



S1132 Series Multi-Standard Signal Generator

User Manual



Saluki Technology Inc.

The document applies to the signal generator of the following models:

- S1132A Signal Generator (9kHz - 6GHz).
- S1132B Signal Generator (9kHz - 6GHz, built-in IQ modulator).

Standard Package of the signal generator:

- 1x Main Machine
- 1x Power Cord Assembly
- 1x Product Certificate
- 1x Coaxial Adapter

Options of S1132 series signal generator in addition to standard accessories :

Option No.	Description
S1132-02	RF Upper Conversion Device
S1132-03	Analog External Audio Modulation
S1132-05	High Stability Time Base Option
S1132-06	Power Meter Control Kit
S1132-07	Omnidirectional Antenna (300MHz - 6GHz)
S1132-08	Directional Antenna (600MHz - 8GHz)

Preface

Thank you for choosing Saluki Technology Products.

We devote ourselves to meeting your demands, providing you high-quality measuring instrument and the best after-sales service. We persist with “superior quality and considerate service”, and are committed to offering satisfactory products and service for our clients.

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Document Authorization

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Product Quality Assurance

The warranty period of the product is 36 months from the date of delivery. The instrument manufacturer will repair or replace damaged parts according to the actual situation within the warranty period.

Product Quality Certificate

The product meets the indicator requirements of the document at the time of delivery. Calibration and measurement are completed by the measuring organization with qualifications specified by the state, and relevant data are provided for reference.

Quality/Settings Management

Research, development, manufacturing and testing of the product comply with the requirements of the quality and environmental management system.

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1 Overview

1.1 Product Overview

S1435 S1132 series RF signal generator provides a wide range of product choices for different functional requirements and application scenarios. Each type of product has outstanding features in its function to characterize the focus of its testing field. S1132 series signal generator features a variety of key analog modulation functions (AM/FM/ΦM/pulse modulation), standard digital modulation functions (ASK/PSK/FSK) and customizable dedicated modulation methods (SSB/DSB/CW modulation, etc.).

In addition, S1132 integrates frequency/amplitude scanning, amplitude-frequency scanning, linear frequency modulation, low-frequency output and up-conversion functions, making the signal generator a flexible and versatile instrument suitable for teaching, research, product development, production and maintenance. Rich logic hardware interface and widescreen LCD display make it easy to control various operations. The complete standard SCPI command set and universal USB, LAN interfaces bring great convenience to your remote control and secondary development.

Key Features

- Frequency range: 9kHz - 6GHz
- Typical output power: -120dBm to +10dBm
- Standard IF input port
- Multiple digital modulation formats, built-in IQ modulator (B type)
- AM/FM/ΦM analog modulation functions, modulation rate up to 1MHz
- Support pulse modulation, minimum pulse width 200ns
- Support linear frequency modulation, can simulate radar signals
- Customizable dedicated communication modulation (SSB/DSB/CW)
- As frequency upper conversion, support external input IF signals
- Internal modulation source: sine/ square/ triangle/ sawtooth waves
- USB/ LAN remote control interface, SCPI supported

1.2 Electrical Safety

Precautions for electrical safety of the instrument:

- 1) Before the instrument is powered on, the actual supply voltage should match the supply voltage marked on the instrument.

- 2) According to the power requirements of the real panel of the instrument, a three-core power cord should be adopted while ensuring reliable grounding of the ground wire during operation. Either floating ground or poor grounding may cause damage to the instrument and even cause injury to operators.
- 3) Do not damage the power cord, otherwise electric leakage will be caused, resulting in damage to the instrument and even injury of the operators. If an external power cord or extension socket is used, it should be checked before use to ensure electrical safety.
- 4) If the power supply socket does not provide an on/off switch, to cut the power of the instrument, you can just directly unplug the instrument, and therefore, it should be ensured that the power plug can be inserted or drawn conveniently.
- 5) Do not use damaged power cords. Before connecting the instrument to the power cord, check the integrity and safety of the power cord, and properly place the power cord to avoid the impact due to human factors, such as, too long power cord that may trip the operator.
- 6) Keep the socket clean and tidy, and ensure the plug and the socket in good contact and reliable engagement.
- 7) Neither the socket nor the power cord can be overloaded, otherwise fire or electric shock will be caused.
- 8) Unless otherwise allowed, do not open the housing of the instrument, which may expose internal circuits and devices of the instrument and cause unnecessary damage.
- 9) If the instrument needs to be fixed at the test site, a qualified electrician is required to install the protective earth wire between the test site and the instrument first.
- 10) Take appropriate overload protections to prevent overload voltage (caused by lightning, for instance) from damaging the instrument or causing personal injury.
- 11) When opening the housing of the instrument, do not place objects not belonging to the interior of the instrument, otherwise, short circuit, damage to the instrument and even personal injury may be caused.
- 12) Unless otherwise stated, the instrument has not received any waterproof treatment, so keep the instrument from contacting with liquid to prevent damage to the instrument or even personal injury.
- 13) Do not place the instrument in an environment where fog is easily formed, for example, moving the instrument in a environment where cold and heat are in alternation, where water droplets formed on the instrument may cause electric shock and other hazards.

1.3 Operation Precautions

1.3.1 Power Check

The S1132 multi-standard signal generator can be powered by 110V-220V alternating current; before turning it on, you must confirm that the ground wire of the AC power source is reliably grounded before inserting the plug of the power cord into a standard three-pin socket. Never use a power cord without a protective ground. Floating ground

or poor grounding may damage the signal generator and even cause personal injury. In order to prevent or reduce the mutual interference caused by multiple devices through the power supply, especially the spike interference generated by high-power devices may cause damage to the instrument hardware, it is best to use a 220V/110V AC stabilized power supply to power the adapter.

Power Parameter	Range
Voltage	100V - 240V
Frequency	50Hz - 60Hz
Max. consumption	20W

1.3.2 Initial Power-up of the Signal Generator

- 1) Turn on the strong power switch at the back of the instrument, and the fan starts to run;
- 2) Turn on the front power control switch, and it takes about 30 seconds to start the instrument;
- 3) After the instrument is started up, it needs to be warmed up for 20 minutes before testing.

2 Interfaces & Buttons

This chapter introduces the front panel, rear panel and button of the S1132 signal generator.

2.1 Front Panel

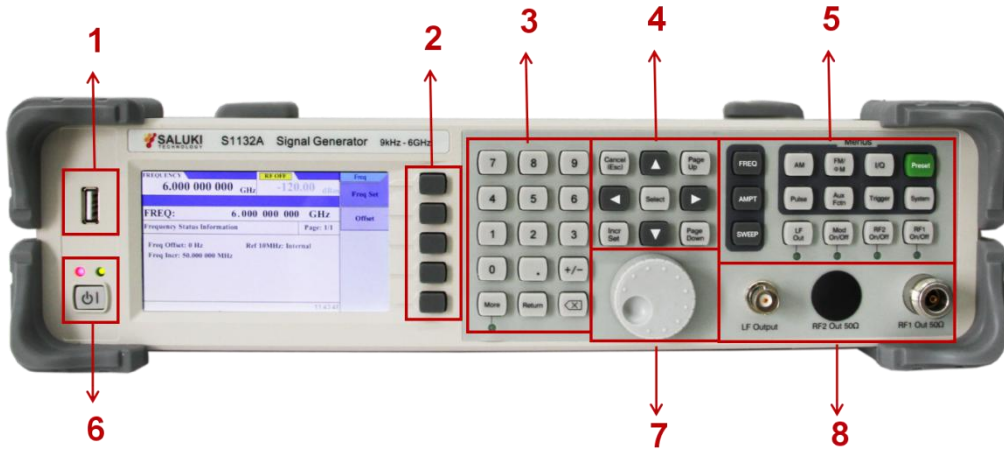


Figure 2-1 Front panel of S1132 signal generator

No.	Description	No.	Description
1	USB interface	5	Function button zone
2	Soft menu	6	Power switch
3	Numeric button zone	7	Knob
4	Selection button zone	8	LF Output, RF2 Out, RF1 Out

