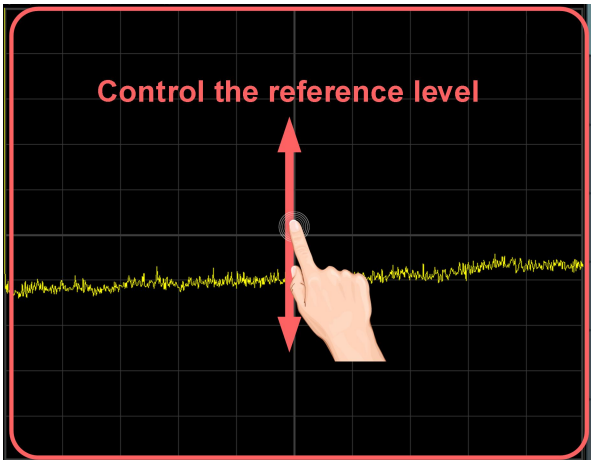
- **Menu items:** Any options in the menu can be switched in the area of touch menu item.



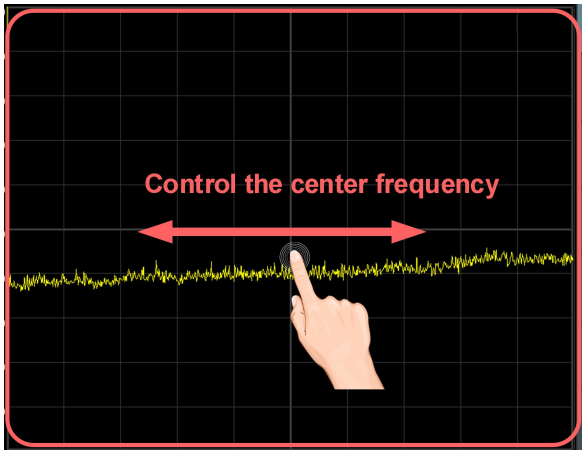
- **Move the frequency standard to the frequency required (Marker → [Marker >]):** When a marker has been activated, press and drag it to the required location and then release it.



- **Set reference level (AMPT → [Ref Level]):** Hold it in trace display area and drag it up or down to decrease or increase the reference level in order to drag the trace up and down.

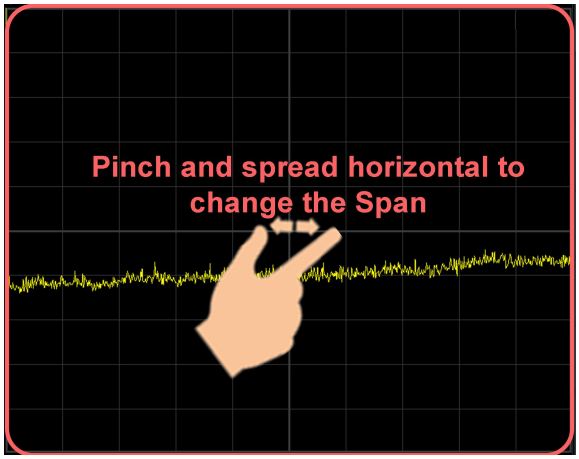


- **Set center frequency (FREQ→ [Center Freq]):** Press it in the trace display area and drag it to the left or right to modify the center frequency, in order to drag the trace to the left or right.

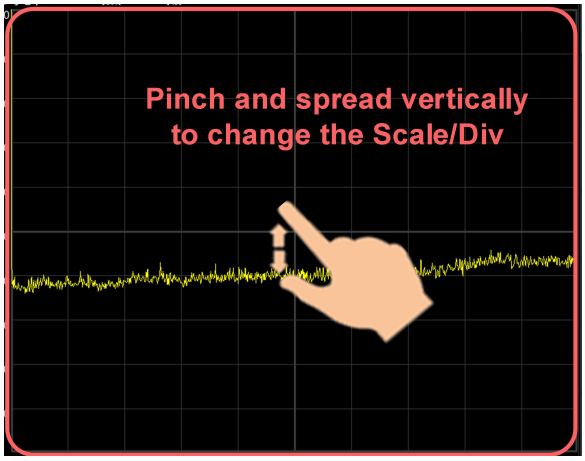


- Trace will suspend refreshing after pressing the trace area and will continue with refreshing after releasing.

- **Set scan span (SPAN→ [Span]):** Place two fingers on the touch screen in a horizontal direction in trace display area, and make them close to or separate from each other to decrease/increase scan span, so as to enlarge/reduce trace horizontally.



- **Set scale/cell (AMPT → [scale/Div]):** Place two fingers on the touch screen in a vertical direction in trace display area, and make them close to or separate from each other to increase/decrease scale/cell, so as to enlarge/reduce trace scale vertically.



