

RIGOL

Programming Guide

Vector Signal Analysis Measurement Application

Applicable to RSA5000-VSA

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RIGOL (SUZHOU) TECHNOLOGIES, INC.

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Document Overview

This manual introduces how to program and control **RIGOL** RSA5000 series spectrum analyzer (VSA mode) by using SCPI commands through the USB or LAN interface.

Main Topics in this Manual:

Chapter 1 Programming Overview

This chapter introduces how to set up remote communication between the spectrum analyzer and the PC, the remote control methods, the syntax, symbols, parameters, and abbreviation rules of the SCPI commands.

Chapter 2 Command System

This chapter introduces the syntax, function, parameters, and usage of each command in VSA mode for the RSA5000 series.

Tip
 For the latest version of this manual, download it from the official website of **RIGOL** (www.rigol.com).

Format Conventions in this Manual:

1. **Keys:**
 The keys on the front panel are usually denoted by the format of "Key Name (Bold) + Text Box". For example, **FREQ** denotes the **FREQ** key.
2. **Menu Keys:**
 The menu softkeys are usually denoted by the format of "Menu Word (Bold) + Character Shading". For example, **Center Freq** denotes the center frequency menu item under the **FREQ** function key.
3. **Connectors:**
 The connectors on the front or rear panel are usually denoted by the format of "Connector Name (Bold) + Square Brackets (Bold)". For example, **[Gen Output 50Ω]**.
4. **Operation Procedures:**
 → indicates the next step of operation. For example, **FREQ** → **Center Freq** indicates pressing **FREQ** on the front panel and then pressing the menu softkey **Center Freq**.

Content Conventions in this Manual:

The RSA5000 series spectrum analyzer includes the following models. Unless otherwise specified, this manual takes RSA5065 as an example to illustrate the usage of each command.

Model	Frequency Range	TG
RSA5065	9 kHz to 6.5 GHz	None
RSA5032	9 kHz to 3.2 GHz	None
RSA5065-TG	9 kHz to 6.5 GHz	6.5 GHz
RSA5032-TG	9 kHz to 3.2 GHz	3.2 GHz

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Chapter 1 Programming Overview

This chapter introduces how to set up remote communication between the spectrum analyzer and the PC, the remote control methods, the syntax, symbols, parameters, and abbreviation rules of the SCPI commands.

Contents in this chapter:

- ◆ [Build Remote Communication](#)
- ◆ [Remote Control Method](#)
- ◆ [SCPI Command Overview](#)

Build Remote Communication

RSA5000 supports communication with PC via USB and LAN interface for remote control. This section introduces in details how to use Ultra Sigma to send commands through the USB interface to control the analyzer.

Operation Procedures:

1. Install Ultra Sigma (PC) software

You can download Ultra Sigma from the official website of **RIGOL** (www.rigol.com) and install the software according to the installation wizard.

2. Connect the analyzer to the PC and configure the interface parameters for the instrument

RSA5000 supports two communication interfaces: USB and LAN, as shown in the following figure.

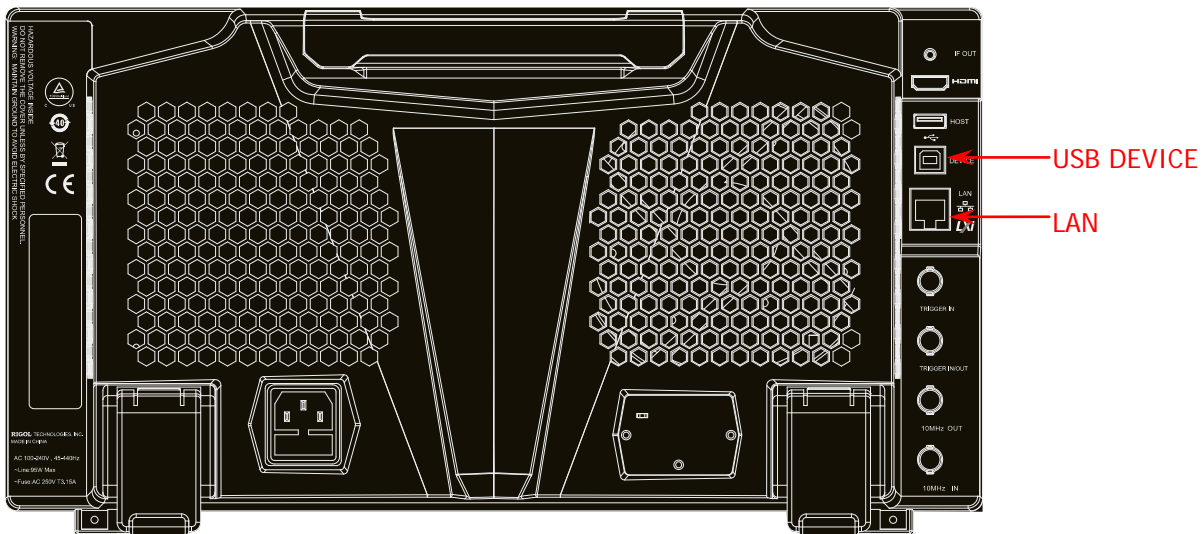


Figure 1-1 RSA5000 Communication Interface

(1) Remote communication via USB:

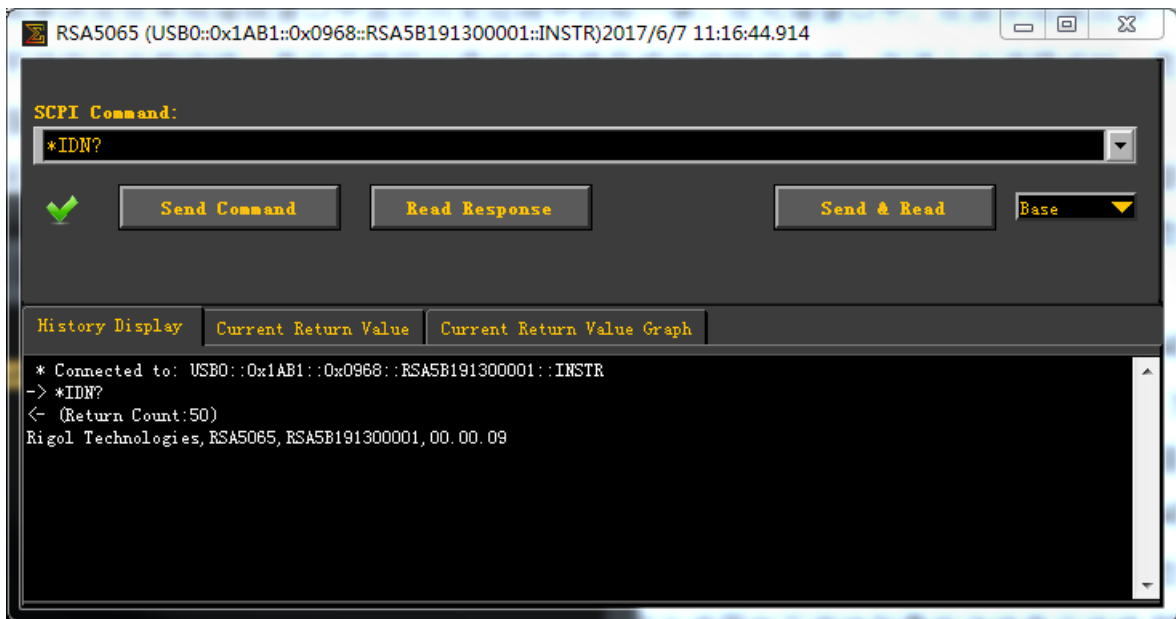
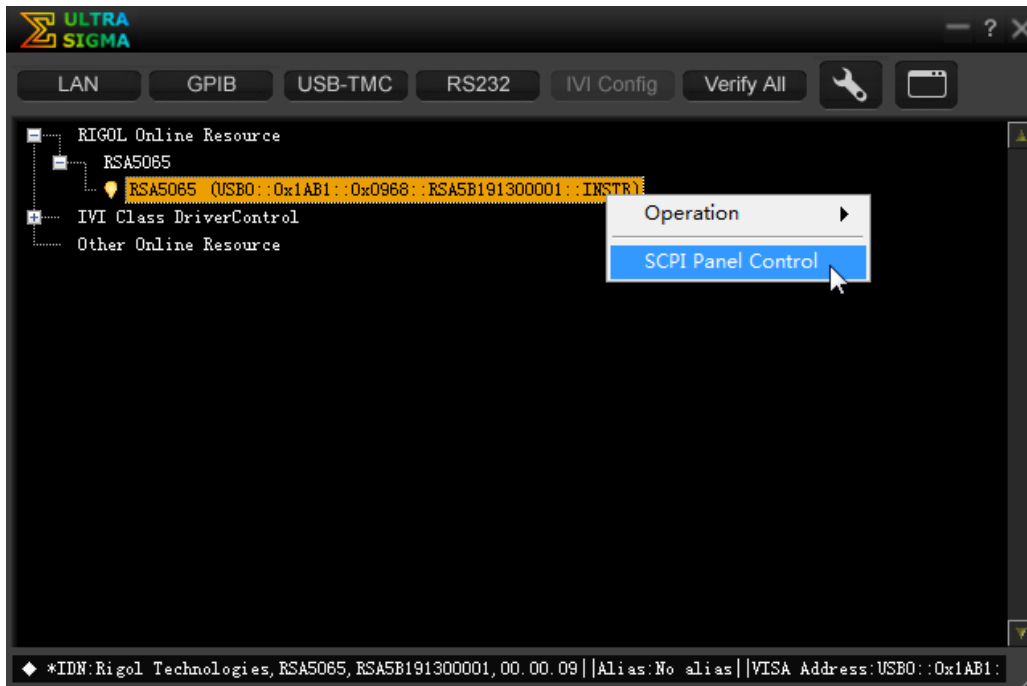
Use the USB cable to connect the USB DEVICE interface on the rear panel of RSA5000 to the USB HOST interface of the PC.

(2) Remote communication via LAN:

- Make sure that your PC has been accessed to the local area network.
- Check whether the local area network where your PC resides supports DHCP or auto IP mode. If not, you need to obtain the available network interface parameters, including the IP address, subnet mask, default gateway, and DNS.
- Connect RSA5000 to the local area network by using the network cable.
- Press **System** → **Interface** → **LAN** to configure the IP address, subnet mask, default gateway, and DNS for the instrument.

3. Check whether the connection is successful

Run Ultra Sigma, and then search for the resources and right-click the resource name. Select "SCPI Panel Control" to open the SCPI command control panel. In the SCPI command control panel, input a correct command. After that, click **Send Command** first and then click **Read Response**. Or you can also directly click **Send & Read** to verify whether the connection works properly. The following figure takes USB interface as an example to illustrate it.



Remote Control Method

1. User-defined programming

You can refer to the SCPI (Standard Commands for Programmable Instruments) commands listed in Chapter 2 in this manual to control RSA5000 by programming in LabVIEW, Visual C++, and other development environments. For details, refer to descriptions in Chapter 3 in *RSA5000 Programming Guide*.

2. Send SCPI commands via the PC software

You can use the PC software to send commands to control RSA5000 remotely. **RIGOL** Ultra Sigma is recommended. You can download the software from **RIGOL** official website (www.rigol.com).

SCPI Command Overview

SCPI (Standard Commands for Programmable Instruments) is a standardized instrument programming language that is built upon the existing standard IEEE 488.1 and IEEE 488.2 and conforms to various standards, such as the floating point operation rule in IEEE 754 standard, ISO 646 7-bit coded character set for information interchange (equivalent to ASCII programming). This chapter introduces the syntax, symbols, parameters, and abbreviation rules of the SCPI commands.

Syntax

The SCPI commands provide a hierarchical tree structure, and consist of multiple subsystems. Each command subsystem consists of one root keyword and one or more sub-keywords. The command line usually starts with ":"; the keywords are separated by ":" and are followed by the parameter settings available; "?" is added at the end of the command line to indicate a query; the commands and parameters are separated by space.

For example,

```
:SENSe:FREQUency:CENTer <freq>
:SENSe:FREQUency:CENTer?
```

SENSe is the root keyword of the command. FREQUency and CENTer are the second-level and third-level keywords respectively. The command line starts with ":", and a colon is also used to separate the multiple-level keywords. <freq> represents the parameters available for setting. "?" represents query. The command :SENSe:FREQUency:CENTer and the parameter <freq> are separated by a space.

In some commands with parameters, "," is often used to separate each parameter. For example, :SYSTem:DATE <year>,<month>,<day>.

Symbol Description

The following four symbols are not part of the SCPI command, and they are not sent with the commands, but taken as delimiters to better describe the parameters in the command.

1. Braces { }

The parameters enclosed in the braces are optional. You do not have to set it, also you can set for one or more times.

2. Vertical Bar |

The vertical bar is used to separate multiple parameters. When using the command, you must select one of the parameters. For example,

In the command :SYSTem:FSWitch[:STATe] OFF|ON|0|1, you can select any of the four available parameters: OFF, ON, 0, or 1.

3. Square Brackets []

The contents (command keywords) in the square brackets can be omitted. If the keyword is omitted, it will be set to the default. For example,

for the [:SENSe]:POWer[:RF]:RANGe? command, sending any of the four commands below can generate the same effect:

```
:POWer:RANGe?
:POWer:RF:RANGe?
:SENSe:POWer:RANGe?
:SENSe:POWer:RF:RANGe?
```

4. Angle Brackets < >

When sending the command, the parameter enclosed in the angle-bracket must contain an effective

value. For example,
send the :SENSe:FREQuency:CENTer 1000 command in [:SENSe]:FREQuency:CENTer <freq> format.

Parameter Type

The command parameters introduced in this manual include 6 types: Bool, Keyword, Integer, Consecutive Real Number, Discrete, and ASCII String.

1. Bool

The parameter can be set to OFF (0) or ON (1).

2. Keyword

The parameter can be any of the values listed.

3. Integer

Unless otherwise specified, the parameter can be any integer within the effective value range. Note: Do not set the parameter to a decimal, otherwise, errors will occur.

4. Consecutive Real Number

Unless otherwise specified, the parameter could be any value within the effective value range according to the accuracy requirement (by default, there are 9 digits after the decimal points).

5. Discrete

The parameter could only be one of the specified values and these values are discontinuous.

6. ASCII String

The parameter can be the combinations of ASCII characters.

Command Abbreviation

All the commands are case-insensitive. They can all be written in upper case or in lower case. For abbreviations, you only need to input all the upper-case letters in the command. For example, the :SYSTem:BEEPer:STATe? command can be abbreviated as :SYST:BEEP:STAT? or :syst:beep:stat?.

Chapter 2 Command System

This chapter introduces the commands of the RSA5000 series spectrum analyzer in VSA mode.

Contents in this chapter:

- ◆ [:CALCulate Commands](#)
- ◆ [:CALibration Commands](#)
- ◆ [:CONFigure Commands](#)
- ◆ [:DISPlay Commands](#)
- ◆ [:FETCh Commands](#)
- ◆ [:FORMat Commands](#)
- ◆ [IEEE 488.2 Common Commands](#)
- ◆ [:INITiate Command](#)
- ◆ [:INSTrument Commands](#)
- ◆ [:MMEMory Commands](#)
- ◆ [\[:SENSe\] Commands](#)
- ◆ [:STATus Commands](#)
- ◆ [:SYSTem Commands](#)
- ◆ [:TRACe Command](#)
- ◆ [:TRIGger Commands](#)

Remarks:

1. For the command set, unless otherwise specified, the query command returns "N/A" (without quotations in its return format) if no specified option is installed. If the queried function is disabled or improper type match is found, the query command will return "Error" (without quotations in its return format).
2. This manual takes RSA5065 as an example to illustrate the range of the parameters in each command.

:CALCulate Commands

Command List:

- ◆ [:CALCulate:DDEMod:MARKer:AOff](#)
- ◆ [:CALCulate:DDEMod:MARKer:COUPlE\[:STATe\]](#)
- ◆ [:CALCulate:DDEMod:MARKer:TABLE\[:STATe\]](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:CPSearch\[:STATe\]](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:FUNctIon](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:FUNctIon:BAND:LEFT](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:FUNctIon:BAND:RIGHT](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:FUNctIon:BAND:SPAN](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:MAXimum](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:MAXimum:LEFT](#)
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- ◆ [:CALCulate:DDEMod:MARKer<n>:MAXimum:PREVIOUS](#)
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- ◆ [:CALCulate:DDEMod:MARKer<n>:MINimum](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:MODE](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:REFerence](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:TRACe](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:X](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:Y:IMAGinary](#)
- ◆ [:CALCulate:DDEMod:MARKer<n>:Y\[:REAL\]](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:CENTer](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:DELTA:CENTer](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:RLEVel](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:START](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:STEP](#)
- ◆ [:CALCulate:MARKer<n>\[:SET\]:STOP](#)

:CALCulate:DDEMod:MARKer:AOff**Syntax**

:CALCulate:DDEMod:MARKer:AOff

Description

Turns off all the enabled markers.

:CALCulate:DDEMod:MARKer:COUPle[:STATe]**Syntax**

:CALCulate:DDEMod:MARKer:COUPle[:STATe] OFF|ON|0|1

:CALCulate:DDEMod:MARKer:COUPle[:STATe]?

Description

Enables or disables the couple marker function.

Queries the state of the couple marker function.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

When you enable the couple marker function, moving any marker will make other markers (that are not fixed or off) move along with it.

Return Format

The query returns 0 or 1.

Example

The following command disables the couple marker function.

:CALCulate:DDEMod:MARKer:COUPle:STATe OFF or :CALCulate:DDEMod:MARKer:COUPle:STATe 0

The following query returns 0.

:CALCulate:DDEMod:MARKer:COUPle:STATe?