2.2 Rear Panel

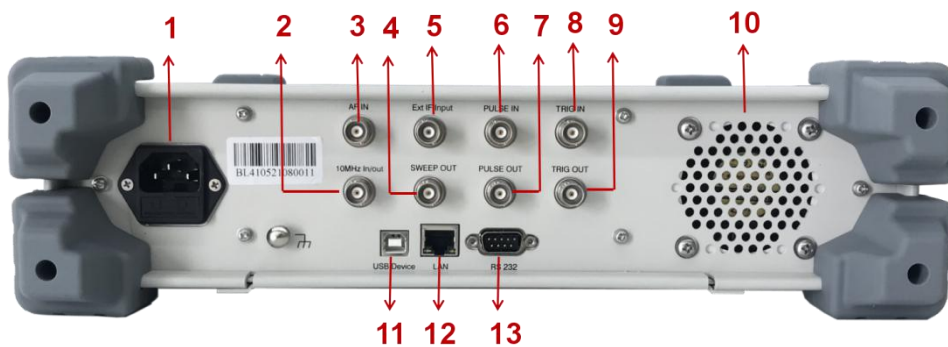


Figure 2-2 Rear panel of S1132 signal generator

No.	Description	No.	Description
1	Power input	8	TRIG IN
2	10MHz IN/OUT	9	TRIG OUT
3	AF IN	10	Fan port
4	SWEEP OUT	11	USB interface
5	Ext IF Input	12	LAN interface
6	PULSE IN	13	RS232 interface
7	PULSE OUT		

3 Operation Guide

This chapter introduces the function and usage of the S1132 signal generator through examples. The contents of this chapter are as follows:

- Continuous Wave Signal
- Sweep Signal
- Analog Modulation Signal
- Digital Modulation Signal
- Pulse Modulation
- LF Signal
- Up-conversion Function
- Power Measurement

3.1 Continuous Wave Signal

The most common output signal of a signal generator is the continuous wave limit signal. In the following example, we use Agilent N9020A spectrum analyzer to measure the CW output signal information of S1132 signal generator (with frequency of 1GHz, amplitude of -10dBm).

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting

- (1) Reset the signal generator

— Press **【Preset】**  button

- (2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm



— Press **【RF1】** button, make the **【RF1】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, a continuous wave signal can be observed on the screen, with a frequency of 1 GHz and an amplitude of -10.46 dBm, as shown in Figure 3-1.

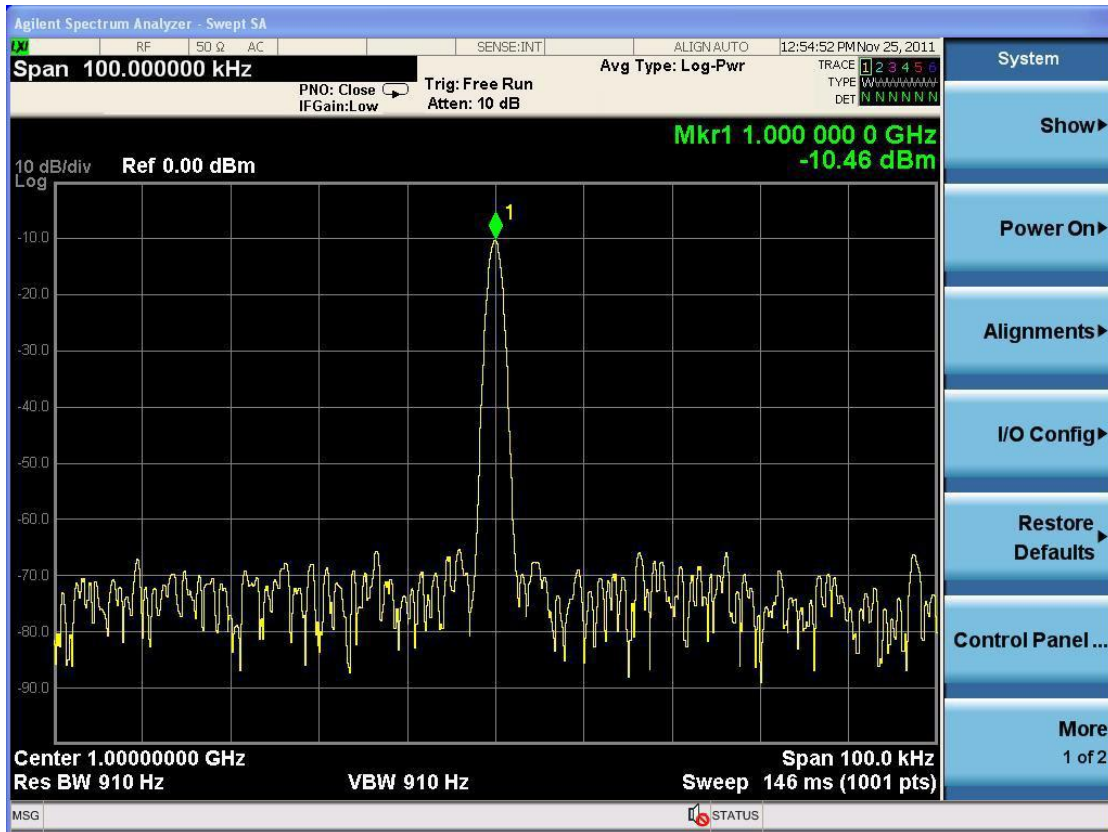


Figure 3-1 Test result of the CW signal

3.2 Sweep Signal

The S1132 signal generator can output signals in three modes: frequency sweep, amplitude sweep, and frequency + amplitude sweep. The following describes the signals output in two modes: frequency sweep, frequency + amplitude sweep.

3.2.1 Frequency sweep signal

Frequency sweep signal refers to the signal continuously output from the start frequency to the stop frequency under the same amplitude.

For example: to output a frequency sweep signal, with frequency from 1GHz to 2GHz, amplitude of -10dBm, number of step points of 50, dwell time of 20ms.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【AMPT】**  button, input -10 dBm

— Press **【Sweep】**  button

— Select [SWP Mode]

— Select [Freq]

— Select [CFG Step]

— Select [Freq Start], input 1 GHz

— Select [Freq Stop], input 2 GHz

— Select [Points], input 50


— Select [Enter]

— Press **【More】**  button

— Select [Dwell], input 20 ms

— Press **【Return】**  button

— Select [Swp Repe] -- “Cont”

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-2.

