

**MS2690A/MS2691A/MS2692A
and MS2830A
Signal Analyzer
Operation Manual
Noise Figure Measurement Function
Remote Control**

Second Edition


- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the “MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Operation)”. Please also refer to this document before using the equipment.
- Keep this manual with the equipment.


ANRITSU CORPORATION


Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

 **DANGER** This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

 **WARNING** This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

 **CAUTION** This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MS2690A/MS2691A/MS2692A and MS2830A

Signal Analyzer

Operation Manual Noise Figure Measurement Function Remote Control

23 October 2012 (First Edition)

11 April 2014 (Second Edition)

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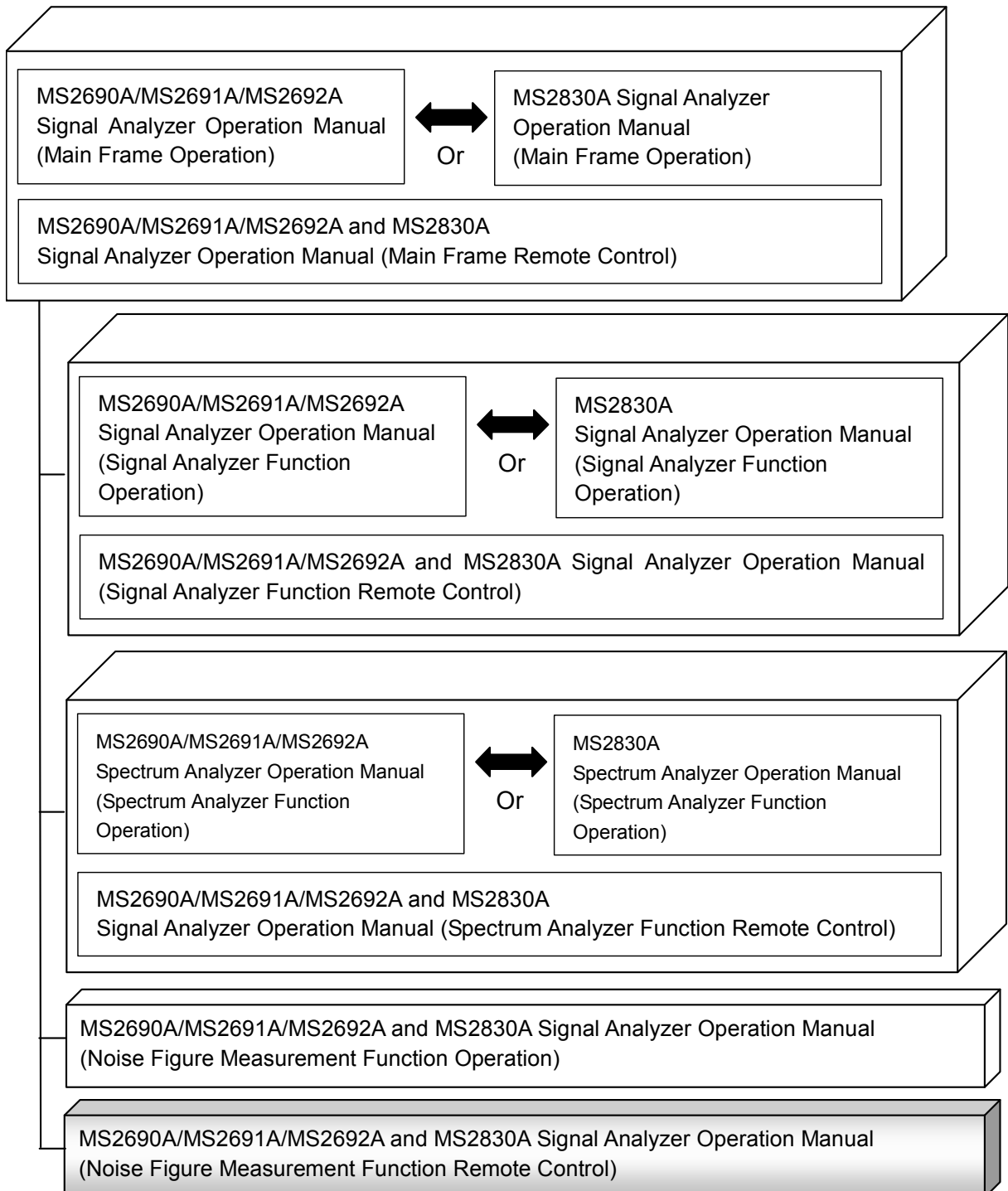
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About This Manual

■ Associated Documents

The operation manual configuration of the MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer is shown below.



- Signal Analyzer Operation Manual (Mainframe Operation)
- Signal Analyzer Operation Manual (Mainframe Remote Control)
Description of basic operations, maintenance procedures, common functions and common remote functions of the mainframe
- Signal Analyzer Operation Manual (Signal Analyzer Function)
- Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control)
Description of basic operations, functions and remote functions of the signal analyzer
- Signal Analyzer Operation Manual (Spectrum Analyzer Function)
- Signal Analyzer Operation Manual (Spectrum Analyzer Function Remote Control)
Description of basic operations, functions and remote functions of the spectrum analyzer
- Signal Analyzer Operation Manual (Noise Figure Measurement Function)
- Signal Analyzer Operation Manual (Noise Figure Measurement Function Remote Control) <This document>
Description of basic operations, functions and remote functions of the Phase Noise

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Chapter 1 Overview

This chapter provides an overview of the remote control of the Noise Figure Measurement Function (hereinafter, referred to as “this application”).


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1.1 Overview

This application can be controlled from an external controller (PC) by remote control commands using the MS2690/MS2691/MS2692A or MS2830A Signal Analyzer (hereinafter, referred to as “this instrument”). The remote control commands are defined by the SCPI format.

1.1.1 Interface

This instrument has GPIB, Ethernet, and USB interfaces for remote control. Those interfaces cannot be used at the same time.

The interface is automatically determined when a command is received at the start of communication. This instrument enters the remote state after the interface has been determined. The front panel  lamp lights during remote interface operation, and goes off during local-interface operation.

Refer to the *MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)* for more details of the basic operations for remote control, such as interface setting.

1.1.2 Controlled Application

Two types of the remote control commands can be used with this instrument: commands that are commonly applied to this instrument itself or all the applications (hereinafter, referred to as “Common commands”), and the other commands unique to the applications. Common commands can be executed at any time and do not depend on the currently controlled application. However, commands unique to an application can be executed at the controlled application. If it is executed at another application, the command is not executed or an error occurs.

In this instrument, multiple applications can be activated at the same time. Only one application resource can be executed at one time per piece of hardware. This application measures an input signal by using the resource of RF Input. Thus, this application cannot be executed at the same time with another application using the same resource such as the signal analyzer function. In order to execute a function unique to the application by using the remote control, you need to select this application while it has been running. Furthermore, this application can be executed at the same time with another application that uses by itself a resource not used by this application, such as the Vector Signal Generator option.

1.2 Native Mode

In this instrument, the syntax/format types of the remote control commands are defined as “Language mode.” The language mode has two modes: SCPI and Native.

(1) SCPI mode

The SCPI mode processes commands conforming to the syntax/format defined in SCPI (ver1999.0). For programming, you can use character strings in long/short form and can omit definition character strings within square brackets ([]).

On the Configuration screen, the SCPI mode is automatically set after transmitting command `SYST:LANG SCPI`.

(2) Native mode

The Native mode processes commands that are in this instrument's own definition type. Unless otherwise specified, the character string of a command header is fixed. If application commands are defined only by the SCPI mode, character strings converted according to the conversion rules are the commands in the Native mode. For programming, you cannot use the grammar of the SCPI mode, such as character strings in long/short form and cannot omit any definition character strings within square brackets ([]).

On the Configuration screen, the Native mode is automatically set after transmitting `SYST:LANG NAT`.

Note:

The `STATUS:QUESTIONABLE` and `STATUS:OPERATION` registers cannot be used in the Native mode, even if the corresponding commands are converted to Native-mode commands according to the conversion rules.

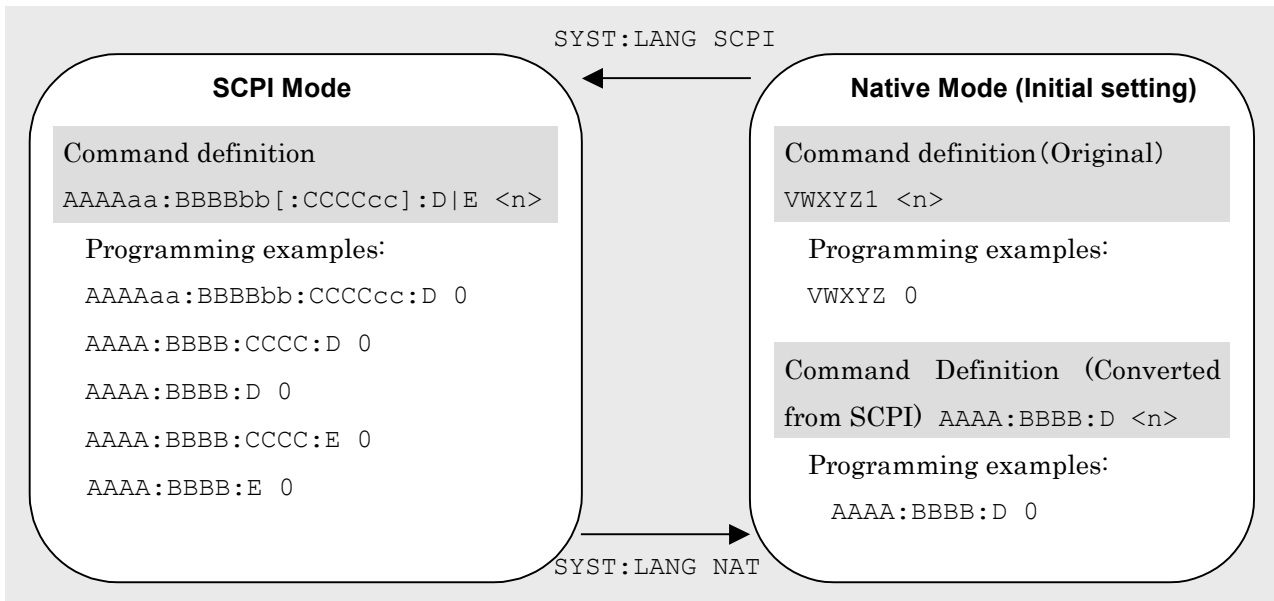


Figure 1.2-1 SCPI and Native modes

This application is only defined as the SCPI mode commands. You need to follow the conversion rules below in order to control this application by using the Native mode.

Conversion Rules

- [1] Move the numeric parameter in the program header of an SCPI command before the argument. Delete a numeric parameter which only has one value and can be deleted. Describe the argument if it cannot be deleted.
- [2] Use the first one if multiple nodes can be selected.
- [3] Delete those layers which can be deleted.
- [4] Alter all long forms into short forms.
- [5] Delete the colon mark (“:”) at the head.

Example

To convert `:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real>` into a Native mode command.

- [1] Delete a numeric parameter in the program header which only has one value and can be deleted.


```
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real>
```

↓

```
:DISPlay:WINDow:TRACe:Y:[SCALe]:RLEVel <real>
```

- [2] Delete those layers which can be deleted.
:DISPlay:WINDow:TRACe:Y[:**SCALE**]:RLEVel <real>
↓
:DISPlay:WINDow:TRACe:Y:RLEVel <real>
- [3] Alter all long forms into short ones.
:**DISPlay:WINDow:TRACe:Y:RLEVel** <real>
↓
:DISP:WIND:TRAC:Y:RLEV <real>
- [4] Delete the colon mark (":") at the head.
:DISP:WIND:TRAC:Y:RLEV <real>
↓
DISP:WIND:TRAC:Y:RLEV <real>

1.3 Setting Numeric Program Data

The following character programs can be used for setting numeric program data (numeric parameter).

(1) DEFault

After DEFault is set to numeric program data, the target parameter is set to the initial value.

(2) MINimum

After MINimum is set to numeric program data, the target parameter is set to the minimum value.

(3) MAXimum

After MAXimum is set to numeric program data, the target parameter is set to the maximum value.

Chapter 2 SCPI Device Message Details

This chapter describes the detailed specifications of SCPI remote control commands for executing the functions of this application. The device messages are listed according to each function. Refer to the *MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)* for the detailed specifications of the IEEE488.2 common device messages and application common device messages.

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2.1 Selecting Application

Table 2.1-1 lists the device messages for setup operations such as starting/selecting/initializing an application.

Table 2.1-1 Selecting Application

Function	Device Message
Load Application	:SYSTem:APPLiCation:LOAD NFIGURE
Unload Application	:SYSTem:APPLiCation:UNLoad NFIGURE
Application Switch	:INSTRument[:SELEct] NFIGURE CONFIG
	:INSTRument[:SELEct]?
Application Status	:INSTRument:SYSTem NFIGURE, [ACTive] INACTive MINimum
	:INSTRument:SYSTem? NFIGURE
Initialization	:INSTRument:DEFault
	:SYSTem:PRESet

:SYSTem:APPLication:LOAD NFIGURE

Load Application

Function

This command loads this application.

Command

```
:SYSTem:APPLication:LOAD NFIGURE
```

Details

This function loads the installed application and registers it to the Application Switch menu. This function is available when the control-targeted application is Config.

Example of Use

To activate this application.
SYST:APPL:LOAD NFIGURE

:SYSTem:APPLication:UNLoad NFIGURE

Unload Application

Function

Exits this application.

Command

```
:SYSTem:APPLication:UNLoad NFIGURE
```

Details

This function exits the active application and deletes it from the Application Switch menu. This function is available when the control-targeted application is Config.

Example of Use

To exit this application.
SYST:APPL:UNL NFIGURE

:INSTrument[:SElect] NFIGURE|CONFIG

Application Switch

Function

Selects the control-targeted application

Command

```
:INSTrument[:SElect] <apl_name>
```

Parameter

<apl_name>	Application
NFIGURE	This Application
CONFIG	Config

Example of Use

To switch the control-targeted application into the Noise Figure measurement function.

```
INST NFIGURE
```

:INSTrument[:SElect]?

Application Switch Query

Function

Queries the control-targeted application.

Query

```
:INSTrument[:SElect]?
```

Response

```
<apl_name>
```

Parameter

<apl_name>	Application name
NFIGURE	This Application
CONFIG	Config

Example of Use

To query the control-targeted application

```
INST?  
> NFIGURE
```


:INSTrument:SYSTem NFIGURE,[ACTive]|INACTive|MINimum

Application Switch And Window Status

Function

Selects the control-targeted application by specifying the window status.

Command

`:INSTrument:SYSTem <apl_name>,<window>`

Parameter

<code><apl_name></code>	Application name
<code>NFIGURE</code>	This Application
<code>SIGANA</code>	Signal Analyzer
<code>SPECT</code>	Spectrum Analyzer
<code>CONFIG</code>	Config
<code><window></code>	Window status
<code>ACTive</code>	Active status
<code>INACTive</code>	Inactive status
<code>MINimum</code>	Minimized
When omitted	Active status

Example of Use

To select the Noise Figure measurement function while the window is active.

```
INST:SYST NFIGURE,ACT
```

:INSTrument:SYSTem? NFIGURE

Application Switch And Window Status Query

Function

Queries the application status.

Query

:INSTrument:SYSTem? <apl_name>

Response

<status>,<window>

Parameter

<apl_name>	Application name
NFIGURE	This Application
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config
<status>	Application status
CURR	Executed and targeted for control
RUN	Executed but not targeted for control
IDLE	Loaded but not executed
UNL	Not loaded
<window>	Window status
ACT	Active status
INAC	Inactive status
MIN	Minimized
NON	No window display

Example of Use

To query the application status
INST:SYST? NFIGURE
> CURR,ACT

:INSTrument:DEFault

Preset Current Application

Function

Initializes the setting and the status of the selected application

Command

`:INSTrument:DEFault`

Example of Use

To initialize the setting and the status of the selected application.
`INST:DEF`

:SYSTem:PRESet

Preset Current Application

Function

Initializes the setting and the status of the selected application

Refer to `:INSTrument:DEFault`

Example of Use

To initialize the setting and the status of the selected application
`SYST:PRES`

2.2 Setting Frequency / Span

Table 2.2-1 shows device message of frequency / span.

Table 2.2-1 Frequency / Span Setting

Function	Device Message
Frequency Span	<code>[:SENSe] [:NFIGure] :FREQuency:SPAN <freq></code>
	<code>[:SENSe] [:NFIGure] :FREQuency:SPAN?</code>
	<code>[:SENSe] [:NFIGure] :FREQuency:SPAN:FULL</code>
Center Frequency	<code>[:SENSe] [:NFIGure] :FREQuency:CENTer <freq></code>
	<code>[:SENSe] [:NFIGure] :FREQuency:CENTer?</code>
Start Frequency	<code>[:SENSe] [:NFIGure] :FREQuency:START <freq></code>
	<code>[:SENSe] [:NFIGure] :FREQuency:START?</code>
Stop Frequency	<code>[:SENSe] [:NFIGure] :FREQuency:STOP <freq></code>
	<code>[:SENSe] [:NFIGure] :FREQuency:STOP?</code>
Sweep Point	<code>[:SENSe] [:NFIGure] :SWEep:POINTs <integer></code>
	<code>[:SENSe] [:NFIGure] :SWEep:POINTs?</code>
Fixed Frequency	<code>[:SENSe] [:NFIGure] :FREQuency:FIXed?</code>
Frequency List	<code>[:SENSe] [:NFIGure] :FREQuency:LIST:DATA <freq>, ([,<freq>]) *</code>
	<code>[:SENSe] [:NFIGure] :FREQuency:LIST:DATA?</code>
	<code>[:SENSe] [:NFIGure] :FREQuency:LIST:COUNT?</code>
Frequency List Position	<code>[:SENSe] [:NFIGure] :FREQuency:LIST:POSition <integer></code>
	<code>[:SENSe] [:NFIGure] :FREQuency:LIST:POSition?</code>
Frequency Mode	<code>[:SENSe] [:NFIGure] :FREQuency:MODE SWEpt SWEep FIXed LIST</code>
	<code>[:SENSe] [:NFIGure] :FREQuency:MODE?</code>

`[[:SENSe][:NFIGure]:FREQuency:SPAN <freq>`

Frequency Span

Function

Sets the Frequency Span.

Command

`[[:SENSe][:NFIGure]:FREQuency:SPAN <freq>`

Parameter

<code><freq></code>	Frequency Span
Range	
When DUT mode is Amplifier or when DUT mode is not Amplifier and local frequency mode is fixed.	
Minimum	2 Hz
Maximum	
[MS2690A]	6 GHz
[MS2691A]	13.5 GHz
[MS2692A]	26.5 GHz
[MS2830A]	3.6 GHz (Option 040)
	6 GHz (Option 041)
	13.5 GHz (Option 043)
	26.5 GHz (Option 044)
	43 GHz (Option 045)
When DUT mode is not Amplifier and local frequency mode is variable.	
Minimum	2 Hz
Maximum	325 GHz (Upper limit frequency of external mixer M03HW)
Resolution	2 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted
Default	3.59 GHz

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Frequency Span to 2 GHz.

`FREQ:SPAN 2GHZ`

[[:SENSE][:NFIGure]:FREQUENCY:SPAN?

Frequency Span Query

Function

Queries the Frequency Span.

Query

[[:SENSE][:NFIGure]:FREQUENCY:SPAN?

Response

<freq>

Parameter

<freq>

Frequency Span

Range

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Minimum 2 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 2 Hz

Maximum 325 GHz (Upper limit frequency of external mixer M03HW)

Resolution 2 Hz

Suffix code None, Value is returned in Hz units

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Frequency Span.

FREQ:SPAN?

> 2000000000

[:SENSe][:NFIGure]:FREQuency:SPAN:FULL

Full Span

Function

Sets the Frequency Span to maximum.