3.7 External Keyboard Control

Insert the keyboard into the USB port on the front panel. Control and input can be realized by keyboard. Buttons are corresponding to the following:

Button	Description	Button	Description	Button	Description
F	Frequency	S	Span	A	Amplitude
R	Auto Tune	B	Band Width	D	Detector
W	Sweep	O	Track Gen	T	Trace
V	Display	I	Trig	M	Mode
Y	System	Q	Quick Save	P	Peak
K	Marker	X	File	L	Save/Recall

N	Preset	H	Help	J	Measure
F1~F7	F1~F7	F9	GHz/dBm	F10	MHz/dB
F11	kHz/dBmV	F12	Hz/mV	0~9	0~9
Backspace	<-	Esc	X	Enter	enter

3.8 Basic Measurement

Basic measurements include, input signal frequency and amplitude display, marked by a frequency marker. Follow these four simple steps below to implement input signal measurement.

Operation:

1. Find the signal frequency across the full sweep width.
2. Setting center frequency.
3. Setting span and resolution bandwidth.
4. Activate marker.
5. Setting amplitude.

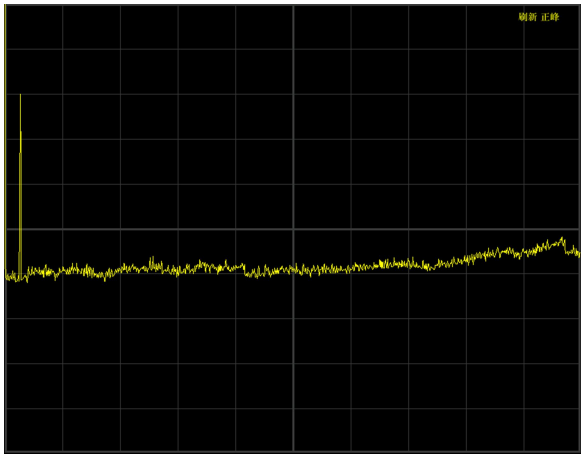
For example, to measure a 100MHz -10dBM signal, you must turn on the spectrum analyzer and ensure it is warmed up for 30 minutes to ensure measurement accuracy.

(1) Equipment connection

Connect the signal source generating RF signals to the RF input port of the spectrum analyzer. Set the signal source as follows: Frequency: 100 MHz; Amplitude: -10 dBm.

(2) Setting parameters

1) Press **Preset** to restore the analyzer to its factory-defined state. The Spectrum analyzer will display the spectrum from 9kHz to the maximum span width. The signal generated will display as a vertical line at 100MHz. As shown in the below figure.



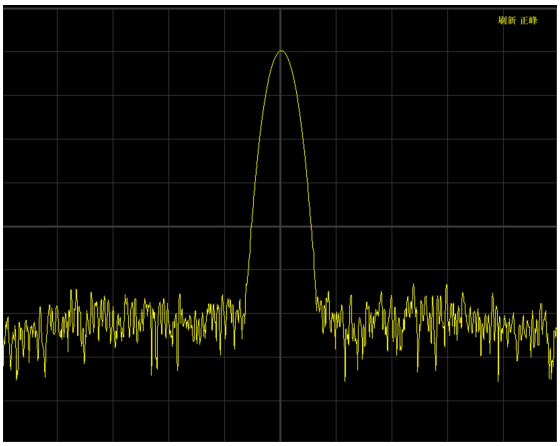
To clearly observe the signal, reduce the frequency span to 1 MHz and set the center frequency to 100MHz.

2) Setting Center Frequency: Press **FREQ**, select [Center frequency] on corresponding pop up menu. Input "100" and select the unit as MHz on the numeric keypad. The keys can be used to set the exact value but the knob and directional keys can also be used to set the center frequency.

3) Setting Frequency Span

- Press **SPAN**, input "**1**" and select **MHz** as its unit using the numeric keypad; or press ↓ to decrease to 1MHz.
- Press **BW**, set [resolution bandwidth] to manual, and input "**30**" and select **kHz** as its unit using the numeric keypad; or press ↓ to decrease to 30kHz.
- Press **Detector**, set the detection type to positive peak.

The below figure shows the signal at a higher resolution. Please note that resolution bandwidth, video bandwidth and frequency span are self-adapted. They adjust to certain values according to frequency span. Sweep time can be self-adapted too.



4) Activate Marker

- Press **Marker** softkey on the bottom,the button is located at the bottom of the screen. Then select [**Marker** >] softkey on the right screen. And press the softkey to select [Marker 1 2 3 4 5 6 7 8], select Marker 1, the marker is located at horizontal center by default, that is the signal peak point or its neighbor.
- Press **Marker** softkey on the bottom, the button is located at the bottom of the screen.Then select [**Peak** >] on the right screen. And select [**Max Search**]. Frequency and amplitude values are read by the marker and shown on the top right of the display area.

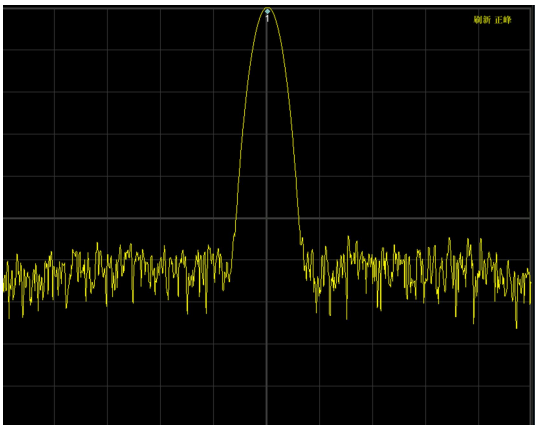
Frequency and amplitude values are read by the marker and shown on the top right of the display area.