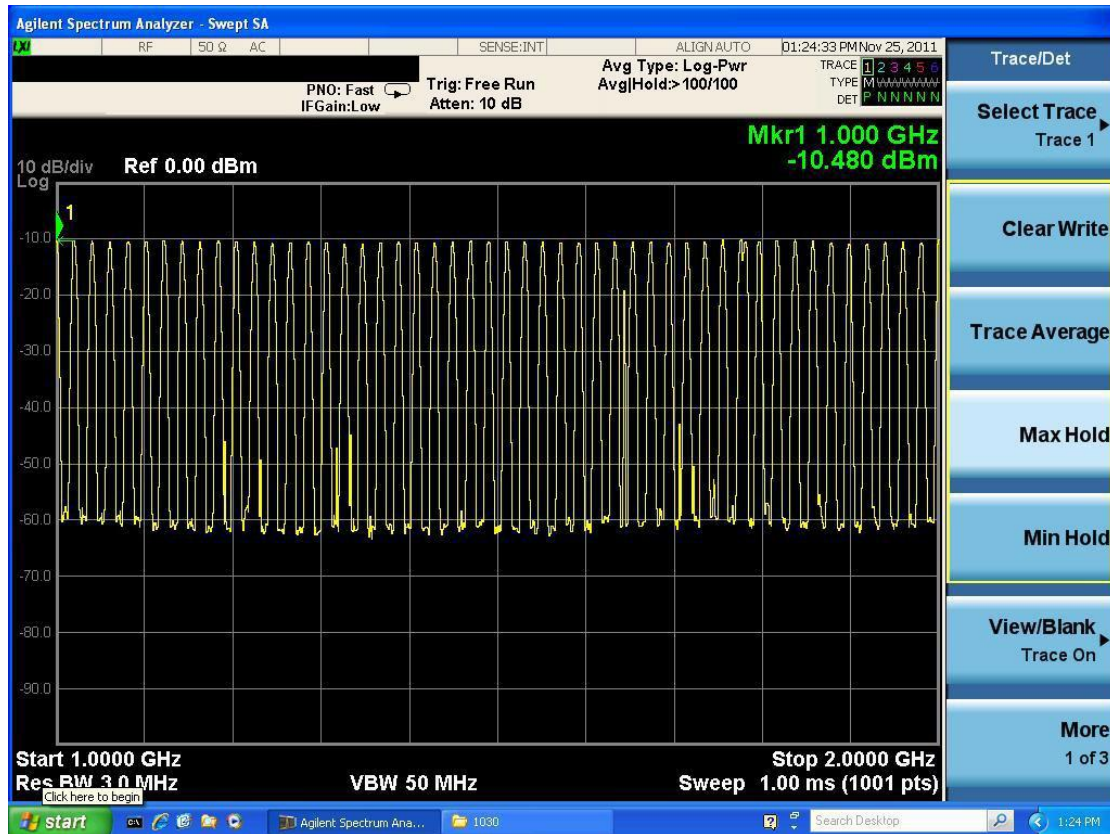


Figure 3-2 Test result of the frequency sweep signal

3.2.2 Frequency + Amplitude sweep signal

Frequency sweep signal refers to the frequency and amplitude sweep from the start value to the end value at the same time.

For example: to output a sweep signal, with frequency from 1GHz to 2GHz, amplitude from -50dBm to -10dBm, number of step points of 50, dwell time of 20ms.

Operation steps:

1. Instrument connection






Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting

- (1) Reset the signal generator

— Press **【Preset】**  button

- (2) Parameter setting

- Press **【AMPT】**  button, input -10 dBm
- Press **【Sweep】**  button
- Select [SWP Mode]
- Select [Freq & Ampl]
- Select [CFG Step]
- Select [Freq Start], input 1 GHz
- Select [Freq Stop], input 2 GHz
- Select [Ampl Start], input -50 dBm
- Select [Ampl Stop], input -10 dBm
- Select [Points], input 50
- Select [Enter]
- Press **【More】**  button
- Select [Dwell], input 20 ms
- Press **【Return】**  button
- Select [Swp Repe] -- “Cont”
- Press **【RF1】**  button, make the **【RF1】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-3.

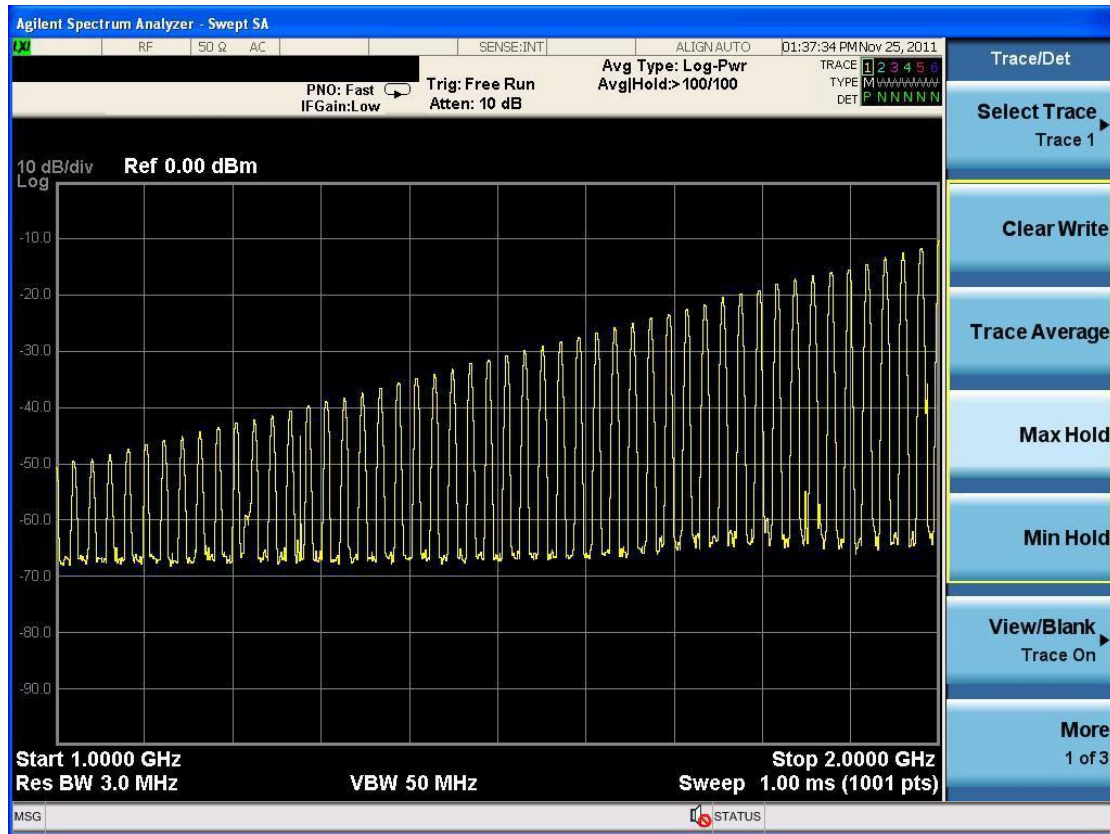


Figure 3-3 Test result of the frequency + amplitude sweep signal

3.3 Analog Modulation Signal

The S1132 signal generator can output AM/FM/PM analog modulation signals. The following introduces various modulation signals with carrier frequency of 1GHz and amplitude of -10dBm.

3.3.1 AM

For example: modulation depth 50%, modulation rate 50kHz

Operation steps:

1. Instrument connection






Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting

- (1) Reset the signal generator

— Press **【Preset】**  button

- (2) Parameter setting

- Press **【FREQ】**  button, input 1 GHz
- Press **【AMPT】**  button, input -10 dBm
- Press **【RF1】**  button, make the **【RF1】** button backlight bright
- Select [Depth], input 50%
- Select [Int Fctn] -- “Frequency”, input 50 kHz
- Press **【Return】**  button
- Select [State] -- “On”
- Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-4.



Figure 3-4 Test result of the AM modulation signal

3.3.2 FM

For example: frequency offset 500kHz, modulation rate 50kHz

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting


(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【FM/ΦM】**  button

— Select [Mode] -- “FM”


— Select [Freq Offset], input 500 kHz

— Select [Int Fctn]

— Select [Freq], input 50 kHz

— Press **【Return】**  button

— Select [FM State] -- “On”

— Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-5.



Figure 3-5 Test result of the FM modulation signal

3.3.3 FM

For example: phase offset 180°, modulation rate 100kHz

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting





(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

- Press **【RF1】**  button, make the **【RF1】** button backlight bright
- Press **【FM/ΦM】**  button
- Select [Mode] -- “ ϕ M”
- Select [Phase Offset], input 180°
- Select [Int Fctn]
- Select [Freq], input 100 kHz
- Press **【Return】**  button
- Select [ϕ M State] -- “On”
- Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-6.



Figure 3-5 Test result of the PM modulation signal

3.4 Digital Modulation Signal

The S1132 signal generator can output ASK/FSK/PSK digital modulation signals. The following introduces various modulation signals with carrier frequency of 1GHz and amplitude of -10dBm.

3.4.1 ASK Modulation

For example: 2ASK mode, modulation depth 50%, rate 100kHz

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting


(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【AuxFctn】**  button

— Select [Digital Mod]

— Select [State] -- “On”



— Select [Mode]

— Select [ASK]

— Select [Parameter]

— Select [Depth], input 50%

— Select [Rate], input 100 kHz

- Press **【Return】**  button
- Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-7.