Command

[:SENSe] [:NFIGure] :FREQuency:SPAN:FULL

Parameter

<freq>	Full Span Frequency
Range	
[MS2690A]	6 GHz
[MS2691A]	13.5 GHz
[MS2692A]	26.5 GHz
[MS2830A]	3.6 GHz (Option 040)
	6 GHz (Option 041)
	13.5 GHz (Option 043)
	26.5 GHz (Option 044)
	43 GHz (Option 045)

Example of Use

To set the Frequency Span to maximum.

FREQ:SPAN:FULL

[[:SENSe][:NFIGure]:FREQuency:CENTer <freq>

Center Frequency

Function

Sets the Center Frequency.

Command

[[:SENSe][:NFIGure]:FREQuency:CENTer <freq>

Parameter

<freq>	Center Frequency
When DUT mode is Amplifier or	
when DUT mode is not Amplifier and local frequency mode is fixed.	
Range	
Minimum	1 Hz
Maximum	
[MS2690A]	5.999999999 GHz
[MS2691A]	13.499999999 GHz
[MS2692A]	26.499999999 GHz
[MS2830A]	3.599999999 GHz (Option 040)
	5.999999999 GHz (Option 041)
	13.499999999 GHz (Option 043)
	26.499999999 GHz (Option 044)
	42.999999999 GHz (Option 045)
When DUT mode is not Amplifier and local frequency mode is variable.	
Minimum	1 Hz
Maximum	324.999999999 GHz ((Upper limit frequency of external mixer M03HW) – 1)
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	Hz is used when omitted
Default	1.805 GHz

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Center Frequency to 1 GHz.

FREQ:CENT 1GHZ

[:SENSe][:NFIGure]:FREQuency:CENTer?

Center Frequency Query

Function

query the Center Frequency.

Query

[:SENSe] [:NFIGure] :FREQuency:CENTer?

Response

<freq>

Parameter

<freq> Center Frequency

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 1 Hz

Maximum

[MS2690A] 5.99999999 GHz

[MS2691A] 13.49999999 GHz

[MS2692A] 26.49999999 GHz

[MS2830A] 3.59999999 GHz (Option 040)

5.99999999 GHz (Option 041)

13.49999999 GHz (Option 043)

26.49999999 GHz (Option 044)

42.99999999 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 324.99999999 GHz ((Upper limit frequency of
external mixer M03HW) – 1)

Resolution 1 Hz

Suffix code None, Value is returned in Hz units

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Center Frequency.

NFIG:FREQ:CENT?

> 1000000000

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

Start Frequency

Function

Sets the Start Frequency.

Command

`[[:SENSe][:NFIGure]:FREQuency:STARt <freq>`

Parameter

<freq> Start Frequency

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 5.99999998 GHz

[MS2691A] 13.49999998 GHz

[MS2692A] 26.49999998 GHz

[MS2830A] 3.59999998 GHz (Option 040)

5.99999998 GHz (Option 041)

13.49999998 GHz (Option 043)

26.49999998 GHz (Option 044)

42.99999998 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 324.99999998 GHz ((Upper limit frequency of external mixer M03HW) – 2)

Resolution 2 Hz

Suffixcode HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ

Hz is used when omitted.

Default 10 MHz

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Start Frequency to 1 GHz.

`FREQ:STAR 1GHZ`

[:SENSe][:NFIgure]:FREQuency:STARt?

Start Frequency Query

Function

Queries the Start Frequency.

Query

[:SENSe] [:NFIgure] :FREQuency:STARt?

Response

<freq>

Parameter

<freq> Start Frequency

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 5.99999998 GHz

[MS2691A] 13.49999998 GHz

[MS2692A] 26.49999998 GHz

[MS2830A] 3.59999998 GHz (Option 040)

5.99999998 GHz (Option 041)

13.49999998 GHz (Option 043)

26.49999998 GHz (Option 044)

42.99999998 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 324.99999998 GHz ((Upper limit frequency of
external mixer M03HW) – 2)

Resolution 2 Hz

Suffix code None, Value is returned in Hz units

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Start Frequency.

FREQ:STAR?

> 1000000000

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

Stop Frequency

Function

Sets the Stop Frequency.

Command

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

Parameter

<freq> Stop Frequency

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 2 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 2 Hz

Maximum 325 GHz (Upper limit frequency of external mixer M03HW)

Resolution 2 Hz

Suffix code HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ

Hz is used when omitted

Default 3.6 GHz

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Stop Frequency to 1 GHz.

FREQ:STOP 1GHZ

[:SENSe][:NFIGure]:FREQuency:STOP?

Start Frequency Query

Function

Queries the Stop Frequency.

Query

[:SENSe] [:NFIGure] :FREQuency:STOP?

Response

<freq>

Parameter

<freq> Stop Frequency
 When DUT mode is Amplifier or
 when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 2 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 2 Hz

Maximum 325 GHz (Upper limit frequency of external
mixer M03HW)

Resolution 2 Hz

Suffix code None, Value is returned in Hz units.

Details

The range varies depending on the setting of DUT mode, Noise Source,
 LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Stop Frequency.

FREQ:STOP?

> 1000000000

`[[:SENSe]][:NFIGure]:SWEep:POINts <integer>`

Sweep Point

Function

Sets the Sweep Point.

Command

```
[[:SENSe]][:NFIGure]:SWEep:POINts <integer>
```

Parameter

<code><integer></code>	Sweep Point
Range	3 to 501
Resolution	2
Suffix code	None
Default	11

Example of Use

To set the Sweep Point to 201.
`SWE:POIN 201`

`[[:SENSe]][:NFIGure]:SWEep:POINts?`

Sweep Point Query

Function

Queries the Sweep Point.

Query

```
[[:SENSe]][:NFIGure]:SWEep:POINts?
```

Response

```
<integer>
```

Parameter

<code><integer></code>	Sweep Point
Range	3 to 501
Resolution	2
Suffix code	None

Example of Use

To query the Sweep Point.
`SWE:POIN?`
> 201

[:SENSe][:NFIGure]:FREQuency:FIXed?

Fixed Frequency Query

Function

Queries the Fixed Frequency.

Query

[:SENSe] [:NFIGure] :FREQuency:FIXed?

Response

<freq>

Parameter

<freq> Fixed Frequency
 When DUT mode is Amplifier or
 when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 325 GHz (Upper limit frequency of external
mixer M03HW)

Resolution 1 Hz

Suffix code None. Value is returned in Hz units.

Details

The range varies depending on the setting of DUT mode, Noise Source,
 LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Fixed Frequency.

FREQ:FIX?

> 1000000000

[[:SENSE][:NFIGure]:FREQUENCY:LIST:DATA <freq>,([,<freq>])*

Frequency List

Function

Creates the Frequency List.

Command

```
[[:SENSE][:NFIGure]:FREQUENCY:LIST:DATA
<freq_1>([,<freq_2>,...,<freq_n>])
```

Parameter

<freq_n> Frequency of measurement List.

Range

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Minimum 0 Hz

Maximum

[MS2690A]	6 GHz	
[MS2691A]	13.5 GHz	
[MS2692A]	26.5 GHz	
[MS2830A]	3.6 GHz	(Option 040)
	6 GHz	(Option 041)
	13.5 GHz	(Option 043)
	26.5 GHz	(Option 044)
	43 GHz	(Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 325 GHz (Upper limit frequency of external mixer M03HW)

Resolution 1 Hz

Suffix code HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
Hz is used when omitted

Default None

Details

The Frequency List is created. The <freq_n> argument can be specified with multiple items by separating with ",".

Note that this command discards the existing Frequency List and creates a new List.

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Frequency List to 1 GHz, 2 GHz, and 3 GHz.
FREQ:LIST:DATA 1GHZ,2GHZ,3GHZ

[:SENSe][:NFIGure]:FREQuency:LIST:DATA?

Frequency List Query

Function

Queries the Frequency List.

Query

[:SENSe] [:NFIGure] :FREQuency:LIST:DATA?

Response

<freq>

Parameter

<freq>

Frequency of measurement List.

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 325 GHz (Upper limit frequency of external
mixer M03HW)

Resolution 1 Hz

Suffix code None. Value is returned in Hz units.

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query a Frequency List.

FREQ:LIST:DATA?

> 1000000000,2000000000,3000000000

[[:SENSE]:NFIGURE]:FREQUENCY:LIST:COUNT?

Frequency List Count Query

Function

Queries the Frequency List lines count.

Query

`[[:SENSE]:NFIGURE]:FREQUENCY:LIST:COUNT?`

Response

`<count>`

Parameter

<code><count></code>	Frequency List lines count
Range	0 to 501
Resolution	1
Suffix code	None

Example of Use

To query the Frequency List lines count.

`FREQ:LIST:COUN?`

`> 3`

[[:SENSE][:NFIGure]:FREQUENCY:LIST:POSITION <integer>

Frequency List Position

Function

Sets the Frequency List line number.

Command

`[[:SENSE][:NFIGure]:FREQUENCY: LIST:POSITION <integer>`

Parameter

<integer>	Frequency List line number
Range	1 to (Total Point + 1)
Resolution	1
Suffix code	None

Example of Use

To set the Frequency List line number to 3.
`FREQ:LIST:POS 3`

[[:SENSE][:NFIGure]:FREQUENCY:LIST:POSITION?

Frequency List Position Query

Function

Queries the Frequency List line number.

Query

`[[:SENSE][:NFIGure]:FREQUENCY:LIST:POSITION?`

Parameter

<integer>	Frequency List line number
Range	1 to Total Point
Resolution	1
Suffix code	None

Example of Use

To query the Frequency List line number.
`FREQ:LIST:POS?`
`> 3`

[[:SENSE]:[:NFIGure]:FREQuency:MODE SWEPT|SWEep|FIXed|LIST

Frequency Mode

Function

Sets the Frequency Mode.

Command

```
[[:SENSE]:[:NFIGure]:FREQuency:MODE <mode>
```

Parameter

<mode>	Frequency Mode
SWEPT	Sets to Sweep Mode
SWEep	Same as above
FIXed	Sets to Fixed Mode
LIST	Sets to List Mode
Default	SWEPT

Details

- Sweep Mode
The measurement is executed with the measurement point generated automatically from the measurement range and measurement points number.
- Fixed Mode
The measurement is executed with the measurement point with a fixed frequency.
- List Mode
The measurement is executed with the arbitrarily specified measurement points within the range of 1 to 501.

Example of Use

To set the Frequency Mode to Fixed Mode.
FREQ:MODE FIX

[[:SENSE]:[:NFIGure]:FREQUENCY:MODE?

Frequency Mode Query

Function

Queries the Frequency Mode.

Query

[:SENSE] [:NFIGure] :FREQUENCY:MODE?

Response

<mode>

Parameter

<mode>	Frequency Mode
SWEP	Sweep Mode
SWE	Same as above
FIX	Fixed Mode
LIST	List Mode

Example of Use

To query the Frequency Mode.

FREQ:LIST:MODE?

> FIX

2.3 Setting Level

Table 2.3-1 shows device message of setting level.

Table 2.3-1 Setting levels

Function	Device Message
RF Attenuator	<code>[:SENSe] [:NFIGure] :POWer [:RF] :ATTenuation <rel_amp></code>
	<code>[:SENSe] [:NFIGure] :POWer [:RF] :ATTenuation?</code>
Pre Amp	<code>[:SENSe] [:NFIGure] :POWer [:RF] :GAIN [:STATE] OFF ON 0 1</code>
	<code>[:SENSe] [:NFIGure] :POWer [:RF] :GAIN [:STATE]?</code>
Scale Range	<code>:DISPlay [:NFIGure] :TRACe :Y [:SCALe] :PDIVision NFIGure NFACTOR GAIN YFACTOR TEFFective PHOT PCOLd, <rel_amp></code>
	<code>:DISPlay [:NFIGure] :TRACe :Y [:SCALe] :PDIVision? NFIGure NFACTOR GAIN YFACTOR TEFFective PHOT PCOLd</code>
	<code>:DISPlay [:NFIGure] :TRACe :NFIGure NFACTOR GAIN YFACTOR TEFFec tive PHOT PCOLd :Y [:SCALe] :PDIVision <rel_amp></code>
	<code>:DISPlay [:NFIGure] :TRACe :NFIGure NFACTOR GAIN YFACTOR TEFFec tive PHOT PCOLd :Y [:SCALe] :PDIVision?</code>
Reference Level	<code>:DISPlay [:NFIGure] :TRACe :Y [:SCALe] :RLEVEL :VALue NFIGure NFACTOR GAIN YFACTOR TEFFective PHOT PCOLd, <level></code>
	<code>:DISPlay [:NFIGure] :TRACe :Y [:SCALe] :RLEVEL :VALue? NFIGure NFACTOR GAIN YFACTOR TEFFective PHOT PCOLd</code>
	<code>:DISPlay [:NFIGure] :TRACe :NFIGure NFACTOR GAIN YFACTOR TEFFec tive PHOT PCOLd :Y [:SCALe] :RLEVEL <level></code>
	<code>:DISPlay [:NFIGure] :TRACe :NFIGure NFACTOR GAIN YFACTOR TEFFec tive PHOT PCOLd :Y [:SCALe] :RLEVEL?</code>

[:SENSe][:NFIGure]:POWer[:RF]:ATTenuation <rel_amp>

RF Attenuator

Function

Sets the Attenuator value.

Command

[:SENSe] [:NFIGure] :POWer[:RF] :ATTenuation <rel_amp>

Parameter

<rel_amp>	Attenuator Value	
Range	0 to 60 dB	
Resolution	[MS269xA]	2 dB step
	[MS2830A]	2 dB step (Other than Option 045)
		10 dB step (Option 045)
Suffix code	DB, DB is used when omitted.	
Default	0 dB	

Detail

Sets the Attenuator value.

Example of Use

To set the Attenuator value to 10 dB.
 POW:ATT 10

`[[:SENSe][:NFIGure]:POWer[:RF]:ATTenuation?`

RF Attenuator Query

Function

Queries the Attenuator value.

Query

```
[[:SENSe][:NFIGure]:POWer[:RF]:ATTenuation?
```

Response

```
<rel_amp>
```

Parameter

<code><rel_amp></code>	Attenuator value
Range	0 to 60 dB
Resolution	[MS269xA] 2 dB step [MS2830A] 2 dB step (Option 045 not installed) 10 dB step (Option 045 installed)
Suffix code	None, Value is returned in dB units.

Example of Use

```
To query the Attenuator setting.  
POW:ATT?  
> 10
```


[:SENSe][:NFIgure]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1

Pre Amp

Function

Sets the PreAmp On/Off.

Command

[:SENSe] [:NFIgure] :POWer [:RF] :GAIN [:STATe] <switch>

Parameter

<switch>	On/Off to PreAmp
ON 1	PreAmp is setting enabled.
OFF 0	PreAmp is setting disabled.
Default	ON

Details

[MS269xA]

This command is always turned off and thus invalid when Option 008/108 6 GHz Preamplifier is NOT installed.

[MS2830A]

This command is always turned off and thus invalid when Option 008/108/068/168 Preamplifier is NOT installed.

Example of Use

To set the Pre-Amp Off.

POW:GAIN OFF

[:SENSe][:NFIgure]:POWer[:RF]:GAIN[:STATe]?

Pre Amp Query

Function

Queries the Pre-Amp On/Off

Query

[:SENSe] [:NFIgure] :POWer [:RF] :GAIN [:STATe] ?

Response

<switch>

Parameter

<switch>	On/Off to Pre-Amp
1	PreAmp is setting enabled.
0	PreAmp is setting disabled.

Example of Use

To query the PreAmp On/Off.

POW:GAIN?

> 0

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:PDIVision
 NFIGure|NFACTOR|GAIN|YFACTOR|TEFFective|PHOT|PCOLd,<rel_amp>
 Scale Range

Function

This command sets the Y axis scale ratio for each type of measurement results.

Command

```
:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:PDIVision
<result>,<rel_amp>
```

Parameter

<result> Measurement result type where the scale ratio is to be set
 NFIGure Noise Figure
 NFACTOR Noise Factor
 GAIN Gain
 YFACTOR Y-Factor
 TEFFective T effective
 PHOT P hot
 PCOLd P cold

<ref_amp> Scale ratio

<result>	NFIGure	NFACTOR	GAIN	YFACTOR	TEFFective	PHOT	PCOLd
Default	1.00 dB	0.715	5.00 dB	1.00 dB	200.0 K	1.00 dB	1.00 dB
Minimum	0.001 dB	0.001	0.001 dB	0.001 dB	0.1 K	0.001 dB	0.001 dB
Maximum	20.0 dB	100	20.0 dB	20.0 dB	20 000 000 K	20.0 dB	20.0 dB
Resolution	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Suffix code	DB, DB when omitted	None.	DB, DB when omitted	DB, DB when omitted	K,C,F, K when omitted	DB, DB when omitted	DB, DB when omitted

Details

The Y axis scale ratio is specified for the measurement result type specified with <result>. The default, step, and others depend on types. Refer to the table above.)

Example of Use

To specify the Noise Figure Y axis scale ratio to 2 dB/div.
 DISP:TRAC:Y:PDIV NFIG,2DB

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:PDIVision?

NFIGure|NFACTOR|GAIN|YFACTOR|TEFFective|PHOT|PCOLd

Scale Range Query

Function

This command queries the Y axis scale ratio for each type of measurement results.

Query

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:PDIVision? <result>

Response

<rel_amp>

Parameter

<result>	Measurement result type where the scale ratio is to be queried
NFIGure	Noise Figure
NFACTOR	Noise Factor
GAIN	Gain
YFACTOR	Y-Factor
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
<rel_amp>	Scale ratio

<result>	NFIGure	NFACTOR	GAIN	YFACTOR	TEFFective	PHOT	PCOLd
Minimum	0.001 dB	0.001	0.001 dB	0.001 dB	0.1 K	0.001 dB	0.001 dB
Maximum	20.0 dB	100	20.0 dB	20.0 dB	20 000 000 K	20.0 dB	20.0 dB
Resolution	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Suffix code	None, dB unit value	None.	None, dB unit value	None, dB unit value	None, K unit value	None, dB unit value	None, dB unit value

Example of Use

To query the Noise Figure scale ratio.

```
DISP:TRAC:Y:PDIV? NFIG
```

```
> 2.000
```

:DISPlay[:NFIGure]:TRACe:NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd:Y[:SCALE]:PDIVision <rel_amp>

Scale Range

Refer to

:DISPlay[:NFIGure]:TRACe:Y[:SCALE]:PDIVision

NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd,<rel_amp>

:DISPlay[:NFIGure]:TRACe:NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd:Y[:SCALE]:PDIVision?

Scale Range Query

Refer to

:DISPlay[:NFIGure]:TRACe:Y[:SCALE]:PDIVision?

NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:RLEVel:VALue

NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd,<level>

Reference Level

Function

This command sets the reference level for each type of measurement results.

Query

```
:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:RLEVel:VALue
<result>,<level>
```

Parameter

<result>	Measurement result of to sets the reference level.
NFIGure	Noise Figure
NFACTor	Noise Factor
GAIN	Gain
YFACTor	Y-Factor
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
<level>	Reference level

<result>	NFIGure	NFACTor	GAIN	YFACTor	TEFFective	PHOT	PCOLd
Default	4.00 dB	2.5	15.00 dB	5.00 dB	1000.0 K	5.00 dB	5.00 dB
Minimum	-100.0 dB	0	-100.0 dB	-100.0 dB	-100 000 000 K	-100.0 dB	-100.0 dB
Maximum	100.0 dB	1E9	100.0 dB	100.0 dB	100 000 000 K	100.0 dB	100.0 dB
Resolution	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Suffix code	DB, DB when omitted.	None.	DB, DB when omitted.	DB,DB when omitted.	K,C,F, K when omitted.	DB, DB when omitted.	DB, DB when omitted.

