

# Spectrum Analyzer

GSP-8000

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## PROGRAMMING MANUAL



ISO-9001 CERTIFIED MANUFACTURER

**GW INSTEK**

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# S SAFETY INSTRUCTIONS

This chapter contains important safety instructions that you must follow during operation and storage. Read the following before any operation to ensure your safety and to keep the instrument in the best possible condition.

## Safety Symbols

These safety symbols may appear in this manual or on the instrument.

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WARNING

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



CAUTION

Caution: Identifies conditions or practices that could result in damage to the instrument or to other properties.



DANGER High Voltage



Attention Refer to the Manual



Earth (ground) Terminal



Frame or Chassis Terminal



Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

## Safety Guidelines

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### General Guideline



#### CAUTION

- Do not place any heavy object on the instrument.
- Avoid severe impact or rough handling that leads to damaging the instrument.
- Do not discharge static electricity to the instrument.
- Use only mating connectors, not bare wires, for the terminals.
- Ensure signals to the RF input do not exceed +30dBm.
- Ensure reverse power to the TG output terminal does not exceed +30dBm.
- Do not supply any input signals to the TG output.
- Do not block the cooling fan opening.
- Do not disassemble the instrument unless you are qualified.

(Measurement categories) EN 61010-1:2010 specifies the measurement categories and their requirements as follows. The instrument falls under category II.

- Measurement category IV is for measurement performed at the source of low-voltage installation.
- Measurement category III is for measurement performed in the building installation.
- Measurement category II is for measurement performed on the circuits directly connected to the low voltage installation.
- Measurement category I is for measurements performed on circuits not directly connected to Mains.

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### Power Supply




#### WARNING

- AC Input voltage range: 100V~240V
  - Frequency: 50/60Hz
  - To avoid electrical shock connect the protective grounding conductor of the AC power cord to an earth ground.
-

- Cleaning
- Disconnect the power cord before cleaning.
  - Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid.
  - Do not use chemicals containing harsh material such as benzene, toluene, xylene, and acetone.

- Operation Environment
- Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (Note below)
  - Temperature: 5°C to 45°C
  - Humidity: <90%
- (Pollution Degree) EN 61010-1:2010 specifies the pollution degrees and their requirements as follows. The instrument falls under degree 2.
- Pollution refers to “addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity”.
- Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
  - Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.
  - Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.

- Storage environment
- Location: Indoor
  - Temperature: -20°C to 70°C
  - Humidity: <90%

- Disposal
- 
- Do not dispose this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.

## Power cord for the United Kingdom

When using the instrument in the United Kingdom, make sure the power cord meets the following safety instructions.

NOTE: This lead/appliance must only be wired by competent persons




**WARNING: THIS APPLIANCE MUST BE EARTHED**

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow:	Earth
Blue:	Neutral
Brown:	Live (Phase)



As the colours of the wires in main leads may not correspond with the coloured marking identified in your plug/appliance, proceed as follows:

The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with either the letter E, the earth symbol  or coloured Green/Green & Yellow.

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.

The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.

If in doubt, consult the instructions provided with the equipment or contact the supplier.

This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, a cable of 0.75mm<sup>2</sup> should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any exposed wiring from a cable, plug or connection that is engaged in a live socket is extremely hazardous. If a cable or plug is deemed hazardous, turn off the mains power and remove the cable, any fuses and fuse assemblies. All hazardous wiring must be immediately destroyed and replaced in accordance to the above standard.

# G ETTING STARTED

This chapter provides a brief overview of the GSP-8000, the package contents and an introduction to the front panel, rear panel and GUI.



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## GSP-8000 Introduction

The GSP-8000 has three frequency ranges, 8.0GHz, 3.8GHz and 1.8GHz. The series is suitable for teaching research, R&D verification, and the test requirements of radio frequency products during production and development stages.

The series provides 1Hz ~ 1MHz resolution bandwidth (RBW), 10Hz ~ 3MHz video bandwidth (VBW), -104dBc/Hz phase noise, a 20dB preamplifier, and the lowest noise floor of -160dBm/Hz (typical).

### Main Features

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Performance	<ul style="list-style-type: none"><li>• Frequency Range:<ul style="list-style-type: none"><li>• GSP-8800: 9kHz ~ 8.0GHz</li><li>• GSP-8380: 9kHz ~ 3.8GHz</li><li>• GSP-8180: 9kHz ~ 1.8GHz</li></ul></li><li>• RBW: 1Hz ~ 1MHz in 1-3-5-10 steps</li><li>• VBW: 10Hz ~ 3MHz in 1-3-5-10 steps</li><li>• Phase Noise: -104 dBc/Hz</li><li>• Sensitivity: -160dBm/Hz Typical @PreAmp On</li></ul>
Features	<ul style="list-style-type: none"><li>• Built-in AM/FM Demodulation</li><li>• Built-in Time Spec Function</li><li>• Measurement Function: ACPR/OCBW/CHPW, NdB BW, Pass-Fail, Freq. Counter, Noise Marker</li><li>• Built-in 20dB Preamplifier</li><li>• Options: Tracking Generator, EMI Filter</li></ul>

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- Interface
- Communication Interface: LAN, USB Host/Device
  - Display: 10.4" XGA Output (1024\*768)

### Accessories

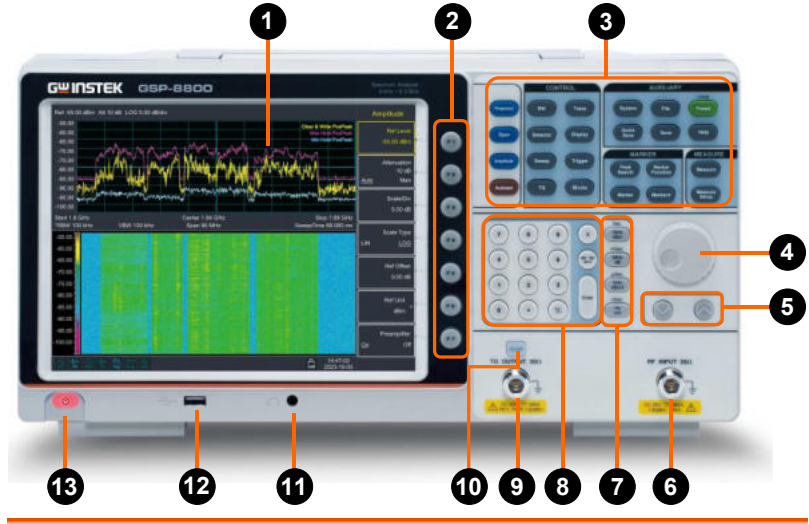
Standard Accessories	Part number	Description
	Region dependant	Power cord
	N/A	Packing List
	N/A	Certificate of calibration
	N/A	Safety Information
	N/A	USB Cable
Options	Option number	Description
	GSP-8180T1	GSP-8180, TG activation option
	GSP-8180E1	GSP-8180, EMI activation option
	GSP-8380T1	GSP-8380, TG activation option
	GSP-8380E1	GSP-8380, EMI activation option
	GSP-8800E1	GSP-8800 - EMI activation option
Optional Accessories	Part number	Description



### Software Downloads


PC Software for Windows System

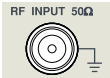
# Appearance

## GSP-8000 Front Panel



1. LCD 1024x768 color LCD display. The display shows the soft keys for the current function, frequency, amplitude and marker information.
  
2. Menu soft keys 

 The F1 to F7 function keys directly correspond to the soft keys on the right-hand side of display.
  
3. Function keys See page 16 for details.
  
4. Knob 

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

5. Arrow keys  (1) Increase or decrease the parameter value at specific steps while editing a parameter.
- (2) Move the cursor through the directory tree in the **File** function


6. RF Input connector  The RF input may be connected to a device via a N type connector.



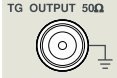
**Note**


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


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.


7. Unit keys  Unit keys include GHz/dBm/s, MHz/dB/ms, kHz/dBmV/μs and Hz/mV/ns. After entering the desired numbers, choose an appropriate unit to complete the input. The specific meaning of unit is decided by the type of input parameter (“frequency”, “amplitude” or “time”).

8. Numeric keypad

9. TG output connector  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.

10. TG output On/Off button  When the TG function is enabled, the backlight of button turns on and turns off when the function is disabled.

11. Earphone interface  3.5mm stereo headphone jack (wired for mono operation)

12. USB Host port  The analyzer may serve as a “host” device to connect to external USB devices.

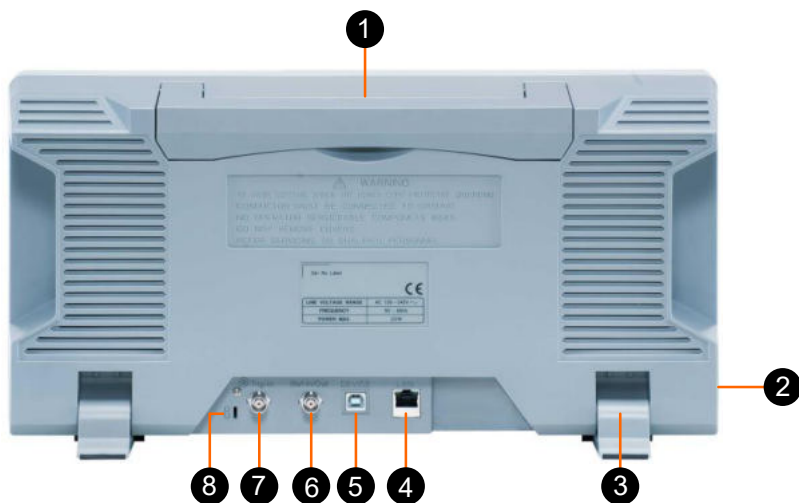
This interface is available for USB storage devices.

13. Power key



Push to turn on, long push to turn off

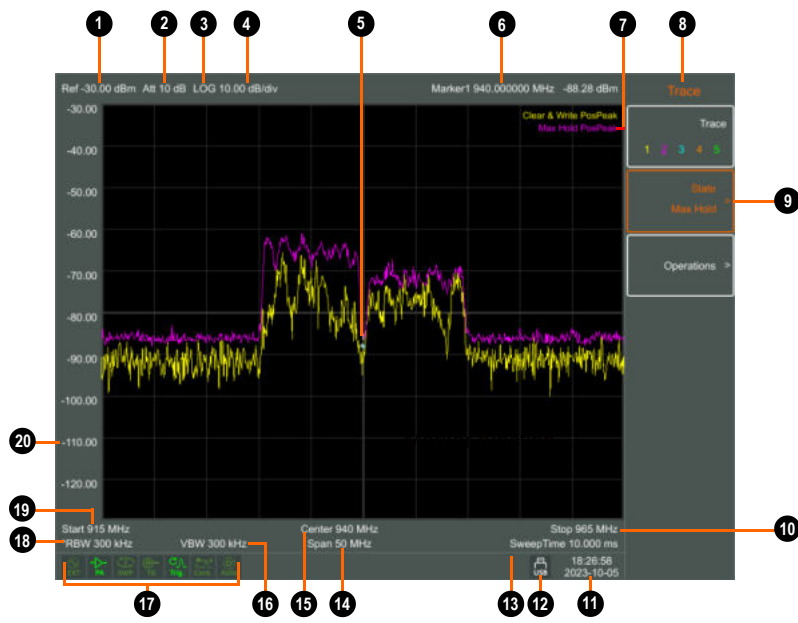
## Rear Panel









- |                         |   |
|-------------------------|---|
| 1. Handle               | Stow the handle for mobile use.   |
| 2. AC power connector   | AC: frequency 50Hz/60Hz $\pm 10\%$ , single-phase alternative 220V $\pm 15\%$ or 110V $\pm 15\%$  |
| 3. Stool                | To adjust the angle of the device   |
| 4. LAN interface        | Through this interface, the analyzer can be connected to your local network for remote control. An integrated testing system can be built quickly, as the analyzer conforms to the LXI C Device class instrument standards. |
| 5. USB Device interface | This configurable USB port permits external USB devices. It supports PictBridge printer and remote-control connection.  |
| 6. Ref In/Out           | The BNC input or output of the 10 MHz reference clock   |
| 7. Trig-In              | Input an external signal (TTL signal) for external trigger function.  |











8. Lock hole                      You can lock the spectrum analyzer to a fixed location using the security lock (please buy it yourself) to secure the spectrum analyzer.

## Display

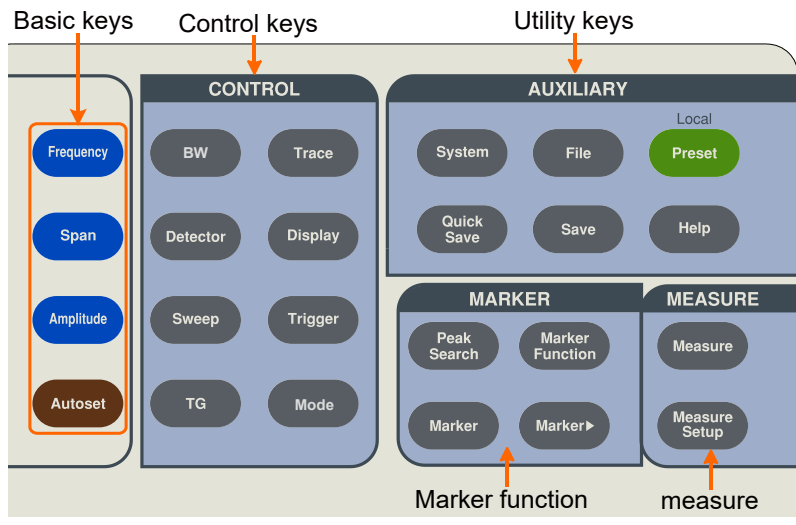


No.	Name	Description	Related Key
1.	Reference level	Reference level	 → [Ref Level]
2.	Attenuation	Display input attenuation setting	 → [Attenuation]
3.	Amplitude Division Type	Can choose logarithmic or linear	 → [Scale Type]
4.	Amplitude Division	Display Division scale	 → [Scale/ Div]
5.	Marker	Display current activated marker	
6.	Marker readout	Display frequency and amplitude of current marker	







7.	Trace Mode	Trace Type and Detector Type	
8.	Menu title	Function of current menu belongs to.	
9.	Menu item	Menu item of current function	
10.	Stop Frequency	Display Stop Frequency	 →[Stop Frequency]
11.	Date/time	Display system date and time	 →[Date/Time]
12.	USB storage device	Show if USB storage device is inserted;	
13.	Sweep Time	System sweep time	 →[Sweep Time]
14.	Span	Display span width	 →[Span]
15.	Center frequency	Display center frequency	 →[Center Freq]
16.	Video bandwidth	Display video bandwidth	 →[VBW]
17.	System status icon	Display spectrum analyzer status	
18.	Resolution bandwidth	Display resolution bandwidth	 →[RBW]
19.	Start Frequency	Display Start Frequency	 →[Start Frequency]
20.	Amplitude Graticule	Display Amplitude Graticule	 →[Ampt Graticule]


## Panel Function Key



### Basic keys

-  **Frequency** 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.
-  **Amplitude** Activates the reference level function, and accesses the amplitude softkeys, with which you set functions that affect data on the vertical axis.
-  **Autoset** Searches the signal automatically within the full frequency range.