Figure 3-7 Test result of the ASK modulation signal

3.4.2 FSK Modulation

For example: 2FSK mode, rate 100kHz

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting


- (1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【AuxFctn】**  button

— Select [Digital Mod]

— Select [State] -- “On”

— Select [Mode]

— Select [FSK]

— Select [2FSK]


— Press **【Return】**  button

— Select [Parameter]

— Select [Deviation], input 100 kHz

— Select [Rate], input 100 kHz

— Press **【Return】**  button

— Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-8.

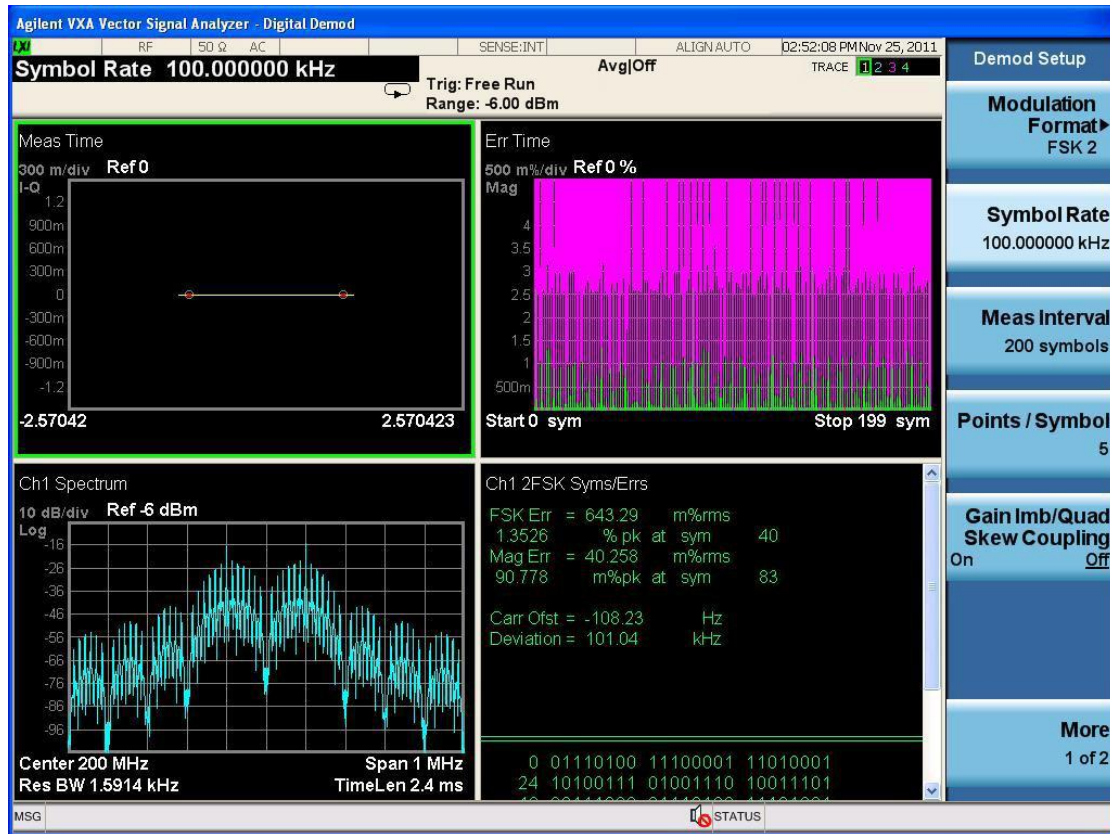


Figure 3-8 Test result of the FSK modulation signal

3.4.3 PSK Modulation

For example: 2PSK mode, rate 100kHz

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting


- (1) Reset the signal generator

— Press **【Preset】**  button

- (2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【AuxFctn】**  button

— Select [Digital Mod]

— Select [State] -- “On”

— Select [Mode]

— Select [PSK]

— Select [2PSK]


— Press **【Return】**  button

— Select [Parameter]

— Select [Phase], input 180°

— Select [Rate], input 100 kHz

— Press **【Return】**  button

— Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-9.

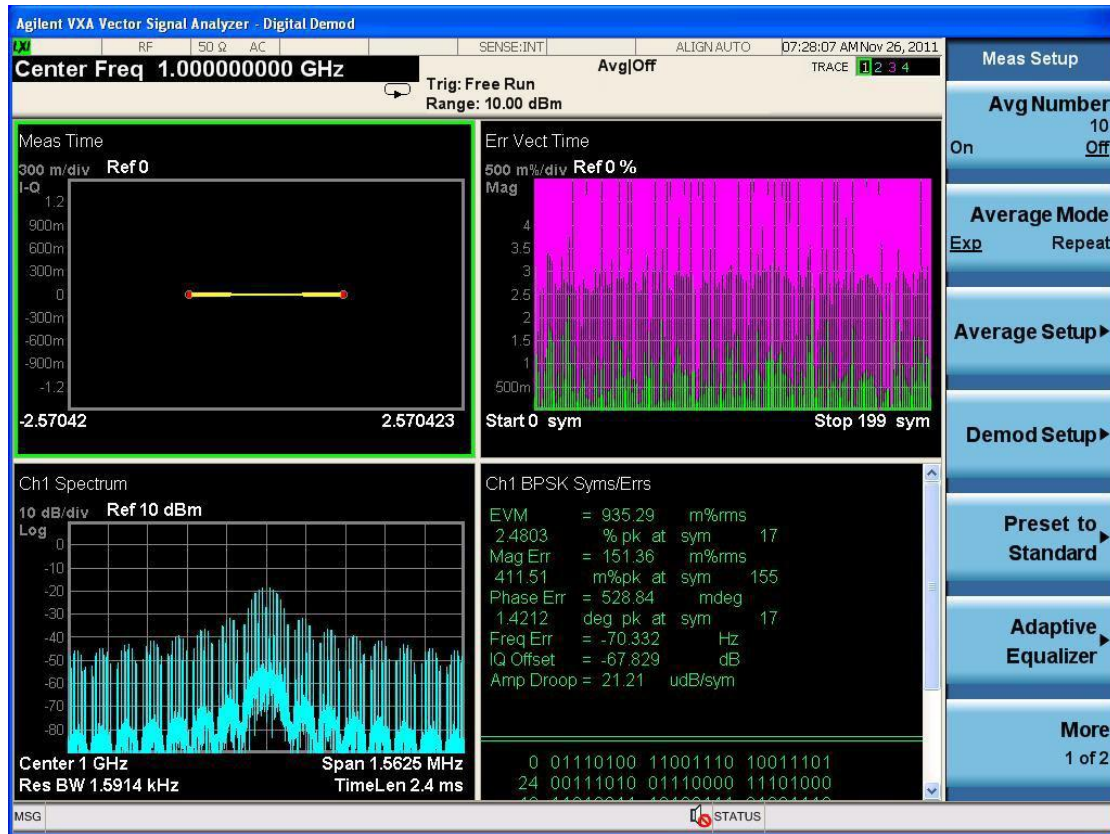


Figure 3-9 Test result of the PSK modulation signal

3.5 Pulse Modulation Signal

The S1132 signal generator can output pulse modulation signals. The following example introduces the pulse modulation signal with carrier frequency of 1GHz and amplitude of -10dBm.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.





2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

- Press **【AMPT】**  button, input -10 dBm
- Press **【RF1】**  button, make the **【RF1】** button backlight bright
- Press **【Pulse】**  button
- Select [Trig Mod]
- Select [Free Run]
- Select [Source] -- “INT”
- Select [Period], input 200 ms
- Select [Width], input 100 ms
- Select [Status] -- “On”
- Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-10.