Details

The reference levels of the measurement result types specified with <result> are set. The default, resolution, and others depend on types.(Refer to the table above.)

Example of Use

To sets the reference level of Noise Figure to 10 dB.

```
DISP:TRAC:Y:RLEV NFIG,10
```

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:RLEVel:VALue?
NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd
 Reference Level Query

Function

This command queries the reference level for each type of measurement results.

Query

:DISPlay[:NFIGure]:TRACe:Y[:SCALe]:RLEVel:VALue? <result>

Response

<level>

Parameter

<result> Measurement result of to reads the reference level.
 NFIGure Noise Figure
 NFACTor Noise Factor
 GAIN Gain
 YFACTor Y-Factor
 TEFFective T effective
 PHOT P hot
 PCOLd P cold

<level> Reference level

<result>	NFIGure	NFACTor	GAIN	YFACTor	TEFFective	PHOT	PCOLd
Minimum	-100.0 dB	0	-100.0 dB	-100.0 dB	-100000000 K	-100.0 dB	-100.0 dB
Maximum	100.0 dB	1E9	100.0 dB	100.0 dB	100000000 K	100 dB	100 dB
Resolution	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Suffix code	None, dB unit value	None.	None, dB unit value	None, dB unit value	None, K unit value	None, dB unit value	None, dB unit value

Details

The reference levels of the measurement result types specified with <result> are set. The default, resolution, and others depend on types. (Refer to the table above.)

Example of Use

To reads the reference level of Noise Figure.
 DISP:TRAC:Y:RLEV NFIG?
 > 10.0

:DISPlay[:NFIGure]:TRACe:NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd:Y[:SCALE]:RLEVel <level>

Reference Level

Refer to

```
:DISPlay[:NFIGure]:TRACe:Y[:SCALE]:RLEVel:VALue
NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd,<level>
```

:DISPlay[:NFIGure]:TRACe:NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd:Y[:SCALE]:RLEVel?

Reference Level Query

Refer to

```
:DISPlay[:NFIGure]:TRACe:Y[:SCALE]:RLEVel:VALue?
NFIGure|NFACTor|GAIN|YFACTor|TEFFective|PHOT|PCOLd
```

2.4 Setting RBW·Average

Table 2.4-1 shows device message of RBW·Average setting.

Table 2.4-1 Device message of RBW·Average setting.

Function	Device Message
Storage On/Off	[:SENSe] [:NFIGure] :AVERAge [:STATe] AVERAge ON OFF 1 0
	[:SENSe] :NFIGure:AVERAge [:STATe] ?
Storage Count	[:SENSe] [:NFIGure] :AVERAge:COUNT <integer>
	[:SENSe] [:NFIGure] :AVERAge:COUNT?
Resolution Band Width	[:SENSe] [:NFIGure] :BWIDth BANDwidth [:RESolution] <freq>
	[:SENSe] [:NFIGure] :BWIDth BANDwidth [:RESolution] ?
Analysis Time	:CALCulate:ATIME:LENGTH <time>
	:CALCulate:ATIME:LENGTH?
	:CALCulate:ATIME:AUTO ON OFF 1 0
	:CALCulate:ATIME:AUTO?

[:SENSe][:NFIGure]:AVERage[:STATe] AVERage|ON|OFF|1|0

Storage On/Off

Function

Sets the Storage mode.

Command

[:SENSe][:NFIGure]:AVERage <switch>

Parameter

<switch>	Storage Mode
AVERage ON 1	Storage mode is set as Average.
OFF 0	Storage mode is set as off.
Default	OFF

Example of Use

To set Storage mode to Average.
 AVER AVER

Related command

This command has the same function as the following commands.
 [:SENSe][:NFIGure]:STORage[:STATe] AVERage|ON|OFF|1|0

[:SENSe][:NFIGure]:AVERage[:STATe]?

Storage On/Off Query

Function

Queries the Storage mode.

Query

[:SENSe][:NFIGure]:AVERage?

Response

<switch>

Parameter

<switch>	Storage Mode
1	Storage mode is set as Average.
0	Storage mode is set as off.

Example of Use

To read the Average mode.
 AVER?
 > 1

Related command

This command has the same function as the following commands.
 [:SENSe][:NFIGure]:STORage[:STATe]?

`[[:SENSe]][:NFIGure]:AVERage:COUNT <integer>`

Storage Count

Function

Sets the Storage Count.

Command

```
[[:SENSe]][:NFIGure]:AVERage:COUNT <integer>
```

Parameter

<code><integer></code>	Storage Count
Range	2 to 999
Resolution	1
Suffix code	None
Default	2

Example of Use

To sets the Storage Count to 100.
`AVER:COUNT 100`

Related command

This command has the same function as the following commands.
`[[:SENSe]:SWEep:COUNT <integer>`
`[[:SENSe]][:NFIGure]:STORage:COUNT <integer>`

[:SENSe] [:NFIGure] :AVERage :COUNT?

Storage Count Query

Function

Queries the Storage Count.

Query

`[:SENSe] [:NFIGure] :AVERage :COUNT?`

Response

<integer>

Parameter

<integer>	Storage Count
Range	2 to 999
Resolution	1
Suffix code	None.

Example of Use

To reads the Storage Count.

AVER:COUNT?

> 100

Related command

This command has the same function as the following commands.

`[:SENSe] :SWEep :COUNT?``[:SENSe] [:NFIGure] :STORage :COUNT?`

`[[:SENSE]:NFIGure]:BWIDth|BANDwidth[:RESolution] <freq>`

Resolution Band Width

Function

Sets the Resolution Band Width.

Command

```
[[:SENSE]][:NFIGure]:BWIDth|BANDwidth[:RESolution] <freq>
```

Parameter

<code><freq></code>	Resolution Band Width
Range	100 kHz to 8 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.
Default	4 MHz

Example of Use

To sets the Resolution Band Width to 1 MHz.
BWID 1MHZ

`[[:SENSE]:NFIGure]:BWIDth|BANDwidth[:RESolution]?`

Resolution Band Width Query

Function

Queries the Resolution Band Width.

Query

```
[[:SENSE]][:NFIGure]:BWIDth|BANDwidth[:RESolution]?
```

Response

```
<freq>
```

Parameter

<code><freq></code>	Resolution Band Width
Range	100 kHz to 8 MHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz units.

Example of Use

To reads the Resolution Band Width.
BWID?
> 1000000

:CALCulate:ATIME:LENGth <time>

Analysis Time

Function

Sets the Analysis Time.

Command`:CALCulate:ATIME:LENGth <time>`**Parameter**

<code><time></code>	Analysis Time
Range	2 μ s to 200 s
Resolution	1 μ s
Suffix code	NS, US, MS, S S is used when omitted.
Default	16.189 ms

Example of Use

To sets the Analysis Time to 64 ms.
`SWE:TIME 64MS`

Related command

This command has the same function as the following commands.
`[:SENSe] [:NFIGure] :SWEep:TIME <time>`

:CALCulate:ATIME:LENGth?

Analysis Time

Function

Queries the Analysis Time.

Query

:CALCulate:ATIME:LENGth?

Response

<time>

Parameter

<time>	Analysis Time
Range	2 μ s to 200 s
Resolution	1 μ s
Suffix code	None, Value is returned in s units

Example of Use

To reads the Analysis Time.

```
SWE:TIME?
```

```
> 0.000064
```

Related command

This command has the same function as the following commands.

```
[[:SENSe]][:NFIGure]:SWEep:TIME?
```

:CALCulate:ATIME:AUTO ON|OFF|1|0

Analysis Time Auto On/Off

Function

Sets the On/Off setting automatically of Analysis time.

Command

[:SENSe] [:NFIGure] :SWEep:TIME:AUTO <switch>

Parameter

<switch>	Automatically setting on/off of Analysis Time.
ON 1	Automatically setting is enabled.
OFF 0	Automatically setting is disabled
Default	ON

Example of Use

To sets the Automatically setting of Analysis Time to Off.
 SWE:TIME:AUTO OFF

Related command

This command has the same function as the following commands.
 [:SENSe] [:NFIGure] :SWEep:TIME:AUTO <switch>

:CALCulate:ATIME:AUTO?

Analysis Time Auto On/Off Query

Function

Queries On/Off setting automatically of Analysis time.

Query

[:SENSe] [:NFIGure] :SWEep:TIME:AUTO?

Response

<switch>

Parameter

<switch>	Automatically setting on/off of Analysis Time
1	Automatically setting is setting enabled.
0	Automatically setting is setting disabled

Example of Use

To Reads the Automatically setting of Analysis Time.
 SWE:TIME:AUTO?
 > 0

Related command

This command has the same function as the following commands.
 [:SENSe] [:NFIGure] :SWEep:TIME:AUTO?

2.5 Marker

Table 2.5-1 shows device message of Marker setting.

Table 2.5-1 Marker Setting

Function	Device Message
Marker Mode	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:MODE NORMal POSition DELTA OFF
	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:MODE?
Relative To	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:REFerence <integer>
	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:REFerence?
Marker X Axis Value	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:X <freq>
	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:X?
Marker X Axis Position	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:X:POSition <real>
	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:X:POSition?
Marker X Axis Position Delta Value	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:X:DELTA?
Marker Y Axis Value	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:Y[1] 2?
Marker Y Axis Delta Value	:CALCulate[:NFIGure]:MARKer[1] 2 3 4[:PEAK]:Y[1] 2:DELTA?
All Marker On/Off	:CALCulate[:NFIGure]:MARKer:ALL OFF 0

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:MODE NORMal|DELTA|OFF

Marker Mode

Function

Sets the Marker Mode.

Command

`:CALCulate[:NFIGure]:MARKer[n]:MODE[:STATE] <mode>`

Parameter

<n>	Marker Number	
1	Specifies Marker 1	
2	Specifies Marker 2	
3	Specifies Marker 3	
4	Specifies Marker 4	
Omitted	Specifies Marker 1	
<mode>	Marker mode	
NORMal	Normal marker	
DELTA	Delta marker	
OFF	Hidden marker	
Default	Marker1	NORMal
	Others	OFF

Example of Use

To set Marker 2 marker mode to the delta marker.

`CALC:MARK2:MODE DELT`

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:MODE?

Marker Mode Query

Function

Queries the Marker Mode.

Query

:CALCulate[:NFIGure]:MARKer[n]:MODE[:STATE]?

Response

<mode>

Parameter

<n>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<mode>	Marker mode
NORM	Normal marker
DELT	Delta marker
OFF	Hidden Marker

Example of Use

To Reads the Marker 2 marker mode
CALC:MARK2:MODE?
> DELT

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:REFerence <integer>

Relative To

Function

This command sets the reference marker when Marker Mode is the delta marker.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:REFerence <integer>
```

Parameter

<n>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<integer>	Marker number set into base.
1	Sets based on the marker 1.
2	Sets based on the marker 2.
3	Sets based on the marker 3.
4	Sets based on the marker 4.
Omitted	Sets based on the active marker.
Default	Marker1 2
	Marker2 3
	Marker3 4
	Marker4 1

Example of Use

To set the Marker 2 reference marker to Marker 4.
 CALC:MARK2:MODE:REF 4

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:REFerence?

Relative To

Function

This command queries the reference marker when Marker Mode is the delta marker.

Query

:CALCulate[:NFIGure]:MARKer[n]:REFerence?

Response

<integer>

Parameter

<n>	Marker Number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<integer>	Base Marker number
1	Sets based on the marker 1.
2	Sets based on the marker 2.
3	Sets based on the marker 3.
4	Sets based on the marker 4.

Example of Use

To read the reference marker of Marker 2 .
CALC:MARK2:MODE:REF?
> 4

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:X <freq>

Marker X Axis Value

Function

This command sets the marker position on the X axis with a frequency.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:X <freq>
```

Parameter

<n> Marker number

1 Specifies Marker 1

2 Specifies Marker 2

3 Specifies Marker 3

4 Specifies Marker 4

Omitted Specifies Marker 1

<freq> X axis position

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 0 44)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 325 GHz (Upper limit frequency of external
mixer M03HW)

Suffix code HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ

HZ is used when omitted.

Default Current Start Frequency

Details

When Frequency Mode is setting Fixed, this command is discounted.

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To set the Marker 1 position on the X axis to 1 GHz.

```
CALC:MARK1:X 1GHZ
```

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:X?

Marker X Axis Value Query

Function

This command queries the marker position on the X axis with a frequency.

Query

:CALCulate[:NFIGure]:MARKer[n]:REFerence?

Response

<freq>

Parameter

<n> Marker number

1 Specifies Marker 1

2 Specifies Marker 2

3 Specifies Marker 3

4 Specifies Marker 4

Omitted Specifies Marker 1

<freq> Position of X Axis

When DUT mode is Amplifier or

when DUT mode is not Amplifier and local frequency mode is fixed.

Range

Minimum 0 Hz

Maximum

[MS2690A] 6 GHz

[MS2691A] 13.5 GHz

[MS2692A] 26.5 GHz

[MS2830A] 3.6 GHz (Option 040)

6 GHz (Option 041)

13.5 GHz (Option 043)

26.5 GHz (Option 044)

43 GHz (Option 045)

When DUT mode is not Amplifier and local frequency mode is variable.

Minimum 1 Hz

Maximum 325 GHz (Upper limit frequency of external mixer M03HW)

Suffix code None, Value is returned in Hz units

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

To query the Marker 1 position on the X axis with a frequency

```
CALC:MARK1:X?
```

```
> 1000000000
```

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:X:POSITION <Integer>

Marker X Axis Position

Function

This command sets the marker position on the X axis with a point number.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:X <integer>
```

Parameter

<n>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<real>	Position of X Axis
Range	0 to Current Point number – 1
Resolution	1
Suffix code	None

Details

When Frequency Mode is setting Fixed, this command is discounted

Example of Use

To set the position on X axis of Marker 1 to 10th point.
 CALC:MARK1:X:POS 9

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:X:POStion?

Marker X Axis Position Query

Function

This command sets the marker position on the X axis by point.

Query

:CALCulate[:NFIGure]:MARKer[n]:X?

Response

<integer>

Parameter

<n>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<integer>	Position of X Axis
Range	0 to Current Point number – 1
Resolution	1
Suffix code	None

Example of Use

To query the Marker 1 position on the X axis by point.

```
CALC:MARK1:X:POS?
```

```
> 9
```


:CALCulate[:NFIGure]:MARKer[1]|2|3|4:X:DELTA?

Marker X Axis Position Query

Function

This command queries the marker position on the X axis with a relative value of the frequency.

Query

```
:CALCulate[:NFIGure]:MARKer[n]:X:DELTA?
```

Response

```
<integer>
```

Parameter

<n>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<integer>	Relative value of the frequency on the X axis
When DUT mode is Amplifier or	
when DUT mode is not Amplifier and local frequency mode is fixed.	
Range	
Minimum	0 Hz
Maximum	
[MS2690A]	6 GHz
[MS2691A]	13.5 GHz
[MS2692A]	26.5 GHz
[MS2830A]	3.6 GHz (Option 040)
	6 GHz (Option 041)
	13.5 GHz (Option 043)
	26.5 GHz (Option 044)
	43 GHz (Option 045)
When DUT mode is not Amplifier and local frequency mode is variable.	
Minimum	1 Hz
Maximum	325 GHz (Upper limit frequency of external mixer M03HW)
Suffix code	None, Value is returned in Hz units

Details

The range varies depending on the setting of DUT mode, Noise Source, LO Frequency, IF Frequency, or Sideband mode.

Example of Use

```
To query the Marker 1 position on the X axis with a relative frequency
CALC:MARK1:X:DELTA?
> 9
```

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:Y[1]|2?

Marker Y Axis Value

Function

This command queries the Y axis value of the marker.

Query

:CALCulate[:NFIGure]:MARKer[n1]:Y[n2]?

Response

<value>

Parameter

<n1>	Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1
<n2>	Trace Number
1	Specifies Trace 1
2	Specifies Trace 2
Omitted	Specifies Trace 1
<value>	Value of Marker on the Y axis
Range	Depends on Result Type.
Suffix code	Non, the value unit depends on Result Type

Details

When Frequency Mode is Fixed, value is returned null value.

Example of Use

To query the Y axis value of Marker 1.

CALC:MARK1:Y?

> 1.000

:CALCulate[:NFIGure]:MARKer[1]|2|3|4[:PEAK]:Y[1]|2:DELTA?

Marker Y Axis Delta Value

Function

This command queries the Y axis relative value of the marker.

Query

```
:CALCulate[:NFIGure]:MARKer[1]|2|3|4[:PEAK]:Y[1]|2:DELTA?
```

Response

<value>

Parameter

<value>	Relation value of marker on the Y axis
Range	Depends on Result Type.
Suffix code	Non, the value unit depends on Result Type

Details

When Frequency Mode is Fixed, value is returned null value.

Example of Use

```
To reads the relation value of marker 1 on the Y axis.
CALC:MARK1:Y:DELTA?
> 1.0000
```

:CALCulate[:NFIGure]:MARKer:ALL OFF|0

All Marker Off

Function

This command switches all markers to Off

Command

```
CALCulate[:NFIGure]:MARKer:ALL <switch>
```

Parameter

<switch>	All Marker Off
OFF 0	Sets all markers to Off.

Example of Use

```
To set all markers to Off
CALC:MARK:ALL OFF
```

2.6 Setting Signal Search

Table 2.6-1 shows device message of Setting Signal Search.

Table 2.6-1 Setting Signal Search

Function	Device Message
Peak Criteria	:CALCulate[:NFIGure]:MARKer:SEARch:TYPE MINimum MAXimum PTPeak
	:CALCulate[:NFIGure]:MARKer:SEARch:TYPE?
Maximum Peak Search	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:MAXimum
Peak Search	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:SEARch
Next Peak Search	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:SEARch:NEXT
Minimum Peak Search	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:MINimum
Peak To Peak Search	:CALCulate[:NFIGure]:MARKer[1] 2 3 4:PTPeak

:CALCulate[:NFIGure]:MARKer:SEARch:TYPE MINimum|MAXimum|PTPeak

Peak Criteria

Function

This command sets the peak search type when Peak Search is executed.

Command

```
:CALCulate[:NFIGure]:MARKer:SEARch:TYPE <mode>
```

Parameter

<mode>	Peak search type
MINimum	Sets the Minimum search
MAXimum	Sets the Maximum search
PTPeak	Sets the Peak To Peak search
Default	MAXimum

Details

For Peak to Peak, Next Peak cannot be executed.

Example of Use

To set the peak search type to Peak To Peak.

```
CALC:MARK:SEAR:TYPE PTP
```

:CALCulate[:NFIGure]:MARKer:SEARch:TYPE?

Peak Criteria Query

Function

This command queries the peak search type when Peak Search has been executed.

Query

```
:CALCulate[:NFIGure]:MARKer:SEARch:TYPE?
```

Response

```
<mode>
```

Parameter

<mode>	Peak Search type
MIN	Minimum search is set.
MAX	Maximum search is set.
PTP	Peak To Peak search is set.

Example of Use

To query the peak search type.

```
CALC:MARK:SEAR:TYPE?
```

```
> PTP
```

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:MAXimum

Maximum Peak Search

Function

This command executes Maximum search.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:MAXimum
```

Parameter

<n>	Marker number of to execute Maximum search.
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1

Example of Use

To execute Maximum search for Marker 1.
CALC:MARK:MAX

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:SEARch

Peak Search

Function

This command executes the peak search.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:SEARch
```

Parameter

<n>	Specifies Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1

Example of Use

To execute the peak search.
CALC:MARK:SEAR

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:SEARch:NEXT

Next Peak Search

Function

This command executes the next peak search.

Command

`:CALCulate[:NFIGure]:MARKer[n]:SEARch:NEXT`

Parameter

<n>	Specifies Marker number
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1

Details

When Peak Criteria is Peak to Peak, it cannot be executed.

Example of Use

To execute the next peak search
`CALC:MARK:SEAR:NEXT`

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:MINimum

Minimum Peak Search

Function

This command executes the Minimum search.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:MINimum
```

Parameter

<n>	Marker number of to execute Minimum search.
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1

Example of Use

To execute Minimum search for marker 1.
CALC:MARK:MIN

:CALCulate[:NFIGure]:MARKer[1]|2|3|4:PTPeak

Peak To Peak Search

Function

This command executes the Peak To Peak search.