:CALCulate:DDEMod:MARKer:TABLE[:STATe]**Syntax**

:CALCulate:DDEMod:MARKer:TABLE[:STATe] OFF|ON|0|1

:CALCulate:DDEMod:MARKer:TABLE[:STATe]?

Description

Enables or disables the marker table.

Queries the state of the marker table.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command disables the marker table.

```
:CALCulate:DDEMod:MARKer:TABLE:STATe OFF or :CALCulate:DDEMod:MARKer:TABLE:STATe 0
```

The following query returns 0.

```
:CALCulate:DDEMod:MARKer:TABLE:STATe?
```

:CALCulate:DDEMod:MARKer<n>:CPSearch[:STATe]**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:CPSearch[:STATe] OFF|ON|0|1
```

```
:CALCulate:DDEMod:MARKer<n>:CPSearch[:STATe]?
```

Description

Enables or disables continuous peak search function, and marks the peak value with Marker N. Queries the status of continuous peak search function.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command enables the continuous peak search function, and marks the peak value with Marker 1.

```
:CALCulate:DDEMod:MARKer1:CPSearch:STATe ON or :CALCulate:DDEMod:MARKer1:CPSearch:STATe 1
```

The following query returns 1.

```
:CALCulate:DDEMod:MARKer1:CPSearch:STATe?
```

:CALCulate:DDEMod:MARKer<n>:FUNCTION**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:FUNCTION BPOWER|OFF
```

```
:CALCulate:DDEMod:MARKer<n>:FUNCTION?
```

Description

Selects the special measurement type for the specified marker. Queries the special measurement type of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
--	Keyword	BPOWER OFF	OFF

Remarks

BPOWER: indicates the bandwidth power.

OFF: turns off all the measurements.

This command is only valid when you open the marker on the frequency domain data.

Return Format

The query returns BPOW or OFF.

Example

The following command sets the measurement type of Marker 1 to band power.

```
:CALCulate:DDEMod:MARKer1:FUNcTion BPOW
```

The following query returns BPOW.

```
:CALCulate:DDEMod:MARKer1:FUNcTion?
```

:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:LEFT**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:LEFT <real>
```

```
:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:LEFT?
```

Description

Sets the left edge frequency or time of the signal involved in the calculation for the band function.

Queries the left edge frequency or time of the signal involved in the calculation for the band function.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<real>	Consecutive Real Number	0 to band right	center frequency-bandwidth/2

Remarks

This command is only valid when you open the marker on the frequency domain data and enable the corresponding bandwidth function.

This command is used to set the left edge time when you select the time-domain data source.

Return Format

The query returns the left edge frequency or time of the signal in scientific notation.

Example

The following command sets the left edge frequency of the signal involved in the calculation for the Marker 1 band function to 2 MHz.

```
:CALCulate:DDEMod:MARKer1:FUNcTion:BAND:LEFT 2000000
```

The following query returns 2.000000000e+06.

```
:CALCulate:DDEMod:MARKer1:FUNcTion:BAND:LEFT?
```

:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:RIGHT**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:RIGHT <real>
```

```
:CALCulate:DDEMod:MARKer<n>:FUNcTion:BAND:RIGHT?
```

Description

Sets the right edge frequency or time of the signal involved in the calculation for the band function.

Queries the right edge frequency or time of the signal involved in the calculation for the band function.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<real>	Consecutive Real Number	band left to $+\infty$	center frequency+bandwidth/2

Remarks

This command is only valid when you open the marker on the frequency domain data and enable the corresponding bandwidth function.

This command is used to set the right edge time when you select the time-domain data source.

Return Format

The query returns the right edge frequency or time of the signal in scientific notation.

Example

The following command sets the right edge frequency of the signal involved in the calculation for the Marker 1 band function to 4 GHz.

```
:CALCulate:DDEMod:MARKer1:FUNction:BAND:RIGHT 4000000000
```

The following query returns 4.000000000e+09.

```
:CALCulate:DDEMod:MARKer1:FUNction:BAND:RIGHT?
```

:CALCulate:DDEMod:MARKer<n>:FUNction:BAND:SPAN**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:FUNction:BAND:SPAN <freq>
```

```
:CALCulate:DDEMod:MARKer<n>:FUNction:BAND:SPAN?
```

Description

Sets the bandwidth or the time span of the signal involved in the calculation for the band function.

Queries the bandwidth or the time span of the signal involved in the calculation for the band function.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<freq>	Consecutive Real Number	0 to $+\infty$	span/20

Remarks

This command is only valid when you open the marker on the frequency domain data and enable the corresponding bandwidth function.

This command is used to set the time span when you select the time-domain data source.

Return Format

The query returns the bandwidth of the signal involved in the calculation for the band function in scientific notation.

Example

The following command sets the bandwidth of the signal involved in the calculation for the Marker 1 band function to 500 MHz.

```
:CALCulate:DDEMod:MARKer1:FUNction:BAND:SPAN 500000000
```

The following query returns 5.000000000e+08.

```
:CALCulate:DDEMod:MARKer1:FUNction:BAND:SPAN?
```

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

:CALCulate:DDEMod:MARKer<n>:MAXimum

Description

Performs one peak search, and marks with the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one peak search, and marks with Marker 2.

:CALCulate:DDEMod:MARKer2:MAXimum

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

:CALCulate:DDEMod:MARKer<n>:MAXimum:LEFT

Description

Searches for the nearest peak which is located at the left side of the current peak and marks it with the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one left peak search, and marks with Marker 2.

:CALCulate:DDEMod:MARKer2:MAXimum:LEFT

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

:CALCulate:DDEMod:MARKer<n>:MAXimum:NEXT

Description

Searches for the peak whose amplitude on the trace is next lower than that of the current peak and marks it with the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one next peak search, and marks with Marker 2.

```
:CALCulate:DDEMod:MARKer2:MAXimum:NEXT
```

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

```
:CALCulate:DDEMod:MARKer<n>:MAXimum:PREVIOUS
```

Description

Searches for the peak whose amplitude on the trace is next higher than that of the current peak and marks it with the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one next higher peak search, and marks with Marker 2.

```
:CALCulate:DDEMod:MARKer2:MAXimum:PREVIOUS
```

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

```
:CALCulate:DDEMod:MARKer<n>:MAXimum:RIGHT
```

Description

Searches for the nearest peak which is located at the right side of the current peak and marks it with the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one right peak search, and marks with Marker 2.

```
:CALCulate:DDEMod:MARKer2:MAXimum:RIGHT
```

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

:CALCulate:DDEMod:MARKer<n>:MINimum

Description

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

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

When no peak is found, a prompt message "No peak found" is displayed on the screen.

Example

The following command performs one minimum search, and marks it with Marker 2.

```
:CALCulate:DDEMod:MARKer2:MINimum
```

:CALCulate:DDEMod:MARKer<n>:MODE

Syntax

```
:CALCulate:DDEMod:MARKer<n>:MODE POSition|DELTA|FIXed|OFF
```

```
:CALCulate:DDEMod:MARKer<n>:MODE?
```

Description

Sets the type of the specified marker.

Queries the type of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
--	Keyword	POSition DELTA FIXed OFF	POSition

Remarks

POSition: indicates the normal marker.

DELTA: indicates difference between two data points.

FIXed: indicates that the marker is fixed.

OFF: turns off the selected marker.

Return Format

The query returns POS, DELT, FIX, or OFF.

Example

The following command sets the type of Marker 1 to POSition.

```
:CALCulate:DDEMod:MARKer1:MODE POSition
```

The following query returns POS.

```
:CALCulate:DDEMod:MARKer1:MODE?
```

:CALCulate:DDEMod:MARKer<n>:REFerence

Syntax

```
:CALCulate:DDEMod:MARKer<n>:REFerence <integer>
```

```
:CALCulate:DDEMod:MARKer<n>:REFerence?
```

Description

Sets the reference marker for the specified marker.
 Queries the reference marker for the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<integer>	Integer	1 to 8	By default, the reference marker is the marker next to it.

Remarks

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

Example

The following command sets the reference marker for Marker 1 to 2.
 :CALCulate:DDEMod:MARKer1:REFerence 2

The following query returns 2.
 :CALCulate:DDEMod:MARKer1:REFerence?

:CALCulate:DDEMod:MARKer<n>:TRACe**Syntax**

:CALCulate:DDEMod:MARKer<n>:TRACe <integer>
 :CALCulate:DDEMod:MARKer<n>:TRACe?

Description

Sets the marker trace for the specified marker.
 Queries the marker trace for the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<integer>	Discrete	1 2 3 4	1

Remarks

<integer> indicates the marker trace, and its range is from Trace 1 to Trace 4.

Return Format

The query returns any integer ranging from 1 to 4.

Example

The following command sets the marker trace of Marker 1 to Trace 2.
 :CALCulate:DDEMod:MARKer1:TRACe 2

The following query returns 2.
 :CALCulate:DDEMod:MARKer1:TRACe?

:CALCulate:DDEMod:MARKer<n>:X

Syntax

```
:CALCulate:DDEMod:MARKer<n>:X <real>
:CALCulate:DDEMod:MARKer<n>:X?
```

Description

Sets the X-axis value of the specified marker. Its default unit is Hz.
Queries the X-axis value of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<real>	Consecutive Real Number	Refer to "Remarks"	--

Remarks

<real> can be any value within the available range of the current X axis. When frequency-domain data source is selected, the X value represents the frequency; when time data source is selected, the X value represents the time.

If the marker mode of the specified marker is Position or Fixed, this command sets the X value of the marker.

If the specified marker mode is Delta, this command sets the X value of the delta marker relative to the reference marker.

When "Fixed" is selected for the marker mode and "Constellation" is selected for the trace format, Marker X is used to determine the data points.

Return Format

The query returns the X-axis value of the marker in scientific notation.

Example

The following command sets the X-axis value of Marker 1 to 150 MHz.

```
:CALCulate:DDEMod:MARKer1:X 150000000
```

The following query returns 1.500000000e+08.

```
:CALCulate:DDEMod:MARKer1:X?
```

:CALCulate:DDEMod:MARKer<n>:Y:IMAGinary

Syntax

```
:CALCulate:DDEMod:MARKer<n>:Y:IMAGinary <real>
:CALCulate:DDEMod:MARKer<n>:Y:IMAGinary?
```

Description

Sets the selected marker's quadrature component (imaginary) of the Y value.

Queries the selected marker's quadrature component (imaginary) of the Y value.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<real>	Consecutive Real Number	--	--

Remarks

Only when "Fixed" is selected for the marker mode and "I-Q" or "Constellation" is selected for the trace format, the command is valid.

Return Format

The query returns the marker's quadrature component (imaginary) of the Y value in scientific notation.

Example

The following command sets the quadrature component Y value of Marker 1 to 0.435.

```
:CALCulate:DDEMod:MARKer1:Y:IMAGinary 0.435
```

The following query returns 4.350000000e-01.

```
:CALCulate:DDEMod:MARKer1:Y:IMAGinary?
```

:CALCulate:DDEMod:MARKer<n>:Y[:REAL]**Syntax**

```
:CALCulate:DDEMod:MARKer<n>:Y[:REAL] <real>
```

```
:CALCulate:DDEMod:MARKer<n>:Y[:REAL]?
```

Description

Sets the Y-axis value of the specified marker.

Queries the Y-axis value of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--
<real>	Consecutive Real Number	--	--

Remarks

This command sets the marker's in-phase component (real part) of the Y value.

Return Format

The query returns the Y-axis value of the marker or the in-phase component of the Y value in scientific notation.

Example

The following command sets the Y-axis value of Marker 1 to 0.325.

```
:CALCulate:DDEMod:MARKer1:Y:REAL 0.325
```

The following query returns 3.250000000e-01.

```
:CALCulate:DDEMod:MARKer1:Y:REAL?
```

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

```
:CALCulate:MARKer<n>[:SET]:CENTer
```

Description

Sets the center frequency of the analyzer to the frequency of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

If the marker mode of the specified marker is Position or Fixed, the center frequency will be set to the frequency of the marker.

If the specified marker mode is Delta, the center frequency will be set to the frequency of the Delta marker.

Example

The following command sets the center frequency to the frequency of Marker 1 (Position).

```
:CALCulate:MARKer1:SET:CENTer
```

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

Syntax

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

Description

Sets the center frequency of the analyzer to half of the frequency difference (absolute frequency) between the two Delta markers.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

It is only valid when the current marker mode is "Delta".

Example

The following command sets the center frequency of the analyzer to half of the frequency difference between the two Delta markers.

```
:CALCulate:MARKer1:SET:DELTA:CENTer
```

:CALCulate:MARKer<n>[:SET]:RLEVEL

Syntax

```
:CALCulate:MARKer<n>[:SET]:RLEVEL
```

Description

Sets the reference level of the analyzer to the amplitude of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

If the marker mode of the specified marker is Position or Fixed, the reference level will be set to the amplitude of the marker.

If the specified marker mode is Delta and the current marker is the reference marker, then the reference level is set to the amplitude of the reference marker; if the current marker is the Delta marker, then the reference level is set to the amplitude of the Delta marker.

Example

The following command sets the reference level of the analyzer to the amplitude of Marker 2 (Position).

```
:CALCulate:MARKer2:SET:RLEVEL
```

:CALCulate:MARKer<n>[:SET]:START

Syntax

```
:CALCulate:MARKer<n>[:SET]:START
```

Description

Sets the start frequency of the analyzer to the frequency of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

If the marker mode of the specified marker is Position or Fixed, the start frequency will be set to the frequency of the marker.

If the specified marker mode is Delta, the start frequency will be set to the frequency of the Delta marker.

Example

The following command sets the start frequency of the analyzer to the frequency of Marker 3 (Position).

```
:CALCulate:MARKer3:SET:START
```

:CALCulate:MARKer<n>[:SET]:STEP

Syntax

```
:CALCulate:MARKer<n>[:SET]:STEP
```

Description

Sets the center frequency step of the analyzer to the frequency of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

If the marker mode of the specified marker is Position or Fixed, the center frequency step will be set to the frequency of the marker.

If the specified marker mode is Delta, the center frequency step will be set to the frequency difference between the Delta marker and the reference marker.

Example

The following command sets the center frequency step of the analyzer to the frequency of Marker 4 (Position).

```
:CALCulate:MARKer4:SET:STEP
```

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

```
:CALCulate:MARKer<n>[:SET]:STOP
```

Description

Sets the stop frequency of the analyzer to the frequency of the specified marker.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6 7 8	--

Remarks

If the marker mode of the specified marker is Position or Fixed, the stop frequency will be set to the frequency of the marker.

If the specified marker mode is Delta, the stop frequency will be set to the frequency of the Delta marker.

Example

The following command sets the stop frequency of the analyzer to the frequency of Marker 2 (Position).

```
:CALCulate:MARKer2:SET:STOP
```

:CALibration Commands

Command List:

- ◆ [:CALibration:\[ALL\]](#)
- ◆ [:CALibration:AUTO](#)

:CALibration:[ALL]

Syntax

:CALibration:[ALL]

Description

Executes self-calibration immediately.

Remarks

If the self-calibration succeeded, the command :CALibration:[ALL]? returns 0; if failed, the command :CALibration:[ALL]? returns 1.

Example

The following command executes the self-calibration immediately.
:CALibration:ALL

:CALibration:AUTO

Syntax

:CALibration:AUTO OFF|ON|0|1
:CALibration:AUTO?

Description

Enables or disables auto calibration.
Queries the setting status of auto calibration.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command enables auto calibration.
:CALibration:AUTO ON or :CALibration:AUTO 1

The following query returns 1.
:CALibration:AUTO?

:CONFIgure Commands

Command List:

- ◆ [:CONFIgure:BERate](#)
- ◆ [:CONFIgure:DDEMod](#)

:CONFIgure:BERate

Syntax

:CONFIgure:BERate

Description

Sets the analyzer to be in the bit error rate measurement state.

:CONFIgure:DDEMod

Syntax

:CONFIgure:DDEMod

Description

Sets the analyzer to be in the digital demodulation measurement state.

:DISPlay Commands

Command List:

- ◆ [:DISPlay:BACKlight](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:DDEMod:EYE:COUNT](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:DDEMod:SYMBOL:FORMat](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:FEED](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:FORMat](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:X\[:SCALe\]:COUPle](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:X\[:SCALe\]:RLEVel](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:X\[:SCALe\]:RPOSition](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:X\[:SCALe\]:SPAN](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:Y\[:SCALe\]:AUTO:ONCE](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:Y\[:SCALe\]:PDIVision](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:Y\[:SCALe\]:RLEVel](#)
- ◆ [:DISPlay:DDEMod:TRACe<n>:Y:UNIT:PREFerence](#)
- ◆ [:DISPlay:DDEMod:WINDow:FORMat](#)
- ◆ [:DISPlay:ENABLE](#)
- ◆ [:DISPlay:GRATICule\[:STATe\]](#)
- ◆ [:DISPlay:HDMI\[:STATe\]](#)

:DISPlay:BACKlight

Syntax

```
:DISPlay:BACKlight <integer>
:DISPlay:BACKlight?
```

Description

Sets the brightness of the backlight of LCD.
Queries the brightness of the backlight of LCD.

Parameter

Name	Type	Range	Default
<integer>	Integer	1 to 100	100

Return Format

The query returns the brightness of the LCD backlight in integer.

Example

The following command sets the brightness of the LCD backlight to 50.
:DISPlay:BACKlight 50

The following query returns 50.
:DISPlay:BACKlight?

:DISPlay:DDEMod:TRACe<n>:DDEMod:EYE:COUNT

Syntax