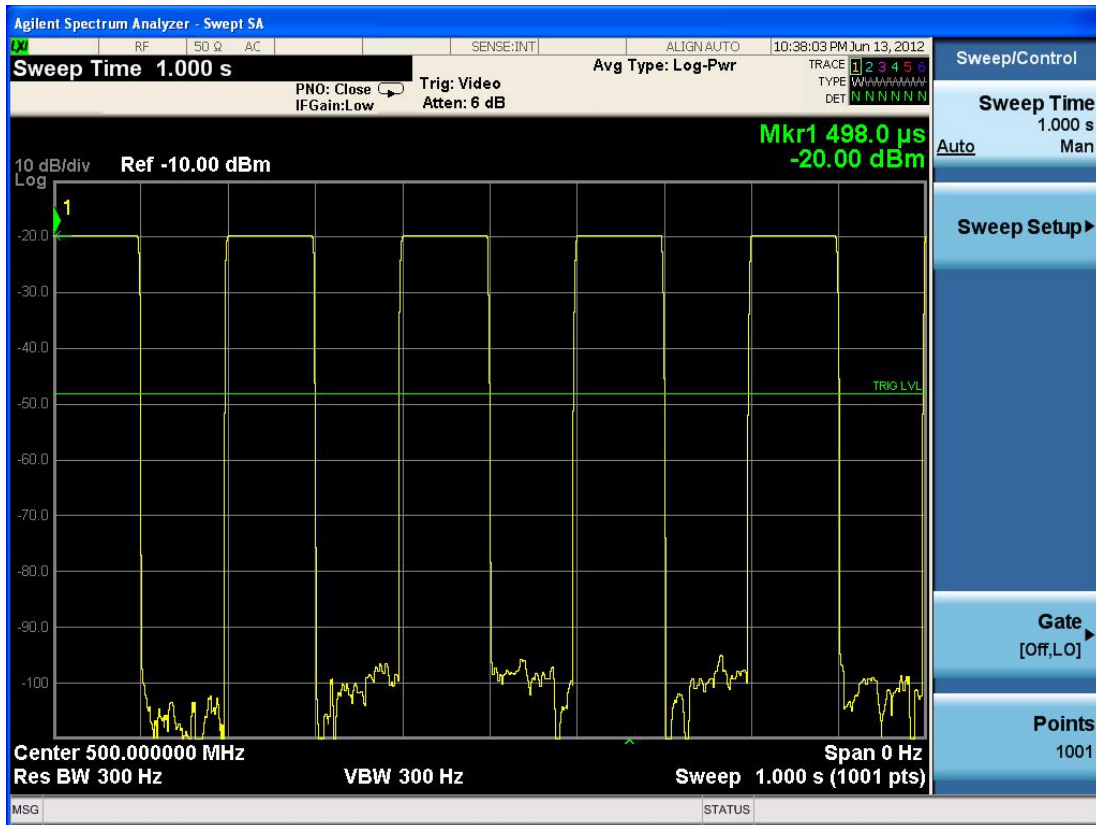


Figure 3-10 Test result of the pulse modulation signal

3.6 LF Output

The S1132 signal generator can output low frequency signals including Sine, Square, Triangle and Sawtooth.

3.6.1 Sine wave

For example: to output LF signal with frequency of 100kHz and amplitude of 1Vpp.

Operation steps:

1. Instrument connection



Use a coaxial cable to connect the LF output port of the signal generator to the channel 1 input port of the MSO-X2020A oscilloscope.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

- Press **【AuxFctn】**  button
- Select [LF OUT]
- Select [Wave]
- Select [Sine]
- Select [Freq], input 100 kHz
- Select [AMPL], input 1 Vpp
- Press **【LF】**  button, make the **【LF】** button backlight bright

3. Test result

After setting the relevant parameters of the oscilloscope, the result is shown in Figure 3-11.

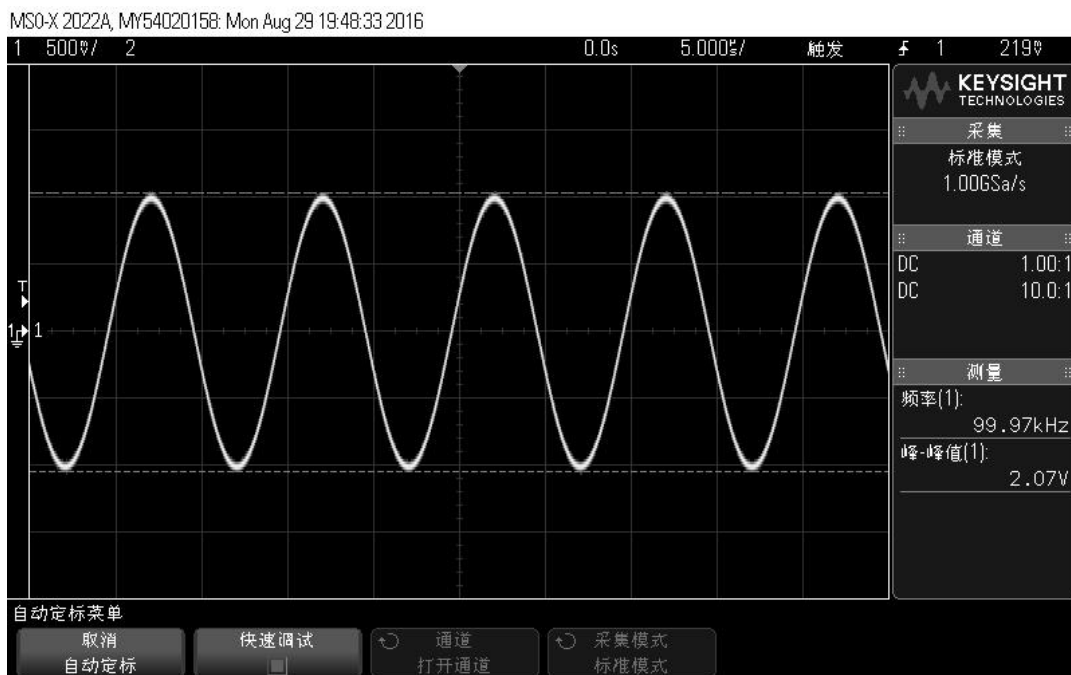


Figure 3-11 Test result of the sine wave signal

3.6.2 Square wave

For example: to output LF signal with frequency of 20kHz and amplitude of 1Vpp.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the LF output port of the signal generator to the channel 1 input end of the MSO-X2020A oscilloscope.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【AuxFctn】**  button


— Select [LF OUT]

— Select [Wave]

— Select [Square]

— Select [Freq], input 20 kHz

— Select [AMPL], input 1 Vpp

— Press **【LF】**  button, make the **【LF】** button backlight bright

3. Test result

After setting the relevant parameters of the oscilloscope, the result is shown in Figure 3-12.