Command

```
:CALCulate[:NFIGure]:MARKer[n]:PTPeak
```

Parameter

<n>	Marker number of to execute Peak To Peak Search.
1	Specifies Marker 1
2	Specifies Marker 2
3	Specifies Marker 3
4	Specifies Marker 4
Omitted	Specifies Marker 1

Example of Use

To execute Peak To Peak search for marker 1.
CALC:MARK:PTP

2.7 Trace

Table 2.7-1 shows device message of trace setting.

Table 2.7-1 Setting trace

Function	Device message
Result Type	:DISPlay[:NFIGure]:DATA:TRACe[1] 2[:RESult] NFIGure NFACTOR GAIN YFACTOR TEFFective PHOT PCOLd
	:DISPlay[:NFIGure]:DATA:TRACe[1] 2[:RESult]?
Layout	:DISPlay[:NFIGure]:FORMat GRAPH TABLE
	:DISPlay[:NFIGure]:FORMat?
Screen On/Off	:DISPlay:SCReen <switch>
	:DISPlay:SCReen?

:DISPlay[:NFIGure]:DATA:TRACe[1]|2[:RESult]
NFIGure|NFACTOR|GAIN|YFACTOR|TEFFective|PHOT|PCOLd
Result Type

Function

This command sets the trace Result Type.

Command

:DISPlay[:NFIGure]:DATA:TRACe[n][:RESult] <result>

Parameter

<n>	Specifies Marker Number
1	Specifies Trace 1
2	Specifies Trace 2
<result>	Result Type
NFIGure	Noise Figure
NFACTOR	Noise Factor
GAIN	Gain
YFACTOR	Y-Factor
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
Default	Trace 1 NFIGure Trace 2 GAIN

Example of Use

To set Trace 1 Result Type to Noise Factor.
DISP:DATA:TRAC NFACTOR

:CALCulate[:NFIGure]:MARKer:SEARch:TYPE?

Result Type Query

Function

This command queries the trace Result Type.

Query

`:DISPlay[:NFIGure]:DATA:TRACe[n] [:RESult]?`

Response

`<result>`

Parameter

<code><n></code>	Specifies Marker Number
1	Specifies Trace 1
2	Specifies Trace 2
<code><result></code>	Result Type
NFIG	Noise Figure
NFAC	Noise Factor
GAIN	Gain
YFAC	Y-Factor
TEFF	T effective
PHOT	P hot
PCOL	P cold

Example of Use

To query Trace 1 Result Type.

```
DISP:DATA:TRAC?
> NFAC
```

:DISPlay[:NFIGure]:FORMat GRAPH|TABLE

Layout

Function

This command sets the measured result display layout.

Command

```
:DISPlay[:NFIGure]:FORMat <type>
```

Parameter

<type>	Layout Type.
GRAPH	Sets the layout to Graph display.
TABLE	Sets the layout to Table display.
Default	GRAPH

Example of Use

To set the layout to Table display.
DISP:FORM TABL

:DISPlay[:NFIGure]:FORMat?

Layout Query

Function

This command queries the measured result display layout.

Query

```
:DISPlay[:NFIGure]:FORMat?
```

Response

```
<type>
```

Parameter

<type>	Layout type
GRAP	Layout is set to Graph display.
TABL	Layout is set to Table display.

Example of Use

To read the layout.
DISP:FORM?
> TABL

:DISPlay:SCReen ON|OFF|0|1

Screen On/Off

Function

This command sets the display On/Off.

Command

`:DISPlay:SCReen <switch>`

Parameter

<code><switch></code>	Display On/Off
ON 1	Display sets to On.
OFF 0	Display sets to Off.
Default	On

Example of Use

To set the display off.
`DISP:SCR OFF`

:DISPlay:SCReen?

Screen Query

Function

This command queries the display On/Off.

Query

`:DISPlay:SCReen?`

Response

`<switch>`

Parameter

<code><switch></code>	Display On/Off
1	Display set to On.
0	Display set to Off.

Example of Use

To queries the display On/Off.
`DISP:SCR?`
`> 0`

2.8 Calibration Setting

Table 2.8-1 shows device message of Calibration setting.

Table 2.8-1 Device message of Setting Calibration.

Function	Device message
Calibrate Now	[:SENSe] [:NFIGure] :CALibration:INITiate
Clear User Cal Data	[:SENSe] [:NFIGure] :CALibration:DELeTe
Apply Calibration	[:SENSe] [:NFIGure] :CALibration:STATe ON OFF 1 0
	[:SENSe] [:NFIGure] :CALibration:STATe?
Max Attenuation	[:SENSe] [:NFIGure] :CALibration:USER:ATTenuation:MAXimum <integer>
	[:SENSe] [:NFIGure] :CALibration:USER:ATTenuation:MAXimum?
Min Attenuation	[:SENSe] [:NFIGure] :CALibration:USER:ATTenuation:MINimum <integer>
	[:SENSe] [:NFIGure] :CALibration:USER:ATTenuation:MINimum?

`[:SENSe] [:NFIGure] :CALibration :INITiate`

Calibrate Now

Function

This command executes the NF Calibration

Command

```
[ :SENSe ] [ :NFIGure ] :CALibration :INITiate
```

Example of Use

To Execute the NF Calibration.

```
CAL : INIT
```

`[:SENSe] [:NFIGure] :CALibration :DELeTe`

Clear User Cal Data

Function

This command deletes all of NF Calibration data exists on the memory and hard disk.

Command

```
[ :SENSe ] [ :NFIGure ] :CALibration :DELeTe
```

Example of Use

To delete NF Calibration data.

```
CAL : DEL
```

`[[:SENSe][:NFIGure]:CALibration:STATe ON|OFF|1|0`

Apply Calibration

Function

This command sets the On/off of adding NF Calibration data to measured results.

Command

```
[[:SENSe][:NFIGure]:CALibration:STATe <switch>
```

Parameter

<code><switch></code>	The On/Off of adding NF Calibration data to measured results.
<code>ON 1</code>	Adding sets to On.
<code>OFF 0</code>	Adding sets to Off.
Default	OFF

Backwards Compatibility SCPI

```
:DISPlay[:NFIGure]:DATA:CORRections[:STATe] <switch>
```

Details

When NF Calibration data does not exist, even setting On does not perform addition.

Example of Use

To enable adding NF Calibration data to measured results.
`CAL:STAT ON`

[[:SENSe][:NFIGure]:CALibration:STATe?

Apply Calibration Query

Function

This command queries the On/Off status of adding NF Calibration data to measured results.

Query

```
[[:SENSe][:NFIGure]:CALibration:STATe?
```

Response

```
<switch>
```

Parameter

```
<switch>      The On/Off of adding NF Calibration data to measured
                results.
                1      Adding set to On.
                0      Adding set to Off.
```

Backwards Compatibility SCPI

```
:DISPlay[:NFIGure]:DATA:CORRections[:STATe]?
```

Example of Use

To query the On/Off status of adding NF Calibration data to measured results.

```
CAL:STAT?
> 1
```

[[:SENSe][:NFIGure]:CALibration:USER:ATTenuation:MAXimum <integer>

Max Attenuation

Function

This command sets the maximum attenuator value for NF Calibration.

Query

```
[[:SENSe][:NFIGure]:CALibration:USER:ATTenuation:MAXimum  
<integer>
```

Parameter

<integer>	Maximum attenuator value for NF Calibration
Range	0 to 40 dB
Resolution	
[MS269xA]	2 dB step
[MS2830A]	2 dB step (Option 045 is not installed) 10 dB step (Option 045 is installed)
Suffix code	DB dB is used when omitted
Default	8 dB

Backwards Compatibility SCPI

```
:INPut[:NFIGure]:ATTenuation[:RF][:MAXimum] <integer>  
:INPut[:NFIGure]:ATTenuation:MWAVE[:MAXimum] <integer>
```

Example of Use

To set the maximum attenuator value for NF Calibration to 10 dB.
CAL:USER:ATT:MAX 10DB

[[:SENSe]][:NFIGure]:CALibration:USER:ATTenuation:MAXimum?

Max Attenuation Query

Function

This command queries the maximum attenuator value for NF Calibration.

Query

```
[[:SENSe]][:NFIGure]:CALibration:USER:ATTenuation:MAXimum?
```

Response

```
<integer>
```

Parameter

<integer> Maximum Value of Attenuator to execute NF Calibration.

Range 0 to 40 dB

Resolution

[MS269xA] 2 dB step

[MS2830A] 2 dB step (Option 045 is not installed)

10 dB step (Option 045 is installed)

Suffix code None, Value is returned in dB unit.

Backwards Compatibility SCPI

```
:INPut[:NFIGure]:ATTenuation[:RF][:MAXimum]?
```

```
:INPut[:NFIGure]:ATTenuation:MWAVE[:MAXimum]?
```

Example of Use

To query the maximum attenuator value for NF Calibration

```
CAL:USER:ATT:MAX?
```

```
> 10
```

[[:SENSE]:[:NFIGURE]:CALIBRATION:USER:ATTENUATION:MINIMUM <integer>

Min Attenuation

Function

This command sets the minimum attenuator value for NF Calibration.

Command

```
[[:SENSE]:[:NFIGURE]:CALIBRATION:USER:ATTENUATION:MINIMUM  
<integer>
```

Response

```
<integer>
```

Parameter

<integer>	Minimum Value of Attenuator to execute NF Calibration.
Range	0 dB to 40 dB
Resolution	
[MS269xA]	2 dB step
[MS2830A]	2 dB step (Option 045 is not installed) 10 dB step (Option 045 is installed)
Suffix code	DB dB is used when omitted
Default	0 dB

Backwards Compatibility SCPI

```
:INPut[:NFIGURE]:ATTenuation[:RF][:MINimum] <integer>  
:INPut[:NFIGURE]:ATTenuation:MWAVE[:MINimum] <integer>
```

Example of Use

To set the minimum attenuator value for NF Calibration to 10 dB.
CAL:USER:ATT:MIN 10DB

[[:SENSe]][:NFIGure]:CALibration:USER:ATTenuation:MINimum?

Min Attenuation Query

Function

This command queries the minimum attenuator value for NF Calibration.

Query

```
[[:SENSe]][:NFIGure]:CALibration:USER:ATTenuation:MINimum?
```

Response

```
<integer>
```

Parameter

<integer> Minimum Value of Attenuator to execute NF Calibration.

Range 0 to 40 dB

Resolution

[MS269xA] 2 dB step

[MS2830A] 2 dB step (Option 045 is not installed.)

10 dB step (Option 045 is installed.)

Suffix code None, Value is returned in dB unit.

Backwards Compatibility SCPI

```
:INPut[:NFIGure]:ATTenuation[:RF][:MINimum]?
```

```
:INPut[:NFIGure]:ATTenuation:MWAVE[:MINimum]?
```

Example of Use

To query the minimum attenuator value for NF Calibration.

```
CAL:USER:ATT:MIN?
```

```
> 10
```

2.9 Setting Correction

Table 2.9-1 shows device Message of Setting Correction.

Table 2.9-1 Device message of setting Correction.

Function	Device message
Noise Source	[[:SENSe]][:NFIGure]:CORRection:ENR:SOURce 346A 346B 346C 346D 346E 346K USER
	[[:SENSe]][:NFIGure]:CORRection:ENR:SOURce?
Noise Source Settling Time	[[:SENSe]][:NFIGure]:NSSTime <time>
	[[:SENSe]][:NFIGure]:NSSTime?
ENR Mode	[[:SENSe]][:NFIGure]:CORRection:ENR:MODE TABLE SPOT
	[[:SENSe]][:NFIGure]:CORRection:ENR:MODE?
Use Meas Table Data for Cal	[[:SENSe]][:NFIGure]:CORRection:ENR:COMMON[:STATE] ON OFF 1 0
	[[:SENSe]][:NFIGure]:CORRection:ENR:COMMON[:STATE]?
Meas Table Entry	[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA <freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]
	[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA ?
Meas Table Entry Count	[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:COUNT?
Clear Meas Table	[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA :DELeTe
Calibration Table Entry	[[:SENSe]][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA <freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]
	[[:SENSe]][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA?
Calibration Table Entry Count	[[:SENSe]][:NFIGure]:CORRection:ENR:CALibration:TABLE:COUNT?
Clear Calibration Table	[[:SENSe]][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA:DELeTe
Spot	[[:SENSe]][:NFIGure]:CORRection:SPOT:MODE ENR THOT
	[[:SENSe]][:NFIGure]:CORRection:SPOT:MODE?
Spot ENR Value	[[:SENSe]][:NFIGure]:CORRection:ENR:SPOT <value>
	[[:SENSe]][:NFIGure]:CORRection:ENR:SPOT?
Spot T hot Value	[[:SENSe]][:NFIGure]:CORRection:ENR:THOT <temperature>
	[[:SENSe]][:NFIGure]:CORRection:ENR:THOT?

Table 2.9-1 Device message of setting Correction. (Cont'd)

Function	Device Message
Loss Comp	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:MODE OFF FIXed TABLE
	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:MODE?
Loss Comp Fixed Value	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:VALue <value>
	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:VALue?
Loss Comp Table	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:TABLE:DATA <freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]
	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:TABLE:DATA ?
Loss Comp Table Entry Count	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:TABLE:COUN t?
Clear Loss Comp Table	[:SENSe] [:NFIGure] :CORRection:LOSS:BEFore AFTer:TABLE:DATA :DELeTe
T Cold Value	[:SENSe] [:NFIGure] :CORRection[:USER]:TCOLd:VALue <value>
	[:SENSe] [:NFIGure] :CORRection[:USER]:TCOLd:VALue?

`[[:SENSe][:NFIGure]:CORRection:ENR:SOURce
346A|346B|346C|346D|346E|346K|USER`

Noise Source

Function

This command selects the noise source.

Command

`[[:SENSe][:NFIGure]:CORRection:ENR:SOURce <source>`

Parameter

<code><source></code>	Noise source model
<code>346A</code>	NC346A Option 1
<code>346B</code>	NC346B Option 1
<code>346C</code>	NC346C
<code>346D</code>	NC346D Option 1
<code>346E</code>	NC346E
<code>346K</code>	NC346Ka
<code>USER</code>	Other Noise source
Default	USER

Details

The settable frequency range depends on noise source models.

Example of Use

To sets the noise source to NC346C.
`CORR:ENR:SOUR 346C`

[[:SENSe]][:NFIGure]:CORRection:ENR:SOURce?

Noise Source Query

Function

This command queries the selected noise source model.

Query

`[[:SENSe]][:NFIGure]:CORRection:ENR:SOURce?`

Response

`<source>`

Parameter

<code><source></code>	Noise source model
346A	NC346A Option 1
346B	NC346B Option 1
346C	NC346C
346D	NC346D Option 1
346E	NC346E
346K	NC346Ka
USER	Other Noise source

Example of Use

To queries the noise source.

```
CORR:ENR:SOUR?
> 346C
```

[[:SENSE]:NFIGure]:NSSTime <time>

Noise Source Settling Time

Function

This command sets Noise Source Settling Time.

Command

```
[[:SENSE]:NFIGure]:NSSTime < time >
```

Parameter

<time>	Noise Source Settling Time
Range	0 to 5 s
Resolution	1 ms
Suffix code	S, MS S is used when omitted
Default	0 ms

Example of Use

To sets the Noise Source Settling Time to 64 ms.
NSST 64MS

[[:SENSE]:NFIGure]:NSSTime?

Noise Source Settling Time Query

Function

This command queries Noise Source Settling Time.

Query

```
[[:SENSE]:NFIGure]:NSSTime?
```

Response

```
<time>
```

Parameter

<time>	Noise Source Settling Time
Range	0 to 5 s
Resolution	1 ms
Suffix code	None, Value is returned in s unit.

Example of Use

To queries the Noise Source Settling Time.
NSST?
>0.064

[[:SENSe][:NFIGure]:CORRection:ENR:MODE TABLE|SPOT

ENR Mode

Function

This command selects ENR Mode

Command

`[[:SENSe][:NFIGure]:CORRection:ENR:MODE <mode>`

Parameter

<code><mode></code>	ENR Mode
<code>TABLE</code>	Sets ENR Mode to Table.
<code>SPOT</code>	Sets ENR Mode to Spot.
Default	TABLE

Example of Use

To sets ENR mode to Spot.
`CORR:ENR:MODE SPOT`

[[:SENSe][:NFIGure]:CORRection:ENR:MODE?

ENR Mode Query

Function

This command queries ENR Mode

Query

`[[:SENSe][:NFIGure]:CORRection:ENR:MODE?`

Response

`<mode>`

Parameter

<code><mode></code>	ENR Mode
<code>TABL</code>	ENR Mode is set to Table
<code>SPOT</code>	ENR Mode is set to Spot.

Example of Use

To queries the ENR Mode.
`CORR:ENR:MODE?`
`>SPOT`

`[[:SENSE]:NFIGure]:CORRection:ENR:COMMon[:STATe] ON|OFF|1|0`

Use Meas Table Data for Cal

Function

This command sets ENR Table used for CAL function.

Command

```
[[:SENSE]:NFIGure]:CORRection:ENR:COMMon[:STATe]  
<switch>
```

Parameter

<code><switch></code>	Table used for calibration
<code>ON 1</code>	Meas (ENR) Table is used.
<code>OFF 0</code>	CAL Table is used.
Default	1

Example of Use

To set the table for calibration to Meas (ENR) Table.
`CORR:ENR:COMM ON`

`[[:SENSE]:NFIGure]:CORRection:ENR:COMMon[:STATe]?`

Use Meas Table Data for Cal Query

Function

This command queries ENR Table used for CAL function.

Query

```
[[:SENSE]:NFIGure]:CORRection:ENR:MODE?
```

Response

```
<switch>
```

Parameter

<code><switch></code>	Table used for calibration
<code>1</code>	Meas (ENR) Table is used.
<code>0</code>	CAL Table is used.

Example of Use

To query the table used for calibration.
`CORR:ENR:COMM?`
>1

`[[:SENSe][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA`

`<freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]`

Meas Table Entry

Function

This command creates a new Measurement Table.

Command

`[[:SENSe][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DA
TA<freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]`

Parameter

<code><freq_n></code>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	HZ is used when omitted
<code><amp_n></code>	ENR
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	DB is used when omitted

Example of Use

To creates a Measurement Table.

`CORR:ENR:TABL:DATA 1GHZ,10DB,2GHZ,15DB,3GHZ,20DB`

`[[:SENSe][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA?`

Meas Table Entry Query

Function

This command queries a new Meas Table.

Query

```
[[:SENSe][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:
DATA?
```

Response

```
<freq_1>, <amp_1>[, <freq_2>, <amp_2>, ..., <freq_n>, <amp_n>]
```

Parameter

<code><freq_n></code>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz unit.
<code><amp_n></code>	ENR
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	None, Value is returned in s unit.

Example of Use

```
To query the Meas Table.
CORR:ENR:TABL:DATA?
> 1000000000,10,2000000000,15,3000000000,20
```

[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:COUNT?

Meas Table Entry Count

Function

This command queries the Meas Table line count.

Query

```
[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:COUNT?
```

Response

<integer>

Parameter

<integer>	Line count of Meas Table.
Range	0 to 501
Suffix code	None.

Example of Use

To queries the line count of Meas Table.

```
CORR:ENR:TABL:COUN?
> 10
```

[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA:DELeTe

Clear Meas Table

Function

This command clear the Meas Table.