```
:DISPlay:DDEMod:TRACe<n>:DDEMod:EYE:COUNT <real>
:DISPlay:DDEMod:TRACe<n>:DDEMod:EYE:COUNT?
```

Description

Sets the eye length of the specified trace.
Queries the eye length of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
<real>	Consecutive Real Number	1 to 40	2

Return Format

The query returns the eye length of the specified trace in scientific notation.

Example

The following command sets the eye length of Trace 1 to 3.
:DISPlay:DDEMod:TRACe1:DDEMod:EYE:COUNT 3

The following query returns 3.
:DISPlay:DDEMod:TRACe1:DDEMod:EYE:COUNT?

:DISPlay:DDEMod:TRACe<n>:DDEMod:SYMBol:FORMat

Syntax

```
:DISPlay:DDEMod:TRACe<n>:DDEMod:SYMBol:FORMat HEXadecimal|BINary
:DISPlay:DDEMod:TRACe<n>:DDEMod:SYMBol:FORMat?
```

Description

Sets the symbol format of the specified trace.
Queries the symbol format of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Keyword	HEXadecimal BINary	BINary

Remarks

HEXadecimal: indicates the hexadecimal format.
BINary: indicates the binary format.

Return Format

The query returns HEX or BIN.

Example

The following command sets the symbol format of Trace 1 to BINary.
:DISPlay:DDEMod:TRACe1:DDEMod:SYMBol:FORMat BINary

The following query returns BIN.
:DISPlay:DDEMod:TRACe1:DDEMod:SYMBol:FORMat?

:DISPlay:DDEMod:TRACe<n>:FEED

Syntax

```
:DISPlay:DDEMod:TRACe<n>:FEED
CTIME|CSPECTrum|MTIME|MSPECTrum|RTIME|RSPECTrum|EVTime|EVSpectrum|IQMError|IQPError|SYMB
ol|SUMMARY|RTTrace
:DISPlay:DDEMod:TRACe<n>:FEED?
```

Description

Sets the data source of the specified trace.
Queries the data source of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Keyword	CTIME CSPECTrum MTIME MSPECTrum RTIME RSPECTrum EVTi me EVSpectrum IQMError IQPError SYMBol SUMMARY RTTrace	MEATime

Return Format

The query returns the data source of the specified trace.

Example

The following command sets the data source of Trace 1 to symbol.
:DISPlay:DDEMod:TRACe1:FEED SYMBol

The following query returns SYMB.
:DISPlay:DDEMod:TRACe1:FEED?

:DISPlay:DDEMod:TRACe<n>:FORMat

Syntax

```
:DISPlay:DDEMod:TRACe<n>:FORMat
IEYE|QEYE|CONS|MLOG|REAL|IMAGinary|VECTor|PHASe|UPHas|MLINear
:DISPlay:DDEMod:TRACe<n>:FORMat?
```

Description

Sets the display format of the specified trace.
Queries the display format of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Keyword	IEYE QEYE CONS MLOG REAL IMAGinary VECTor PHASe UPHas MLINear	VECTor

Remarks

IEYE: indicates I-Eye.
QEYE: indicates Q-Eye.
CONS: indicates constellation.
MLOG: indicates log magnitude.
REAL: indicates the real part of data.
IMAGinary: indicates the imaginary part of data.
VECTor: indicates the I-Q vector.
PHASe: indicates wrap phase.
UPHas: indicates unwrap phase.
MLINear: indicates line magnitude.

Return Format

The query returns IEYE, QEYE, CONS, MLOG, REAL, IMAG, VECT, PHAS, UPH, or MLIN.

Example

The following command sets the display format of Trace 1 to CONS.
:DISPlay:DDEMod:TRACe1:FORMat CONS

The following query returns CONS.
:DISPlay:DDEMod:TRACe1:FORMat?

:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:COUPlE

Syntax

```
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:COUPlE OFF|ON|0|1
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:COUPlE?
```

Description

Enables or disables the X Scale auto mode of the specified trace.
Queries the status of the X Scale auto mode for the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Bool	OFF ON 0 1	ON 1

Remarks

ON: sets to Auto mode. The instrument adjusts the X-axis reference value and X-axis width to an optimal state.

OFF: sets to Manual mode. You need to set the X-axis reference value and X-axis width manually.

Return Format

The query returns 0 or 1.

Example

The following command enables the X Scale auto mode of Trace 1.

```
:DISPlay:DDEMod:TRACe1:X:SCALE:COUPlE ON or :DISPlay:DDEMod:TRACe1:X:SCALE:COUPlE 1
```

The following query returns 1.

```
:DISPlay:DDEMod:TRACe1:X:SCALE:COUPlE?
```

:DISPlay:DDEMod:TRACe<n>:X[:SCALE]:RLEVel**Syntax**

```
:DISPlay:DDEMod:TRACe<n>:X[:SCALE]:RLEVel <real>
```

```
:DISPlay:DDEMod:TRACe<n>:X[:SCALE]:RLEVel?
```

Description

Sets the X-axis reference of the selected trace.

Queries the X-axis reference of the selected trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
<real>	Consecutive Real Number	Time-Domain Data: (-1e+12) to (1e+12) Frequency-Domain Data: -1THz to 1THz	25 (19.1406 us) /1 GHz

Remarks

This command is valid only when the X-axis scale is set to Manual.

When the time-domain data source is selected, the reference unit is symbol or s; when the frequency-domain data source is selected, the reference unit is Hz.

Return Format

The query returns the X-axis reference of the selected trace in scientific notation.

Example

The following command sets the X-axis reference of Trace 1 to 25.

```
:DISPlay:DDEMod:TRACe1:X:SCALE:RLEVel 25
```

The following query returns 2.500000000e+01.

```
:DISPlay:DDEMod:TRACe1:X:SCALE:RLEVel?
```

:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:RPOSition

Syntax

```
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:RPOSition LEFT|CENTer|RIGHT
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:RPOSition?
```

Description

Sets the position from which the X-axis scale reference value is calculated for the specified trace.
Queries the position from which the X-axis scale reference value is calculated for the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Keyword	LEFT CENTer RIGHT	LEFT

Return Format

The query returns LEFT, CENT, or RIGH.

Example

The following command sets the position from which the X-axis scale reference value is calculated for Trace 1 to LEFT.

```
:DISPlay:DDEMod:TRACe1:X:SCALe:RPOSition LEFT
```

The following query returns LEFT.

```
:DISPlay:DDEMod:TRACe1:X:SCALe:RPOSition?
```

:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:SPAN

Syntax

```
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:SPAN <real>
:DISPlay:DDEMod:TRACe<n>:X[:SCALe]:SPAN?
```

Description

Sets the X-axis width of the selected trace.
Queries the X-axis width of the selected trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
<real>	Consecutive Real Number	Time-Domain Data: 0 to (1e+12) Frequency-Domain Data: 0Hz to 1THz	50 (38.2812 us) /3.125 MHz

Remarks

This command is valid only when the X-axis scale is set to Manual.
When the time-domain data source is selected, the reference unit is symbol or s; when the frequency-domain data source is selected, the reference unit is Hz.

Return Format

The query returns the X-axis width of the selected trace in scientific notation.

Example

The following command sets the X-axis width of Trace 1 to 50.

```
:DISPlay:DDEMod:TRACe1:X:SCALe:SPAN 50
```

The following query returns 5.000000000e+01.
:DISPlay:DDEMod:TRACe1:X:SCALE:SPAN?

:DISPlay:DDEMod:TRACe<n>:Y[:SCALE]:AUTO:ONCE

Syntax

:DISPlay:DDEMod:TRACe<n>:Y[:SCALE]:AUTO:ONCE

Description

Sets the Y-axis reference level and the Y-axis scale value automatically to ensure that the signal can be fully displayed for better observation of the trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--

Example

The following command executes the auto scale operation for Trace 1.
:DISPlay:DDEMod:TRACe1:Y:SCALE:AUTO:ONCE

:DISPlay:DDEMod:TRACe<n>:Y[:SCALE]:PDIVision

Syntax

:DISPlay:DDEMod:TRACe<n>:Y[:SCALE]:PDIVision <rel>
:DISPlay:DDEMod:TRACe<n>:Y[:SCALE]:PDIVision?

Description

Sets the Y-axis scale of the specified trace.
Queries the Y-axis scale of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
<rel>	Consecutive Real Number	-1e+09 to 1e+12	0.3

Remarks

The scale unit is determined by the Y-axis unit.

Return Format

The query returns the Y-axis scale value in scientific notation.

Example

The following command sets the Y-axis scale value of Trace 1 to 0.3.
:DISPlay:DDEMod:TRACe1:Y:SCALE:PDIVision 0.3

The following query returns 3.000000000e-01.
:DISPlay:DDEMod:TRACe1:Y:SCALE:PDIVision?

:DISPlay:DDEMod:TRACe<n>:Y[:SCALe]:RLEVel**Syntax**

:DISPlay:DDEMod:TRACe<n>:Y[:SCALe]:RLEVel <real>
 :DISPlay:DDEMod:TRACe<n>:Y[:SCALe]:RLEVel?

Description

Sets the Y-axis reference of the specified trace.
 Queries the Y-axis reference of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
<ampl>	Consecutive Real Number	-1e+12 to 1e+12	0

Remarks

The reference unit is determined by the Y-axis unit.

Return Format

The query returns the reference in scientific notation.

Example

The following command sets the Y-axis reference of Trace 1 to -10 dB.
 :DISPlay:DDEMod:TRACe1:Y:SCALe:RLEVel -10

The following query returns -1.000000000e+01.
 :DISPlay:DDEMod:TRACe1:Y:SCALe:RLEVel?

:DISPlay:DDEMod:TRACe<n>:Y:UNIT:PREFereNce**Syntax**

:DISPlay:DDEMod:TRACe<n>:Y:UNIT:PREFereNce PEAK|RMS|POWer
 :DISPlay:DDEMod:TRACe<n>:Y:UNIT:PREFereNce?

Description

Sets the Y-axis unit of the specified trace.
 Queries the Y-axis unit of the specified trace.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4	--
--	Keyword	PEAK RMS POWer	PEAK

Remarks

This command is valid when the data source is "CaptureTime" or "CaptureSpectrum".

Return Format

The query returns PEAK, RMS, or POW.

Example

The following command sets the Y-axis unit of Trace 1 to PEAK.
 :DISPlay:DDEMod:TRACe1:Y:UNIT:PREFereNce PEAK

The following query returns PEAK.
 :DISPlay:DDEMod:TRACe1:Y:UNIT:PREFereNce?

:DISPlay:DDEMod:WINDow:FORMat

Syntax

```
:DISPlay:DDEMod:WINDow:FORMat SINGLE|LRWindow|UDWindow|LRDWindow|UDRWindow|QUAD
:DISPlay:DDEMod:WINDow:FORMat?
```

Description

Sets the trace window layout.
Queries the trace window layout.

Parameter

Name	Type	Range	Default
--	Keyword	SINGLE LRWindow UDWindow LRDWindow UDRWindow QUAD	QUAD

Remarks

SINGLE: indicates the single window.
LRWindow: indicates left and right windows.
UDWindow: indicates top and bottom windows.
LRDWindow: indicates left, right, and bottom windows.
UDRWindow: indicates left, bottom, and right windows.
QUAD: indicates four windows.

Return Format

The query returns SING, LRW, UDW, LRDW, UDRW, or QUAD.

Example

The following command sets the trace window layout to SINGLE.
:DISPlay:DDEMod:WINDow:FORMat SINGLE

The following query returns SING.
:DISPlay:DDEMod:WINDow:FORMat?

:DISPlay:ENABLE

Syntax

```
:DISPlay:ENABLE OFF|ON|0|1
:DISPlay:ENABLE?
```

Description

Turns on or off the LCD.
Queries the status of the LCD.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command enables the LCD.
:DISPlay:ENABLE ON or :DISPlay:ENABLE 1

The following query returns 1.
:DISPlay:ENABLE?

:DISPlay:GRATicule[:STATe]**Syntax**

:DISPlay:GRATicule[:STATe] OFF|ON|0|1
 :DISPlay:GRATicule[:STATe]?

Description

Enables or disables the display of the graticule.
 Queries the display of the graticule.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command enables display of the graticule.
 :DISPlay:GRATicule:STATe ON or :DISPlay:GRATicule:STATe 1

The following query returns 1.
 :DISPlay:GRATicule:STATe?

:DISPlay:HDMI[:STATe]**Syntax**

:DISPlay:HDMI[:STATe] OFF|ON|0|1
 :DISPlay:HDMI[:STATe]?

Description

Enables or disables HDMI output.
 Queries the status of HDMI output.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command enables HDMI output.
 :DISPlay:HDMI:STATe ON or :DISPlay:HDMI:STATe 1

The following query returns 1.
 :DISPlay:HDMI:STATe?

:FETCh Commands

Command List:

- ◆ [:FETCh:BER?](#)
- ◆ [:FETCh:DDEMod?](#)

:FETCh:BER?

Syntax

:FETCh:BER?

Description

Queries the bit error rate measurement results.

:FETCh:DDEMod?

Syntax

:FETCh:DDEMod?

Description

Queries the digital demodulation measurement results.

:FORMat Commands

Command List:

- ◆ [:FORMat:BORDER](#)
- ◆ [:FORMat\[:TRACe\]\[:DATA\]](#)

:FORMat:BORDER

Syntax

```
:FORMat:BORDER NORMal|SWAPped
:FORMat:BORDER?
```

Description

Selects the binary data byte order for data transmission.
Queries the binary data byte order for data transmission.

Parameter

Name	Type	Range	Default
--	Keyword	NORMal SWAPped	NORMal

Remarks

NORMal: indicates that the byte sequence begins with the most significant byte (MSB) and ends with the least significant byte (LSB).
SWAPped: indicates that the byte sequence begins with the least significant byte (LSB) and ends with the most significant byte (MSB).

Return Format

The query returns NORM or SWAP.

Example

The following command queries the binary data byte order for data transmission to NORMal.
:FORMat:BORDER NORMal

The following query returns NORM.
:FORMat:BORDER?

:FORMat[:TRACe][:DATA]

Syntax

```
:FORMat[:TRACe][:DATA] ASCii|INTeger,32|REAL,32|REAL,64
:FORMat[:TRACe][:DATA]?
```

Description

Sets the input/output format of the trace data.
Queries the input/output format of the trace data.

Parameter

Name	Type	Range	Default
--	Keyword	ASCii INTeger,32 REAL,32 REAL,64	ASCii

Remarks

ASCii: ASCII characters, separated by commas.

INTEger,32: binary 32-bit integer values.

REAL,32: binary 32-bit real values.

REAL,64: binary 64-bit real values.

Return Format

The query returns ASC,8, INT,32, REAL,32, or REAL,64.

Example

The following command sets the input/output format of the trace data to REAL,32.

```
:FORMat:TRACe:DATA REAL,32
```

The following query returns REAL,32.

```
:FORMat:TRACe:DATA?
```

IEEE 488.2 Common Commands

IEEE 488.2 common commands are used to operate or query the status registers. For the structure of the status register, refer to "[:STATUS Commands](#)".

Command List:

- ◆ [*CLS](#)
- ◆ [*ESE](#)
- ◆ [*ESR?](#)
- ◆ [*IDN?](#)
- ◆ [*OPC](#)
- ◆ [*RCL](#)
- ◆ [*RST](#)
- ◆ [*SAV](#)
- ◆ [*SRE](#)
- ◆ [*STB?](#)
- ◆ [*TRG](#)
- ◆ [*TST?](#)
- ◆ [*WAI](#)

CLS*Syntax**

*CLS

Description

Clears all the event registers and status byte registers.

ESE*Syntax**

*ESE <value>

*ESE?

Description

Sets the enable register for the standard event status register.

Queries the enable register for the standard event status register.

Parameter

Name	Type	Range	Default
<value>	Integer	Refer to "Remarks"	0

Remarks

Bit 2, Bit 3, Bit 4, and Bit 7 are reserved; you can set their values but they will not affect the system. Bit 1 and Bit 6 are not used and are always treated as 0; therefore, the range of <value> is a decimal value that corresponds to the binary values ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which Bit 1 and Bit 6 are 0.

Return Format

The query returns an integer. The integer equals to the binary-weighted sum of all the bits set in the register. For example, the query returns 144 if Bit 4 (16 in decimal) and Bit 7 (128 in decimal) are enabled.

Example

The following command sets the enable register for the standard event status register to 16.

*ESE 16

The following query returns 16.

*ESE?

ESR?*Syntax**

*ESR?

Description

Queries and clears the event register for the standard event status register.

Remarks

Bit 1 and Bit 6 in the standard event status register are not in use, and are regarded as 0. The query returns a decimal value that corresponds to the binary values ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which Bit 1 and Bit 6 are 0.

Return Format

The query returns an integer. The integer equals to the binary-weighted sum of all the bits set in the register. For example, the query returns 144 if Bit 4 (16 in decimal) and Bit 7 (128 in decimal) are enabled.

Example

The following query returns 24 (Bit 3 and Bit 4 have been set).

*ESR?

IDN?*Syntax**

*IDN?

Description

Queries the ID string of the instrument.

Return Format

The query returns the ID string in the following format:
 Rigol Technologies,<model>,<serial number>,XX.XX.XX
 <model>: instrument model
 <serial number>: serial number of the instrument
 XX.XX.XX: software version of the instrument

Example

The following query returns Rigol Technologies,RSA5065,RSA5A010200001,00.02.00.

*IDN?

OPC*Syntax**

*OPC

*OPC?

Description

Sets Bit 0 (Operation Complete, OPC) in the standard event status register to 1 after the current operation is finished.

Queries whether the current operation is finished.

Return Format

The query returns 1 after the current operation is finished; otherwise, the query returns 0.

RCL*Syntax**

*RCL <integer>

Description

Recalls the selected register.

Parameter

Name	Type	Range	Default
<integer>	Integer	1 to 16	--

Example

The following command recalls Register 1.