### Control keys

-  **BW** Activates the RBW (resolution bandwidth), VBW (video bandwidth) function, and accesses the softkeys that control the bandwidth.

- Trace** Accesses the softkeys that allow you to store and manipulate trace information.
- Detector** Accesses the softkeys that allow you to configure detector functions.
- Display** Accesses the softkeys that allow you to control what is displayed on the analyzer, including the display line, graticule, Label, Menu Hide, Brightness and Screen Sleep.
- Sweep** Accesses the softkeys that allow you to set the sweep time, select the sweep mode of the analyzer.
- Trigger** Accesses the softkeys that allow you to select the trigger mode of the analyzer.
- TG** Accesses the softkeys that allow you to set the tracking generator.
- Mode** Accesses the softkeys that allow you to set the Spectrum and demodulation mode.

### Marker function keys

- Peak Search** Places a marker on the highest/lowest peak, and accesses the Peak functions menu.
- Marker** Accesses the marker control keys that select the type and number of markers and turns them on and off.
- Marker▶** Accesses the marker function soft keys that allow you to set other system parameters based on the current marker's value.
- Marker Function** Accesses the menu of other marker functions, such as N-dB bandwidth measure, marker noise, and frequency counting.

### Advanced measure keys

Measure

Accesses the softkeys that let you make transmitter power measurements such as Time Spec, ACPR (adjacent channel power), channel power, and OBW (occupied bandwidth), etc.

Measure Setup

Sets the parameters for the selected measurement function.

### Utility keys

System

Accesses the softkeys that allow you to get the system information, or set the system parameters.

File

Accesses the softkeys that allow you to configure the file system of the analyzer.

Preset

Resets the analyzer to the factory settings or user state. This state can be specified in **【System】** → [PowerOn/Preset▶] → [Preset▶].

Quick Save

Save the contents of the current screen quickly.

Save

Accesses the soft keys that allow you to save current screen, trace data, user state or limit line data.

Help

Press the Help key to activate the help system. Press the Help key again to exit.

# REMOTE CONTROL

This chapter describes the basic configuration of IEEE488.2 based remote control. This chapter includes interface configuration, a remote control overview as well as the control syntax and commands.

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## Interface Configuration

### Configure to USB Remote Interface

USB configuration	PC side connector	Type A, host
	GSP side connector	Rear panel Type B, slave
	Speed	1.1/2.0 (full speed/high speed)
	USB Class	USB TMC (USB T&M class)

Panel operation	1. Connect the USB cable to the rear panel USB B port.	
-----------------	--	---


 **Note** It may take a few moments to switch USB modes.

### Configure the LAN Interface


The GSP-8000 supports LAN standard for 488.2 communications.

**Background** The LAN interface is used for remote control over a network. The spectrum analyzer supports DHCP connections so the instrument can be automatically connected to an existing network. Alternatively, network settings can also be manually configured.

LAN configuration Settings	IP	Gateway
	Mask	DHCP on/off

Connection	Connect an Ethernet cable from the network to the rear panel LAN port.	
------------	--	---

## Settings

1. Press  >Setting[F2]>LAN[F1] to set the LAN settings:

*IP Address[F1]* Sets the IP address.

*Subnet Mask[F2]* Sets the subnet mask.

*Gateway[F3]* Sets the gateway.

*DHCP[F4]* Sets the DHCP on/off

*Hint: Use dotted decimal notation when entering IP addresses, ie., 172.16.20.8*

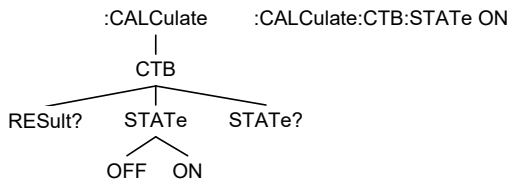
2. Press *Enter*[F1] to confirm the LAN configuration settings.
-

## Command Syntax

Compatible Standard	IEEE488.2 SCPI, 1999	Full compatibility Full compatibility
---------------------	-------------------------	--

**Command Structure** SCPI (Standard Commands for Programmable Instruments) commands follow a tree-like structure, organized into nodes. Each level of the command tree is a node. Each keyword in a SCPI command represents each node in the command tree. Each keyword (node) of a SCPI command is separated by a colon (:).

For example, the diagram below shows an SCPI sub-structure and a command example.



**Command types** There are a number of different instrument commands and queries. A command sends instructions or data to the unit and a query receives data or status information from the unit.

### Command types

**Simple** A single command with/without a parameter

**Example** \*RST

Query                    A query is a simple or compound command followed by a question mark (?). A parameter (data) is returned.

Example                    :CALCulate:CSO:STATE?

Compound                Two or more commands on the same command line. Compound commands are separated with either a semi-colon (;) or a semi-colon and a colon (;:).

A semi-colon is used to join two related commands, with the caveat that the last command must begin at the last node of the first command.

A semi-colon and colon are used to combine two commands from different nodes.

Example                    :calc:ctb:stat on;result?

Command Forms        Commands and queries have two different forms, long and short. The command syntax is written with the short form of the command in capitals and the remainder (long form) in lower case.

The commands can be written in capitals or lower-case, just so long as the short or long forms are complete. An incomplete command will not be recognized.

Below are examples of correctly written commands.

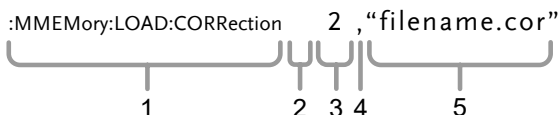
Long form :CALCulate:ACPR:STATe?  
 :calculate:acpr:state?  
 :CALCULATE:ACPR:STATE?

Short form :CALC:ACPR:STAT?  
 :calc:acpr:stat?

**Square Brackets** Commands that contain square brackets indicate that the contents are optional. The function of the command is the same with or without the square bracketed items, as shown below.

Both “:OUTPut[:STATe]?” and “:OUTPut?” are both valid forms.

**Command Format**



- |                   |  |
|-------------------|--|
| 1. Command header | 4. Comma (no space before/after comma) |
| 2. Space          | 5. Parameter 2                         |
| 3. Parameter 1    |  |

**Common Input Parameters**

Type	Description	Example
<Boolean>	Boolean logic	0, 1
<Binary>	Binary data	#B0101010001
<Hexadecimal>	Hexadecimal data	#H2345ACDF
<NR1>	integers	0, 1, 2, 3
<NR2>	decimal numbers	0.1, 3.14, 8.5
<NR3>	floating point	4.5e-1, 8.25e+1
<NRf>	any of NR1, 2, 3	1, 1.5, 4.5e-1
<freq>	Input: <NRf> + unit	2.5 mhz

Unit = kHz, MHz, GHz.

Note: The unit can be omitted (unit defaults to Hz).

Return:

<NR3>            2.5e+5

Note: Units = Hz.

<limit num>    <NR1>

<point>        <NR1>

<offset>

Input:

<NRf> + unit    30 db

Note: The unit can be omitted (unit defaults to dB).

Return:

<NR3>            3.0e+1

Note: Units = dB.

<rel\_ampl>

Input:

<NRf> + unit    20 db

Note: The unit can be omitted (unit defaults to dB).

Return:

<NR3>            2.0e+1

Note: Units = dB.

<ampl>

Input:            30 mv

NR3 +unit type

Note: The unit can be omitted. (Unit defaults to current y-axis unit).

Return:

<NR3>            3.0e-2

Note: Units = current y axis unit.

<trace name>

<NR1>            trace1



<time>	Input: <NR3> + unit    2.3e-6 ms  Unit = ms, ns, ps, ks Note: The unit can be omitted (unit defaults to seconds).  Return: <NR3>                3.0e-2  Note: Units = seconds.
<character data>	<Character        ON data>
<file name>	<Data string>    "QuickXX.png"
<pixel data>	<arbitrary block #<nonzero data>                digit><digits>< 8 bit data bytes>

## Note:

<digits> represents the data block length descriptor. Expressed as an integer number equal to the total number of <8 bit data bytes> that follows.

<nonzero digit> represents the number of digits that are part of the data block length descriptor.

## Example:

#41202<8 bit data bytes>

4 digits will be part of the data block length descriptor and therefore 1202 <8 bit data bytes> will follow.

---

Message  
Terminator

LF

Line feed code (0x0A)

---

## SCPI Introduction

SCPI (Standard Commands for Programmable Instrument) is a standard instruction set for programmable devices under IEEE 488.2. SCPI commands are divided into two parts: IEEE 488.2 Common Commands and SCPI Instrument Specific Control Commands.

Common commands are commands that the instrument specified in IEEE 488.2 must support. Its syntax and semantics follow IEEE 488.2. Common commands are independent from the measurement and are used to control reset, self-test and status inspection. For an introduction of SCPI common commands, refer to the relative chapter below.

SCPI instrument-specific control commands are used to measure, read data, and toggle switches, including all measurement functions and specific functions.

### Configure the LAN Interface

The SCPI command is a tree hierarchy that includes multiple subsystems, each consisting of a root key and one or more level keys. The command line usually begins with a colon ":"; the keywords are separated by the colon ":" followed by the optional parameter settings; the question mark "?" is added after the command line to query this function; the commands and parameters separate with "space".

---

E.g

```
:CALCulate:BANDwidth:NDB <rel_ampl>
```

```
:CALCulate:BANDwidth:NDB?
```

CALCulate is the root keyword of the command, BANDwidth and NDB are the second level, third level keywords. The command line starts with a colon ":" and at the same time separates keywords at all levels, <rel\_ampl> indicates configurable parameters; the question mark "?" indicates a query; the command:

CALCulate:BANDwidth:NDB and parameter <rel\_ampl> "separate.

In some commands with parameters, it is common to use commas "," to separate the parameters, for example:

```
:SYSTEM:DATE <year>,<month>,<day>
```

For professionalization, the final command should include a newline character (\n) to indicate the end of the command. If multiple commands are issued simultaneously, the command lines should be separated by a semicolon (;).

---

## Symbol Description

The following four symbols are not part of the SCPI command, but are usually used to assist in specifying the parameters in the command.

---

Brace { }	Parameters in brace are optional and can be set one or more times or even don't set them. E.g:
-----------	---

The frequency and magnitude of {, <freq>, <rel\_ampl>} in the command [:SENSe]:CORRection:CSET <n>:DATA <freq>, <rel\_ampl> {, <freq>, <rel\_ampl>} can be omitted, or to set one or more pairs of

---

	frequency and amplitude parameters.
Vertical bar	Vertical bars are used to separate multiple parameter options, one of which must be selected when sending commands. E.g,  In DISPlay:MENU:STATe OFF   ON   0   1 command, the parameters that can be selected are "OFF", "ON", "0" or "1".
Square bracket [ ]	The contents of the square bracket (command key) are optional and are executed regardless of whether they are omitted. E.g [:SENSe]:CORRection:OFFSet[:MAGNitude]?  The effect of sending the following three commands is the same: :CORRection:OFFSet? :CORRection:OFFSet:MAGNitude? :SENSe:CORRection:OFFSet?
Triangle bracket < >	The parameters in the triangle brackets must be replaced with a valid value. E.g:  :DISPlay:BRIGtness <integer> :DISPlay:BRIGtness 10

## Parameter Type

---

Overview	The commands contain 8 kinds of parameters, different parameters have different setting methods.
arbitrary block	A specified length of arbitrary data, for example, #6377512xxxxx . . . where  6 indicates that the following 6 digits (377512) specify the length of the data in bytes; xxxxx ... indicates the data or #0xxxxx...<LF><&EOI>
boolean	Boolean numbers or values, for example,  ON or ≠ 0  OFF or 0
discrete	A list of specific values, for example,  MIN, MAX
NR1 numeric	Integers, for example,  0, 2, 30, -5
NR2 numeric	Decimal numbers, for example,  0.6, 3.1415926, -2.6
NR3 numeric	Floating point numbers, for example,  3.1415E-7, -8.2E3
NRF numeric	Flexible decimal number that may be type NR1, NR2 or NR3  See NR1, NR2, and NR3 examples
string	Alphanumeric characters (must be within quotation marks)  "Model, 123456"

arbitrary block      A specified length of arbitrary data, for example,  
#6377512xxxxx . . . where  
6 indicates that the following 6 digits (377512)  
specify the length of the data in bytes; xxxxx ...  
indicates the data or #0xxxxx...<LF><&EOI>

## Command abbreviation

---

All commands are case sensitive, meaning that if the command is not written in the correct upper or lower-case format, it will not be recognized. However, if you want to abbreviate, you must enter all capital letters in the command format, for example:

:CALCulate:BANDwidth:NDB? can be abbreviated  
into:CALC:BAND:NDB?

## Third-party programming entrance

---

Overview	The analyzer and the computer can communicate through the following interfaces: LAN interface and USB interface. Please refer to the product's user manual for the use of various communication interface.
----------	--

---

When using commands to program, all command words are sent and recognized as ASCII strings for operation and secondary development.

You can implement the following actions by programming:

- Set the analyzer
- Implement the measurement

Get data from the spectrum analyzer (instrument working status and measurement data results)

## SCPI Command List

In this command set, unless otherwise specified, the query function returns “**N/A**” (without the quotes) when the function is optional and not installed. And when the query function is not turned on or the type does not match, it returns “**ERR**” (without quotes).

### IEEE 488.2 Common Commands

---

The IEEE standard defines some common commands for querying basic information about the instrument or performing common basic operations. The commands usually start with "\*" and the command keyword is three characters in length.