Command

```
[[:SENSe]][:NFIGure]:CORRection:ENR[:MEASurement]:TABLE:DATA:DELeTe
```

Example of Use

To clear the Meas Table.

```
CORR:ENR:TABL:DATA:DEL
```

`[[:SENSe][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA`

`<freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]`

Calibration Table Entry

Function

This command creates a new Cal Table.

Command

```
[[:SENSe][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA  
<freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]
```

Parameter

<code><freq_n></code>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted
<code><amp_n></code>	ENR
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	DB, DB is used when omitted

Example of Use

To creates a Cal Table.

```
CORR:ENR:CAL:TABL:DATA 1GHZ,10DB,2GHZ,15DB,3GHZ,20DB
```


[:SENSe][:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA?

Calibration Table Entry Query

Function

This command queries a new Cal Table.

Query

[:SENSe] [:NFIGure] :CORRection:ENR:CALibration:TABLE:
DATA?

Response

<freq_1>, <amp_1> [, <freq_2>, <amp_2>, ..., <freq_n>, <amp_n>]

Parameter

<freq_n>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz unit.
<amp_n>	ENR
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	None, Value is returned in dB unit.

Example of Use

To query the Cal Table.

```
CORR:ENR:CAL:TABLE:DATA?
> 1000000000,10,2000000000,15,3000000000,20
```

[[:SENSE]:NFIGure]:CORRection:ENR:CALibration:TABLE:COUNT?

Calibration Table Entry Count

Function

This command queries the Cal Table line count.

Query

```
[[:SENSE]:NFIGure]:CORRection:ENR:CALibration:TABLE:COUNT?
```

Response

<integer>

Parameter

<integer>	Line count of Cal Table.
Range	0 to 501
Suffix code	None.

Example of Use

To queries the line count of Cal Table.

```
CORR:ENR:CAL:TABLE:COUN?  
> 10
```

[[:SENSE]:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA:DELeTe

Clear Calibration Table

Function

This command clear the Cal Table.

Command

```
[[:SENSE]:NFIGure]:CORRection:ENR:CALibration:TABLE:DATA:DELeTe
```

Example of Use

To clear the Cal Table.

```
CORR:ENR:CAL:TABLE:DATA:DEL
```

[:SENSe][:NFIGure]:CORRection:SPOT:MODE ENR|THOT

Spot

Function

This command selects ENR or T hot to be used when ENR Mode is Spot.

Command

```
[:SENSe] [:NFIGure] :CORRection:SPOT:MODE <mode>
```

Parameter

<mode>	ENR or T hot
ENR	Sets to use ENR.
THOT	Sets to use T-hot.
Default	ENR

Example of Use

To set to select T hot.
CORR:SPOT:MODE THOT

[:SENSe][:NFIGure]:CORRection:SPOT:MODE?

Spot Query

Function

This command queries ENR or T hot to be used when ENR Mode is Spot

Query

```
[:SENSe] [:NFIGure] :CORRection:SPOT:MODE?
```

Response

```
<mode>
```

Parameter

<mode>	ENR or T hot
ENR	Sets to use ENR.
THOT	Sets to use T-hot.

Example of Use

To query which is selected ENR or T Hot, when ENR Mode is Spot.
CORR:SPOT:MODE?
> THOT

`[[:SENSE]:NFIGure]:CORRection:ENR:SPOT <value>`

Spot ENR Value

Function

This Command sets the Spot ENR value.

Command

```
[[:SENSE]:NFIGure]:CORRection:ENR:SPOT <value>
```

Parameter

<code><value></code>	Spot ENR value.
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	DB dB is used when omitted
Default	15.200 dB

Example of Use

To set the Spot ENR value to 20.000 dB.
`CORR:ENR:SPOT 20DB`

`[[:SENSE]:NFIGure]:CORRection:ENR:SPOT?`

Spot ENR Value Query

Function

This Command queries the Spot ENR value.

Query

```
[[:SENSE]:NFIGure]:CORRection:ENR:SPOT?
```

Response

```
<value>
```

Parameter

<code><value></code>	Spot ENR value.
Range	-17.000 to 50.000 dB
Resolution	0.001 dB
Suffix code	None, value is returned in dB unit.

Example of Use

To read the Spot ENR value.
`CORR:ENR:SPOT?`
>20

[[:SENSE]:NFIGure]:CORRection:ENR:THOT <temperature>

Spot T hot Value

Function

This Command sets the Spot T hot value.

Command

[:SENSE] [:NFIGure]:CORRection:ENR:THOT <temperature>

Parameter

<value>	Spot T hot value
Range	0.00 to 29650000.00 K
Resolution	0.01
Suffix code	K, C, F
Default	9892.80 K

Example of Use

To set the Spot T hot value to 273.00 K.
CORR:ENR:THOT 273K

[[:SENSE]:NFIGure]:CORRection:ENR:THOT?

Spot T hot Value Query

Function

This Command queries the Spot T Hot value.

Query

[:SENSE] [:NFIGure]:CORRection:ENR:THOT?

Response

<value>

Parameter

<value>	Spot T hot value
Range	0.00 to 29650000.00 K
Resolution	0.01 K
Suffix code	None, value is returned in K unit.

Example of Use

To read the Spot T hot value.
CORR:ENR:THOT?
> 273.00

**[[:SENSE][:NFIGure]:CORRection:LOSS:BEFore|AFTer:MODE
OFF|FIXed|TABLe**

Loss Comp

Function

This command sets the Loss Comp mode.

Command

```
[[:SENSE]][:NFIGure]:CORRection:LOSS:BEFore|AFTer:MODE  
<mode>
```

Parameter

<select>	Before DUT or After DUT
BEFore	Specifies Before DUT
AFTer	Specifies After DUT
<mode>	Mode setting
OFF	Sets the Loss Comp to Off
FIXed	Sets the Loss Comp to Fixed mode
TABLe	Sets the Loss Comp to Table mode
Default	OFF

Example of Use

To set the mode of Loss Comp Before DUT to Table mode
CORR:LOSS:BEF:MODE TABL

[[:SENSe][:NFIGure]:CORRection:LOSS:BEFore|AFTer:MODE?

Loss Comp Query

Function

This command queries the Loss Comp mode setting.

Query

`[[:SENSe][:NFIGure]:CORRection:LOSS:BEFore|AFTer:MODE?`

Response

`<mode>`

Parameter

<code><select></code>	Before DUT or After DUT
<code>BEFore</code>	Specifies Before DUT
<code>AFTer</code>	Specifies After DUT
<code><mode></code>	Mode setting
<code>OFF</code>	Set the Loss Comp to off.
<code>FIX</code>	Set the Loss Comp to Fixed mode.
<code>TABL</code>	Set the Loss Comp to Table mode.

Example of Use

To query the mode of Loss Comp Before DUT.

```
CORR:LOSS:BEF:MODE?
> TABL
```

[[:SENSE][:NFIGURE]:CORRECTION:LOSS:BEFORE|AFTER:VALUE <value>

Loss Comp Fixed Value

Function

This command Sets the Fixed mode value of Loss Comp.

Command

```
[[:SENSE][:NFIGURE]:CORRECTION:LOSS:BEFORE|AFTER:VALUE  
<value>
```

Parameter

<select>	Before DUT or After DUT
BEFORE	Specifies Before DUT
AFTER	Specifies After DUT
<value>	Fixed mode value of Loss Comp
Range	-99.999999 to 99.999999 dB
Resolution	0.000001 dB
Suffix code	DB, DB is used when omitted.
Default	0 dB

Example of Use

To set the Fixed mode value of Loss Comp Before DUT to 20 dB.
CORR:LOSS:BEF:VAL 20DB

[:SENSe][:NFIgure]:CORRection:LOSS:BEFore|AFter:VALue?

Loss Comp Fixed Value Query

Function

This command queries the Fixed mode value of Loss Comp.

Query

[:SENSe] [:NFIgure] :CORRection:LOSS:BEFore|AFter:VALue?

Response

<value>

Parameter

<select>	Before DUT or After DUT
BEFore	Specifies Before DUT
AFter	Specifies After DUT
<value>	Fixed mode value of Loss Comp.
Range	-99.999999 to 99.999999 dB
Resolution	0.000001 dB
Suffix code	None, Value is returned in dB units

Example of Use

```
To query the Fixed mode value of Loss Comp Before DUT.
CORR:LOSS:BEF:VAL?
> 20.000000
```

`[[:SENSe][:NFIgure]:CORRection:LOSS:BEFore|AFter:TABLE:DATA
<freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,<amp_n>]`

Loss Comp Table

Function

This command creates the new Loss Comp Table.

Command

```
[[:SENSe][:NFIgure]:CORRection:LOSS:BEFore|AFter:TABLE  
:DATA <freq_1>,<amp_1>[,<freq_2>,<amp_2>,...,<freq_n>,  
<amp_n>]
```

Parameter

<code><table></code>	Specified Table
<code>BEFore</code>	The Loss Comp Before DUT table is the target.
<code>AFter</code>	The Loss Comp AFter DUT table is the target.
<code><freq_n></code>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted
<code><amp_n></code>	Loss Value
Range	-99.999999 dB to 99.999999 dB
Resolution	0.000001 dB
Suffix code	DB, DB is used when omitted

Example of Use

To create the new Loss Comp Before DUT Table.

```
CORR:LOSS:BEF:TABL:DATA 1GHZ,10DB,2GHZ,15DB,3GHZ,20DB
```

[:SENSe][:NFIgure]:CORRection:LOSS:BEFore|AFter:TABLE:DATA?

Loss Comp Table Query

Function

This command queries Loss Comp Table.

Query

[:SENSe] [:NFIgure] :CORRection:LOSS:BEFore|AFter:TABLE
:DATA?

Response

<freq_1>, <amp_1> [, <freq_2>, <amp_2>, ..., <freq_n>, <amp_n>

Parameter

<table>	Specified Table
BEFore	The Loss Comp Before DUT table is the target
AFter	The Loss Comp AFter DUT table is the target.
<freq_n>	Frequency
Range	
Minimum	0 Hz
Maximum	100 GHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz unit.
<amp_n>	Loss Value
Range	-99.999999 dB to 99.999999 dB
Resolution	0.000001 dB
Suffix code	None, Value is returned in dB unit.

Example of Use

To query the Loss Comp Before DUT table.

CORR:LOSS:BEF:TABL:DATA?

> 1000000000,10,2000000000,15,3000000000,20

[[:SENSE][:NFIGure]:CORRection:LOSS:BEFore|AFter:TABLE:COUNT?

Loss Comp Table Entry Count

Function

This command queries the Loss Comp Table line count.

Query

```
[ :SENSe ] [ :NFIGure ] :CORRection:LOSS:BEFore|AFter:TABLE  
:COUNT?
```

Response

<integer>

Parameter

<table>	Specified Table
BEFore	The Loss Comp Before DUT table is the target.
AFter	The Loss Comp AFter DUT table is the target.
<integer>	Line count. of Loss Comp Table.
Range	0 to 501
Suffix code	None

Example of Use

```
To query the line count of Loss Comp Before DUT table.  
CORR:LOSS:BEF:TABL:COUN?  
> 10
```

[[:SENSE][:NFIGure]:CORRection:LOSS:BEFore|AFter:TABLE:DATA:DELeTe

Clear Loss Comp Table

Function

This command clear the Loss Comp Table.

Command

```
[ :SENSe ] [ :NFIGure ] :CORRection:LOSS:BEFore|AFter:TABLE  
:DATA:DELeTe
```

Parameter

<table>	Specified Table
BEFore	The Loss Comp Before DUT table is the target
AFter	The Loss Comp AFter DUT table is the target.

Example of Use

```
To Clear the Loss Comp Before DUT table.  
CORR:LOSS:BEF:TABL:DATA:DEL
```

`[[:SENSE]:NFIGure]:CORRection[:USER]:TCOLd:VALue <value>`

T Cold Value

Function

This command sets the T cold value.

Command

`[[:SENSE]:NFIGure]:CORRection[:USER]:TCOLd:VALue <value>`

Parameter

<code><value></code>	T cold value
Range	0.00 to 29650000.00 K
Resolution	0.01 K
Suffix code	K, C, F. K is used when omitted.
Default	296.50 K

Example of Use

To set the T cold to 290K.
`CORR:TCOL:VAL 290K`

`[[:SENSE]:NFIGure]:CORRection[:USER]:TCOLd:VALue?`

T Cold Value Query

Function

This command queries the T cold value.

Query

`[[:SENSE]:NFIGure]:CORRection[:USER]:TCOLd:VALue?`

Response

`<value>`

Parameter

<code><value></code>	T cold value
Range	0.00 to 29650000.00 K
Resolution	0.01 K
Suffix code	None, Value is returned in K unit.

Example of Use

To query the T cold value.
`CORR:TCOL:VAL?`
`> 290`

2.10 Setting DUT mode

Table 2.10-1 shows device message of Setting DUT mode.

Table 2.10-1 DUT Mode Setting

Function	Device message
DUT	[:SENSe][:NFIGure]:MODE:DUT AMPLifier UPConv DOWNconv
	[:SENSe][:NFIGure]:MODE:DUT?

`[[:SENSe]][:NFIGure]:MODE:DUT AMPLifier|UPConv|DOWNconv` DUT

Function

This command selects the DUT mode.

Command

```
[[:SENSe]][:NFIGure]:MODE:DUT <mode>
```

Parameter

<mode>	DUT mode
AMPLifier	Amplifier mode
UPConv	Up converter mode
DOWNconv	Down converter mode
Default	AMPLifier

Backwards Compatibility SCPI

```
[[:SENSe]:CONFigure:MODE:DUT
```

Example of Use

To set the DUT mode to Down converter.

```
MODE:DUT DOWN
```

`[[:SENSe]][:NFIGure]:MODE:DUT?`

DUT Query

Function

This command queries the DUT mode.

Query

```
[[:SENSe]][:NFIGure]:MODE:DUT?
```

Response

```
<mode>
```

Parameter

<mode>	DUT mode
AMPL	Amplifier mode
UPC	Up converter mode
DOWN	Down converter mode

Backwards Compatibility SCPI

```
[[:SENSe]:CONFigure:MODE:DUT?
```

Example of Use

To set the DUT mode.

```
MODE:DUT?
> DOWN
```

2.11 Execute measurement and query results

Table 2.11-1 shows device messages to execute measurement and to query results.

Table 2.11-1 Device Messages to execute measurement and to query results

Function	Device Messages
Continuous Measurement	:INITiate:CONTInuous OFF ON 0 1
	:INITiate:CONTInuous?
	:INITiate:MODE:CONTInuous
Single Measurement	:INITiate:MODE:SINGLE
Initiate	:INITiate[:IMMediate]
Get Result	:FETCh MEASure READ[:NFIGure]?
T Cold Scalar	:FETCh MEASure READ[:NFIGure]:SCALar[:DATA]:TCOLd?
T Cold Array	:FETCh MEASure READ[:NFIGure][:ARRay][:DATA]:TCOLd?
Corrected Results Scalar	:FETCh MEASure READ[:NFIGure]:SCALar[:DATA]:CORREcted:NFIGure NFACTOR GAIN TEFFective PHOT PCOLd?
Corrected Result Array	:FETCh MEASure READ[:NFIGure][:ARRay][:DATA]:CORREcted:NFIGure NFACTOR GAIN TEFFective PHOT PCOLd?
Uncorrected Results Scalar	:FETCh MEASure READ[:NFIGure:]SCALar[:DATA]:UNCORREcted:NFIGure NFACTOR YFACTOR TEFFective PHOT PCOLd?
Uncorrected Result Array	:FETCh MEASure READ[:NFIGure][:ARRay][:DATA]:UNCORREcted:NFIGure NFACTOR YFACTOR TEFFective PHOT PCOLd?
Maximum Noise Figure	:FETCh MEASure READ[:NFIGure]:METer:MAXimum?
Minimum Noise Figure	:FETCh MEASure READ[:NFIGure]:METer:MINimum?
Average Noise Figure	:FETCh MEASure READ[:NFIGure]:METer:AVERAge?
Max To Min Noise Figure	:FETCh MEASure READ[:NFIGure]:METer:MTM?

:INITiate:CONTinuous OFF|ON|0|1

Continuous Measurement

Function

This command switches the measurement execution mode Single/Continuous.

Command

```
:INITiate:CONTinuous <switch>
```

Parameter

<switch>	Executing Measurement mode.
0 OFF	Single measurement
1 ON	ContinuousMeasurement (Default)

Details

When On is set, Continuous status is held.
When Off is set, Single status is held.

Example of Use

To execute the Continuous measurement.
INIT:CONT ON

:INITiate:CONTinuous?

Continuous Measurement Query

Function

This command queries the measurement execution mode.

Query

```
:INITiate:CONTinuous?
```

Response

```
<switch>
```

Parameter

<switch>	Executing Measurement mode.
0	Single measurement
1	ContinuousMeasurement

Example of Use

To query the Executing Measurement mode.
INIT:CONT?
> 0

:INITiate:MODE:CONTInuous

Continuous Measurement

Function

This command starts the Continuous measurement.

Command

```
:INITiate:MODE:CONTInuous
```

Details

Note that synchronization control during the Continuous mode is not supported.

Example of Use

To execute the Continuous measurement.

```
INIT:MODE:CONT
```

:INITiate:MODE:SINGle

Single Measurement

Function

This command starts the Single measurement.

Command

```
:INITiate:MODE:SINGle
```

Details

When reading out measured values such as a marker value after executing this command, use the "*WAI" command to execute synchronization control.

Example of Use

To execute the Single measurement, and to queries a marker value.

```
INIT:MODE:SING
```

```
*WAI
```

```
CALC:MARK:Y?
```

:INITiate[:IMMediate]

Initiate

Function

This command starts the measurement in the current measurement execution mode.

Command

```
:INITiate:[IMMediate]
```

Details

When reading out measured values such as a marker value after executing this command, use the "*WAI" command to execute synchronization control. Note that synchronization control during the Continuous mode is not supported.

Example of Use

To start the measurement in the current capture mode and query a marker value.

```
INIT
*WAI
CALC:MARK:Y?
```

:FETCh|MEASure|READ[:NFIGure]?

Get Result

Function

This command queries the latest measurement result.

Query

:FETCh|MEASure|READ[:NFIGure]?

Response

Returns the following 13 measurement values in comma-separated format.

T cold
Noise Figure (Corrected)
Noise Factor (Corrected)
Gain
T-Effective (Corrected)
P hot (Corrected)
P cold (Corrected)
Noise Figure (Non-corrected)
Noise Factor (Non-corrected)
Y-Factor
T-Effective (Non-corrected)
P hot (Non-corrected)
P cold (Non-corrected)

Details

FETCh: Returns the latest measurement result.
MEASure, READ: Executes the measurement and returns the result.
When multiple measurement points exist, the value queried by this function is the value of the last measurement point.

Example of Use

To execute the measurement and query the measurement result.
MEAS?
> 296.50,0.079,1.018,-0.046,5.317,14.310,0.127,0.079,
1.018,1.006,5.317,14.310,0.127

:FETCh|MEASure|READ[:NFIGure]:SCALar[:DATA]:TCOLd?

T Cold Scalar

Function

This command queries the T cold value on the latest measurement execution.

Query

```
:FETCh|MEASure|READ[:NFIGure]:SCALar[:DATA]:TCOLd?
```

Response

```
<tcold>
```

Parameter

<tcold>	T cold value on the latest measurement
Range	0.00 to 29650000.00 K
Resolution	0.01 K
Suffix code	None, in K unit.

Details

FETCh: Returns the latest measurement result
MEASure, READ: Executes the measurement and returns the result.
 When multiple measurement points exist, the value queried by this function is the value of the last measurement point.

Example of Use

```
To query the T cold value on the latest measurement execution.
FETC:SCAL:TCOL?
> 296.50
```

:FETCh|MEASure|READ[:NFIGure][:ARRay][:DATA]:TCOLd?

T Cold Array

Function

This command queries the T cold values on the latest measurement execution for all measurement points.