5) Setting amplitude

The reference level will be shown at the top of the display grid. To get a better dynamic range, the real signal peak point should be located at or near the top of display grid (reference level). The reference level is also the maximum value on Y axis. Here we reduce to 20dB reference level to increase the dynamic range.

Press **AMPTD**, the amplitude setting menu will pop up, and the [reference level] soft key will be activated. The reference level can be input at the top left of the display grid. Input "-10" using the numeric keypad and set the unit to dBm. You can also use the ↓ key or the knob for adjustment.

The reference level is set at -10dBm, which is the signal peak value near the top of the grid. The balance between the signal peak value and noise is dynamic range.



4. Warranty

4.1 Troubleshooting

Typical issues that may occur when using your spectrum analyzer:

- Power on malfunction
- No signal display
- Wrong measurement results or poor frequency or amplitude precision.

1. Power on malfunction

Power on malfunction can include a situation where the screen is still dark (no display) after switch on.
If the screen is still dark after power on, please check:

1) If the power supply has been connected correctly and it the power supply voltage range is within the specification.
2) If the power switch has been turned on.
3) If the fan is running, please contact us for service.

If the power indicator is not lit and the fan is not spinning, there might be a problem with the power supply of the spectrum analyzer. If the system cannot be accessed, it could be a CPU failure in the spectrum analyzer. If all the above checks are normal, then it's possible that the components related to graphic display are faulty.

2. No signal display

If there is no signal display at any wave band. Please try the following: set a signal generator at 30 MHz frequency and -20 dBm power and connect it to the spectrum analyzer RF input connector. If there is still no signal display, there may be a problem with the spectrum analyzer hardware circuit. Please contact us for service.

3. Poor signal frequency precision

If the display contents shakes a lot or the frequency readout exceeds the error range during measurements, check if the signal source is stable. If so, check if spectrum analyzer reference is precise. Select internal or external frequency reference according to measurement conditions: press **FREQ** →[Frequency reference Internal External]. If the frequency is still not precise, then the spectrum analyzer LO has lost its phase lock, please contact us for service.

4. Poor readout amplitude precision

If signal amplitude readout is not precise, perform a calibration. If amplitude readout is still not precise, then it may be a problem with internal circuit, please contact us for service.

4.2 Spectrum Analyzer Repair

When it is difficult to solve your spectrum analyzer's problem, you can contact us by phone or fax. When it's confirmed that the instrument is damaged and need return to repair, you need to wrap the spectrum with the original packaging material and the packing box, follow the steps below to package:

(1) Write a detailed description of the malfunction of the spectrum analyzer, put it in the box together with the spectrum analyzer.
(2) Put the instrument in a dustproof / antistatic plastic bag to reduce possible damage.
(3) Place pads in four corners of mother packaging carton, then put the instrument into the mother carton.
(4) Seal the carton with tape and tighten it with nylon tape.
(5) Mark the carton with words of "Fragile! Do not touch! Carefully".
(6) Ship by type of precise instruments.
(7) Keep all the copies of shipping sheets.

Caution: The use of other materials to package the spectrum analyzer may damage the instrument. Do not use polystyrene pellets as packaging materials, they can not adequately fit the instrument, and can be sucked into fan by the generated electrostatic, causing the spectrum analyzer damage.

5. Appendix

5.1 Appendix A: Accessories

(The accessories subject to final delivery.)

Standard Accessories



Power Cord



Quick Guide



USB Cable



N-BNC joint



Metal Case



Adapter



GPS Antenna

CD Rom

Optional Accessories



N-N Cable



N-SMA Cable



SMA-SMA Cable



SMA Adaptor



N-SMA Adaptor





Near Field Probe includes: Four near-field probes, N-SMA adapter, SMA-SMA cable (Frequency range: 30 MHz – 3 GHz)

Carrying Case

5.2 Appendix B: General Care and Cleaning

General Care

Please do not place the instrument in areas exposed to direct sunlight for prolonged periods.

Caution

To avoid any damage to the instrument or probes, do not exposed it to any sprays, liquids, or solvents.

Cleaning

Inspect the instrument and probes as often as operating conditions require.
To clean the instrument exterior, perform the following steps:
Wipe the dust from the instrument surface with a soft cloth. Take care not to scratch the transparent LCD protection screen when cleaning.

⚠ **Warning:** Before re-applying power, ensure that the instrument is completely dry, avoiding any electric shock or electrical short circuit resulting from moisture.

5.3 Appendix C: USB Disk Requirements

USB disk requirements:
Max capacity 4G, NTFS file system is not supported.
If the USB disk doesn't work properly, format your USB disk and then try again.

5.4 Appendix D: PC Software Requirements

The PC software does not support Windows XP.

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