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---

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## SCPI Commands

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*RST	44

### \*IDN?

→ Query

**Description**      Queries the manufacturer, model number, serial number, and firmware version of the instrument.

**Query Syntax**      \*IDN?

**Return parameter** <character data> Returns the instrument identification as a character data in the following format:  
 GWINSTEK, GSP-8800, XXXXXXXX, T.X.X.X.X  
 Manufacturer: GWINSTEK  
 Model number: GSP-8800  
 Serial number: XXXXXXXX  
 Firmware version: V1.X.X.X

### \*RST

Set →

**Description**      \*RST will perform a factory reset.

**Syntax**              \*RST

## CALCulate Commands

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:CALCulate:BWIDth|BANDwidth:NDB (Set) →  
→ (Query)

Description	Set the power ratio to measure the frequency bandwidth of the current frequency scale, which drops NdB on both sides.
Syntax	:CALCulate:BWIDth BANDwidth:NDB <rel_amp>
Query Syntax	:CALCulate:BWIDth BANDwidth:NDB?
Parameter	<rel_amp> <NR2> 1 dB to 60 dB
Return parameter	<NR3>
Example	:CALC:BAND:NDB 5

:CALCulate:BWIDth|BANDwidth:RESult? → (Query)

Description	Returns the NdB bandwidth measurement.
Query Syntax	:CALCulate:BWIDth BANDwidth:RESult?
Return parameter	<NR1> NdB bandwidth in Hz.
Example	:CALC:BAND:RES? returns 26000

:CALCulate:BWIDth|BANDwidth[:STATe] (Set) →  
→ (Query)

Description	Sets or queries the state of the NdB bandwidth measurement function. The function measures the bandwidth, at the number of dB down specified in :CALCulate:BWIDth BANDwidth:NDB, of the maximum signal on the display.
Syntax	:CALCulate:BWIDth BANDwidth[:STATe] {OFF ON 0 1}
Query Syntax	:CALCulate:BWIDth BANDwidth[:STATe]?
Parameter	0 Turns NdB BW off.



	1	Turns NdB BW on.
	OFF	Turns NdB BW off.
	ON	Turns NdB BW on.
Return parameter	0	NdB BW is off.
	1	NdB BW is on.
Example	:CALC:BAND ON	

**:CALCulate:FREQMarkers:AOFF** (Set) →

Description	Turns all the markers off.	
Syntax	:CALCulate:FREQMarkers:AOFF	
Example	:CALC:FREQM:AOFF	

**:CALCulate:FREQMarker|MARKer:PHNoise** (Set) →  
**[[:STATe]]** → (Query)

Description	Sets or queries the state of the Marker Noise function for the specified marker. This function measures the average noise level at the marked point and then normalize this value to 1 Hz bandwidth.	
Syntax	:CALCulate:FREQMarker:PHNoise[:STATe]{OFF ON 0 1}	
Query Syntax	:CALCulate:FREQMarker:PHNoise[:STATe]?	
Parameter	0	Turns Marker Noise off.
	1	Turns Marker Noise on.
	OFF	Turns Marker Noise off.
	ON	Turns Marker Noise on.
Return parameter	0	Marker Noise is off.
	1	Marker Noise is on.
Example	:CALC:FREQM:PHN ON	

**:CALCulate:FREQMarker:PHNoise:Y?** → Query

Description	Returns the normalized noise level over a BW of 1Hz from the marker position.
Query Syntax	:CALCulate:FREQMarker:PHNoise:Y?
Return parameter	<NR2> Normalized noise level in dBm.
Example	:CALC:FREQM:PHN:Y? returns 127.8

Set →

**:CALCulate:FREQuency:COUNt:RESolution** → Query

Description	Sets or queries the frequency counter resolution in Hz.
Syntax	:CALCulate:FREQuency:COUNt:RESolution <freq>
Query Syntax	:CALCulate:FREQuency:COUNt:RESolution?
Parameter	< freq > Frequency resolution in Hz Only 1000, 100, 10, 1 Hz are meaningful.
Return parameter	< freq > Frequency resolution in Hz
Example	:CALC:FREQ:COUN:RES 1

Set →

**:CALCulate:FREQuency:COUNt[:STATe]** → Query

Description	Sets or queries the state of the marker frequency counter function.
Syntax	:CALCulate:FREQuency:COUNt[:STATe] {OFF ON 0 1}
Query Syntax	:CALCulate:FREQuency:COUNt[:STATe]?
Parameter	0 Turns frequency counter off. 1 Turns frequency counter on. OFF Turns frequency counter off. ON Turns frequency counter on.

Return parameter	0	Frequency counter is off.
	1	Frequency counter is on.
Example	:CALC:FREQ:COUN: 1	

**:CALCulate:FREQuency:COUNt:X?** → Query

Description	Returns the counter frequency of the selected marker in Hz.	
Query Syntax	:CALCulate:FREQuency:COUNt:X?	
Parameter	<n>	<NR1> Marker number 1 to 8.
Return parameter	<freq>	<NR1> Frequency in Hz.
Example	:CALC:FREQ:COUN:X? returns 230580000	

**:CALCulate:FUNcTION:AOff** Set →

Description	Turns off the opened noise markers or NdB BW measurements, but not the markers themselves.	
Syntax	:CALCulate:FUNcTION:AOff	
Example	:CALC:FUNC:AOff	

**:CALCulate:MARKer<n>:CPEak[:STATe]** Set →  
→ Query

Description	Sets or queries the state of continuous peaking. It continuously puts the selected marker on the highest displayed signal peak. This function is intended to maintain the marker on signals with a frequency that is changing, and an amplitude that is not changing.	
Syntax	:CALCulate:MARKer<n>:CPEak[:STATe] {OFF ON 0 1}	
Query Syntax	:CALCulate:MARKer<n>:CPEak[:STATe]?	
Parameter	<n>	<NR1> Marker number 1 to 5

	0	Turns continuous peaking off.
	1	Turns continuous peaking on.
	OFF	Turns continuous peaking off.
	ON	Turns continuous peaking on.
Return parameter	0	Continuous peaking is off.
	1	Continuous peaking is on.
Example	:CALC:MARK1:CPE ON	

**:CALCulate:MARKer<n>:DELTA[:SET]:CENTer** 

Description	Changes the center frequency of the analyzer to the frequency difference between the two markers. This command is not available if the delta marker is off.	
Syntax	:CALCulate:MARKer<n>:DELTA[:SET]:CENTer	
Parameter	<n>	<NR1> Marker number 1 to 5.
Example	:CALC:MARK1:DELT:CENT	

**:CALCulate:MARKer<n>:DELTA[:SET]:SPAN** 

Description	Changes the span of the analyzer to the frequency difference between the two markers. This command is not available if the delta marker is off.	
Syntax	:CALCulate:MARKer<n>:DELTA[:SET]:SPAN	
Parameter	<n>	<NR1> Marker number 1 to 5.
Example	:CALC:MARK1:DELT:SPAN	

**:CALCulate:MARKer<n>:MAXimum****Set** →

**Description** Performs peak search and places a marker on the highest peak.

**Syntax** :CALCulate:MARKer<n>:MAXimum

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:MAX

**:CALCulate:MARKer<n>:MAXimum:LEFT****Set** →

**Description** Places the selected marker on the next highest signal peak to the left of the current marked peak.

**Syntax** :CALCulate:MARKer<n>:MAXimum:LEFT

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:MAX:LEFT

**:CALCulate:MARKer<n>:MAXimum:NEXT****Set** →

**Description** Places the selected marker on the next highest signal peak from the current marked peak.

**Syntax** :CALCulate:MARKer<n>:MAXimum:NEXT

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:MAX:NEXT

**:CALCulate:MARKer<n>:MAXimum:RIGHT****Set** →

**Description** Places the selected marker on the next highest signal peak to the right of the current marked peak.

**Syntax** :CALCulate:MARKer<n>:MAXimum:RIGHT

**Parameter** <n> <NR1> Marker number 1 to 5.

Example :CALC:MARK1:MAX:RIGH

**:CALCulate:MARKer<n>:MINimum** Set →

**Description** Places the selected marker on the lowest point on the trace that is assigned to that particular marker number.

**Syntax** :CALCulate:MARKer<n>:MINimum

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:MIN

**:CALCulate:MARKer<n>[:SET]:CENTer** Set →

**Description** Sets the center frequency equal to the specified marker frequency, which moves the marker to the center of the screen. In delta marker mode, the center frequency is set to the delta marker frequency. This command is not available in zero span.

**Syntax** :CALCulate:MARKer<n>[:SET]:CENTer

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:CENT

**:CALCulate:MARKer<n>[:SET]:RLEVel** Set →

**Description** Sets the reference level to the specified marker amplitude. In delta marker mode, the reference level is set to the delta marker amplitude.

**Syntax** :CALCulate:MARKer<n>[:SET]:RLEVel

**Parameter** <n> <NR1> Marker number 1 to 5.

**Example** :CALC:MARK1:RLEV

**:CALCulate:MARKer<n>[:SET]:START (Set) →**

Description	Sets the start frequency to the value of the specified marker frequency. In delta marker mode, the start frequency is set to the delta marker frequency. This command is not available in zero span.
Syntax	:CALCulate:MARKer<n>[:SET]:START
Parameter	<n> <NR1> Marker number 1 to 5.
Example	:CALC:MARK1:STAR

**:CALCulate:MARKer<n>[:SET]:STEP (Set) →**

Description	Sets the center frequency step size equal to the specified marker frequency. In delta marker mode, the center frequency step size is set to the delta marker frequency. This command is not available in zero span.
Syntax	:CALCulate:MARKer<n>[:SET]:STEP
Parameter	<n> <NR1> Marker number 1 to 5.
Example	:CALC:MARK1:STEP

**:CALCulate:MARKer<n>[:SET]:STOP (Set) →**

Description	Sets the stop frequency to the value of the specified marker frequency. In delta marker mode, the stop frequency is set to the delta marker frequency. This command is not available in zero span.
Syntax	:CALCulate:MARKer<n>[:SET]:STOP
Parameter	<n> <NR1> Marker number 1 to 5.
Example	:CALC:MARK1:STOP

:CALCulate:MARKer<n>:STATe|MODE (Set) →  
→ (Query)

Description	Sets or queries the state of the selected marker.	
Syntax	:CALCulate:MARKer<n>:STATe {OFF NORMal DELTA 0 NORM DELT}	
Query Syntax	:CALCulate:MARKer<n>:STATe?	
Parameter	<n> OFF 0 NORMal NORM DELTA DELT	<NR1> Marker number 1 to 8 Turns the selected marker off. Set the selected frequency marker to normal mode. The selected frequency scale is in difference mode.
Return parameter	Off NORMal DELTA	The selected marker is off. Set the selected frequency marker to normal mode. The selected frequency scale is in difference mode.
Example	:CALC:MARK1:STAT NORM	

:CALCulate:MARKer|FREQMarkers:TABLE:STATe (Set) →  
→ (Query)

Description	Sets or queries the state of the marker table.	
Syntax	:CALCulate:FREQMarkers:TABLE:STATe{OFF ON 0 1}	
Query Syntax	:CALCulate:FREQMarkers:TABLE:STATe?	
Parameter	0 1 OFF ON	Turns the table off. Turns the table on. Turns the table off. Turns the table on.
Return parameter	0 1	The table is off. The table is on.



Example :CALC:FREQM:TABL:STAT ON

:CALCulate:MARKer<n>:TOTRACe|TRACe

→ Set →  
→ Query

**Description** Sets or queries the state of continuous peaking. It continuously puts the selected marker on the highest displayed signal peak. This function is intended to maintain the marker on signals with a frequency that is changing, and an amplitude that is not changing.

**Syntax** :CALCulate:MARKer<n>:TOTRACe <integer>  
:CALCulate:MARKer<n>:TRACe <integer>

**Query Syntax** :CALCulate:MARKer<n>:TOTRACe?  
:CALCulate:MARKer<n>:TRACe?

**Parameter/** <n> <NR1> Marker number 1 to 8

**Return parameter** <integer> The number of the trace: (1, 2, 3, 4, 5)

**Example** :CALC:MARK1:TOTRAC 2

:CALCulate:MARKer<n>:DELTa:X?

→ Query

**Description** Returns the reference marker position of delta marker.

**Query Syntax** :CALCulate:MARKer<n>:DELTa:X?

**Parameter** <n> <NR1> Marker number 1 to 5

**Return parameter** <freq> Frequency in Hz

**Example** :CALC:MARK3:DELT:X?  
returns  
300000000Hz

:CALCulate:MARKer<n>:DELTa:Y?

→ Query

**Description** Returns the reference marker's vertical position of delta marker.

Query Syntax	:CALCulate:MARKer<n>:DELTA:Y?	
Parameter	<n>	<NR1> Marker number 1 to 5
Return parameter	<ampl>	Power or voltage. If the specified marker is not active, returns ERR.
Example	:CALC:MARK3:DELT:Y? returns 9.8dBm	

Set →  
 → Query

**:CALCulate:MARKer<n>:X**

Description	Sets or returns the marker position. In delta marker mode, this command returns the frequency difference between the markers.	
Syntax	:CALCulate:MARKer<n>:X <freq>	
Query Syntax	:CALCulate:MARKer<n>:X?	
Parameter	<n>	<NR1> Marker number 1 to 5
	<freq>	Frequency in GHz, MHz, kHz, Hz. The default unit is Hz.
Return parameter	<freq>	Frequency in Hz. If the specified marker is not active, returns ERR.
Example	:CALC:MARK2:X 300MHz query :CALC:MARK2:X? returns 300000000Hz	

**:CALCulate:MARKer<n>:Y?**

→ Query

Description	Returns the marker's vertical position. In delta marker mode, this command returns the amplitude difference between the markers.	
Query Syntax	:CALCulate:MARKer<n>:Y?	
Parameter	<n>	<NR1> Marker number 1 to 5

Return parameter	<code>&lt;amp;gt;</code>	Power or voltage. If the specified marker is not active, returns ERR.
------------------	--------------------------	---

Example	:CALC:MARK3:Y? returns 9.8dBm
---------	-------------------------------------

Set →  
 → Query

---

**:CALCulate:NETMeasure:POSition**

Description	Sets and queries the percentage position of the 0dB scale screen.	
Syntax	:CALCulate:NETMeasure:POSition <value>	
Query Syntax	:CALCulate:NETMeasure:POSition?	
Parameter	<code>&lt;value&gt;</code>	50. 0dB scale percentage 0% to 100%
Return parameter	-10 dB	Tracks source reference level -10dB
Example	:CALC:NETM:POS 10 :CALC:NETM:POS? Return 10	

Set →  
 → Query

---

**:CALCulate:NETMeasure:RLEVel**

Description	Sets and queries the 0dB scale position.	
Syntax	:CALCulate:NETMeasure:RLEVel <value>	
Query Syntax	:CALCulate:NETMeasure:RLEVel?	
Parameter	<code>&lt;value&gt;</code>	-10. Sets the reference level -200 to 200 units dB
Return parameter	-10 dB	Tracks the source reference level -10dB
Example	:CALC:NETM:RLEV -10 :CALC:NETM:RLEV? Return -10 dB	

**:CALCulate:NTDate:NORMALize:ON** (Set) →  
→ (Query)

Description	Turns the tracking generator normalization on/off or queries its state.	
Syntax	:CALCulate:NTDate:NORMALize:ON {OFF ON 0 1}	
Query Syntax	:CALCulate:NTDate:NORMALize:ON?	
Parameter	0	Turns the normalization off.
	1	Turns the normalization on.
	OFF	Turns the normalization off.
	ON	Turns the normalization on.
Return parameter	0	The normalization is off.
	1	The normalization is on.
Example	:CALC:NTD:NORM:ON ON :CALC:NTD:NORM:ON? Return 1	

**:CALCulate:NTDate:NORMALize** (Set) →

Description	Perform normalization.	
Syntax	:CALCulate:NTDate:NORMALize	
Parameter	Null	
Return parameter	Null	
Example	:CALC:NTD:NORM	

**:CALCulate:TRACe<n>:PEAK:MODE** (Set) →  
→ (Query)

Description	Sets and queries peak search types	
Syntax	:CALCulate:TRACe<n>:PEAK:MODE {Min Max}	
Query Syntax	:CALCulate:TRACe<n>:PEAK:MODE?	