Query

```
:FETCh|MEASure|READ[:NFIGure][:ARRay][:DATA]:TCOLd?
```

Response

```
<tcold>
```

Parameter

<tcold>	T cold value on the latest measurement execution
Range	0.00 to 29650000.00 K
Resolution	0.01 K
Suffix code	None, Value is returned in K units

Details

FETCh: Returns the latest measurement result.
MEASure, READ: Executes the measurement and returns the result.

Example of Use

To query the T cold value on the latest measurement execution.
FETC:TCOL?
> 296.50,296.50,296.50

:FETCh|MEASure|READ[:NFIGure]:SCALar[:DATA]:CORRected:NFIGure|NF
ACtor|GAIN|TEFFective|PHOT|PCOLd?

Corrected Results Scalar

Function

This command queries the latest corrected measurement result.

Query

```
:FETCh|MEASure|READ[:NFIGure]:SCALar[:DATA]:CORRected:NFIGure|NFACTOR|GAIN|TEFFective|PHOT|PCOLd?
```

Response

<value>

Parameter

<result>	Measurement result type
NFIGure	Noise Figure
NFACTOR	Noise Factor
GAIN	Gain
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
<value>	Various measurement results

Details

FETCh: Returns the latest measurement result.
MEASure, READ: Executes the measurement and returns the result.
 When multiple measurement points exist, the value queried by this function is the value of the last measurement point.

Example of Use

```
To obtain the NF latest corrected measurement result.
FETC:SCAL:CORR:NFIG?
> 0.079
```

:FETCh|MEASure|READ[:NFIGure][:ARRay][:DATA]:CORReCted:NFIGure|NFACtor|GAIN|TEFFective|PHOT|PCOLd?

Corrected Result Array

Function

This command queries the latest corrected measurement result for each measurement point.

Query

```
:FETCh|MEASure|READ[:NFIGure][:DATA]:CORReCted:NFIGure|NFACtor|GAIN|TEFFective|PHOT|PCOLd?
```

Response

```
<value>
```

Parameter

<result>	Measurement result type
NFIGure	Noise Figure
NFACTOR	Noise Factor
GAIN	Gain
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
<value>	Various measurement results

Details

FETCh: Returns the latest measurement result.
MEASure, READ: Executes the measurement and returns the result.

Example of Use

To obtain the NF latest measurement result before correction.

```
FETC:CORR:NFIG?  
> 0.079,0.09,0.075
```


:FETCh|MEASure|READ[:NFIGure:]SCALar[:DATA]:UNCorrected:NFIGure|NFACTOR|YFACTOR|TEFFective|PHOT|PCOLd?

Uncorrected Results Scalar

Function

This command queries the latest measurement result before correction.

Query

`:FETCh|MEASure|READ[:NFIGure]:SCALar[:DATA]:UNCorrected:NFIGure|NFACTOR|GAIN|TEFFective|PHOT|PCOLd?`

Response

`<value>`

Parameter

<code><result></code>	Measurement result type
<code>NFIGure</code>	Noise Figure
<code>NFACTOR</code>	Noise Factor
<code>GAIN</code>	Gain
<code>TEFFective</code>	T effective
<code>PHOT</code>	P hot
<code>PCOLd</code>	P cold
<code><value></code>	Various measurement results

Details

FETCh: Returns the latest measurement result
MEASure, READ: Executes the measurement and returns the result.
 When multiple measurement points exist, the value queried by this function is the value of the last measurement point.

Example of Use

To obtain the NF latest measurement result before correction.
`FETC:SCAL:UNC:NFIG?`
`> 0.079`

:FETCh|MEASure|READ[:NFIGure][:ARRay][:DATA]:UNCorrected:NFIGure|NFACTOR|YFACTOR|TEFFective|PHOT|PCOLd?

Uncorrected Result Array

Function

This command queries the latest measurement result before correction for each measurement point.

Query

```
:FETCh|MEASure|READ[:NFIGure][:DATA]:UNCorrected:NFIGure|NFACTOR|GAIN|TEFFective|PHOT|PCOLd?
```

Response

<value>

Parameter

<result>	Measurement result
NFIGure	Noise Figure
NFACTOR	Noise Factor
GAIN	Gain
TEFFective	T effective
PHOT	P hot
PCOLd	P cold
<value>	Various measurement results

Details

FETCh: Returns the latest measurement result.
MEASure, READ: Executes the measurement and returns the result.

Example of Use

To query the latest measurement result before correction.
FETC:UNC:NFIG?
> 0.079,0.09,0.075

:FETCh|MEASure|READ[:NFIGure]:METer:MAXimum?

Maximum Noise Figure

Function

This command queries the Noise Figure maximum value when the meter reads.

Query

```
:FETCh|MEASure|READ[:NFIGure]:METer:MAXimum?
```

Response

```
<max>          Noise Figure maximum value
```

Details

With this command, FETCh, MEASure, and READ have the same execution result.

When Frequency Mode is not Fixed, -999.00 is returned.

Example of Use

To query the Noise Figure maximum value.

```
FETC:MET:MAX?
```

```
> 0.5
```

:FETCh|MEASure|READ[:NFIGure]:METer:MINimum?

Minimum Noise Figure

Function

This command queries the Noise Figure minimum value when the meter reads.

Query

```
:FETCh|MEASure|READ[:NFIGure]:METer:MINimum?
```

Response

```
<min>          Noise Figure minimum value
```

Details

With this command, FETCh, MEASure, and READ have the same execution result.

When Frequency Mode is not Fixed, -999.00 is returned.

Example of Use

To query the Noise Figure minimum value.

```
FETC:MET:MIN?
```

```
> 0.001
```

:FETCh|MEASure|READ[:NFIGure]:METer:AVERage?

Average Noise Figure

Function

This command queries the Noise Figure average value when the meter reads.

Query

```
:FETCh|MEASure|READ[:NFIGure]:METer:AVERage?
```

Response

```
<avg>          Noise Figure average value
```

Details

With this command, FETCh, MEASure, and READ have the same execution result.

When Frequency Mode is not Fixed, -999.00 is returned.

Example of Use

To query the Noise Figure average value

```
FETC:MET:AVER?
```

```
> 0.03
```

:FETCh|MEASure|READ[:NFIGure]:METer:MTM?

Max To Min Noise Figure

Function

This command queries the difference between Noise Figure maximum and minimum values when the meter reads.

Query

```
:FETCh|MEASure|READ[:NFIGure]:METer:MTM?
```

Response

```
<mtm>          Difference between Noise Figure maximum and  
                minimum values
```

Details

With this command, FETCh, MEASure, and READ have the same execution result.

When Frequency Mode is not Fixed, -999.00 is returned.

Example of Use

Queries the difference between Noise Figure maximum and minimum values.

```
FETC:MET:MTM?
```

```
> 0.499
```

2.12 Save / Load Files

Table 2.12-1 shows device message of save / load files.

Table 2.12-1 Save / Load Files

Function	Device Messages
Save Meas Table	:MMEMory:STORe:ENR[:MEASurement] [<file_name>[,<device>]]
Load Meas Table	:MMEMory:LOAD:ENR[:MEASurement] <file_name>[,<device>]
Save Cal Table	:MMEMory:STORe:ENR:CALibration [<file_name>[,<device>]]
Load Cal Table	:MMEMory:LOAD:ENR:CALibration <file_name>[,<device>]
Save Frequency List	:MMEMory:STORe:FREQuency [<file_name>[,<device>]]
Load Frequency List	:MMEMory:LOAD:FREQuency <file_name>[,<device>]
Save Loss Comp Table	:MMEMory:STORe:LOSS BEFore AFTer[,<file_name>[,<device>]]
Load Loss Comp Table	:MMEMory:LOAD:LOSS BEFore AFTer,<file_name>[,<device>]
Export Meas Results	:MMEMory:STORe:RESults [<file_name>[,<device>]]

:MMEMory:STORe:ENR[:MEASurement] [<file_name>[,<device>]]

Save Meas Table

Function

This command saves Meas Table.

Command

```
:MMEMory:STORe:ENR[:MEASurement] [<file_name>[,<device>]]
```

Parameter

<file_name>	File name
<device>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Details

The file is saved in CSV format.

Example of Use

To save Meas Table as a file name, "Test_Measure"
MMEM:STOR:ENR "Test_Measure"

:MMEMory:LOAD:ENR[:MEASurement] <file_name>[,<device>]

Load Meas Table

Function

This command loads Meas Table.

Command

```
:MMEMory:LOAD:ENR[:MEASurement] <file_name>[,<device>]
```

Parameter

<file_name>	File name
<device>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Example of Use

To load the file "Test_Measure" to set it in Meas Table.
MMEM:LOAD:ENR "Test_Measure"

:MMEMory:STORe:ENR:CALibration [<file_name>[,<device>]]

Save Cal Table

Function

This command saves Cal Table.

Command

`:MMEMory:STORe:ENR:CALibration [<file_name>[,<device>]]`

Parameter

<code><file_name></code>	File name
<code><device></code>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Details

The file is saved in CSV format.

Example of Use

To save Cal Table as a file name, "Test_Calibration"

```
MMEM:STOR:ENR:CAL "Test_Calibration"
```

:MMEMory:LOAD:ENR:CALibration <file_name>[,<device>]

Load Meas Table

Function

This command loads Cal Table.

Command

`:MMEMory:LOAD:ENR:CALibration <file_name>[,<device>]`

Parameter

<code><file_name></code>	File name
<code><device></code>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Example of Use

To load the file "Test_Calibration" to set it in Cal Table.

```
MMEM:LOAD:ENR:CAL "Test_Calibration"
```

:MMEMory:STORe:FREQuency [<file_name>[,<device>]]

Save Frequency List

Function

This command saves Frequency List in a file.

Command

```
:MMEMory:STORe:FREQuency [<file_name>[,<device>]]
```

Parameter

<file_name>	File name
<device>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Details

The file is saved in CSV format.

Example of Use

To save Frequency List as a file name, "Test_FreqList"
MMEM:STOR:FREQ "Test_FreqList"

:MMEMory:LOAD:FREQuency <file_name>[,<device>]

Load Frequency List

Function

This command loads Frequency List from a file.

Command

```
:MMEMory:LOAD:FREQuency <file_name>[,<device>]
```

Parameter

<file_name>	File name
<device>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Example of Use

To load the file "Test_FreqList" to set it in Frequency List.
MMEM:LOAD:FREQ "Test_FreqList"

:MMEMory:STORe:LOSS BEFore|AFTer[,<file_name>[,<device>]]

Save Loss Comp Table

Function

This command saves Loss Comp Table in a file.

Command

`:MMEMory:STORe:LOSS BEFore|AFTer[,<file_name>[,<device>]]`

Parameter

`<file_name>` File name
`<device>` Drive name
(A,B,D,E,..., D drive is used when omitted.)

Details

The file is saved in CSV format.

Example of Use

To save the Loss Comp Before DUT table as a file name,
"Test_LCBDUT".

`MMEM:STOR:LOSS BEF, "Test_LCBDUT"`**:MMEMory:LOAD:LOSS BEFore|AFTer,<file_name>[,<device>]**

Load Loss Comp Table

Function

This command loads Loss Comp Table from a file.

Command

`:MMEMory:LOAD:LOSS BEFore|AFTer, <file_name>[,<device>]`

Parameter

`<file_name>` File name
`<device>` Drive name
(A,B,D,E,..., D drive is used when omitted.)

Example of Use

To load the file "Test_LCBDUT" to set it in the Loss Comp Before DUT
table.

`MMEM:LOAD:LOSS BEF, "Test_LCBDUT"`

:MMEMory:STORe:RESults [<file_name>[,<device>]]

Export Meas Results

Function

This command saves a measurement result in a file.

Command

```
:MMEMory:STORe:RESults [<file_name>[,<device>]]
```

Parameter

<file_name>	File name
<device>	Drive name (A,B,D,E,..., D drive is used when omitted.)

Details

The file is saved in CSV format.

Example of Use

To save a measurement result as a file name, "Test_Result"

```
MMEM:STOR:RES "Test_Result"
```

2.13 Setting Convert

Table 2.13-1 lists device messages related to convert settings.

Table 2.13-1 Convert Setting

Function	Device Messages
DUT LO Mode	[:SENSE] [:NFIGURE] :MODE:DUT:LOSCillator FIXed VARIABLE
	[:SENSE] [:NFIGURE] :MODE:DUT:LOSCillator?
Downconverter Fixed IF Frequency	[:SENSE] [:NFIGURE] :MODE:DOWNconv:IF:FREQUENCY <freq>
	[:SENSE] [:NFIGURE] :MODE:DOWNconv:IF:FREQUENCY?
Downconverter Fixed LO Frequency	[:SENSE] [:NFIGURE] :MODE:DOWNconv:LOSCillator:FREQUENCY <freq>
	[:SENSE] [:NFIGURE] :MODE:DOWNconv:LOSCillator:FREQUENCY?
Downconverter LO Offset	[:SENSE] [:NFIGURE] :MODE:DOWNconv:LOSCillator:OFFSet DSB LSB USB
	[:SENSE] [:NFIGURE] :MODE:DOWNconv:LOSCillator:OFFSet?
Upconverter Fixed IF Frequency	[:SENSE] [:NFIGURE] :MODE:UPConv:IF:FREQUENCY <freq>
	[:SENSE] [:NFIGURE] :MODE:UPConv:IF:FREQUENCY?
Upconverter Fixed LO Frequency	[:SENSE] [:NFIGURE] :MODE:UPConv:LOSCillator:FREQUENCY <freq>
	[:SENSE] [:NFIGURE] :MODE:UPConv:LOSCillator:FREQUENCY?
Upconverter LO Offset	[:SENSE] [:NFIGURE] :MODE:UPConv:LOSCillator:OFFSet DSB LSB USB
	[:SENSE] [:NFIGURE] :MODE:UPConv:LOSCillator:OFFSet?

`[[:SENSe]][:NFIGure]:MODE:DUT:LOSCillator FIXed|VARiable`

DUT LO Mode

Function

This command selects local frequency mode for upconverting/downconverting.

Command

```
[[:SENSe]][:NFIGure]:MODE:DUT:LOSCillator <mode>
```

Parameter

<mode>	DUT Local mode
FIXed	Fixed mode
VARiable	Variable mode
Default	FIXed

Backwards Compatibility SCPI

```
[[:SENSe]:CONFIGure:MODE:DUT:LOSCillator
```

Example of Use

To set local frequency fixed mode.
`MODE:DUT:LOSC FIX`

`[[:SENSe]][:NFIGure]:MODE:DUT:LOSCillator?`

DUT LO Mode Query

Function

This command queries local frequency mode for upconverting/downconverting.

Query

```
[[:SENSe]][:NFIGure]:MODE:DUT:LOSCillator?
```

Response

```
<mode>
```

Parameter

<mode>	Converter Local mode
FIX	Fixed mode
VAR	Variable mode

Backwards Compatibility SCPI

```
[[:SENSe]:CONFIGure:MODE:DUT:LOSCillator?
```

Example of Use

To query local frequency fixed mode.
`MODE:DUT:LOSC?`
> FIX

[[:SENSE][:NFIGure]:MODE:DOWNconv:IF:FREQUENCY <freq>

Downconverter Fixed IF Frequency

Function

This command sets IF Frequency when local frequency mode of Downconverter mode is varied.

Command

```
[[:SENSE][:NFIGure]:MODE:DOWNconv:IF:FREQUENCY <freq>
```

Parameter

<freq>	IF Frequency
Range	1 Hz to the upper limit frequency of the main unit
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.
Default	30 MHz

Backwards Compatibility SCPI

```
[[:SENSE]:CONFIGure:MODE:DOWNconv:IF:FREQUENCY
```

Example of Use

To set IF Frequency of Downconverter mode to 1 GHz.
MODE:DOWN:IF:FREQ 1GHZ

`[[:SENSe][:NFIGure]:MODE:DOWNconv:IF:FREQuency?`

Downconverter Fixed IF Frequency Query

Function

This command queries IF Frequency when local frequency mode of Downconverter mode is varied.

Query

```
[[:SENSe][:NFIGure]:MODE:DOWNconv:IF:FREQuency?
```

Response

```
<freq>
```

Parameter

<code><freq></code>	IF Frequency
Range	1 Hz to the upper limit frequency of the main unit
Resolution	1 Hz

Backwards Compatibility SCPI

```
[[:SENSe]:CONFigure:MODE:DOWNconv:LOSCillator:FREQuency?
```

Example of Use

To query IF Frequency of Downconverter mode.

```
MODE:DOWN:IF:FREQ?
```

```
> 1000000000
```

[:SENSe][:NFIGure]:MODE:DOWNconv:LOSCillator:FREQuency <freq>

Downconverter Fixed LO Frequency

Function

This command sets LO Frequency when local frequency mode of Downconverter mode is fixed.

Command

```
[:SENSe][:NFIGure]:MODE:DOWNconv:LOSCillator:FREQuency
<freq>
```

Parameter

<freq>	LO Frequency
Range	2 Hz to 325 GHz (when sideband mode is DSB) 3 Hz to 325 GHz (when sideband mode is LSB) 2 Hz to 325 GHz (when sideband mode is USB)
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.
Default	10 GHz

Backwards Compatibility SCPI

```
[:SENSe]:CONFIGure:MODE:DOWNconv:LOSCillator:FREQuency
```

Example of Use

To set LO Frequency of Downconverter mode to 1 GHz.
MODE:DOWN:LOSC:FREQ 1GHZ

`[[:SENSe][:NFIGure]:MODE:DOWNconv:LOSCillator:FREQUENCY?`

Downconverter Fixed LO Frequency Query

Function

This command queries LO Frequency when local frequency mode of Downconverter mode is fixed.

Query

```
[[:SENSe][:NFIGure]:MODE:DOWNconv:LOSCillator:FREQUENCY
```

Response

```
<freq>
```

Parameter

<code><freq></code>	LO Frequency
Range	2 Hz to 325 GHz (when sideband mode is DSB) 3 Hz to 325 GHz (when sideband mode is LSB) 2 Hz to 325 GHz (when sideband mode is USB)
Resolution	1 Hz

Backwards Compatibility SCPI

```
[[:SENSe]:CONFIGure:MODE:DOWNconv:LOSCillator:FREQUENCY?
```

Example of Use

```
To query LO Frequency of Downconverter mode.  
MODE:DOWN:LOSC:FREQ?  
> 1000000000
```


[[:SENSE]:[:NFIGURE]:MODE:DOWNconv:LOSCillator:OFFSet DSB|LSB|USB

Downconverter LO Offset

Function

This command sets LO Offset of Downconverter mode.

Command

```
[[:SENSE]:[:NFIGURE]:MODE:DOWNconv:LOSCillator:OFFSet
<mode>
```

Parameter

<mode>	Frequency offset mode
DSB	Double sideband (without offset)
LSB	Lower sideband (Signal frequency < LO Frequency)
USB	Upper sideband (Signal frequency > LO Frequency)
Default	LSB

Backwards Compatibility SCPI

```
[[:SENSE]:CONFIGure:MODE:DOWNconv:LOSCillator:OFFSet
```

Example of Use

To set LO Offset of Downconverter mode to Double sideband.

```
MODE:DOWN:LOSC:OFFS DSB
```

[[:SENSE]:[:NFIGURE]:MODE:DOWNconv:LOSCillator:OFFSet?

Downconverter LO Offset Query

Function

This command queries LO Offset of Downconverter mode.

Query

```
[[:SENSE]:[:NFIGURE]:MODE:DOWNconv:LOSCillator:OFFSet?
```

Response

```
<mode>
```

Parameter

<mode>	Frequency offset mode
DSB	Double sideband (without offset)
LSB	Lower sideband (Signal frequency < LO Frequency)
USB	Upper sideband (Signal frequency > LO Frequency)

Backwards Compatibility SCPI

```
[[:SENSE]:CONFIGure:MODE:DOWNconv:LOSCillator:OFFSet?
```

Example of Use

To query LO Offset of Downconverter mode.

```
MODE:DOWN:LOSC:OFFS?
> DSB
```

`[[:SENSe][:NFIGure]:MODE:UPConv:IF:FREQuency <freq>`

Upconverter Fixed IF Frequency

Function

This command sets IF Frequency when local frequency mode of Upconverter mode is varied.