```
*RCL 1
```

RST*Syntax**

```
*RST
```

Description

Restores the instrument to its factory default settings.

SAV*Syntax**

```
*SAV <integer>
```

Description

Saves the current instrument state to the selected register.

Parameter

Name	Type	Range	Default
<integer>	Integer	1 to 16	--

Example

The following command saves the current instrument state to Register 1.

```
*SAV 1
```

SRE*Syntax**

```
*SRE <value>
```

```
*SRE?
```

Description

Sets the enable register for the status byte register.

Queries the enable register for the status byte register.

Parameter

Name	Type	Range	Default
<value>	Integer	Refer to " Remarks "	0

Remarks

Bit 0 and Bit 1 are not used and are always treated as 0; therefore, the range of <value> are the decimal numbers corresponding to the binary numbers ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which Bit 0 and Bit 1 are 0.

Return Format

The query returns an integer. The integer equals to the binary-weighted sum of all the bits set in the register. For example, the query returns 144 if Bit 4 (16 in decimal) and Bit 7 (128 in decimal) are enabled.

Example

The following command sets the enable register for the status byte register to 16.

```
*SRE 16
```

The following query returns 16.

```
*SRE?
```

STB?*Syntax**

```
*STB?
```

Description

Queries the event register for the status byte register.

Remarks

Bit 0 and Bit 1 in the status byte register are not in use, and are regarded as 0. The query returns a decimal value that corresponds to the binary values ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which Bit 0 and Bit 1 are 0.

Return Format

The query returns an integer. The integer equals to the binary-weighted sum of all the bits set in the register. For example, the query returns 144 if Bit 4 (16 in decimal) and Bit 7 (128 in decimal) are enabled.

Example

The following query returns 24 (Bit 3 and Bit 4 have been set).

```
*STB?
```

TRG*Syntax**

```
*TRG
```

Description

Triggers a sweep or measurement immediately.

TST?*Syntax**

```
*TST?
```

Description

Queries whether the self-check operation is finished.

Remarks

The query returns 0 or 1. A zero is returned if the test is successful, 1 if it fails.

WAI*Syntax**

*WAI

Description

Waits for all the pending operations to complete before executing any additional commands.

:INITiate Command

Command List:

- ◆ [:INITiate:BER:REStart](#)
- ◆ [:INITiate:CONTInuous](#)

:INITiate:BER:REStart

Syntax

:INITiate:BER:REStart

Description

Restarts the BER test.

Remarks

This command is valid only when the BER Test measurement function is selected.

:INITiate:CONTInuous

Syntax

:INITiate:CONTInuous OFF|ON|0|1
:INITiate:CONTInuous?

Description

Selects continuous (ON|1) or single (OFF|0) sweep mode.
Queries the current sweep mode.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command sets the instrument to sweep continuously.
:INITiate:CONTInuous ON or :INITiate:CONTInuous 1

The following query returns 1.
:INITiate:CONTInuous?

:INSTrument Commands

Command List:

- ◆ [:INSTrument:COUPle:FREQuency:CENTer](#)
- ◆ [:INSTrument:DEFault](#)
- ◆ [:INSTrument:NSElect](#)
- ◆ [:INSTrument\[:SElect\]](#)

:INSTrument:COUPle:FREQuency:CENTer

Syntax

```
:INSTrument:COUPle:FREQuency:CENTer ALL|NONE
:INSTrument:COUPle:FREQuency:CENTer?
```

Description

Turns on or off the global center frequency of the instrument.
Queries the setting status of the global center frequency of the instrument.

Parameter

Name	Type	Range	Default
--	Keyword	ALL NONE	NONE

Remarks

NONE: turns off the global center frequency.
ALL: turns on the global center frequency.
If you execute this command in any mode, the center frequency of the current mode is set to the global center frequency. Adjusting the center frequency in a mode, while the global center frequency is on, will modify the global center frequency.

Return Format

The query returns ALL or NONE.

Example

The following command enables the global center frequency of the instrument.
:INSTrument:COUPle:FREQuency:CENTer ALL

The following query returns ALL.
:INSTrument:COUPle:FREQuency:CENTer?

:INSTrument:DEFault

Syntax

```
:INSTrument:DEFault
```

Description

Resets the parameters of the current mode to the factory default settings.

:INSTrument:NSElect

:INSTrument[:SElect]

Syntax

```
:INSTrument:NSElect 1|2|3|4
:INSTrument:NSElect?
:INSTrument[:SElect] SA|RTSA|VSA|EMI
:INSTrument[:SElect]?
```

Description

Selects the working mode of the instrument.
Queries the working mode of the instrument.

Parameter

Name	Type	Range	Default
--	Discrete	1 2 3 4	1
--	Keyword	SA RTSA VSA EMI	SA

Remarks

The above parameters 1|2|3|4 correspond to SA|RTSA|VSA|EMI, respectively.
After running the command of switching the working mode, we recommend you set the timeout value to 8 s, or perform the next operation after a delay of 8 s.

Example

The following command sets the working mode of the instrument to VSA.

```
:INSTrument:NSElect 3
:INSTrument:SElect VSA
```

The following query returns 3 or VSA.

```
:INSTrument:NSElect?
:INSTrument:SElect?
```

:MMEMory Commands

Command List:

- ◆ [:MMEMory:DELeTe](#)
- ◆ [:MMEMory:LOAD:FMT](#)
- ◆ [:MMEMory:LOAD:STATe](#)
- ◆ [:MMEMory:LOAD:TRACe:DATA](#)
- ◆ [:MMEMory:MOVE](#)
- ◆ [:MMEMory:STORe:FMT](#)
- ◆ [:MMEMory:STORe:SCReen](#)
- ◆ [:MMEMory:STORe:STATe](#)
- ◆ [:MMEMory:STORe:TRACe:DATA](#)

Remarks:

The mode name in the path specified in this manual is "VSA" mode.

:MMEMory:DELeTe

Syntax

```
:MMEMory:DELeTe <file_name>
```

Description

Deletes a specified file.

Parameter

Name	Type	Range	Default
<file_name>	ASCII String	--	--

Remarks

<file_name> should contain the path and the filename.

This operation fails if the file with the specified filename does not exist.

Example

The following command deletes the "state1.sta" file from the "/vsa/state" folder.

```
:MMEMory:DELeTe /vsa/state/state1.sta
```

:MMEMory:LOAD:FMT

Syntax

```
:MMEMory:LOAD:FMT <label>,<file_name>
```

Description

Loads the edited FMT file (.csv).

Parameter

Name	Type	Range	Default
<label>	Keyword	UPPer LOWer	---
<file_name>	ASCII String	---	---

Remarks

This operation fails if the specified file does not exist.

Example

The following command loads the FMT file (mask1.csv) to the upper mask.

```
:MMEMory:LOAD:FMT upper,mask1.csv
```

:MMEMory:LOAD:STATE**Syntax**

```
:MMEMory:LOAD:STATE <file_name>
```

Description

Loads the specified state file (.sta).

Parameter

Name	Type	Range	Default
<file_name>	ASCII String	--	--

Remarks

This operation fails if the file with the specified filename does not exist.

Example

The following command loads the state file (state1.sta) to the instrument.

```
:MMEMory:LOAD:STATE state1.sta
```

:MMEMory:LOAD:TRACe:DATA**Syntax**

```
:MMEMory:LOAD:TRACe:DATA <label>,<file_name>
```

Description

Loads the specified measurement data file (suffixed with .csv).

Parameter

Name	Type	Range	Default
<label>	Keyword	TRACE1 TRACE2 TRACE3 TRACE4	--
<file_name>	ASCII String	--	--

Remarks

This operation fails if the file with the specified filename does not exist.

Example

The following command loads the measurement data file (trace1.csv) to Trace1.

```
:MMEMory:LOAD:TRACe:DATA TRACE1,trace1.csv
```

:MMEMory:MOVE

Syntax

```
:MMEMory:MOVE <file_name1>,<file_name2>
```

Description

Renames the specified file <file_name1> as <file_name2>.

Parameter

Name	Type	Range	Default
<file_name1>	ASCII String	--	--
<file_name2>	ASCII String	--	--

Remarks

<file_name1> and <file_name2> should contain the path and the filename.
This operation fails if the file with the specified filename does not exist.

Example

The following command renames the state file (state1.sta) in the folder (/vsa/state) as "state2.sta".
:MMEMory:MOVE /vsa/state/state1.sta,/vsa/state/state2.sta

:MMEMory:STORe:FMT

Syntax

```
:MMEMory:STORe:FMT <label>,<file_name>
```

Description

Saves the FMT file with a specified filename suffixed with ".csv" to the default path ("/mode name"/mask).

Parameter

Name	Type	Range	Default
<label>	Keyword	UPPer LOWer	--
<file_name>	ASCII String	--	--

Remarks

If the specified file already exists, overwrite it.

Example

The following command saves the upper mask FMT file with the filename (mask1.csv) to the "/vsa/mask" folder.

```
:MMEMory:STORe:FMT UPPer,mask1
```

:MMEMory:STORe:SCReen

Syntax

```
:MMEMory:STORe:SCReen <file_name>
```

Description

Saves the current screen image with the specified filename suffixed with ".jpg", ".png/", or ".bmp" to the default path ("/mode name"/screen).

Parameter

Name	Type	Range	Default
<file_name>	ASCII String	--	--

Remarks

If the specified file already exists, overwrite it.

If a suffix (.jpg/.png/.bmp) is added to the filename, you can save the current screen image with a different format based on its different suffix.

If no suffix is added to the filename, then by default, the current screen image is saved in the currently selected format.

Example

The following command saves the current screen image with the filename "screen.jpg" to the folder (/vsa/screen).

```
:MMEMory:STORe:SCReen screen.jpg
```

:MMEMory:STORe:STATe**Syntax**

```
:MMEMory:STORe:STATe <file_name>
```

Description

Saves the current instrument state with the specified filename suffixed with ".sta" to the default path ("/mode name"/state).

Parameter

Name	Type	Range	Default
<file_name>	ASCII String	--	--

Remarks

If the specified file already exists, overwrite it.

Example

The following command saves the current instrument state with the filename "state.sta" to the folder (/vsa/state).

```
:MMEMory:STORe:STATe state
```

:MMEMory:STORe:TRACe:DATA**Syntax**

```
:MMEMory:STORe:TRACe:DATA <label>,<file_name>
```

Description

Saves the trace measurement results with a specified filename suffixed with ".csv" to the default path ("/mode name"/data).

Parameter

Name	Type	Range	Default
<label>	Keyword	TRACE1 TRACE2 TRACE3 TRACE4	--
<file_name>	ASCII String	--	--

Remarks

If the specified file already exists, overwrite it.

Example

The following command saves Trace1 measurement data with the specified filename "mydata.csv" to the folder (/vsa/data).

```
:MMEMory:STORe:TRACe:DATA TRACE1,mydata
```

[[:SENSe] Commands

Command List:

- ◆ [\[:SENSe\]:ACQuisition:TIME](#)
- ◆ [:INPut:IMPedance](#)
- ◆ [\[:SENSe\]:CORRection:IMPedance\[:INPut\]\[:MAGNitude\]](#)
- ◆ [\[:SENSe\]:CORRection:SA\[:RF\]:GAIN](#)
- ◆ [\[:SENSe\]:DDEMod:ALPHa](#)
- ◆ [\[:SENSe\]:DDEMod:FFT:WINDow\[:TYPE\]](#)
- ◆ [\[:SENSe\]:DDEMod:FILTer:MEASurement](#)
- ◆ [\[:SENSe\]:DDEMod:FILTer:REFerence](#)
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- ◆ [\[:SENSe\]:DDEMod:LOAD:KNOWndata](#)
- ◆ [\[:SENSe\]:DDEMod:MODulation](#)
- ◆ [\[:SENSe\]:DDEMod:MSK:FORMat](#)
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- ◆ [\[:SENSe\]:DDEMod:RTTrace:DETector](#)
- ◆ [\[:SENSe\]:DDEMod:SRATe](#)
- ◆ [\[:SENSe\]:DDEMod:STANdard:PRESet](#)
- ◆ [\[:SENSe\]:DDEMod:SWEp:POINts](#)
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- ◆ [\[:SENSe\]:FREQuency:CENTer](#)
- ◆ [\[:SENSe\]:FREQuency:CENTer:STEP:AUTO](#)
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- ◆ [\[:SENSe\]:FREQuency:STOP](#)
- ◆ [\[:SENSe\]:POWer\[:RF\]:RANGe](#)

[[:SENSe]:ACQuisition:TIME

Syntax

```
[[:SENSe]:ACQuisition:TIME <time>
[:SENSe]:ACQuisition:TIME?
```

Description

Sets the acquisition time for producing one single trace.
Queries the acquisition time for producing one single trace.

Parameter

Name	Type	Range	Default
<time>	Consecutive Real Number	100 ms to 40 s	99.9946 ms

Return Format

The query returns the acquisition time in scientific notation.

Example

The following command sets the acquisition time to 10 s.
[:SENSe:ACQuisition:TIME 10

The following query returns 9.999997623e+00.
[:SENSe:ACQuisition:TIME?

:INPut:IMPedance

[[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude]

Syntax

```
:INPut:IMPedance 50|75
:INPut:IMPedance?
[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude] 50|75
[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude]?
```

Description

Sets the input impedance for voltage-to-power conversion. The unit is Ω .
Queries the input impedance for voltage-to-power conversion.

Parameter

Name	Type	Range	Default
--	Discrete	50 75	50

Remarks

If the output impedance of the system under measurement is 75 Ω , you should use a 75 Ω to 50 Ω adapter (option) supplied by **RIGOL** to connect the analyzer with the system under test, and then set the input impedance to 75 Ω .

Return Format

The query returns 50 or 75.

Example

The following command sets the input impedance to 75 Ω .
:INPut:IMPedance 75 or :SENSe:CORRection:IMPedance:INPut:MAGNitude 75

The following query returns 75.
:INPut:IMPedance? or :SENSe:CORRection:IMPedance:INPut:MAGNitude?

[:SENSe]:CORRection:SA[:RF]:GAIN

Syntax

```
[:SENSe]:CORRection:SA[:RF]:GAIN <rel_ampl>
[:SENSe]:CORRection:SA[:RF]:GAIN?
```

Description

Sets the external gain.
Queries the external gain.

Parameter

Name	Type	Range	Default
<rel_ampl>	Consecutive Real Number	-120 dB to 120 dB	0 dB

Return Format

The query returns the external gain value in scientific notation. The unit is dB.

Example

The following command sets the external gain value to 20 dB.
:SENSe:CORRection:SA:RF:GAIN 20

The following query returns 2.000000000e+01.
:SENSe:CORRection:SA:RF:GAIN?

[:SENSe]:DDEMod:ALPHa

Syntax

```
[:SENSe]:DDEMod:ALPHa <real>
[:SENSe]:DDEMod:ALPHa?
```

Description

Sets the roll-off factor of the raised cosine or the BT value of the Gaussian filter.
Queries the roll-off factor of the raised cosine or the BT value of the Gaussian filter.

Parameter

Name	Type	Range	Default
<real>	Consecutive Real Number	0.05 to 100	0.22

Return Format

The query returns the roll-off factor or the BT value in scientific notation.

Example

The following command sets the roll-off factor of the raised cosine to 0.22.
:SENSe:DDEMod:ALPHa 0.22

The following query returns 2.200000000e-01.
:SENSe:DDEMod:ALPHa?

[:SENSe]:DDEMod:FFT:WINDow[:TYPE]

Syntax

```
[:SENSe]:DDEMod:FFT:WINDow[:TYPE] UNIFORM|HANNing|GAUSSian|FLATtop
[:SENSe]:DDEMod:FFT:WINDow[:TYPE]?
```

Description

Sets the type of the FFT window function.
 Queries the type of the FFT window function.

Parameter

Name	Type	Range	Default
--	Keyword	UNIForm HANNing GAUSSian FLATtop	UNIForm

Return Format

The query returns UNIF, HANN, GAUS, or FLAT.

Example

The following command sets the type of the FFT window function to GAUSSian.
 :SENSe:DDEMod:FFT:WINDow:TYPE GAUSSian

The following query returns GAUS.
 :SENSe:DDEMod:FFT:WINDow:TYPE?

[:SENSe] :DDEMod :FILTer :MEASurement**Syntax**

[:SENSe] :DDEMod :FILTer :MEASurement NONE | RRCosine | GAUSSian | RECTangle | USER <n>
 [:SENSe] :DDEMod :FILTer :MEASurement ?

Description

Sets the measurement filter type.
 Queries the measurement filter type.

Parameter

Name	Type	Range	Default
--	Keyword	NONE RRCosine GAUSSian RECTangle USER	RRCosine
<n>	Discrete	1 2 3 4 5 6	---

Remarks

NONE: disables the filter.
 RRCosine: indicates the root raised cosine.
 GAUSSian: indicates the Gaussian filter.
 RECTangle: indicates the rectangular filter.
 USER<n>: indicates the user-defined filter n (1 to 6).

Return Format

The query returns NONE, RRC, GAUS, RECT, USER1, USER2, USER3, USER4, USER5, or USER6.

Example

The following command sets the measurement filter to GAUSSian.
 :SENSe:DDEMod:FILTer:MEASurement GAUSSian

The following query returns GAUS.
 :SENSe:DDEMod:FILTer:MEASurement?

[[:SENSe]:DDEMod:FILTer:MEASurement:USER<n>[:DATA]

Syntax

```
[[:SENSe]:DDEMod:FILTer:MEASurement:USER<n>[:DATA] <ampl>{,<ampl>}
[:SENSe]:DDEMod:FILTer:MEASurement:USER<n>[:DATA]?
```

Description

Sets the data of the specified measurement user-defined filter.
Queries the data of the specified measurement user-defined filter.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6	---
<ampl>	Consecutive Real Number	---	---

Return Format

The query returns the user-defined filter data in scientific notation.

Example

The following command sets the data of the measurement user-defined filter 1.