Parameter	<n> Min Max	<NR1> trace number 1 to 5. Peak min search mode. Peak max search mode.
Return parameter	Min Max	Sets the minimum peak search. Set the maximum peak search.
Example	:CALC:TRAC1:PEAK:MODE MAX :CALC:TRAC1:PEAK:MODE? Return Max	

Set →  
 → Query

**:CALCulate:TRACe<n>:PEAK:EXCur | EXCursion**

Description	Sets and queries the peak height of the selected trace. Unit dB	
Syntax	:CALCulate:TRACe<n>:PEAK:EXCur <value> :CALCulate:TRACe<n>:PEAK:EXCursion <value>	
Query Syntax	:CALCulate:TRACe<n>:PEAK:EXCur? :CALCulate:TRACe<n>:PEAK:EXCursion?	
Parameter	<n> <value>	<NR1> Marker number 1 to 5 <NR2> 0 dB to 120 dB
Return parameter	<value>	10.00 dB
Example	:CALC:TRAC1:PEAK:EXC 10 :CALC:TRAC1:PEAK:EXC? Return 10.00 dB	

Set →  
 → Query

**:CALCulate:TRACe<n>:PEAK:LIST:SORT**

Description	Set and query the peak list sorting type.	
Syntax	:CALCulate:TRACe<n>:PEAK:LIST:SORT {ampt freq}	
Query Syntax	:CALCulate:TRACe<n>:PEAK:LIST:SORT?	

Parameter	<n>	<NR1> Marker number 1 to 5
	Ampt	Selects traces peak list amplitude sorting.
	Freq	Selects traces peak list frequency sorting.
Return parameter	Ampt	Traces peak list amplitude sorting.
	Freq	Traces peak list frequency sorting.
Example	:CALC:TRAC1:PEAK:LIST:SORT AMPT :CALC:TRAC1:PEAK:LIST:SORT? Return Ampt	

:CALCulate:TRACe<n>:PEAK:LIST:[STATe] 



Description	Sets or queries the peak list switch.	
Syntax	:CALCulate:TRACe<n>:PEAK:LIST:[STATe] <ON OFF 1 0>	
Query Syntax	:CALCulate:TRACe<n>:PEAK:LIST:[STATe]?	
Parameter	<n>	<NR1> Marker number 1 to 5
	0	Selects traces off peak list.
	1	Selects traces on peak list.
	OFF	Selects traces off peak list.
	ON	Selects traces on peak list.
Return parameter	0	Selects traces to turn off peak list.
	1	Selects traces to turn on peak list.
Example	:CALC:TRAC1:PEAK:LIST:STAT 1 :CALC:TRAC1:PEAK:LIST:STAT? Return 1	

**:CALCulate:TRACe<n>:PEAK:LIST:VALue** → Query

**Description**            Queries the frequency point of the peak list of the currently selected trace and the corresponding amplitude value.

**Syntax**                    :CALCulate:TRACe<n>:PEAK:LIST:VALue?

**Parameter**            <n>            <NR1> Marker number 1 to 5.

**Example**                :CALC:TRAC1:PEAK:LIST:VAL?  
                               Return  
                               500 MHz -20 dBm, 1.00GHz -18.0 dBm,...

**:CALCulate:TUNE:AUTO** Set →

**Description**            Runs the auto tune function.

**Syntax**                    :CALCulate:TUNE:AUTO

**Example**                :CALC:TUNE:AUTO

## CONFigure Commands

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### :CONFigure:ACPower



Description	This command places the analyzer in Adjacent Channel Power measurement state.	
Syntax	:CONFigure:ACPower <value>	
Parameter	<value>	Sets the adjacent channel power measurement parameter.
	0	Turns off adjacent channel power measurement.
	1	Turns on adjacent channel power measurement.
	OFF	Turns off adjacent channel power measurement.
	ON	Turns on adjacent channel power measurement.
Example	:CONF:ACP 1	

### :CONFigure:CHPower



Description	This command places the analyzer in Channel Power measurement state.	
Syntax	:CONFigure:CHPower <value>	
Parameter	<value>	Sets the channel power measurement parameter



0	Turns off channel power measurement
1	Turns on channel power measurement
OFF	Turns off channel power measurement
ON	Turns on channel power measurement

Example :CONF:CHP 1

### :CONFigure:OBWidth



Description This command places the analyzer in Occupied Bandwidth measurement state.

Syntax :CONFigure:OBWidth <value>

Parameter	<value>	Sets the occupied Bandwidth measurement parameter.
	0	Turns off bandwidth occupied measurement.
	1	Turns on bandwidth occupied measurement.
	OFF	Turns off bandwidth occupied measurement.
	ON	Turns on bandwidth occupied measurement.

Example :CONF:OBW 1

### :CONFigure:SANalyzer



Description Disable all measurement functions.

Syntax :CONFigure:SANalyzer

Example :CONF:SAN

**:CONFigure:SATime**

Set →

Description	Turns on or off time spectrum measure mode.	
Syntax	:CONFigure:SATime <value>	
Parameter	<value>	Sets time spectrum measure parameter.
	0	Turns time spectrum measure off.
	1	Turns time spectrum measure on.
	OFF	Turns time spectrum measure off.
	ON	Turns time spectrum measure on.
Example	:CONF:SAT	

**DISPlay Commands**

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:DISPlay:ANNotation:CLOCK:DATE:FORMat  

Description	Sets or queries the display format of date&time.	
Syntax	:DISPlay:ANNotation:CLOCK:DATE:FORMat {YMDhms HMSymd}	
Query Syntax	:DISPlay:ANNotation:CLOCK:DATE:FORMat?	
Parameter/ Return parameter	YMDhms	Set the display format of date&time to YYYY-MM-DD HH:MM:SS.
	HMSymd	Set the display format of date&time to HH:MM:SS YYYY-MM-DD.

Example :DISP:ANN:CLOC:DATE:FORM YMDhms  
 :DISP:ANN:CLOC:DATE:FORM?  
 return  
 YMDhms

Set →  
 → Query

**:DISPlay:ANNotation:CLOCK[:STATe]**

Description Turns the on-screen date&time display on/off or queries its state.

Syntax :DISPlay:ANNotation:CLOCK[:STATe] {OFF|ON|0|1}

Query Syntax :DISPlay:ANNotation:CLOCK[:STATe]?

Parameter	0	Turns the date&time display off.
	1	Turns the date&time display on.
	OFF	Turns the date&time display off.
	ON	Turns the date&time display on.

Return parameter	0	The date&time display is off.
	1	The date&time display is on.

Example :DISP:ANN:CLOC ON  
 :DISP:ANN:CLOC?  
 Return 1

Set →  
 → Query

**:DISPlay:MENU:STATe**

Description Turns the full screen display mode on/off or queries its state.

Syntax :DISPlay:MENU:STATe {OFF|ON|0|1}

Query Syntax :DISPlay:MENU:STATe?

Parameter	0	Turns the full screen display mode off.
	1	Turns the full screen display mode on.
	OFF	Turns the full screen display mode off.
	ON	Turns the full screen display mode on.

Return parameter	0	The full screen display mode is off.
	1	The full screen display mode is on.

Example :DISP:MENU:STAT 1

:DISPlay:WINDow:HIDe:STATe 



Description Turns on or off the menu auto hiding when not any touch or key press.



Syntax :DISPlay:WINDow:HIDe:STATe {OFF|ON|0|1}

Query Syntax :DISPlay:MENU:STATe?

Parameter	0	Turns the auto hide off.
	1	Turns the auto hide on.
	OFF	Turns the auto hide off.
	ON	Turns the auto hide on.

Return parameter	0	The auto hide is off.
	1	The auto hide is on.

Example :DISP:WIN:HID:STAT 1

:DISPlay:WINDow:HIDe:TIME 



Description Set or query the right menu to automatically hide the time.

Syntax :DISPlay:WINDow:HIDe:TIME <TIME>

Query Syntax :DISPlay:WINDow:HIDe:TIME?

Parameter/  
Return parameter <TIME> Range:5s - 50s. Default Unit ns.


Example :DISP:WIN:HID:TIM 5e9

**:DISPlay:WINDow:LABEl** 



Description	Turns the on-screen label on/off or queries its state.	
Syntax	:DISPlay:WINDow:LABEl {OFF ON 0 1}	
Query Syntax	:DISPlay:WINDow:LABEl?	
Parameter	0	Turns the label off.
	1	Turns the label on.
	OFF	Turns the label off.
	ON	Turns the label on.
Return parameter	0	The label is off.
	1	The label is on.
Example	:DISP:WIN:LABE 1	

**:DISPlay:WINDow:SCREen:BRIGhtness** 



Description	Set or query screen brightness.	
Syntax	:DISPlay:WINDow:SCREen:BRIGhtness <BRIGhtness>	
Query Syntax	:DISPlay:WINDow:SCREen:BRIGhtness?	
Parameter/ Return parameter	<BRIGhtness>	Range:1- 100
Example	:DISP:WIN:SCR:BRIG 50	

**:DISPlay:WINDow:SCREen:SLEEp:STATe** 



Description	Set or query the screen sleep switch.	
Syntax	:DISPlay:WINDow:SCREen:SLEEp:STATe {OFF ON 0 1}	
Query Syntax	:DISPlay:WINDow:SCREen:SLEEp:STATe?	

Parameter	0	Turn off screen sleep.
	1	Turn on screen sleep.
	OFF	Turn off screen sleep.
	ON	Turn on screen sleep.
Return parameter	0	Turn off screen sleep.
	1	Turn on screen sleep.
Example	:DISP:WIN:SCR:SLE:STAT 1	

→  
 →

**:DISPlay:WINDow:SCREen:TIME**

Description	Set or query the automatic screen-off time.	
Syntax	:DISPlay:WINDow:SCREen:TIME <TIME>	
Query Syntax	:DISPlay:WINDow:SCREen:TIME?	
Parameter/ Return parameter	<TIME>	Range:1Min - 60Min. Default Unit ns.
Example	:DISP:WIN:SCR:TIM 60e9	

**:DISPlay:WINDow:TRACe:MATH:1EXChang2**       →

Description	Swap the contents of trace 1 and trace 2 and put them in display mode at the same time.	
Syntax	:DISPlay:WINDow:TRACe:MATH:1EXChange2	
Example	:DISP:WIN:TRAC:MATH:1EXC2	

**:DISPlay:WINDow:TRACe:MATH:2DL2**       →

Description	Trace 2 amplitude value minus the value of the displayed line.	
Syntax	:DISPlay:WINDow:TRACe:MATH:2DL2	
Example	:DISP:WIN:TRAC:MATH:2DL2	

**:DISPlay:WINDow:TRACe:MATH:2EXChang3**      (Set) →

Description      Swap the contents of trace 2 and trace 3 and put them in display mode at the same time.

Syntax            :DISPlay:WINDow:TRACe:MATH:2EXChang3

Example          :DISP:WIN:TRAC:MATH:2EXC3

**:DISPlay:WINDow:TRACe:MATH:1TO3**              (Set) →

Description      Change the content of trace 1 to trace 3, and set trace 3 to view mode.

Syntax            :DISPlay:WINDow:TRACe:MATH:1TO3

Example          :DISP:WIN:TRAC:MATH:1TO3

**:DISPlay:WINDow:TRACe:MATH:2TO3**              (Set) →

Description      Change the content of trace 2 to trace 3, and set trace 3 to view mode.

Syntax            :DISPlay:WINDow:TRACe:MATH:2TO3

Example          :DISP:WIN:TRAC:MATH:2TO3

**:DISPlay:WINDow[:TRACe]:X[:SCALe]:OFFSet**      → (Query)

Description      Sets or queries the X-axis frequency offset.

Syntax            :DISPlay:WINDow[:TRACe]:X[:SCALe]:OFFSet <freq>

Query Syntax     :DISPlay:WINDow[:TRACe]:X[:SCALe]:OFFSet?

Parameter        <freq>            <NRf>

Return parameter <NR1>          Frequency in Hz.