Command

```
[[:SENSe][:NFIGure]:MODE:UPConv:IF:FREQuency <freq>
```

Parameter

<code><freq></code>	IF Frequency
Range	1 Hz to the upper limit frequency of the main unit
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.
Default	30 MHz

Backwards Compatibility SCPI

```
[[:SENSe]:CONFIGure:MODE:UPConv:IF:FREQuency
```

Example of Use

To set IF Frequency of Upconverter mode to 1 GHz.
`MODE:UPC:IF:FREQ 1GHZ`

[[:SENSe][:NFIGure]:MODE:UPConv:IF:FREQuency?

Upconverter Fixed IF Frequency Query

Function

This command queries IF Frequency when local frequency mode of Upconverter mode is varied.

Query

```
[[:SENSe][:NFIGure]:MODE:UPConv:IF:FREQuency?
```

Response

```
<freq>
```

Parameter

<freq>	IF Frequency
Range	1 Hz to the upper limit frequency of the main unit
Resolution	1 Hz

Backwards Compatibility SCPI

```
[[:SENSe]:CONFigure:MODE:UPConv:IF:FREQuency?
```

Example of Use

To query IF Frequency of Upconverter mode.

```
MODE:UPC:IF:FREQ?
> 1000000000
```

`[[:SENSe][:NFIGure]:MODE:UPConv:LOSCillator:FREQuency <freq>`

Upconverter Fixed LO Frequency

Function

This command sets LO Frequency when local frequency mode of Upconverter mode is fixed.

Command

```
[[:SENSe][:NFIGure]:MODE:UPConv:LOSCillator:FREQuency  
<freq>
```

Parameter

<code><freq></code>	LO Frequency
Range	2 Hz to 325 GHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.
Default	10 GHz

Backwards Compatibility SCPI

```
[[:SENSe]:CONFIGure:MODE:UPConv:LOSCillator:FREQuency
```

Example of Use

To set LO Frequency of Upconverter mode to 1 GHz.
`MODE:UPC:LOSC:FREQ 1GHZ`

[[:SENSe]][:NFIGure]:MODE:UPConv:LOSCillator:FREQUENCY?

Upconverter Fixed LO Frequency Query

Function

This command queries LO Frequency when local frequency mode of Upconverter mode is fixed.

Query

```
[[:SENSe]][:NFIGure]:MODE:UPConv:LOSCillator:FREQUENCY
```

Response

```
<freq>
```

Parameter

```
<freq>      LO Frequency
Range        2 Hz to 325 GHz
Resolution   1 Hz
```

Backwards Compatibility SCPI

```
[[:SENSe]:CONFigure:MODE:UPConv:LOSCillator:FREQUENCY?
```

Example of Use

```
To query LO Frequency of Upconverter mode.
MODE:UPC:LOSC:FREQ?
> 1000000000
```

`[[:SENSE][:NFIGure]:MODE:UPConv:LOSCillator:OFFSet LSB|USB`

Upconverter LO Offset

Function

This command sets LO Offset of Upconverter mode.

Command

```
[[:SENSE][:NFIGure]:MODE:UPConv:LOSCillator:OFFSet <mode>
```

Parameter

<mode>	Frequency offset mode
LSB	Lower sideband (Signal frequency < LO Frequency)
USB	Upper sideband (Signal frequency > LO Frequency)
Default	LSB

Backwards Compatibility SCPI

```
[[:SENSE]:CONFIGure:MODE:UPConv:LOSCillator:OFFSet
```

Example of Use

To set LO Offset of Upconverter mode to Upper sideband.

```
MODE:UPC:LOSC:OFFS USB
```

`[[:SENSE][:NFIGure]:MODE:UPConv:LOSCillator:OFFSet?`

Upconverter LO Offset Query

Function

This command queries LO Offset of Upconverter mode.

Query

```
[[:SENSE][:NFIGure]:MODE:UPConv:LOSCillator:OFFSet?
```

Response

```
<mode>
```

Parameter

<mode>	Frequency offset mode
LSB	Lower sideband (Signal frequency < LO Frequency)
USB	Upper sideband (Signal frequency > LO Frequency)

Backwards Compatibility SCPI

```
[[:SENSE]:CONFIGure:MODE:UPConv:LOSCillator:OFFSet?
```

Example of Use

To query LO Offset of Upconverter mode.

```
MODE:UPC:LOSC:OFFS?
```

```
> USB
```

2.14 Setting External LO

Table 2.14-1 lists the device messages related to External LO settings.

Table 2.14-1 External LO Setting

Function	Device Messages
External LO Control	SYSTem:CONFIgure:LOSCillator:CONTRol[:STATe] OFF ON 0 1
	SYSTem:CONFIgure:LOSCillator:CONTRol[:STATe]?
External LO Select	SYSTem:CONFIgure:LOSCillator:SELEct INTernal EXTernal
	SYSTem:CONFIgure:LOSCillator:SELEct?
GPIB Address Select for External LO	:SYSTem:COMMunicate:GPIB[1][:SELf]:ADDRess <integer>
	:SYSTem:COMMunicate:GPIB[1][:SELf]:ADDRess?
External LO Type	SYSTem:CONFIgure:LOSCillator:TYPE SCPI CUSTom
	SYSTem:CONFIgure:LOSCillator:TYPE?
External LO Auxiliary Command	SYSTem:CONFIgure:LOSCillator:COMMand:AUXiliary <command>
	SYSTem:CONFIgure:LOSCillator:COMMand:AUXiliary?
External LO Frequency Prefix	SYSTem:CONFIgure:LOSCillator:COMMand:FREQuency:PREFix <prefix>
	SYSTem:CONFIgure:LOSCillator:COMMand:FREQuency:PREFix?
External LO Frequency Suffix	SYSTem:CONFIgure:LOSCillator:COMMand:FREQuency:SUFFix <suffix>
	SYSTem:CONFIgure:LOSCillator:COMMand:FREQuency:SUFFix?
External LO Power Prefix	SYSTem:CONFIgure:LOSCillator:COMMand:POWER:PREFix <prefix>
	SYSTem:CONFIgure:LOSCillator:COMMand:POWER:PREFix?
External LO Power Suffix	SYSTem:CONFIgure:LOSCillator:COMMand:POWER:SUFFix <suffix>
	SYSTem:CONFIgure:LOSCillator:COMMand:POWER:SUFFix?
External LO Power Level	SYSTem:CONFIgure:LOSCillator:PARAMeter:POWER[:LEVel] <ampl>
	SYSTem:CONFIgure:LOSCillator:PARAMeter:POWER[:LEVel]?
External LO Settling Time	SYSTem:CONFIgure:LOSCillator:PARAMeter:SETTling[:TIME] <time>
	SYSTem:CONFIgure:LOSCillator:PARAMeter:SETTling[:TIME]?
External LO Maximum Frequency	SYSTem:CONFIgure:LOSCillator:PARAMeter:MAXimum[:FREQuency] <freq>
	SYSTem:CONFIgure:LOSCillator:PARAMeter:MAXimum[:FREQuency]?
External LO Minimum Frequency	SYSTem:CONFIgure:LOSCillator:PARAMeter:MINimum[:FREQuency] <freq>
	SYSTem:CONFIgure:LOSCillator:PARAMeter:MINimum[:FREQuency]?

:SYSTem:CONFigure:LOSCillator:CONTRol[:STATe] OFF|ON|0|1

External LO Control

Function

This command controls External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:CONTRol[:STATe] <switch>
```

Parameter

<switch>	External LO Control
OFF 0	Off (Default)
ON 1	On

Example of Use

To control External LO.
SYST:CONF:LOSC:CONT ON

:SYSTem:CONFigure:LOSCillator:CONTRol[:STATe]?

External LO Control Query

Function

This command queries External LO control.

Query

```
:SYSTem:CONFigure:LOSCillator:CONTRol[:STATe]?
```

Response

```
<switch>
```

Parameter

<switch>	External LO Control
0	Off (Default)
1	On

Example of Use

To query External LO control.
SYST:CONF:LOSC:CONT?
> 1

:SYSTem:CONFigure:LOSCillator:SElect INTernal|EXTernal

External LO Select

Function

This command selects External LO.

Command

`:SYSTem:CONFigure:LOSCillator:SElect <select>`

Parameter

<code><select></code>	External LO Select
<code>INTernal</code>	Internal SG option (Default)
<code>EXTernal</code>	External Signal Generator

Example of Use

To set External LO Select to Internal SG option.

`SYST:CONF:LOSC:SEL INT`**:SYSTem:CONFigure:LOSCillator:SElect?**

External LO Select Query

Function

This command queries External LO Select.

Query

`:SYSTem:CONFigure:LOSCillator:SElect?`

Response

`<select>`

Parameter

<code><select></code>	External LO Select
<code>INT</code>	Internal SG option (Default)
<code>EXT</code>	External Signal Generator

Example of Use

To query External LO Select.

`SYST:CONF:LOSC:SEL?``> INT`

:SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess <integer>

GPIB Address Select for External LO

Function

This command sets the GPIB address for External LO.

Command

```
:SYSTem:COMMunicate:GPIB[1] [:SELF] :ADDRess <integer>
```

Parameter

<integer>	GPIB Address
Range	0 to 30
Resolution	1
Suffix code	None
Default	18

Example of Use

To set the GPIB address for External LO to 0.

```
SYST:COMM:GPIB:ADDR 0
```

:SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess?

GPIB Address Select for External LO Query

Function

This command queries the GPIB address for External LO.

Query

```
:SYSTem:COMMunicate:GPIB[1] [:SELF] :ADDRess?
```

Response

```
<integer>
```

Parameter

<integer>	GPIB Address
Range	0 to 30
Resolution	1

Example of Use

To query the GPIB address for External LO.

```
SYST:COMM:GPIB:ADDR?
```

```
> 0
```

:SYSTem:CONFigure:LOSCillator:TYPE SCPI|CUSTom

External LO Type

Function

This command sets command type for External LO control.

Command

`:SYSTem:CONFigure:LOSCillator:TYPE <type>`

Parameter

<code><type></code>	Command type for External LO control
SCPI	SCPI command (Default)
CUSTom	Arbitrary setting command

Example of Use

To control External LO by SCPI command.

`SYST:CONF:LOSC:TYPE SCPI`**:SYSTem:CONFigure:LOSCillator:TYPE?**

External LO Type Query

Function

This command queries type for External LO control.

Query

`:SYSTem:CONFigure:LOSCillator:TYPE?`

Response

`<type>`

Parameter

<code><type></code>	External LO control
SCPI	SCPI command (Default)
CUST	Arbitrary setting command

Example of Use

To query command type for External LO control

`SYST:CONF:LOSC:TYPE?``> CUST`

:SYSTem:CONFigure:LOSCillator:COMMand:AUXiliary <command>

External LO Auxiliary Command

Function

This command sets auxiliary command for External LO.

Command

:SYSTem:CONFigure:LOSCillator:COMMand:AUXiliary <command>

Parameter

<command>	Command character string Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension) The following characters cannot be used: ¥ / ? “ ” ‘ ’ < >
Default	OUTP:STAT ON

Example of Use

To set auxiliary command ‘OUTP:STAT ON’ to External LO.
SYST:CONF:LOSC:COMM:AUX 'OUTP:STAT ON'

:SYSTem:CONFigure:LOSCillator:COMMand:AUXiliary?

External LO Auxiliary Command Query

Function

This command queries the auxiliary command set for External LO.

Query

:SYSTem:CONFigure:LOSCillator:COMMand:AUXiliary?

Response

<command>

Parameter

<command>	Command character string Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension)
-----------	--

Example of Use

To query the auxiliary command set for External LO.
SYST:CONF:LOSC:COMM:AUX?
> OUTP:STAT ON

:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:PREFix <prefix>

External LO Frequency Prefix

Function

This command sets in External LO the frequency command that is added as a prefix to a frequency value set for External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:PREFix
<prefix>
```

Parameter

<prefix> Command character string
 Character string within 79 characters enclosed by double quotes (“”) or single quotes (‘’) (excluding extension)
 The following characters cannot be used:
 ¥ / ? “ ” ‘ ’ < > |

Default **FREQ**

Example of Use

To set the frequency command ‘FREQ’ in External LO.
 SYST:CONF:LOSC:COMM:FREQ:PREF 'FREQ'

:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:PREFix?

External LO Frequency Prefix Query

Function

This command queries the frequency command set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:PREFix?
```

Response

```
<prefix>
```

Parameter

<prefix> Command character string
 Character string within 79 characters enclosed by double quotes (“”) or single quotes (‘’) (excluding extension)

Example of Use

To query the frequency command set in External LO.
 SYST:CONF:LOSC:COMM:FREQ:PREF?
 > FREQ

:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:SUFFix <suffix>

External LO Frequency Suffix

Function

This command sets in External LO the suffix code that is added as a suffix to a frequency value set for External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:SUFFix  
<suffix>
```

Parameter

<suffix> Command character string
Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension)

The following characters cannot be used:

¥ / ? “ ” ‘ ’ < > |

Default HZ

Example of Use

To set the frequency suffix code ‘HZ’ in External LO.

```
SYST:CONF:LOSC:COMM:FREQ:SUFF 'HZ'
```

:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:SUFFix?

External LO Frequency Suffix Query

Function

This command queries the frequency suffix code set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:COMMand:FREQuency:SUFFix?
```

Response

```
<suffix>
```

Parameter

<suffix> Command character string
Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension)

Example of Use

To query the frequency suffix code set in External LO.

```
SYST:CONF:LOSC:COMM:FREQ:SUFF  
> HZ
```

:SYSTem:CONFigure:LOSCillator:COMMand:POWer:PREFix <prefix>

External LO Power Prefix

Function

This command sets in External LO the output level command that is added as a prefix to a power value set for External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:COMMand:POWer:PREFix
<prefix>
```

Parameter

<prefix>	Command character string
DSB	Character string within 79 characters enclosed by double quotes (“”) or single quotes (‘’) (excluding extension)
	The following characters cannot be used: ¥ / ? “ ” ‘ ’ < >
Default	POW

Example of Use

To set the output level command ‘POW’ in External LO.
 SYST:CONF:LOSC:COMM:POW:PREF 'POW'

:SYSTem:CONFigure:LOSCillator:COMMand:POWer:PREFix?

External LO Power Prefix Query

Function

This command queries the output level command set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:COMMand:POWer:PREFix?
```

Response

```
<prefix>
```

Parameter

<prefix>	Command character string
	Character string within 79 characters enclosed by double quotes (“”) or single quotes (‘’) (excluding extension)

Example of Use

To query the output level command set in External LO.
 SYST:CONF:LOSC:COMM:POW:PREF?
 > POW

:SYSTem:CONFigure:LOSCillator:COMMand:POWer:SUFFix <suffix>

External LO Power Suffix

Function

This command sets in External LO the suffix code that is added as a suffix to output level set for External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:COMMand:POWer:SUFFix  
<suffix>
```

Parameter

<suffix>	Command character string Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension) The following characters cannot be used: ¥ / ? “ ” ‘ ’ < >
Default	DBM

Example of Use

To set the output-level suffix code ‘DBM’ in External LO.
SYST:CONF:LOSC:COMM:POW:SUFF ‘DBM’

:SYSTem:CONFigure:LOSCillator:COMMand:POWer:SUFFix?

External LO Power Suffix Query

Function

This command queries the suffix code of output level set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:COMMand:POWer:SUFFix?
```

Response

```
<suffix>
```

Parameter

<suffix>	Command character string Character string within 79 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension)
----------	--

Example of Use

To query the suffix code of output level set in External LO.
SYST:CONF:LOSC:COMM:POW:SUFF?
> DBM

:SYSTem:CONFigure:LOSCillator:PARAmeter:POWer[:LEVel] <ampl>

External LO Power Level

Function

This command sets the output level of External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:POWer[:LEVel]
<ampl>
```

Parameter

<ampl>	Output Level
Range	-100.0 to 100.0 dBm
Resolution	0.1 dB
Default	0.0 dB
Suffix code	DBM
	DBM is used when omitted

Example of Use

To set the output level of External LO to 1.0 dBm.

```
SYST:CONF:LOSC:PAR:POW 1.0
```

:SYSTem:CONFigure:LOSCillator:PARAmeter:POWer[:LEVel]?

External LO Power Level Query

Function

This command queries the output level set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:POWer[:LEVel]?
```

Response

```
<ampl>
```

Parameter

<ampl>	Output Level
Range	-100.0 to 100.0 dBm
Resolution	0.1 dB
Suffix code	None, value is returned in dBm units.

Example of Use

To query the output level set in External LO.

```
SYST:CONF:LOSC:PAR:POW?
```

```
> 1.0
```

:SYSTem:CONFigure:LOSCillator:PARAmeter:SETTling[:TIME] <time>

External LO Settling Time

Function

This command sets settling time (stabilizing time) of External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:SETTling[:TIME]  
<time>
```

Parameter

<time>	Settling Time (stabilizing time)
Range	0 to 5 s
Resolution	1 ms
Default	0 ms
Suffix code	MS, S
	S is used when omitted

Example of Use

To set settling time of External LO to 0.2 s.
SYST:CONF:LOSC:PAR:SETT 0.2

:SYSTem:CONFigure:LOSCillator:PARAmeter:SETTling[:TIME]?

External LO Settling Time Query

Function

This command queries the settling time (stabilizing time) set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:SETTling[:TIME]?
```

Response

```
<time>
```

Parameter

<type>	Settling Time (stabilizing time)
Range	0 to 5 s
Resolution	1 ms
Suffix code	None. Value is returned in s units.

Example of Use

To query the settling time set in External LO.
SYST:CONF:LOSC:PAR:SETT?
> 0.2

`:SYSTem:CONFigure:LOSCillator:PARAmeter:MAXimum[:FREQUENCY]`

`<freq>`

External LO Maximum Frequency

Function

This command sets Maximum Frequency of External LO.

Command

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:MAXimum[:FREQUENCY] <freq>
```

Parameter

<code><freq></code>	Maximum Frequency	
Range		
Minimum	[MS2830A]	100 kHz
	[MS2690A/MS2691A/MS2692A]	125 MHz
	[External LO]	0 Hz
Maximum	[MS2830A-020]	3.6 GHz
	[MS2690A-020/MS2691A-020/MS2692A-020/MS2830A-021]	6 GHz
	[External LO]	325 GHz
Resolution	1 Hz	
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ	
	HZ is used when omitted.	

Example of Use

To set Maximum Frequency of External LO to 1 GHz.
`SYST:CONF:LOSC:PAR:MAX 1GHZ`

:SYSTem:CONFigure:LOSCillator:PARAmeter:MAXimum[:FREQUENCY]?

External LO Maximum Frequency Query

Function

This command queries Maximum Frequency set in External LO.

Query

:SYSTem:CONFigure:LOSCillator:PARAmeter:MAXimum[:FREQUENCY]?

Response

<freq>

Parameter

<freq>	Maximum Frequency	
Range		
Minimum	[MS2830A]	100 kHz
	[MS2690A/MS2691A/MS2692A]	125 MHz
	[External LO]	0 Hz
Maximum	[MS2830A-020]	3.6 GHz
	[MS2690A-020/MS2691A-020/MS2692A-020/MS2830A-021]	6 GHz
	[External LO]	325 GHz
Suffix code	None. Value is returned in Hz units.	

Example of Use

To query Maximum Frequency set in External LO.
 SYST:CONF:LOSC:PAR:MAX?
 > 1000000000

`:SYSTem:CONFigure:LOSCillator:PARAmeter:MINimum[:FREQUENCY] <freq>`

External LO Minimum Frequency

Function

This command sets Minimum Frequency of External LO.