```
:SENSe:DDEMod:FILTer:MEASurement:USER1:DATA
-0.000321525,0.00294817,0.002500879,-0.001910775,-0.005052538
```

The following query returns

```
-3.215250000e-04,2.948170000e-03,2.500879000e-03,-1.910775000-03,-5.052538000e-03。
:SENSe:DDEMod:FILTer:MEASurement:USER1:DATA?
```

[[:SENSe]:DDEMod:FILTer:REference

Syntax

```
[[:SENSe]:DDEMod:FILTer:REference RCOSine|RRCosine|GAUSSian|RECTangle|HSINe|USER<n>
[:SENSe]:DDEMod:FILTer:REference?
```

Description

Sets the reference filter type.
Queries the reference filter type.

Parameter

Name	Type	Range	Default
--	Keyword	RCOSine RRCosine GAUSSian RECTangle HSINe USER	RCOSine
<n>	Discrete	1 2 3 4 5 6	---

Remarks

RCOSine: indicates the raised cosine filter.
RRCosine: indicates the root raised cosine.
GAUSSian: indicates the Gaussian filter.
RECTangle: indicates the rectangular filter.
HSINe: indicates the half-sine filter.
USER<n>: indicates the user-defined filter n (1 to 6).

Return Format

The query returns RCOS, RRC, GAUS, RECT, HSIN, USER1, USER2, USER3, USER4, USER5, or USER6.

Example

The following command sets the reference filter to GAUSSian.

:SENSe:DDEMod:FILTer:REFeRence GAUSSian

The following query returns GAUS.

:SENSe:DDEMod:FILTer:REFeRence?

[[:SENSe]:DDEMod:FILTer:REFeRence:USER<n>[:DATA]

Syntax

[[:SENSe]:DDEMod:FILTer:REFeRence:USER<n>[:DATA] <ampl>{,<ampl>}]

[[:SENSe]:DDEMod:FILTer:REFeRence:USER<n>[:DATA]?]

Description

Sets the data of the specified reference user-defined filter.

Queries the data of the specified reference user-defined filter.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2 3 4 5 6	---
<ampl>	Consecutive Real Number	---	---

Return Format

The query returns the user-defined filter data in scientific notation.

Example

The following command sets the data of the reference user-defined filter 1.

:SENSe:DDEMod:FILTer:REFeRence:USER1:DATA

-0.000321525,0.00294817,0.002500879,-0.001910775,-0.005052538

The following query returns

-3.215250000e-04,2.948170000e-03,2.500879000e-03,-1.910775000e-03,-5.052538000e-03.

:SENSe:DDEMod:FILTer:REFeRence:USER1:DATA?

[[:SENSe]:DDEMod:FSK:DEVIation:REFeRence

Syntax

[[:SENSe]:DDEMod:FSK:DEVIation:REFeRence <freq>]

[[:SENSe]:DDEMod:FSK:DEVIation:REFeRence?]

Description

Sets the reference frequency offset in the FSK modulation.

Queries the reference frequency offset in the FSK modulation.

Parameter

Name	Type	Range	Default
<freq>	Consecutive Real Number	1 kHz to 1T Hz	1 kHz

Remarks

This command is only valid when you select FSK as the modulation format and reference deviation mode is set to Manual.

Return Format

The query returns the reference frequency offset in scientific notation. The unit is Hz.

Example

The following command sets the reference frequency offset to 1 MHz.

```
:SENSe:DDEMod:FSK:DEViation:REFerence 1000000
```

The following query returns 1.000000000e+06.

```
:SENSe:DDEMod:FSK:DEViation:REFerence?
```

[[:SENSe]:DDEMod:FSK:DEViation:REFerence:AUTO**Syntax**

```
[[:SENSe]:DDEMod:FSK:DEViation:REFerence:AUTO ON|OFF|1|0
```

```
[[:SENSe]:DDEMod:FSK:DEViation:REFerence:AUTO?
```

Description

Enables or disables the reference frequency offset mode in the FSK modulation.

Queries the status of the reference frequency offset mode in the FSK modulation.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Remarks

ON|1: indicates that Auto mode is selected.

OFF|0: indicates that Manual mode is selected.

This command is only valid when you select FSK as the modulation format.

Return Format

The query returns 0 or 1.

Example

The following command sets the reference frequency offset mode in the FSK modulation to Auto.

```
:SENSe:DDEMod:FSK:DEViation:REFerence:AUTO ON
```

```
or :SENSe:DDEMod:FSK:DEViation:REFerence:AUTO 1
```

The following query returns 1.

```
:SENSe:DDEMod:FSK:DEViation:REFerence:AUTO?
```

[[:SENSe]:DDEMod:LOAD:KNOWndata**Syntax**

```
[[:SENSe]:DDEMod:LOAD:KNOWndata <path>
```

```
[[:SENSe]:DDEMod:LOAD:KNOWndata?
```

Description

Loads the BER test file from the specified path.

Queries the BER test file.

Parameter

Name	Type	Range	Default
<path>	Consecutive Real Number	--	--

Remarks

Before performing the BER test, load the BER test reference file (.xml) first.

<path> should contain the path and the filename.

Return Format

The query returns the BER test filename.

Example

The following command loads the BER test file "ber1.xml" from the path "/vsa/BerTest".

```
:SENSe:DDEMod:LOAD:KNOWndata /vsa/BerTest/ber1.xml
```

The following query returns ber1.

```
:SENSe:DDEMod:LOAD:KNOWndata?
```

[[:SENSe]:DDEMod:MODulation**Syntax**

```
[[:SENSe]:DDEMod:MODulation
```

```
QAM16|QAM32|QAM64|BPSK|QPSK|OQPSK|DQPSK|PSK8|PI4DQPSK|PI8DPSK8|DPSK8|FSK2|FSK4|FSK8|MSK|ASK2|ASK4
```

```
[[:SENSe]:DDEMod:MODulation?
```

Description

Sets the modulation mode.

Queries the modulation mode.

Parameter

Name	Type	Range	Default
--	Keyword	QAM16 QAM32 QAM64 BPSK QPSK OQPSK DQPSK PSK8 PI4DQPSK PI8DPSK8 DPSK8 FSK2 FSK4 FSK8 MSK ASK2 ASK4	QPSK

Return Format

The query returns QAM16, QAM32, QAM64, BPSK, QPSK, OQPSK, DQPSK, PSK8, PI4DQPSK, PI8DPSK8, DPSK8, FSK2, FSK4, FSK8, MSK, ASK2, or ASK4.

Example

The following command sets the modulation mode to QPSK.

```
:SENSe:DDEMod:MODulation QPSK
```

The following query returns QPSK.

```
:SENSe:DDEMod:MODulation?
```

[[:SENSe]:DDEMod:MSK:FORMat**Syntax**

```
[[:SENSe]:DDEMod:MSK:FORMat NORMal|DIFFerential
```

```
[[:SENSe]:DDEMod:MSK:FORMat?
```

Description

Sets the differential coding state of MSK.

Queries the differential coding state of MSK.

Parameter

Name	Type	Range	Default
--	Keyword	NORMal DIFFerential	--

Remarks

NORMAL: indicates that disable the differential coding.

DIFFERENTIAL: indicates that enable the differential coding.

Return Format

The query returns NORM or DIFF.

Example

The following command enables the differential coding.

```
:SENSe:DDEMod:MSK:FORMat DIFFerential
```

The following query returns DIFF.

```
:SENSe:DDEMod:MSK:FORMat?
```

[[:SENSe]:DDEMod:PPSYmbol**Syntax**

```
[[:SENSe]:DDEMod:PPSYmbol <integer>
```

```
[[:SENSe]:DDEMod:PPSYmbol?
```

Description

Sets points/symbol in digital demodulation.

Queries points/symbol in digital demodulation.

Parameter

Name	Type	Range	Default
<integer>	Discrete	4 8 16	4

Return Format

The query returns points/symbol in integer.

Example

The following command sets points/symbol to 4.

```
:SENSe:DDEMod:PPSYmbol 4
```

The following query returns 4.

```
:SENSe:DDEMod:PPSYmbol?
```

[[:SENSe]:DDEMod:RTTrace:DETECTOR**Syntax**

```
[[:SENSe]:DDEMod:RTTrace:DETECTOR POSitive|NEGative|AVERage|SAMple
```

```
[[:SENSe]:DDEMod:RTTrace:DETECTOR?
```

Description

Sets the detector for the current real-time spectrum trace.

Queries the detector for the current real-time spectrum trace.

Parameter

Name	Type	Range	Default
---	Keyword	POSitive NEGative AVERage SAMple	POSitive

Remarks

This command is valide only when the "RT Trace" data source is selected.

Return Format

The query returns POS, NEG, AVER or SAM.

Example

The following command sets the detector to POSitive.

```
:SENSe:DDEMod:RTTTrace:DETECTOR POSitive
```

The following query returns POS.

```
:SENSe:DDEMod:RTTTrace:DETECTOR?
```

[[:SENSe]:DDEMod:SRATe**Syntax**

```
[[:SENSe]:DDEMod:SRATe <frequency>
```

```
[[:SENSe]:DDEMod:SRATe?
```

Description

Sets the symbol rate of the digital demodulation.

Queries the symbol rate of the digital demodulation.

Parameter

Name	Type	Range	Default
<frequency>	Consecutive Real Number	Refer to "Remarks"	1 MHz

Remarks

The minimum symbol rate is 1 kHz.

The maximum symbol rate $SR_{max} = SP_{max} \times 1.28 / (\text{points/symbol})$. Wherein, SP_{max} is the maximum span. If the option RSA5000-B40 is not installed, SP_{max} is 25 MHz. If the option RSA5000-B40 is installed, SP_{max} is 40 MHz.

Return Format

The query returns the symbol rate in scientific notation.

Example

The following command sets the symbol rate to 1 MHz.

```
:SENSe:DDEMod:SRATe 1000000
```

The following query returns 1.000000000e+06.

```
:SENSe:DDEMod:SRATe?
```

[[:SENSe]:DDEMod:STANdard:PRESet**Syntax**

```
[[:SENSe]:DDEMod:STANdard:PRESet
```

```
GSM|NADC|WCDMA|PDC|PHP|BLUETOOTH|WLAN11B|ZIGBEE2450|TETRA|DECT|APCO|ZIGBEE868|ZIGBEE915
```

Description

Sets the preset standard of the digital demodulation.

Parameter

Name	Type	Range	Default
--	Keyword	GSM NADC WCDMA PDC PHP BLUETOOTH WLAN11B ZIGBEE2450 TETRA DECT APCO ZIGBEE868 ZIGBEE915	--

Return Format

The query returns GSM, NADC, WCDMA, PDC, PHP, BLUETOOTH, WLAN11B, ZIGBEE2450, TETRA, DECT, APCO, ZIGBEE868, or ZIGBEE915.

Example

The following command sets the preset standard of the digital demodulation to GSM.
:SENSe:DDEMod:STANdard:PRESet GSM

[[:SENSe]:DDEMod:SWEep:POINts**Syntax**

[[:SENSe]:DDEMod:SWEep:POINts <integer>
[:SENSe]:DDEMod:SWEep:POINts?

Description

Sets the number of symbols in digital demodulation.
Queries the number of symbols in digital demodulation.

Parameter

Name	Type	Range	Default
<integer>	Integer	Refer to "Remarks"	50

Remarks

The minimum capture length is 10.
The maximum capture length MImax is determined by points/symbol. When setting points/symbol to 4, MImax is 4096; when setting points/symbol to 8, MImax is 2048; when setting points/symbol to 16, MImax is 1024.

Return Format

The query returns the number of symbols in integer.

Example

The following command sets the number of symbols to 200.
:SENSe:DDEMod:SWEep:POINts 200

The following query returns 200.
[:SENSe]:DDEMod:SWEep:POINts?

[[:SENSe]:DDEMod:SYNC:ALENgt**Syntax**

[[:SENSe]:DDEMod:SYNC:ALENgt <interger>
[:SENSe]:DDEMod:SYNC:ALENgt?

Description

Sets the sync analyze length.
Queries the sync analyze length.

Parameter

Name	Type	Range	Default
<interger>	Integer	50 to 4096	50

Remarks

This command is valide only when the sync search function is enabled and the burst search is disabled.

Return Format

The query returns the sync analyze length in integer.

Example

The following command sets the sync analyze length to 50.

```
:SENSe:DDEMod:SYNC:ALENgtH 50
```

The following query returns 50.

```
:SENSe:DDEMod:SYNC:ALENgtH?
```

[[:SENSe]:DDEMod:SYNC:BURSt:RUNIn**Syntax**

```
[[:SENSe]:DDEMod:SYNC:BURSt:RUNIn <interger>
```

```
[[:SENSe]:DDEMod:SYNC:BURSt:RUNIn?
```

Description

Sets the burst search run-in.

Queries the burst search run-in.

Parameter

Name	Type	Range	Default
<interger>	Integer	0 to 16384	0

Remarks

This command is valide only when the burst search function is enabled.

Return Format

The query returns the burst search run-in in integer.

Example

The following command sets the burst search run-in to 50.

```
:SENSe:DDEMod:SYNC:BURSt:RUNIn 50
```

The following query returns 50.

```
:SENSe:DDEMod:SYNC:BURSt:RUNIn?
```

[[:SENSe]:DDEMod:SYNC:BURSt:STATe**Syntax**

```
[[:SENSe]:DDEMod:SYNC:BURSt:STATe OFF|ON|0|1
```

```
[[:SENSe]:DDEMod:SYNC:BURSt:STATe?
```

Description

Enables or disables the burst search.

Queries the setting status of the burst search.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command enables the burst search.

```
:SENSe:DDEMod:SYNC:BURSt:STATe ON or :SENSe:DDEMod:SYNC:BURSt:STATe 1
```

The following query returns 1.

```
:SENSe:DDEMod:SYNC:BURSt:STATe?
```

[[:SENSe]:DDEMod:SYNC:SLENgth**Syntax**

```
[[:SENSe]:DDEMod:SYNC:SLENgth <time>
```

```
[[:SENSe]:DDEMod:SYNC:SLENgth?
```

Description

Sets the burst search length.

Queries the burst search length.

Parameter

Name	Type	Range	Default
<time>	Consecutive Real Number	50 us to 16.3840 ms	50 us

Return Format

The query returns the burst search length in scientific notation.

Example

The following command sets the burst search length to 200 μ s.

```
:SENSe:DDEMod:SYNC:SLENgth 0.0002
```

The following query returns 2.000000000e-04.

```
:SENSe:DDEMod:SYNC:SLENgth?
```

[[:SENSe]:DDEMod:SYNC:SWORd:OFFSet**Syntax**

```
[[:SENSe]:DDEMod:SYNC:SWORd:OFFSet <integer>
```

```
[[:SENSe]:DDEMod:SYNC:SWORd:OFFSet?
```

Description

Sets the sync offset of the sync search.

Queries the sync offset of the sync search.

Parameter

Name	Type	Range	Default
<integer>	Consecutive Real Number	-2048 to 2048	0

Return Format

The query returns the sync offset in integer.

Example

The following command sets the sync offset to -3.

```
:SENSe:DDEMod:SYNC:SWORd:OFFSet -3
```

The following query returns -3.

```
:SENSe:DDEMod:SYNC:SWORd:OFFSet?
```

[[:SENSe]:DDEMod:SYNC:SWORd:PATtern

Syntax

```
[[:SENSe]:DDEMod:SYNC:SWORd:PATtern <string>
[:SENSe]:DDEMod:SYNC:SWORd:PATtern?
```

Description

Sets the bit pattern for the sync search.
Queries the bit pattern for the sync search.

Parameter

Name	Type	Range	Default
<string>	Consecutive Real Number	0 to 32 symbols	--

Return Format

The query returns the bit pattern for the sync search in strings.

Example

The following command sets the bit pattern for the sync search to 1011010.
[:SENSe]:DDEMod:SYNC:SWORd:PATtern 1011010

The following query returns 1011010.
[:SENSe]:DDEMod:SYNC:SWORd:PATtern?

[[:SENSe]:DDEMod:SYNC:SWORd:STATe

Syntax

```
[[:SENSe]:DDEMod:SYNC:SWORd:STATe OFF|ON|0|1
[:SENSe]:DDEMod:SYNC:SWORd:STATe?
```

Description

Enables or disables the sync word search.
Queries the setting status of the sync word search.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command enables the sync word search.
[:SENSe]:DDEMod:SYNC:SWORd:STATe ON or :SENSe:~:DDEMod:SYNC:SWORd:STATe 1

The following query returns 1.
[:SENSe]:DDEMod:SYNC:SWORd:STATe?

[[:SENSe]:FREQuency:CENTer

Syntax

```
[[:SENSe]:FREQuency:CENTer <freq>
[:SENSe]:FREQuency:CENTer?
```

Description

Sets the center frequency.
Queries the center frequency.

Parameter

Name	Type	Range	Default
<freq>	Consecutive Real Number	1.562 kHz to (Fmax ^[1] – 1.562 kHz)	1 GHz

Note^[1]: The maximum measurement frequency Fmax is determined by the instrument model. For RSA5065, Fmax is 6.5 GHz; for RSA5032, Fmax is 3.2 GHz.

Return Format

The query returns the center frequency in scientific notation. The unit is Hz.

Example

The following command sets the center frequency to 2 MHz.
:SENSe:FREQuency:CENTer 2000000

The following query returns 2.000000000e+06.
:SENSe:FREQuency:CENTer?

[:SENSe]:FREQuency:CENTer:STEP:AUTO**Syntax**

[:SENSe]:FREQuency:CENTer:STEP:AUTO OFF|ON|0|1
[:SENSe]:FREQuency:CENTer:STEP:AUTO?

Description

Enables or disables the auto setting mode of the CF step.
Queries the status of the auto setting mode of the CF step.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command enables the auto setting mode of the CF step.
:SENSe:FREQuency:CENTer:STEP:AUTO ON or :SENSe:FREQuency:CENTer:STEP:AUTO 1

The following query returns 1.
:SENSe:FREQuency:CENTer:STEP:AUTO?

[:SENSe]:FREQuency:CENTer:STEP[:INCRement]**Syntax**

[:SENSe]:FREQuency:CENTer:STEP[:INCRement] <freq>
[:SENSe]:FREQuency:CENTer:STEP[:INCRement]?

Description

Sets the CF step.
Queries the CF step.

Parameter

Name	Type	Range	Default
<freq>	Consecutive Real Number	-Fmax to Fmax	Span/10

Return Format

The query returns the center frequency step in scientific notation. The unit is Hz.

Example

The following command sets the CF step to 100 kHz.