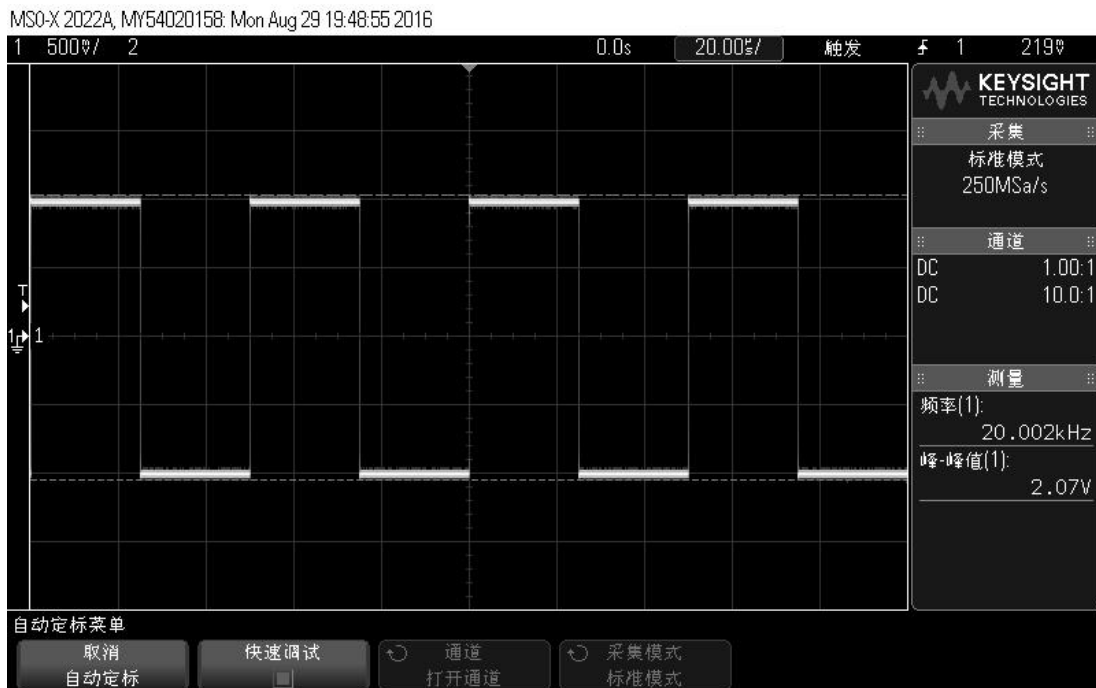


Figure 3-12 Test result of the square wave signal

3.6.3 Triangle wave

For example: to output LF signal with frequency of 100kHz and amplitude of 1Vpp.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the LF output port of the signal generator to the channel 1 input end of the MSO-X2020A oscilloscope.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【AuxFctn】**  button


— Select [LF OUT]

— Select [Wave]

— Select [Triangle]

— Select [Freq], input 100 kHz

— Select [AMPL], input 1 Vpp

— Press **【LF】**  button, make the **【LF】** button backlight bright

3. Test result

After setting the relevant parameters of the oscilloscope, the result is shown in Figure 3-13.

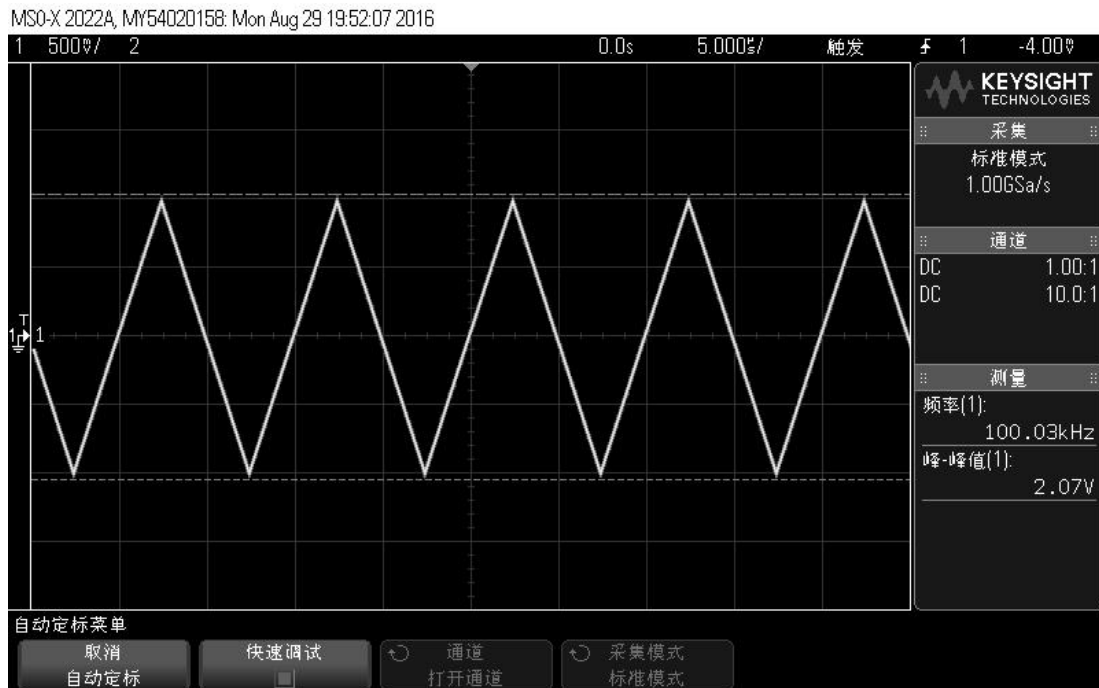


Figure 3-13 Test result of the triangle wave signal

3.6.4 Sawtooth wave

For example: to output LF signal with frequency of 100kHz and amplitude of 1Vpp.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the LF output port of the signal generator to the channel 1 input end of the MSO-X2020A oscilloscope.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button


(2) Parameter setting

— Press **【AuxFctn】**  button

— Select [LF OUT]

— Select [Wave]

— Select [Sawtooth]

- Select [Freq], input 100 kHz
- Select [AMPL], input 1 Vpp
- Press **【LF】**  button, make the **【LF】** button backlight bright

3. Test result

After setting the relevant parameters of the oscilloscope, the result is shown in Figure 3-14.

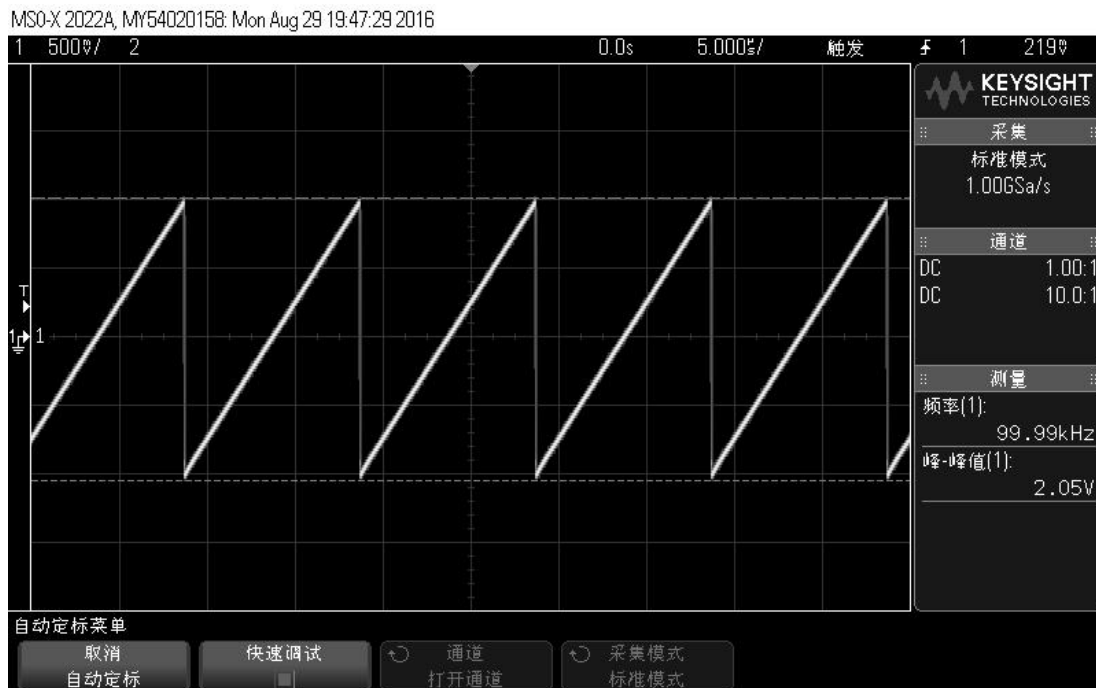


Figure 3-14 Test result of the triangle wave signal

3.7 Up-conversion Function

The S1132 signal generator has an up-conversion function, which is used to up-convert a signal from 25MHz to 200MHz to a signal from 200MHz to 6GHz.

Operation steps:

1. Instrument connection

Need to use two signal generators. Connect the RF signal output port of signal generator 1 to the IF signal input port of signal generator 2, and use a coaxial cable to connect the RF signal output port of signal generator 2 to the RF input port of the N9020A spectrum analyzer.