Example          :DISP:WIN:X:OFFS 1000



Set →  
 → Query

**:DISPlay:WINDow[:TRACe]:Y:DLINe**

Description	Sets or queries the display line amplitude level.	
Syntax	:DISPlay:WINDow[:TRACe]:Y:DLINe <ampl>	
Query Syntax	:DISPlay:WINDow[:TRACe]:Y:DLINe?	
Parameter	<ampl>	<NRf> power or voltage in the current Y-axis unit.
Return parameter	<NR3>	
Example	:DISP:WIN:Y:DLIN -5.0e+1	

Set →  
 → Query

**:DISPlay:WINDow[:TRACe]:Y:DLINe:STATe**

Description	Turns the display line on/off or queries its state.	
Syntax	:DISPlay:WINDow[:TRACe]:Y:DLINe:STATe {OFF ON 0 1}	
Query Syntax	:DISPlay:WINDow[:TRACe]:Y:DLINe:STATe?	
	0	Turns the display line off.
	1	Turns the display line on.
	OFF	Turns the display line off.
	ON	Turns the display line on.
Return parameter	0	The display line is off.
	1	The display line is on.
Example	:DISP:WIN:Y:DLIN:STAT 1 :DISP:WIN:Y:DLIN:STAT? return 0	

Set →  
 → Query

**:DISPlay:WINDow[:TRACe]:Y[:SCALE]:GAUge**

Description	Turns the on-screen scale on/off or queries its state.	
-------------	--	--

Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:GAUge {OFF ON 0 1}
Query Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:GAUge?
	0 Turns the scale off.
	1 Turns the scale on.
	OFF Turns the scale off.
	ON Turns the scale on.
Return parameter	0 The scale is off.
	1 The scale is on.
Example	:DISP:WIN:Y:GAU 1 :DISP:WIN:Y:GAU? return 1

Set →      → Query

**:DISPlay:WINDow[:TRACe]:Y[:SCALe]:PDIVision**

Description	Sets or queries the Y-axis scale/div when the amplitude scale is logarithmic.	
Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:PDIVision <rel_amp>	
Query Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:PDIVision?	
Parameter/	<rel_amp>	<NR1> 0.01 dB to 1000dB.
Return parameter		
Example	:DISP:WIN:Y:PDIV 10 :DISP:WIN:Y:PDIV? Return 10.0	

Set →      → Query

**:DISPlay:WINDow[:TRACe]:Y[:SCALe]:RLEVEL**

Description	Sets or queries the Y-axis reference level. The units depend on the scale type (logarithmic/linear).	
Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:RLEVEL <amp>	
Query Syntax	:DISPlay:WINDow[:TRACe]:Y[:SCALe]:RLEVEL?	

Parameter/	<ampl>	<NRf> in current active unit
Return parameter	<NR3>	Current active unit
Example	:DISP:WIN:Y:RLEV -10 :DISP:WIN:Y:RLEV? Return -10.0	

Set →  
 → Query

**:DISPlay:WINDow:X[:SCALe]:SPACing**

Description	Set or query the frequency scale type: logarithmic or linear.	
Syntax	:DISPlay:WINDow:X[:SCALe]:SPACing {LINear LOGarithmic}	
Query Syntax	:DISPlay:WINDow:X[:SCALe]:SPACing?	
Parameter/	LINear	Linear scale
Return parameter	LOGarithmic	Logarithmic scale
Example	:DISP:WIN:X:SPAC LOG :DISP:WIN:X:SPAC? Return LOGarithmic	

Set →  
 → Query

**:DISPlay:WINDow:Y[:SCALe]:RLEVel:OFFSet**

Description	Sets or queries the Y-axis reference level offset.	
Syntax	:DISPlay:WINDow:Y[:SCALe]:RLEVel:OFFSet <rel_ampl>	
Query Syntax	:DISPlay:WINDow:Y[:SCALe]:RLEVel:OFFSet?	
Parameter	<rel_ampl>	<NRf>dB
Return parameter	<NR3>	
Example	:DISP:WIN:Y:RLEV:OFFS -5.0e+1 dB :DISP:WIN:Y:RLEV:OFFS? Return 0	

Set →

→ Query

:DISPlay:WINDow:Y[:SCALE]:SPACing

Description	Sets or queries the type of scale: logarithmic or linear.	
Syntax	:DISPlay:WINDow:Y[:SCALE]:SPACing {LINear LOGarithmic}	
Query Syntax	:DISPlay:WINDow:Y[:SCALE]:SPACing?	
Parameter/	LINear	Linear scale
Return parameter	LOGarithmic	Logarithmic scale
Example	:DISP:WIN:Y:SPAC LOG :DISP:WIN:Y:SPAC? Return LOGarithmic	

## INITiate Commands

:INITiate:CONTInuous .....75

### :INITiate:CONTInuous

Set →

→ Query

Description	Sets the sweep mode to continuous or single mode or queries its state.	
Syntax	:INITiate:CONTInuous {OFF ON 0 1}	
Query Syntax	:INITiate:CONTInuous?	
	0	Sets the sweep mode to single.
	1	Sets the sweep mode to continuous.
	OFF	Sets the sweep mode to single.
	ON	Sets the sweep mode to continuous.
Return parameter	0	The sweep mode is single.
	1	The sweep mode is continuous.
Example	:INIT:CONT ON	

## MMEMory Commands

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### :MMEMory:CATalog?

→ Query

Description	Returns a list of all the files that have been saved to the local memory.
-------------	---

Query Syntax	:MMEMory:CATalog?
--------------	-------------------

Example	:MMEM:CAT? >20171010_155852.csv,20171107_145956.png,2017107_150136.png, ...
---------	--

### :MMEMory:COpy:SCReen

Set →

Description	Exports the screen file to PC software.
-------------	---

Syntax	:MMEMory:COpy:SCReen <file_name>
--------	----------------------------------

Parameter	<file_name> XXX.png
-----------	---------------------

---

Example :MMEM:COPY:SCR 20171107\_145956.png

---

**:MMEMory:COpy:TRACe** Set →

---

Description Exports the trace file to PC software.

---

Syntax :MMEMory:COpy:TRACe <file\_name>

---

Parameter <file\_name> XXX.csv

---

Example :MMEM:COpy:TRAC 20171010\_155852.csv

---

**:MMEMory:DELeTe:ALL** Set →

---

Description Deletes all files.

---

Syntax :MMEMory:DELeTe:ALL

---

Example :MMEM:DEL:ALL

---

**:MMEMory:DELeTe:SCReen** Set →

---

Description Deletes the selected screen file from the current directory.

---

Syntax :MMEMory:DELeTe:SCReen <file\_name>

---

Parameter <file\_name> XXX.png

---

Example :MMEM:DEL:SCR 20171107\_145956.png

---

**:MMEMory:DELeTe:SCReen:ALL** Set →

---

Description Deletes all screen files.

---

Syntax :MMEMory:DELeTe:SCReen:ALL

---

Example :MMEM:DEL:SCR:ALL

---

**:MMEMory:DELeTe:TRACe** (Set) →

Description	Deletes the selected trace file from the current directory.
Syntax	:MMEMory:DELeTe:TRACe <file_name>
Parameter	<file_name> XXX.csv
Example	:MMEM:DEL:TRAC 20171010_155852.csv

**:MMEMory:DELeTe:TRACe:ALL** (Set) →

Description	Deletes all trace files.
Syntax	:MMEMory:DELeTe:TRACe:ALL
Example	:MMEM:DEL:TRAC:ALL

**:MMEMory:DISK:INFormation** → (Query)

Description	Displays information about the files stored on the current disk.
Query Syntax	:MMEMory:DISK:INFormation?
Example	:MMEM:DISK:INF?

**:MMEMory:LOAD:LIMitline** (Set) →

Description	Load limit line data.
Syntax	:MMEMory:LOAD:LIMitline <file_name>
Parameter	<file_name> XXX.sp
Example	:MMEM:LOAD:LIM 20171010_155852.sp



**:MMEMory:LOAD:SCReen****Set** →

Description Loads screen data from a file to the internal memory.

Syntax :MMEMory:LOAD:SCReen <file\_name>

Parameter <file\_name> XXX.png

Example :MMEM:LOAD:SCR 20171107\_145956.png

**:MMEMory:LOAD:TRACe****Set** →

Description Load the trace data screenshot.

Syntax :MMEMory:LOAD: TRACe <file\_name>

Parameter <file\_name> XXX.csv

Example :MMEM:LOAD:TRAC 20171010\_155852.csv

**:MMEMory:STORe:LIMitline****Set** →

Description Saves the limit line data from internal memory to a file. If the file name is null, the file name is based on the date/time. The format is sp.

Syntax :MMEMory:STORe:LIMitline <file\_name>

Parameter <file\_name> XXX

Example :MMEM:STOR:LIM 20171107\_145956

**:MMEMory:STORe:QUICK:SAVE****Set** →

Description Quick save the screenshot. When a USB flash drive is inserted, the image is saved into the USB flash drive, otherwise saved into the internal memory.

Syntax :MMEMory:STORe:QUICK:SAVE {fileName}

Example :MMEM:STOR:QUICK:SAVE  
:MMEM:STOR:QUICK:SAVE 123

:MMEMory:STORe:QUICK:SAVE:TYPE (Set) →  
→ (Query)

Description Set or query the quick save type.

Syntax :MMEMory:STORe:QUICK:SAVE:TYPE  
{SCReen|TRAcE|USER|LimitLine}

Query Syntax :MMEMory:STORe:QUICK:SAVE:TYPE?

Parameter/ Return parameter	SCReen	Save screenshot.
	TRAcE	Save trace data.
	USER	Save user parameter.
	LimitLine	Save Limit Line.

Example :MMEM:STOR:QUICK:SAVE:TYPE Screen  
:MMEM:STOR:QUICK:SAVE:TYPE?  
Return  
Screen

:MMEMory:STORe:SCReen (Set) →

Description Save the current screenshot to internal memory. If the file name is null, the file name is based on the date and time and the format is png.

Syntax :MMEMory:STORe:SCReen <file\_name>

Parameter <file\_name> XXX

Example :MMEM:STOR:SCR 20171107\_145956

**:MMEMory:STORe:STATe** (Set) →

Description	Save the instrument state to user-defined configuration, used to set the startup parameters of the analyzer or preset parameters. If the file name is null, the file name is based on the date/time, and the format is user.
Syntax	:MMEMory:STORe:STATe <file_name>
Parameter	<file_name> XXX
Example	:MMEM:STOR:STAT 20171107_145956

**:MMEMory:STORe:TRACe** (Set) →

Description	Saves the trace data from internal memory to a file. If the file name is null, the file name is based on the date/time, and the format is cvs.
Syntax	:MMEMory:STORe:LIMitline <file_name>
Parameter	<file_name> XXX
Example	:MMEM:STOR:LIM 20171107_145956

**:MMEMory:STORAGe** (Set) →  
→ (Query)

Description	Switch storage to internal storage or external U disk.
Syntax	:MMEMory:STORAGe {INT EXT}
Query Syntax	:MMEMory::STORAGe?
Parameter/ Return parameter	INT Switch internal memory. EXT Switch external memory.
Example	:MMEM:STORAG INT :MMEM:STORAG? Return INT

## OUTPut Commands

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[[:SOURce]:OUTPut:TRACk[:STATe] (Set) →  
→ (Query)

Description	Set or query trace source output status.	
Syntax	:OUTPut:TRACk[:STATe] {OFF ON 0 1}	
Query Syntax	:OUTPut:TRACk[:STATe]?	
Parameter	0	Turns TG output off.
	1	Turns TG output on.
	OFF	Turns TG output off.
	ON	Turns TG output on.
Return parameter	0	TG output is off.
	1	TG output is on.
Example	:OUTP:TRAC ON :OUTP:TRAC? Return 1	

**SENSe Commands**

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Set →

**[:SENSe]:ACPower:BANDwidth:ACHannel:COUNt** → Query

Description	Sets or queries the number of upper and lower adjacent channels measured by adjacent channel power.	
Syntax	[:SENSe]:ACPower:BANDwidth:ACHannel:COUNt <integer>	
Query Syntax	[:SENSe]:ACPower:BANDwidth:ACHannel:COUNt?	
Parameter/ Return parameter	<integer>	<NR1> Adjacent channels number
Example	:ACP:BAND:ACH:COUN 1	

**[[:SENSe]:ACPower:BANDwidth:INTegration]** 
 →  
 →

Description	Sets or queries the range of integration used in calculating the power in the main channel.	
Syntax	:OUTPut:TRACk[:STATe] {OFF ON 0 1}	
Query Syntax	:OUTPut:TRACk[:STATe]?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:ACP:BAND:INT 2.0e+7	

**[[:SENSe]:ACPower:CSPacing]** 
 →  
 →

Description	Sets or queries the channel spacing between the main channels.	
Syntax	[:SENSe]:ACPower:CSPacing <freq>	
Query Syntax	[:SENSe]:ACPower:CSPacing?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:ACP:CSP 1.0e+8	

**[[:SENSe]:AVERage:COUNT]** 
 →  
 →

Description	Sets or queries the number of traces that are used with the average function.	
Syntax	[:SENSe]:AVERage:COUNT <integer>	
Query Syntax	[:SENSe]:AVERage:COUNT?	
Parameter/ Return parameter	<integer>	<NR1>
Example	:AVER:COUN 20 :AVER:COUN? return 20	

Set →  
 → Query

**[[:SENSE]:AVERage[:STATE]**

---

Description	Enable or disable the trace averaging function of the current measurement or query its status.	
Syntax	[:SENSE]:AVERage[:STATE] {OFF ON 0 1}	
Query Syntax	[:SENSE]:AVERage[:STATE]?	
Parameter	0	Turns the Average function off.
	1	Turns the Average function on.
	OFF	Turns the Average function off.
	ON	Turns the Average function on.
Return parameter	0	The Average function is off.
	1	The Average function is on.
Example	:AVER ON :AVER? return 1	

Set →  
 → Query

**[[:SENSE]:BANDwidth|BWIDth[:RESolution]**

---

Description	Sets or queries the resolution bandwidth (RBW).	
Syntax	[:SENSE]:BANDwidth BWIDth[:RESolution] <freq>	
Query Syntax	[:SENSE]:BANDwidth BWIDth[:RESolution]?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:BAND 1.0e+6	

Set →  
 → Query

**[[:SENSE]:BANDwidth|BWIDth[:RESolution]:AUTO**

---

Description	Sets the RBW to auto (on) or manual (off) or queries its state.	
-------------	---	--



Syntax	[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO {MAN AUTO 0 1}	
Query Syntax	[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO?	
Parameter	0	Sets RBW to manual (off).
	1	Sets RBW to automatic (on).
	MAN	Sets RBW to manual (off).
	AUTO	Sets RBW to automatic (on).
Return parameter	0	RBW is set to manual (off).
	1	RBW is set to automatic (on).
Example	:BAND:AUTO ON	

Set →  
 → Query

**[:SENSe]:BANDwidth|BWIDth:VIDeo**

Description	Sets or queries the video bandwidth (VBW).	
Syntax	[:SENSe]:BANDwidth BWIDth:VIDeo <freq>	
Query Syntax	[:SENSe]:BANDwidth BWIDth:VIDeo?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:BAND:VID 1.0e+6	

Set →  
 → Query

**[:SENSe]:BANDwidth|BWIDth:VIDeo:AUTO**

Description	Sets the VBW to auto (on) or manual (off) or queries its state.	
Syntax	[:SENSe]:BANDwidth BWIDth:VIDeo:AUTO {OFF ON 0 1}	
Query Syntax	[:SENSe]:BANDwidth BWIDth:VIDeo:AUTO?	
Parameter	0	Sets VBW to manual (off).
	1	Sets VBW to automatic (on).
	OFF	Sets VBW to manual (off).