```
:SENSe:FREQuency:CENTer:STEP:INCRement 100000
```

The following query returns 1.000000000e+05.

```
:SENSe:FREQuency:CENTer:STEP:INCRement?
```

[:SENSe]:FREQuency:SPAN?**Syntax**

```
[:SENSe]:FREQuency:SPAN?
```

Description

Queries the frequency span of the current channel.

Return Format

The query returns the span in scientific notation. The unit is Hz.

Example

The following query returns 3.125000000e+06.

```
:SENSe:FREQuency:SPAN?
```

[:SENSe]:FREQuency:START**Syntax**

```
[:SENSe]:FREQuency:START <freq>  
[:SENSe]:FREQuency:START?
```

Description

Sets the start frequency.

Queries the start frequency.

Parameter

Name	Type	Range	Default
<freq>	Consecutive Real Number	0 Hz to (Fmax – 3.125 kHz)	center frequency - span/2

Return Format

The query returns the start frequency in scientific notation. The unit is Hz.

Example

The following command sets the start frequency to 100 MHz.

```
:SENSe:FREQuency:START 100000000
```

The following query returns 1.000000000e+08.

```
:SENSe:FREQuency:START?
```

[:SENSe]:FREQuency:STOP

Syntax

```
[:SENSe]:FREQuency:STOP <freq>
[:SENSe]:FREQuency:STOP?
```

Description

Sets the stop frequency.
Queries the stop frequency.

Parameter

Name	Type	Range	Default
<freq>	Consecutive Real Number	3.125 kHz to Fmax	center frequency + span/2

Return Format

The query returns the stop frequency in scientific notation. The unit is Hz.

Example

The following command sets the stop frequency to 10 MHz.
:SENSe:FREQuency:STOP 10000000

The following query returns 1.000000000e+07.
:SENSe:FREQuency:STOP?

[:SENSe]:POWer[:RF]:RANGe

Syntax

```
[:SENSe]:POWer[:RF]:RANGe <real>
[:SENSe]:POWer[:RF]:RANGe?
```

Description

Sets the amplitude of the largest sinusoidal input signal without being clipped by the IF ADC.
Queries the amplitude of the largest sinusoidal input signal without being clipped by the IF ADC.

Parameter

Name	Type	Range	Default
<real>	Integer	-15 dBm to 25 dBm	20 dBm

Return Format

The query returns the signal amplitude in scientific notation. The unit is dBm.

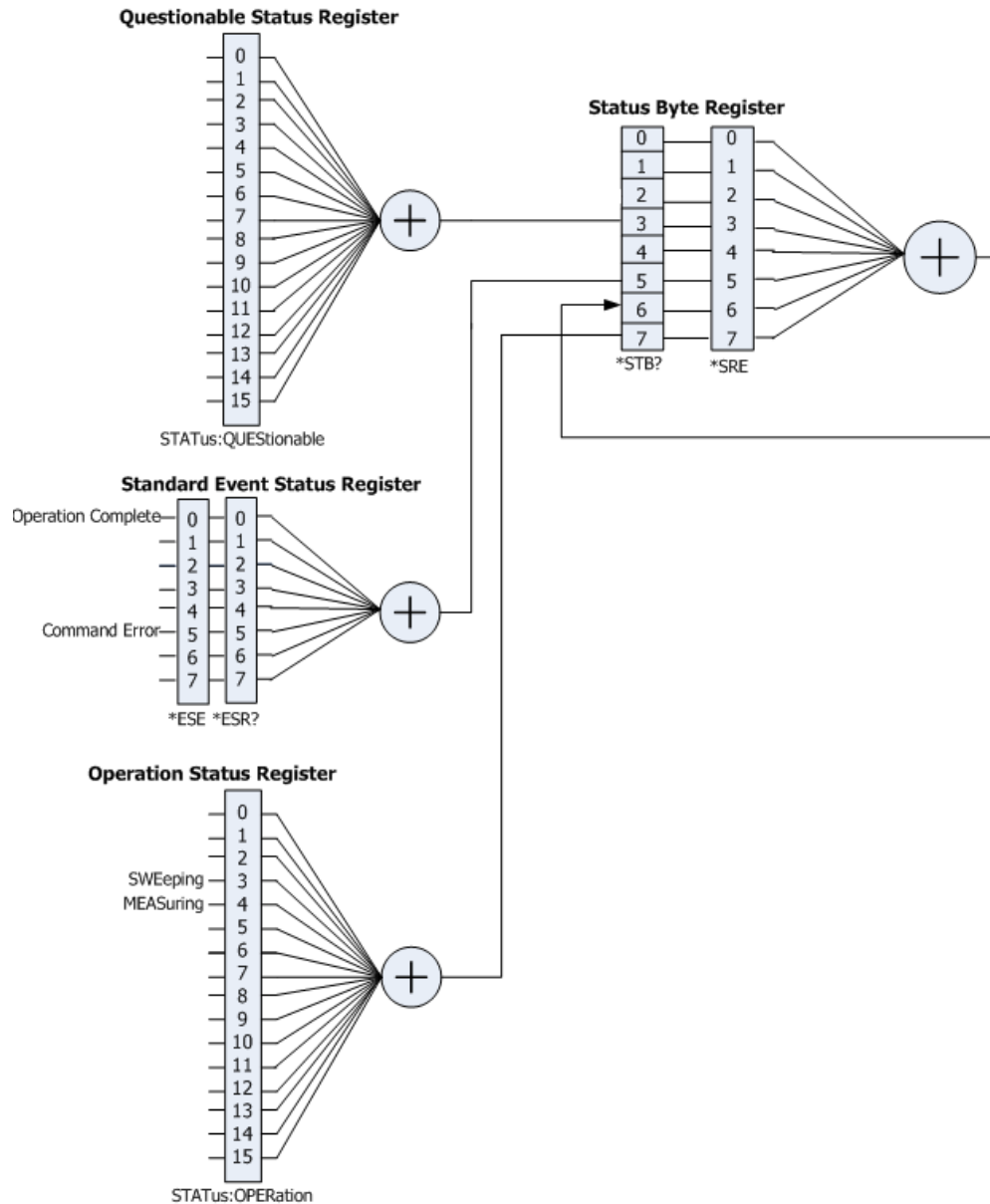
Example

The following command sets the amplitude of the largest sinusoidal input signal without being clipped by the IF ADC to 20 dBm.
:SENSe:POWer:RF:RANGe 20

The following query returns 2.000000000e+01.
:SENSe:POWer:RF:RANGe?

:STATus Commands

The :STATus commands and [IEEE 488.2 Common Commands](#) are used to operate or query the status registers. The structure of the status register is shown in the following figure. The STATus commands are used to set and query the questionable status register and operation status register. IEEE488.2 common commands can be used to operate on the standard event status register and status byte register.



Command List:

- ◆ [:STATus:OPERation:CONDition?](#)
- ◆ [:STATus:OPERation:ENABLE](#)
- ◆ [:STATus:OPERation\[:EVENT\]?](#)
- ◆ [:STATus:PRESet](#)
- ◆ [:STATus:QUEStionable:CONDition?](#)
- ◆ [:STATus:QUEStionable:ENABLE](#)
- ◆ [:STATus:QUEStionable\[:EVENT\]?](#)

:STATus:OPERation:CONDition?

Syntax

:STATus:OPERation:CONDition?

Description

Queries the condition register of the operation status register.

Return Format

The query returns the condition register in integer. For example, 24.

:STATus:OPERation:ENABle

Syntax

:STATus:OPERation:ENABle <integer>

:STATus:OPERation:ENABle?

Description

Sets the enable register of the operation status register.

Queries the enable register of the operation status register.

Parameter

Name	Type	Range	Default
<integer>	Integer	Refer to "Remarks"	0

Remarks

The definition of the Operation Status Register is shown in the following table. Bit 0-2, Bit 5-7, Bit 13, and Bit 14 are reserved. You can set their values but they will not affect the system. Bit 15 and Bit 12-8 are not used and are always treated as 0. Therefore, the parameter <integer> can be any decimal value that corresponds to the binary-weighted sum of the bits that range from 0000000000000000 (0 in decimal) to 1111111111111111 (32,767 in decimal) and of which Bit 15 and Bit 12-8 are 0.

Bit	Value	Description
0	1	Reserved
1	2	Reserved
2	4	Reserved
3	8	SWEEping
4	16	MEASuring
5	32	Reserved
6	64	Reserved
7	128	Reserved
8	0	Not Used
9	0	Not Used
10	0	Not Used
11	0	Not Used
12	0	Not Used
13	8192	Reserved
14	16384	Reserved
15	0	Not Used

Return Format

The query returns the enable register of the Operation Status Register in integer.

Example

The following command sets the enable register of the Operation Status Register to 100.

```
:STATus:OPERation:ENABLE 100
```

The following query returns 100.

```
:STATus:OPERation:ENABLE?
```

:STATus:OPERation[:EVENT]?**Syntax**

```
:STATus:OPERation[:EVENT]?
```

Description

Queries the event register of the Operation Status Register.

Return Format

The query returns the event register in integer. For example, 24.

:STATus:PRESet**Syntax**

```
:STATus:PRESet
```

Description

Clears the enable register of the Operation Status Register and Questionable Status Register.

:STATus:QUEStionable:CONDition?**Syntax**

```
:STATus:QUEStionable:CONDition?
```

Description

Queries the condition register of the Questionable Status Register.

Return Format

The query returns the condition register of the Questionable Status Register in integer. For example, 0.

:STATus:QUEStionable:ENABLE**Syntax**

```
:STATus:QUEStionable:ENABLE <integer>
```

```
:STATus:QUEStionable:ENABLE?
```

Description

Sets the enable register of the Questionable Status Register.

Queries the enable register of the Questionable Status Register.

Parameter

Name	Type	Range	Default
<integer>	Integer	Refer to "Remarks"	0

Remarks

The definition of the Questionable Status Register is shown in the following table. Bit 0-8, Bit 13, and Bit 14 are reserved. You can set their values but they will not affect the system. Bit 15, Bit 12-9 are not used and they are always treated as 0. Therefore, the parameter <integer> can be any decimal value that corresponds to the binary-weighted sum of the bits that range from 0000000000000000 (0 in decimal) to 1111111111111111 (32,767 in decimal) and of which Bit 15 and Bit 12-9 are 0.

Bit	Value	Description
0	1	Reserved
1	2	Reserved
2	4	Reserved
3	8	Reserved
4	16	Reserved
5	32	Reserved
6	64	Reserved
7	128	Reserved
8	256	Reserved
9	0	Not Used
10	0	Not Used
11	0	Not Used
12	0	Not Used
13	8192	Reserved
14	16384	Reserved
15	0	Not Used

Return Format

The query returns the enable register of the Questionable Status Register in integer.

Example

The following command sets the enable register of the Questionable Status Register to 100.

```
:STATus:QUESTionable:ENABle 100
```

The following query returns 100.

```
:STATus:QUESTionable:ENABle?
```

:STATus:QUESTionable[:EVENT]?**Syntax**

```
:STATus:QUESTionable[:EVENT]?
```

Description

Queries the event register of the Questionable Status Register.

Return Format

The query returns the event register of the Questionable Status Register in integer. For example, 0.

:SYSTem Commands

Command List:

- ◆ [:SYSTem:BEEPer:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:APPLy](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:AUToip:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:DHCP:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:ADDResS](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:DNS:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:DNSBack](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:DNSPreferred](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:DNSServer](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:GATeway](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:IP:SUBMAsk](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:MANuip:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:MDNS:STATe](#)
- ◆ [:SYSTem:COMMunicate:LAN\[:SELF\]:RESet](#)
- ◆ [:SYSTem:CONFigure:INFormation?](#)
- ◆ [:SYSTem:DATE](#)
- ◆ [:SYSTem:FSWitch\[:STATe\]](#)
- ◆ [:SYSTem:LANGuage](#)
- ◆ [:SYSTem:LKEY](#)
- ◆ [:SYSTem:OPTion:STATe?](#)
- ◆ [:SYSTem:PON:TYPE](#)
- ◆ [:SYSTem:PRESet](#)
- ◆ [:SYSTem:PRESet:SAVE](#)
- ◆ [:SYSTem:PRESet:TYPE](#)
- ◆ [:SYSTem:PRESet:USER:SAVE](#)
- ◆ [:SYSTem:SCPI:DISPlay](#)
- ◆ [:SYSTem:SECurity:CLEAr](#)
- ◆ [:SYSTem:SHOW](#)
- ◆ [:SYSTem:TIME](#)

:SYSTem:BEEPer:STATe**Syntax**

```
:SYSTem:BEEPer:STATe OFF|ON|0|1
:SYSTem:BEEPer:STATe?
```

Description

Turns on or off the beeper.
Queries the on/off status of the beeper.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 0 or 1.

Example

The following command turns on the beeper.
:SYSTem:BEEPer:STATe ON or :SYSTem:BEEPer:STATe 1

The following query returns 1.
:SYSTem:BEEPer:STATe?

:SYSTem:COMMunicate:LAN[:SELF]:APPLy**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:APPLy
```

Description

Applies the LAN interface parameter settings.

:SYSTem:COMMunicate:LAN[:SELF]:AUTOip:STATe**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:AUTOip:STATe OFF|ON|0|1
:SYSTem:COMMunicate:LAN[:SELF]:AUTOip:STATe?
```

Description

Enables or disables the auto IP setting mode.
Queries the status of the auto IP setting mode.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

The analyzer attempts to acquire the IP address configuration according to the sequence of DHCP, Auto IP, and Manual IP. These three modes cannot be disabled at the same time.
ON|1: enables the auto IP mode.
OFF|0: disables the auto IP mode and selects DHCP configuration mode.

Return Format

The query returns 0 or 1.

Example

The following command enables the auto IP setting mode.

```
:SYSTem:COMMunicate:LAN:SELF:AUTOip:STATe ON or :SYSTem:COMMunicate:LAN:SELF:AUTOip:STATe 1
```

The following query returns 1.

```
:SYSTem:COMMunicate:LAN:SELF:AUTOip:STATe?
```

:SYSTem:COMMunicate:LAN[:SELF]:DHCP:STATe**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:DHCP:STATe OFF|ON|0|1
```

```
:SYSTem:COMMunicate:LAN[:SELF]:DHCP:STATe?
```

Description

Enables or disables the DHCP configuration mode.

Queries the status of the DHCP configuration mode.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Remarks

The analyzer attempts to acquire the IP address configuration according to the sequence of DHCP, Auto IP, and Manual IP. These three modes cannot be disabled at the same time.

ON|1: enables the DHCP configuration mode.

OFF|0: disables the DHCP configuration mode and selects the auto IP mode.

Return Format

The query returns 0 or 1.

Example

The following command enables the DHCP configuration mode.

```
:SYSTem:COMMunicate:LAN:SELF:DHCP:STATe ON or :SYSTem:COMMunicate:LAN:SELF:DHCP:STATe 1
```

The following query returns 1.

```
:SYSTem:COMMunicate:LAN:SELF:DHCP:STATe?
```

:SYSTem:COMMunicate:LAN[:SELF]:IP:ADDRESS**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:ADDRESS <ip_address>
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:ADDRESS?
```

Description

Sets the IP address.

Queries the IP address.

Parameter

Name	Type	Range	Default
<ip_address>	ASCII String	Refer to "Remarks"	--

Remarks

The format of <ip_address> is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) of the address is from 1 to 223 (except 127); and the range for the other three segments is from 0 to 255.

This command is only valid in manual IP setting mode.

Return Format

The query returns the current IP address in the format of "nnn.nnn.nnn.nnn".

Example

The following command sets the IP address to "172.16.3.199".

```
:SYSTem:COMMunicate:LAN:SELF:IP:ADDReSS 172.16.3.199
```

The following query returns 172.16.3.199.

```
:SYSTem:COMMunicate:LAN:SELF:IP:ADDReSS?
```

:SYSTem:COMMunicate:LAN[:SELF]:IP:DNS:STATe

Syntax

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNS:STATe OFF|ON|0|1
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNS:STATe?
```

Description

Sets the mode to obtain the DNS.

Queries the mode to obtain the DNS.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

ON|1: enables the auto mode of DNS, that is, selects the auto mode.

OFF|0: disables the auto mode of DNS, that is, selects the manual mode.

Return Format

The query returns 0 or 1.

Example

The following command enables the auto mode of DNS.