2. Parameter setting

- (1) Reset the two signal generators





- Press **【Preset】**  button

(2) Parameter setting

Signal generator 1:

- Press **【FREQ】**  button, input 200 MHz
- Press **【AMPT】**  button, input -9.82 dBm
- Press **【RF1】**  button, make the **【RF1】** button backlight bright

Signal generator 2:

- Press **【FREQ】**  button, input 2.7 MHz
- Press **【AMPT】**  button, input -20 dBm
- Press **【AuxFctn】**  button
- Select [Ext Rf]
- Select [Source] -- “EXT”
- Select [EXT IF], input 200 MHz
- Press **【RF1】**  button, make the **【RF1】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-16.

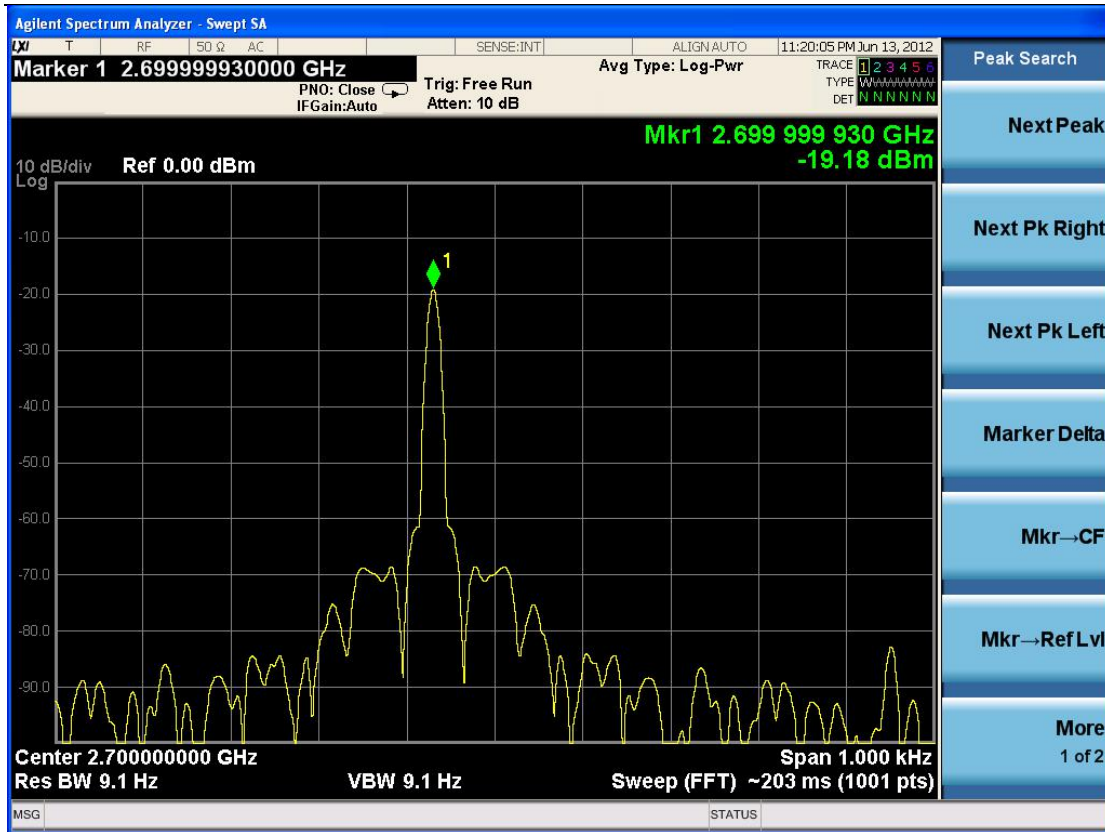


Figure 3-16 Test result of the up-conversion function

3.8 DRG

The S1132 signal generator has linear frequency modulation function.

Operation steps:

1. Instrument connection

Use a coaxial cable to connect the signal output end of the signal generator to the RF input port of the N9020A spectrum analyzer.

2. Parameter setting

(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【AMPT】**  button, input -10 dBm


— Press **【AuxFctn】**  button


- Select [DRG]
- Select [State] -- “On”
- Select [Upper Limit], input 1 GHz
- Select [Points], input 100
- Select [Rate], input 0.1 μ s

— Press **【More】**  button

— Select [Mode]

— Select [Bothway]

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【MOD】**  button, make the **【MOD】** button backlight bright

3. Test result

After setting the relevant parameters of the spectrum analyzer, the result is shown in Figure 3-17.

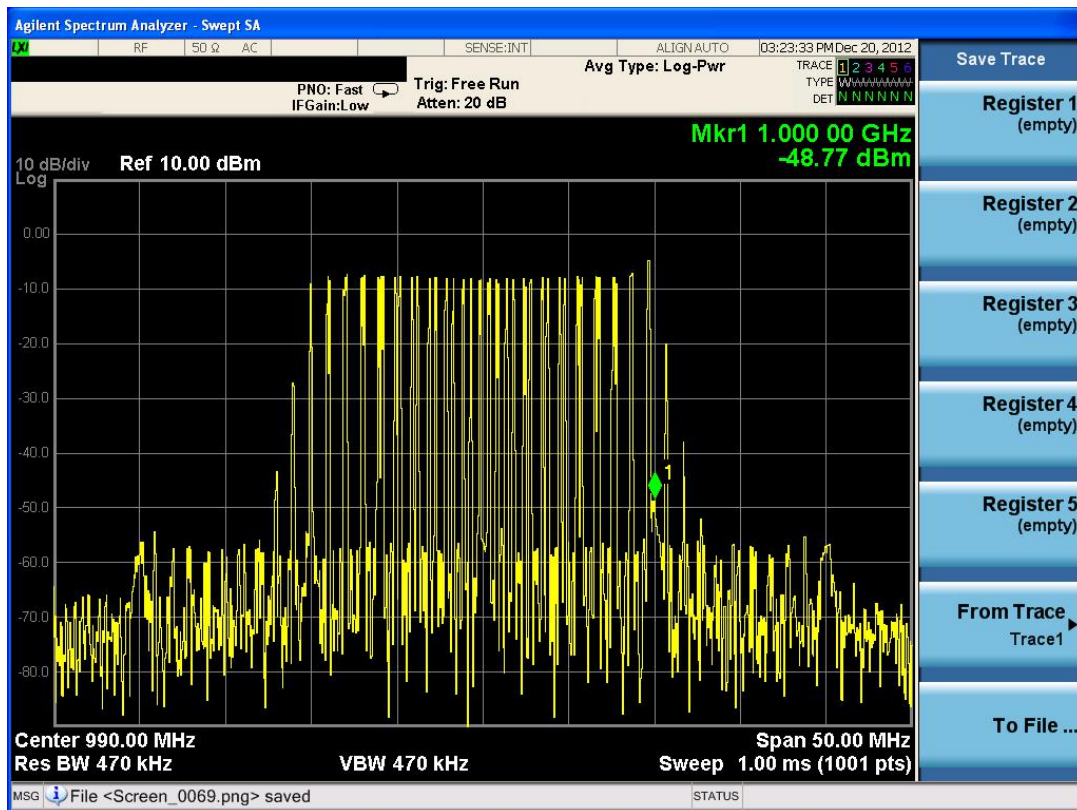


Figure 3-17 Test result of the DRG function

3.8 Power Measurement

The S1132 signal generator can perform power measurement by using SUP60 USB power sensor.

Operation steps:

1. Instrument connection

Use the USB cable to connect the power sensor to the USB port of the signal generator, then connect the signal input port of the power sensor to the RF signal output port of the signal generator.

2. Parameter setting


(1) Reset the signal generator

— Press **【Preset】**  button

(2) Parameter setting

— Press **【FREQ】**  button, input 1 GHz

— Press **【AMPT】**  button, input -10 dBm

— Press **【RF1】**  button, make the **【RF1】** button backlight bright

— Press **【AuxFctn】**  button

— Select [USB Power]

— Select [State] -- “On”

— Select [Channel Freq], input 1 GHz, same as the output frequency of signal generator

4 Remote Control

Users can program and control S1132 signal generator through standard SCPI commands. Users can communicate with PC through instrument buses such as USB and LAN. This chapter introduces in detail how to remotely control the signal generator through various interfaces.