Command

`:SYSTem:CONFigure:LOSCillator:PARAmeter:MINimum[:FREQUENCY] <freq>`

Parameter

<code><freq></code>	Minimum Frequency
Range	
Minimum	[MS2830A] 100 kHz [MS2690A/MS2691A/MS2692A] 125 MHz [External LO] 0 Hz
Maximum	[MS2830A-020] 3.6 GHz [MS2690A-020/MS2691A-020/ MS2692A-020/MS2830A-021] 6 GHz [External LO] 325 GHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ HZ is used when omitted.

Example of Use

To set Minimum Frequency of External LO to 100 MHz.

`SYST:CONF:LOSC:PAR:MIN 100MHZ`

:SYSTem:CONFigure:LOSCillator:PARAmeter:MINimum[:FREQUENCY]?

External LO Minimum Frequency Query

Function

This command queries Minimum Frequency set in External LO.

Query

```
:SYSTem:CONFigure:LOSCillator:PARAmeter:MINimum[:FREQUENCY]?
```

Response

```
<freq>
```

Parameter

<freq>	Minimum Frequency
Range	
Minimum	[MS2830A] 100 kHz [MS2690A/MS2691A/MS2692A] 125 MHz [External LO] 0 Hz
Maximum	[MS2830A-020] 3.6 GHz [MS2690A-020/MS2691A-020/ MS2692A-020/MS2830A-021] 6 GHz [External LO] 325 GHz
Suffix code	None. Value is returned in Hz units.

Example of Use

```
To query Minimum Frequency set in External LO.  
SYST:CONF:LOSC:PAR:MIN?  
> 100000000
```

Chapter 3 SCPI Status Register

This chapter describes the SCPI commands and the Status register for querying application statuses.

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3.1 Querying Measurement Status

:STATus:ERRor?

Measurement Status Query

Function

Queries the measurement status.

Query

:STATus:ERRor?

Response

<status>

Parameter

<status>	Measurement status	
Value	= bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7 + bit8 + bit9 + bit10 + bit11 + bit12 + bit13 + bit14 + bit15	
	bit0 : 2 ⁰ = 1	Not measured
	bit1 : 2 ¹ = 2	Exceeded the level.
	bit2 : 2 ² = 4	(Unused)
	bit3 : 2 ³ = 8	(Unused)
	bit4 : 2 ⁴ = 16	(Unused)
	bit5 : 2 ⁵ = 32	(Unused)
	bit6 : 2 ⁶ = 64	(Unused)
	bit7 : 2 ⁷ = 128	(Unused)
	bit8 : 2 ⁸ = 256	(Unused)
	bit9 : 2 ⁹ = 512	(Unused)
	bit10 : 2 ¹⁰ = 1024	(Unused)
	bit11 : 2 ¹¹ = 2048	(Unused)
	bit12 : 2 ¹² = 4096	(Unused)
	bit13 : 2 ¹³ = 8192	(Unused)
	bit14 : 2 ¹⁴ = 16384	(Unused)
	bit15 : 2 ¹⁵ = 32768	(Unused)
Range	0 to 65535	

Details

0 is returned when terminated normally.
This command is available only in SCPI mode.

Example of Use

To query the measurement status.
:STAT:ERR?
> 0

3.2 Questionable Status Register

Fig. 3.2-1, Table 3.2-1, Figure 3.2-2, and Table 3.2-2 show the layer structure of the Questionable Status register.

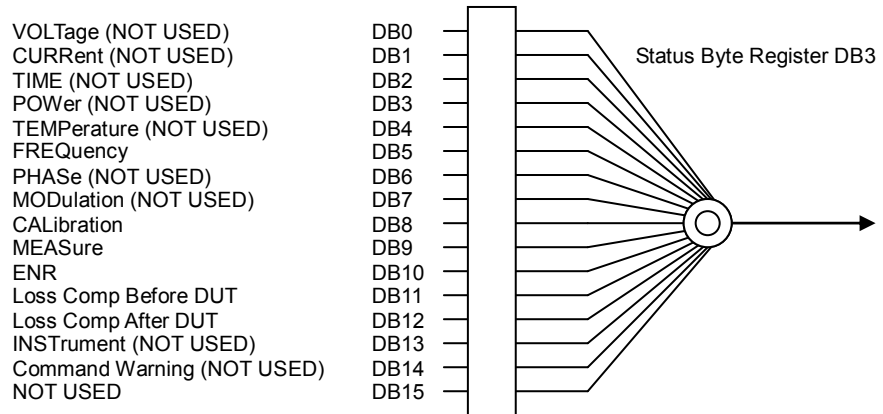


Figure 3.2-1 Questionable Status Register

Table 3.2-1 Bit Definition of Questionable Status Register

Bit	Definition
DB5	Unlock Reference Clock
DB8	NF Calibration Status UnCal
DB9	Questionable Measure Register Summary
DB10	Usage of ENR Status
DB11	Usage of Loss Comp Before DUT
DB12	Usage of Loss Comp After DUT

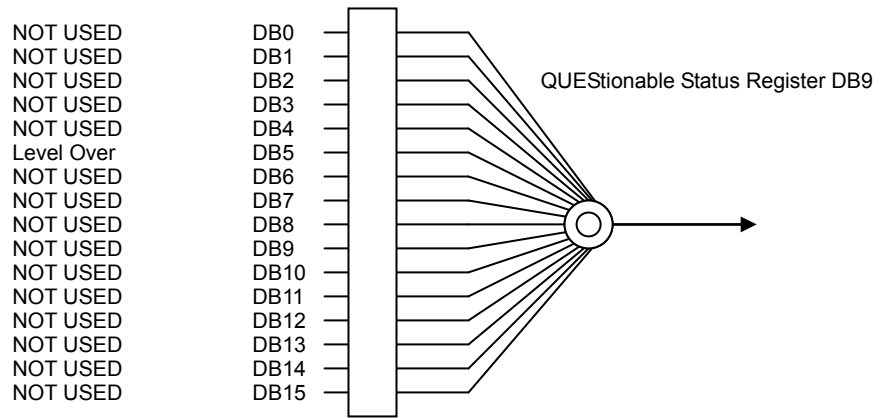


Figure 3.2-2 Questionable Measure Register

Table 3.2-2 Bit Definition of Questionable Measure Register

Bit	Definition
DB5	Indicates the level over occurrence.

Table 3.2-3 lists the device messages for the Questionable Status register.

These device messages are available only in SCPI mode.

Table 3.2-3 Device Messages for Questionable Status Register

Function	Device Message
Questionable Status Register Event	:STATus:QUESTionable[:EVENT]?
Questionable Status Register Condition	:STATus:QUESTionable:CONDition?
Questionable Status Register Enable	:STATus:QUESTionable:ENABle <integer>
	:STATus:QUESTionable:ENABle?
Questionable Status Register Negative Transition	:STATus:QUESTionable:NTRansition <integer>
	:STATus:QUESTionable:NTRansition?
Questionable Status Register Positive Transition	:STATus:QUESTionable:PTRansition <integer>
	:STATus:QUESTionable:PTRansition?
Questionable Measure Register Event	:STATus:QUESTionable:MEASure[:EVENT]?
Questionable Measure Register Condition	:STATus:QUESTionable:MEASure:CONDition?
Questionable Measure Register Enable	:STATus:QUESTionable:MEASure:ENABle <integer>
	:STATus:QUESTionable:MEASure:ENABle?
Questionable Measure Register Negative Transition	:STATus:QUESTionable:MEASure:NTRansition <integer>
	:STATus:QUESTionable:MEASure:NTRansition?
Questionable Measure Register Positive Transition	:STATus:QUESTionable:MEASure:PTRansition <integer>
	:STATus:QUESTionable:MEASure:PTRansition?



:STATus:QUESTionable[:EVENT]?

Questionable Status Register Event

Function

Queries the event register of the Questionable Status register.

Query

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

Response

```
<integer>
```

Parameter

<integer>	Byte summation of event register
Resolution	1
Range	0 to 65535

Example of Use

To query the contents of the event register of the Questionable Status register.

```
:STAT:QUES?  
> 0
```

:STATus:QUESTionable:CONDition?

Questionable Status Register Condition

Function

Queries the condition register of the Questionable Status register.

Query

```
:STATus:QUESTionable:CONDition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of condition register
Resolution	1
Range	0 to 65535

Example of Use

To query the content of the condition register of the Questionable Status register.

```
:STAT:QUES:COND?  
> 0
```

:STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function

Sets the event enable register of the Questionable Status register.

Command

`:STATus:QUEStionable:ENABle <integer>`

Parameter

<code><integer></code>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To set the event enable register of the Questionable Status Register to 16.

`:STAT:QUES:ENAB 16`**:STATus:QUEStionable:ENABle?**

Questionable Status Register Enable Query

Function

Queries the event enable register of the Questionable Status register.

Query

`:STATus:QUEStionable:ENABle?`

Response

`<integer>`

Parameter

<code><integer></code>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To query the event enable register of the Questionable Status Register.

`:STAT:QUES:ENAB?``> 16`

:STATus:QUEStionable:NTRansition <integer>

Questionable Status Register Negative Transition

Function

Sets the transition filter (negative transition) of the Questionable Status register.

Command

```
:STATus:QUEStionable:NTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (negative transition) of the Questionable Status register to 16.

```
:STAT:QUES:NTR 16
```

:STATus:QUEStionable:NTRansition?

Questionable Status Register Negative Transition Query

Function

Queries the transition filter (negative transition) of the Questionable Status register.

Query

```
:STATus:QUEStionable:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the Questionable Status register.

```
:STAT:QUES:NTR?  
> 16
```

:STATus:QUEStionable:PTRansition <integer>

Questionable Status Register Positive Transition

Function

Sets the transition filter (negative transition) of the Questionable Status register.

Command

```
:STATus:QUEStionable:PTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (positive transition) of the Questionable Status Register to 16.

```
:STAT:QUES:PTR 16
```

:STATus:QUEStionable:PTRansition?

Questionable Status Register Positive Transition Query

Function

Queries the transition filter (positive transition) of the Questionable Status Register.

Query

```
:STATus:QUEStionable:PTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the Questionable Status Register.

```
:STAT:QUES:PTR?
```

```
> 16
```

:STATus:QUESTionable:MEASure[:EVENT]?

Questionable Measure Register Event

Function

Queries the event register of the Questionable Measure Register.

Query

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

Response

```
<integer>
```

Parameter

<integer>	Byte summation of event register
Resolution	1
Range	0 to 65535

Example of Use

To query the content of the event register of the Questionable Measure Register.

```
:STAT:MEAS:QUES?  
> 0
```

:STATus:QUESTionable:MEASure:CONDition?

Questionable Measure Register Condition

Function

Queries the condition register of the Questionable Measure register.

Query

```
:STATus:QUESTionable:CONDition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of condition register
Resolution	1
Range	0 to 65535

Example of Use

To query the content of the condition register of the Questionable Measure register.

```
:STAT:QUES:MEAS:COND?  
> 0
```


:STATus:QUESTionable:MEASure:ENABle <integer>

Questionable Measure Register Enable

Function

Sets the event enable register of the Questionable Measure register.

Command

`:STATus:QUESTionable:ENABle <integer>`

Parameter

<code><integer></code>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To set the event enable register of the Questionable Measure register to 16.

`:STAT:QUES:MEAS:ENAB 16`**:STATus:QUESTionable:MEASure:ENABle?**

Questionable Measure Register Enable Query

Function

Queries the event enable register of the Questionable Measure register.

Query

`:STATus:QUESTionable:ENABle?`

Response

`<integer>`

Parameter

<code><integer></code>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To query the event enable register of the Questionable Measure Register.

`:STAT:QUES:MEAS:ENAB?``> 16`

:STATus:QUEStionable:MEASure:NTRansition <integer>

Questionable Measure Register Negative Transition

Function

Sets the transition filter (negative transition) of the Questionable Measure register.

Command

```
:STATus:QUEStionable:NTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (negative transition) of the Questionable Measure register to 16.

```
:STAT:QUES:MEAS:NTR 16
```

:STATus:QUEStionable:MEASure:NTRansition?

Questionable Measure Register Negative Transition Query

Function

Queries the transition filter (negative transition) of the Questionable Measure register.

Query

```
:STATus:QUEStionable:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the Questionable Measure register.

```
:STAT:QUES:MEAS:NTR?  
> 16
```

:STATus:QUEStionable:MEASure:PTRansition <integer>

Questionable Measure Register Positive Transition

Function

Sets the transition filter (positive transition) of the Questionable Measure register.

Command

```
:STATus:QUEStionable:PTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (positive transition) of the Questionable Measure register to 16.

```
:STAT:QUES:MEAS:PTR 16
```

:STATus:QUEStionable:MEASure:PTRansition?

Questionable Measure Register Positive Transition Query

Function

Queries the transition filter (positive transition) of the Questionable Measure register.

Query

```
:STATus:QUEStionable:PTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the Questionable Measure register.

```
:STAT:QUES:MEAS:PTR?
```

```
> 16
```

3.3 Operation Status: Register

Figure 3.3-1 and Table 3.3-1 show the layer structure of the Operation Status register.

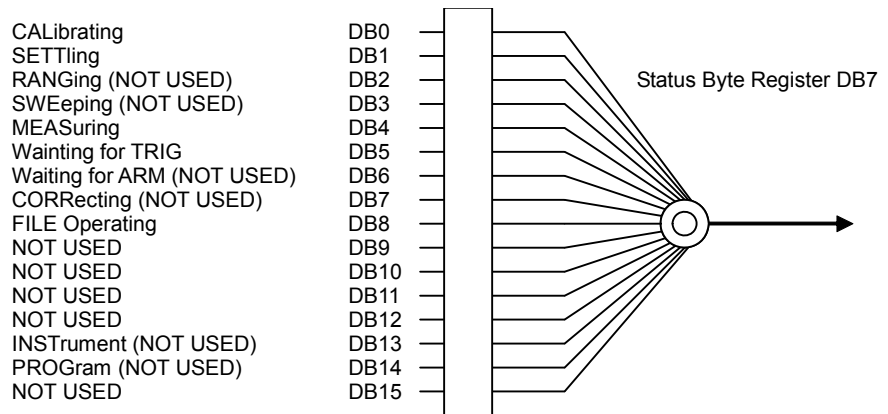


Figure 3.3-1 Operation Status Register

Table 3.3-1 Bit Definition of Operation Status Register

Bit	Definition
DB0	Executing CAL
DB1	Displaying Warm Up
DB4	Analyzing
DB5	Waiting for trigger
DB8	Manipulating file

Table 3.3-2 lists the device messages for the Operation Status register.

These device messages are available only in SCPI mode.

Table 3.3-2 Device Messages for Operation Status Register

Function	Device Message
Operation Status Register Event	:STATus:OPERation[:EVENT]?
Operation Status Register Condition	:STATus:OPERation:CONDition?
Operation Status Register Enable	:STATus:OPERation:ENABle <integer>
	:STATus:OPERation:ENABle?
Operation Status Register Negative Transition	:STATus:OPERation:NTRansition <integer>
	:STATus:OPERation:NTRansition?
Operation Status Register Positive Transition	:STATus:OPERation:PTRansition <integer>
	:STATus:OPERation:PTRansition?

:STATus:OPERation[:EVENT]?

Operation Status Register Event

Function

Queries the event register of the Operation Status register.

Query

`:STATus:OPERation[:EVENT]?`

Response

`<integer>`

Parameter

<code><integer></code>	Byte summation of event register
Resolution	1
Range	0 to 65535

Example of Use

To query the content of the event register of Operation Status register.

```

:STAT:OPER?
> 0

```

:STATus:OPERation:CONDition?

Operation Status Register Condition

Function

Queries the condition register of the Operation Status Register.

Query

`:STATus:OPERation:CONDition?`

Response

`<integer>`

Parameter

<code><integer></code>	Byte summation of condition register
Resolution	1
Range	0 to 65535

Example of Use

To query the content of the condition register of the Operation Status register.

```

:STAT:OPER:COND?
> 0

```

:STATus:OPERation:ENABLE <integer>

Operation Status Register Enable

Function

Sets the event enable register of the Operation Status register.

Command

```
:STATus:OPERation:ENABLE <integer>
```

Parameter

<integer>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To set the event enable register of the Operation Status register to 16.

```
:STAT:OPER:ENAB 16
```

:STATus:OPERation:ENABLE?

Operation Status Register Enable Query

Function

Queries the event enable register of the Operation Status register.

Query

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

Response

```
<integer>
```

Parameter

<integer>	Byte summation of event enable register
Resolution	1
Range	0 to 65535

Example of Use

To query the event enable register of the Operation Status register.

```
:STAT:OPER:ENAB?
```

```
> 16
```

:STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function

Sets the transition filter (negative transition) of the Operation Status register.

Command

```
:STATus:OPERation:NTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (negative transition) of the Operation Status register to 16.

```
:STAT:OPER:NTR 16
```

:STATus:OPERation:NTRansition?

Operation Status Register Negative Transition Query

Function

Queries the transition filter (negative transition) of the Operation Status register.

Query

```
:STATus:OPERation:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (negative transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the Operation Status register.

```
:STAT:OPER:NTR?
> 16
```

:STATus:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function

Sets the transition filter (positive transition) of the Operation Status register.

Command

```
:STATus:OPERation:PTRansition <integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To set the transition filter (positive transition) of the Operation Status register to 16.

```
:STAT:OPER:PTR 16
```

:STATus:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function

Queries the transition filter (positive transition) of the Operation Status register.

Query

```
:STATus:OPERation:PTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Byte summation of transition filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the Operation Status register.

```
:STAT:OPER:PTR?  
> 16
```


3.4 Utility

Table 3.4-1 lists the device messages for the Utility .

Table 3.4-1 Device Messages for Utility

Function	Device Message
Erase Warm Up Message	:DISPlay:ANNotation:WUP:ERASe
Display Title	:DISPlay:ANNotation:TITLe[:STATe] OFF ON 0 1
	:DISPlay:ANNotation:TITLe[:STATe]?
Title Entry	:DISPlay:ANNotation:TITLe:DATA <string>
	:DISPlay:ANNotation:TITLe:DATA?

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SCPI Status Register

:DISPlay:ANNotation:WUP:ERASe

Erase Warm Up Message

Function

Erases the warm-up message displayed immediately after startup.

Command

:DISPlay:ANNotation:WUP:ERASe

Example of Use

To query the transition filter (positive transition) of the Operation Status register.

:DISP:ANN:WUP:ERAS

:DISPlay:ANNotation:TITLe[:STATe] OFF|ON|0|1

Display Title

Function

Turns the title display on/off.

Command

```
:DISPlay:ANNotation:TITLe[:STATe] <switch>
```

Parameter

<switch>	Title display On/Off
OFF 0	Off
ON 1	On (Default)

Example of Use

To display the title.
:DISP:ANN:TITL ON

:DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function

Queries whether the title display is enabled/disabled.

Query

```
:STATus:OPERation:PTRansition?
```

Response

```
<switch>
```

Parameter

<switch>	Title display On/Off
0	Off
1	On

Example of Use

To query the title display On/Off state.
:DISP:ANN:TITL
> 1

:DISPlay:ANNotation:TITLe:DATA <string>

Title Entry

Function

Sets the title character string.

Command

`:DISPlay:ANNotation:TITLe:DATA <string>`

Parameter

`<string>` Character string within 32 characters enclosed by double quotes (" ") or single quotes ('')

Example of Use

To set the title character string 'TEST'.

`:DISP:ANN:TITL:DATA 'TEST'`**:DISPlay:ANNotation:TITLe:DATA?**

Title Entry Query

Function

Queries the title character string.

Query

`:DISPlay:ANNotation:TITLe:DATA?`

Response

`<string>`

Parameter

`<string>` Character string within 32 characters enclosed by double quotes (" ") or single quotes ('')

Example of Use

To query the title character string.

`:DISP:ANN:TITL:DATA?``> TEST`