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNS:STATe ON or :SYSTem:COMMunicate:LAN:SELF:IP:DNS:STATe 1
```

The following query returns 1.

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNS:STATe?
```

:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSBack

Syntax

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSBack <ip_address>
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSBack?
```

Description

Sets the backup address for the DNS.

Queries the backup address for the DNS.

Parameter

Name	Type	Range	Default
<ip_address>	ASCII String	Refer to "Remarks"	--

Remarks

The format of <ip_address> is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) of the address is from 1 to 223 (except 127); and the range for the other three segments is from 0 to 255. This command is only valid in manual DNS setting mode.

Return Format

The query returns the current backup DNS address in the format of "nnn.nnn.nnn.nnn".

Example

The following command sets the backup address of DNS to "172.16.2.2".

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSBack 172.16.2.2
```

The following query returns 172.16.2.2.

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSBack?
```

:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSPreferred **:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSServer**

Syntax

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSPreferred <ip_address>
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSPreferred?
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSServer <ip_address>
```

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:DNSServer?
```

Description

Sets the preferred address for the DNS.

Queries the preferred address for the DNS.

Parameter

Name	Type	Range	Default
<ip_address>	ASCII String	Refer to "Remarks"	--

Remarks

The format of <ip_address> is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) of the address is from 1 to 223 (except 127); and the range for the other three segments is from 0 to 255.

This command is only valid in manual DNS setting mode.

Return Format

The query returns the currently preferred DNS address in the format of "nnn.nnn.nnn.nnn".

Example

The following command sets the preferred DNS address to "172.16.2.2".

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSPreferred 172.16.2.2
```

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSServer 172.16.2.2
```

The following query returns 172.16.2.2.

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSPreferred?
```

```
:SYSTem:COMMunicate:LAN:SELF:IP:DNSServer?
```

:SYSTem:COMMunicate:LAN[:SELF]:IP:GATeway

Syntax

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:GATeway <ip_address>
:SYSTem:COMMunicate:LAN[:SELF]:IP:GATeway?
```

Description

Sets the default gateway.
Queries the default gateway.

Parameter

Name	Type	Range	Default
<ip_address>	ASCII String	Refer to "Remarks"	--

Remarks

The format of <ip_address> is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) of the address is from 1 to 223 (except 127); and the range for the other three segments is from 0 to 255. This command is only valid in manual IP setting mode.

Return Format

The query returns the current default gateway in the format of "nnn.nnn.nnn.nnn".

Example

The following command sets the default gateway to "172.16.3.1".
:SYSTem:COMMunicate:LAN:SELF:IP:GATeway 172.16.3.1

The following query returns 172.16.3.1.
:SYSTem:COMMunicate:LAN:SELF:IP:GATeway?

:SYSTem:COMMunicate:LAN[:SELF]:IP:SUBMask

Syntax

```
:SYSTem:COMMunicate:LAN[:SELF]:IP:SUBMask<ip_address>
:SYSTem:COMMunicate:LAN[:SELF]:IP:SUBMask?
```

Description

Sets the subnet mask.
Queries the subnet mask.

Parameter

Name	Type	Range	Default
<ip_address>	ASCII String	Refer to "Remarks"	--

Remarks

The format of <ip_address> is "nnn.nnn.nnn.nnn". The range for the first segment (nnn) is from 0 to 255. This command is only valid in manual IP setting mode.

Return Format

The query returns the current subnet mask in the format of "nnn.nnn.nnn.nnn".

Example

The following command sets the subnet mask to "255.255.255.0".
:SYSTem:COMMunicate:LAN:SELF:IP:SUBMask 255.255.255.0

The following query returns 255.255.255.0.
:SYSTem:COMMunicate:LAN:SELF:IP:SUBMask?

:SYSTem:COMMunicate:LAN[:SELF]:MANuip:STATe**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:MANuip:STATe OFF|ON|0|1
:SYSTem:COMMunicate:LAN[:SELF]:MANuip:STATe?
```

Description

Enables or disables the manual IP setting mode.
 Queries the status of the manual IP setting mode.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

The analyzer attempts to acquire the IP address configuration according to the sequence of DHCP, Auto IP, and Manual IP. These three modes cannot be disabled at the same time.

ON|1: enables the manual IP mode.

OFF|0: disables the manual IP mode and selects the DHCP mode.

Return Format

The query returns 0 or 1.

Example

The following command enables the manual IP setting mode.

```
:SYSTem:COMMunicate:LAN:SELF:MANuip:STATe ON or :SYSTem:COMMunicate:LAN:SELF:MANuip:STATe
1
```

The following query returns 1.

```
:SYSTem:COMMunicate:LAN:SELF:MANuip:STATe?
```

:SYSTem:COMMunicate:LAN[:SELF]:MDNS:STATe**Syntax**

```
:SYSTem:COMMunicate:LAN[:SELF]:MDNS:STATe OFF|ON|0|1
:SYSTem:COMMunicate:LAN[:SELF]:MDNS:STATe?
```

Description

Enables or disables the state of the network information sending.
 Queries the on/off status of the network information sending.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

ON|1: The state of the network information sending is turned on.

ON|0: The state of the network information sending is turned off.

Return Format

The query returns 0 or 1.

Example

The following command sets the state of the network information sending to "on".

```
:SYSTem:COMMunicate:LAN:SELF:MDNS:STATe ON or :SYSTem:COMMunicate:LAN:SELF:MDNS:STATe
1
```

The following query returns 1.
:SYSTem:COMMunicate:LAN:SELF:MDNS:STATe?

:SYSTem:COMMunicate:LAN[:SELF]:RESet

Syntax

:SYSTem:COMMunicate:LAN[:SELF]:RESet

Description

Resets the LAN setting: enable the DHCP, disable Auto IP and the Manual IP.

:SYSTem:CONFigure:INFormation?

Syntax

:SYSTem:CONFigure:INFormation?

Description

Queries the system information of the spectrum analyzer.

Remarks

The system information includes the model, serial number, software and hardware version number, and firmware version number.

Return Format

The query returns the system information. For example,

Model:RSA5065

SN:RSA5B192000020

Main Board:00.01.00

Keyboard:00.01.00

CPU:00.01.00

SPU:00.01.02

WPU:00.01.00

BOOT:00.01.00

OS:00.01.00

Firmware:00.01.00

Note: When you use RSA5065-TG/RSA5032-TG, the query also returns information about "TG Board".

:SYSTem:DATE

Syntax

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

:SYSTem:DATE?

Description

Sets the date of the instrument.

Queries the date of the instrument.

Parameter

Name	Type	Range	Default
<year>	ASCII String	2,000 to 2,099	--
<month>	ASCII String	01 to 12	--
<day>	ASCII String	01 to 31	--

Return Format

The query returns the current date in the format of "YYYY,MM,DD".

Example

The following command sets the date of the instrument to 2017/11/16.

```
:SYSTem:DATE 2017,11,16
```

The following query returns 2017,11,16

```
:SYSTem:DATE?
```

:SYSTem:FSWitch[:STATe]**Syntax**

```
:SYSTem:FSWitch[:STATe] OFF|ON|0|1
```

```
:SYSTem:FSWitch[:STATe]?
```

Description

Sets the power switch on the front panel to be turned on or off.

Queries whether the power switch on the front panel is turned on or off.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	ON 1

Return Format

The query returns 0 or 1.

Example

The following command sets the power switch on the front panel to be turned off.

```
:SYSTem:FSWitch:STATe OFF or :SYSTem:FSWitch:STATe 0
```

The following query returns 0.

```
:SYSTem:FSWitch:STATe?
```

:SYSTem:LANGuage**Syntax**

```
:SYSTem:LANGuage ENGLISH|CHINEse
```

```
:SYSTem:LANGuage?
```

Description

Sets the language of the instrument.

Queries the language of the instrument.

Parameter

Name	Type	Range	Default
--	Keyword	ENGLISH CHINEse	ENGLISH

Return Format

The query returns ENGL or CHIN.

Example

The following command sets the language to English.

```
:SYSTem:LANGuage ENGLISH
```

The following query returns ENGL.
:SYSTem:LANGuage?

:SYSTem:LKEY

Syntax

```
:SYSTem:LKEY <option info>@<license info>
:SYSTem:LKEY? <option info>
```

Description

Installs and activates the specified option.
Queries the serial number of the specified option.

Parameter

Name	Type	Range	Default
<option info>	ASCII String	--	--
<license info>	ASCII String	--	--

Remarks

The parameter <option info> indicates the order number of the option. <license info> indicates the serial number of the option.

Example

The following command installs the option RSA5000-PA.

```
:SYSTem:LKEY
RSA5000-PA@8AD12B8EBC5DF492D1D4289B7CBA5B6150BF6F5D752D645C36D74530B05F39B49C461B2
3A50D6C94A34E06782AC4380070B0D1A86BA84E02768391FFD70C2103
```

The following query returns

```
8AD12B8EBC5DF492D1D4289B7CBA5B6150BF6F5D752D645C36D74530B05F39B49C461B23A50D6C94A3
4E06782AC4380070B0D1A86BA84E02768391FFD70C2103.
:SYSTem:LKEY? RSA5000-PA
```

:SYSTem:OPTion:STATe?

Syntax

```
:SYSTem:OPTion:STATe? <option name>
```

Description

Queries whether an option is activated or not.

Parameter

Name	Type	Range	Default
<option name>	ASCII String	--	--

Return Format

The query returns 0 (not activated) or 1 (activated).

Example

The following command queries whether the option RSA5000-PA is activated.

```
:SYSTem:OPTion:STATe? RSA5000-PA
```


:SYSTem:PON:TYPE

Syntax

```
:SYSTem:PON:TYPE PRESet|LAST
:SYSTem:PON:TYPE?
```

Description

Selects the setting type the instrument recalls at power-on.
Queries what setting type the instrument recalls at power-on.

Parameter

Name	Type	Range	Default
--	Keyword	PRESet LAST	PRESet

Remarks

PRESet: indicates preset settings, including factory mode and 6 user-defined settings.
LAST: indicates the last setting.

Return Format

The query returns PRES or LAST.

Example

The following command sets the instrument to recall the last setting.
:SYSTem:PON:TYPE LAST

The following query returns LAST.
:SYSTem:PON:TYPE?

:SYSTem:PRESet

Syntax

```
:SYSTem:PRESet
```

Description

Recalls the preset settings of the system and recovers the system to the state specified by the [:SYSTem:PRESet:TYPE](#) command.

:SYSTem:PRESet:SAVE

Syntax

```
:SYSTem:PRESet:SAVE USER1|USER2|USER3|USER4|USER5|USER6
```

Description

Saves the specified user setting.

Parameter

Name	Type	Range	Default
--	Keyword	USER1 USER2 USER3 USER4 USER5 USER6	--

:SYSTem:PRESet:TYPE

Syntax

```
:SYSTem:PRESet:TYPe FACTory|USER1|USER2|USER3|USER4|USER5|USER6
:SYSTem:PRESet:TYPe?
```

Description

Selects the preset type of the system to the factory mode or any one of the items from User1 to User6. Queries the preset type of the system.

Parameter

Name	Type	Range	Default
--	Keyword	FACTory USER1 USER2 USER3 USER4 USER5 USER6	FACTory

Return Format

The query returns FACT, USER1, USER2, USER3, USER4, USER5, or USER6.

Example

The following command sets the preset type of the system to User5.
:SYSTem:PRESet:TYPe USER5

The following query returns USER5.
:SYSTem:PRESet:TYPe?

:SYSTem:PRESet:USER:SAVE

Syntax

```
:SYSTem:PRESet:USER:SAVE
```

Description

Saves the current user setting.

Remarks

If the current preset type is "FACTory", save the current user setting to User1. If the current preset type is "User1 through User6", save the current user setting to the specified user.

:SYSTem:SCPI:DISPlay

Syntax

```
:SYSTem:SCPI:DISPlay OFF|ON|0|1
:SYSTem:SCPI:DISPlay?
```

Description

Enables or disables the SCPI display. Queries the setting status of the SCPI display.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Remarks

When you use the SCPI commands to control the instrument remotely, turning on the SCPI Display will go to the specified menu of the corresponding command; turning off the SCPI Display will not go to the specified menu.

Return Format

The query returns 0 or 1.

Example

The following command enables the SCPI display.

```
:SYSTem:SCPI:DISPlay 1 or :SYSTem:SCPI:DISPlay ON
```

The following query returns 1.

```
:SYSTem:SCPI:DISPlay?
```

:SYSTem:SECurity:CLEAr**Syntax**

```
:SYSTem:SECurity:CLEAr
```

Description

Clears all the data that you set safely.

Remarks

Deletes all the files that you have saved, deletes all the configuration files, and executes the factory resetting operation.

:SYSTem:SHOW**Syntax**

```
:SYSTem:SHOW OFF|SYSTem|OPTion|LICense
```

```
:SYSTem:SHOW?
```

Description

Displays the system-related information.

Queries the system-related information.

Parameter

Name	Type	Range	Default
--	Keyword	OFF SYSTem OPTion LICense	OFF

Remarks

OFF: turns off the system information display.

SYSTem: displays the system information.

OPTion: displays the option information.

LICense: displays the registration information.

Return Format

The query returns OFF, SYST, OPT, or LIC.

Example

The following command displays the system information.

```
:SYSTem:SHOW SYSTem
```

The following query returns SYST.

```
:SYSTem:SHOW?
```

:SYSTem:TIME

Syntax

:SYSTem:TIME <hour>,<minute>,<second>

:SYSTem:TIME?

Description

Sets the system time of the instrument.

Queries the system time of the instrument.

Parameter

Name	Type	Range	Default
<hour>	ASCII String	00 to 23	--
<minute>	ASCII String	00 to 59	--
<second>	ASCII String	00 to 59	--

Return Format

The query returns the current system time in the format of "HH,MM,SS".

Example

The following command sets the system time to "15:10:30".

```
:SYSTem:TIME 15,10,30
```

The following query returns 15,10,30.

```
:SYSTem:TIME?
```


:TRIGger Commands

Command List:

- ◆ [:TRIGger\[:SEQuence\]:ATRigger](#)
- ◆ [:TRIGger\[:SEQuence\]:ATRigger:STATe](#)
- ◆ [:TRIGger\[:SEQuence\]:EXTernal<n>:DELay](#)
- ◆ [:TRIGger\[:SEQuence\]:EXTernal<n>:DELay:STATe](#)
- ◆ [:TRIGger\[:SEQuence\]:EXTernal<n>:SLOPe](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:CRITeria](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:DELay](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:DELay:STATe](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK](#)
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- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK:RELative:AMPLitude](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK:RELative:FREQuency](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK<n>:BUILd](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK<n>:DATA](#)
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- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK<n>:NAME](#)
- ◆ [:TRIGger\[:SEQuence\]:FMT:MASK<n>:NEW](#)
- ◆ [:TRIGger\[:SEQuence\]:HOLDoff](#)
- ◆ [:TRIGger\[:SEQuence\]:HOLDoff:STATe](#)
- ◆ [:TRIGger\[:SEQuence\]:LEVel](#)
- ◆ [:TRIGger\[:SEQuence\]:SOURce](#)
- ◆ [:TRIGger2:MODE](#)

:TRIGger[:SEQuence]:ATRigger

Syntax

```
:TRIGger[:SEQuence]:ATRigger <time>
:TRIGger[:SEQuence]:ATRigger?
```

Description

Sets the auto trigger time.
Queries the auto trigger time.

Parameter

Name	Type	Range	Default
<time>	Consecutive Real Number	1 ms to 100 s	100 ms

Remarks

This command is only valid when the auto triggering function is enabled.

Return Format

The query returns the time value in scientific notation. The unit is s.

Example

The following command sets the time to 10 ms.

```
:TRIGger:SEQuence:ATRigger 0.01
```

The following query returns 1.000000000e-02.

```
:TRIGger:SEQuence:ATRigger?
```

:TRIGger[:SEQuence]:ATRigger:STATe**Syntax**

```
:TRIGger[:SEQuence]:ATRigger:STATe OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:ATRigger:STATe?
```

Description

Enables or disables the auto trigger function.

Queries the setting status of auto trigger function.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 1 or 0.

Example

The following command enables the auto trigger function.

```
:TRIGger:SEQuence:ATRigger:STATe ON or :TRIGger:SEQuence:ATRigger:STATe 1
```

The following query returns 1.

```
:TRIGger:SEQuence:ATRigger:STATe?
```

:TRIGger[:SEQuence]:EXTernal<n>:DELay**Syntax**

```
:TRIGger[:SEQuence]:EXTernal<n>:DELay <time>
```

```
:TRIGger[:SEQuence]:EXTernal<n>:DELay?
```

Description

Sets the delay time for the external trigger.

Queries the delay time for the external trigger.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	--
<time>	Consecutive Real Number	0 μ s to 500 ms	1 μ s

Remarks

When the parameter n is set to 1, it indicates External Trigger 1; when set to 2, it indicates External Trigger 2.

This command is only valid when the external trigger delay function is enabled.

Return Format

The query returns the delay time for the external trigger in scientific notation. The unit is s.

Example

The following command sets the delay time for External Trigger 1 to 100 ms.

```
:TRIGger:SEQuence:EXTErnal1:DELAy 0.1
```

The following query returns 1.000000000e-01.

```
:TRIGger:SEQuence:EXTErnal1:DELAy?
```

:TRIGger[:SEQuence]:EXTErnal<n>:DELAy:STATe**Syntax**

```
:TRIGger[:SEQuence]:EXTErnal<n>:DELAy:STATe OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:EXTErnal<n>:DELAy:STATe?
```

Description

Enables or disables the external trigger delay function.

Queries the status of the external trigger delay function.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	--
--	Bool	OFF ON 0 1	OFF 0

Remarks

When the parameter n is set to 1, it indicates External Trigger 1; when set to 2, it indicates External Trigger 2.

Return Format

The query returns 1 or 0.