4.1 Via USB Port

1. Instrument connection

Connect the signal generator to your PC via USB remote control.

2. Install the USB driver

After the signal generator is correctly connected to the PC and turned on, the PC will pop up the hardware update wizard dialog box. Please follow the wizard's prompts to install the "USB DEVICE" driver.

3. View device resources

The searched resources will appear in the "NI-VISA USB Devices" directory, and the USB interface information will be as shown in the figure below:

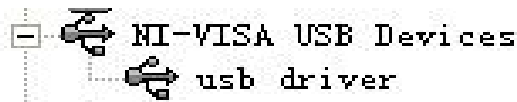


Figure 4-1 Device resources

4. Communication test

Double-click to open the remote control software, send commands and read data. As shown below:

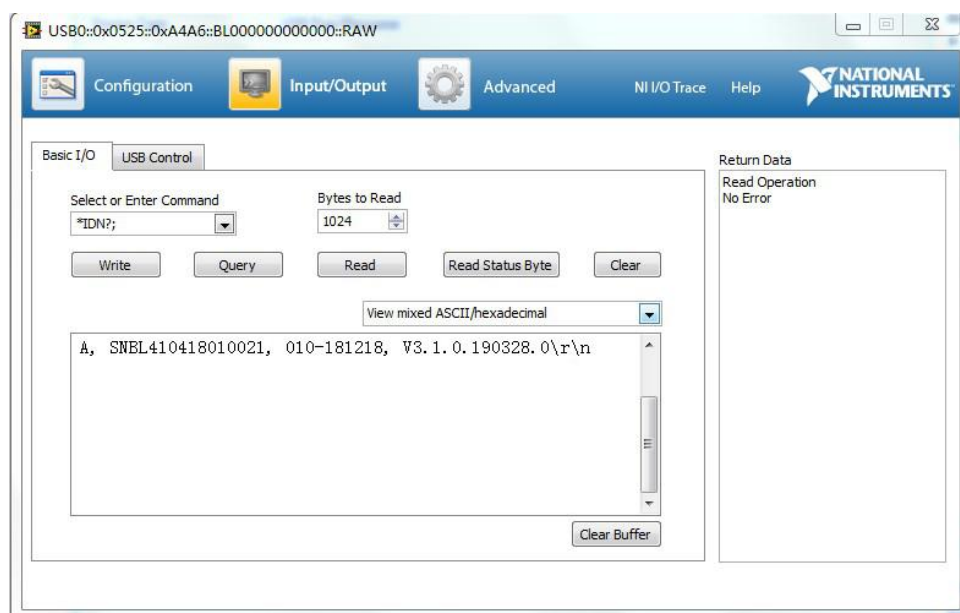


Figure 4-2 Read and write commands via USB

4.2 Via LAN Port

1. Instrument connection

Connect the signal generator to your local area network through the LAN interface.

2. Communication test

Open the TCP control software, connect via IP (192.168.1.6) and port number (4060), send commands and read data. As shown below:



Figure 4-3 Read and write commands via LAN

5 Faults and Repair

This chapter lists the common faults and troubleshooting methods that may occur during the use of the signal generator.

5.1 Common Faults and Troubleshooting Methods

1. After powering on, the instrument has a black screen without any display.

Check if the fan is spinning:

- (1) If the fan rotates normally, the connection line of the display screen may be loose.
- (2) If the fan does not rotate, the machine has not started normally.

2. The key is not responding or the key value is wrong.

- (1) If all the keys do not respond, it may be that the keyboard cable is loose.
- (2) If the key value is wrong, the keyboard may be damaged. Please contact the manufacturer for repair.

3. There is no signal output after normal startup.

If there is no signal output from the signal generator, please follow the operation steps in Chapter 3. If there is still no signal display, it may be a hardware failure of the machine, please contact the manufacturer for repair.

4. The frequency display of the signal is not accurate.

When outputting a signal, if the frequency of the read signal exceeds the allowable error range or the signal fluctuates left and right, check whether the tested signal generator is stable. If so, please contact the manufacturer for repair.

5. The amplitude output of the signal is not accurate.

If the signal amplitude is not accurate, check whether the tested signal generator is stable. If so, please contact the manufacturer for repair.

5.2 Obtain After-sales Services

In case of failure to the S1132 signal generator, check and save the error message, analyze possible causes, and refer to the methods provided in chapter 5.1 for preliminary troubleshooting. If the problem cannot be solved, contact the service and consultation center of the company as per the contact information provided below and provide us with the error message collected. We will coordinate with you to solve the problem as soon as possible.

Contact information:

Service Tel: +886. 909 602 109
Website: www.salukitec.com
Email: sales@salukitec.com
Address: No. 367 Fuxing N Road, Taipei 105, Taiwan

In case of any failure to the signal generator that is difficult to be eliminated, contact us by phone or fax. If it is confirmed by both parties that the signal generator has to be returned for repairing, pack the instrument with the original packing materials and case by following the steps below:

- 1) Prepare a detailed description of the failure of the signal generator and put it into the package along with the instrument.
- 2) Pack it with the original packing materials, so as to minimize possible damage.
- 3) Place cushions at the four corners of the outer packing carton, and place the instrument in the outer packing carton.
- 4) Seal the opening of the packing carton with adhesive tape and reinforce the packing carton with nylon tape.
- 5) Specify text like “**Fragile! Do not touch! Handel with care!**” and so on.
- 6) Keep a copy of all shipping documents.

6 Technical Specifications

Model	S1132A	S1132B	
Frequency			
Frequency Range	9kHz - 6GHz		
Frequency Resolution	0.23Hz		
Internal Reference			
Reference Frequency	10MHz		
Temperature Stability	±0.5ppm (option: ±5ppb)		
Internal Reference Output	10MHz, +2dBm (typ.)		
Spectral Purity			
Harmonic	≤ -40dBc (typ.)		
Non-harmonic	≤ -65dBc (typ.)		
Single Sideband Phase Noise	f=1GHz	-100dBc/Hz@10kHz	
Amplitude			
Output Power Range	9kHz - 50kHz	-120dBm to 0dBm	
	50kHz - 6GHz	-120dBm to +10dBm	
Power Accuracy	±1.0dB (typ.)		
Output Power Resolution	0.1dB		
Amplitude/ Frequency Scan			
Scan Type	Step scan, List scan		
Trigger Mode	Auto, External		
Internal Modulation Source (LF)			
Waveform	Sine, square, triangle, sawtooth		
Frequency Range	Sine	0.1Hz – 500kHz	
	Square	0.1Hz - 20kHz	
	Triangle/ Sawtooth	0.1Hz - 100kHz	
Modulation			
Analog modulation (AM/FM/ΦM): support internal/external modulation source			
AM	Modulation Depth	0 -100%	0 -100%
	Modulation Rate	20Hz - 1MHz	1Hz - 1MHz
FM	Frequency Offset	5MHz	5MHz

	Modulation Rate	20Hz - 1MHz	1Hz - 1MHz
ΦM	Modulation Phase	0° - 360°	0° - 360°
	Modulation Rate	20Hz - 1MHz	1Hz - 1MHz
Digital modulation: support internal/external modulation source			
	IQ modulator	Nonsupport	Support
	Internal source	ASK/2FSK/4FSK/8FSK/2 PSK/4PSK/8PSK	Standard digital modulation
	External source	Modulation sequence	Arb (I/Q data)
	Modulation rate	1Hz - 1MHz	10kHz - 20MHz
Pulse modulation			
	Break-make ratio	≥ 70dB	
	Pulse period	200ns - 160s	
	Pulse width	100ns - 85s	
Linear Frequency Modulation (LFM)			
	Scan range (max.)	20MHz	Nonsupport
	Scan speed	20ns - 20ms	
Frequency Upper Conversion			
	Input IF Frequency Range	200MHz ± 10MHz	
	Input IF Power Range	-50dBm to 0dBm	

-END OF DOCUMENT-