	ON	Sets VBW to automatic (on).
Return parameter	0	RVW is set to manual (off).
	1	RVW is set to automatic (on).

Example :BAND:VID:AUTO OFF

**[[:SENSE]:BANDwidth|BWIDth:EMC** (Set) →  
→ (Query)

**Description** Sets the EMI filter bandwidth (must be set to the exact bandwidth).

**Syntax** [:SENSE]:BANDwidth:EMC <freq>  
[:SENSE]:BWIDth:EMC <freq>

**Query Syntax** [:SENSE]:BANDwidth:EMC?  
[:SENSE]:BWIDth:EMC?

**Parameter** <freq> <NRf> (Only 200Hz, 9kHz, 120kHz, 1MHz are valid settings)

**Return parameter** <NR3> Return frequency 200Hz, 9kHz, 120kHz, 1MHz.

Example BAND:EMC 200  
BAND:EMC?  
Return 1.000000 MHz

**[[:SENSE]:BANDwidth:EMC:STATe** (Set) →  
→ (Query)

**Description** Turns the EMI filter on/off or queries its state.

**Syntax** [:SENSE]:BANDwidth:EMC:STATe {OFF|ON|0|1}

**Query Syntax** [:SENSE]:BANDwidth:EMC:STATe?

Parameter	0	Turns the EMI filter off.
	1	Turns the EMI filter on.
	OFF	Turns the EMI filter off.
	ON	Turns the EMI filter on.

Return parameter	0	The EMI filter is off..
	1	The EMI filter is on.

Example                    BAND:EMC:STAT 0

Set →  
 → Query

**[:SENSe]:DEMod:AM[:CARRier]:FREQuency**

Description            Sets or queries the carrier frequency for AM demodulation.

Syntax                    [:SENSe]:DEMod:AM[:CARRier]:FREQuency <freq>

Query Syntax            [:SENSe]:DEMod:AM[:CARRier]:FREQuency?

Parameter                <freq>                <NRf>

Return parameter        <NR3>                Hz

Example                    :DEM:AM:FREQ 10 MHz  
                               :DEM:AM:FREQ?  
                               Return 1.000000 MHz

Set →  
 → Query

**[:SENSe]:DEMod:AM:IFBW**

Description            Sets or queries the IF bandwidth for AM demodulation.

Syntax                    [:SENSe]:DEMod:AM:IFBW <freq>

Query Syntax            [:SENSe]:DEMod:AM:IFBW?

Parameter                <freq>                <NRf>

Return parameter        <NR3>                Hz

Example                    :DEM:AM:IFBW 3.0e+5

Set →  
 → Query

**[:SENSe]:DEMod:MODulation:STATe**

Description            Sets or queries the state of AM demodulation.

Syntax                    [:SENSe]:DEMod:MODulation:STATe {ON|OFF|1|0}

Query Syntax            [:SENSe]:DEMod:MUDulation:STATe?

Parameter	0	Turns AM demodulation off.
	1	Turns AM demodulation on.
	OFF	Turns AM demodulation off.
	ON	Turns AM demodulation on.
Return parameter	0	AM demodulation is off.
	1	AM demodulation is on.
Example	:DEM:MOD:STAT 1 :DEM:MOD:STAT? Return 1	

Set →  
 → Query

**[[:SENSE]:DEMod:MODulation:MODE**

Description	Set and query the mode of modulation analysis.	
Syntax	[:SENSE]:DEMod:MODulation:MODE {AM FM}	
Query Syntax	[:SENSE]:DEMod:MODulation:MODE?	
Parameter	AM	Turns AM mode on.
	FM	Turns FM mode on.
Return parameter	AM	AM mode
	FM	FM mode
Example	:DEM:MOD:MODE AM :DEM:MOD:MODE? Return AM	

Set →  
 → Query

**[[:SENSE]:DEMod:FM[:CARRIER]:FREQUENCY**

Description	Sets or queries the carrier frequency for FM demodulation.	
Syntax	[:SENSE]:DEMod:FM[:CARRIER]:FREQUENCY <freq>	
Query Syntax	[:SENSE]:DEMod:FM[:CARRIER]:FREQUENCY?	
Parameter	<freq>	<NRf>

Return parameter <NR3> Hz  
 Example :DEM:FM:FREQ 10.000000MHz

→  
 →

**[[:SENSE]:DEMod:FM:IFBW**

Description Sets or queries the IF bandwidth for FM demodulation.

Syntax [:SENSE]:DEMod:FM:IFBW <freq>

Query Syntax [:SENSE]:DEMod:FM:IFBW?

Parameter <freq> <NRf>

Return parameter <NR3> Hz

Example :DEM:FM:IFBW 3.0e+5

→  
 →

**[[:SENSE]:DEMod:FREQuency**

Description Sets or queries the radio frequency for the audio demodulation function.

Syntax [:SENSE]:DEMod:FREQuency <freq>

Query Syntax [:SENSE]:DEMod:FREQuency?

Parameter <freq> <NRf> Audio demodulation frequency

Return parameter <NR3> Hz

Example :DEM:FREQ 87.6MHz  
 :DEM:FREQ?  
 Return  
 87.600000 MHz

→  
 →

**[[:SENSE]:DEMod:MODE**

Description Sets or queries the demodulation type for the audio demodulation function.

Syntax [:SENSE]:DEMod:MODE {FM|AM}

Query Syntax [:SENSE]:DEMod:MODE?

Parameter/	AM	AM demodulation.
Return parameter	FM	FM demodulation.
Example	:DEM:MODE AM :DEM:MODE? Return AM	

Set →  
 → Query

**[[:SENSE]:DEMod:STATe**

Description	Turns the audio demodulation on/off or queries its state.	
Syntax	[:SENSE]:DEMod:STATe {OFF ON 0 1}	
Query Syntax	[:SENSE]:DEMod:STATe?	
Parameter	0	Turns the audio demodulation off.
	1	Turns the audio demodulation on.
	OFF	Turns the audio demodulation off.
	ON	Turns the audio demodulation on.
Return parameter	0	The audio demodulation is off.
	1	The audio demodulation is on.
Example	:DEM:STAT ON :DEM:STAT? Return 1	

Set →  
 → Query

**[[:SENSE]:FREQuency:CENTer**

Description	Sets or queries the center frequency.	
Syntax	[:SENSE]:FREQuency:CENTer <freq>	
Query Syntax	[:SENSE]:FREQuency:CENTer?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:FREQ:CENT 1.0e+9	

Set →  
 → Query

---

Description	Sets the center frequency step size to auto (on) or manual (off) or queries its state.	
Syntax	[:SENSe]:FREQuency:CENTer:STEP:AUTO {OFF ON 0 1}	
Query Syntax	[:SENSe]:FREQuency:CENTer:STEP:AUTO?	
Parameter	0	Turn center frequency step to manual (off).
	1	Turn center frequency step to auto (on).
	OFF	Turn center frequency step to manual (off).
	ON	Turn center frequency step to auto (on).
Return parameter	0	Center frequency step is set to manual.
	1	Center frequency step is set to automatic.
Example	:FREQ:CENT:STEP:AUTO OFF	

Set →  
 → Query

---

Description	Sets or queries the center frequency step frequency.	
Syntax	[:SENSe]:FREQuency:CENTer:STEP[:INCRement] <freq>	
Query Syntax	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	FREQ:CENT:STEP 1000 FREQ:CENT:STEP? Return 1e+9	

Set →  
 → Query

**[:SENSe]:FREQuency:REFerence**

---

Description	Sets or queries the frequency reference to internal or external.	
Syntax	[:SENSe]:FREQuency:REFerence {INT EXT}	
Query Syntax	[:SENSe]:FREQuency:REFerence?	
Parameter/ Return parameter	INT	Internal reference
	EXT	External reference
Example	:FREQ:REF INT :FREQ:REF? Return INT	

Set →  
 → Query

**[:SENSe]:FREQuency:SPAN**

---

Description	Sets or queries the frequency span. Setting the span to 0 Hz puts the analyzer into zero span.	
Syntax	[:SENSe]:FREQuency:SPAN <freq>	
Query Syntax	[:SENSe]:FREQuency:SPAN?	
Parameter	<freq>	<NRf>
Return parameter	<NR3>	Hz
Example	:FREQ:SPAN 1.0e+9 :FREQ:SPAN? Return 1e+7	

Set →

**[:SENSe]:FREQuency:SPAN:FULL**

---

Description	Sets the frequency span to full scale.
Syntax	[:SENSe]:FREQuency:SPAN:FULL
Example	:FREQ:SPAN:FULL



**[[:SENSe]:FREQuency:SPAN:PREVious** (Set) →

Description      Sets the frequency span to the previous span setting.

Syntax             [:SENSe]:FREQuency:SPAN:PREVious

Example            :FREQ:SPAN:PREV

**[[:SENSe]:FREQuency:SPAN:ZERO** (Set) →

Description      Sets the frequency span to zero span.

Syntax             [:SENSe]:FREQuency:SPAN:ZERO

Example            :FREQ:SPAN:ZERO

(Set) →

**[[:SENSe]:FREQuency:STARt** → (Query)

Description      Sets or queries the start frequency.

Syntax             [:SENSe]:FREQuency:STARt <freq>

Query Syntax      [:SENSe]:FREQuency:STARt?

Parameter         <freq>      <NRf>

Return parameter <NR3>      Hz

Example            :FREQ:STAR 100MHz  
                       :FREQ:STAR?  
                       Return  
                       1e+8

(Set) →

**[[:SENSe]:FREQuency:STOP** → (Query)

Description      Sets or queries the stop frequency.

Syntax             [:SENSe]:FREQuency:STOP <freq>

Query Syntax      [:SENSe]:FREQuency:STOP?

Parameter         <freq>      <NRf>

Return parameter <NR3> Hz

Example :FREQ:STOP 100MHz  
:FREQ:STOP?  
Return  
1e+8

**[[:SENSE]:OBWidth:PERCent**

Set →

→ Query

Description Sets or queries the percentage of signal power used when determining the occupied bandwidth (OBW).

Syntax [[:SENSE]:OBWidth:PERCent <percent>

Query Syntax [[:SENSE]:OBWidth:PERCent?

Parameter <freq> <NRf>

Return parameter <NR3> %

Example :OBW:PERC 33  
:OBW:PERC?  
Return  
33

**[[:SENSE]:PASSFAIL:LINELimit:LOWer:CLEar**

Set →

Description Clears all points of the lower limit line.

Syntax [[:SENSE]:PASSFAIL:LINELimit:LOWer:CLEar

Example :PASSFAIL:LINEL:LOW:CLE

**[[:SENSE]:PASSFAIL:LINELimit:LOWer:POINT  
<n>:DElete**

Set →

Description Deletes the specified point in the lower limit line.

Syntax [[:SENSE]:PASSFAIL:LINELimit:LOWer:POINT  
<n>:DElete

Parameter <n> <NR1> Point number

Example :PASSFAIL:LINEL:LOW:POIN1:DEL

Set →

[[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:X → Query

Description Sets or queries the frequency limit of the specified point in the lower limit line.

Syntax [[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:X  
<freq>

Query Syntax [[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:X?

Parameter <n> <NR1> Point number  
<freq> <NRf> Frequency in Hz or ns.

Return parameter <NR3> Hz

Example :PASSFAIL:LINEL:LOW:POIN1:X 1.0GHz  
:PASSFAIL:LINEL:LOW:POIN1:X?  
Return  
1.9e+9

Set →

[[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:Y → Query

Description Sets or queries the amplitude limit of the specified point in the lower limit line.

Syntax [[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:Y  
<freq>

Query Syntax [[:SENSe]:PASSFAIL:LINELimit:LOWer:POINT<n>:Y?

Parameter <n> <NR1> Point number  
<ampl> Amplitude in dBm

Return parameter <NR3> dBm

Example :PASSFAIL:LINEL:LOW:POIN1:Y -20  
:PASSFAIL:LINEL:LOW:POIN1:Y?  
Return  
-20

**[[:SENSE]:PASSFAIL:LINELimit:LOWer:ADD** Set →

Description	Add lower limit edit point.	
Syntax	[:SENSE]:PASSFAIL:LINELimit:LOWer:ADD <freq> <ampl>	
Parameter	<freq>	Point frequency
	<ampl>	Amplitude in dBm
Example	:PASSFAIL:LINEL:LOW:ADD 1.9e9 -10	

Set →

**[[:SENSE]:PASSFAIL:LINELimit:LOWer:STATE** → Query

Description	Turns the lower limit line on/off or queries its state.	
Syntax	[:SENSE]:PASSFAIL:LINELimit:LOWer:STATE {OFF ON 0 1}	
Query Syntax	[:SENSE]:PASSFAIL:LINELimit:LOWer:STATE?	
Parameter	0	Turns the lower limit line off.
	1	Turns the lower limit line on.
	OFF	Turns the lower limit line off.
	ON	Turns the lower limit line on.
Return parameter	0	The lower limit line is off.
	1	The lower limit line is on.
Example	:PASSFAIL:LINEL:LOW:STAT 1 :PASSFAIL:LINEL:LOW:STAT? Return 1	

**[[:SENSE]:PASSFAIL:LINELimit:RESulte?** → Query

Description	Returns the Pass/Fail judgment of limit line testing.
-------------	---

Syntax	[:SENSe]:PASSFAIL:LINELimit:RESulte?	
Parameter	0	Fail
	1	Pass
Example	:PASSFAIL:LINEL:RESulte? return 1	

[:SENSe]:PASSFAIL:LINELimit:STATe (Set) →  
→ (Query)

Description	Turns limit line testing of pass/fail measurement function on/off.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:STATe {OFF ON 0 1}	
Query Syntax	[:SENSe]:PASSFAIL:LINELimit:STATe?	
Parameter	0	Turns limit line testing off.
	1	Turns limit line testing on.
	OFF	Turns limit line testing off.
	ON	Turns limit line testing on.
Return parameter	0	Limit line testing is off.
	1	Limit line testing is on.
Example	:PASSFAIL:LINEL:STAT 1 :PASSFAIL:LINEL:STAT? Return 1	

[:SENSe]:PASSFAIL:LINELimit:UPPer:CLEar (Set) →

Description	Clears all points of the upper limit line.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:CLEar	
Example	:PASSFAIL:LINEL:UPP:CLE	

**[[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt  
<n>:DELeTe**

**Set** →

Description	Deletes the specified point in the upper limit line.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt <n>:DELeTe	
Parameter	<n>	<NR1> Point number
Example	:PASSFAIL:LINEL:UPP:POIN1:DEL	

**Set** →

**[[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:X** → **Query**

Description	Sets or queries the frequency limit of the specified point in the upper limit line.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:X <freq>	
Query Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:X?	
Parameter	<n>	<NR1> Point number
	<freq>	<NRf> Frequency in Hz
Return parameter	<NR3>	Hz
Example	:PASSFAIL:LINEL:UPP:POIN1:X 9e+8	

**Set** →

**[[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:Y** → **Query**

Description	Sets or queries the amplitude limit of the specified point in the upper limit line.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:Y <ampl>	
Query Syntax	[:SENSe]:PASSFAIL:LINELimit:UPPer:POINt<n>:y?	
Parameter	<n>	<NR1> Point number
	<ampl>	Amplitude in dBm
Return parameter	<NR3>	dBm

Example :PASSFAIL:LINEL:UPP:POIN1:Y -10

**[[:SENSe]:PASSFAIL:LINELimit:UPPer:ADD** Set →

Description Add upper limit edit point.