Example

The following command enables the delay function of External Trigger 1.

```
:TRIGger:SEQuence:EXTErnal1:DELAy:STATe ON or :TRIGger:SEQuence:EXTErnal1:DELAy:STATe 1
```

The following query returns 1.

```
:TRIGger:SEQuence:EXTErnal1:DELAy:STATe?
```

:TRIGger[:SEQuence]:EXTErnal<n>:SLOPe**Syntax**

```
:TRIGger:SEQuence:EXTErnal<n>:SLOPe POSitive|NEGative
```

```
:TRIGger:SEQuence:EXTErnal<n>:SLOPe?
```

Description

Sets the trigger edge for the external trigger.

Queries the trigger edge for the external trigger.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	--
--	Keyword	POSitive NEGative	POSitive

Remarks

When the parameter n is set to 1, it indicates External Trigger 1; when set to 2, it indicates External Trigger 2.

POSitive: indicates the rising edge.

NEGative: indicates the falling edge.

Return Format

The query returns POS or NEG.

Example

The following command sets the trigger edge of External Trigger 1 to POSitive.

```
:TRIGger:SEQuence:EXTernal1:SLOPe POSitive
```

The following query returns POS.

```
:TRIGger:SEQuence:EXTernal1:SLOPe?
```

:TRIGger[:SEQuence]:FMT:CRITeria**Syntax**

```
:TRIGger[:SEQuence]:FMT:CRITeria ENTer|LEAVe|INSide|OUTSide|ELEave|LENTer
```

```
:TRIGger[:SEQuence]:FMT:CRITeria?
```

Description

Sets the trigger criteria for FMT.

Queries the trigger criteria for FMT.

Parameter

Name	Type	Range	Default
---	Keyword	ENTer LEAVe INSide OUTSide ELEave LENTer	ENTer

Remarks

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns ENT, LEAV, INS, OUTS, ELE, or LENT.

Example

The following command sets the trigger criteria for FMT to Enter.

```
:TRIGger:SEQuence:FMT:CRITeria ENTer
```

The following query returns ENT.

```
:TRIGger:SEQuence:FMT:CRITeria?
```

:TRIGger[:SEQuence]:FMT:DELAy**Syntax**

```
:TRIGger[:SEQuence]:FMT:DELAy <time>
```

```
:TRIGger[:SEQuence]:FMT:DELAy?
```

Description

Sets the delay time for FMT.

Queries the delay time for FMT.

Parameter

Name	Type	Range	Default
<time>	Consecutive Real Number	0 us to 500 ms	1 μ s

Remarks

When "Inside" or "Outside" is selected to be the trigger criteria, the FMT trigger delay command is invalid. This command is only valid when the following conditions are met: FMT is selected to be the trigger source; FMT trigger delay function is enabled.

Return Format

The query returns the delay time for FMT in scientific notation. The unit is s.

Example

The following command sets the delay time for FMT to 100 ms.

```
:TRIGger:SEQuence:FMT:DELay 0.1
```

The following query returns 1.000000000e-01.

```
:TRIGger:SEQuence:FMT:DELay?
```

:TRIGger[:SEQuence]:FMT:DELay:STATE**Syntax**

```
:TRIGger[:SEQuence]:FMT:DELay:STATe OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:FMT:DELay:STATe?
```

Description

Enables or disables the FMT trigger delay function.

Queries the status of the FMT trigger delay function.

Parameter

Name	Type	Range	Default
---	Bool	OFF ON 0 1	OFF 0

Remarks

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns 1 or 0.

Example

The following command enables the FMT trigger delay function.

```
:TRIGger:SEQuence:FMT:DELay:STATe ON or :TRIGger:SEQuence:FMT:DELay:STATe 1
```

The following query returns 1.

```
:TRIGger:SEQuence:FMT:DELay:STATe?
```

:TRIGger[:SEQuence]:FMT:MASK**Syntax**

```
:TRIGger[:SEQuence]:FMT:MASK UPPer|LOWer|BOTH
```

```
:TRIGger[:SEQuence]:FMT:MASK?
```

Description

Sets the mask to be used for the current trigger.

Queries the mask to be used for the current trigger.

Parameter

Name	Type	Range	Default
---	Keyword	UPPer LOWer BOTH	UPPer

Remarks

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns UPP, LOW, or BOTH.

Example

The following command sets the mask to be used for the current trigger to Upper.

```
:TRIGger:SEQuence:FMT:MASK UPPer
```

The following query returns UPP.

```
:TRIGger:SEQuence:FMT:MASK?
```

:TRIGger[:SEQuence]:FMT:MASK:EDIT

Syntax

```
:TRIGger[:SEQuence]:FMT:MASK:EDIT UPPer|LOWer
```

```
:TRIGger[:SEQuence]:FMT:MASK:EDIT?
```

Description

Sets the mask type that is currently viewed/edited.

Queries the mask type that is currently viewed/edited.

Parameter

Name	Type	Range	Default
---	Keyword	UPPer LOWer	UPPer

Remarks

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns UPP or LOW.

Example

The following command sets the mask that is currently viewed/edited to Upper.

```
:TRIGger:SEQuence:FMT:MASK:EDIT UPPer
```

The following query returns UPP.

```
:TRIGger:SEQuence:FMT:MASK:EDIT?
```

:TRIGger[:SEQuence]:FMT:MASK:RELative:AMPLitude

Syntax

```
:TRIGger[:SEQuence]:FMT:MASK:RELative:AMPLitude OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:FMT:MASK:RELative:AMPLitude?
```

Description

Sets whether the amplitudes of the mask points are coupled to the reference level of the instrument.

Queries whether the amplitudes of the mask points are coupled to the reference level of the instrument.

Parameter

Name	Type	Range	Default
---	Bool	OFF ON 0 1	OFF 0

Remarks

OFF|0: disables the coupling function. That is, when "Fixed" is selected under **Y Axis Type**, the amplitude of the current mask point will not be affected by the reference level.

ON|1: enables the coupling function. That is, when "Relative" is selected under **Y Axis Type**, the amplitude of the current mask point is the difference between the point and the current reference level.

If you modify the state of this parameter after the mask has been set, the amplitude of the mask should make corresponding changes based on the state of the parameter, so as to keep the relations between the mask and the reference level of the instrument unchanged.

When on, the amplitude of the mask point is expressed as an offset from the reference level.

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns 1 or 0.

Example

The following command enables the coupling relationship between the amplitudes of the mask points and the instrument's reference level.

```
:TRIGger:SEQuence:FMT:MASK:RELative:AMPLitude ON
```

```
or :TRIGger:SEQuence:FMT:MASK:RELative:AMPLitude 1
```

The following query returns 1.

```
:TRIGger:SEQuence:FMT:MASK:RELative:AMPLitude?
```

:TRIGger[:SEQuence]:FMT:MASK:RELative:FREQuency

Syntax

```
:TRIGger[:SEQuence]:FMT:MASK:RELative:FREQuency OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:FMT:MASK:RELative:FREQuency?
```

Description

Sets whether the frequencies of the mask points are coupled to the center frequency of the instrument.

Queries whether the frequencies of the mask points are coupled to the center frequency of the instrument.

Parameter

Name	Type	Range	Default
---	Bool	OFF ON 0 1	OFF 0

Remarks

OFF|0: disables the coupling function. That is, when "Fixed" is selected under **X Axis Type**, the frequency of the current mask point will not be affected by the center frequency.

ON|1: enables the coupling function. That is, when "Relative" is selected under **X Axis Type**, the frequency of the current mask point is the difference between the point and the current center frequency.

If you modify the state of this parameter after the mask has been set, the frequency of the mask should make corresponding changes based on the state of the parameter, so as to keep the relations between the mask and the center frequency of the instrument unchanged.

When on, the frequencies of the mask points are expressed as an offset from the center frequency. At this time, the frequencies of the mask points can be negative values.

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns 1 or 0.

Example

The following command enables the coupling relationship between the frequencies of the mask points and the instrument's center frequency.

```
:TRIGger:SEquence:FMT:MASK:RELative:FREQuency ON
```

```
or :TRIGger:SEquence:FMT:MASK:RELative:FREQuency 1
```

The following query returns 1.

```
:TRIGger:SEquence:FMT:MASK:RELative:FREQuency?
```

:TRIGger[:SEquence]:FMT:MASK<n>:BUIld**Syntax**

```
:TRIGger[:SEquence]:FMT:MASK<n>:BUIld
```

Description

Creates a mask according the RT trace data.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	--

Remarks

When <n> is set to 1, it indicates that the upper mask is being edited; when it is set to 2, it indicates that the lower mask is being edited.

This command is only valid when you select FMT to be the trigger source.

Example

The following command creates a upper mask.

```
:TRIGger:SEquence:FMT:MASK1:BUIld
```

:TRIGger[:SEquence]:FMT:MASK<n>:DATA**Syntax**

```
:TRIGger[:SEquence]:FMT:MASK<n>:DATA <freq>,<ampl>{,<freq>,<ampl>}
```

```
:TRIGger[:SEquence]:FMT:MASK<n>:DATA?
```

Description

Edits the mask parameters.

Queries the mask parameters.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	---
<freq>	Consecutive Real Number	0 Hz to 6.5 GHz	
<ampl>	Consecutive Real Number	-1,000 dBm to 1,000 dBm	

Remarks

When <n> is set to 1, it indicates that the upper mask is being edited; when it is set to 2, it indicates that the lower mask is being edited.

This command is only valid when you select FMT to be the trigger source.

Return Format

The query returns the mask parameters that are being edited currently in scientific notation.

Example

The following command edits the two points of the upper mask.

```
:TRIGger:SEQuence:FMT:MASK1:DATA -80000000, -50, 80000000, -50
```

The following query returns $-8.000000e+07$, $-5.000000e+01$, $8.000000e+07$, $-5.000000e+01$

```
:TRIGger:SEQuence:FMT:MASK1:DATA?
```

:TRIGger[:SEQuence]:FMT:MASK<n>:DELeTe**Syntax**

```
:TRIGger[:SEQuence]:FMT:MASK<n>:DELeTe
```

Description

Deletes the specified mask.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	---

Remarks

When <n> is set to 1, edit the upper mask; when set to 2, edit the lower mask.

This command is only valid when you select FMT to be the trigger source.

:TRIGger[:SEQuence]:FMT:MASK<n>:NAME**Syntax**

```
:TRIGger[:SEQuence]:FMT:MASK<n>:NAME <string>
```

```
:TRIGger[:SEQuence]:FMT:MASK<n>:NAME?
```

Description

Saves the FMT file with a specified filename suffixed with ".csv" to the default path ("/mode name"/mask).

Queries the currently saved FMT filename.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	---
<string>	ASCII String	---	---

Remarks

If the specified file already exists, overwrite it.

When <n> is set to 1, edit the upper mask; when set to 2, edit the lower mask.

Example

The following command saves the upper mask FMT file with the filename (mask1.csv) to the "/vsa/mask" folder.

```
:TRIGger:SEQuence:FMT:MASK1:NAME mask1
```

The following query returns mask1.

```
:TRIGger:SEQuence:FMT:MASK1:NAME?
```

:TRIGger[:SEQuence]:FMT:MASK<n>:NEW

Syntax

```
:TRIGger[:SEQuence]:FMT:MASK<n>:NEW
```

Description

Clears the currently activated mask and creates a default new mask.

Parameter

Name	Type	Range	Default
<n>	Discrete	1 2	---

Remarks

When <n> is set to 1, it indicates that the upper mask is being edited; when it is set to 2, it indicates that the lower mask is being edited.

This command is only valid when you select FMT to be the trigger source.

:TRIGger[:SEQuence]:HOLDoff

Syntax

```
:TRIGger[:SEQuence]:HOLDoff <time>
```

```
:TRIGger[:SEQuence]:HOLDoff?
```

Description

Sets the trigger holdoff time.

Queries the trigger holdoff time.

Parameter

Name	Type	Range	Default
<time>	Consecutive Real Number	100 μ s to 500 ms	100 ms

Remarks

This command is only valid when the trigger holdoff function is enabled.

Return Format

The query returns the trigger holdoff time in scientific notation. The unit is s.

Example

The following command sets the sync holdoff time to 100 ms.

```
:TRIGger:SEQuence:HOLDoff 0.1
```

The following query returns 1.000000000e-01.

```
:TRIGger:SEQuence:HOLDoff?
```

:TRIGger[:SEQuence]:HOLDoff:STATe

Syntax

```
:TRIGger[:SEQuence]:HOLDoff:STATe OFF|ON|0|1
```

```
:TRIGger[:SEQuence]:HOLDoff:STATe?
```

Description

Turns on or off the trigger holdoff function.

Queries the status of the trigger holdoff function.

Parameter

Name	Type	Range	Default
--	Bool	OFF ON 0 1	OFF 0

Return Format

The query returns 1 or 0.

Example

The following command enables the trigger holdoff function.

```
:TRIGger:SEQuence:HOLDoff:STATe ON or :TRIGger:SEQuence:HOLDoff:STATe 1
```

The following query returns 1.

```
:TRIGger:SEQuence:HOLDoff:STATe?
```

:TRIGger[:SEQuence]:LEVel**Syntax**

```
:TRIGger[:SEQuence]:LEVel <ampl>
```

```
:TRIGger[:SEQuence]:LEVel?
```

Description

Sets the trigger level of the IF power trigger.

Queries the trigger level of the IF power trigger.

Parameter

Name	Type	Range	Default
<ampl>	Consecutive Real Number	-140 dBm to 30 dBm	0 dBm

Remarks

This command is only valid when IF power trigger is selected.

Return Format

The query returns the trigger level in scientific notation.

Example

The following command sets the trigger level of IF power to 10 dBm.

```
:TRIGger:SEQuence:LEVel 10
```

The following query returns 1.000000e+01.

```
:TRIGger:SEQuence:LEVel?
```

:TRIGger[:SEQuence]:SOURce**Syntax**

```
:TRIGger[:SEQuence]:SOURce EXTernal1|EXTernal2|IMMediate|FMT|POWer
```

```
:TRIGger[:SEQuence]:SOURce?
```

Description

Sets the trigger source.

Queries the trigger source.

Parameter

Name	Type	Range	Default
--	Keyword	EXTernal1 EXTernal2 IMMediate FMT POWer	IMMediate

Remarks

EXternal1: indicates External Trigger 1.
 EXternal2: indicates External Trigger 2.
 IMMEDIATE: indicates the free-run trigger.
 FMT: indicates the frequency mask trigger.
 POWer: indicates IF Power Trigger.

Return Format

The query returns EXT1, EXT2, IMM, FMT, or POW.

Example

The following command sets the trigger source to free-run trigger.
 :TRIGger:SEquence:SOURce IMMEDIATE

The following query returns IMM.
 :TRIGger:SEquence:SOURce?

:TRIGger2:MODE**Syntax**

:TRIGger2:MODE IN|OUT|0|1
 :TRIGger2:MODE?

Description

Sets the interface type of External Trigger 2.
 Queries the interface type of External Trigger 2.

Parameter

Name	Type	Range	Default
--	Keyword	IN OUT 0 1	IN 0

Remarks

IN|0: indicates the input interface.
 OUT|1: indicates the output interface.

Return Format

The query returns 0 or 1.

Example

The following command sets External Trigger 2 to be the input interface.
 :TRIGger2:MODE IN

The following query returns 0.
 :TRIGger2:MODE?

Chapter 3 Appendix

Appendix A: Default Settings

Sending the [*RST](#) command can restore the instrument to default settings, as shown in the table below.

Parameter Name	VSA Parameter Value
FREQ	
Center Freq	1 GHz
Start Freq	998.4375 MHz
Stop Freq	1.0015625 GHz
CF Step	Auto, 312.5 kHz
SPAN	
X Scale	Auto
Ref Value	19.1406 us
Width	38.2812 us
AMPT	
Ref Value	0
Scale/Div	300 m
Range	20 dBm
BW	
FFT Window	Rectangular
Trigger	
Source	Free Run
Slope	Positive
Delay	Off, 1 us
Power	0 dBm
Hold-off	Off, 100 ms
Auto Trig	Off, 100 ms
Mask Type	Upper
Trigger Mask	Upper
Trigger Criteria	Enter
Active Mask	Upper
Frequency	0 Hz
Amplitude	0 dB
X Offset	0 Hz
Y Offset	0 dB
X Axis Type	Relative
Y Axis Type	Relative
Trace	
Selected Trace	Trace1
Data	Mea Time/Symbol
Trace Format	I-Q
Eye Length	2
Symbol Format	Binary
Trace Det	Pos Peak
Mode Setup	
Global CF States	Off, 1 GHz
Meas	
Measurement Function	Demod Setup
Meas Setup	
Mod Format	QPSK
Ref Deviation Mode	Auto
Ref Deviation	1 kHz

Diff Encoding	On
Meas Interval	50
Points/Symbol	4
Symbol Rate	1 MHz
Meas Filter	None
Ref Filter	RRC
Alpha/BT	0.22
Burst Search Length	50 us
Burst Search Run-In	0
Burst Search	Off
Sync Analyze Length	50
Sync Search	Off
Sync Offset	0
Window Layout	Four Window
Marker	
Selected Marker	Marker1
Marker Mode	Position
Reference Marker	Marker2
Marker Trace	Trace1
Couple Markers	Off
Marker Table	Off
Marker X	25 symbol
Peak	
Cont Peak	Off
Marker Func	
Band Function	Off
Band Span	3.125 kHz
System^[1]	
Power On	Preset
Preset Type	Default
Align Auto	On
LAN Setting Mode	DHCP
Graticule	On
HDMI	On
HDMI Resolution	1280*720 60Hz
LCD	On
LCD Backlight	100%
Power Switch	Default
Beep Switch	Off
SCPI Display	On
User Key	Off
Language	English

Note^[1]: Not affected by Preset settings.

Appendix B: Warranty

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

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

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