Syntax [[:SENSe]:PASSFAIL:LINELimit:UPPer:ADD <freq> <ampl>

Parameter <freq> Point frequency  
<ampl> Amplitude in dBm

Example :PASSFAIL:LINEL:UPP:ADD 1.9e9 -10

**[[:SENSe]:PASSFAIL:LINELimit:UPPer:STATE** Set →  
→ Query

Description Turns the upper limit line on/off or queries its state.

Syntax [[:SENSe]:PASSFAIL:LINELimit:UPPer:STATE {OFF|ON|0|1}

Query Syntax [[:SENSe]:PASSFAIL:LINELimit:UPPer:STATE?

Parameter 0 Turns the upper limit line off.  
1 Turns the upper limit line on.  
OFF Turns the upper limit line off.  
ON Turns the upper limit line on.

Return parameter 0 The upper limit line is off.  
1 The upper limit line is on.

Example :PASSFAIL:LINEL:UPP:STAT 1

**[[:SENSe]:PASSFAIL:LINELimit:X:OFFSet** Set →  
→ Query

Description Sets or queries the frequency offset (Shift X) of the upper and lower limit line.

Syntax [[:SENSe]:PASSFAIL:LINELimit:X:OFFSet <freq>

Query Syntax	[:SENSe]:PASSFAIL:LINELimit:X:OFFSet?	
Parameter	<freq>	<NRf> Frequency in Hz
Return parameter	<NR3>	Hz
Example	:PASSFAIL:LINEL:X:OFFS 1.0e+6 :PASSFAIL:LINEL:X:OFFS? Return 1.0e+6	

Set →  
 → Query

**[:SENSe]:PASSFAIL:LINELimit:Y:OFFSet**

Description	Sets or queries the amplitude offset (Shift Y) of the upper and lower limit line.	
Syntax	[:SENSe]:PASSFAIL:LINELimit:Y:OFFSet <ampl>	
Query Syntax	[:SENSe]:PASSFAIL:LINELimit:Y:OFFSet?	
Parameter	<ampl>	<NRf> Amplitude in dBm
Return parameter	<NR3>	dBm
Example	:PASSFAIL:LINEL:Y:OFFS -15 :PASSFAIL:LINEL:Y:OFFS? Return -15	

Set →  
 → Query

**[:SENSe]:PASSFAIL:WINDow:AMPLitude:LOWer**

Description	Sets or queries the lower amplitude of amplitude line in window testing.	
Syntax	[:SENSe]:PASSFAIL:WINDow:AMPLitude:LOWer <ampl>	
Query Syntax	[:SENSe]:PASSFAIL:WINDow:AMPLitude:LOWer?	
Parameter	<ampl>	Amplitude in dBm
Return parameter	<NR3>	dBm



Example :PASSFAIL:WIN:AMPL:LOW -20  
 :PASSFAIL:WIN:AMPL:LOW?  
 Return  
 -20.00 dBm

(Set) →

**[[:SENSE]:PASSFAIL:WINDOW:AMPLITUDE:UPPER** → (Query)

Description Sets or queries the upper amplitude of amplitude line in window testing.

Syntax [[:SENSE]:PASSFAIL:WINDOW:AMPLITUDE:UPPER <ampl>

Query Syntax [[:SENSE]:PASSFAIL:WINDOW:AMPLITUDE:UPPER?

Parameter <ampl> Amplitude in dBm

Return parameter <NR3> dBm

Example :PASSFAIL:WIN:AMPL:UPP -10  
 :PASSFAIL:WIN:AMPL:UPP?  
 Return  
 -10.00 dBm

(Set) →

**[[:SENSE]:PASSFAIL:WINDOW:AMPLITUDE:STATE** → (Query)

Description Turns the amplitude line of window testing on/off or queries its state.

Syntax [[:SENSE]:PASSFAIL:WINDOW:AMPt:STATE {OFF|ON|0|1}

Query Syntax [[:SENSE]:PASSFAIL:WINDOW:AMPt:STATE?

Parameter	0	Turns the amplitude line off.
	1	Turns the amplitude line on.
	OFF	Turns the amplitude line off.
	ON	Turns the amplitude line on.

Return parameter	0	The amplitude line is off.
	1	The amplitude line is on.

Example :PASSFAIL:WIN:AMPL:STAT 1  
 :PASSFAIL:WIN:AMPL:STAT?  
 Return  
 1

(Set) →

**[[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:END** → (Query)

Description Sets or queries the stop frequency of frequency line in window testing.

Syntax [[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:END<freq>

Query Syntax [[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:END?

Parameter <freq> <NRf> Frequency in Hz

Return parameter <NR3> Hz

Example :PASSFAIL:WIN:FREQ:END 8e+8  
 :PASSFAIL:WIN:FREQ:END?

(Set) →

**[[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:START** → (Query)

Description Sets or queries the start frequency of frequency line in window testing.

Syntax [[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:START<freq>

Query Syntax [[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:START?

Parameter <freq> <NRf> Frequency in Hz

Return parameter <NR3> Hz

Example :PASSFAIL:WIN:FREQ:STAR 6e+8  
 :PASSFAIL:WIN:FREQ:STAR?

(Set) →

**[[:SENSE]:PASSFAIL:WINDOW:FREQUENCY:STATE** → (Query)

Description Turns the frequency line of window testing on/off or queries its state.

Syntax	[:SENSe]:PASSFAIL:WINDow:FREQuency:STATe {OFF ON 0 1}	
Query Syntax	[:SENSe]:PASSFAIL:WINDow:FREQuency:STATe?	
Parameter	0	Turns the frequency line off.
	1	Turns the frequency line on.
	OFF	Turns the frequency line off.
	ON	Turns the frequency line on.
Return parameter	0	The frequency line is off.
	1	The frequency line is on.
Example	:PASSFAIL:WIN:FREQ:STAT 1 :PASSFAIL:WIN:FREQ:STAT? Return 1	

**[:SENSe]:PASSFAIL:WINDow:RESulte?** → Query

Description	Returns the Pass/Fail judgment of window testing.	
Syntax	[:SENSe]:PASSFAIL:WINDow:RESulte?	
Return parameter	0	Fail
	1	Pass
Example	:PASSFAIL:WIN:RES? return 1	

**[:SENSe]:PASSFAIL:WINDow:STATe** Set →  
→ Query

Description	Turns window testing of pass/fail measurement function on/off.	
Syntax	[:SENSe]:PASSFAIL:WINDow:STATe {OFF ON 0 1}	
Query Syntax	[:SENSe]:PASSFAIL:WINDow:STATe?	
Parameter	0	Turns window testing off.

	1	Turns window testing on.
	OFF	Turns window testing off.
	ON	Turns window testing on.
Return parameter	0	Window testing is off.
	1	Window testing is on.
Example	:PASSFAIL:WIN:STAT 1 :PASSFAIL:WIN:STAT? Return 1	

[[:SENSE]:PASSFAIL:WINDow:SWEEP:STATe (Set) →  
→ (Query)

Description	Turns window sweep on/off or queries its state. When the window sweep is on, only the window formed by the intersection of the amplitude line and the frequency line is swept, the peripheral stops sweeping; the full frequency is swept when it is off.	
Syntax	[:SENSE]:PASSFAIL:WINDow:SWEEP:STATe {OFF ON 0 1}	
Query Syntax	[:SENSE]:PASSFAIL:WINDow:SWEEP:STATe?	
Parameter	0	Turns window sweep off.
	1	Turns window sweep on.
	OFF	Turns window sweep off.
	ON	Turns window sweep on.
Return parameter	0	Window sweep is off.
	1	Window sweep is on.
Example	:PASSFAIL:WIN:SWEEP:STAT 1	

Set →  
 → Query

**[[:SENSe]:POWer[:RF]:ATTenuation**

---

Description	Sets or queries the input attenuation.	
Syntax	[:SENSe]:POWer[:RF]:ATTenuation <rel_amp>	
Query Syntax	[:SENSe]:POWer[:RF]:ATTenuation?	
Parameter/ Return parameter	<rel_amp>	<NR1> 0 dB to 40 dB.
Example	:POW:ATT 10 dB :POW:ATT? Return 10	

Set →  
 → Query

**[[:SENSe]:POWer[:RF]:ATTenuation:AUTO**

---

Description	Sets or queries whether the automatic input attenuation is on/off.	
Syntax	[:SENSe]:POWer[:RF]:ATTenuation:AUTO {OFF ON 0 1}	
Query Syntax	[:SENSe]:POWer[:RF]:ATTenuation:AUTO?	
Parameter	0	Turns automatic input attenuation off.
	1	Turns automatic input attenuation on.
	OFF	Turns automatic input attenuation off.
	ON	Turns automatic input attenuation on.
Return parameter	0	Automatic input attenuation is off.
	1	Automatic input attenuation is on.
Example	:POW:ATT:AUTO ON	

**[[:SENSe]:POWer[:RF]:GAIN[:STATe]:AUTO** Set →  
→ Query

Description	Turns the preamplifier on/off or queries its state.	
Syntax	[:SENSe]:POWer[:RF]:GAIN[:STATe]:AUTO {OFF ON 0 1}	
Query Syntax	[:SENSe]:POWer[:RF]:GAIN[:STATe]:AUTO?	
Parameter	0	Turns the preamplifier off.
	1	Turns the preamplifier on.
	OFF	Turns the preamplifier off.
	ON	Turns the preamplifier on.
Return parameter	0	The preamplifier is off.
	1	The preamplifier is on.
Example	:POW:GAIN:AUTO ON	

**[[:SENSe]:SWEep:TIME** Set →  
→ Query

Description	Sets or queries the sweep time.	
Syntax	[:SENSe]:SWEep:TIME <time>	
Query Syntax	[:SENSe]:SWEep:TIME?	
Parameter	<freq>	Sweep time in s, ms, us, ns. The default unit is ns.
Return parameter	<NR3>	Sweep time in millisecond.
Example	:SWE:TIME 60 ms	

**[[:SENSe]:SWEep:TIME:AUTO** Set →  
→ Query

Description	Sets the Sweep time setting to auto (on) or manual (off).	
Syntax	[:SENSe]:SWEep:TIME:AUTO {OFF ON 0 1}	
Query Syntax	[:SENSe]:SWEep:TIME:AUTO?	

---

Parameter	0	Sets sweep time to manual (off).
	1	Sets sweep time to auto (on).
	OFF	Sets sweep time to manual (off).
	ON	Sets sweep time to auto (on).
Return parameter	0	Sweep time is set to manual.
	1	Sweep time is set to automatic.
Example	:SWE:TIME:AUTO 0	

---

## SOURce Commands

:SOURce:POWer:TRACk[:POWer] ..... 110

:SOURce:POWer:TRACk[:POWer] 
 →  
 →

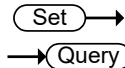
Description	Sets or queries the tracking generator output power level.	
Syntax	:SOURce:POWer:TRACk[:POWer] <ampl>	
Query Syntax	:SOURce:POWer:TRACk[:POWer]?	
Parameter	<ampl>	<NRf> Power or voltage, -40 dBm to 0 dBm
Return parameter	<NR3>	Sweep time in millisecond.
Example	:SOUR:POW:TRAC -5	



## SYSTEM Commands

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### :SYSTem:COMMunicate:LAN:DHCP



Description	Turns the DHCP on/off or queries its state..	
Syntax	:SYSTem:COMMunicate:LAN:DHCP {OFF ON 0 1}	
Query Syntax	:SYSTem:COMMunicate:LAN:DHCP?	
Parameter	0	Turns the DHCP off.
	1	Turns the DHCP on.
	OFF	Turns the DHCP off.
	ON	Turns the DHCP on.
Return parameter	0	The DHCP is off.
	1	The DHCP is on.
Example	:SYST:COMM:LAN:DHCP 0	

:SYSTem:COMMunicate:LAN:GATE Set →  
→ Query

Description	Sets or queries the gateway address. Gate (gateway address) should match with IP address.
Syntax	:SYSTem:COMMunicate:LAN:GATE <gate>
Query Syntax	:SYSTem:COMMunicate:LAN:GATE?
Parameter	<gate> <String>
Return parameter	<String>
Example	:SYST:COMM:LAN:GATE 192.168.1.1

:SYSTem:COMMunicate:LAN:IP:ADDRes Set →  
→ Query

Description	Sets or queries the device IP address.
Syntax	:SYSTem:COMMunicate:LAN:IP:ADDRes <ip address>
Query Syntax	:SYSTem:COMMunicate:LAN:IP:ADDRes?
Parameter	<ip address> <String>
Return parameter	<String>
Example	:SYST:COMM:LAN:IP:ADDR 192.168.1.72

:SYSTem:COMMunicate:LAN:MASK Set →  
→ Query

Description	Sets or queries the device subnet mask address. Mask (subnet mask address) should match with IP address.
Syntax	:SYSTem:COMMunicate:LAN:MASK <mask>
Query Syntax	:SYSTem:COMMunicate:LAN:MASK?
Parameter	<mask> <String>
Return parameter	<String>
Example	:SYST:COMM:LAN:MASK 255.255.255.0

**:SYSTem:CONFigure:FIRMwareupdate**

Set →

Description Updates the system with new firmware from files located on an external USB drive.

Syntax :SYSTem:CONFigure:FIRMwareupdate

Example :SYST:CONF:FIRM

**:SYSTem:CONFigure:information?**

→ Query

Description Queries the system information, such as the serial number, hardware version, and temperature of the instrument.

Syntax :SYSTem:CONFigure:INFormation?

Return parameter <String> Returns the system information as a string in the following format:  
Serial Number = GSP XXXXXX,  
Hardware Version = X.X.X.X,  
temperature = X°C

Example :SYSTem:CONFigure:INFormation?  
returns  
Serial Number = GSP183201, Hardware Version =  
3.0.0.0, temperature = 52.50°C

**:SYSTem:DATE**

Set →

→ Query

Description Sets or queries the system date.

Syntax :SYSTem:DATE <year>,<month>,<day>

Query Syntax :SYSTem:DATE?

Parameter/  
Return parameter <year> <NR1> Year, a 4-digit integer 2000 to 2100.  
<month> <NR1> Month, a 2-digit integer 01 to 12.  
<day> <NR1> Day, a 2-digit integer 01 to 31.

Example :SYST:DATE 2011,07,01

:SYSTem:LANGUage

Set →

→ Query

Description Sets or queries the language that the instrument uses to display on the screen.

Syntax :SYSTem:LANGUage {ENGLish|CHINese}

Query Syntax :SYSTem:LANGUage?

Parameter/ Return parameter	ENGLish	The instrument displays in English.
	CHINese	The instrument displays in Chinese.

Example :SYST:LANG ENGL

Set →

→ Query

:SYSTem:PON:TYPE

Description Sets the power-on type between user-defined and factory default.

Syntax :SYSTem:PON:TYPE {FACTory|USER}

Query Syntax :SYSTem:PON:TYPE?

Parameter/ Return parameter	FACTory	Factory default
	USER	User defined preset

Example :SYST:PON:TYPE USER

Set →

→ Query

:SYSTem:PRESet:TYPE

Description Sets the preset type between user-defined and factory default.

Syntax :SYSTem:PRESet:TYPE {FACT|USER}

Query Syntax :SYSTem:PRESet:TYPE?

Parameter/ Return parameter	FACT	Factory default
	USER	User defined preset

Example :SYST:PRESet:TYPE USER

:SYSTem:SPEaker:VOLume (Set) →  
→ (Query)

Description	Sets or queries the volume setting for the demodulation function.
Syntax	:SYSTem:SPEaker:VOLume <integer>
Query Syntax	:SYSTem:SPEaker:VOLume?
Parameter/ Return parameter	<integer> <NR1> 0 to 100
Example	:SYST:SPE:VOL 50

:SYSTem:TIME (Set) →  
→ (Query)

Description	Sets or queries the system time.
Syntax	:SYSTem:TIME <hour>,<minute>,<second>
Query Syntax	:SYSTem:TIME?
Parameter/ Return parameter	<hour> <NR1> Hour, a 2-digit integer 00 to 23. <minute> <NR1> Minute, a 2-digit integer 00 to 59. <second> <NR1> Second, a 2-digit integer 00 to 59.
Example	:SYST:TIME 19,05,30

:SYSTem:TOUCh:ON (Set) →  
→ (Query)

Description	Set or query touch screen control parameter switch.
Syntax	:SYSTem:TOUCh:ON {ON OFF 1 0}
Query Syntax	:SYSTem:TOUCh:ON?
Parameter	0 Disable touchscreen controls. 1 Enable touchscreen controls.

	OFF	Disable touchscreen controls.
	ON	Enable touchscreen controls.
Return parameter	0	Disable touchscreen controls.
	1	Enable touchscreen controls.
Example	:SYST:TOUC:ON 1 :SYST:TOUC:ON? Return 1	

Set →  
 → Query

**:SYSTem:AUTo:SHUTdown:ON**

Description	Set or query the automatic shutdown parameter switch.	
Syntax	:SYSTem:AUTo:SHUTdown:ON {ON OFF 1 0}	
Query Syntax	:SYSTem:AUTo:SHUTdown:ON?	
Parameter	0	Disable automatic shutdown.
	1	Enable automatic shutdown.
	OFF	Disable automatic shutdown.
	ON	Enable automatic shutdown.
Return parameter	0	Disable automatic shutdown.
	1	Enable automatic shutdown.
Example	:SYST:AUT:SHUT:ON 1 :SYST:AUT:SHUT:ON? Return 1	

Set →  
 → Query

**:SYSTem:AUTo:SHUTdown:TIME**

Description	Set or query the time setting of automatic shutdown.	
Syntax	:SYSTem:AUTo:SHUTdown:TIME <time>	
Query Syntax	:SYSTem:AUTo:SHUTdown:TIME?	

Parameter/ Return parameter	time	<NR1> 5Min - 240Min. Unit minutes
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Example	:SYST:AUT:SHUT:TIME 10 :SYST:AUT:SHUT:TIME? Return 10Min
---------	---

:SYSTem:MODE	 
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Description	Sets or queries the system mode.
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Syntax	:SYSTem:MODE {Spectrum Demod Modulation}
--------	--

Query Syntax	:SYSTem:MODE?
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Parameter/ Return parameter	Spectrum Demod Modulation
--------------------------------	---------------------------------

Example	:SYST:MODE Modulation :SYST:MODE? Return Modulation
---------	--

## TRACe Commands

TRACe<n>[:DATA].....	118
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### TRACe<n>[:DATA]?

→ Query

Description	Returns the trace data for the selected trace.	
Syntax	:TRACe<n>[:DATA]?	
Return parameter	<n>	<NR1> Trace number 1 to 5
	<data>	Start with #9, the following 9 digits specify the length of the data. Trace data is separated by a comma “,” and each data length is fixed at 7 bits.
Example	:TRAC1? returns #9000004807,64.7301,-68.163, ..., -36.195,-57.951	

### :TRACe:SOCKdata?

→ Query

Description	Returns the trace data for the selected trace as a stream of bytes.	
Query Syntax	:TRACe[:DATA]? TRACE1 TRACE2 TRACE3 TRACE4 TRACE5	
Parameter	TRACE1	The selected trace.
	TRACE2	
	TRACE3	
	TRACE4	
	TRACE5	



Return parameter	<code>&lt;data&gt;</code>	Byte stream of trace data, start with #9, the following 9 digits specify the length of the data in bytes; and each data length is fixed at 4 bytes.
------------------	---------------------------	---

Example	<pre>:TRAC:SOCK? TRACE1 returns #9000002406\C1\13\F5z\C1\13\EF\F0\C1\14\18\B5 \C1\13\FD\9E\C1\13\F7(\C1\14\04L\C1\13\F1\AD\ C1\14\15\81\C1\13\FA\17\C1\13\F9\D1\C1\13\FA\ F5\C1\13\F5\BF...</pre>
---------	---

Set →  
 → Query

**:TRACe<n>:MODE**

Description	Sets or queries the operation mode of the selected trace.
-------------	---

Syntax	<pre>:TRACe&lt;n&gt;:MODE {WRITE MAXHold MINHold BLANK VIEW}</pre>
--------	--

Query Syntax	<pre>:TRACe&lt;n&gt;:MODE?</pre>
--------------	----------------------------------

Parameter/ Return parameter	<code>&lt;n&gt;</code>	<code>&lt;NR1&gt;</code> Trace number 1 to 5
	WRITE	Clear and Write
	MAXHold	Hold the maximum points from each sweep
	MINHold	Hold the minimum points from each sweep
	BLANK	Clear the trace
	VIEW	Hold the last trace

Example	<pre>:TRAC1:MODE VIEW</pre>
---------	-----------------------------

Set →  
 → Query

**[[:SENSe]:TRACe<n>:DETEctor[:FUNCTION]**

Description	Sets or queries the trace detection mode.
-------------	---

Syntax                   [:SENSe]:TRACe<n>:DETEctor[:FUNCTion]  
 {POSitive|NEGative|NORMal|SAMPlE|RMS|VAVerage|  
 QPEak}

Query Syntax           [:SENSe]:TRACe<n>:DETEctor[:FUNCTion]?

Parameter/ Return parameter	POSitive	Sets the detector mode to Peak+.
	NEGative	Sets the detector mode to Peak-.
	NORMal	Sets the detector mode to Normal.
	SAMPlE	Sets the detector mode to Sample.
	RMS	Sets the detector mode to RMS.
	VAVerage	Sets the detector mode to Voltage average.
	QPEak	Sets the detector mode to quasi-peak.

Example                 :TRAC1:DET POSitive  
 :TRAC1:DET?  
 return POSTive

**[:SENSe]:DETEctor:LIST?**



Description           Query the list of detector names.

Query Syntax           :DETEctor:LIST?

Return parameter	POSitive	Peak+
	NEGative	Peak-
	NORMal	Normal
	SAMPlE	Sample
	RMS	RMS
	VAVerage	Voltage average
	QPEak	Sets the detector mode to quasi-peak.

Example                 :DET:LIST?  
 return  
 POSitive,NEGative,SAMPlE,NORMal,VAVerage,RMS,  
 QPEak

:TRACe<n>:READy? → Query

Description	Query whether the trace is scanned.	
Query Syntax	:TRACe:READy?	
Return parameter	<n>	<NR1> Trace number 1 to 5
	1	Scan complete.
	0	Scan not completed.
Example	:TRAC<1>:READ? return 1	

## TRIGger Commands

:TRIGger:SEQuence:SOURce .....	122
:TRIGger:SEQuence:SOURce:VIDeo:POWer .....	122

:TRIGger:SEQuence:SOURce (Set) →  
→ (Query)

Description	Sets or queries the triggering source.	
Syntax	:TRIGger:SEQuence:SOURce {RUN VIDeo POSitive NEGative}	
Query Syntax	:TRIGger:SEQuence:SOURce?	
Parameter/ Return parameter	RUN	Run trigger
	VIDeo	Video trigger
	POSitive	Positive trigger
	NEGative	Negative trigger
Example	:TRIG:SEQ:SOUR RUN	

:TRIGger:SEQuence:SOURce:VIDeo:POWer (Set) →  
→ (Query)

Description	Sets or queries the video trigger power.	
Syntax	:TRIGger:SEQuence:SOURce:VIDeo:POWer <ampl>	
Query Syntax	:TRIGger:SEQuence:SOURce:VIDeo:POWer?	
Parameter	<ampl>	<NRf> power
Return parameter	<NR3>	
Example	:TRIG:SEQ:SOUR:VID:POW 10	

## UDISK Commands

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:UDISK:STOR:SCReen .....	123
:UDISK:STOR:TRACe.....	123

### :UDISK:STOR:SCReen



Description	Save the current snapshot to the spectrum folder automatically created on the USB storage device. If the file name is blank, the file name is based on the date/time, and the format is png.
-------------	--

Syntax	:UDISK:STOR:SCReen <file_name>
--------	--------------------------------

Example	:UDIS:STOR:SCR 20171107_145956
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### :UDISK:STOR:TRACe



Description	Saves the trace data to a folder named "spectrum" (created automatically) in USB storage device, the file is named based on date/time, the format is cvs.
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Syntax	:UDISK:STOR:TRACe <file_name>
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Example	:UDIS:STOR:TRAC 20171107_145956
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## UNIT Commands

:UNIT:POWer ..... 124

:UNIT:POWer

Set →

→ Query

Description	Sets the amplitude unit.	
Syntax	:UNIT:POWER {DBM DBUW DBPW DBMV DBUV W V}	
Query Syntax	:UNIT:POWER?	
Parameter/ Return parameter	DBM	Decibels
	DBUW	Decibels relative to one microwatt
	DBPW	Decibels relative to one picowatt
	DBMV	Decibels relative to one millivolt
	DBUV	Decibels relative to one microvolt
	W	Watt
	V	Volt
Example	:UNIT:POW DBM	

# APPENDIX

## ASCII to Binary Coded Decimal Table

Background            The :PIXel query uses binary coded decimal notation when returning the value of each pixel that is displayed.

Decimal	Binary	ASCII	Decimal	Binary	ASCII
0	00000000	NUL	64	01000000	@
1	00000001	SOH	65	01000001	A
2	00000010	STX	66	01000010	B
3	00000011	ETX	67	01000011	C
4	00000100	EOT	68	01000100	D
5	00000101	ENQ	69	01000101	E
6	00000110	ACK	70	01000110	F
7	00000111	BEL	71	01000111	G
8	00001000	BS	72	01001000	H
9	00001001	HT	73	01001001	I
10	00001010	LF	74	01001010	J
11	00001011	VT	75	01001011	K
12	00001100	FF	76	01001100	L
13	00001101	CR	77	01001101	M
14	00001110	SO	78	01001110	N
15	00001111	SI	79	01001111	O
16	00010000	DLE	80	01010000	P
17	00010001	DC1	81	01010001	Q
18	00010010	DC2	82	01010010	R
19	00010011	DC3	83	01010011	S
20	00010100	DC4	84	01010100	T
21	00010101	NAK	85	01010101	U
22	00010110	SYN	86	01010110	V

23	00010111	ETB	87	01010111	W
24	00011000	CAN	88	01011000	X
25	00011001	EM	89	01011001	Y
26	00011010	SUB	90	01011010	Z
27	00011011	ESC	91	01011011	[
28	00011100	FS	92	01011100	\
29	00011101	GS	93	01011101	]
30	00011110	RS	94	01011110	^
31	00011111	US	95	01011111	_
32	00100000	Space	96	01100000	`
33	00100001	!	97	01100001	a
34	00100010	"	98	01100010	b
35	00100011	#	99	01100011	c
36	00100100	\$	100	01100100	d
37	00100101	%	101	01100101	e
38	00100110	&	102	01100110	f
39	00100111	'	103	01100111	g
40	00101000	(	104	01101000	h
41	00101001	)	105	01101001	i
42	00101010	*	106	01101010	j
43	00101011	+	107	01101011	k
44	00101100	,	108	01101100	l
45	00101101	-	109	01101101	m
46	00101110	.	110	01101110	n
47	00101111	/	111	01101111	o
48	00110000	0	112	01110000	p
49	00110001	1	113	01110001	q
50	00110010	2	114	01110010	r
51	00110011	3	115	01110011	s
52	00110100	4	116	01110100	t
53	00110101	5	117	01110101	u
54	00110110	6	118	01110110	v
55	00110111	7	119	01110111	w
56	00111000	8	120	01111000	x
57	00111001	9	121	01111001	y
58	00111010	:	122	01111010	z
59	00111011	;	123	01111011	{
60	00111100	<	124	01111100	



61	00111101	=	125	01111101	}
62	00111110	>	126	01111110	~
63	00111111	?	127	01111111	DEL